



STAR HERO

James Cambias & Steven S. Long

STAR HERO

**STAR HERO • Science Fiction Roleplaying Using
The HERO SYSTEM**

Authors: James Cambias, Steven S. Long

Editing & Development: Steven S. Long

Layout and Graphic Design: Andy Mathews

Cover: Jason Engle

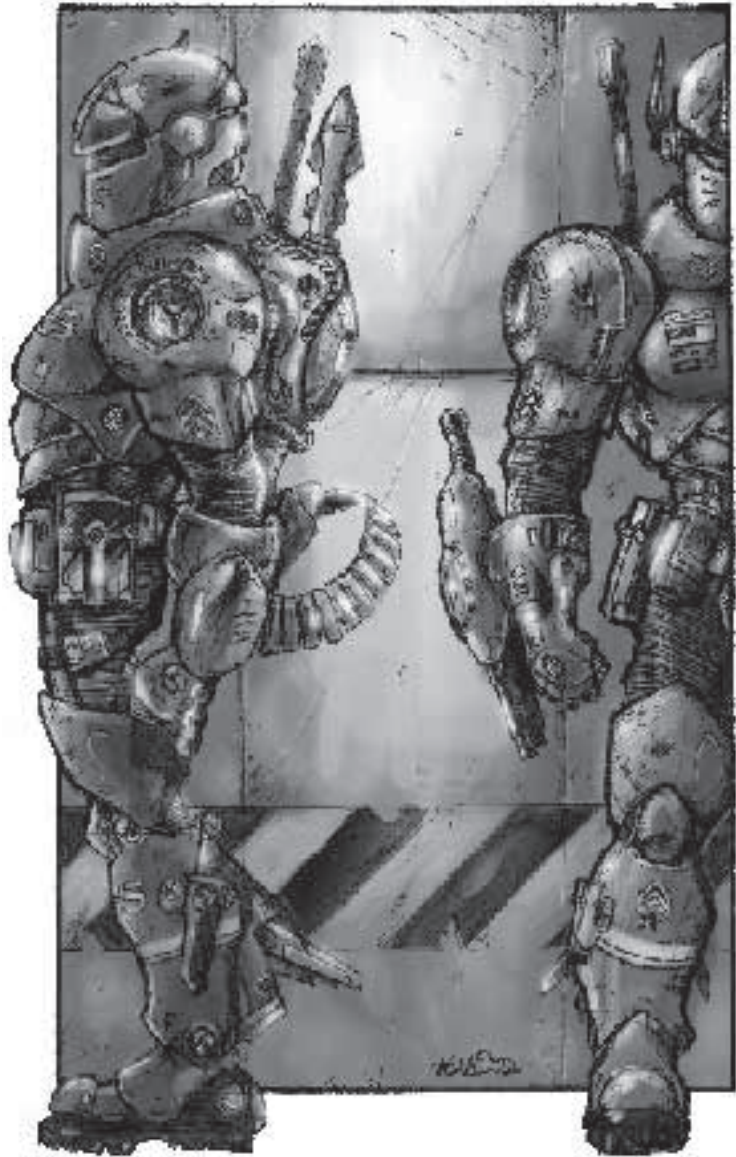
Interior Artwork: Storn Cook, Andrew
Cremeans, Keith Curtis, Malcolm Harrison, Jeff
Hebert, Bryce Nakawaga, Brad Nault, Klaus Sch-
erwinski, Greg Smith, and Chris Stevens. Photos
courtesy NASA/JPL/Cal Tech.

A WORD OR TWO OF APPRECIATION

Jim dedicates this book to Dr. Diane A. Kelly, his favorite
scientific advisor.

The Hero staff dedicates this book to RJM Hughes, one of
our fans, who passed away in August 2002. His presence on
our message boards will be missed.

Special Thanks: We'd like to offer our special thanks to the
Digital Hero playtesters and testreaders who reviewed the
Star Hero manuscript, spotted typos, checked the math,
offered suggestions and ideas, and generally helped to
make this book even better than it would have been. Spe-
cial thanks also goes to the fans who participated in mes-
sage board and mailing list discussions of what *Star Hero*
should be, and what its contents should include; it's always
great to have the help of enthusiastic fans!



HERO System™ ® is DOJ, Inc.'s trademark for its roleplaying system.

HERO System © 1984, 1989, 2002 by DOJ, Inc. d/b/a Hero Games. All rights reserved.

Conquerors, Killers, And Crooks © 2002 by DOJ, Inc. d/b/a Hero Games.

All rights reserved.

Champions © 1984, 1989, 2002 by DOJ, Inc. d/b/a Hero Games. All rights reserved.

Justice Inc., Danger International, Dark Champions, Fantasy Hero, Pulp Hero, and

Star Hero © 2002 by DOJ, Inc. d/b/a Hero Games. All rights reserved.

No part of this book may be reproduced or transmitted in any form or by any means,
electronic or mechanical, including photocopying, recording, or computerization, or by
any information storage and retrieval system, without permission in writing from the
Publisher: DOJ, Inc., 1 Haight Street, Suite A, San Francisco, California 94102.
Printed in the U.S.A. First printing November 2002.

Produced and distributed by DOJ, Inc. d/b/a Hero Games.

Stock Number: DOJHERO300

ISBN Number: 1-58366-007-0

<http://www.herogames.com>

TABLE OF CONTENTS

Introduction

Introduction	5

The Genre

Science Fiction Subgenres	8

Apocalypse/Post-Apocalypse	8

Cyberpunk	8
Earthbound Science Fiction	9
Hard Science Fiction	9
Low Science Fiction	10
Military Science Fiction	10
Planetary Romance	10
Retro-SF	11
Space Opera	12
Time Travel	12
Utopias and Dystopias	13
Science Fiction Elements and Features	14

Cross-Fertilization: Metagenres in SF	17

Comedy	17
Horror	17
Mystery	18
Romance	18
Satire and Social Commentary	18
Tragedy	19

Star Hero and Other Genres	20

Champions	20
Dark Champions	20
Fantasy Hero	20
Pulp Hero	21
Western Hero	21
Other Eras	21

Character Creation

Racial Package Deals	23

Species Package Deals	23
Environmental Package Deals	28

Professional Package Deals	33

Character Creation	39

Characteristics	39
Skills	39
Perks	48
Talents	50
Powers	52
Power Advantages	59
Power Limitations	61
Disadvantages	61

The Universe, Part One

Galaxies	67

The Milky Way	67
Other Galaxies	69
Globular Clusters	69

Star Sectors	70

Stellar Cartography	70
Interstellar Phenomena And Dangers	71

Stars	73

Star System Types	73
Orbital Separation	73
Star Types	74
Exotic Objects	75
Sample Sector	78

The Universe, Part Two

Planetary Systems	80

Orbital Distance	80
System Zones	80
System Anomalies	81

Planets	82

Orbital Effects	82
Mass	82
Moons	84
Planetary Rotation	85
Atmosphere	86
Climate	88

Life	90

Exotic Life	90
Complexity	91
Intelligent Life	91

Surface	92

Hydrosphere	92
Dominant Terrain	92
Resources	93

Other Objects	95

Asteroids	95
Comets	96
Space Habitats	96
Megastructures	97

The Universe, Part Three

Earth's Solar System	100

The Sun	100
The Planets	100
Mercury	100

Venus	101
The Moon	101
Mars	102
The Asteroids	103
Jupiter	104
Saturn	105
Uranus	105
Neptune	106
Pluto	106
The Kuiper Belt	107
The Oort Cloud	107
Beyond Sol	107
Nearby Stars	107
Further Afield	108

Civilizations

Future Worlds	110

Utopia	110
Bigger Tailfins	110
Cultural Stereotypes	111
Cultural Fusion	111
Dystopia	112
Post-Apocalypse	112

Creating Alien Species	115

Alien Archetypes	115
Alien Bodies, Alien Minds	116
Creating Player Character Species ...	119
Package Deal Components	120
Alien Species As NPCs	122

Alien Civilization	124

Technology	124
Population	124
Economics	127
Government	131
The Basics Of Government	131
Interstellar Governments	133
Agencies	134
Languages	138
Diversity	139
Culture	139

Technology

Technology In The Campaign	142

Technology Levels	142
Tech Scales	142
Creating A Tech Scale	142
Alternate Tech Paths	143
Varying Tech Paths	143
Obsolete And Advanced Technology	143
Alien Technology	144

TABLE OF CONTENTS

Prime Directives And Quarantines	145	Space Stations and Starbases.....	208	Terran Empire	252
Technology Improvements	145	Space Station Types	208	Example Psionic Powers.....	254
Rubber Science	146	Size	208		
Weapons And Defenses	148	Location.....	210	The GM	
Melee Weapons	148	Equipment	210	Creating A Campaign	259
Ranged Weapons.....	148	Space Combat	212	Campaign Theme	259
Defenses.....	155	Actions In Starship Combat	212	Campaign Types	259
Military Technology	158	Starship Combat Movement		Subgenre	259
Other Technology	160	And Maneuvers	214	Campaign Subject	262
Computers	160	Movement Basics	214	Setting	265
Robots	165	Realistic Movement	215	Running The Game	267
Biotechnology.....	168	Dramatic Movement	215	Adventure Structure	267
Nanotechnology.....	169	Attacking And Defending.....	216	Plotting	268
Power And Energy Technology	171	Sensor Locks	216	Dealing With Disconnects.....	270
Teleportation	173	Combat Modifiers	216	Disadvantages And How To Use	
Miscellaneous Equipment.....	174	Combat Maneuvers	216	Them.....	273
Survival Devices	174	Damage And Its Effects.....	217	The Star Hero Environment	276
Medical Devices	175	Other Actions In Combat	220	Albedo	276
Communications And Sensor		Example Vehicles.....	222	Gravity	276
Devices	175			Zero Gravity	280
Tools	176	Time Travel		Vacuum	281
Acquiring Equipment	177	Temporal Mechanics And		Atmospheres.....	283
Starships and Space Stations		Consequences.....	233	Explosive Decompression.....	285
Starship Creation	180	Real-Life Mechanics	233	Villains And NPCs.....	287
General Starship Considerations ...	180	Game Mechanics.....	233	Villain Archetypes	289
A Brief History Of Human		Expanded Time Travel Rules	233	Non-Player Characters.....	292
Space Travel	180	Methods And Effects.....	235	NPC Archetypes	293
Space Vehicle Types	181	Options	237		
Obtaining A Space Vehicle.....	182	Paradoxes And Complications.....	238	Characters	
Basic Spacecraft Design	183	Fixed History	238	Argos Exploration	296
Power Systems.....	184	Mutable History	238	Robert Avilla	297
Propulsion Systems	185	Time Travel Campaigns.....	239	Jennifer Degraff.....	299
Acceleration.....	185	Alternate Histories	240	Jason Grigori.....	301
Normal Propulsion	188	Psionics		Segaro Krez'shul.....	302
Faster-Than-Light Propulsion	190	Psionic Considerations	243	Kiritha Tal	304
Weapon Systems.....	194	The Basics	243	Villains	306
Missiles	195	How They Do It.....	243	Major Allyssa Barth	306
Beam Weapons	195	Power Level	243	Bertrand Devereaux	308
Guns	196	Available Powers	244	Dargen.....	310
Defenses.....	197	Rarity.....	246	Ghenak Vaa'resh	311
Operations Systems	200	Social Issues.....	246	Zee'gansh.....	313
Personnel Systems	202	Rules Considerations	249	Generic NPCs	314
Disadvantages.....	204	Psionic Campaigns	251	Bibliography And Filmography	317
Planetary Vehicles And Mecha.....	205	Campaign Types	251	Index.....	319
Hovercraft	205	Example: Psionics In The		Notes	323
Mecha	205				

INTRODUCTION



Ever since the australopithecines first looked up and saw the glittering lights in the nighttime sky, humans have been fascinated by space, the vastness of space, with its equally vast possibilities for other worlds, other forms of life, and even other people like ourselves, has held a special place in our minds that nothing has ever dispelled.

With the coming of the technological revolutions of the twentieth century, which made travel to the Moon and into near space possible, interest in science fiction broadened and deepened. Thousands of stories, novels, movies, and television shows featuring the bizarre aliens, almost magical devices, and powerful starships of “SF” became a part not only of American, but world, culture. Franchises such as *Star Trek*, *Star Wars*, and *Doctor Who* became icons, known to billions of people around the planet.

It's only natural that gamers, many of whom were interested in science fiction long before they learned what roleplaying games were, would want to simulate the characters and adventures of SF in their campaigns. Some of the earliest RPGs were science fiction games, and numbered among them are many of the most popular games in the history of the hobby.

Given the interest in science fiction gaming, it's only appropriate that the *HERO System*, a set of rules unmatched in its flexibility and adaptability to multiple genres, have a genre book devoted to the infinite opportunities for adven-

ture the SF genre affords. *Star Hero* is a set of rules, guidelines, and advice you can use to run gaming campaigns in the style of your favorite science fiction. Like Hero's other *genre books*, you can think of it as a sort of “instruction manual” that shows you how to use the *HERO System 5th Edition* “toolkit” to create the best, most interesting characters and campaigns possible.

HOW TO USE THIS BOOK

Star Hero is designed both for players experienced with SF roleplaying and those who are new to this style and genre of play. Nothing in these pages is secret or for the GM's eyes only, so every reader can read it all the way through and then decide which portions he wants to utilize.

Chapter One, *Starships, Spacemen, And Bug-Eyed Aliens: The Science Fiction Genre*, describes the major subgenres of SF — Hard SF, Military SF, Space Opera, and so on — with notes about how to simulate them in *HERO System* campaigns. It also discusses common genre elements and “bits” (such as aliens, hyperspace, and robots), and applying “meta-genres” such as comedy, horror, or romance.

Chapter Two, *Citizens Of The Galaxy: Character Creation*, covers the subject of creating *Star Hero* characters. It contains dozens of Species and Professional Package Deals, and a thorough review of the Skills, Powers, and other elements of the *HERO System* as they pertain to science fiction PCs.

Chapters Three through Five are a brief tour through the wonders of astronomy as they relate to science fiction gaming. If you want to know how to create your own galaxies, star systems, and planets for your *Star Hero* campaign, these chapters show you how — and provide random generation tables for your use. Chapter Five looks at Earth's solar system, both as an example system and as a possible setting for many SF games.

Chapter Six discusses alien life and alien civilizations. Aliens are one of the most common and important elements of SF, and this section of the book shows you how to create intriguing, plausible, and just plain fun alien species and societies for your *Star Hero* games. Again, there are random generation tables if you want to use them.

Chapter Seven, *Computers, Blasters, And Robots: Technology*, delves into the all-important subject of technology in *Star Hero*. It starts with general concerns — how to establish a “tech level” system

“SF”

To avoid cluttering the text too much, this book often uses the abbreviation “SF” for “science fiction.” Another common abbreviation, FTL, stands for “faster-than-light” (similarly, STL is “slower-than-light”).



for your game, how different species's technologies might interact — and progresses to a review of the major categories of technology found in science fiction, with dozens of examples. The chapter also includes a section on acquiring technology and establishing prices for it.

Chapter Eight, *To Soar Among The Stars: Starships And Space Stations*, covers both those subjects and ground vehicles such as hovercraft and mecha. In addition to detailed rules for creating spacecraft and the like, it has an extensive section of rules for starship combat.

Chapter Nine, *Yesterday, Today, And Tomorrow: Time Travel*, looks at the intriguing subject of traveling through time. It discusses theories on how time travel might work, possible methods, the perils and pitfalls of influencing the time-stream, and how to set up a "Time Hero" time travel campaign.

Chapter Ten, *The Powers Of The Mind: Psionics*, discusses the nature and role of mental powers in science fiction generally, and *Star Hero* campaigns in particular. It reviews the types of powers psis tend to possess, their role in society and the campaign, and other relevant factors. It includes a look at how to build psionic powers with the right "flavor" for SF games, with plenty of sample powers to get you started.

Chapter Eleven, *A Journey Into The Unknown: Game-mastering Star Hero*, offers suggestions and ideas for creating and running *Star Hero* campaigns. It includes information and rules about common SF environments, such as high and low gravity, unusual atmospheres, and the like.

Chapter Twelve, *Argos Exploration*, contains some sample characters from Hero's "Terran Empire" setting — five heroes and five adversaries. You can use these as starting characters for your own players, or simply as examples of ways to build *Star Hero* PCs. The chapter also has some "generic" NPC writeups GMs can use.

The book closes with a bibliography of the authors' favorite science fiction, and other books of use to *Star Hero* gamers.

So, get your blaster and your energy sword, strap into the pilot's seat, and get ready to fly out amongst the stars. It's time for *Star Hero* adventure!

SCIENCE!

More so than most games, science fiction RPG campaigns have to pay at least some attention to scientific reality. You need a certain amount of verisimilitude, even if it's just to create realistic-sounding technobabble, to preserve the feel of the genre. If the GM starts talking about purple stars, or gives the wrong size for the Milky Way Galaxy, the obvious scientific errors may taint players' enjoyment of the game.

That being said, roleplaying games are ultimately about fun and adventure, not scientific accuracy. Except for the hardest of Hard SF settings and campaigns, a little fudging of the facts or a few

minor mistakes shouldn't cause any trouble. Don't spend so much time worrying about scientific reality that the game suffers because of it.

Star Hero strives to present just the right level of scientific realism for good gaming — enough that players and GMs don't make ludicrous errors, but not so much that the players need astronomy textbooks to figure out what's going on or start to question the existence of FTL drives. Throughout this book, you'll find plenty of suggestions and ideas on when, and when not, to use "real science." Where necessary, the book presents rules for simulating "realistic" activity, but in some cases those rules are slightly tweaked or fudged to make them easier to use in play. If you know enough to spot the technical inaccuracies, and to be bothered by them, you probably know enough to fix them for yourself.

For example, beginning on page 185, you'll find rules for "realistic" acceleration and movement in space. While these rules are a lot more realistic than the standard HERO System movement rules, they're still not truly "realistic." A truly realistic movement system would involve acceleration per Segment per Segment, requiring 720" of movement per Turn to achieve 1 G of acceleration. That's reaching the point where there's too much work involved; it begins to slow down and hinder the flow of the game. If you really want that level of detail, you can make the necessary changes to the rules, but the average gamer does just fine with the "more realistic, but not totally realistic" system.

Another good example of stressing playability over "realism" can be found in the rules for gravity. The rules on page 278 set a rate of 5 STR Telekinesis to equal one gravity (1 G) worth of "pull" (an arithmetic progression), even though the lifting capacity of STR doubles for every 5 points (a geometric progression). This works better for gaming because it's easy to remember, allows for a fairly broad range of effects for gravitic weapons, and works more like a Grab would when it comes to determining how characters cope with high gravity. But it's easily changed if the GM prefers more "realism."

On a related point, the results provided by the random tables in Chapters Three through Six should be taken as guidelines. No random system can account for every variable in the galaxy, so if you find the outcome not agreeing with what you want, make whatever adjustments you need.

This book was written in early-mid 2002, and the scientific facts it presents reflect what was known to astronomers as of about that time. Since new discoveries are being made every day, it's entirely possible that scientists' views of the universe will change after this book is printed. But the odds are, if you're aware of the differences, you also know enough to account for them in your game in a logical yet fun way.



The Genre

STARSHIPS, SPACEMEN, AND BUG-EYED ALIENS

There are probably as many definitions of science fiction as there are readers and writers of it. The author and critic Damon Knight once famously defined it as “Whatever we’re pointing to when we say, ‘that’s science fiction.’” It occupies the uneasy ground between pure fantasy and pure realism. In general, the fantastic elements in a science fiction story are at least possible — justified (however tenuously) by scientific plau-

sibility. Often this means little more than abundant use of “technobabble,” but even then the principle holds: the appeal is to science, however unlikely or bogus, rather than magic or the supernatural. Since *Star Hero* is a roleplaying game, not a critical study of science fiction as a genre, this chapter tends more towards Damon Knight’s definition, including material on space opera, science fantasy, and crossovers with other genres.

SCIENCE FICTION SUBGENRES



COZY CATASTROPHES

Not all apocalypses are created equal. Some devastate the Earth, while others conveniently kill off the Human race but leave everything intact. *Day Of The Triffids* and *The Stand* both managed to get rid of Humanity without much large-scale destruction. For the lucky few survivors, the result is a consumer's paradise: all the goods and luxuries of modern society are just lying around to be picked up. There may still be cannibal motorcycle bandits to contend with, but it's much more fun to battle them in an expensive car.

The work of rebuilding society is much easier if the catastrophe is a cozy one; just figure out how to get the power plant running and you're in business. Consequently, cozy catastrophe stories tend to focus on struggles among the survivors about what sort of new society to create.

The term "science fiction" is broad, encompassing many different types of stories, characters, and settings. In the course of almost a century as an identifiable genre, science fiction has spawned dozens of popular subgenres. Some of them are important enough to rate their own sourcebooks (like *Cyber Hero*). The boundaries between them are sometimes fuzzy, and many films, stories, or roleplaying campaigns fit into two or more subgenres at once. (For more on running games in each of the subgenres, see Chapter Eleven.)

APOCALYPSE AND POST-APOCALYPSE

While science fiction is usually described as an optimistic genre, it's full of stories about the collapse of civilization. The causes of the collapse are various: plagues which depopulate the Earth (as in Mary Shelley's *The Last Man* or Stephen King's *The Stand*), endless warfare (in H.G. Wells's *Things To Come*), nuclear war (*The Road Warrior*, Paul O. Williams's "Pelbar Cycle," Piers Anthony's *Battlecircle*, and countless others), asteroid impacts (*Lucifer's Hammer*, by Niven and Pournelle), mass blindness (in John Wyndham's *Day Of The Triffids*), a new Ice Age (the film *Quintet*), shoddy software (remember the "Y2K bug"?), global warming (*Waterworld* or John Barnes's *Mother Of Storms*), and even the literal Apocalypse (in the *Left Behind* series of Christian thrillers).

The great appeal of *The End Of The World As We Know It* is that all the irritating restrictions and complications of modern life are swept away and replaced by others more conducive to "adventure." Instead of battling traffic to get to work on time, the survivors battle each other to survive. Impersonal threats like inflation are replaced by personal, immediate problems like cannibal motorcycle gangs. The level of destruction is secondary to the complete absence of any authority. People are totally free, and what they choose to do with that freedom drives the story. Some writers use the apocalypse as a way to sweep away the corrupt old world and allow for the creation of a Utopia; others use the post-apocalypse setting as a venue for action-adventure.

Apocalyptic SF generally divides into stories which focus on the big disaster itself, and those which pick up the story generations or centuries later in the new societies which have grown up (what SF fans and gamers generally refer to as the "post-apocalyptic" subgenre). The latter type shades

into the Planetary Romance subgenre, with Earth as the unknown world dotted with strange societies. (A few save the revelation that the planet is Earth for the Big Surprise Ending, as in the original *Planet of the Apes*.) Tales of surviving the apocalypse and its aftermath can delve into the minutiae of rebuilding civilization, or just center on blowing away cannibal motorcyclists.

APOCALYPTIC/POST-APOCALYPTIC STAR HERO CAMPAIGNS

"Post-Apocalyptic Hero" games (and the "Apocalypse Hero" campaigns that may very well precede them) usually involve Standard Heroic PCs built on 75 Base Points + 75 Disadvantages. If the GM wants to throw in a weird twist, such as the existence of magic or the supernatural, he may prefer Powerful or Very Powerful Heroic characters instead.

CYBERPUNK

Cyberpunk science fiction became popular in the 1980s, with the appearance of William Gibson's novel *Neuromancer* and the Ridley Scott film *Blade Runner*. The name tells what makes it distinctive. "Cyber" reflects the growing fascination with computer networks, virtual reality, and the accelerating pace of technological change in the modern world and the near future. "Punk" indicates a focus on the seamier side of a world transformed by technology.

Typically, Cyberpunk stories are set on or near Earth in the near future, but study or reflect the effects of rapid change and the possibilities of melding Humans and machines. The feel is gritty, urban, multicultural, and rebellious — characters are often outlaws battling large, impersonal corporations. The archetypical Cyberpunk character is the "cyberspace cowboy" — an elite hacker trained to outwit sophisticated and deadly countermeasures as he navigates the data networks to steal valuable information. Cybered drivers/pilots, as depicted in such works as Walter Jon Williams's *Hardwired*, are a variant on the hacker. The "samurai" (a heavily-cybered warrior with an attitude often as lethal as his weaponry) is also popular; Gibson's Molly Millions epitomizes this sort of character.

Cyberpunk is sufficiently successful as a subgenre to spin off a couple of daughter types of its own: "biopunk" and "nanopunk" keep the rebellious tone and urban setting, but shift the focus from computer piracy and glittering mechanical implants to "gene hacking" and Humanity altered by genetic engineering or nanotechnology.

CYBERPUNK CAMPAIGNS

Cyber Hero games are Heroic campaigns. The PCs are most often Standard Heroic characters, with 75 Base Points + 75 Disadvantage points. However, cyberpunk characters are often quite powerful, combining high Skill rolls with various special abilities produced by artificial enhancements. Therefore, the GM may want to consider making them Powerful or Very Powerful Heroic characters, particularly if he prefers for the PCs to buy cyberware with Character Points instead of getting it for free.

See the *Cyborgs* sidebar, page 28, for more information on cyberware, and the *Cyberspace* section, page 162, for details on the virtual world of the 'Net.

EARTHBOUND SCIENCE FICTION

Though space travel remains the iconic image of science fiction, it's worth remembering that many of the early masters of the genre did quite well with stories set entirely on Earth. Earthbound science fiction usually focuses more on changes to Human society rather than interactions with alien beings. The time period tends to be modern-day or near-future, although some more pessimistic writers have examined how Human civilization might develop if space travel never becomes practical.

Just because a story is set on Earth doesn't mean it can't involve fantastic and exotic cultures or events. A perennial favorite of pulp-era stories was the Lost World — a remote or isolated region where strange beings and stranger societies can develop. The arrival of aerial mapping and satellite photography drove most lost world stories off to other planets, but they still have a place in Pulp-style or Victorian adventures. Gamemasters who want to put a Lost World in a modern or near-future setting need to do some fancy handwaving to explain how it has remained undiscovered.

Similarly, just because the story's limited to Earth doesn't mean it can't involve aliens — they just have to come to the PCs, instead of the PCs going to them. They might be invaders (as in H.G. Wells's *The War Of The Worlds*), mysterious grey-skinned beings who want to harvest Humans for their own inscrutable purposes, or simply visitors interested in seeing Earth's "tourist attractions" who happen to bring adventure with them. Alternately, the "aliens" could be an altered, or newly-intelligent, form of Earth life, such as the insectile beings of Frank Herbert's *Hellstrom's Hive* or *The Green Brain*.

EARTHBOUND STAR HERO CAMPAIGNS

Earthbound *Star Hero* games are Heroic campaigns, with Standard Heroic PCs built on 75 Base Points + 75 Disadvantage points. Typically the PCs' access to the fantastic technology so common to other forms of science fiction is limited, though they may, as in the movie *Men In Black*, have access to technology brought to Earth by alien species.



HARD SCIENCE FICTION

Hard SF emphasizes scientific and technical accuracy, sometimes at the expense of character development and plot (though the best Hard SF combines both technical and dramatic aspects without detracting from either). The great appeal of a Hard SF story is that the events and technology depicted are, theoretically, really possible, at least at some point in mankind's development. In many such settings, not even that most common staple of science fiction, faster-than-light travel, exists, though some otherwise Hard SF stories do have FTL ships because they're such a useful enabling device.

Hard SF's focus on technical matters and scientific phenomena often means the stories concern the exploits of inventors and engineers dealing with unforeseen problems in hostile environments. Conflicts in Hard SF stories are as frequently resolved with a little-known piece of real science as with fisticuffs and blaster fire. Many are, in essence, mystery stories where the resolution of the dilemma depends not on the characters' detective work, but on their scientific and engineering acumen.

SURREALISTIC SCIENCE FICTION

At its most speculative, science fiction can question the very nature (or existence) of reality itself. What if everything we see is a dream, or an illusion? What if everything we remember is a lie? Philip K. Dick (*Do Androids Dream of Electric Sheep?*, which became the film *Blade Runner*) is perhaps the best-known surrealist science fiction writer, but even arch-Hard SF author Robert Heinlein managed stories like “Them” and “The Unpleasant Profession of Jonathan Hoag.” Questions about the nature of reality turn up with surprising regularity in films and television.

The chief feature of surrealist SF is simply that Things Are Not As They Seem. The memories, perceptions and identities of the characters can all be false. Naturally, this can be overdone: if everything is arbitrary and mutable, it's hard for the reader or the player to care about what happens.

Running a wholly surrealist *Star Hero* campaign probably isn't practical, but GMs could certainly inject an occasional surrealist story into otherwise normal campaigns. An RPG also opens up the interesting possibility of running two parallel campaigns, each of which is a work of fiction in the other. The heroes in the Cyberpunk setting venture into a virtual reality parlor and enter the Space Opera campaign. But the Space Opera characters are playing a “psionic novel” set in the Cyberpunk world. Which world is the “real” one?

HARD SCIENCE FICTION *STAR HERO* CAMPAIGNS

Hard SF *Star Hero* games are, at best, Standard Heroic campaigns, with PCs built on 75 Base Points + 75 Disadvantage points. Many use even lower point totals, such as 75 + 50 — characters' non-scientific abilities are often quite low, so that they have to think their way out of dilemmas.

LOW SCIENCE FICTION

Low Science Fiction is a close cousin of Hard SF. It avoids most of the high-tech trappings common to science fiction, instead taking place at the low end of the technology scale. That limits the campaign and characters to relatively plausible near-future technological developments instead of the fantastic devices common to Space Opera and the like. The “Aliens” movies, starring Sigourney Weaver, represent this subgenre in many respects. Low SF is most common in television and movie SF, since it's easier (and cheaper) to depict — novel writers don't suffer from budget restrictions.

In Low SF, characters carry advanced firearms rather than energy weapons. When planetside, they travel in advanced all-terrain vehicles or helicopters instead of hovercraft. To travel from world to world, they put themselves into “cold sleep” (cryogenic suspension) for near-light-speed travel and suffer from time dilation effects (see page 174). Similarly, Low SF characters are almost always Humans; aliens rarely appear in such settings, since the lack of dependable FTL travel makes it difficult or impossible for them to mingle with Humans (assuming any sentient aliens exist at all). Other common SF characters, abilities, or elements — such as robots, psionics, time travel, and mecha — are typically inappropriate.

One interesting twist on the typical Low SF setting is a colony, backwater world, or other less-advanced part of an otherwise normal, high-tech science fiction setting. Characters find themselves having to make do with lesser tech, instead of the cutting-edge devices available to most people in the galaxy.

Ironically, Low SF isn't really more “realistic” than other types simply because it limits the technology available. Reasonable extrapolations of future technology show that some amazing things may be possible in only a few decades. Low SF tacitly ignores potential major advances to focus on recognizable characters in a recognizable setting.

LOW SCIENCE FICTION *STAR HERO* CAMPAIGNS

Low SF *Star Hero* games are mostly the same as Hard SF games: Standard Heroic campaigns with PCs built on 75 Base Points + 75 Disadvantage points. Some GMs allow even fewer points, thus further emphasizing the grim-and-gritty aspects of the subgenre; others prefer more points, since the PCs have to rely solely on their own skills — can't fall back on advanced technology the way other *Star Hero* characters can.

MILITARY SCIENCE FICTION

Military SF is a very popular subgenre, focusing on futuristic military operations and battles. It can involve space battleships trading broadsides in vacuum, or tough battlesuited Space Marines slugging it out on alien planets. By adjusting the technologies available, the GM can create settings which echo the Napoleonic Wars of Captain Hornblower, the island-hopping and carrier duels of World War II's Pacific theater of operations, or the ground-pounding horrors of World War I trench warfare.

Military SF is often Low SF because of the sheer killing power of advanced technology. When the outcome of a battle depends more on stealth technology and smart missiles, there isn't much room for individual heroism. But that's not a hard and fast rule; it's entirely possible to tell Military SF stories in high-tech settings, as the “Dominion War” story arc on *Star Trek: Deep Space Nine* so ably shows. Gamers often have a lot of fun figuring out ways to use teleporting artillery, FTL missiles, anti-matter explosives, and planetary fortresses to wage war.

A particularly enduring type of Military SF is the alien invasion story, in which extraterrestrials drop down out of the sky and begin trying to take over the world. It worked for H.G. Wells in *The War of the Worlds*, the producers of the film *Independence Day*, and thousands of writers and moviemakers in between. Alien invasions usually land on a modern-day or past Earth; a future setting is more likely to be a space war story. One twist on this theme, as seen in Robert Heinlein's *Starship Troopers* or Orson Scott Card's *Ender's Game*, is to focus on how the PCs train to invade an enemy world.

MILITARY SCIENCE FICTION *STAR HERO* CAMPAIGNS

Military SF *Star Hero* games are Standard (or sometimes Powerful) Heroic campaigns, with PCs built on 75-100 Base Points plus up to 75-100 points of Disadvantages. Some GMs prefer the higher point totals, since the powerful technology common to this subgenre can easily eclipse the PCs in importance if they're not particularly competent.

PLANETARY ROMANCE

Closely related to both Pulp SF and Space Opera, Planetary Romance stories center on a single world, often teeming with exotic cultures and menaces. The technology level is usually low enough to allow for swordplay and swashbuckling derring-do, though characters can still find nifty remnants of advanced superscience. Stories tend to be quests or picaresque journeys which take the heroes on a tour of interesting and dangerous places; Planetary Romances resemble *Fantasy Hero* in some ways, but with blasters, force-fields, and aliens instead of magic and monsters. The “Barsoom” stories of Edgar Rice Burroughs serve as a

model for the genre, but the novels of writers like L. Sprague de Camp (in his “Krishna” books) and Jack Vance (*Big Planet*, the “Planet of Adventure” series) hone it to perfection.

A more recent offshoot of the Planetary Romance is the “Big Dumb Object” story. These tales share the colorful landscape and exotic cultures, but set the story on a vast and ancient artificial structure. Examples include Larry Niven’s *Ringworld* and John Varley’s “Gaia” series. The goal when exploring a Big Dumb Object is usually to find out who built it and why; often the sheer Bigness of the Object is the chief obstacle faced by the heroes.

In either case, the central focus of the story is the same: the planet/Object and its inhabitants and features. Unlike many science fiction stories, which involve traveling vast distances through space in starships, Planetary Romances stick to a single world. Either the characters have no way to get off-planet, or their means of space travel has been disabled (which makes “find a way to repair the ship” an excellent motivator for the GM to use). This means the GM has to develop that one world in detail. He needs to know everything from its planetological data (year, length of day, core composition, orbital pattern, hydrology, climate, and so forth), to its major and minor geographical features, to the people and cultures who call it home. Part of the goal of the campaign is often to find out about the world, so the GM needs to have answers at the ready when the PCs begin to explore and investigate.



PLANETARY ROMANCE STAR HERO CAMPAIGNS

Planetary Romance campaigns usually feature PCs who are at least Standard Heroic characters (75 Base Points + 75 Disadvantages). Since the PCs are likely cut off from help or outside resources, the GM may want to give them more Character Points, so that they’re more self-sufficient. Higher point totals also suit the quasi-swashbuckling nature of these stories.

RETRO-SF

Since science fiction as a genre has a history stretching back to the 1860s (if not earlier), there’s now a thriving subgenre in which authors (and gamers!) revive old styles and tropes. The tone usually falls somewhere between affectionate parody and nostalgic homage. Types of Retro-SF include:

STEAMPUNK

“Steampunk” is a coined term referring, generally, to stories which take the work of Verne, Wells, and their ilk as inspiration. They can either be set in a Victorian-era setting with anachronistic technology, or in an alternate present based on Steam Age visions of the future. Either way, puffing smokestacks and rivets are the order of the day, and the sun doesn’t set on the steam-powered British Empire. The “punk” aspect draws on the genuine squalor and misery of the early Industrial Revolution, often blended with Cyberpunk tropes like computer hackers (breaking into the giant Babbage engines that keep the Empire running) or mechanical implants (which may need winding or stoking). The seminal Steampunk novels are *The Difference Engine*, by William Gibson and Bruce Sterling, and K. W. Jeter’s *Infernal Devices*.

Steampunk *Star Hero* campaigns are usually Standard Heroic games (75 Base Points + 75 Disadvantages), though some GMs prefer to descend lower, perhaps even to Competent Normal levels, when setting games in the Victorian Age.

PULP SCIENCE FICTION

Science fiction tales featuring the likes of Buck Rogers and Flash Gordon were extremely popular in the freewheeling pulp magazines and film adventure serials of the 1920s and 1930s, and *Star Hero* campaigns and stories inspired by them have a particular look, feel, and tone. Rocketships resemble hood ornaments, aliens are Humans with green skin and finned helmets, and the weapon of

SUPERTANKS AND POWERED ARMOR

One source of Military SF’s enduring popularity is the hardware, especially really big fighting machines. Supertanks are one common trope; these tend to be hovercraft or antigravity vehicles armed with huge energy cannons. Some supertanks dispense with crews, letting a sophisticated artificial intelligence run the machine. Sloppy programming can lead to interesting complications. Another favorite big war machine is the humanoid battlesuit, usually equipped with an arsenal of built-in weapons and the ability to fly. These range from slightly more than man-size (as in *Starship Troopers*) to the city-sized Super-Dimensional Fortress of the animated *Macross* epic. See Chapters Seven and Eight for some examples of this sort of technology.

SWORDS AND STARSHIPS

A surprising number of science fiction settings manage to work sword-play into a high-technology setting. This is mostly because sword-fights are a lot cooler than just incinerating somebody with your laser pistol.

Since swords aren't commonly used even on twenty-first century Earth, the author of a science fiction swash-buckler has to explain why they have returned to favor. Sometimes the reason is social: in L. Sprague de Camp's "Krishna," stories the interstellar authorities strictly control what technology explorers can bring with them on primitive planets, and enforce the rules with brainwashing machines. A technological solution was used by Frank Herbert in the *Dune* series. His characters had personal force-fields which could stop high-velocity projectiles, but which a slow-moving blade could penetrate. The lightsabers of *Star Wars* can penetrate any defenses, but can't be used as projectiles or beams, making a revival of sword fighting techniques essential for the Jedi Knights. In more general terms, it might be a matter of spacefaring safety: an errant blaster shot aboard a starship could penetrate the hull and cause explosive decompression that kills everyone aboard, whereas swords pose no such danger.

choice is the Art Deco ray gun. Pulp science fiction adventures often take place in the old-fashioned version of the Solar System, with a swampy Venus and a dry, canal-covered Mars.

Pulp *Star Hero* campaigns are usually Standard Heroic games (75 Base Points + 75 Disadvantages). However, GMs seeking the maximum level of grandiose adventure and swashbuckling heroism may want Powerful or Very Powerful Heroic characters instead.

FIFTIES SCI-FI

"Fifties Sci-Fi" refers to tales based more on the monster and alien-invasion movies of the Atomic Era than on written fiction of the time. In Fifties Sci-Fi, the main threats are either radiation-spawned giant monsters or flying saucer aliens from space. A dash of Cold War paranoia and the sense that "the government is keeping this quiet" usually add a slightly malevolent tone to what would otherwise be pure camp, but in the end square-jawed jet pilots and pipe-smoking scientists usually save the day. The cheesiness of much of the source material makes it almost impossible not to play Fifties Sci-Fi for laughs.

Fifties Sci-Fi *Star Hero* campaigns ordinarily feature Standard Heroic (75 Base Points + 75 Disadvantages) PCs. They can handle most of the threats with forthright heroism, true-blue American scientific genius, and a good right hook, so they don't need to be extremely powerful.

SPACE OPERA

Originally coined as a derogatory term for the tired old "spaceship yarn" of the early pulps, *Space Opera* now refers to stories which try to recapture the sense of wonder and high adventure that characterized pulp sci-fi. In Space Opera scientific accuracy and rigorous speculation take a distant second place to exotic settings and fast-paced adventure. Probably the purest Space Opera stories were the *Lensman* series by E.E. "Doc" Smith, but the greatest success of Space Opera has come in film and television, where *Star Trek*, *Star Wars*, and *Babylon 5* embody all the subgenre's virtues (and flaws). More recently, authors like Iain M. Banks and Lois McMaster Bujold have revisited Space Opera, adding a greater depth of character and theme.

Space Opera requires a large canvas: the scale is at least the whole Solar System, but most stories/campaigns are galactic (or even intergalactic) in scope. Spaceships travel at many times the speed of light, range from merely big to mind-bogglingly huge, and mount weapons which fire brightly-colored beams of devastating power. Alien species are numerous and often very weird in appearance and habits. Sophisticated technology is commonplace, and often embodies Clarke's Law (see page 160). Psionics exist, and are sometimes immensely powerful. Science is a matter of genius inventors creating even bigger and more powerful spaceships, superweapons, computers, and tools in a remarkably short time. The focus is on big events

like wars, planet-cracking disasters, and the fate of whole civilizations.

SPACE OPERA *STAR HERO* CAMPAIGNS

Space Opera is probably the easiest SF subgenre to run as a *Star Hero* campaign; most science fiction RPGs derive from, and use, the elements and features of Space Opera more than any other subgenre. The campaigns are usually Heroic, with PCs who are at least Standard Heroic characters (75 Base Points + 75 Disadvantages). In many campaigns, the PCs are built on even more points (as Powerful or Very Powerful Heroic characters, or sometimes even Low-Powered Superheroics) — that allows for the high Skill Rolls, psionic powers, and other abilities often displayed by Space Opera characters.

TIME TRAVEL

If space isn't big enough, characters can also go roaming through time. Stories of time travel go back to Mark Twain's *A Connecticut Yankee in King Arthur's Court*, but the concept remained strictly fantasy until H.G. Wells came up with the notion of a Time Machine in the novel of the same name. Even then, of course, it was all just fantasy with technological trappings, but in later decades scientists began to discover curious loopholes in General Relativity and modern physics which may actually allow time travel under certain conditions.

Tales of time travel tend to break down into two main categories. The first follow Twain and Wells and use time travel as an enabling device that lets characters have exciting adventures in the past or future. The second type centers on the mechanics and paradoxes of time travel itself. These tend to be short stories like Robert Heinlein's "All You Zombies" or paradox-riddled films like *Back To The Future*.

Time travel is such an enduring trope in science fiction that it tends to work its way into all the

ADJECTIVE FATIGUE

A potential problem for Space Opera adventures is "adjective fatigue." Once the heroes have defeated the Ultimate Evil Overlord, they soon run across a Super-Ultimate Overlord. The giant starships and super-weapons get bigger and more devastating in each episode. After saving the Galaxy, they have to save the whole Universe, and then the entire Multiverse, and then....

The simplest way to avoid this problem is to start at an appropriately low scale. If the heroes begin by toppling the Galactic Empire, it's hard to top that in later scenarios. But if they begin by thwarting one power-mad Imperial governor, then with what they've learned and the allies they've made, they can work their way up. The *Lensman* stories followed this pattern: at first the Galactic Patrol was just concerned with fighting drug runners and pirates. Then they had to face the secret conspiracy behind the pirates. Then they confronted an aggressive rival empire which sponsored the conspiracy... and so on right up to the final battle of Good against Evil.

other subgenres (except Low SF). *Star Trek* and *Babylon 5* both have time travel episodes, and S.M. Stirling's popular *Island In The Sea Of Time* centers on the military adventures of modern Americans stuck in the Bronze Age. A time-hop can be a one-shot adventure in an ongoing campaign, or the characters can make a career of visiting other times as agents of the Time Police or simply tourists. Combining space and time travel lets the stories wander all over the cosmos, in the footsteps of the BBC's Doctor Who.

A variant on time travel is visiting alternate universes and other dimensions. These are worlds like our own, but existing "next to it" in some higher level of reality. Alternate histories are worlds in which some particular historical event turned out differently (perennial favorites are the American Civil War and World War II). They allow characters to see the results of changing history without involving them in all the potential paradoxes and complications of visiting their own past. Some alternate worlds even have different natural laws, with functioning magic or other supernatural powers to liven things up.

For more on time travel, refer to Chapter Nine.

TIME TRAVEL STAR HERO CAMPAIGNS

Gamemasters can easily center entire campaigns around the idea of PCs traveling through time, either deliberately (perhaps as "Time Cops"), or involuntarily/uncontrollably (as with Doctor Who, at some points of his career). Player characters in Time Travel games are usually 75 Base Points + 75 Disadvantages Standard Heroic characters. Technical Skills and a knowledge of history are *de rigueur*, and usually much more valuable than the ability to fight well. Some GMs may even wish to consider giving characters extra Character Points that can only be used to buy history-related Background Skills.

UTOPIAS AND DYSTOPIAS

One of the oldest themes in science fiction is showing how the world could be a better place. Usually this is accomplished by creating a society in which all the author's pet ideas are put into practice, and everything he dislikes is eliminated. (Or everything *she* dislikes: feminist utopias are a particularly enduring subset.) Once all that is done, the result is an ideal society.

Ideal societies have an unfortunate tendency to be static and unchanging, because there's no way to improve on perfection. In a roleplaying game they are rather unsatisfying places for adventures, since in a smoothly-running ideal society there aren't all that many adventures to have. One way to have perfection and still go adventuring is to place the Utopia in danger from hostile outside forces who want to destroy it. Alternately, the inhabitants of a Utopia may feel it's their duty to spread the benefits of their ideal society to the outside world. Of course, one person's ideal society is another's living hell.

JUST VISITING

Time travel is a great excuse to let characters from a historical or present-day roleplaying campaign spend some time in a science fiction setting. While it can be just a fun outing to a different playground, there's a lot of potential in letting the characters see the consequences of things they were doing back in the "real" campaign setting. If their visit to the future reveals that a minor villain becomes the Tyrant of Earth, they'll certainly redouble their efforts to catch him. (Even more disturbingly, what if one of the PCs is destined to commit some atrocity?) Similarly, visits to the past can let characters meet their earlier selves, see (or even cause) the origins of their adversaries, and possibly learn some secrets which can help them in their ongoing campaign.

This is not without its pitfalls, however: characters dropped into a highly-advanced future world are likely to hit the malls for a superscience shopping spree, and then either use high-tech firepower when they get back home, or else transform the world economy with new inventions. Those who travel into the past tend to acquire lots of valuable old postage stamps, or else start up stock portfolios or bank accounts which have grown to titanic proportions when they return to their proper time. Unless the GM wants to have his campaign altered this way (which would certainly make for an interesting change of pace!), he needs to find a way to prevent the characters from doing these things — ranging from not giving them the opportunity, to appealing to the players' senses of drama and fair play, to have items that are "temporally out of place" quickly crumble to dust.

The flip side of the coin from Utopia is Dystopia: a society in which something (or everything) has gone wrong. As with Utopias, they are often an excuse for the author to air his political views, by showing the awful consequences if those he disagrees with get their way. The most famous dystopia is George Orwell's *1984*, which was a warning about the true face of Communism at a time when it still had a following among the British left.

Dystopias are slaves of fashion, reflecting with uncanny accuracy the concerns of the decade in which they are written. Orwell wrote in 1948 when the Cold War was at its coldest. A few years later Frederick Pohl warned about unconstrained consumerism in *The Midas Plague*, and a couple of decades after that the big problem was overpopulation in the film *Soylent Green*. Other dystopias retain their appeal: fundamentalist right-wing dictatorships in America are a perennial favorite, from Robert Heinlein's *Revolt In 2100* to Margaret Atwood's *The Handmaid's Tale*. In many ways, the entire Cyberpunk subgenre could be regarded as a dystopia reflecting fears over corporate power (and greed) and the dehumanizing effects of technology.

UTOPIA/DYSTOPIA STAR HERO CAMPAIGNS

Star Hero campaigns focusing on utopias or dystopias are relatively rare; such places are better to visit, for single game sessions or story arcs, than

RAY GUNS

One Retro-SF notion which rather surprisingly came true is the idea of the "ray gun." One early example was the Heat-Ray of H.G. Wells's *Martian invaders*, and during the Pulp Era both heroes and villains wielded a dazzling array of weapons that projected rays of various colors and destructive effects. Scientists, meanwhile, scoffed at the notion because everyone knows a beam of light or radiation spreads out in a cone and could never deliver enough energy to do damage. Then a team at Bell Labs invented the laser, and today energy weapons are the stuff of Pentagon research projects rather than pulp fiction.

Gamemasters and players who want to "personalize" their characters' ray guns a bit can use the following handy tables. Roll 1d6 for beam type, then roll again for the beam's color.

1d6 Roll	Beam Type
1	Straight beam
2	Pulse beam
3	Wavy beam
4	Line of circles/disks
5	Sphere(s)
6	Narrow cone

1d6 Roll	Beam Color
1	Red
2	Blue
3	Purple
4	Green
5	Yellow/Gold
6	Silver/White

AS GOOD AS IT GETS?

For a slightly more grown-up approach, instead of a dystopia being the result of Evil Overlords or the triumph of a political party the GM didn't vote for, what if the dystopia is the best anyone can manage in a tough situation? Real-world examples of this are all too common: Rome during the decline of the Roman Empire was a pretty oppressive and dystopian place, but all attempts at reform were futile, the barbarians kept coming over the border, and heavy-handed Emperors were about the only alternative to anarchy. And when the Empire finally did fall, the ensuing centuries of darkness weren't any better.

Putting the characters in a dystopia which can't really be fixed sounds like a recipe for a pretty depressing campaign, but there's still scope for individual heroism and small-scale victories. You may not be able to overthrow the Overlords, but you can keep one person from falling into the hands of the Secret Police, or possibly bring about the downfall of a corrupt official. Characters who are servants of the regime can try to maintain their own decency in a grim world.

they are to live in. Games permanently focused on such settings usually feature Competent Normal or Standard Heroic PCs (50-75 Base Points + 50-75 Disadvantages). However, utopian characters may be much more powerful, even Superheroic, because their societies have unlocked the secrets of psionics, immortality, superhuman abilities, or what have you.

SCIENCE FICTION ELEMENTS AND FEATURES

No matter what the subgenre, certain elements and features — or “bits,” in gamer parlance — occur from setting to setting in science fiction. Here's a brief review of some of the most important ones.

ALIENS

Although sentient species from worlds other than Earth aren't *required* for science fiction — some classics, such as *Dune*, feature no aliens at all — they exist in most science fiction settings. They range from species identical to Humans in all but superficial ways (odd bumps or ridges on the head, unusual skin tones, weird alien customs), to species so different from Life As We Know It that Humans can barely relate to or interact with them (energy beings, psionic life-forms, silicon-bodied aliens).

Some SF settings feature only one or two alien species; others, including most Space Opera universes, feature hundreds or thousands of them. In either case, their purpose in the story is often to provide the author with a chance to comment on “the Human condition,” or to cast some Human custom into stark relief by comparing and contrasting it with alien practices. In *Star Hero* campaigns, alien species provide players with the chance to try something different, and to dive into some unusual roleplaying experiences.

For more on creating aliens and alien civilizations, and the roles they play in *Star Hero* stories, see Chapter Six.

BIG DUMB OBJECTS

“Big dumb object” is a genre term for gigantic artifacts found in space or on planets. The best known examples include the Ringworld (depicted in Larry Niven's novel of the same name) and Dyson spheres, but plenty of others exist. They're a staple of Planetary Romance and some Space Opera settings; they're perfect for exploration-oriented adventures. For more information on them, see pages 11, 95, and 206.

BLASTERS

If you're in a setting with advanced technology, what fun is it to shoot at people using weapons based on gunpowder and bullets? It's a lot more in tune with the genre to use an energy pistol that fires a brightly-colored bolt of energy. Generically known as “blasters” (or, in earlier SF, “ray guns” or “death rays”), these weapons crop up, in an infinity of shapes, sizes, and explanations, in most science fiction settings. Examples include the phasers of *Star Trek*, Han Solo's blaster (and Chewbacca's

bowcaster), and the laser- or plasma-based weapons found in many stories. For more information about different types of blasters and how to build them in *HERO System* terms, see pages 55, 150-53.

CLONES

The idea of creating a carbon-copy of a living being is not a new one, but it's seen new life in science fiction in recent decades with the advance of Human genetic science. Now that doctors can viably clone advanced mammals, and some talk about cloning Humans, the concept has even more relevance for *Star Hero* campaigns. A character could create a clone of himself or another person for many purposes: artificial immortality (surgeons transplant the character's brain from healthy body to health body over the centuries); crime (the character fakes his own death, or creates an alibi, using the clone); trade (a Human with special abilities might be duplicated as an item of commerce, or a dissolute species might create custom-designed sex-slaves for sale); or warfare (armies of cloned soldiers solve all your recruiting problems). See page 54 for more on creating clones in the *HERO System*.

COMPUTERS

Computers — thinking and calculating machines — have been a feature of science fiction from the genre's earliest days. From the helpful ship's computer of *Star Trek*, to the dangerously unbalanced ship's computer HAL in *2001: A Space Odyssey*, to tiny computers built into characters' clothing, SF writers have explored how computers and people might interact in the future. Given their prevalence in twenty-first century Earth society, computers have become an even more common, and powerful feature of the genre; some subgenres, such as Cyberpunk, can't really exist without computer as a plot element.

In the *HERO System*, characters build computers using the rules on pages 459-61 of the *HERO System 5th Edition, Revised* rulebook. Page 163 of this book has further information, and also contains several sample computers for starships and space stations at the end of Chapter Eight.

GALACTIC EMPIRES

In many science fiction settings, particularly Space Operas, the dominant (or *a* dominant) form of government is the “galactic empire” — a large entity spanning multiple star systems (or even galaxies), and typically ruled over by a single Emperor, tyrant, Senate, Council, or other person/institution. First featured prominently in Isaac Asimov's *Foundation* novels, the galactic empire has become a feature of many SF stories. It may not always be an empire, exactly — the Federation of *Star Trek* isn't one — but any large, multi-stellar government usually fits this theme. See pages 131 and 289 for more information.

GENERATION SHIPS

Writers unwilling to invent FTL flight (or similar rubber science methods of rapid travel) for their settings still need a way to get Humans off

Earth and out to new planets where they can meet aliens and have adventures — even though the trip would take many Human lifetimes. In some cases, travelers use suspended animation, but a more interesting device is the *generation ship*, a vessel large enough, and properly equipped, to house multiple generations of Humans as they live, have children, and die en route to their ultimate destination.

Stories involving generation ships usually go one of two ways. First, the story can focus on the ship itself — life aboard it, things it encounters, how people react to the end of the journey. Second, it can feature an FTL ship (often one invented by the same species that launched the generation ship centuries ago) discovering the generation ship, and what happens thereafter. Either situation would make for a fascinating *Star Hero* campaign or adventure.

For more on generation ships, see page 190.

HIVE MINDS

In many SF universes and stories, there's at least one species — often an insectile one — with a “hive mind” that psionically links all members of the species. This has some decided benefits (such as instantaneous communication and sharing of knowledge), but also some drawbacks (“individuals” treated as disposal elements of the greater “overmind”). Often hive mind characters appear in stories dealing with issues of free will and self-identification.

In *HERO System* terms, hive mind species typically have Mind Link with each other, bought to cover interstellar distances. An occasional variant is a species built as a single individual with massive amounts of Duplication.

HYPERSPACE

Rather than trying to distort science too much by making physical FTL travel possible, some science fiction writers create an alternate dimension, *hyperspace*, that starships can enter and travel through at faster-than-light velocities. In some cases, hyperspace lets physical objects achieve FTL speeds impossible in normal space; in other cases, it acts as a “shortcut” that allows rapid journeys from star to star. For more on hyperspace travel, see page 192.

THE ORIGIN OF HUMANKIND

Many science fiction stories have dealt with, directly or indirectly, the question of mankind's origin. The movie *2001: A Space Odyssey* touches on this theme somewhat; so do some parts of Larry Niven's “Known World” cycle, and some episodes of *Star Trek*. In these stories, it often turns out that an Elder Civilization (page 122) jump-started Humanity, or made sure it was invested with intelligence, or carried its genetic material to other worlds (thus explaining why Humans meet other Humans in other star systems). The “deep mystery” of how Humanity evolved the way it did makes an excellent background element for a *Star Hero* campaign.



PLEASURE PLANETS

In lots of science fiction settings, there's a planet... or two... or three serving as “resort worlds” — the ultimate vacation destination. Devoted to a non-stop sybaritic lifestyle, these worlds exist only to please vacationing tourists with whatever their hearts desire. In darker SF settings, “vacation” activities on these planets often turn out to be immoral or illegal, but some are just for good-hearted fun. Inevitably, though, when Our Heroes arrive, they discover there's trouble in paradise, and they have to put a stop to it.

PSIONICS

The powers of the mind have fascinated SF writers for decades, and they exert a similar attraction on gamers. Some science fiction settings feature low-powered but intriguing mental abilities (like Gil Hamilton's telekinetic “arm” in Niven's short stories); in others, such as E.E. “Doc” Smith's “Lensman” stories, characters have mental powers capable of laying waste planets and galaxies. See Chapter Ten for more about psionics in *Star Hero*.

ROBOTS AND ANDROIDS

From the humanoid mechanical men of Asimov's *Robot* series of novels, to the oddly-shaped droids of *Star Wars*, robots (and the more Human-appearing androids) have been a feature of science fiction since its earliest days. Sometimes they're valuable helpers, sometimes deadly ene-

mies, and in a few cases they even gain sentence and become heroes. In the *HERO System*, they're typically built using the Automaton rules; see page 165 of this book, and pages 206-10 of the *HERO System Bestiary*, for more information and some examples.

ROGUES

Many SF stories feature at least one "rogue" character — a fellow who's often in trouble with the law, and sometimes an outright criminal, but nevertheless has a heart of gold and "does the right thing" when it's necessary. Harry Mudd, Han Solo, and Harry Harrison's "Stainless Steel Rat" all fit this mold, along with hundreds of other characters. See Chapter Two for suggestions on how to build such characters.

RUBBER SCIENCE

"Rubber science" is a general term for the scientific impossibilities that occur frequently in SF (particularly Space Opera). In many cases, the characters and story matter more than strict scientific or technical accuracy; much of what occurs in SF novels and television shows is not physically possible (as early twenty-first century Humans understand "possible," anyway). If necessary, a writer can blithely ignore Science, or develop some pseudo-scientific principles to explain how things work, and get on with the business of telling a good story. See Chapter Seven for more information and examples.

SCIENTISTS

Where science (or psuedo-science) is important to the story, there you'll often find scientists (or their close cousins, technicians and engineers). Well-versed in the scientific principles important to the story, they're of vital importance when someone's starship breaks down, the motives of the blood-consuming alien creature need to be deduced, an alien plague ravages a planet, or characters want to explore a black hole safely.

SPACE STATIONS AND STARSHIPS

As common in SF as aliens, if not more so, space stations (and their mobile counterparts, starships) are what allow characters to live, breathe, and travel in the dangerous depths of outer space. In many *Star Hero* campaigns, the characters' starship or home starbase is as much an NPC as any shopkeeper or mercenary; it has its own personality, peccadilloes, and way of impacting the story. See Chapter Eight for more information.

TERRAFORMING

Terraforming is the process by which Humans make an uninhabitable planet suitable for Human life. (Of course, aliens can do the same thing, but the results of "xenofarming" a planet may not be the same, if the aliens have highly different physiologies from Humans.) Realistically, it takes centuries of extraordinary effort, but in Space Opera settings it may be quite easy. See page 87 for more information.

TIME TRAVEL

While some SF settings don't allow time travel at all, others feature it frequently, and some science fiction story cycles depend on it as their central enabling device. Journeying back and forth through time raises so many interesting issues, and creates so many bizarre questions, that *Star Hero* GMs willing to put in a little effort can get a lot of game mileage out of the concept. See above and Chapter Nine for more information.

TRAVEL

Travel, and the related concept of exploration, is a major element in many science fiction universes. Space itself, as *Star Trek* reminds us, is "the final frontier" — the one domain that it's impossible to ever become totally familiar with. There's always a strange new realm to go to, right beyond the next star system, and many characters can't resist the lure of the open "road."



CROSS-FERTILIZATION: METAGENRES IN SF



While most science fiction stories fit, broadly speaking, into the meta-genre of “action-adventure,” they don’t all come from that mold. In the past century writers and filmmakers have blended science fiction with just about every other mood and theme possible in fiction. Some of the crossovers are naturals, others are difficult to pull off with a straight face.

COMEDY

Science Fiction and comedy have had an uneasy partnership. The clichés and earnest tone of SF make it a natural target for parody or self-parody, as in Douglas Adams’s *Hitchhiker’s Guide To The Galaxy* series or the cartoon “Duck Dodgers in the 24½th Century.” There is a whole subgenre of SF stories which are nothing but elaborate setups for excruciating puns. But funny SF is possible, and stories can be both good comedy and good science fiction. Examples include the *Buck Godot* comics series, novels like Connie Willis’s *Bellwether* or the *Hoka* series by Poul Anderson and Gordon Dickson, and films like *Men In Black*.

The simplest way to do SF comedy is to parody the genre, with silly aliens who look like food or cartoon characters, items like the “Kill-o-Zap Gun,” and civilization threatened by shortages of the shaving-cream atom. This can be very funny and entertaining if done right. But it can get old quickly. One game session spent chasing around the Planet of the Prune People with phasers set to “fricasee” is entertaining, but by the second or third game the amusement value of funny names and mocking the conventions of the genre gets thin.

A more enduring form of science fiction comedy uses the possibilities of the SF genre to create comic situations and characters. This is somewhat more difficult than parody, but it has more shelf life. Eric Frank Russell’s Hugo-winning story “Allamagoosa” is a good guide: while preparing for an inspection, the crew of a spaceship painstakingly goes down the inventory of components to make sure everything is in order, but discovers one item on the list which nobody can remember or find. Their increasingly desperate efforts to find the device or account for its absence are the source of the humor in the story, since everything they do just makes the situation worse.

It’s remarkably easy to do the same thing in a roleplaying game, since gamers have a real talent for picking the wrong course of action and then

sticking to it with relentless tenacity. However, players sometimes resent discovering that they’re the fall guys. If they know it’s a comedy, they may be able to relax and enjoy seeing their characters in a fix. More competitive gamers may have trouble with the idea of not “winning” the adventure. One principle to remember is that in a comedy, everything comes out all right in the end. Fate may conspire against the characters, they may be frustrated at every turn, but nobody gets hurt by anything worse than a pie in the face.

HORROR

Horror and science fiction grew up as genres side by side in Victorian novels and pulps like *Weird Tales*, so it’s natural for them to borrow from each other. *Frankenstein* is an early classic of both SF and horror. The “Aliens” series of movies is one of the best modern examples of SF horror, and the genre staple *2001: A Space Odyssey* also has important horror elements.

The great advantage to blending the two is that science fiction allows you to deploy horror elements which don’t rely on the supernatural. Instead of ghosts and vampires you can use alien monsters, dehumanizing brain implants, or predatory cyberspace entities. The greater realism possible makes it easier to believe in the horrors, and that makes them scarier.

It’s possible to run a relatively “straight” horror adventure in a science fiction setting: a mad slasher lurking aboard a deserted starship is just as scary as one in a castle or a college dorm. But science fiction also supplies some elements which amp up the horror. If the characters are stuck aboard a spaceship floating in empty space, they can’t flee whatever evil is stalking them. If they’re wanderers in a post-apocalyptic wasteland, there are no police to call when horror strikes. The sense of isolation and (at least partial) helplessness which is so important to a good horror story is easy to achieve in many SF environments.

However, there’s a countervailing difficulty: the tools and weapons available to the heroes make them hard to frighten. When you’re packing a plasma rifle and have a belt pouch full of regeneration pills, what’s so scary about a werewolf? When a character can cross the galaxy in a day or two, how isolated can he really be?

There are two useful approaches to making science fiction horror genuinely scary. First, deprive the heroes of their ultra-tech toys and make them

ANOTHER SOURCE OF INSPIRATION

Pages 35-43 of *Champions* contain advice on applying meta-genres to superhero campaigns. Much of that advice is general, and could certainly work in *Star Hero* campaigns as well.

ROMANTIC COMEDY

Comedy is all about making people act ridiculous, and through all of Human history the most reliable way to do this is to make them fall in love. Romantic attraction dissolves dignity and restraint, makes people absurdly sensitive and insecure, and puts one's ego and happiness entirely at the mercy of another person. In fact, the ancient Greeks defined a play as a comedy if it ended with a marriage (tragedies ended with a funeral).

Romantic comedy in a science fiction setting allows a considerably broader range of potential partners falling in and out of love: Humans, aliens, robots, clones, artificial intelligences, androids, time travelers, immortals, and many others. Science fiction also creates loads of potential new complications. Characters falling in love in a virtual environment may not like each other in the real world; someone falling in love with one member of a group of identical clones could be unable to tell which is the right one; Humans and aliens in love may be frustrated by incompatible reproductive systems; advances in biochemistry could make genuine "love potions" available at every drugstore. A clever GM can get a lot of story mileage out of such circumstances.

rely on their own wits. (The film *Aliens* is a great example of this, as all the Colonial Marines's super-weapons and vehicles are either rendered useless by the situation, or get broken or lost.) The more the characters (and their players) have come to rely on gadgetry, the more uneasy they'll be without it. Taking away the toys can be as complicated as a series of accidents and equipment failures, or as simple as starting the adventure in a situation which doesn't call for much in the way of equipment: a vacation or an undercover mission.

The second approach is to make the horrors immune to super-tech weaponry. Maybe they don't have physical bodies to blow apart, or maybe they can regenerate any amount of damage. However you justify it, a monster who keeps coming despite a barrage of laser bolts is pretty scary, especially to characters who prefer to solve their problems with gunplay. Jack Vance's short story "Three-Legged Joe" provides a perfect example of an indestructible monster the characters have to defeat with their intelligence, rather than their weaponry.

MYSTERY

Detective stories were another pulp perennial, but actual science fiction mystery stories are surprisingly rare. The reason is that the story must work both as science fiction and as a plausible mystery, which can be difficult to pull off. Isaac Asimov managed it in several stories, as did Larry Niven. In a roleplaying campaign the players have enough time to get familiar with the setting and the way the world works, which means SF mysteries become quite possible.

Another problem with creating science fictional mysteries is the rapid advance of crime-solving technology. Present-day police can deploy tools like DNA analysis, face-recognition software, cell-phone eavesdropping, computer databases, psychological profiling, and long-range listening devices. A futuristic setting could add even more powerful technologies like nanotech forensic robots, telepathic cops, and superhumanly intelligent computers. The existence of such tools makes it very difficult for a criminal to hide his traces, and in game terms it makes solving a crime little more than a series of technical Skill Rolls.

The GM can constrain the power of crime-solving tools somewhat with laws and regulations: judges may refuse to grant permission for high-tech eavesdropping, and criminals are already getting cagey about letting the authorities take genetic samples. Strict rules may limit when psionic detectives may use their powers, or perhaps psionic evidence isn't admissible in court.

Crooks are also good at coming up with ways to block or trick forensic technology. If nanobots can gather up skin cells from the crime scene to trace the culprit's DNA, clever criminals could either deploy their own nanobots to scour the area clean, or else confuse the issue by scattering samples of DNA from dozens of other people at the site. If the cops can use psionics, the crooks can hire rogue telepaths to read the minds of the detectives (and the crooks aren't going to be worried about privacy regulations). If

superhuman AIs help out with police work, other super-smart computers could be planning or even committing crimes.

ROMANCE

Science fiction and romance have had an uneasy relationship for decades. Until the 1960s, the primary readership of SF was young men, and relationships were seen as so much "mushy stuff." An SF hero might be in love with the mad scientist's beautiful daughter, but a quick kiss before doing battle with the Lava Men was about all the reader saw of their relationship. At the same time, however, Science Fiction and its twin Fantasy were both part of a strongly romantic stream of popular fiction. Characters were motivated by love, even if the readers didn't want to read about it.

Changes in the readership and the general culture encouraged a change in treatments of romance and sexuality in SF, particularly during the 1970s. Writers began to explore "adult" themes, more explicit sexual situations began to appear in stories, and the genre approached the final taboo: realistic depictions of relationships.

In SF roleplaying, much the same has happened, compressed into a shorter timespan: the hobby went from all-male to something approaching an even mix, and recent games have paid more attention to relationships among characters and NPCs in play. A *Star Hero* campaign can center on love and romance in a variety of settings — if the players are interested.

Science fiction romance opens up an intriguing possibility: interspecies romance. Can a Human find love with an alien? In Planetary Romance and Space Opera SF, the answer is usually yes, since the aliens tend to be very Human-like anyhow. (Or at least the species learn to inquire about such things, as with the discussions of *rishathra* among the inhabitant's of Niven's Ringworld.) But what about Hard SF settings? It's one thing to fall in love with a green-skinned girl dressed in filmy chiffon, but what if the "girl" looks like a cross between a spider and a squid? Science fiction writers still have mixed feelings about such relationships: are they abhorrent and dehumanizing, or noble and enlightened? Issues like this are perfectly suited for exploration in *Star Hero*.

SATIRE AND SOCIAL COMMENTARY

Writers have been using science fiction to comment on contemporary society ever since Plato invented Atlantis. Gamemasters can follow in this tradition and use SF adventures to air their own opinions on the way the world should be. By exaggerating a trend or taking something to its logical conclusion, one can see potential flaws. If equality is good, should society use genetic engineering and brain surgery to make everyone exactly alike? If large corporations are growing ever bigger and more powerful, a future world might show everything subordinated to the Bottom Line. Freedom is good, but is complete anarchy really better than living under

laws? These are all issues which can be examined in an SF setting.

There are a couple of pitfalls to be avoided when doing this. The first is simply that the players may not share the GM's views. His brilliant satire on feminism may strike one of the players as nothing but piggishness, while her nightmarish world of capitalism run wild might be another player's utopia. The second issue is that a certain deftness of touch is required if the game is not to degenerate into a series of Ham-Fisted Moral Tales. The TV series *The Twilight Zone* often skated on the edge of this precipice, and sometimes went right over. Characters can espouse a view you dislike without being caricatures, and people have reasons (however flawed) for doing things you don't approve of.

TRAGEDY

The flip side of comedy is tragedy. The traditional tragic structure tells of a hero (or heroes) doomed by some flaw, and ultimately destroyed by it. A hero's tragic flaw can be anything — stubborn devotion to duty, impetuous action, over-caution, even love for another. Sound familiar? Those are all character Disadvantages in the *HERO System*. Creating a tragedy is simply a matter of setting up a situation in which a hero's Disadvantages have dire consequences. Having done that, though, a real tragedy requires that the Gamemaster actually go through with it. A tragic hero who cheats fate isn't a tragic hero at all. Being a tragic hero is all about defying fate even as it overwhelms you.

The elements of science fiction open up some

THE RETURN OF HAMLET

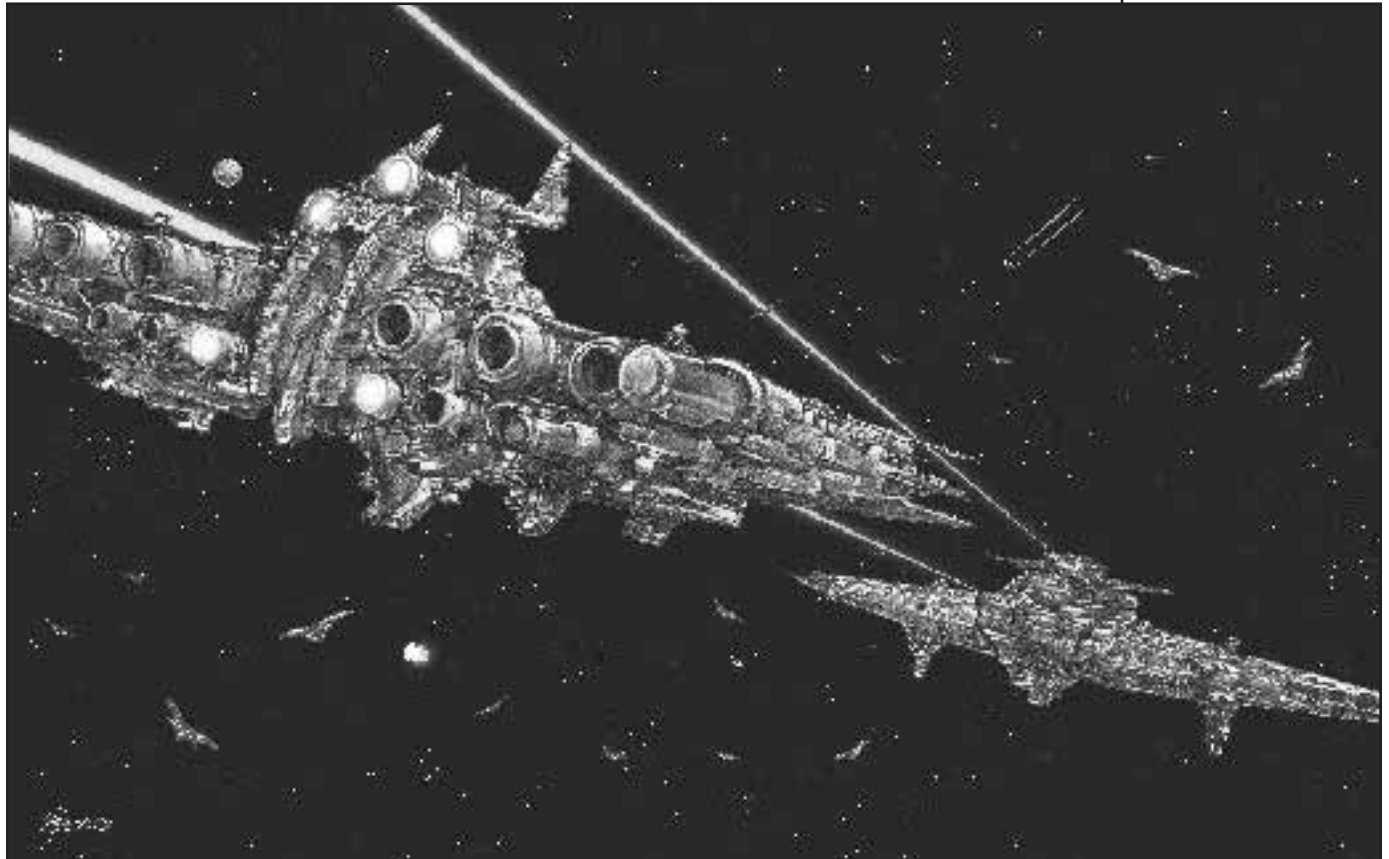
Tragedies tend to be one-shots: Hamlet comes home, plots to avenge his father, and the stage is littered with bodies. Not much sequel potential. Roleplaying games are usually ongoing campaigns. How to reconcile the two? There are three ways.

The first is to go ahead and kill off the tragic hero. Characters die in games. The player can create a new one — possibly a vengeance-obsessed brother with his own tragic fate awaiting him.

The second is to recall that being destroyed by fate and being killed are not the same thing. A tragic hero could be financially ruined, lose his loved ones, or see his home planet blown to bits, and still live on, embittered and broken. The character of Athos in Dumas's *The Three Musketeers* is a man who has lived through a tragedy.

The final method is the "Rosencrantz and Guildenstern" approach. In this the player characters aren't the heroes, but instead are working with an NPC who is. This lets the GM send the tragic figure hurtling toward his doom without any worry about players changing their minds or derailing the situation. However, players don't much enjoy being spectators; the GM needs to give their characters plenty to do.

interesting possibilities for tragedy. Time travel, for example, can easily have all sorts of unintended negative results, even if the characters use it carefully and with the best of intentions. Cultural or biological differences may doom an interspecies romance from the start. The PCs' vastly powerful technology may cause equally vast problems if they lose, misuse, or damage it.



STAR HERO AND OTHER GENRES



THE HERO UNIVERSE

In this section, and elsewhere throughout this book, the text refers to the *Hero Universe*. The Hero Universe is a “meta-setting” that joins together most of the published settings produced (or to be produced) by Hero Games, thus creating a continuum of events and a level of interaction between characters not otherwise possible. If you’d like to learn more, you can download the *Hero Universe* document from the “Free Stuff” webpage at www.herogames.com.

EVERYONE’S A SUPERHERO

If an ordinary soldier or policeman in the twenty-fifth century has equipment which makes him the equal of a present-day superhero, what do the heroes in that setting have? Is there much point in being able to fly and project bolts of energy when anyone with a few credits to spare can buy an antigravity pack and a blaster gun? Superheroes in a high-tech setting do face the problem that their powers may not give them much of an advantage over the off-the-shelf items available to ordinary citizens. If those normal folk have cybernetic implants and are genetically improved, or are aliens with innate powers of their own, the

Science fiction is a broad genre, with almost limitless possibilities for storytelling. One of those possibilities is the mixing of SF with other genres, such as fantasy, superheroes, or westerns. This ranges from strangely anachronistic planets, to time-traveling SF characters getting stuck in the past, to using the elements of another genre in an SF setting... and beyond.

Champions

Superheroes are often ostensibly science fiction characters. Except where a hero’s powers explicitly derive from magic, superheroes generally have a “rubber science” or “technobabble” explanation for how they got their abilities. In comic books, Superman is an extraterrestrial, the X-Men are mutants, Iron Man has a high-tech battlesuit, and Plastic Man’s powers come from exposure to chemicals.

You can use the weapons and equipment described in *Star Hero* to outfit a high-tech superhero operating in a contemporary *Champions* campaign (paying the appropriate point cost for the powers they confer, of course). An alien or time-traveler with off-the-shelf supertech equipment could be quite effective as a crimefighter (or supervillain) in the present (witness Captain Chronos from *Conquerors, Killers, And Crooks*). Some aliens may have superpowers themselves, either as the result of the same sorts of origins Human superheroes experience, or because the alien’s species naturally possesses some sort of ability that makes him “superhuman.” The Malvan gladiators of the Champions Universe are an example of this.

Of course, superheroes often get out into space themselves. Whether they’re foiling an alien invasion, rescuing a Dependent kidnapped by intergalactic slavers, or just test-driving a gadgeteer’s starship, characters from a *Champions* campaign sometimes visit other planets and meet exotic aliens. It’s even possible to run a relatively straight superheroic campaign in an interstellar setting. The *Galactic Champions* setting in the Hero Universe involves superheroes who right wrongs and battle evildoers across the galaxy. In comic books the Legion of Superheroes and the Green Lantern Corps have similar duties, and the Lensmen of Doc Smith’s pulp epics were certainly as powerful as any caped hero.

Dark Champions

The stereotypical *Dark Champions* grim vigilante may not have much place in most SF settings, but the *Danger International* subgenre — espionage and intrigue — is definitely an appropriate one to cross with SF. Call it *Danger Interstellar*.

Spy stories and science fiction blend seamlessly into one another. Often the distinction between an espionage “technothriller” and near-future or cyberpunk SF is nothing more than a matter of marketing. Certainly James Bond has spent an awful lot of his career facing villains with secret bases and superweapons straight out of science fiction. The crossover goes the other way, too: Poul Anderson’s Ensign Flandry, Harry Harrison’s Slippery Jim DiGriz, and Robert Heinlein’s Friday accomplish feats of espionage and deception which Mr. Bond would surely have approved of.

Crossing *Star Hero* with *Danger International* can simply be a matter of setting the campaign a few decades in the future. This lets the game-master rearrange international politics without worrying about next week’s headlines, and allows the agents to visit Earth orbit or even Mars. Most of the weapons and gadgets are present-day tech, but a few next-generation prototypes like chemical laser rifles or remotely piloted combat vehicles can liven things up.

On the other hand, the GM can take things a step further, setting his “great game” of spycraft and assassination in the distant future. This presents some of the same problems as crimefighting — high-tech gadgetry may make some forms of spying too easy, or too difficult, which spoils the fun. The campaign may need to fall back on the Human (alien?) element, with scenarios which focus on the characters’ ability to gather information on their own, without spy-tech.

Fantasy Hero

Other than the equipment list and the scope of the typical campaign, the main difference between *Fantasy Hero* characters and *Star Hero* adventurers is the existence of magic. Gamemasters who want to run a crossover adventure have to decide what role magic plays in the *Star Hero* universe. Does it work at all? Does it only work on some planets? The official Hero Universe assumes the background magic level of the Earth (and most of Earth’s Universe/reality) changes over time, going from high in the age of Atlantis to

low in the Cyberpunk era, and not reviving until the Galactic Champions period. Other planets may be washed by different mystic tides and currents, so that a high-magic world could exist in the middle of a high-technology space empire. And of course, the Hero Universe is but one perspective on this issue. It's easy to envision a setting where fantasy spells and science fiction starships merge into an intriguing blend; the only question is how much the GM wants of each.

A planet of mages would be an interesting place for space explorers to visit. Imagine the surprise of the heroes when the locals respond to laser fire with fireball spells! This can be amusing even if the mages are actually fakers, doing a "Wizard of Oz" con game using hidden technology or psionic powers to make it appear they can command magic.

Or turn it around and send a group of fantasy characters out to explore strange new worlds. This assumes magic isn't limited to just one planet, since otherwise a magical spaceship won't get very far. A whole starfaring magical civilization might exist, with *Fantasy Hero* spells instead of *Star Hero* technology.

Finally, the GM can just pour it all into the blender at once. Characters can use magic spells, psionic powers, mutant abilities, or technological tools, all at once. Distinctions among them are just a matter of vocabulary. The Galactic Emperor's starships carry scrying-mages and are guarded by powerful enchantments, cyber-wizards jack into the Hypernet to cast spells in virtual reality, dragons carry blaster-armed riders into battle against psionic demon-cyborgs, and stealthy thieves use suction boots and gravitic lockpicks along with a Potion of Insubstantiality when they try to steal the Soulgem from a wizard's orbital fortress.

Pulp Hero

Since science fiction came out of the pulps, drawing a distinction between it and pulp adventure seems kind of arbitrary. Most pulp campaigns are likely to have at least a dose of Weird Science and fantastic inventions. But even the most hard SF campaign can benefit from an infusion of pulpish vitality and pacing. If the heroes spend too much time finessing the interstellar trade system or upgrading their cyberware, toss in a sneering, double-dyed pulp villain with a beautiful-but-deadly daughter, a lair full of death-traps and exotic creatures, and a Sinister Plan.

Western Hero

An old criticism of some pulp science fiction was that it was nothing but "westerns in space." An enterprising GM can make the most of that by playing up the similarities. Almost any interstellar campaign is likely to have remote frontier worlds where the only law is a titanium star and a blaster. The Western ideal is such a powerful archetype in American culture that space colonists may well try to create a society based on a real or imaginary version of the Old West. For a completely over-the-top campaign, give the heroes six-shot lasers and robot horses when they try to clean up a lawless sector of space.

Going the other way, science fiction can creep into Western adventures via the "steampunk" route. Remember, Jules Verne set his fantastic adventures in the 1860s and 1870s, the golden age of the gunslinger. Perhaps a group of heroic cowpokes could run afoul of a mad inventor and his amazing steampunk gadgets, or find themselves acting as Earth's first line of defense against an alien invasion (as in the amazing story "Night of the Cooters," by Howard Waldrop).

One of the most common time travel/alternate history changepoints is the American Civil War, which overlaps considerably with the classic period of Western adventures. Time Police may have to prevent Confederate sympathizers from smuggling machine-guns or death rays to Robert E. Lee's troops, or else an alternate history campaign might involve cowboy adventures as the Union and its rival Confederacy struggle for control of the West.

Other Eras

The Victorian period is the home time for Steampunk science fiction, discussed above. The Classical era of Greece and Rome is a natural destination for time travellers, or else might survive the onslaught of the barbarians in an alternate history, with laser-armed legions bearing the Imperial Eagles to the stars. Shorn of its fantasy trappings, the real-historical Middle Ages could be an interesting time for SF adventures — either full-bore Space Opera as knights battle alien invaders and fight as mercenaries on distant worlds, or genuine Hard SF in the days when science itself was in its infancy.

Continued from last page

superhero is just a guy who likes to wear capes.

One way around this problem is to encourage players to design supers with powers that aren't easily duplicated by technology. Superpowers like Growth, Stretching, Desolidification, or Mental Powers are all possibilities.

Another solution is to embrace the problem and run with it. The comic series *Top Ten*, by Alan Moore, examines the problems of superheroes working as cops in a city where everyone from bum to mayor is also super-powered. Fighting crime is easy when you can shrug off the bad guys' bullets; when they have blasters it becomes a dangerous job. Isn't doing a dangerous job what being a hero is all about?





Character Creation

CITIZENS OF
THE GALAXY

Characters in science fiction adventures come in a variety of types and shapes: aliens, cyborgs, mutants, gene-modified animals, androids, telepaths, and robots. And maybe a normal Human or two. This chapter discusses the various ele-

ments you should consider when creating a *Star Hero* character — species, environment, profession, and more — and describes how to simulate them in *HERO System* terms.

RACIAL PACKAGE DEALS



In a star-spanning campaign, players may want to create characters from a variety of non-Human species. Even if the PCs are all Human, the GM may still wish to create alien foes.

Individual GMs must decide for themselves whether to allow players to create their own alien species. In a setting with only a few starfaring species, it's probably best for the GM to define all the alien types and let players choose from that menu of possibilities. If the campaign is wide-ranging and includes hundreds of different species, then GMs may wish to allow players to do some of the work, creating their own exotic aliens to run as characters. (Of course, the GM should always review player-created Package Deals, and can veto abusive alien designs, or ones which simply don't fit in with the campaign's universe.)

Although each science fiction setting is different, with its own unusual aliens and locales, certain archetypical species tend to occur throughout SF, and particularly in science fiction RPGs. This section includes Package Deals not only for various species, but which reflect the culture or unusual environment the character grew up in (or was genetically designed to thrive in).

Typically a character should only have one Species Package Deal, plus one Cultural Package Deal, and one Environment Package Deal, if those are appropriate and/or desired. However, a GM might allow a character to take more than one in some cases. See also the *Crossbreeds* sidebar on page 24.

See Chapter Six for more information on creating alien species.

SPECIES PACKAGE DEALS

These Package Deals represent common types of alien species found in much SF. They're all presented "generically," without reference to any particular setting or location, since *Star Hero* is not a setting book. You should consider making slight changes to them to adapt them to your specific campaign, or to create alternate forms of the same general species.

There is no Human Package Deal, because Humans serve as the "baseline" from which other species Packages are derived — the Package indicates how the species in question is "better" or "worse" than Humanity in some respects. Human characters can, of course, take Cultural or Environment Package Deals (see below).

ANDROID PACKAGE DEAL

A character with this Package Deal is an incredibly sophisticated android or robot. Though clearly a "manufactured" sentient being, the character is advanced enough to interact normally with other people. His systems are so high-tech that he takes damage like other characters (loss of STUN represents systems being knocked offline temporarily, expenditure of END represents strain on his internal power sources, and so forth). The character also needs the Fringe Benefit *Free Robot* (page 50) in some settings.

This Package assumes the character looks like an android, and exists in a setting that restricts androids' civil rights (which most do). You can easily remove those Disadvantages if you prefer.

For more information about robot and android characters, see page 165.

ANDROID PACKAGE DEAL

Ability	Cost
Android Form: Armor (6 PD/6 ED)	18
Android Form: Life Support: Total	45
Sensors: 20 points' worth of Enhanced Senses of player's choice	20
Computer Memory: Eidetic Memory	5
Onboard Computer Systems: Absolute Time Sense, Bump Of Direction, Lightning Calculator, Universal Translator (INT Roll)	29
Disadvantages	Value
Distinctive Features: Android (Concealable With Effort; Noticed And Recognizable)	-10
Social Limitation: Android (restricted civil rights, suffers from prejudice) (Very Frequently, Minor)	-15

Total Cost Of Package: 92

BOTANOID PACKAGE DEAL

A "botanoid" is a species of sentient plant. Although tough, and usually strong, they also tend to be a little slower than other species. Some have the ability to communicate with other, non-sentient, plant species (though plants rarely have anything interesting to say), or other plant-based powers.

CROSSBREEDS

In science fiction settings with lots of alien species, such as *Star Trek*, it's not uncommon for sentient species to crossbreed. The resulting hybrid offspring usually have some features of both species, often somewhat muted or altered to reflect their "diluted" genetic heritage. The character's Everyman Skills, attitudes, and the like usually depend on which homeworld he was raised on; he may also suffer from prejudice or discrimination (possibly simulated with a Social Limitation) if half-breeds are scorned.

Since each crossbreed is different, there's no Package Deal for them. Instead, the player and the GM should work together to come up with an appropriate Package that combines attributes from the Packages for his parent species. In most cases those attributes shouldn't be as strong as in either parent species's Package.

BOTANOID PACKAGE DEAL

Ability	Cost
+3 STR	3
+1 PD	1
Bark/Fibrous Skin: Damage Resistance (3 PD/3 ED)	3
Photosynthesis: Life Support (Diminished Eating: only has to eat once per week)	1

Disadvantages	Value
-2 DEX	-6
-2" Running	-4
Vulnerability: 1½x STUN from Fire Attacks	-10

Total Cost Of Package: -12

Options	Cost
Plant Communication: Telepathy 6d6 (Plant class of minds), Reduced Endurance (0 END; +½); No Range (-½), Communication Only (-¼)	+26
Spines: HKA ½d6, Continuous (+1), Damage Shield (+½), Inherent (+¼), Persistent (+½), Reduced Endurance (0 END; +½); Always On (-½), Activation Roll 14- (-½), No STR Bonus (-½)	+15
Spore Projection: Energy Blast 3d6, NND (defense is Life Support [Self-Contained Breathing]; +1); Limited Range (2"; -¼), 3 Charges (-1 ¼)	+12
Tendrils: Stretching 1", Reduced Endurance (0 END; +½); Always Direct (-¼), No Noncombat Stretching (-¼), No Velocity Damage (-¼)	+4

CANINOID PACKAGE DEAL

Caninoids are aliens who evolved from canine stock — wolves, dogs, hyenas, or the like. Wolf-humanoids are perhaps the most common in science fiction gaming, but they're certainly not the only type possible. Caninoids tend to work well in groups (coming, as they do, from animals that live in packs), and can be both tenacious and rapacious.

CANINOID PACKAGE DEAL

Ability	Cost
+2 STR	2
+1 DEX	3
Running +2"	4
Nightvision:	5
Canine Senses: +1 PER with all Sense Groups	3

Disadvantages	Value
None	

Total Cost Of Package: 17

ENERGY BEING PACKAGE DEAL

This Package Deal represents an alien composed primarily of energy, though not to the extent that it's normally insubstantial or totally immune to physical effects.

ENERGY BEING PACKAGE DEAL

Ability	Cost
+5 DEX	15
Energy Body: Physical and Energy Damage Reduction, Resistant, 25%	30
Energy Body: Energy Blast 4d6, Damage Shield (+½), Continuous (+1), Reduced Endurance (0 END; +½), Persistent (+½), Inherent (+¼), Personal Immunity (+¼); Always On (-½)	53

Disadvantages	Value
-3 STR	-3
-2 BODY	-4
Vulnerability: 1 ½ x STUN and BODY from opposite energy type, or some similar attack (Common)	-20

Total Cost Of Package: 71

Options	Cost
Energysense: Detect Energy (INT Roll) (Sight Group), Discriminatory, Analyze, Range, Sense	+27

Zap Touch: Energy Blast 6d6; No Range (-½), Side Effect (character loses 1 BODY every time he uses the power; -½)	+15

FELINOID PACKAGE DEAL

Cat-people, such as Larry Niven's Kzinti, are one of the most common types of aliens encountered in science fiction literature and gaming. This Package Deal represents a sort of "average" felinoid, one not tied to a particular type of cat. You can easily create more specific Package Deals for lion-men, leopard-men, jaguar-men, ocelot-men, and so forth by altering this Package slightly.

FELINOID PACKAGE DEAL

Ability	Cost
+3 DEX	9
Claws: HKA ½d6 (plus STR); Reduced Penetration (-¼)	8
Nightvision	5
Running +2"	4
Leaping +2"	2

Disadvantages	Value
-1 CON	-2
-1 BODY	-2

Total Cost Of Package: 24

HERDFOLK PACKAGE DEAL

This Package Deal is for sentient species descended from herd animals or other grazing creatures. Typically vegetarians, and often skittish, they are fast runners and surprisingly strong — when angered, or frightened into a violent response, they can be dangerous, especially if they retain horns or hooves.

HERDFOLK PACKAGE DEAL

Ability	Cost
+3 STR	3
+1 CON	2
Running +3"	6
Herdfolk Senses: +1 PER with Smell/Taste Group	2
Disadvantages	Value
-2 PRE	-2
Total Cost Of Package: 11	
Option	Cost
Horns: HKA ½d6 (plus STR)	+10
Kick: HA +3d6; Hand-To-Hand Attack (-½) +10	

ICHTHYOID PACKAGE DEAL

This Package Deal represents an ichthyoid (fish-like) sentient humanoid species, perhaps one native to a waterworld. Typically, ichthyoids define "water" as their normal environment for breathing; they must take Life Support (Expanded Breathing: air) to breathe normally in gaseous environments, or wear special life support suits (a Dependence; see page 62).

ICHTHYOID PACKAGE DEAL

Ability	Cost
+2 DEX	6
Swimming +4"	4
Infrared Perception (Sight Group)	5
Disadvantages	Value
None	
Total Cost Of Package: 15	

INSECTOID PACKAGE DEAL

Insectile species occur fairly frequently in science fiction, often as villains or antagonists because of the Human reader's instinctive loathing for "bugs." They range from multi-limbed (and often multi-fanged) monstrosities, to members of hive mind species whose thinking is utterly alien to Humans, to industrious laborers renowned across the spiral arm for their diligence.

INSECTOID PACKAGE DEAL

Ability	Cost
+1 STR	1
+1 DEX	3
Chitinous Skin: Damage Resistance (2 PD/2 ED)	2
Insect Senses: +1 PER with Smell/Taste Group	2
Disadvantages	Value
-1 CON	-2
-2 COM	-1
Total Cost Of Package: 5	
Options	Cost
Claws/Mandibles: HKA ½d6 (plus STR); Reduced Penetration (-¼)	+8
Faceted Eyes: Increased Arc Of Perception (360 Degrees) for Sight Group	+10
Hive Mind: Mind Link, any willing target, up to 8 people at once; Only With Others Who Have Mind Link (-1)	+15
Multi-Limbed: Extra Limbs (as many as desired), Inherent (+¼)	+6

REPTILOID PACKAGE DEAL

Reptilian aliens — snake-men, lizard-men, and the like — crop up in many different types of science fiction stories; like felinoids, they seem to hold a particular appeal for gamers. This Package Deal represents an "average" reptiloid, one easily customizable to suit particular reptile types or perspectives on such species.

REPTILOID PACKAGE DEAL

Ability	Cost
+2 STR	2
+1 PD	1
Scaly Skin: Damage Resistance (2 PD/2 ED)	2
Running +1"	2
Swimming +1"	1
Disadvantages	Value
None	
Total Cost Of Package: 8	
Options	Cost
Claws: HKA ½d6 (plus STR); Reduced Penetration (-¼)	+8
Supreme Climbing: Clinging (normal STR); Requires A Climbing Roll (-½)	+7
Tail: Extra Limb, Inherent (+¼); Limited Manipulation (-¼)	+5
Venomous Bite: HKA 1 point; No STR Bonus (-½) (total cost: 3 points) plus RKA 2d6, NND (defense is appropriate LS [Immunity]; +1), Does BODY (+1); No Range (-½), 2 Charges (-1 ½), HKA Must Do BODY (-½), Extra Time (onset time begins 5 Minutes after victim is bitten; -2), Gradual Effect (10 Minutes; 1d6/5 minutes; -¾), Linked (-¼) (total cost: 14 points)	+17



SHAPESHIFTER PACKAGE DEAL

In some science fiction settings, shapeshifters — beings with the ability to alter their forms — exist. The Founders of *Star Trek: Deep Space Nine* are a good example. In most cases the ability to change shape is limited to other humanoid forms, but sometimes the beings can assume any shape they wish. This Package Deal presents the more limited form of shapeshifting, but can easily be expanded by exchanging Shape Shift for Multiform.

Shapeshifters do not often enjoy the trust of non-shifting aliens, who regard them with suspicion and distrust. The Package Deal reflects this with a Hunted, but you could substitute a Social Limitation, Reputation, or the like if you prefer.

SHAPESHIFTER PACKAGE DEAL

Ability	Cost
+2 DEX	6
Shapeshifting: Shape Shift (Sight, Hearing, Smell/Taste, and Touch Groups; any humanoid form), Imitate	39
Disadvantages	Value
Hunted: local non-shifting authorities 11- (Mo Pow, NCI, Watching)	-15
Total Cost Of Package: 30	

SILICON LIFE-FORM PACKAGE DEAL

Although life on Earth is based on carbon, in a science fiction setting that doesn't have to be the case on every planet. Life could be based on other elements. One of the most common "alternate element" life-forms in SF is sentient beings with silicon bodies — rock- or crystal-men, so to speak. Although tough and strong, they also tend to be slow and ponderous, and quite heavy.

SILICON LIFE PACKAGE DEAL

Ability	Cost
+3 STR	3
+3 CON	6
+2 BODY	4
+3 PD	3
+1 ED	1
Silicon Body: Damage Resistance (4 PD/4 ED)	4
Disadvantages	Value
-2 DEX	-6
Physical Limitation: Heavy (about four times Human weight) (Frequently, Slightly Impairing)	-10
Total Cost Of Package: 5	

URSOID PACKAGE DEAL

Ursoids are aliens who resemble, in form if not in general attitudes, the bears of Earth. Big, strong, tough, and often known for their abilities as fighters, they can be surprisingly gentle and philosophical in the right circumstances.

URSOID PACKAGE DEAL

Ability	Cost
+5 STR	5
+5 CON	10
+3 BODY	6
Tough Skin: Damage Resistance (1 PD/1 ED)	1
Disadvantages	Value
Running -1"	-2
Total Cost Of Package: 20	
Option	Cost
Claws/Fangs: HKA ½d6 (plus STR); Reduced Penetration (-¼)	+8
Roar: +10 PRE; Only For Fear/Intimidation-Based PRE Attacks (-1), Incantations (-¼)	+4

WINGED HUMANOID PACKAGE DEAL

Sentient humanoids with the ability to fly exist in many science fiction settings. They range from bird-men, to bat-men, to gargoyle- or demon-like aliens. They tend to be light and relatively fragile, and often come from low-gravity worlds. If giving a winged humanoid character Flight could potentially unbalance the game, substitute Gliding instead.

WINGED HUMANOID PACKAGE DEAL

Ability	Cost
+2 DEX	6
Wings: Flight 8"; Restrainable (-½)	11
+3 PER with Sight Group	6
Disadvantages	Value
-2 BODY	-4

Total Cost Of Package: 19

CULTURAL PACKAGE DEALS

In science fiction, it's not uncommon to find species that are overwhelmingly associated with a particular lifestyle, manner of interacting with others, or cultural stereotype. In some cases, it may be appropriate to represent this with Cultural Package Deals, such as the ones described below. Cultural Package Deals should rarely, if ever, be required; a player can always define his character as a rebel who flouted his species's cultural trends and traditions.

CONTEMPLATIVE CULTURE PACKAGE DEAL

Science fiction is filled with examples of species renowned for their wisdom, learning, spiritual strength, philosophical depth, and/or contemplative natures. From the Vulcans and Bajorans of *Star Trek* to the Minbari of *Babylon 5*, these species often demonstrate to PCs from Earth just how much potential the Human species has.

Though often peaceful, even pacifistic, Contemplative Species characters may be highly-trained fighters, versed in martial arts and other esoteric combat disciplines. They also often possess psionic powers. They sometimes embrace logic and scorn emotional behavior, which can have its benefits (Eidetic Memory, high Deduction rolls), but also some drawbacks (inability to relate to emotional species, as reflected by various Psychological and Social Limitations).

CONTEMPLATIVE CULTURAL PACKAGE DEAL

Ability	Cost
+3 INT	3
+3 EGO	6
+3 PRE	3
Any four KSs or SSs at 11- each	8
Disadvantages	Value
None	

Total Cost Of Package: 20

CRIMINAL CULTURE PACKAGE DEAL

Many SF societies are characterized by rampant levels of crime. They may be kleptocracies (rule by thieves, or more accurately by organized crime), or just worlds where anarchy reigns and every person has to look out for himself. This Cultural Package Deal may also be appropriate for characters living in societies like Soviet Russia, where one's ability to interact with the black market, and one's contacts, are necessary to survive and thrive.

CRIMINAL CULTURAL PACKAGE DEAL

Ability	Cost
+1 INT	1
+1 PRE	1
6 points' worth of Skills from the following list:	6
Bribery, Climbing, Computer Programming, Conversation, Forgery, Gambling, Lockpicking, Persuasion, Security Systems, Seduction, Sleight Of Hand, Stealth, Trading, any Background Skill	
WFs (2 points' worth)	2
Contacts (4 points' worth; player's choice)	4
Disadvantages	Value
None	

Total Cost Of Package: 14

MERCANTILE CULTURE PACKAGE DEAL

It's not uncommon for some species in a science fiction setting to be depicted only with regard to matters of trade and business. The Ferengi of *Star Trek* are the best-known example, but many settings feature species who only seem to enter the story when there's dealing to be done and profit to be made.

MERCANTILE CULTURAL PACKAGE DEAL

Ability	Cost
Trading	3
6 points' worth of Skills from the following list:	6
Bureaucratics, Conversation, Electronics, High Society, Oratory, Persuasion, Seduction, Stealth, Streetwise, any Background Skill	
Contacts (4 points' worth; player's choice)	4
Disadvantages	Value
None	

Total Cost Of Package: 13



CYBORGS

The term “cyborg” refers to any combination of living and mechanical systems (in the Cyberpunk subgenre, the systems are usually referred to as “cyberware”). The Terminator in the movies is one example — a killer robot clad in living flesh — while television’s Six Million Dollar Man was a Human equipped with super-powered mechanical limbs.

Many *Star Hero* campaigns allow characters to be cyborgs, since replacing biological material with technological counterparts not only expands the characters’ capabilities, but raises all sorts of interesting roleplaying issues, such as “where does the man end and the machine begin?”. In some games (particularly *Cyber Hero* campaigns), GMs let characters buy cyborg parts in-game with money, regarding them as just another form

WARRIOR CULTURE PACKAGE DEAL

Science fiction is rife with species best known for their abilities as warriors, such as the Klingons of *Star Trek* or the Kzinti of Larry Niven’s “Known Space” stories. Usually tough, strong, and skilled with a variety of weapons, members of warrior species often embrace elaborate codes of honor that keep their societies from descending into eternal, anarchistic warfare. Others care only about victory, regardless of how they achieve it.

WARRIOR CULTURAL PACKAGE DEAL

Ability	Cost
+3 STR	3
+1 DEX	3
+2 CON	4
+2 BODY	4
WFs (6 points’ worth)	6
Disadvantages	Value
Psychological Limitation appropriate to species (Code Of Honor, Belligerent, Hair-Trigger Temper, or the like)	-15
Total Cost Of Package: 5	

ENVIRONMENT PACKAGE DEALS

Even within a single species, people from different environments can show tremendous variation in appearance and abilities. On Earth, the people of Peru and Tibet are more comfortable at high altitude than people native to sea level, and the Inuit are adapted to Arctic conditions. In the future, we may see Humans shaped by other worlds, either naturally or by sophisticated genetic engineering. Sentient aliens could easily have the same intraspecies diversity.

To represent these variations, characters can take Environment Package Deals. The abilities provided by these Packages could come from heredity, genetic engineering, accidental mutation, or many other factors, but in general they reflect an adaptation of a sentient being to a particular world or environment (hence the name). Characters may buy more than one Environment Package Deal if they have a good explanation for doing so (for example, a Heavyworlder could also be Psionic). If an Environment Package Deal and Species Package Deal provide the same abilities or Disadvantages, the player and GM should decide together whether to combine the abilities (to whatever degree), or to replace one Package’s ability with something else to prevent duplication.

HEAVYWORLDERS

Humans living on planets with heavy gravity are likely to be large and massively strong, simply to survive. Their strength may be the result of genetic modification, or the effect of living in powerful gravity. Heavyworlders’s abilities keep them from suffering any particular disadvantages in their home setting, but other members of their species recognize them as heavyworlders instantly, and often find their squat, over-muscled physiques unattractive, even dangerous. (Similarly, heavyworlders may find ordinary members of their species “petite” or “fragile,” and thus unappealing in some ways.)

Heavyworlders require a lot of food to support their prodigious bodies, and when away from their homeworlds may be prone to accidentally breaking ordinary objects that can’t withstand their weight and strength. Traditionally, heavyworlders and lightworlders don’t get along with each other (much like the customary fantasy fiction antipathy between Dwarves and Elves).

This Package assumes a native environment of up to 2 G; for heavyworlders native to even higher-gravity worlds, add +5 STR per +1 G. See also pages 203 and 278.

LIGHTWORLDERS

Just as Heavyworlders are adapted to high-gravity environments, Lightworlders are optimized for planets with between 0.1 and 0.6 G. Humans living on the Moon, Mars, or the moons of Jupiter and Saturn would all be Lightworlders. They tend

HEAVYWORLDER PACKAGE DEAL

Ability	Cost
+5 STR	5
+3 CON	6
+3 BODY	6
Heavy: Knockback Resistance -1"	2
High Gravity Training: Environmental Movement (High-G)	1
Used To High G: Armor (2 PD/0 ED); Only To Protect Against G Force Damage (-1)	1

Disadvantages	Value
Physical Limitation: Large (Infrequently, Slightly Impairing)	-5

Total Cost Of Package: 16

to be tall and slender, and are usually not as strong and tough as their normal-gravity kin because they have less tissue mass (making them prime targets for brutal criminals in some societies). Since low-gravity planets tend to have low air pressure, lightworlders are also adapted to thin air. Their features may be the result of genetic engineering, or just the effect of living in low gravity.

Most Lightworlders should take the *Gravity Adaptation* Physical Limitation (page 64). The exact version of Gravity Adaptation chosen depends on the level of gravity in the environment the character's accustomed to.

LIGHTWORLDER PACKAGE DEAL

Ability	Cost
+1 DEX	3
Adapted To Thin Air: Life Support (Expanded Breathing: can breathe normally in thin atmospheres)	1
Low Gravity Training: Environmental Movement (Low-G)	4

Disadvantages	Value
-2 STR	-2
-1 CON	-2
-1 BODY	-2

Total Cost Of Package: 2

MERFOLK

Most of Earth is covered by ocean, and many alien worlds could have no landmasses at all, only oceans. Normal Humans can only venture undersea in submarines or diving suits, but genetic manipulation could create a race of Humans capable of living in water permanently. This Package assumes the merfolk's genetic designers wanted them to have the ability to interact with surface-dwellers, so they can still breathe air and walk on land. In appearance, they are stocky, hairless people with webbed hands and feet, and visible gill slits on the

sides of their thick necks. Their eyes are large and sensitive, so they normally use sunglasses or similar protective eyewear on the surface.

MERFOLK PACKAGE DEAL

Ability	Cost
Water-Breathing: Life Support (Expanded Breathing: breathe underwater; Safe Environments: High Pressure, Intense Cold)	8
Webbed Hands And Feet: Swimming +3"	3
Nightvision	5
Environmental Movement: Aquatic Movement	3

Disadvantages	Value
Vulnerability: 2 x Effect from Sight Group Flashes based on bright light (Common)	-20

Total Cost Of Package: -1

MUTANTS

In real life, most mutants are stillborn, or else go through life with crippling handicaps. In SF stories (especially the cinematic kind), some people (be they Human or alien) are born with or develop favorable mutations. They may be the children born a generation after an atomic war, the direct victims of that selfsame war (or a similar one involving biological or chemical mutative agents), or the unfortunate inhabitants of a high-radiation planet. Mutants are a particularly common feature of post-apocalyptic SF stories.

Because SF mutants always seem to be recognizable — either due to their deformities, a distinctive manner of dress, or both — this Package Deal includes a *Distinctive Features* Disadvantage. You can discard the Distinctive Features if you prefer, or replace it with appropriate Physical Limitations, Social Limitations, and the like.

MUTANT PACKAGE DEAL

Ability	Cost
One mutant ability (see sidebar, page 31)	10

Disadvantages	Value
-2 COM	-1
Distinctive Features: Mutant (Concealable With Effort; Causes Major Reaction [Prejudice])	-15

Total Cost Of Package: -6

PSIONIC PACKAGE DEAL

If psionic abilities exist in a game world, characters who have them are members of a powerful elite. The nature of psi powers is too variable for a single Package Deal; in some game worlds Talents like Danger Sense, Simulate Death, and Universal Translator are psi powers, while in other games you're not a real psionic unless you can wreck cities with a thought. The Psi-Agent Package Deal (page 35) includes one set of Skills and Perks for a working psi; otherwise the GM must determine what powers are available and how many points characters can spend on them.

Continued from last page

of equipment. In other games, GMs require PCs to spend Character Points to spend Character Points for their cyborg parts, because they consider them more like "super-powers" than equipment and want to control their prevalence and use.

Being a cyborg doesn't usually require a Package Deal; characters simply acquire the cybernetic parts they desire by the appropriate method for the campaign. Here's a list of sample cybernetic parts characters could have. They're built with the Limitation *Restrained* at the -¼ level; see page 200 of the *HERO System 5th Edition* for a discussion of this.

Communications

Implant: This tiny device, implanted in the skull, allows a character to receive and broadcast on radio bands without using outside equipment. Radio Perception/Transmission (Radio Group) (10 Character Points); Restrained (-¼). Total cost: 8 points.

Cybernetic Arm: Made of titanium steel, micro-motors, and high-tech plastics, this artificial arm is much stronger than a character's natural arm. +10 STR (10 Active Points); Only When Using The Right Arm (-¼), Restrained (-¼), No Figured Characteristics (-½). Total cost: 5 points.

Cybernetic Eye: Incorporating some of the most advanced optical technology available, cybernetic eyes not only replace a character's normal vision, but allow him to see into other spectra as well.

Infrared Perception, Ultraviolet Perception, and Telescopic (+4 versus Range Modifier) (all for Sight Group) (16 Active

Continued on next page

Continued from last page

Points); Restrained (-¼). Total cost: 13 points.

Cybernetic Leg: A character with this high-tech artificial leg can run and jump much better than one with ordinary flesh-and-blood legs.

Running +5" (10 Active Points); Restrained (-¼) (total cost: 8 points) plus Leaping +4" (4 Active Points); Restrained (-¼) (total cost: 3 points). Total cost: 11 points.

A character can take this Package together with any Species Package, unless the GM has declared that certain species never possess psychic abilities.

PSIONIC PACKAGE DEAL	
Ability	Cost
+5 EGO	10
+3 INT	3
Psionics: Psionic powers of character's choice (see Chapter Ten for examples)	30
Disadvantages	Value
None	
Total Cost Of Package: 43	

SIZE/WEIGHT

Some alien species are significantly larger or smaller than the defined Human norm. The disadvantages to this are covered by taking a Physical Limitation (see page 63). The benefits are covered by the templates presented here, which include the appropriate Physical Limitation. In the case of species which are more or less Human height, but still weigh significantly more (such as silicon aliens), reduce the frequency and/or degree of impairment, as appropriate.



Cost Size: Insectile (character is about one-sixty-fourth Human size)
16 **Easily Hidden:** +12 to Concealment (24 Active Points); Self Only (-½)
60 **Hard To Hit:** +12 DCV
24 **Hard To Perceive:** +12 to Stealth
-30 **Less Impressive:** -30 PRE (minimum of 0; adjust cost accordingly)
-36 **Shorter Legs:** Running -18" (minimum of 1"; may be changed to compensate for reduced movement due to negative STR)
-30 **Weaker:** -30 STR (minimum of -30; adjust cost accordingly)
-20 **Physical Limitation:** Insectile (All The Time, Greatly Impairing)
Total cost: -16 points.

Cost Size: Minute (character is about one-thirty-second Human size)
13 **Easily Hidden:** +10 to Concealment (20 Active Points); Self Only (-½)
50 **Hard To Hit:** +10 DCV
20 **Hard To Perceive:** +10 to Stealth
-25 **Less Impressive:** -25 PRE (minimum of 0; adjust cost accordingly)
-30 **Shorter Legs:** Running -15" (minimum of 1"; may be changed to compensate for reduced movement due to negative STR)
-25 **Weaker:** -25 STR (minimum of -30; adjust cost accordingly)
-15 **Physical Limitation:** Minute (Frequently, Greatly Impairing)
Total cost: -12 points.

Cost Size: Minuscule (character is about one-sixteenth Human size)
11 **Easily Hidden:** +8 to Concealment (16 Active Points); Self Only (-½)
40 **Hard To Hit:** +8 DCV
16 **Hard To Perceive:** +8 to Stealth
-20 **Less Impressive:** -20 PRE (minimum of 0; adjust cost accordingly)
-24 **Shorter Legs:** Running -12" (minimum of 1"; may be changed to compensate for reduced movement due to negative STR)
-20 **Weaker:** -20 STR (minimum of -30; adjust cost accordingly)
-15 **Physical Limitation:** Minuscule (Frequently, Greatly Impairing)
Total cost: -12 points.

Cost Size: Tiny (character is about one-eighth Human size)
8 **Easily Hidden:** +6 to Concealment (12 Active Points); Self Only (-½)
30 **Hard To Hit:** +6 DCV
12 **Hard To Perceive:** +6 to Stealth
-15 **Less Impressive:** -15 PRE (minimum of 0; adjust cost accordingly)
-18 **Short Legs:** Running -9" (minimum of 1"; may be changed to compensate for reduced movement due to negative STR)
-15 **Weak:** -15 STR (minimum of -30; adjust cost accordingly)
-10 **Physical Limitation:** Tiny (Frequently, Slightly

Impairing)

Total cost: -8 points.

- Cost **Size: Diminutive** (character is about one-quarter Human size)
- 5 **Easily Hidden:** +4 to Concealment (8 Active Points); Self Only (-½)
- 20 **Hard To Hit:** +4 DCV
- 8 **Hard To Perceive:** +4 to Stealth
- 10 **Less Impressive:** -10 PRE (minimum of 0; adjust cost accordingly)
- 12 **Short Legs:** Running -6" (minimum of 1"; may be changed to compensate for reduced movement due to negative STR)
- 10 **Weak:** -10 STR (minimum of -30; adjust cost accordingly)
- 10 **Physical Limitation:** Diminutive (Frequently, Slightly Impairing)

Total cost: -9 points.

- Cost **Size: Small** (character is about half Human size)
- 3 **Easily Hidden:** +2 to Concealment (4 Active Points); Self Only (-½)
- 10 **Hard To Hit:** +2 DCV
- 4 **Hard To Perceive:** +2 to Stealth
- 5 **Less Impressive:** -5 PRE (minimum of 0; adjust cost accordingly)
- 6 **Short Legs:** Running -3" (minimum of 1"; may be changed to compensate for reduced movement due to negative STR)
- 5 **Weak:** -5 STR (minimum of -30; adjust cost accordingly)
- 5 **Physical Limitation:** Small, down to half Human size and/or mass (1m, or ½") (Infrequently, Slightly Impairing)

Total cost: -4 points.**Reach for Large Characters**

Large characters' extra reach is simulated with inches of Stretching, bought with these Power Modifiers: Reduced Endurance (0 END; +½); Always Direct (-¼), No Noncombat Stretching (-¼), No Velocity Damage (-¼).

As with everything else in a Size package, reach is not required. Some characters, particularly Humaniform ones, need it. Others can't reach significantly far away from their bodies, so they don't need reach.

Large Characters and DCV

As noted under *Physical Limitation*, for every step *larger* than Human size, a character suffers -2 DCV, and all PER Rolls to perceive him are at +2. The DCV penalty was included in the Physical Limitation for two reasons: first, it almost never varies from the standard (unlike the DCV bonus for being smaller than Human size, which often varies); and because the rules for negative DCV Levels (*HERO System 5th Edition, Revised*, page 54) are optional. However, the value of the negative DCV Levels (using the standard cost of 5 Character Points per Level) exceeds the points the character gets from the Physical Limitation. If you prefer, you can adopt the negative DCV Levels rule, and then instead of including the reduced DCV as part of the Physical Limitation, subtract the negative Levels' cost from the cost of the Size Template.

Cost **Size: Large** (character is up to twice Human size)

- 15 **Greater Strength:** +15 STR
- 6 **Greater Mass:** +3 BODY
- 6 **Heavy:** Knockback Resistance -3"
- 5 **More Impressive:** +5 PRE
- 12 **Long Legs:** Running +6"
- 3 **Tougher:** +3 ED
- 4 **Reach:** Stretching 1"
- 5 **Physical Limitation:** Large (Infrequently, Slightly Impairing)

Total cost: 46 points.

Cost **Size: Enormous** (character is up to four times Human size)

- 30 **Greater Strength:** +30 STR
- 12 **Greater Mass:** +6 BODY
- 12 **Heavy:** Knockback Resistance -6"
- 10 **More Impressive:** +10 PRE
- 24 **Long Legs:** Running +12"
- 6 **Tougher:** +6 ED
- 9 **Reach:** Stretching 2"
- 15 **Physical Limitation:** Enormous (Frequently, Greatly Impairing)

Total cost: 88 points.

Cost **Size: Huge** (character is up to eight times Human size)

- 45 **Greater Strength:** +45 STR
- 18 **Greater Mass:** +9 BODY
- 18 **Heavy:** Knockback Resistance -9"
- 15 **More Impressive:** +15 PRE
- 36 **Long Legs:** Running +18"
- 9 **Tougher:** +9 ED

MUTANT ABILITIES

These mutant powers are all based on realistic biology, usually the effect of an enlarged or duplicated body part. Each is worth 10 Character Points. In a comic book-, pulp, or cinematic-oriented game, more astonishing powers are possible — psionic abilities, energy blasts, shapeshifting, and so forth.

Double Heart: +3 CON, +2 BODY

Four Arms: +4 STR and Extra Limbs (2), Inherent (+¼)

Four Eyes: Increased Arc Of Perception (360 Degrees) (Normal Sight) and Nightvision

Giant Brain: +5 INT and Eidetic Memory

Fangs: HKA 1d6; No STR Bonus (-½)

Huge Eyes: Increased Arc Of Perception (240 Degrees) (Sight Group) and Nightvision

Incredible Digestive System: Life Support (Diminished Eating: once per week; Immunity: Alcohol, Phytotoxins; Longevity: ages at half normal rate)

Incredible Immune System: Life Support (Immunity to all diseases and bioagents of character's homeworld)

Thickened Skin: Armor (3 PD/3 ED) and Life Support (Safe Environment: High Pressure)

- 17

Reach: Stretching 4"
- 15

Physical Limitation: Huge (Frequently, Greatly Impairing)
- Total cost: 143 points.
- Cost

Size: Gigantic (character is up to sixteen times Human size)
- 60

Greater Strength: +60 STR
- 24

Greater Mass: +12 BODY
- 24

Heavy: Knockback Resistance -12"
- 20

More Impressive: +20 PRE
- 48

Long Legs: Running +24"
- 12

Tougher: +12 ED
- 34

Reach: Stretching 8"
- 15

Physical Limitation: Gigantic (Frequently, Greatly Impairing)
- Total cost: 207 points.
- Cost

Size: Gargantuan (character is up to thirty-two times Human size)
- 75

Greater Strength: +75 STR
- 30

Greater Mass: +15 BODY
- 30

Heavy: Knockback Resistance -15"
- 25

More Impressive: +25 PRE
- 60

Long Legs: Running +30"
- 15

Tougher: +15 ED
- 69

Reach: Stretching 16"
- 15

Physical Limitation: Gargantuan (Frequently, Greatly Impairing)
- Total cost: 289 points.
- Cost

Size: Colossal (character is up to sixty-four times Human size)
- 90

Greater Strength: +90 STR
- 36

Greater Mass: +18 BODY
- 36

Heavy: Knockback Resistance -18"
- 30

More Impressive: +30 PRE
- 72

Long Legs: Running +36"
- 18

Tougher: +18 ED

- 137

Reach: Stretching 32"
- 20

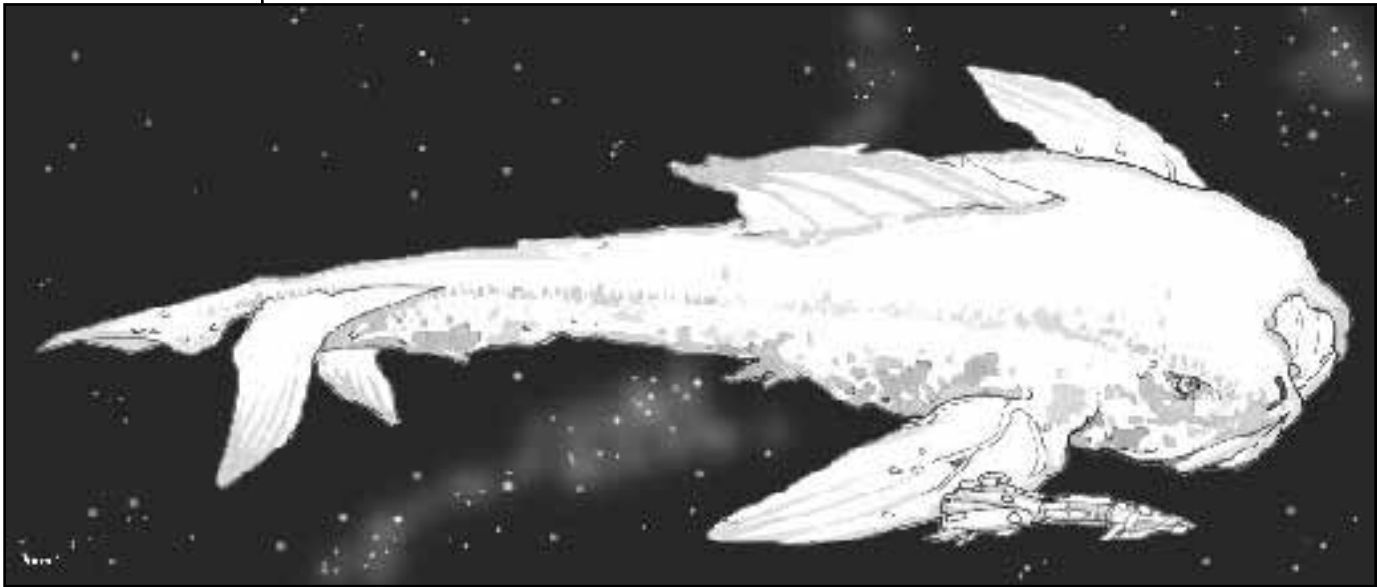
Physical Limitation: Colossal (All The Time, Greatly Impairing)
- Total cost: 399 points.

SPACERS

Also known as Belters or Freefallers, Spacers are people born and raised in a microgravity environment. For example, Humans raised in the asteroid belt or in orbital space stations would be Spacers. They may have genetic modifications to help them survive — in particular, bones which don't weaken in low gravity, improved resistance to radiation, immunity to spacesickness, and possibly the ability to use feet more as gripping hands (like those of chimpanzees or orangutans). Spacers tend to be physically weak and very tall. Because they can only visit planets wearing exoskeletons or riding float chairs, Spacers naturally prefer their own artificial environments. In some settings, Spacers may be the norm for certain species, with only a small proportion of "groundlings" or "dirtsiders" living on planets.

SPACER PACKAGE DEAL

Ability	Cost
Spaceborn: Life Support (Safe Environment: High Radiation)	2
Feet As Useful As Hands: Extra Limbs (2)	5
Zero-G Training: Environmental Movement (Zero G)	4
Disadvantages	Value
-2 STR	-2
-1 CON	-2
Physical Limitation: Cannot Move In Normal Gravity Without Assistance (Frequently, Greatly Impairing)	-15
Total Cost Of Package:	-8



PROFESSIONAL PACKAGE DEALS



Species Package Deals reflect a character's genetics, and Environment Package Deals show how the place he grew up in (or was bio-engineered for) affected him. In many cases a character's background dictates which of these Racial Package Deals he can select. Professional Package Deals are different. They represent the training and study people go through to learn a career, and as such usually indicate voluntary choices on a character's part.

The following Packages represent jobs or lifestyles common to science fiction stories and settings. Not all Packages are appropriate for all campaigns, and some may need adjustments or additions for specific settings. None of the Packages have the *Galactic Computernet Access Card* Fringe Benefit, since that may not exist in some *Star Hero* campaigns, but it's an appropriate addition to many of them.

A few of these Packages include a Psychological Limitation (such as *Overconfidence* for Pilots). That's because those attitudes or codes are very closely associated with that profession in science fiction. However, if it's not appropriate for the character you have in mind, you can easily switch it for another Disadvantage.

COLONIST

The people who journey into space to settle distant worlds come from a variety of backgrounds. Some leave home because they are hoping for a better life, others are searching for political or religious freedom. A few are on the run. The only thing they have in common is the determination to stick it out in a hostile environment. Colonists on habitable planets learn farming, while those living in space or on hostile worlds learn hydroponics. Asteroid or space station colonists should replace the *Animal Handler* and *Survival*

Skills with the Talent *Environmental Movement* (Zero-G). For more heroic colonist player characters, the *Jack Of All Trades* Skill Enhancer is very useful.

DIPLOMAT

On twenty-first century Earth, diplomats are mostly middle-level bureaucrats doing the detail work of policies set by government leaders. In a future world of interstellar travel, they may become more important as communication lags make it impossible for national leaders to simply pick up the phone during a crisis. In that case a diplomat may find himself making policy on the fly, hoping his decisions meet with his superiors' approval down the line.

Diplomats assigned to make contact with alien species must be able to adapt to strange ways of thinking and communicating. Moreover, intelligence-gathering and occasional discreet espionage have always been part of diplomacy, and that will likely continue in the future.

This Package assumes a diplomat with a fair amount of autonomy and responsibility. It does not include the *Universal Translator* Talent (either naturally or built into a Focus); if that exists in the campaign, most diplomats will have it. Other useful improvements include the *Traveler* and *Well-Connected* Skill Enhancers, Money, Followers, and lots of Contacts. The *Diplomatic Immunity* Fringe Benefit means the character's host planet cannot prosecute him for ordinary crimes (although anything beyond a misdemeanor will certainly get him sent home). By replacing Diplomatic Immunity with some appropriate Skills, you can also use this Package Deal for other types of politicians.

DIPLOMAT PACKAGE DEAL

Ability	Cost
Conversation	3
High Society	3
KS: Political Science (INT Roll)	3
Language (player's choice; fluent conversation)	2
Persuasion	3
Contacts (11 points' worth of player's choice)	11
Fringe Benefit: Diplomatic Immunity	5

Disadvantages	Value
Hunted: host government 8- (Mo Pow, NCI, Watched)	-10
Social Limitation: Subject To Orders	-20

Total Cost Of Package: 0

COLONIST PACKAGE DEAL

Ability	Cost
Animal Handler (choose group)	2
AK: colony's region 11-Mechanics	2
PS: Farming, Hydroponic Farming, or Mining (player's choice) 11-Survival (choose environment)	2
TF (2 points' worth)	2
WF (2 points' worth)	2

Disadvantages	Value
None	

Total Cost Of Package: 15

DOCTOR

Futuristic medicine can work miracles, but only if there's someone handy to provide treatment. This Package can represent a starship's medical officer, a cyberpunk "black clinic" operator, or the self-taught general practitioner on a colony planet. The Hippocratic Oath requires doctors to treat any patient (even an enemy), and forbids them to use their skills to cause harm.

If you want to expand this Package, consider adding Contacts (particularly appropriate for a

DOCTOR PACKAGE DEAL

Ability	Cost
Deduction	3
Paramedics	3
PS: Doctor (INT Roll)	3
SS: Biology (INT Roll)	3
SS: Chemistry (INT Roll)	3
SS: Medicine (INT Roll)	3
SS: Surgery (INT Roll)	3
SS: Xenobiology (INT Roll)	3
Fringe Benefit: License To Practice Medicine	1

Disadvantages	Value
Psychological Limitation (Hippocratic Oath)	-20

Total Cost Of Package: 5

practicing physician with access to the local hospitals and medical community), Cramming (essential for getting through medical school!), Money, and perhaps some Favors from grateful former patients.

EXPLORER

Explorers survey new worlds and make contact with alien civilizations. They may work for some agency like NASA or the Interstellar Scout Service, or they may be freelancers driven by wanderlust and the hope of finding a valuable world and striking it rich. Explorers are optimized for planetary-surface work; scouts who never leave their spaceships are best modeled with the Pilot Package Deal, below. Player character Explorers may want the *Jack Of All Trades* or *Traveler Skill Enhancers*. The *Universal Translator* Talent is extremely useful for Explorers, if it exists in the setting.

EXPLORER PACKAGE DEAL

Ability	Cost
Navigation (Land, Space)	3
Any two SSs at 11- each	4
Survival (4 points' worth)	4
TF (4 points' worth)	4
WF (2 points' worth)	2
9 points' worth of Skills from the following list:	9

Breakfall, Climbing, Electronics, Gambling, Inventor, Paramedics, Riding, Shadowing, Stealth, Systems Operation, Tracking, any Background Skill

Disadvantages	Value
Rivalry: Professional (other explorers)	-5

Total Cost Of Package: 21

LAW ENFORCEMENT AGENT

From the cop on the beat in cyberspace, to the incorruptible Space Patrol officer, to the hard-bitten bounty hunter in a remote frontier dive, lawmen are a staple in science fiction. They can be upright representatives of order and civilization, or the street-level enforcers of tyranny. Whatever the setting, law enforcers have authority and know how to use it. The Package assumes a uniformed officer empowered to carry weapons and arrest people on a given world; for authority throughout a region of space, upgrade the Fringe Benefit to Interstellar Police Powers. For plainclothes officers, bounty hunters, or private detectives, drop the Distinctive Feature. Bounty hunters and private investigators downgrade Police Powers to a 2-point Private Investigator's License, but also don't have the *Subject To Orders* Social Limitation.

PILOT

Pilots fly spacecraft, be they orbital shuttles, space fighters, interstellar merchant vessels, scout ships, or galactic dreadnoughts. They tend to have fast reflexes, good vision, and an intuitive grasp of Newtonian physics. Pilots in fiction traditionally have a healthy ego and a willingness to test the design limits of their spacecraft with risky maneuvers, hence the *Overconfidence* Psychological Limi-





LAW ENFORCEMENT PACKAGE DEAL

Ability	Cost
Criminology	3
KS: Criminal Law 11-	2
PS: Law Enforcement Agent 11-	2
WF (2 points' worth)	2
9 points' worth of Skills from the following list:	9
Bugging, Computer Programming, Deduction, Forensic Medicine, Interrogation, Lockpicking, Paramedics, Security Systems, Stealth, Streetwise, Systems Operation, any Background Skill	
Contacts (10 points' worth; player's choice)	10
Fringe Benefit: Planetary Police Powers	5

Disadvantages	Value
Distinctive Features: Uniform (Easily Concealed; Noticed And Recognizable)	-5
Social Limitation: Subject To Orders	-20

Total Cost Of Package: 8

PILOT PACKAGE DEAL

Ability	Cost
Combat Piloting	3
Navigation (Space)	2
SS: Astronomy 11-	2
TF: Science Fiction & Space Vehicles	2
9 points' worth of Skills from the following list:	9
Computer Programming, Electronics, Mechanics, Paramedics, Stealth, Systems Operation, any Background Skill	
Environmental Movement (Zero G)	4

Disadvantages	Value
Psychological Limitation: Overconfidence	-15

Total Cost Of Package: 7

tation. You can replace this with *Thrillseeker* instead, or with a suitable Rivalry, Hunted, or DNPC.

PSI-AGENT

Psi-Agents are law enforcement or espionage specialists with psionic powers. In tyrannical societies, they use their mental powers to seek out rebellion and dissent. In more open cultures, Psi-Agents specialize in solving crimes committed by psionics, tracking psionic bad guys, and assisting

ordinary law enforcement officers with “unsolvable” crimes. Unless society is very tolerant of those with psi powers, the combination of public fear and their admittedly formidable powers gives

PSI-AGENT PACKAGE DEAL

Ability	Cost
Psionic powers (as appropriate; must be approved by GM)	40
Analyze Psionics	3
KS: The Psionic World 11-	2
Power Skill (player's choice)	3
SS: Psionics 11-	2
WF (2 points' worth)	2
6 points' worth of Skills from the following list:	6
Bugging, Computer Programming, Criminology, Deduction, Forensic Medicine, Interrogation, Lockpicking, Paramedics, Security Systems, Stealth, Streetwise, Systems Operation, any Background Skill	
Contacts (player's choice)	5
Fringe Benefit: Interstellar Police Powers	8
Fringe Benefit: Psionic Police Powers	3

Disadvantages	Value
Distinctive Features: Uniform (Easily Concealed; Noticed And Recognizable)	-5
Hunted: local authorities 8- (Mo Pow, NCI, Watching)	-10
Social Limitation: Subject To Orders	-20

Total Cost Of Package: 39

Psi-Agents a frightening reputation. To prevent them from misusing their abilities, Psi-Agents are closely watched, both by the “mundane” authorities and other Psi-Agents.

ROGUE

It's hard to make a living. Why not let other people do the work, then live off them? That's how rogues manage: swindling, stealing, and smuggling their way to success. The most honest rogues are merchants who just happen to deal in things forbidden by local laws. The worst are simply predators, willing to kill for hire. A Rogue's exact nature depends on the campaign style and tone. A swashbuckling Space Opera can have colorful space pirates and gamblers (many with hearts of gold, of course). A Cyberpunk game might have “heroes” who really are cynical professional thieves and assassins. Hard SF runs to slightly

ROGUE PACKAGE DEAL

Ability	Cost
Streetwise +2	7
WF (2 points' worth)	2
15 points' worth of Skills from the following list:	15
Acrobatics, Breakfall, Bribery, Climbing, Computer Programming, Combat Piloting, Conversation, Forgery, Gambling, High Society, Lockpicking, Persuasion, Security Systems, Seduction, Sleight Of Hand, Stealth, Trading, any Background Skill	
Contacts (8 points' worth; player's choice)	8
Disadvantages	Value
Hunted: local authorities 8- (Mo Pow, NCI, Watched)	-10
Reputation: rogue, 11-	-10
Total Cost Of Package: 12	

shady “entrepreneurs” and smugglers evading oppressive bureaucracy. This Package assumes a rogue whose shady nature is known to, or at least suspected by, the local authorities, but who hasn’t been caught — yet.

SCIENTIST

It is called *science* fiction, after all. Scientists are often characters in SF stories, especially in Hard SF and stories of exploration. In Cyberpunk SF, scientists are apt to be NPC researchers in thrall to some megacorporation. In Space Opera, they’re often white-coated supergeniuses, capable of whipping up a weapon to stop an intergalactic menace (with a little help from their beautiful daughters). In Military SF, they may be shipboard engineers, weapon designers, or analysts. Despite their reputation as ivory-tower eccentrics, many are pretty capable and well-rounded individuals.

SCIENTIST PACKAGE DEAL

Ability	Cost
Computer Programming	3
Deduction	3
Any two KSs at 11- each	4
Any two SSs (INT Roll each)	6
Any two SSs at 11- each	4
6 points' worth of Skills from the following list:	6
Electronics, Inventor, Mechanics, Security Systems, Systems Operation, Weaponsmith, any Background Skill	
Contacts (6 points' worth; player's choice)	6
Disadvantages	Value
Psychological Limitation: Curiosity	-15
Rivalry: Professional (another scientist)	-5
Total Cost Of Package: 12	

SOLDIER

Humans have been waging war for all of recorded history, and there’s no reason to expect they’ll stop in the future — or that other sentient species aren’t equally warlike. Soldiers in science fiction include battlesuited Space Marines attack-

ing enemy planets from orbit, tough mercenaries ready to fight anything anywhere, post-apocalyptic warlords, and bioengineered super-troopers. Tactics and technical skills are as important as weapon training.

If necessary, you can easily customize this Package by altering or adding Skills to represent specialized types of soldiers (space marine, tele-artillery officer, mechanized infantryman, and so forth). With a few additions (such as Combat Luck, Combat Sense, Danger Sense, or Mental Powers) you can create “super-soldiers” or “psi-warriors.” You can also add some appropriate Disadvantages — conscripts may only feel loyalty to their unit, professionals are responsible to the service or the state, and mercenaries obey whoever signs the paycheck.

SOLDIER PACKAGE DEAL

Ability	Cost
PS: Soldier 11-	2
Tactics	3
TF (player's choice)	1
Weaponsmith (one category)	2
WF (6 points' worth)	6
15 points' worth of Skills from the following list:	15
Breakfall, Bureaucratics, Combat Driving, Combat Piloting, Computer Programming, Demolitions, Electronics, Mechanics, Paramedics, Security Systems, Stealth, Survival, Systems Operation, any Background Skill	
Disadvantages	Value
Distinctive Features: Uniform (Easily Concealed; Noticed And Recognizable)	-5
Social Limitation: Subject To Orders	-20
Total Cost Of Package: 4	

SPY

From the shapeshifting saboteurs and wily Romulan espionage agents of *Star Trek: Deep Space Nine* to Robert Heinlein’s “courier” Friday, spies are a staple of many science fiction settings. Smart, competent, ruthless, and well-equipped,

SPY PACKAGE DEAL

Ability	Cost
Computer Programming	3
Conversation	3
Systems Operation (3 points' worth)	3
TF (2 points' worth)	2
WF (2 points' worth)	2
15 points' worth of Skills from the following list:	15
Bugging, Bureaucratics, Climbing, Combat Driving, Combat Piloting, Deduction, Demolitions, Electronics, Forgery, Gambling, High Society, Lockpicking, Persuasion, Security Systems, Seduction, Stealth, Survival, any Background Skill	
Contacts (10 points' worth; player's choice)	10
Disadvantages	Value
Social Limitation: Subject To Orders	-20
Total Cost Of Package: 18	

they're often far more dangerous than a squad of soldiers.

STARSHIP OFFICER — COMMAND

Large, spacefaring navies and exploratory institutions are found in many science fiction settings. Any such organization needs specific types of officers to crew its starships and keep them safe in the face of the many dangers the universe holds.

Command officers range from the captain, who usually has absolute authority over the crew and the ship, to junior officers responsible for the day-to-day operation of various departments on the ship. Since ships often spend months or years away from their home bases, command officers shoulder a heavy burden — they have to keep morale up and efficiency high, protect the crew, and perform many other duties.

Most command officers, particularly high-ranking ones, feel responsible for the safety and well-being of their crews. You can simulate this with various Psychological Limitations, or even by taking the crew as DNPCs (assuming it's not too large a crew).

COMMAND OFFICER PACKAGE DEAL

Ability	Cost
Combat Piloting	3
AK (region of player's choice) 11-	2
KS: Regulations 11-	2
Navigation (Space)	2
PS: Starship Command Officer 11-	2
TF: Science Fiction & Space Vehicles	2
WF (2 points' worth)	2
15 points' worth of Skills from the following list:	15
Bureaucratics, Computer Programming, Electronics, High Society, Paramedics, Persuasion, Stealth, Survival, Systems Operation, any Background Skill	
Disadvantages	Value
Distinctive Features: Uniform (Easily Concealed; Noticed And Recognizable)	-5
Social Limitation: Subject To Orders	-20
Total Cost Of Package: 5	

STARSHIP OFFICER — ENGINEERING/SCIENCE

Officers in the Engineering and/or Science departments of a starship are responsible for various scientific and technical tasks. They study nearby astronomical phenomena, keep the ship in good repair, help upgrade the weapons to fight off an otherwise unbeatable foe, and bring their analytical skills to bear on many problems.

STARSHIP OFFICER — OPERATIONS

This Package Deal represents “average” starship officers — the operations personnel who fly the ship, man the sensors and communications consoles, and perform other routine duties.



ENGINEERING/SCIENCE OFFICER PACKAGE DEAL

Ability	Cost
Computer Programming	3
Electronics	3
Inventor	3
AK (region of player's choice) 11-	2
KS: Regulations 8-	1
Mechanics	3
PS: Starship Engineering/Science Officer 11-	2
Any three SSs at 11- each	6
Systems Operation (3 points' worth)	3
WF (2 points' worth)	2
6 points' worth of Skills from the following list:	6
Bureaucratics, Combat Piloting, Paramedics, Persuasion, Stealth, Survival, any Background Skill	
Disadvantages	Value
Distinctive Features: Uniform (Easily Concealed; Noticed And Recognizable)	-5
Social Limitation: Subject To Orders	-20
Total Cost Of Package: 9	

OPERATIONS OFFICER
PACKAGE DEAL

Ability	Cost
Computer Programming	3
AK (region of player's choice) 11-	2
KS: Regulations 8-	1
PS: Starship Operations Officer 11-	2
Any SS at 11-	2
Systems Operation (7 points' worth)	7
WF (2 points' worth)	2
12 points' worth of Skills from the following list:	12
Bureaucratics, Combat Piloting, Electronics, Mechanics, Paramedics, Persuasion, Stealth, Survival, any Background Skill	
Disadvantages	Value
Distinctive Features: Uniform (Easily Concealed; Noticed And Recognizable)	-5
Social Limitation: Subject To Orders	-20
Total Cost Of Package: 6	

STARSHIP OFFICER —
TACTICAL/STRATEGIC

A starship's tactical and strategic officers operate its weapons and defensive systems, devise new weapons (or improvements for existing ones), and advise the captain during emergencies and times of war. They also often function as the ship's security personnel.

TACTICAL/STRATEGIC
OFFICER PACKAGE DEAL

Ability	Cost
Computer Programming	3
AK (region of player's choice) 11-	2
KS: Regulations 11-	2
PS: Starship Tactical/Strategic Officer 11-	2
Systems Operation (3 points' worth)	3
Tactics	3
WF: Small Arms, plus 2 more points' worth	4
Weaponsmith (choose category)	2
9 points' worth of Skills from the following list:	9
Bureaucratics, Combat Driving, Combat Piloting, Paramedics, Persuasion, Security Systems, Shadowing, Stealth, Streetwise, Survival, Teamwork, any Background Skill	
Disadvantages	Value
Distinctive Features: Uniform (Easily Concealed; Noticed And Recognizable)	-5
Social Limitation: Subject To Orders	-20
Total Cost Of Package: 5	

TECH

As technology becomes more important, so do the people who know how to keep it running. On a spaceship, the miracle-working engineer (with or without Scottish accent) is often the most important person on board. How would Cyberpunk's street samurai or cyberspace cowboys do their cool stuff without someone to keep their cyberware and computers working? This Package represents a skilled

mechanic or technician, capable of maintaining systems, constructing things from existing designs, or even creating his own inventions.

Both in the real world and science fiction, technicians are often better with machinery than people. You can represent this by adding an appropriate Psychological Limitation.

TECH PACKAGE DEAL

Ability	Cost
Any two SSs at 11- each	4
15 points' worth of Skills from the following list, two at +2, three at base roll:	23
Bugging, Computer Programming, Deduction, Demolitions, Electronics, Inventor, Mechanics, Security Systems, Systems Operation, Weaponsmith (+1 category)	
Disadvantages	Value
None	
Total Cost Of Package: 27	

TRADER

Omnipotent beings with godlike powers, or advanced societies with access to replicator technology, can make whatever they want simply by wishing for it. Everyone else has to buy things from a trader or a merchant. Wherever somebody has something and wants something else, someone can make a profit on the deal. A reliable trope of science fiction is the daring interstellar trader, seeking out new life and market opportunities. On a backwater planet or among the blasted ruins of a post-apocalyptic future, the trader in his battered truck may be the only thing keeping civilization alive. On a space station, the trader may set up shop and become a more sedentary merchant. Even in cyberspace there are traders, brokering secrets and vital data.

Improvements for more powerful trader characters include the *Lightning Calculator* Talent, a few points in Money, and the *Traveler* or *Well-Connected* Skill Enhancers.

TRADER PACKAGE DEAL

Ability	Cost
Bureaucratics	3
High Society or Streetwise	3
AK: trading area 11-	2
Trading +2	7
TF (2 points' worth)	2
9 points' worth of Skills from the following list:	9
Combat Piloting, Conversation, Electronics, High Society, Mechanics, Oratory, Paramedics, Persuasion, Security Systems, Seduction, Stealth, Streetwise, Survival, any Background Skill	
Contacts (8 points' worth; player's choice)	8
Disadvantages	Value
Psychological Limitation: Always Has His Eye On The Bottom Line	-10
Rivalry: Professional (with competitor[s])	-5
Total Cost Of Package: 19	

CHARACTER CREATION



The *HERO System* character creation rules are tremendously broad and flexible. Here are some suggestions, re-interpretations, and “tweaks” to make them more appropriate or useful for *Star Hero* games.

CHARACTERISTICS

The Characteristics are the same in any setting, but some of them become more important in *Star Hero* campaigns.

STRENGTH

With machinery to do the heavy work, physical strength is generally less important in most future settings. An old cliché of science fiction is the people of the future with huge heads and puny bodies. As noted in the *Heavyworlder* and *Lightworlder* Environment Packages (see page 28), a character’s Strength may vary with his home gravity. The relation isn’t direct, because even in free fall a person still needs some strength.

Gravity affects both how much a character can lift and how far he can throw things. See page 278 for more information.

DEXTERITY

Some SF characters, particularly spacers who are used to working in cramped but delicate environments, have high manual deftness, but their reflexes aren’t necessarily any faster than other peoples’. You can simulate this by buying DEX with the Limitation *Only For DEX Rolls* (-1). DEX with that Limitation increases DEX Rolls, and Skill Rolls based on DEX, but does not affect a character’s CV or initiative in combat.

CONSTITUTION

The effects of spending long periods in different gravity are poorly understood, but it appears that both low and high gravity environments might reduce a Human’s fitness. (Presumably alien species would suffer similar effects when away from their normal gravity.) Gamemasters in Hard SF campaigns may wish to include a CON penalty in Package Deals for characters and species native to zero gravity or anything over 1.5 G.

COMELINESS

Beauty, they say, is only skin deep. As plastic surgery gets easier and cheaper, buying a beautiful skin becomes only a little more difficult than getting some nice clothes. In futuristic settings, everyone may have the same Comeliness, and trends in personal appearance might come and go like trends in clothing and

music. Only rebels and eccentrics would leave their appearance unimproved or below average. In such a world, a genuinely beautiful person might stand out in the crowd of “generic” good looks.

SPEED

Cyberpunk computer hackers or space pilots who fly their ships through direct brain links may wish to purchase extra SPD with Limitations such as *Only In Cyberspace* (-1) or *Only For Flying Vehicles* (-1). The player and the GM should work out which Segments the character gets his “extra” Phases on, the effects of Aborting, and so forth; see Menton in *Conquerors, Killers, And Crooks* for an example.

SKILLS

Given the breadth of the SF genre, any of the Skills in the *HERO System 5th Edition, Revised* rulebook could come into play at some point. Here are a few notes on special applications for various Skills.

For information on Skill Roll penalties for dealing with alien or obsolete technologies, see pages 143-44.

BACKGROUND SKILLS

Star Hero characters often buy KSs, PSs, and SSs with the prefixes “xeno-” or “exo-,” such as SS: Exobiology, SS: Xenoarchaeology, or KS: Xeno-Art History. Both prefixes mean “foreign” or “alien,” and refer to a character’s knowledge of the subject in question as it pertains to species other than his own. A Human with SS: Exobiology might know a lot about Denebian biology, whereas a Denebian with the same Skill would know about Human biology instead.

In a setting featuring few alien species, a Xeno/Exo Background Skill is easier to use, because there’s less to know, and therefore the Skill Roll penalties are likely to be smaller. In settings featuring dozens, hundreds, or even thousands of alien species, a general Xeno/Exo knowledge may not help the character much — he’d be better off buying Background Skills relating to particular species he knows about.

Technically, a Xeno/Exo Skill provides a character with knowledge of the subject as it pertains to *any* species besides his own. However, this may entail some hefty penalties; GMs can adapt the rule for KSs (page 43) if necessary. For better results and/or greater realism, characters should buy Background Skills by species.

INTERACTION SKILLS

In some settings, characters of one species have difficulty interacting with characters of any other species — something about the “alien” nature

GRAVITY PENALTIES

Skills involving physical motion, such as Acrobatics, Breakfall, or any technology-manipulation Skill, may suffer penalties due to higher or lower gravity. The *HERO System* rules assume a character grew up, as Humans tend to, in an environment of about 1.0 G. If a character was trained in a different environment, he may suffer different penalties — for example, a heavyworlder is fine in 1.5 G, but might suffer low-gravity penalties at 1.3 G, when most characters would experience high-gravity penalties instead. Characters trying to perform tasks in high-G may have to make STR Versus STR Rolls to move (page 278); those in either type of environment may suffer Skill Roll penalties of -1 to -2 to reflect their unfamiliarity with the environment.

Characters can buy appropriate *Environmental Movement* Talents to eliminate gravity penalties; see page 51.

EVERYMAN SKILLS

Different science fiction settings have different Everyman Skill sets. Listed below are suggested Skill sets for various types of *Star Hero* campaigns.

Cyberpunk

Acting
Climbing
Computer Programming
Concealment
Conversation
Deduction
Native Language (4 points' worth; includes literacy)
Paramedics
Persuasion
One PS at 11- (job, hobby, or other area of interest)
Shadowing
Stealth
TF: Small Motorized Ground Vehicles
AK: Home City or Cyberspace

Hard SF

Acting
Climbing
Computer Programming
Concealment
Conversation
Deduction
Native Language (4 points' worth; includes literacy)
Paramedics
Persuasion
One PS at 11- (job, hobby, or other area of interest)
Shadowing
Stealth
TF: Small Motorized Ground Vehicles or Hovercraft or Personal-Use Spacecraft
AK: Home Planet

Low SF

Acting
Climbing
Computer Programming
Concealment
Conversation
Deduction
Native Language (4 points' worth; includes

of other species makes it hard to relate to them. Sometimes this phenomenon depends on "classes" of aliens; a mammalian species might relate just fine to any other mammalian species, but reptilian or ichthyoid species give it the willies. This trait is most common in Low SF or "realistic" settings; it almost never exists in Space Opera or Pulp SF, where dozens of alien species freely mingle together.

To reflect this discomfort, GMs can impose a penalty on all Interaction Skill rolls between members of two different species: -2 for relatively similar species; -4 for dissimilar species; and -8 (or more) for greatly different species (like a physical being and an energy being).

ACTING

Characters may have difficulty acting like members of another species, since aliens are, well, *alien*. When a character impersonates a member of a species other than his own to a character who knows what members of that species are like, he suffers a -2 to -5 penalty to his Acting roll. He can eliminate this penalty by buying bonuses to Acting *Only To Impersonate [Species]* (-1), or by succeeding with a KS: [Species] roll. Gamemasters may also wish to impose some of the penalties from the Alien Disguise Table (page 42) on Acting rolls.

ANALYZE

Psionic characters with *Analyze Psionics* can determine another psionic's abilities with a Skill Roll, per the normal rules for the Skill. Technicians and scientists who study alien technology may also learn *Analyze Alien Tech*. Astrobiologists or xenologists who study lots of different alien beings with weird powers can learn *Analyze Alien Powers* — a tremendous help when dealing with unknown creatures and strange abilities.

ANIMAL HANDLER

In realistic Hard SF campaigns, alien animals are all completely different from any terrestrial species. Each planet has its own menu of animal categories, and knowing how to deal with creatures native to one world doesn't help on a new or strange planet (though the GM might allow an Animal Handler roll at -5).

In a more cinematic setting, such as a Pulp or Space Opera campaign, alien animals may well look and act like Terran creatures. If it has wings and feathers, it's a bird, even if it comes from a planet orbiting Epsilon Eridani. Characters should still suffer a Skill Roll penalty of -2 for working with alien creatures in a group they know how to handle — at least until they've spent a game session or two learning about those animals' habits and instincts.

BREAKFALL

Breakfall gets easier in low gravity and harder in high gravity. Apply a Skill Roll penalty of -1 for every 20% increase above 1.0 G. For example, on a planet with a surface gravity of 1.6 G, the Breakfall penalty is -3. On the other hand, low gravity gives a +1 Skill Roll bonus at anything between 0.3 and 0.6 G, and +2 for gravity below 0.3 G.

It may seem odd, but Breakfall is a useful Skill to have in zero gravity! Characters can use Breakfall to cushion the impact when they bounce off a wall in free fall. They receive a +2 bonus to the roll for this purpose.

BUGGING

On twenty-first century Earth, surveillance devices are already fantastically small and easy to conceal, and future advances in nanotechnology will only make them harder to find. Advanced bugs may actually be tiny robot insects, capable of crawling into a room to eavesdrop. The technological arms race is particularly intense in bugging — obsolete bugs or countermeasures get large penalties. See *Obsolete And Advanced Technology*, page 143.

COMPUTER PROGRAMMING

Except for a few Low SF settings such as *Dune*, computers are omnipresent in science fiction. From massive supercomputers capable of running entire civilizations, to bio-computers able to catch true "viruses," to hand-held computers containing many thousands of times the processing power and storage capacity of the computers of twenty-first century Earth, they crop up in *Star Hero* games all the time, and that makes the *Computer Programming* Skill especially useful.

Paradoxically, computers become both more and less complex in science fiction. On the one hand, ease-of-use and user-friendly features improve to the point where most characters can "perform" complex computing tasks simply by telling the computer what they want to do — they never have to press a key or control panel. Thus, Computer Programming as a Skill may die out among large segments of the population, to be replaced by, if anything, a PS: *Use Computer Skill*. On the other hand, the internal workings of computers become more and more sophisticated, meaning engineers, scientists, and hard-core computer users still need Computer Programming to build, repair, and get full benefit from their computers. Characters may need a Fringe Benefit like *Galactic Computernet Access Card* to use certain networks or computer systems, in much the same way that people on modern Earth subscribe to Internet service providers.

In some settings, computers diversify incredibly, making the ability to use or program one type of computer virtually useless when the character encounters another type of computer. You can simulate this with a -1 to -5 penalty to Computer Programming rolls, depending on the degree of difference between the systems. But again, ease-of-use features may compensate for much of this.

In a Space Opera or Pulp-oriented *Star Hero* campaign, having a single *Computer Programming* Skill is sufficient; there's no point getting bogged down in technical details or imposing penalties for using unusual systems. On the other hand, in a Cyberpunk or Hard SF type of game, GMs and players may want to take technical differences into account. One of the easiest ways to do this (besides

the Skill Roll penalties suggested above) is to split Computer Programming up into various categories, the way Gambling and Survival are normally. A sample list of subcategories is suggested in the accompanying box. Characters can learn any one category for 2 Character Points for a $(9 + (\text{INT}/5))$ roll; each additional category costs +2 Character Points, or each additional subcategory +1 Character Point; improving the roll for all categories known costs +2 Character Points for each +1 to the roll.

EXPANDED COMPUTER PROGRAMMING

Personal Computers

Handheld Computers
Portable Computers (laptops and such)
Desktop Computers

Computer Networks

Local Networks
Cyberspace

Mainframe Computers And Supercomputers

Hacking And Computer Security

Infiltration
Defense

Military And Starship Computers

Artificial Intelligence

In a Cyberpunk-era game, Gamemasters may refine the categories even more, to specific manufacturers and years. After all, programming an IBM computer running a Microsoft OS in 1992 is very different from doing the same thing in 2002.



CRIMINOLOGY; FORENSIC MEDICINE

At higher tech levels, the amount of information a forensic scientist can squeeze out of a corpse or a crime scene is astounding.

Even on modern Earth, a fragment of hair or skin can provide identifying DNA. In near-future campaigns, that DNA could be decoded to create a genetic model of the suspect or an unidentified body, in effect making a “virtual clone” for identification purposes. Criminals will have to develop equally sophisticated methods to avoid leaving trace evidence (or to destroy whatever they do leave behind).

CRYPTOGRAPHY

The growth of computer networks and electronic commerce has turned encryption from something known only to intelligence agencies and theorists to a booming subset of the software industry. Codes and code-breaking methods are extremely technology-sensitive — apply the *Obsolete Technology* rules from Chapter Seven when characters tackle codes that are ahead or behind their own knowledge (or the “knowledge” of the equipment they’re using).

DEMOLITIONS

Improvements in technology make chemical explosives both more powerful and safer to use. Asteroid miners, large-scale engineers, and militaries may make more use of nuclear explosives, or even antimatter explosives. Apply the penalties for Obsolete and Advanced Technology when characters try to use unfamiliar demolition gear, and be ruthless about the effects of failures.

DISGUISE

Advanced prosthetics, high-tech surgery, artificial flesh, and smart materials make Disguise easier, but characters in a *Star Hero* game may need to disguise themselves as weird aliens or variants of their own species. Use the modifiers from the table on page 42 when a character tries to disguise himself as a member of a very different-looking alien species. Use all modifiers that apply.

ELECTRONICS

In pulpish SF, being able to fix one electronic device lets you fix any electronic device. In more realistic campaigns, characters need to purchase the appropriate categories of Systems Operation (see below) for devices they actually know how to fix. Working with an unfamiliar system imposes a -3 penalty.

FORGERY

Forgery is a very technology-sensitive skill. Forgers who can absolutely fool contemporary methods of detection can be easily exposed by high-tech equipment, while a forger trying to beat advanced countermeasures may not even

Continued from last page

literacy)
Paramedics
Persuasion
One PS at 11- (job, hobby, or other area of interest)
Shadowing
Stealth
TF: Small Motorized Ground Vehicles
AK: Home Planet

Military SF

Acting
Climbing
Computer Programming
Concealment
Conversation
Deduction
Native Language (4 points' worth; includes literacy)
Paramedics
Persuasion
One PS at 11- (job, hobby, or other area of interest)
Shadowing
Stealth
TF: Small Motorized Ground Vehicles or Hovercraft or Personal-Use Spacecraft
AK: Home Planet

Post-Apocalyptic SF

Acting
Climbing
Concealment
Conversation
Deduction
Native Language (4 points' worth; no literacy)
Paramedics
Persuasion
One PS at 11- (job, hobby, or other area of interest)
Shadowing
Stealth
Survival (choose one 1-point environment subcategory)
TF: Small Motorized Ground Vehicles or Riding Animals (choose one 1-point subcategory)
AK: Home City or Region

Continued on next page

Continued from last page

Space Opera

- Acting
- Climbing
- Computer Programming
- Concealment
- Conversation
- Deduction
- Native Language (4 points' worth; includes literacy)
- Paramedics
- Persuasion
- One PS at 11- (job, hobby, or other area of interest)
- Shadowing
- Stealth
- TF: Hovercraft or Personal-Use Spacecraft
- AK: Home Planet, Star System, or Sector

ALIEN DISGUISE TABLE

Alien Type	Modifier
Posture	
Similar posture	-0
Semi-Erect	-1
Horizontal posture	-2
Limbs	
More limbs	-1
Fewer limbs	-2
Size	
Smaller than character	-2
Less than half character's mass	-3 per halving
Larger than character	-1
More than twice character's mass	-2 per doubling
Skin	
Body covered with hair or feathers	+1
Body covered with shell	+2
Bare skin	-1
Miscellaneous	
Distinctive scent or other emission	-2
Amorphous blob	-4
Different home environment	-2

know what he has to fake. Apply the *Obsolete And Advanced Technology* rules from Chapter Seven whenever forgers and detectors from differing technology levels are involved.

HIGH SOCIETY

What constitutes “High Society” and how to behave properly in it are both culture- and time-dependent. Time travelers, dimension-hoppers, and interstellar tourists may experience serious problems. Unless a character has an appropriate Area Knowledge or Culture Knowledge for any alien culture or any time more than a century removed from the character’s home era, he’ll suffer penalties to his High Society rolls.

The exact penalties for strange cultures depends on how realistic the campaign is. In a cinematic world, an interstellar adventurer can use High Society fairly easily: -1 penalty for planets other than home, and another -1 for non-Human aliens. A cinematic time traveler’s penalty is never more than -2, no matter how far back he goes.

In realistic settings (Cyberpunk or Hard SF, for example) the penalties are steeper: -3 for all alien cultures, with an additional -2 if the aliens have different dietary habits or environmental requirements.

INTERROGATION

In settings where direct neural implants are commonplace, this Skill might become *Mind Hacking* — the ability to use intrusive computer programs to examine (and perhaps even alter) the subject’s memories. Cinematic versions may require the Mind Hacker to enter some sort of virtual reality dreamscape as his consciousness wanders through the subject’s brain. Computer Programming and SS: Psychology are Complementary Skills for Mind Hacking.

Settings with advanced knowledge of psychology and hypnosis replace Interrogation with

Brainwashing. The Science Skills *Neurobiology* and *Psychology* are Complementary. A successful use not only makes the subject tell what he knows, but can implant suggestions and false memories

At the GM’s option, either use of Interrogation may be able to implant or alter memories. If so, consider this a Major Transform 2d6, with +1d6 for every 2 points by which the brainwasher makes his roll. Achieving this effect usually takes a lot of time, however (1 Hour or more), and may involve a Skill Versus Skill Contest against the target’s EGO Roll.

INVENTOR

As a genre which centers on the effects of technological change, science fiction is a natural habitat of the *Inventor* Skill. There are two ways to handle inventors in science fiction games.

Cinematic inventors can improvise gadgets on the fly, create a superweapon out of odds and ends, and turn simple farm equipment into a cabbage-throwing war machine during a commercial break. Cinematic inventors need Skill Rolls to overcome penalties for inadequate time and material, and a lenient GM who wants instant gadgeteering in the campaign.

Realistic inventors need a lot of time, equipment, and money to create new devices. Gamemasters can use the point cost of the new invention as a rough guideline for how hard it is to create. Divide the Active Point cost by 10 and apply the result as a penalty to the Inventor’s Skill Roll. (Gamemasters who want to make inventing harder should increase the penalty to -1 per 5 Active Points.) When an inventor just wants to improve an existing device, use only the difference between the original device’s *Real Point* cost and the improved version’s *Real Point* cost to determine the penalty. (This means it’s easiest to create a bulky, fragile, unreliable prototype and then gradually refine it.) The GM should monitor the inventing process carefully to make sure characters don’t abuse the rules, and that using Inventor contributes to the fun of the game.

Example: *Doctor Kelly is trying to build a portable laser weapon using modern-day technology. The laser is an RKA 1d6, Armor Piercing (22 Active Points) (which imposes a -2 penalty to her Inventor roll). Like all lasers it has the Beam (-¼) Limitation. Doctor Kelly’s prototype has only 4 Charges (-1), and is a OAF Bulky Fragile (-1¼). The total Limitation value is -3, so the total cost is 5 points.*

Some time later, Dr. Kelly wants to improve the device, making it less bulky and fragile, and giving it more Charges (12). The new laser will cost 9 Real Points, which is 4 points more than the original. That gives Dr. Kelly a -0 penalty to improve the laser.

This process assumes the new invention involves an application of existing technology. Double the penalties for devices which are more advanced than the available technology in the campaign world. If the campaign uses Tech Levels

(see Chapter Seven), double the penalty for each tech level above the campaign norm. The GM can always rule that some devices are simply impossible to invent at a given Tech Level because the inventor doesn't have the right theoretical background. As an example, consider an inventor trying to create new superweapons for the American Civil War. The theoretical science behind submarines existed as early as 1860; so a sufficiently large and well-funded program could have built World War I-style submarines half a century early. But aerodynamics was not well understood in 1860, so no amount of money could produce a workable airplane.

Gamemasters may wish to rule that some very complex inventions require a number of "sub-inventions" to create — before the hero can invent the liquid-fuelled rocket he has to invent gyroscopic stabilization, high-speed fuel pumps, and cryogenic fuel storage first. A big project like the Manhattan Project or the Apollo Program required thousands of sub-inventions and sub-sub-inventions to accomplish. (Tacitly ignoring these precursors is the easiest way to encourage cinematic lone inventors creating marvels.)

Time Required

The time required to create an invention depends on the device's Active Point Cost: it requires about a day's work for each Active Point of a device. Rushing things applies a penalty to skill — consult the Time Chart on page 45 of the *HERO System 5th Edition, Revised* and apply modifiers as appropriate based on how much the inventor wants to speed up the process. On the other hand, inventors can take longer and obtain extra time bonuses.

Help

Having help can be a real boon for the inventor. When figuring the time required, divide by the number of people working on the project. Collaborators can use their appropriate Skill Rolls as Complementary Skills to the lead character's Inventor Skill Roll. But there's a penalty for having lots of help — use the *worst* skill level of all the characters involved with the project when making the Complementary Skill Roll.

Example: *Steve is designing a new game system. He has Inventor 14-, and his PS: Game Designer is 18-. But to get the game out the door in time, he has called in two helpers, Jim and Ken. Their PS: Game Designer rolls are 12- and 13-. With three of them working, the development time is cut to a third, but the Complementary Skill Roll to assist the Inventor roll uses Jim's mediocre 12- skill instead of Steve's excellent 18- level.*

Cost

In Heroic games, characters often have to worry about monetary costs. The cost to create an invention depends on the required time and how exotic the materials are. At modern prices, figure \$200 per person per day of development work for salaries and associated expenses (adjust for the era). For materials, a modern baseline would be \$100

per kilogram for commercially-available items. Exotic materials can cost considerably more — up to millions of dollars per gram for scarce radioactive isotopes or complex hormones (the final price tag is up to the GM). An ordinary, well-stocked workshop costs about \$100 per day to operate. Advanced facilities like particle accelerators or chemical refiners can cost \$1,000 or more per hour of use. "Throwing money at the problem" can produce better and faster results: for every doubling of expenses the inventor gets a +1 to his Skill Roll. However, inadequate money is a project-killer: for every 10% below the calculated expenses, the inventor suffers a -2. In realistic campaigns, the project is simply impossible below half the appropriate cost. In cinematic games, a sufficiently clever inventor can improvise and scrounge with no money at all.

KNOWLEDGE SKILLS

When characters operate on a progressively larger and larger scale, their Area Knowledges become less and less useful at the local level. A character with AK: The Solar System would know about the planets and their major states, but would know relatively little about individual cities. Area Knowledge for a sector would mean the character knows about star systems and planets, but would probably have very little knowledge of planetary-scale nations, and might miss a few minor moons or asteroids. Galactic Area Knowledge would allow someone to know the major interstellar states, a few of the most important sectors and star systems, and the most common starfaring species. Most stars and planets would be too trivial for the character to know more about than the name and perhaps one key fact, at most.

The same holds true for other types of KSs. A KS in Galactic History or Galactic Cultures doesn't provide as much precise information about a given historical event or culture as a similar KS focusing on a sector, solar system, or planet.

LANGUAGES

In Space Opera and other low-realism games, everybody may speak a common language — Galactic, or Interlang, or whatever. (In *really* pulpish games, aliens all mysteriously know English.) For more detailed settings, each alien civilization has its own language, and learning them can be a major headache. Alien languages add points to the cost of each level of fluency, as shown on the accompanying table. Use all modifiers that apply.

The table accounts for two variables: the alien-ness of the language, and the method of communication. The GM determines the level of alien-ness (with "Human" meaning "the character's own species"). In a Space Opera campaign, many languages will be Virtually Human, while in a more realistic game Moderately Alien is the best the characters can hope for in most situations.

The methods of communication may prevent a character from learning a language at all (or at least using it without special technology). If the Rigellians communicate with scents that Humans cannot emit, the two species cannot communicate

KNOWLEDGE SKILL PENALTIES

As a rough guideline for the effects of "scale" discussed in the text, GMs can use the following ranking of magnitudes of knowledge. Figure out which category the character's KS falls into, then what category the fact he wants to know is most appropriate for. For each step up or down the list, the character suffers a -5 penalty to know the fact. The GM may alter this penalty for facts he feels are particularly noteworthy or obscure. Thus, if a character has KS: Galactic History, he suffers a -25 penalty for trying to remember an average fact about an event that took place in some nation.

Intergalactic
Galactic/Interstellar
Star Sector
Solar System
Planet
Continent/Region
Nation
Province/City
Village/Locality

Gamemasters may not want to use this system, or may want to significantly reduce the penalties, in campaigns with a more "cinematic" feel, such as many Space Opera and Retro-SF games.



ALIEN LANGUAGE MODIFIERS TABLE

Alienness Of Language	Extra Cost
Virtually Human	+0
Moderately Alien	+1
Very Alien	+2
Extremely Alien	+3

Method Of Communication	Extra Cost
Spoken	+0
Spoken, but uses difficult sounds	+1
Ultrasonic or other non-Human sounds	+2
Visual language	+2
Scent or Exotic Sense Language	+3

until Humans develop special devices to emit the proper odors. See Jack Vance’s superb short story “The Moon Moth” for an example of how characters can get themselves into trouble with unfamiliar methods of communication.

Gamemasters who posit a common origin for the sentient species of the Galaxy — a mutual progenitor, or an ancient race that “seeded” the planets genetically — might try to come up with a Language Familiarity Table suitable for their *Star Hero* campaigns. However, even allowing for such a common origin, most languages diverge so quickly from planet to planet that there’s not enough similarity between them to justify a point savings.

LOCKPICKING

Opening locks gets much easier when you have more advanced tools to do it with. Apply the Obsolete and Advanced Technology rules when a high-tech character tries to open a low-tech lock, or vice-versa.

MARTIAL ARTS

In most *Star Hero* campaigns, a character’s opportunity to learn new and intriguing martial arts styles increases dramatically. After all, a potential student now has not just dozens of styles to choose from, but dozens of *worlds’* worth of styles, with all the variation that implies.

ENERGY BLADE FENCING

Energy Blades (page 148) are an elite weapon, and the techniques for fighting effectively using them are closely guarded secrets of the masters. Because Energy Blades do immense damage and pierce most defenses on their own, this fighting art emphasizes hitting one’s opponent, avoiding hits, and disarming, rather than increasing the amount of damage done. Battles between Energy Blade warriors are often long, drawn-out affairs, but against unskilled opponents, Energy Blade masters are devastatingly quick.

ENERGY BLADE FENCING

Usable with Energy Blades Weapon Group; Energy Blades Weapon Element is free

Maneuver	Phs	Pts	OCV	DCV	Damage/Effect
Disarm	½	5	+0	+1	Disarm, +10 STR
Dodge	½	4	—	+5	Dodge all attacks, Abort
Parry	½	4	+2	+2	Block, Abort
Swift Strike	½	4	+2	+2	Weapon Strike
Wary Strike	½	5	+1	+3	Weapon Strike

Skills

- Acrobatics
- Breakfall
- Defense Maneuver
- Fast Draw
- Two-Weapon Fighting
- WF: Blades
- WF: Energy Blades*
- WF: Off Hand

Of course, some types of aliens are so non-Human that mankind cannot learn their fighting styles. An octopoid alien whose fighting depends on using his many tentacles to Grab and crush, or a clawed alien with a martial art that emphasizes his natural weaponry, probably can’t teach a Human anything. But in most science fiction universes a substantial portion of the alien species are humanoid, so Humans can probably study their martial arts without much problem.

At the GM’s discretion, some maneuvers (such as Nerve Strikes) may only apply to a single species (typically, the character’s own species) when learned. Characters have to buy a Science Skill in the anatomy of an alien species before they can use such attacks successfully on members of that species.

One option for science fiction martial arts is to limit or abolish the *Style* Distinctive Feature (see *The Ultimate Martial Artist*, page 135). In a galaxy possibly featuring thousands of martial arts forms, it’s extremely unlikely a particular fighter has in-depth knowledge of more than a tiny fraction of them. Therefore the odds are against the *Style* Distinctive Feature actually being a Disadvantage most of the time, particularly if the character travels extensively. Therefore the GM should think about giving fewer points for the Disadvantage, or even disallowing its use entirely.

Alternately, a character’s *Analyze Style* Skill might only apply to martial arts developed by his own species; he would have to purchase the Skill for each species or region whose fighting styles he studies (for example, Analyze Bandarian Styles, Analyze Fomalhauti Cluster Styles, and so forth).

See also *The Ultimate Martial Artist*, pages 86-87, for two SF martial arts styles, Maashira and Zero Gravity Combat.

MECHANICS

Mechanics remains mechanics in the future, even if it takes a back seat to electronics or more advanced technology. The chief difference is that some systems require extremely specialized tools — repairing a nanotech device would call for a powerful microscope and tiny manipulators, while fixing a nuclear reactor demands remote-operated robots to avoid a messy death. Apply the Skill Roll modifiers on page 45 of the *HERO System 5th Edition, Revised* rulebook, paying close attention to the modifiers for proper equipment and familiarity with the subject.

MIMICRY

When mimicking an alien, assume the base Skill Roll penalty is -2 for species which speak in the same sound range as the character, -3 to -5 for aliens using very difficult sounds in their language. (This is in addition to the penalty for foreign languages.) Characters cannot use Mimicry to imitate beings who make sounds the character cannot produce. If a species communicates through means other than sound (such as flashing lights or pheromonic emissions), the GM must decide whether a character can mimic their “speech” at all, and if so what penalties this entails (usually at least -5).

NAVIGATION

In a spacefaring campaign, Navigation (Space) is crucial, though other forms of Navigation may also be common if the PCs are explorers or the like.

At the GM's option, the existence of FTL travel,

or particular methods of FTL travel, may require new Navigation subskills. Navigation (Hyperspace) allows a character to determine his position in hyperspace, both relative to other points in hyperspace and to normal space; if the environment of hyperspace is sufficiently weird and unlike normal space, GMs may opt to make this an entirely separate Skill. Navigation (FTL) allows a character to determine his position while whipping along at FTL speeds, and involves compensating for redshift, light lag, and the movement of objects throughout the Galaxy.

Time and interdimensional travel allow travel in two entirely new ways, and consequently require two new subskills. Navigation (Time) allows a character to determine where in the past or future he is. Knowledge and Science Skills such as History, Astronomy, Archaeology, and possibly Anthropology serve as Complementary Skills. Navigation (Dimensional) allows a character to determine his location among the dimensions of the multiverse. It may be the same as Navigation (Hyperspace) if all dimensions open onto the same hyperspace.

POWER

This Skill occurs in *Star Hero* under a variety of names. If a character is psionic, he may have *Psionics*. Alien species with natural powers may get it as an Everyman Skill.

PROFESSIONAL SKILL: ZERO-G OPERATIONS

Professional Skills abound in *Star Hero*, as in any other Heroic campaign. But one in particular is of note for science fiction characters — PS: Zero-G Operations.





Zero-G Operations is a DEX-Based Professional Skill. A character with this Skill can perform all ordinary tasks in Zero-G with none of the penalties listed on pages 278-79. If a task is especially difficult or complicated, or the character must perform it under crisis conditions, he has to make a PS: Zero-G Operations roll. If he succeeds, he can perform the task without penalty. (That includes suffering none of the difficulties described on pages 278-79.) If he fails, he can still attempt the task, but suffers the standard -3 penalty and other associated difficulties.

RIDING

Riding requires the same consideration as Transport Familiarity (see below), since the types of animals a character can ride depends on his TFs. In a Space Opera or Pulp-style *Star Hero* campaign, a character's ability to ride a particular type of animal from his homeworld may automatically extend to similar creatures on other worlds. For example, a Human who can ride horses can ride any horse-like creature on any world (though the GM may impose a minor penalty, such as -1, until the character and his mount get to know each other). Alternately, for purposes of Riding the GM may allow characters to buy 2-point Riding TFs by planet: Earth Riding Creatures, Venusian Riding Creatures, Spica IV Riding Creatures, and so forth.

In a Hard SF game, Riding (and associated TFs) rarely, if ever, carry over from world to world. A character who wanted to ride horse-like creatures on many worlds would have to pay for each 1-point TF separately: Earth Equines, Venusian Equines, Spica IV Equines, and so on.

At the GM's option, a character can use Riding for creatures he does not have a TF for, but at a mini-

mum -3 penalty to all rolls. Creatures larger than the "Huge Animals" TF category (such as the sandworms of *Dune*) may impose additional penalties on the Riding roll, because they're so large and tough it's hard to control them.

SCIENCE SKILL

Every piece of "rubber science" (see page 146) in a *Star Hero* campaign should have an appropriate Science Skill associated with it. Some new sciences for use in science fiction campaigns include:

Dimensional Engineering: The science of inter-dimensional and time travel (the latter subject, by itself, is also known as Temporal Physics).

Hyperspace Physics: Sometimes known as Tachyonics or Warp Physics, this is the science of faster-than-light travel.

Memetics: The science of ideologies and mass manipulation (sometimes called socioengineering or psychoengineering).

Psionics: The study of mental powers and their applications.

Xenobiology: The study of alien life forms.

Xenology: The study of alien civilizations and societies.

SECURITY SYSTEMS

As with Lockpicking, Security Systems is a technology-dependent Skill. A high-tech crook can cut through low-tech systems with appalling ease, while low-tech intruders may not even know of the existence of advanced security systems until all hell breaks loose. Use the rules on *Obsolete And Advanced Technology* in Chapter Seven.

SEDUCTION

In realistic game worlds, Seduction is only possible among members of the same species. Humans can seduce Humans, and Rigellians can seduce Rigellians, but a Human and a Rigellian can only be good friends. Among members of a species from radically different cultures, GMs may wish to apply a penalty of -1 to -3 to reflect differing standards of romantic behavior.

In Space Opera or Pulp science fiction, where many aliens resemble Humans with minor cosmetic differences, inter-species Seduction is possible. (See many episodes of *Star Trek* for examples.) In such cases, consult the Alien Seduction Table and apply all relevant modifiers. For "Human," read "member of

ALIEN SEDUCTION TABLE

Alien Form	Skill Modifier
Externally very similar to Humans	-0
Minor differences from Human	-1
Non-Human but mammalian	-2
Nonmammalian vertebrates	-4
Invertebrates	-6
Non-Material/no physical form	-8
Additional Modifiers	
Alien species is asexual	-2
Alien species has specific mating cues (e.g., scent, color)	-2

the character's own species," and make other appropriate changes.

If characters simply use Seduction to make friends or ingratiate themselves, the GM may wish to consider reducing or eliminating the penalties described above.

SURVIVAL

In Space Opera campaigns, planetary environments are broadly similar, so an expert in Mountain Survival on Earth can get along in high-altitude regions on other Earthlike worlds with only a -1 penalty. In Hard SF and other realistic settings, each planet's environments are distinct, so that Survival: Earth Deserts and Survival: Martian Deserts are separate Skills. In such campaigns, characters must specify the planet where they learned Survival.

Gamemasters may also wish to take into account the relative degree of similarity between planets. Even among worlds classifiable as "Earthlike," a great deal of variation can occur. See the accompanying table for suggested modifiers; these modifiers are in addition to the -1 penalty described above, if that's used.

Of course, no amount of skill can overcome the absolute limits imposed by the environment. A character on Mercury can't find water using Survival because there simply isn't any water to find.

PLANETARY SIMILARITY TABLE

Degree Of Similarity	Survival Roll Penalty
Very similar	-0
Mostly similar	-1
A little similar	-2
Mostly different	-3
Very different	-4
Extremely different	-5

SYSTEMS OPERATION

As described in the *HERO System 5th Edition*, *Revised* rulebook, Systems Operation is a "cinematic" Skill — characters using it can operate any kind of system. This approach may not be appropriate for highly realistic campaigns. Instead, they may wish to break the Skill down into categories. The accompanying box presents one possible scheme for subdividing Systems Operation, though others are certainly possible given the nature and prevalence of technology in a campaign. Characters can learn any one category for 2 Character Points for a $(9 + (\text{INT}/5))$ roll; each additional category costs +2 Character Points, or each additional subcategory +1 Character Point; improving the roll for all categories known costs +2 Character Points for each +1 to the roll.

Technology affects Systems Operation heavily. If appropriate, apply the *Obsolete And Advanced Technology* rules from Chapter Seven.

TRANSPORT FAMILIARITY

In the standard *HERO System* rules, all spacecraft and starships are covered by one simple, inexpensive Transport Familiarity. While that may work well for some Space Opera and Pulp SF campaigns, it's not appropriate for many *Star Hero* settings. For games where the GM desires greater detail, consider each of the subcategories listed under "Science Fiction &

EXPANDED SYSTEMS OPERATION TABLE

Communications Systems (may be purchased as a group)

Telephone Communications (installing and using the phone system)
 Cellular & Digital Communications (cellular phones, pagers, and so forth)
 Radio (standard radio systems, CB radio, ham radio, military radios)
 Broadcast Communications (television or broadcast radio equipment)
 Satellite Communications (use of satellites and satellite networks to transmit signals, GPS systems)
 Communications Jamming Equipment (equipment specially designed to jam transmissions)
 FTL Communications
 Dimensional/Temporal Communications

Environmental Systems (may be purchased as a group)

Life Support Systems (breathing gases, heating, and so forth)
 Personnel Support Systems (food synthesizers, waste management, and so forth)
 Recreation Systems (games, holo-chambers, and so forth)

Medical Systems (may be purchased as a group)

Medical Sensors (x-ray equipment, MRI equipment, and so forth)
 Surgical Equipment

Sensor Systems (must be purchased separately)

Air/Space Traffic Control Systems (other than radar and radio)
 Medical Sensors (see above)
 Metal Detectors
 Radar
 Sonar (passive and active arrays, towed arrays)
 Sensor Jamming Equipment (equipment specifically designed to jam sensors)
 FTL Sensors
 Dimensional/Temporal Sensors

Weapons Systems (must be purchased separately)

Advanced weapons such as missiles are launched with the Systems Operation Skill. Each type of advanced weapon has its own Weapon System subgroup — Patriot missiles, antimatter space torpedoes, and so forth. (This does not apply to vehicular weapons; those require WF: Vehicle Weapons.)

Space Vehicles" as a separate, 2-point TF category of its own.

In some campaigns, GMs may wish to add an additional category: Dimensional/Time Vehicles. It covers time machines, dimension-ships, and any other vehicle that can travel between realities or times.

SKILLS AS TOOLS

One trend of technology has long been to move the skill from the user to the device. Rifle sights are built-in accuracy, and nowadays things like microwave ovens have a little bit of built-in cooking skill. This is only going to accelerate in the future. It's fairly easy to model this using the *HERO System* — simply buy the Skill as a Power with the *Focus* Limitation, using the rules on page 141 of the 5th Edition rulebook.

If direct brain links exist, it may be possible to “jack in” a skill module which contains a skill the user doesn't already know. This is purchased the same way — the controlling Characteristic is 0, because presumably the skill module software is generic and doesn't get to take advantage of the user's own abilities. But of course, the better the software, the higher the roll it provides the character.

In Hard SF or high-realism games, GMs may want to go one step further and make each planet's or species's space vehicles a separate TF. Thus, a character with TF: Human Military Spacecraft couldn't safely pilot Mon'dabi Military Spacecraft. As noted in the *HERO System 5th Edition, Revised*, page 74, methods of construction, number and placement of manipulatory limbs, control panel organizational logic, and other factors may make it difficult or impossible for one species to use another's starships.

Most of the hovercraft, landspeeders, and gravitic/magnetic ground vehicles common in some SF settings typically fall under the Common Motorized Ground Vehicles category as a *Hovercraft* subcategory. Larger hovercraft, or military hovercraft, are usually subcategories under the Uncommon Motorized Ground Vehicle category.

WEAPON FAMILIARITY

The number and types of weapons available to characters is greater in science fiction than any other genre, given the panoply of worlds, cultures, and technological levels to choose from. It's not uncommon for characters in a *Star Hero* game to carry everything from clubs, knives, and swords to blasters and disintegrators. See the accompanying table for suggested additions to the WF categories; GMs are, of course, free to alter or add to the existing lists to better suit their individual campaigns.

Gamemasters may want to consider making each planet's or species's weapons a separate WF. Thus, a character with WF: Ackálian Common Melee Weapons or WF: Human Small Arms can't use Varanyi Common Melee Weapons or Denebian Small Arms without suffering the normal nonproficiency penalty. Depending on a species's number of limbs or fingers and similar considerations, other species may find it difficult or impossible to use their weapons, regardless of proficiency.

WEAPONSMITH

Because lasers, blasters, and the like are so common in *Star Hero* settings, GMs may wish to break out the “Energy Weapons” category of Weaponsmith into two or more categories. The categories in the *Star Hero Weapon Familiarities* table work well in most settings: Small Arms, Beam Weapons, and Energy Weapons. That way, knowing how to fix a laser may tell a character almost nothing about working on a disintegrator.

PERKS

Star Hero characters find Perks just as useful as modern-day or fantasy characters do. They even have access to a few that aren't available in other genres.

ADVANCED TECH

This new Perk is suitable primarily for *Star Hero* campaigns that have a defined system of Tech Levels (see page 142). It represents a charac-

WEAPON FAMILIARITIES

Uncommon Melee Weapons (add to existing category)

Electric Whip
Energy Blades
Inertial Gloves
Stun Rods

Small Arms (add to existing category)

Liquid-Propellant Rifles
Gauss Guns
Polymer Guns
Rocket Pistols
Rocket Rifles
Missile Guns
Sonic Stunners
Tranquilizer Dart Guns

Beam Weapons (may be purchased as a group)

Laser Pistols
Laser Rifles
Electron Beam Weapons
Particle Guns

Energy Weapons (may be purchased as a group)

Ion Blasters
Plasma Guns
Disintegrators

Alternately, for some campaigns GMs may prefer to establish a *Science Fiction Small Arms* category including all weapons listed in the Small Arms, Beam Weapons, and Energy Weapons categories of this table.

ter who has access to equipment more advanced than the campaign setting standard. Maybe he's from a planet with better technology, found a cache of ancient technology, or is a highly-skilled inventor.

The GM should monitor and control all uses of this Perk. Having Advanced Tech does *not* necessarily mean that every piece of equipment a character possesses is better than normal, or that he can at any time re-equip himself with tech as advanced as what he starts the game with (or obtains in mid-game). It also does not allow him to distribute advanced technology to all of his friends (*i.e.*, the other PCs), give it away freely to allies, and then get more; typically he only has enough for himself (and to keep himself re-supplied, as reasonably necessary).

Advanced Tech costs 15 Character Points per Tech Level above the campaign standard (or, at the GM's option, only 10 Character Points per Tech Level for a single type of technology, such as computers, weapons, or sensors). Gamemasters should be *very* cautious about allowing more than one level of Advanced Tech, and characters must get the GM's permission to buy this Perk (particularly after the game starts).

ANONYMITY

As information-gathering technology becomes both more powerful and more ubiquitous, anonymity becomes harder to obtain, and more valuable. In highly-regimented *Star Hero* societies, GMs may wish to increase the cost of this Perk to 5 or more points.



FRINGE BENEFITS

Most of the existing Fringe Benefits — including Starship License and Galactic Computernet Access Card — are appropriate for *Star Hero* campaigns.

Galactic Computernet Access Card

Depending on the nature and extent of the computer nets in a *Star Hero* setting, the GM may want to change the cost of this Fringe Benefit. In an empire ruled by a cruel overlord, access to the computer networks might be restricted, so the Fringe Benefit would cost more points. On the other hand, in a quasi-utopian Space Opera setting, the cost might drop to 1 point (or even no points) to reflect the openness of society.

Additionally, the cost of the Fringe Benefit may depend on how much access a character has. The standard cost (be it 3 Character Points, as in the rulebook, or 1 point in a less restrictive setting) reflects the lowest, most common level of access available — the access of the average citizen. Gamemasters may want to charge characters with greater access (such as high-ranking military officers, security agents, and government officials) more. Use the guidelines for the *Computer Link* Perk (which is essentially the same thing) to determine the cost.

In some settings, this Fringe Benefit may count as an “Everyman Perk” — everyone gets it at the lowest level for free. Characters with greater access pay for that access, typically as part of a Professional Package Deal.

Despite the name, this Fringe Benefit doesn’t necessarily involve having a “card.” It could just as easily be a personal passcode, DNA scan, identity chip, or the like.

See page 161 for more information on the Galactic Computernet.

Head Of State

Given the size and power of the galactic governments in many *Star Hero* settings, GMs may wish to expand this Fringe Benefit a little (see accompanying sidebar). For characters who aren’t leaders of a government, but instead are powers behind the throne, heirs waiting to take command, or the like, buy the next-lowest Fringe Benefit.

Police Powers

In *Star Hero* campaigns, you should rename International Police Powers *Planetary Police Powers* (though the old name still applies on balkanized worlds). For 8 Character Points, characters can buy *Interstellar Police Powers*, giving them the authority to enforce the law throughout a single star-spanning government.

In campaigns which feature special psionic police, GMs may allow a related Fringe Benefit, *Psionic Police Powers*, for 3 Character Points (this is in addition to the cost of the character’s Police Powers Fringe Benefit). This Perk means the character is licensed to use psionic powers as part of the investigative process, and gives him primary jurisdiction over crimes involving the use of psionics.

Similarly, campaigns involving “time cops” who travel back and forth in time to prevent “chrono-criminals” from disrupting the time-stream may use the Fringe Benefit *Temporal Police Powers* for 3 Character Points (again, this is in addition to the cost of standard Police Powers).

STAR HERO HEAD OF STATE

Cost	Fringe Benefit
10	Head Of State of a single nation
13	Head Of State of a planet
15	Head Of State of a small interstellar society
20	Head Of State of a medium-sized interstellar society
25	Head Of State of a large interstellar society

Starship License

This Fringe Benefit gives a character the right to own and operate a single starship. Characters who own more than one ship have to buy the Fringe Benefit multiple times. Alternately, the GM can allow a new Fringe Benefit, *Starship Master's License*, for 2 Character Points. This qualifies the character to captain any civilian vessel (there may be restrictions as to size or type), and allows him to own as many vessels as he can afford.

New Fringe Benefits

Here are a few Fringe Benefits specific to *Star Hero*:

Free Robot (1 point): In most cases, robots and androids, even artificially intelligent ones, are considered property. One with this Fringe Benefit is not property; it is recognized as an independent sentient being with legal rights and citizenship. (Robotic characters may also need to change or not take Social Limitations pertaining to their status.)

Licensed Psionic (1 point): A character with this Fringe Benefit may use his psionic powers for legal purposes and according to established regulations — for example, to assist with business negotiations, find lost objects, or the like. In some settings, the authorities hunt down and capture unlicensed psis.

Time Machine License (2 points): A character with this Fringe Benefit is allowed to own and operate a time machine for legal purposes — scientific and historical research, noninvasive tourism, recovery of endangered species and lost artworks, and so forth. The Time Police may pursue and arrest unlicensed time travelers.

MONEY

In some SF settings, money is obsolete or useless. The “Culture” of Iain M. Banks’s novels and the Federation of *Star Trek* are posteconomic societies where individuals can get pretty much whatever they want without money. Of course, even there a person can’t just walk off with a starship or a space habitat. For anything over a defined limit in value (set by the GM based on local resources and the needs of the campaign), posteconomic characters must make a roll to persuade whoever’s in charge of production facilities that they really need the item. Use Bureaucratics, Persuasion, Seduction, or Trading (whichever is most appropriate for the situation), with a penalty to the roll based on how much the value of the requested item exceeds the established limit (typically -1 for every +10% value, but the GM makes the final determination).

See the *Economics* section of Chapter Seven for more information.

REPUTATION

Andy Warhol once observed that in the future, everyone will be famous, but only for fifteen minutes. Certainly mass media makes it possible for people to have a widespread reputation, but the constant “churn” of the media landscape means this year’s hero is next year’s trivia question. At the same time, improved communications allow

people to have groups of colleagues and friends spread across the world (or even the galaxy), which can provide tremendous “leverage” for a character’s Reputation.

In *Star Hero*, a character’s Reputation could be known across thousands of worlds, or even throughout time; characters almost always have to pay the 2-point cost for “large group” for their Reputation. But they can, and often should, only take the Reputation on an 8-, since it’s difficult to be known by *everyone* (or even a substantial portion of “everyone”) among trillions of aliens.

VEHICLES AND BASES

Since *Star Hero* is a Heroic genre, characters can usually buy starships, houses, and the like with money. However, given the enormous cost of starships in many settings (millions or billions of units of currency), a character may find it more convenient to spend Character Points on these items. That also ensures he won’t have interstellar mortgage brokers constantly pestering him for a monthly payment. On the other hand, the need to acquire enough money to buy a ship with cash is a great character motivator for the GM to use. See Chapter Eight for more information about Vehicles and Bases generally, including options for acquiring them.

TALENTS

Science fiction dramatically expands the opportunities for people to have unusual abilities. For example, you can simulate the abilities possessed by many aliens with Talents. All members of a serpentine species might be Double-Jointed, and rigorous training in childhood might give all members of a contemplative species Eidetic Memory. Some Talents may become universal, like Absolute Time Sense in a world with implant computers (see “Everyman Powers,” page 52). In campaigns involving psionic powers, many Talents are probably low-grade psi abilities. Danger Sense, Simulate Death, and Universal Translator are good candidates for truly uncanny powers.

ABSOLUTE TIME SENSE

Characters may define this Talent as a computer implant, since all computers have a built-in clock function. (The same “implant” special effect can apply to many other Talents, such as Bump Of Direction, Lightning Calculator, or Universal Translator.)

This Talent becomes particularly useful in campaigns involving time travel. At the GM’s discretion, a character with Absolute Time Sense can, with a successful PER Roll, also tell approximately how far he’s traveled in time from his normal time-frame. Alternately, for +5 Character Points, a character can convert Absolute Time Sense into *Time Travel Sense*, which gives him the innate ability not only to gauge the passage of time, but to determine how far he has travelled in time and the current date.

DANGER SENSE

In worlds with psi powers, Danger Sense is a low-powered form of Precognition. Gamemasters may decide to let characters with Danger Sense improve their ability to full-fledged Precognition with proper training and experience.

EIDETIC MEMORY

Eidetic Memory crops up frequently in science fiction settings. Not only is it handy for super-scientist types and technical geniuses, it's *de rigueur* for species oriented toward logic, regimentation, or the like (such as the Vulcans of *Star Trek*). It's virtually required for robotic characters.

ENVIRONMENTAL MOVEMENT

Zero-G Training (the form of Environmental Movement that eliminates penalties for performing tasks in zero gravity) is common among space travelers. Here are a few other gravity-related forms of Environmental Movement; see pages 278-81 for more information about gravity penalties.

High Gravity Training (1 Point): Negates the -1 penalty for heavy gravity, but does *not* change the encumbrance penalty.

Low Gravity Training (1 to 4 Points): Negates penalties for low gravity. For 1 Character Point, characters can negate up to -1 worth of low gravity penalties; for 3 points, up to -2; for 4 points, up to -3.

Zero G, high G, and low G are all separate environments for purposes of Environmental Movement; a character who wants to function in two or more of them must buy the Talent multiple times.

FTL PILOT

Some science fiction settings limit the ability to pilot FTL-capable ships to only certain persons. Typically, FTL pilots have to possess certain “perceptions” or analytical skills that make it possible for them to fly at superluminal speeds safely. Anyone else who tries to pilot an FTL ship quickly runs it into a star, destroying the entire vessel and everyone aboard. If FTL travel involves hyperspace, only some people know how to open hyperspace portals, or can stand to look at the chaotic vista of hyperspace (as a pilot must) without going insane.

In *Star Hero* settings that adopt this trope, characters who want to be able to pilot FTL ships must buy this Talent.

■ **FTL Pilot Cost:** 4 Character Points (Navigation (FTL or Hyperspace) and TF: FTL/Hyperspace Spacecraft)

HOTSHOT PILOT

This Talent represents a character who's a naturally gifted or highly-trained pilot. This has two effects. First, he receives a +2 bonus for all Combat Piloting rolls. Second, when piloting a ship no larger than 100 ktons in starship combat, his piloting skills make the vessel harder to hit (granting it +2 DCV).

■ **Hotshot Pilot Cost:** 24 Character Points (+2 to Combat Piloting plus +2 DCV, Usable By Other [any ship of up to 100 ktons; +5]; Only For A Starship Character Is Piloting [-2])



LATENT PSIONIC

In *Star Hero* games featuring psionic powers, typically characters gain those powers through heredity, *i.e.*, they are born with them, and thus should start the game with them. However, some players might not want for their characters' psionic abilities to have manifested at the time game play begins (either for dramatic reasons, or because they can't afford to spend Character Points on Mental Powers yet). The GM might allow such characters to buy the Talent *Latent Psionic* for a set cost (typically 5 Character Points). This means the character can buy psionic abilities later in the game — without this Talent, or some appropriate in-game explanation, characters cannot buy psionic powers after game play begins. When a

UNIVERSAL TRANSLATORS

Universal Translation

Matrix: This device, commonly built into communications systems, hand-held translators, and the like, can convert a person's speech into any of the thousands of languages in its database without effort. It can analyze and convert languages not in its database, but this takes time and a sufficiently large sample of the new language. This device does not necessarily confer literacy; that depends on the situation and the GM's evaluation of the technology.

Universal Translator 15- (26 Active Points); OAF (hand-held translator; -1), Restricted Function (only works instantly on languages in its database, others require time and samples to analyze; -0). Total cost: 13 points (or 17 points for OIF).

Intrinsic Language: The character speaks the "hard-wired" language embodied in the Human brain structure. He can make himself understood by any Human being, past or future. Aliens are still too alien to understand, but this is a good way to let time travellers speak to everyone they meet. It does not necessarily convey literacy; that depends on the situation and the GM's evaluation of the technology.

Universal Translator (INT Roll) (20 Active Points); Human Languages Only (-1). Total cost: 10 points.

Psychotronic Translator:

Campaigns including psionic powers sometimes have these devices, which essentially read people's surface thoughts as they speak and broadcast them as words. Psychotronic

Continued on next page

character is ready for his latent psionic potential to be realized, he simply converts the points spent on this Talent into points spent on his first psionic ability.

■ **Latent Psionic Cost:** 5 Character Points (5 points set aside for later purchase of Mental Powers)

SIMULATE DEATH

Besides being an appropriate psionic power, Simulate Death works perfectly for simulating "cold sleep pods" for STL travel, "stasis boxes" in which objects (or people) are kept for decades or centuries without deterioration, and similar technologies. Some alien species may have this Talent to reflect their ability to slow down their metabolic processes without harm.

UNIVERSAL TRANSLATOR

This Talent shouldn't exist in Hard SF campaigns or other settings emphasizing realism. It's hard enough for Humans to learn and understand other Human languages.

Gamemasters who want to dodge the issue of having characters learn new languages every game session can allow this Talent, typically bought as a psionic ability or device; such gadgets are common in many science fiction settings. See the sidebar for some examples. Don't forget the penalties for translating languages "extremely different" from the ones the character (or the designers of his translation device) knows; there are lots of weird ways for aliens to communicate.

POWERS

In science fiction settings, *HERO System Powers* have numerous uses. In addition to high technology — FTL starship drives, teleportation pads, advanced sensors — and weapons such as laser pistols, Powers simulate the abilities of aliens and alien fauna. Described below are some potential uses for various powers; other, more obvious uses (such as Armor to build Space Marine armored battlesuits) are not mentioned (though they may be used for examples in Chapter Seven).

DEFENSE POWERS

In *Star Hero* campaigns, many Defense Powers, particularly those protecting spacecraft, use the optional form of Ablative described on page 116 of the *HERO System 5th Edition, Revised*, under which shots subtract Active Points from the defense. See Chapter Eight for some examples.

MOVEMENT POWERS

Many Movement Powers are affected by gravity. See page 279 for further information.

SENSE-AFFECTING POWERS

In Space Opera settings featuring lots of aliens with lots of weird senses, it may prove difficult or impossible to affect or "blind" a reasonable percentage of any group of characters with any given Sense-Affecting Power. Gamemasters may wish to consider either (a) lowering the cost of all Sense Groups to the "Nontargeting" rate, or (b) raising the cost of all Sense

EVERYMAN POWERS

Some settings assume a fairly impressive arsenal of genetic and cybernetic modifications for ordinary people: the inhabitants of Iain M. Banks's "Culture" novels have longevity, are immune to most poisons and diseases, and can trigger the release of artificial bloodstream chemicals to go without sleep, overcome fatigue, and boost reaction time. Gamemasters may consider giving certain abilities out for free, if they are universal in the campaign.

One good example is advanced medicine. If some means of delaying aging or preventing diseases exists, anyone who can afford it will want it. In any setting more advanced than the present, a near-total immunity to viral diseases could be universal, and if medical nanobots are available, this could even be immunity to any and all forms of infection. Genetic modification or nanosurgery could give everyone increased longevity or even immortality!

Widespread cybernetics opens up other possibilities for "Everyman Powers." In a world where everybody has a communicator implant, then the Radio Perception/Transmission power could be available for free.

Some common "Everyman Powers" for future settings:

Chronometer Implant: Absolute Time Sense. Total cost: 3 points.

Communication Implant: See the "Cyborgs" sidebar, page 28.

Gland Override: Aid 2d6, Variable Effect (either STR, CON, DEX, or EGO, one at a time; +¼), Delayed Return Rate (points fade at the rate of 5 per Minute; +¼) (30 Active Points); Self Only (-½), 2 Charges (-1 ½). Total cost: 10 points.

Longevity Treatment: Life Support (Longevity: half normal aging rate). Total cost: 1 point.

Nanobot Immune Enhancers: Life Support (Immunity: all diseases and biowarfare agents common to one planet or species) (10 Active Points); Activation Roll 15- (-¼). Total cost: 8 points.

Superefficient Sleep: Life Support (Diminished Sleep: 8 hours per week). Total cost: 1 point.

Universal Vaccine: Life Support (Immunity: all viral infections). Total cost: 4 points.

Groups to the "Targeting" rate.

In campaigns featuring a lot of starship combat, GMs may want to declare the Radio Group a Targeting Sense Group, at least for purposes of building stealth defenses for starships. Most of the Senses used by one ship to target another are based on Radar, or are assigned to the Radio Group.

ABSORPTION

Alien creatures who feed directly on energy may have this Power. Realistically, it should only work against a tightly-limited group of effects, but a Space Opera energy creature may have the ability to absorb any type of energy.

Some fictional spaceship defensive screens actually absorb energy rather than reflecting it. You

can build this as Absorption Linked to Force Field or Force Wall, with the points Absorbed typically feeding into the starship's power plant (Endurance Reserve). Overloads may be a problem — the device may specify, as a Side Effect, that any energy "Absorbed" beyond the maximum translates directly into damage to the ship in some fashion.

AID

Aid shows up quite a bit in the form of science fiction wonder drugs to boost a person's performance. Just about any Characteristic can have an appropriate booster drug — even Comeliness (possibly with the $-\frac{1}{2}$ Limitation *Only To Counteract Aging*). Usually there is a cost or side effect — booster drugs may have the *Costs Endurance Advantage*, or Side Effects that apply when the power stops working (once the Aided points wear off, the user "crashes," taking STUN and/or BODY damage).

CHANGE ENVIRONMENT

This power may show up as a psionic ability, especially with pyrokinesis or cryokinesis, which alter the temperature around the psionic character. Sometimes the temperature change is an uncontrollable side effect of other psionic abilities.

Terraforming — the conversion of planets which cannot support Human (or other) life into inhabitable worlds — is a specialized form of Change Environment suitable for settings or planets where the effects have to be maintained through powerful atmospheric generators or similar technology. (Permanent changes require Area Of Effect Major Transforms.) This type of terraforming is Change Environment bought with the *Megascale Advantage* (enough to affect the entire planet), and Limitations such as *Extra Time*, *Focus*, *Gradual Effect*, and *Requires A Skill Roll*. Although the environmental changes may be immense, they may take decades or centuries to effect. (See page 87 for some examples.)

CHARACTERISTICS

There are many ways to enhance a character's basic abilities, including:

Tools: Powered exoskeletons (increased STR)

Cyberware: Nerve-boosters (improving Dexterity), respiratory superchargers (improving Constitution or Endurance), implanted dermal armor (providing extra PD and ED), and so forth

Drugs: These can boost just about any Characteristic, though they are often better modeled with Aid (see above).

Genetic engineering can also increase Characteristics, but it's best applied by simply buying up the individual's Characteristics during character creation, since it isn't really possible after conception except in truly fantastic Space Opera campaigns.

CLAIRSENTIENCE

In science fiction stories and films, Clairsentience is usually a psychic or psionic ability, often with the *No Conscious Control* or *Activation Roll* Limitations. You can also use it to model "telepresence" devices which allow people to connect their senses to robots at remote locations, or to build security monitor cameras.

Ordinarily, once a character establishes his Clairsentience perception point for a given activation of the power, it's "fixed" at that point. To move it to another point, he'd have to deactivate that use and activate the Clairsentience again at the new perception point. To move the perception point while its the power remains active is a +5 Character Point Adder, *Mobile Perception Point*. The perception point can move up to 6" per Phase, and travels in three dimensions (i.e., it can "fly"). The perception point can pass through solid objects, though that may blind the character, disorient him, cause him to move the point "off course," or the like, based on the situation, special effects, common sense, and dramatic sense. (If the point cannot move through solid objects, the Clairsentience takes a -0 Limitation.) A character can double his perception point's rate of speed for every +5 Character Points. Moving the perception point any number of inches up to its maximum movement requires a Half Phase Action.

Clairsentience normally allows a character to perceive only one perception point at a time — if he wants to look at some other location, he has to either move his perception point (as described above), or de-activate the power and re-activate it at the new location. At the GM's option, a character can buy an Adder called *Multiple Perception Points* to have the ability to perceive multiple perception points at once. For each +5 Character Points, the character can have up to double the number of perception points active at one time (two perception points for +5 Character Points, up to four perception points for +10 Character Points, and so forth).

The perception point for Clairsentience is not normally perceivable by other characters. If it is, the Clairsentience may take the *Focus* or *Visible* Limitation to reflect that.

CLINGING

This power is surprisingly common in Hard SF, since it's useful to simulate things like magnetic boots (for walking around on spacecraft hulls or in zero-g environments) or suction-cup gloves. These are usually OIFs, with Limitations indicating what types of surfaces they can cling to (metal for magnetic boots, smooth hard things for suction cups). Alien beings may have this power naturally, in which case it may qualify for the *Inherent Advantage*.

DAMAGE REDUCTION

Tough aliens, especially those with silicon-based biology, may have natural Physical Damage Reduction, as may Cyberpunk characters with artificially reinforced bones and flesh. Robots with good power-surge control may have Energy Damage Reduction, and psionics with layered mental defenses can purchase Mental Damage Reduction.

Continued from last page

Translators don't work with written languages, recordings, or machines, and are blocked by Mental Defense.

Detect Meaning Of Speech (INT Roll) (10 Active Points); OAF (-1), Living Beings Only ($-\frac{1}{4}$), Does Not Work Against Beings With Mental Defense ($-\frac{1}{4}$). Total cost: 4 points.

Translator Chip:

Implanted in a character's skull, this device allows easy real-time translation of known languages, but is useless when dealing with some tongue outside its database.

Universal Translator (INT Roll) (20 Active Points); Restricted Function (only works instantly on languages in its database, others require time and samples to analyze; -0). Total cost: 20 points.

STAR HERO POWERS

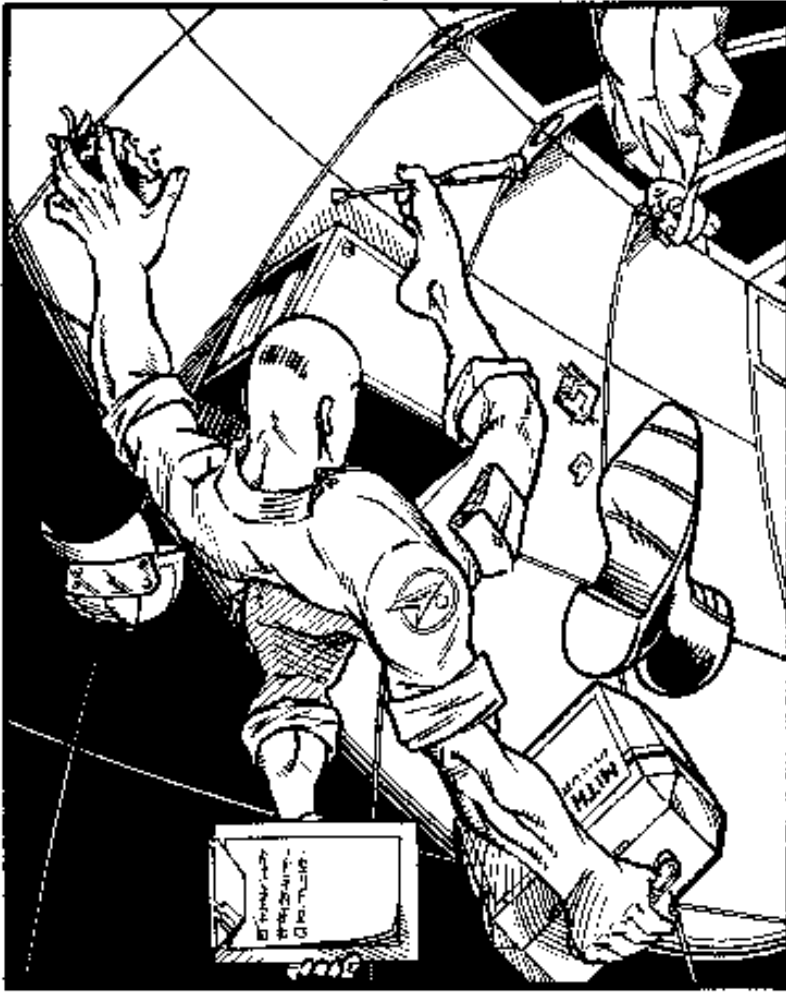
Adreno-Booster Drug:

Aid STR 3d6, Delayed Return Rate (points fade at the rate of 5 per Minute; $+\frac{1}{4}$) (37 Active Points); OAF (-1), 4 Charges (-1), Side Effects (character suffers Drain STUN 3d6 when drug's effects wear off, always occurs; -1). Total cost: 9 points

Sensor Drone:

Clairsentience (Sight and Hearing Groups), 16x Range (2,800"), Mobile Perception Point (cannot move through solid objects) (55 Active Points); OAF (-1) (total cost: 27 points) plus Stealth 15- (total cost: 15 points). Total cost: 42 points.

Mag-Boots: Clinging (normal STR) (10 Active Points); OIF ($-\frac{1}{2}$), Only To Cling To Ferrous Objects ($-\frac{1}{2}$). Total cost: 5 points.



DARKNESS

Darkness can represent several effects in science fiction. The first is natural Darkness defenses analogous to a squid's ink jet. They are usually Sight Group Darkness, although a spray of nasal anaesthetic could affect the Smell/Taste Group instead. Most animals have only a few Charges of their Darkness defense available. You can also use Darkness to model sensor countermeasures, like chaff or jamming; see page 199.

DISPEL

You can use Dispel to create sensor jamming strong enough to burn out the opposing communications device, or "reverse harmonic" countermeasures to bring down an enemy's force-fields. Cyberpunk computer hackers may use Dispel to create various sorts of offensive or defensive software. Most such uses of Dispel have Limitations reflecting the fact that they only affect certain special effects of the power they target (a device that shorts out electronically-generated force fields won't necessarily have any effect on an alien's self-generated Force Field power).

DRAIN

You can simulate rubber science "suppression fields" or "draining fields" with a Drain against a specific Power. Campaigns with Psi powers may

include "Psi Suppression Helmets" to negate an individual's abilities. This is simply a special effects-based Drain bought through a Focus (see *Champions*, pages 120-21, for an example).

Suppress can be used the same way as Drain, generally.

DUPLICATION

Splitting into Duplicates is rare in science fiction. Shapeless blob creatures might be able to do it, or colony beings. Duplication could also represent the mindless drones of a hive creature.

Another application of Duplication is the creation of clones. Assuming the setting has even the slightest respect for "realism," creating the Duplicate should take a while — days, at least, and possibly months (you can simulate this with the *Extra Time Limitation*). Unless artificial-aging and memory-implantation methods are available, the clone has to grow up and be educated in the normal fashion for members of its species (which may require the *Altered Duplicates Advantage*, if care isn't taken to make the clone turn out just like its "parent"). Of course, the *Cannot Recombine Limitation* is necessary.

Time cops and other characters who can move through time may have a "Temporal Fugue" power which is effectively Duplication: they hop back in time to the very recent past, creating a multitude of alternate selves to help in a battle or with a difficult task. This form of Duplication requires a $-\frac{1}{2}$ form of the *Feedback Limitation* — STUN and BODY damage done to any Duplicate affects all "later" ones, and the death of any Duplicate is the death of the character.

ENDURANCE RESERVE

Batteries, power cells, or a vehicle's fuel supply are all examples of Endurance Reserves. In especially realistic campaigns, different devices and systems may have independent Reserves which are not compatible — the sensors draw power from their batteries, and the laser cannons from their power packs, while the engine requires fuel. Reserves often have the *Limited Recovery Limitation* to reflect their specialized requirements. Chapter Seven offers some suggestions on how to simulate different power sources with Endurance Reserve.

Because Endurance Reserve does not cost END to use, ordinarily characters cannot Push it. At the GM's option, resourceful starship engineers in cinematic or Space Opera campaigns might be able to "Push" a device's Endurance Reserve to get just a little bit more power efficiency out of it. Have the engineer take an appropriate amount of time (minimum of a Full Phase) and make a Skill Roll (typically Electronics or Mechanics). For every point he makes the roll by, he can "Push" the Reserve's END by 1, to a maximum of 10. Characters can only do this once per Reserve per game session, unless the GM rules otherwise.

ENERGY BLAST

Slinging bolts of energy has been a staple of science fiction since H.G. Wells's *Martians* first

used their Heat-Rays to incinerate the British Army. While many of these attacks work better, in game terms, as RKAs, Energy Blast is appropriate for several types, including the ones listed below. See Chapter Seven for examples of some of these weapons.

Blasters are superscience weapons which fire bolts of undefined energy at the target. They are straight Energy Blast effects, and in some models are set for “stun only.” They’re most appropriate for Space Opera settings.

Electric Guns fire a bolt of electricity along a path of ionized air heated by a small laser beam. The intensity of an electric shock can be set to do STUN only, so they’re usually bought as a Multipower with two slots (one an ordinary EB, one with the *STUN Only Limitation*) and Charges on the reserve. They take the *Limitation Not In Rain, Vacuum, Or Water* (-½).

Force Projectors shoot a beam of “force” (by means unknown to modern science) which hits the target like a physical blow. This is typically a physical EB with the *Double Knockback Advantage* (+¾) (assuming the campaign uses Knockback).

Heat Beams are like a giant searchlight projecting intense heat (a favorite of Wells’s Martians). Heat Beams can be built using either EB or RKA; they usually have the *Power Modifiers Area Of Effect (Line)* and *Reduced By Range*.

Particle Beams project a stream of subatomic particles accelerated to near the speed of light. They damage the target both with radiation effects and an ionizing blast. They’re built as Energy Blasts with the *Armor Piercing* and *Beam Power Modifiers*.

Plasma Weapons, such as fusion guns or plasma blasters, fire or spray superheated matter at the target. They tend to be straightforward Energy Blasts, often with high numbers of dice.

Sonic Weapons in science fiction are usually harmless stunners — Energy Blasts with the *NND Advantage* and the *Limitations Does Not Work In A Vacuum* (-¼) and *Reduced By Range* (-¼). Deadlier sonic blasts, capable of disrupting tissue and shattering rigid materials, are Killing Attacks.

Tachyon Beams fire bolts of tachyons — theoretical particles which can only travel faster than light. In game terms, this is just a special effect, but when combined with faster-than-light sensors it enables spaceships to do battle over extremely long distances without worrying about time lag.

ENHANCED SENSES

Technology has been boosting Human senses since the first telescopes were invented, and *Star Hero* campaigns often feature many different types of sense-enhancing technology (not to mention alien species with strange senses of their own).

In Hard SF settings, the available senses should be those which detect real phenomena: electromagnetic radiation, trace chemicals, electrical or magnetic fields, sound and vibration, gravity, the passage of time, and changes in position. Senses relying on chemical detection (such as smell and

taste) usually have very short ranges. Sound and vibration senses require some medium, like water, air, or solid material. Sensors are generally built to detect one specific effect or emission, and cannot be tuned to read an “unknown form of energy.”

More cinematic campaigns typically have more capable and flexible sensors. To save time and effort, GMs should consider allowing characters to build starship sensors (and perhaps some forms of personal sensor technology) as Power Frameworks (typically Variable Power Pools) only for Enhanced Senses. That way the ship’s crew can shift from one type of sensor to the next, limited only by the science officer’s ability to twiddle the dials and the engineer’s skill at reconfiguring the main dish antenna.

Star Hero GMs should also let characters apply appropriate Advantages, particularly *MegaScale*, to Senses, even though this is not allowed in most genres. Otherwise, it becomes difficult to simulate many of the abilities and actions typically seen in science fiction.

Because Active Detects make the user’s presence and location obvious, most spacecraft have both active and passive sensors, so they can lurk silently when they have to and then “light up” when they attack. If sensors are accurate and defenses are limited, space battles often resemble submarine actions — lots of listening and waiting, and then sudden all-out attacks. For a more Space Opera feel, limit the sensors to make space pilots rely on their own steely eyes.

EXTRA-DIMENSIONAL MOVEMENT

Ever since the idea of higher and parallel dimensions was put forth, science fiction writers have been using them for all kinds of effects. Some of the more common include:

Cyberspace: If virtual reality worlds are a major part of the campaign, then one way to model them is to describe entering Cyberspace as a Limited form of Extra-Dimensional Movement (see page 163).

Hyperspace Drive: One method of faster-than-light travel shifts the spaceship into an alternate universe or dimension in which distances are smaller, then back into our world at the appropriate destination. See page 192 for more information and examples.

Mindscapes: Telepaths exploring a person’s mental landscape may model it as a form of Extra-Dimensional Movement, taking them to the “world” inside the target’s head.

Microverse Travel: When scientists determined that atoms resemble tiny solar systems, a number of authors quickly turned out stories about Humans visiting the tiny planets inside an atom. These were usually Pulp SF planets with beautiful princesses. Visiting the microverse is a form of Extra-Dimensional Movement (the character Shrinker, in *Conquerors, Killers, And Crooks*, has this sort of ability).

Time Travel: This is Extra-Dimensional Movement to any date in time. See page 233 for expanded time travel rules.

THE RANGE OF TRANSMIT

Usually it’s not necessary to establish an exact range over which a Sense with the Transmit Sense Modifier can “broadcast” — the GM can simply establish ranges for Transmit on a case-by-case basis, depending on special effects, the technology used in the campaign, common sense, and dramatic sense. In situations where knowing the exact range is important, GMs can use one of two methods.

For strict precision, give any Sense with Transmit a broadcast range of 1 kilometer per Active Point. To increase this range, apply the *MegaScale Advantage*, with the +¼ level increasing it to 10 km per Active Point, and so on up the *MegaScale Table* from there. Characters may need to apply *MegaScale* as a naked Advantage, or put Senses in a Multipower (one slot *MegaScaled*, one not), to create both short-range and long-range sensors.

For more “dramatic” results, assume a transmission can reach anywhere within an area defined by the GM (one city, one nation, one planet, one solar system, or the like). For each +5 Character Points, the character can increase the range of transmission by one step down the *MegaScale Table*.

STAR HERO POWERS

Jetpack: Flight 10" (20 Active Points); OIF (-½), Only On Earth (-1), 1 Continuing Fuel Charge (special fuel cells, Easily obtained, 1 Hour; -0). Total cost: 8 points.

Personal Force Barrier Generator: Force Wall (8 PD/8 ED), Reduced Endurance (0 END; +½) (60 Active Points); OIF (-½), Self Only (-½) (total cost: 30 points) plus Telekinesis (20 STR), Reduced Endurance (0 END; +½) (45 Active Points); OIF (-½), Linked (-¼), Only To Push With The Force Wall (-1) (total cost: 16 points). Total cost: 46 points.

Personal Force Shield: Force Field (0 PD/20 ED), Reduced Endurance (0 END; +½) (30 Active Points); OIF (-½) (total cost: 20 points) plus Force Field (12 PD/0 ED), Reduced Endurance (0 END; +½) (18 Active Points); OIF (-½), Only Against High-Velocity Projectiles (-½) (total cost: 9 points). Total cost: 29 points.

Most Extra-Dimensional Movement devices are bought either as vehicles, or as Fragile Foci (and in the latter case, they're often Independent as well). Typically, they require a Skill Roll to use properly, with failure meaning the characters either don't go anywhere, or end up somewhere they hadn't intended!

FASTER THAN LIGHT TRAVEL

One of the key concepts in science fiction is the ability to travel to other stars and encounter other civilizations. To get around that spoilsport Einstein's universal speed limit, writers have come up with a variety of faster-than-light travel methods. Exactly how fast stardrives go depends on the GM and the rules of the campaign setting. Most forms of FTL travel assume that there are no relativistic time-dilation effects, though GMs willing to calculate such effects can sometimes use them to create plot points (as in Dan Simmons's *Hyperion* novels, where characters have to account for time-debt when using FTL ships).

FTL Travel is the simplest way to create a faster-than-light craft, because the cost and effects of travel are easy to calculate. See page 190 for more discussion of FTL drives.

FLIGHT

In Hard SF settings, Flight requires either wings or some kind of thruster capable of lifting the character's weight. Realistic flying gear is usually specialized for a given environment: helicopters built for Earth's gravity and atmosphere won't work properly on Mars (and definitely won't work on the Moon). In campaigns which span multiple planets, some Flight equipment may have the Limitation *Only On [Planet]* (-½ to -2, depending on how much of the campaign takes place on that world). Obviously any kind of aerodynamic or aerostatic flight won't work at all in vacuum.

Less realistic campaigns aren't so restricted. They may feature jetpacks (a staple of Pulp SF), antigravity belts, or superscience "repulsorlift" devices. Some of these devices work as well in the vacuum of space as in atmospheres, others do not.

See page 279 for more information regarding the effects of gravity on Flight.

FORCE FIELD AND FORCE WALL

To real scientists, a "force field" is a technical term used to describe the effects of things like gravity and magnetism. We live in a force field that holds us to the surface of the Earth. The only type of protective Force Field plausible under hard science is a magnetic shield like the Earth's magnetic field, offering protection against charged particles and cosmic rays. Otherwise, armor is the only real defense.

But in Space Opera, force fields are everywhere, from personal shield belts, to starship "integral defense fields," to planetary force shields. These often have Limitations or other restrictions. For example, common to some SF

settings, particularly those combining spaceships and swordplay, are energy-only shields. These stop energy attacks and high-velocity projectiles, but not slow-moving attacks like blades and punches. This would best be modeled as a Force Field with lots of Energy Defense and the Limitation *Only Against High-Velocity Projectiles* (-½ or more) for the Physical Defense.

It's traditional for science fiction force fields to be transparent. Some writers who pay attention to detail make them mirror-surfaced or matte black so visible-light lasers can't pierce them. In that case, they block the vision of anyone inside the shield (a -½ Side Effect).

Many science fiction force fields behave more like Force Walls in game terms — they create a barrier or bubble rather than hugging the user's skin. In some cases, a force field generator may be able to switch modes and do both (a Multipower). Characters cannot normally use Force Walls to push against things, but many science fiction shields can; you can simulate this power by Linking Telekinesis with Force Wall.

HEALING

You can model the improved medical technology found in most SF settings with the Healing power. Realistic Healing should take lots of extra time — at least a day per die of Healing. Even nanotech medicine can't just magically make you well. Space Opera and Pulp SF have near-magical healing, invoking rubber science devices like "regeneration fields" and "cellular stimulators" to cut the time down to mere hours.

Regeneration is still close to rubber science, although since some animals can regrow limbs Humans may someday learn the trick. It takes a while — on the order of weeks or months.

The literal resurrection of dead people is impossible even in Space Opera, but if "brain taping" or other means of recording a person's mental state exists, then one can simply grow a new body (cloned from a tissue sample) and input the personality and memories. In some settings this requires characters to keep clones in storage at a "clone bank" and make periodic updates to their recorded selves. This is Resurrection with at least a week of Extra Time and various other Limitations (including Immobile Fragile Focus); destroying any of the equipment stops the Resurrection.

IMAGES

The invention of holography quickly made three-dimensional projected images a standard feature of science fiction. Decades later, it appears that creating free-standing visual images in thin air may not be possible (but of course that's no barrier to having such things in Space Opera *Star Hero* campaigns; see page 175 for an example). On the other hand, sophisticated computer-controlled speakers do make sound or sonar images quite feasible. Some forms of electronic countermeasures would have the effect of creating Images for the Radio sense group.

The *Set Effect* Limitation is appropriate for many such uses.

While most *Star Hero* Images require a projector (a Focus), some alien beings may be able to create them unaided. Creatures like dolphins or bats with sonar senses may be able to generate false sonar images. David Brin's novel *Sundiver* included an alien with an organic laser eye which could generate holograms.

INVISIBILITY

When H.G. Wells wrote *The Invisible Man*, the idea of making someone invisible seemed plausible. Later discoveries made it seem completely fantastic, but modern developments in stealth technology, "smart" camouflage materials, and fiber optics have put it back into the realm of the possible.

Stealth coatings create Invisibility, either for the Radio Group (airplanes, spacecraft) or the Hearing Group (submarines). Smart or reactive camouflage can provide visual Invisibility, usually with the *Chameleon* or *Only When Not Attacking* Limitations. Invisibility without some kind of "fringe" effect is very hard to achieve in SF — if nothing else, no amount of camouflage can get rid of your shadow! To achieve that effect, you'd need sophisticated light-bending devices or the like, appropriate only in Space Opera and Pulp SF-style games.

Alien beings may have chameleon powers, giving them Invisibility to whatever sense their natural enemies use for hunting. Psionic Invisibility is another possibility, in games with mental powers. Psi invisibility can have no fringe and work when the character is moving and fighting, but it would have the Limitation *Doesn't Affect Machines* — a sensor, lacking any mind for the character to affect, still perceives him normally.

LIFE SUPPORT

Just about all science fiction stories which take place away from Earth involve some form of Life Support — without it, the characters can't get very far. Space suits and starships provide their occupants with a Safe Environment against vacuum, radiation, and intense cold.

Most forms of life support are created by protective suits or vehicles (diving suits, medical cleansuits, radiation-shielded capsules, and the like). But various medical treatments can also provide forms of Life Support: vaccinations or nanotech immune-enhancers create Immunity against certain diseases and toxins. Good medicine in general can create Longevity, as can rubber science substances like the boosterspace used in Niven's "Known Space" stories.

In a Hard SF campaign, Terran medical science can't vaccinate against unknown diseases. Immunity only applies to viruses and pathogens known to the people creating the vaccines. On the other hand, alien bugs may not be able to affect Humans.

NASA and Russian space medicine specialists have learned a lot about the effects of zero gravity. Without gravity, Human muscles and bones get weaker over time (presumably the same would apply to alien species). Any realistic campaign

which involves a lot of time in zero-G should probably include some way to avoid those effects — a serum to counter the degeneration, or "resistance suits" to keep the muscles toned. Hard SF characters can buy this as a 1-point form of Life Support, *Safe Environment: Zero Gravity*. Space Opera and cinematic characters don't have to worry about such things, and at the GM's option any character with Environmental Movement (Zero-G) doesn't suffer from these negative effects anyway.

MENTAL DEFENSE

In game settings where psionic powers are known and reasonably common, Mental Defense of some sort will definitely be widespread. This is likely to be true even in a world dominated by powerful psionic individuals: they won't want other psis spying on their thoughts. The exact nature of the defenses depend on what mental powers are common and how they work in the game world. The most obvious is some kind of helmet, headband, or "tin foil hat" providing Mental Defense through a Focus.

Non-psionic characters without access to psi-blocking technology can sometimes "hide their thoughts" by mentally repeating catchy tunes, concentrating on unpleasant images, or cloaking ideas in obscure metaphors. It isn't infallible and requires effort, but sometimes it's just what's needed: Mental Defense (10 points) (10 Active Points); Concentration ($\frac{1}{2}$ DCV, must Concentrate throughout; $-\frac{1}{2}$), Requires An EGO Roll (assuming an EGO Roll of 12-; $-\frac{3}{4}$). Total cost: 4 points.

MIND CONTROL

Mind Control is fairly common in science fiction. In addition to psionic forms of mental domination (see Chapter Ten), characters can control others' minds by mundane methods. Mind control drugs, alien pheromones that overwhelm the senses to induce lust or rage, and "brain hacking" with neural probes are all forms of Mind Control.

MISSILE DEFLECTION & REFLECTION

This power has several applications in science fiction. It can be a telekinetic's ability to divert attacks, a starship's "deflector shields" or "repulsors," or even a sophisticated antimissile system like the Strategic Defense Initiative. The *Ranged* and *Uncontrolled* Advantages are often applied when this Power is bought as part of a starship's or space station's defenses, and *MegaScale* is often applied in conjunction with Ranged.

MULTIFORM

Shape-changing aliens are a fixture of Space Opera and Pulp SF, but are less common in Hard science fiction. Realistically, it's difficult for creatures to change their shape — think of how long it takes a caterpillar to become a butterfly, or a woman to recover from pregnancy. For all but the most cinematic *Star Hero* campaigns, Multiform should usually take the *Extra Time* Limitation (hours or days), and perhaps *Costs Endurance* and *Increased Endurance Cost*, to reflect the fact that changing your body around is physically demanding.

POWER EXAMPLES: MIND CONTROL

Mind Control Drug: Mind Control 12d6 (60 Active Points); OAF Fragile (easily spilled or diluted drug; $-1\frac{1}{4}$), No Range ($-\frac{1}{2}$), Based On CON (ED applies; -1). Total cost: 16 points (or 13 points if the drug has the *Set Effect* Limitation).

Alien Pheromones: Mind Control 10d6, NND (defense is Life Support [Self-Contained Breathing]; $+\frac{1}{2}$), Reduced Endurance ($\frac{1}{2}$ END; $+\frac{1}{4}$) (87 Active Points); Limited Range (3"; $-\frac{1}{4}$), Set Effect (defined when character buys power, typically sexual arousal or rage; -1). Total cost: 39 points.

Neural Probe: Mind Control 15d6, Reduced Endurance (0 END; $+\frac{1}{2}$) (112 Active Points); OAF Bulky Fragile (neural probe equipment; $-1\frac{3}{4}$), Extra Time (1 Hour; -3), Requires A PS: Brain Hacking Roll ($-\frac{1}{4}$). Total cost: 19 points

STAR HERO POWERS

Sonic Multitool: Electronics 15- (15 Active Points); OAF (-1) (total cost: 7 points) and Mechanics 15- (15 Active Points); OAF (-1) (total cost: 7 points). Total cost: 14 points.

Underwater Impeller Pack: Swimming +10" (10 Active Points); OIF (-½), Side Effect (noisy, -3 to Stealth rolls or +3 to Hearing PER Rolls to perceive user, always occurs; -½). Total cost: 5 points.

Personal Tractor Beam: Telekinesis (20 STR) (30 Active Points); OAF (tractor beam device; -1), Affects Whole Object (-¼), Limited Range (10"; -¼). Total cost: 12 points.

Skillchip Interface System: A 13-point Multipower with four ultra slots; each slot is an OIF (skillchip), and as a result, the reserve also takes the OIF Limitation (defined as the interface system installed in the character's head, which is easily removed for cleaning and maintenance). Four example slots for a burglar character: Climbing 14-, Electronics 14-, Lock-picking 14-, Security Systems 14-. Total cost: 13 points.

If the GM does not permit Skills as Powers in Power Frameworks, buy each chip separately, with the Limitations Lockout (cannot use any other chip while this chip is in use; -½) and Extra Time (takes a Full Phase to switch chips; -½). Total cost: 24 points (6 points per chip).

Halfway plausible shapeshifters have a set "menu" of alternate forms, using the standard Multiform rules. Completely cinematic shapeshifters can adopt any form, but that's really a Variable Power Pool limited to Multiform powers, or a Multiform with a *large* menu of additional shapes.

SHAPE SHIFT

While characters who can actually change their features to resemble others are best left to pulpish or cinematic campaigns, this power does have a place in Hard SF or Cyberpunk games. A computer hacker who can adopt someone else's identity in cyberspace is effectively using Shape Shift (Radio Sense Group) with several Limitations. Spacecraft with electronic countermeasures to let them fool IFF systems have Shape Shift (Radio Sense Group). A high-tech disguise kit is Shape Shift (Sight and Touch Groups) with a Required Skill Roll, Extra Time, and a Focus.

SKILLS

One effect of advanced technology is that the machines get more skillful rather than their users. Devices like GPS receivers essentially give the user the *Navigation* Skill, for example. This trend is likely to continue; many SF settings feature technology able to perform almost any Skill, often with Skill Levels to boot.

Characters in Cyberpunk games can purchase Skills "off the rack" as programmed chips that plug into neural interface sockets. These are Skills bought as OIFs, typically as part of a Power Framework (assuming the GM permits this). While handy for the character, they raise a host of questions and can lead to all sorts of plot hooks for the GM to exploit: if an enemy has used the same chip, can he figure out what the character will do and take advantage of that knowledge? What happens if a chip is mis-programmed, or has a "bug" in it? If a chip is "used," is it possible it accidentally stored some information from its previous owner's brain — information that owner desperately wants to keep secret?

TELEKINESIS

From the planet-moving telekinesis displayed by the characters in some Space Opera stories, to the barely-useful "arm" of Larry Niven's character Gil Hamilton, Telekinesis occurs frequently in SF. Psionic telekinesis (psychokinesis) works about as described on page 231 of the *HERO System 5th Edition, Revised* (Telekinesis BOECV, and often with Fine Manipulation). Force projectors or "tractor beams" are Telekinesis bought with the *Focus* and *Affects Whole Object* Limitations, and often able to function across MegaScale ranges.

TELEPATHY

In fiction, "telepathy" and "telepathic" are often used as a broad term to describe many different types of psionic abilities, even if those powers aren't built using this Power. In addition to straightforward psionic telepathy, this can also represent invasive "brain scanning" using devices to remotely read out a brain's electrical impulses

(similar to the Neural Probe on page 57 — just substitute Telepathy for Mind Control). Telepathy versus the Machine class of minds can simulate special electromagnetic sensors that read what's inside a computer.

TELEPORTATION

In Space Opera, Pulp, and other cinematic forms of SF, devices for teleporting characters across great distances are common, since they make it easy for the author to avoid wasting time on boring travel scenes. The transporters of *Star Trek*, transmat beams of *Doctor Who*, and transfer booths/stepping disks featured in Niven's "Ring-world" novels are all good examples. For crossing interplanetary distances, a few levels of MegaScale are usually required. You can even simulate some FTL drives, such as stargates, with MegaScale Teleportation (plus a few appropriate Limitations, like Extra Time) rather than Flight or FTL Travel.

Gamemasters striving for "realism" should disallow the *No Relative Velocity* and *Safe Blind Teleport* Advantages for this Power. They can also take the different rotation speed and direction of places on a planet's surface into account — jumping to the other side of the world means you arrive with a velocity of 3,200 kilometers per hour eastward. This limits the maximum jump to no more than a couple of degrees of longitude or latitude, or about 200 kilometers.

The existence of Teleportation technology raises all sorts of interesting dilemmas and potential story hooks; *Star Trek* has explored many of them. Can characters use a teleportation device to create armies of "cloned" soldiers, or to instantly heal someone? Is it possible to accidentally duplicate a character, or merge two characters, and what are the legal and moral implications of such an accident? Does using the device pose any other risks? What happens if the equipment fails in mid-teleport? By developing a reasonable explanation for how teleportation devices work (even if it's a rubber science theory), GMs can answer these questions consistently, and even plan stories around them. See Chapter Seven for more information.

TRANSFORM

Science fiction involves many forms of transformation, both voluntary and involuntary.

Viruses or nanotech machines can Transform characters' bodies — usually with the *Gradual Effect* Limitation, and often with No Normal Defense (the defense is an appropriate Life Support [Immunity]). Such transformations can be Major or Minor. Healing may occur normally, or may require an all-or-nothing cure.

Nanotechnology can also transform inanimate objects into other things. Again, the process takes some time, and a key Limitation is that the nanobots can only make one specific product. As described in Chapter Seven, realistic nanotech should require lots of cooling and energy to accomplish in less than several days' time.

In Pulp SF, various rubber science rays and

serums can transform hapless victims — de-evolution rays, monster serums, accelerated time projectors, and so forth. Unlike viruses and nanotech, Pulp devices work quickly, and tend to be massive Immobile Foci.

Psionic powers and sophisticated brainwashing can transform the Mind and Spirit, typically using the rules for Mental Transforms on page 240 of the *HERO System 5th Edition, Revised*. Healing from this sort of Transform can be normal healing as the character's brain readjusts, or it may require a specific cure (usually some kind of counter-brainwashing).

POWER ADVANTAGES

Most Power Advantages work in the normal fashion in *Star Hero* campaigns. Here are a few notes on non-standard applications.

DELAYED EFFECT

This is most useful in situations like Cyberpunk campaigns, where a computer hacker can have only a certain number of programs running at a given time. The hacker prepares his attack software (using Extra Time to keep the cost down) and applies Delayed Effect so he can trigger it when he meets stiff opposition in cyberspace.

DOES BODY

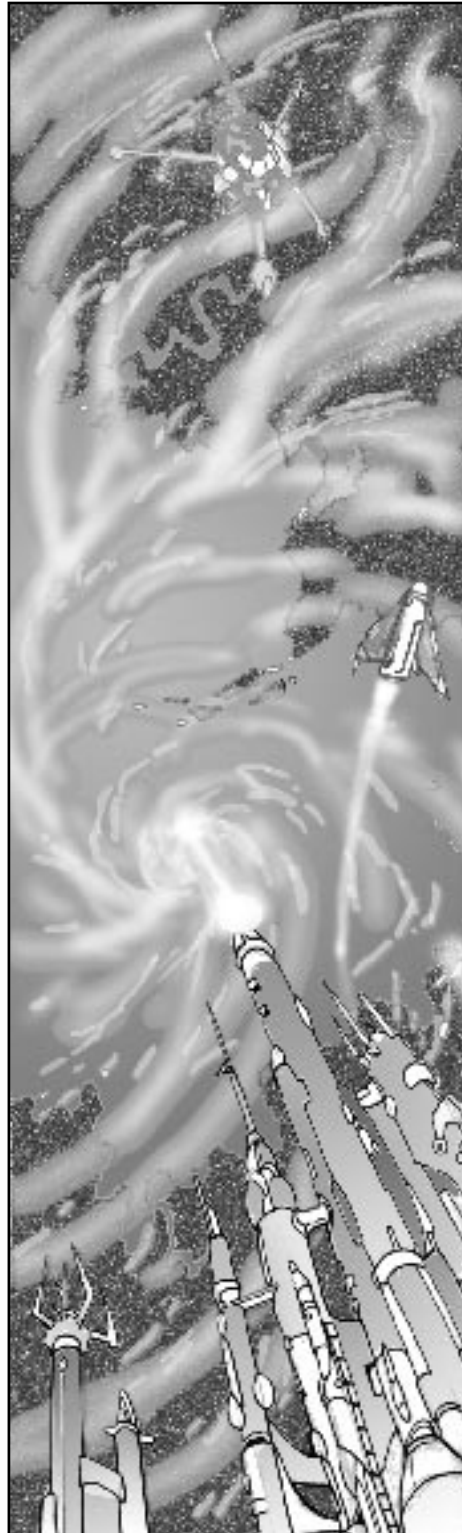
This powerful Advantage is useful for simulating certain types of nanotech weapons, psionic powers, bizarre alien poisons, and the like. Because attacks with Does BODY are often lethal, GMs should be wary about allowing them unless the PCs at least have a chance to apply countermeasures.

DURATION

The *Persistent* Advantage is a good way to represent that hoary SF chestnut, the machine that keeps running for centuries or millennia after its creators vanish (though of course there may be a malfunction or two to make the PCs' lives interesting when they find the device...). And *Inherent*, of course, is appropriate for many aliens' innate powers, such as a reptiloid's tail.

EXPLOSION

Depending on special effect, Explosions may behave unusually in a vacuum (such as outer space). In that situation, fragments of shrapnel and such may travel much further than they otherwise would, while still retaining the ability to cause damage; GMs should consider giving them an extra 1" per -1 DC effect. On the other hand, the expanding gases of an Explosion may dissipate so quickly that they're not as effective as they could be without air or some other medium to propagate through; GMs may want to forbid characters to buy some Explosions with a greater than -1 DC per 1" damage reduction rate.



MEGASCALE

Because of the vast distances involved in most science fiction stories, particularly those featuring a lot of starship combat or space travel, this Advantage is extremely common in *Star Hero* campaigns. It's most often applied to engines (and other movement devices), weapons, and sensors.

As mentioned above under *Teleportation*, MegaScale Teleportation is a good way to simulate devices like the transporter of *Star Trek*. Similarly, starships may model jump drives as MegaScaled Teleportation (usually at the 1" = 1 light-year or 10 light-years level), and fixed stargates may combine the "gate" rules with extremely long-range Mega-Scaling (say, 1" = 100 or 1,000 light-years, or more). Some FTL drives may work better if built with MegaScale Flight instead of FTL Travel.

For beam weapons, a good scale is 1" equals 10, 100, or 1,000 kilometers. See page 217 regarding lightspeed lag.

Although the standard rule is that characters shouldn't apply Advantages to Senses, *Star Hero* Gms should allow them to apply MegaScale — otherwise, it becomes very expensive to build the sort of long-range sensors so common in SF. Sensors can have ranges of thousands of light-years, but resolution requires very big detectors — to see anything smaller than a star at interstellar ranges, you need huge telescopes separated by thousands of kilometers, or rubber science. The practical limit for realistic vehicle-mounted sensors is about 1" = 1 million kilometers, though rubber science sensors can work over much greater ranges. Detecting things at interstellar ranges also brings up the question of light-speed lag. In the real universe, distance equals time — an image a light-year away is a year old. Faster-than-light sensors based on tachyon pulses or other rubber science definitely require MegaScale.

A MegaScaled power cannot be "scaled down" to less than 1", whatever the MegaScale defines 1" as equalling. For example, a sensor with MegaScale (1" = 1 light-year) can't detect anything closer than 1 light-year away (in much the same way that an observatory telescope can view the Moon and stars, but not a city a few miles away). At the GM's option, any MegaScaled power at greater than 1" = 1 kilometer can pay for an additional +¼ Advantage to scale down as far as 1" = 1 kilometer, thus allowing much greater flexibility. However, a MegaScaled power can never work at a closer range than 1" = 1 kilometer (or whatever 1" is defined as, since the +¼ level of MegaScale allows for 1" to equal anything up to a kilometer). To affect things closer than that, buy the MegaScaled power in a Multipower with a regularly-scaled version of the same ability.

NO NORMAL DEFENSE

Although, as the rulebook indicates, not belonging to a particular species is not generally a valid defense against an NND, GMs should remember that in a Space Opera setting with many different species, an NND that affects one may not affect others. A substance poisonous to Humans may be a delicious taste treat to Fomalhauti, for example. It may be worthwhile for the GM to define which species a given poison, drug, or other attack does or does not affect; this may justify a Limitation (see *Limited Power*, below).

PENETRATING

Penetrating can simulate the way radiation weapons interact with armor. Armor (or any mass) stops a part of radiation energy, but some always gets through. When combined with Continuous, Penetrating can represent attacks like chemicals or nanobots which gradually seep through armor.

STICKY

This is a great way to model the horrifying effects of things like nanotech "gray goo" weapons or voracious swarms of weird alien insects. It can also represent computer viruses, when applied to attacks in cyberspace. Realistically, electric current is Sticky — touching someone in contact with a powerful electric source means you get shocked, too.

TRANSDIMENSIONAL

If the GM defines a "hyperspace" or "subspace" dimension for his campaign setting, powers which can "reach into" or affect that dimension without leaving normal space need this Advantage. (The same applies to most powers that can affect other points in time.) Transdimensional attacks are even possible — a ship which can attack targets in hyperspace from normal space (or vice versa) would have a significant tactical advantage against a species lacking such technology.

VARIABLE ADVANTAGE

Powers with a technological or biological basis tend to have a set effect, so Variable Advantage usually isn't appropriate. If the GM allows it at all, it should be limited to a specific set of Advantages — like a blaster which can switch among High-Intensity (Armor Piercing), Wide-Angle (Area Of Effect), and Autofire modes.

VARIABLE SPECIAL EFFECT

This is really hard to justify in a science fiction setting — how can a device have the same effect but switch between causes? A laser can't suddenly start emitting sound waves. One really weird example of this Advantage in an SF story is the Lazy Gun in Iain M. Banks's *Against A Dark Background*, which never destroys its target the same way twice. (Nobody in the story can explain it, either.)

POWER LIMITATIONS

Most Limitations work in the normal fashion in *Star Hero* campaigns. Here are a few notes on non-standard applications.

ALWAYS ON

This Limitation is particularly suitable for certain psionic powers. A favorite cliché in SF stories is the telepath who wants to get away from other people's thoughts because he can't fully shut down his Telepathy. (In some cases you can simulate this with a Physical Limitation instead of Limiting the Telepathy itself.)

CONCENTRATION

Psionic powers in SF stories often take this Limitation — the mentalist has to stop, focus on his target, furrow his brow, and really *think* about affecting the target. The same applies to devices that require a lot of focusing or adjusting. Vehicles may have this Limitation on their Movement Powers, if the vehicle has to power down or come to a halt to use a special engine (such as a "jump drive").

INCANTATIONS

This Limitation has relatively few applications in SF. However, you can sometimes use it to simulate a spoken security password a character has to recite to make a device work, or the spoken protocol used to engage a starship's self-destruct sequence (such as in *Star Trek III: The Search For Spock*).

GRADUAL EFFECT

Many realistic powers take time to work. Even nanotech super-medicines won't make injured characters well in an instant. In addition to poisons and drugs, it can simulate Space Opera weapons like "plasma envelopes" which take time to chew through a starship's shields (thus allowing the heroic engineer to develop a countermeasure before the hull melts).

LIMITED POWER

Technological devices are often designed to work in very specific conditions, and GMs can use the *Limited Power* Limitation to reflect that. However, it's only a Limitation if the characters can reasonably be expected to encounter other conditions! If the campaign is set on Titan and all the characters' gear is built for a methane atmosphere at low temperatures, then there's no reason to reduce the point cost just because things wouldn't work right on Mercury. If the characters travel from planet to planet regularly, then it's a fair Limitation. The value of the Limitation typically varies from $-\frac{1}{2}$ to -2 , depending on how often the GM expects characters to encounter those conditions (or visit that planet).

Many medical devices (and poisons) are species-specific. Human medical tech won't help aliens much, and vice-versa. This is a $-\frac{1}{2}$ Limitation in situations where aliens are present most of the time, $-\frac{1}{4}$ if they only turn up occasionally, and

-0 if they rarely appear in the campaign. Obviously, if aliens don't exist at all in the campaign, it isn't a Limitation.

Similarly, some devices or abilities may only work against a particular species's technology. This most often occurs with defensive technology — a force field attuned to defend against Mon'dabi blasters may have little or no effect against Se'cra weaponry. This is worth $-\frac{1}{4}$ to -1 , typically, depending on how often the GM expects the character to encounter technology he cannot affect.

Does Not Work In A Vacuum is a common form of Limited Power, and is usually worth $-\frac{1}{4}$ in most campaigns. In some *Star Hero* campaigns, it may be worth more — $-\frac{1}{2}$, or even -1 — if the characters spend a lot of time in space. But even in *Star Hero*, most characters stay in pressurized, breathable environments most of the time, so the $-\frac{1}{4}$ may still be appropriate.

SIDE EFFECTS

Many SF powers have Side Effects, especially in the prototype stage. Examples include super-weapons which may blow up, psi powers which cause everyone nearby to suffer a splitting headache, or simply machines which make a deafening roar when running.

Some aliens may have powers which don't have Side Effects on their species but which do affect others — a silicon-chemistry being's Tunneling ability which showers everyone nearby with acid, for instance. The alien itself doesn't mind a little acid, but his Human companions have grounds for complaint. This is a $\frac{1}{4}$ reduction in the value of the Side Effect, since it affects the being's environment but not himself. If the campaign involved all silicon aliens, the Side Effect wouldn't be a real Limitation at all.

DISADVANTAGES

Most Disadvantages work in the normal fashion in *Star Hero* campaigns. Here are a few notes on non-standard applications. Gamemasters should also refer to page 273 for information on using Disadvantages in the campaign.

ACCIDENTAL CHANGE

Beings with multiple forms, who might be susceptible to Accidental Change, are most common on the Pulp or Space Opera end of the science fiction spectrum. Examples include things like alien shapeshifters masquerading as Humans, bio-engineered super-soldiers keeping their enhancements hidden, or possibly aliens who change sex in response to certain stimuli.

AGE

Most *Star Hero* campaigns are Heroic, and therefore impose Normal Characteristic Maxima on the characters as a default, for no points. Age would still be a valid Disadvantage; many characters in science fiction are older than adventurers in other genres, due to the beneficial effects of advanced medical science. In game terms, this often

DISADVANTAGE POINTS

Most *Star Hero* campaigns are Standard Heroic campaigns. The rules typically limit characters in a Standard Heroic campaign to no more than 25 points' worth of Disadvantages from any one type of Disadvantage — up to 25 points' worth of Hunteds, 25 points' worth of Psychological Limitations, and so forth.

This may cause some problems, since characters in Heroic campaigns usually don't have access to as many Disadvantages as Super-heroic characters do. Disadvantages like Accidental Change, Enraged/Berserk, Susceptibility, and Vulnerability don't occur nearly as often in Heroic games. *Star Hero* characters may run into trouble trying to come up with 75 points' worth of Disadvantages from the ones they can, realistically, take.

Gamemasters concerned about this problem have several options. First, they can waive the 25 point limit — either get rid of it altogether, or increase it to, say, 30 or 40 points. Second, they can increase the characters' Base Points, thus diminishing the number of points they have to acquire via Disadvantages.

means not taking the *Age Disadvantage* until much later than the character otherwise would, or taking the “40+” version even though the character’s in his 90s... or 120s.... See page 273 for a discussion of other aspects of aging in a setting involving both alien species and high-tech medicine.

DEPENDENCE

All characters have a “Dependence” on their natural breathing gas — Humans on the proper oxygen-nitrogen mix, for example. However, they don’t get any *Disadvantage* points for this unless the campaign requires them to spend significant amounts of time (more than half of their in-game time) in other environments. For example, a character who belongs to a methane-breathing species who’s part of a PC group where all the other characters are oxygen-breathers could take a *Dependence*, since he spends most of his time in oxygenated atmospheres. He’d have to wear special breathing equipment most of the time, and if he lost it could easily suffocate. On the other hand, if the campaign features a variety of environments, with all characters equally inconvenienced over the course of the game, then this sort of *Dependence* counts as an “Everyman *Disadvantage*” for which no characters get points.

Of course, breathing gases aren’t the only thing PCs could become *Dependent* on. Characters may well develop exotic addictions in a science fiction setting; there’s a universe of drugs and other seductive forms of entertainment out there. But food, even rare and specific types, doesn’t normally qualify for a *Dependence*; everyone has to eat to survive (see *Weird Diets*, page 117).

DEPENDENT NPC

In a science fiction setting, characters can have a startling variety of *DNPCs*. Besides the usual cast of loved ones and relatives, alien characters can have nonsentient mates, parasites can have their hosts, and time-travelers can have ancestors or descendants as *DNPCs*. A character with a sentient Vehicle or Computer might even take that piece of “equipment” as a *DNPC*, with the GM’s permission, though this should be rare.

DISTINCTIVE FEATURES

In a *Star Hero* campaign featuring a wide range of aliens, cyborgs, mutants, and androids who commonly show up during stories, few (if any) species should get a *Distinctive Features Disadvantage* (few of the *Species* or *Environment Package Deals* listed earlier in this chapter have it, for example). In that sort of campaign, a species should qualify for *Distinctive Features* only if there’s some significant hindrance or restriction related to it — for example, a *Distinctive Feature* defined as a noxious body odor that offends most other species, or a species so reviled throughout the galaxy that everyone automatically distrusts its members. Even then, don’t forget to apply the *Not Distinctive In Some Cultures Or Societies* -5 point modifier, if appropriate; an alien’s not likely to be distinctive on his homeworld. (See also *Interspecies Society* on page 116.)

In more realistic campaigns, where most characters are Human and aliens are rare, any non-Human species might qualify for *Distinctive Features*. It all depends on how disadvantageous the GM considers “alien appearance” to be. Remember,



just looking different isn't necessarily enough to earn Disadvantage points; the alien character has to suffer because of his appearance for some reason.

Advanced technology opens up new forms of Distinctive Features, such as a recognizable android whose particular model is notorious for erratic behavior. In a high-tech setting, a character's Distinctive Feature may require special senses to detect, such as "unusual genome."

Take the campaign's tech level into account when determining how easily a character can conceal his Distinctive Features. If holographic disguise technology or rapid-healing plastic surgery are available, few features may count as anything other than "Easily Concealed."

ENRAGED/BERSERK

Characters in a futuristic setting can become Enraged just as often as those in a modern or fantasy environment, but some unique science fiction variations exist. A person might be psychologically conditioned to attack something in response to a code phrase or visual stimulus. (Call this the "Manchurian Disadvantage.") These "Human time bombs" aren't necessarily angry or irrational; they're behaving like programmed machines.

The more conventional form of Enraged is acceptable, too; science fiction is full of characters who like to pick fights out of species hatred or anger at having been on the losing side in a war. They're a dependable source of distractions in play. A hero who gets Enraged around Rigelians is going to get into lots of bar fights in spaceports where Rigelian freighters dock.

HUNTED

In high-tech SF societies, being Hunted by the authorities is no joke. It becomes a serious problem when widespread data networks, DNA tracing, foolproof facial-recognition software, and the like exist. To avoid being found the character has to live outside normal society — no credit cards, no System Identification Code, no passport, no government jobs (or jobs requiring a background check), no higher education, and no medical insurance. Having a fake identity helps somewhat, but dedicated investigators equipped with high-tech surveillance methods can find specific individuals given enough time. Thus, in *Star Hero*, the police and similar agencies almost always count as More Powerful and have Non-combat Influence. If appropriate, the GM may want to make all Hunteds involving "the authorities" or persons/institutions with access to official records worth another +5 Character Points (similar to the "Public Identity" bonus), to reflect how difficult it can be to hide in such settings.

On the other hand, with convenient interstellar travel, fugitives may be able to hop from world to world ahead of the authorities. Teleportation technology provides even better escape opportunities, especially if, as in Dan Simmons's novel *Hyperion* and its sequels, it's extremely common and has interstellar range. Gamemasters may

forbid characters to take Hunters with the *Limited Geographical Area* modifier for this reason.

Of course, plenty of other types of Hunteds exist. A character who offends a particular alien species may find that species Hunting him (at the GM's option, being Hunted by an entire species gains a character +10 Character Points for his Disadvantage). After an interstellar war, a known war hero may find his "victim's" relatives seeking vengeance. The possibilities are as endless as the Galaxy itself.

PHYSICAL LIMITATION

Physical Limitations in most science fiction settings have to be pretty severe, or pretty distinctive, to overcome advanced medicines, medical nanobots, and other high-tech methods of keeping bodies functioning properly. Typical ones, like *Blindness* or *Missing One Limb*, aren't applicable in most *Star Hero* settings; players have to be more imaginative than that. At the very least, they have to explain why, for example, a character's blindness cannot be cured through implants or neurotechnology, as with Geordi La Forge on *Star Trek: The Next Generation*. On the other hand, contact with alien life-forms might create as-yet unsuspected physical problems.

Two types of Physical Limitations that medical science can't cure relate to characters' size, and their acclimation to different levels of gravity.

Size/Weight

In a *Star Hero* setting, it's possible to have sentient alien species who are significantly larger or smaller than the game's defined Human norm of 1" tall and 100 kilograms in weight. Larger and/or heavier characters have problems in a technological society because they can't fit through doors easily, have trouble walking on upper stories because they break through the floor or ceiling, can't be carried in normal vehicles, accidentally crush furniture and break things, and so forth. Smaller and/or lighter characters are less disadvantaged, but sometimes have trouble reaching things, making themselves noticed, and the like.

Additionally, there are some drawbacks more easily defined in game rules terms. For every step *larger* than normal Human size, a character suffers -2 DCV, and all PER Rolls to perceive him are at +2. For example, a Gargantuan alien is at -10 DCV, and +10 PER to perceive. For every step *smaller* than normal Human size, a character suffers +3" Knockback from attacks. These extra inches only add to the distance traveled, not the damage taken from being Knocked Back.

The accompanying table provides suggested Physical Limitation values for characters of various sizes. (For the benefits of being smaller and/or larger, see the *Size/Weight* Environmental Package Deals on page 30.) These guidelines assume the character spends a significant amount of time (more than half of his in-game time) in settings suited for characters of "normal Human" size and weight. If that's not the case, the GM should reduce the value of the Disadvantage appropriately.

Size does not necessarily indicate that a

SIZE PHYSICAL LIMITATION

Value	Physical Limitation
20	Insectile, down to 1/64 Human size and/or mass (.032m, or .016") or smaller (All The Time, Greatly Impairing)
15	Minute, down to 1/32 Human size and/or mass (.064m, or .032") (Frequently, Greatly Impairing)
15	Minuscule, down to 1/16 Human size and/or mass (.125m, or .064") (Frequently, Greatly Impairing)
10	Tiny, down to 1/8 Human size and/or mass (.25m, or .125") (Frequently, Slightly Impairing)
10	Diminutive, down to one-quarter Human size and/or mass (.5m, or ¼") (Frequently, Slightly Impairing)
5	Small, down to half Human size and/or mass (1m, or ½") (Infrequently, Slightly Impairing)
0	Human size and/or mass (no Limitation)
5	Large, up to twice Human size and/or mass (4m, or 2") (Infrequently, Slightly Impairing)
15	Enormous, up to four times Human size and/or mass (8m,

Continued on next page

Continued from last page

	or 2.1-4") (Frequently, Greatly Impairing)
15	Huge, up to eight times Human size and/or mass (16m, or 4.1-8") (Frequently, Greatly Impairing)
15	Gigantic, up to 16 times Human size and/or mass (32m, or 8.1-16") (Frequently, Greatly Impairing)
15	Gargantuan, up to 32 times Human size and/or mass (64m, or 16.1-32") (Frequently, Greatly Impairing)
20	Colossal, up to 64 times Human size and/or mass (128 m, or 32.1-64") or larger (All The Time, Greatly Impairing)

character is taller than a normal Human; it may reflect length or girth instead. The Physical Limitation reflects overall size and bulk, not just height. The specified parameters are *guidelines*; GMs should give each character the Physical Limitation that fits him best, regardless of whether the character is exactly the listed size.

Gravity Adaptation

Characters who come from species or groups native to low-gravity environments experience difficulties in normal-gravity settings. At the GM's discretion, the following Physical Limitations may be appropriate, assuming the character spends most (if not all) of his in-game time in normal gravity environments.

Low Home Gravity (All The Time, Slightly Impairing; 15 points): The character is used to 0.6-0.8 G. In normal gravity, he tires more quickly; increase the END cost of any physical activity by ten percent (10%) (minimum of +1 END).

Very Low Home Gravity (All The Time, Greatly Impairing; 20 points): The character is used to 0.3-0.5 G. In normal gravity, he tires more quickly; increase the END cost of any physical activity by twenty percent (20%) (minimum of +1 END). Additionally, he can't move as quickly; he must sell back his Running and Swimming by 2" (minimum of 1").

Extremely Low Home Gravity (All The Time, Fully Impairing; 25 points): The character is used to 0-0.25 G. In normal gravity, he tires more quickly; increase the END cost of any physical activity by one-third (33%) (minimum of 2 END). Additionally, he can't move as quickly; he must sell back his Running and Swimming by 4" (minimum of 1").

Alien Physiology

In some campaigns, some types of aliens have physiologies so unusual that they have difficulty getting proper medical attention in the usual campaign setting. This is fairly rare; most science fiction doctors are pretty well-versed in "xenomedicine" and usually able to cope with whatever medical emergencies arise. But some characters are so alien that doctors have trouble treating them when they get sick or suffer injury.

The value of the Alien Physiology Physical Limitation depends on two factors: how unusual the character's physiology is; and how often this causes him difficulty (*i.e.*, how often he tends to need medical care). The first factor is reflected by the penalty doctors suffer to Paramedics, SS:

REPUTATION SCALE MODIFIERS

Number Of People Aware Of Reputation	-5 Points	Campaign Scale -10 Points	-15 Points
Planet (1 billion)	1 million beings	50,000 beings	1,000 beings
System (20 billion)	100 million beings	1 million beings	50,000 beings
Sector (100 billion)	1 billion beings	100 million beings	1 million beings
Quadrant (10 trillion)	20 billion beings	1 billion beings	100 million beings
Galaxy (1 quadrillion)	100 billion beings	20 billion beings	1 billion beings

Medicine, and any similar rolls when treating the character. If doctors suffer Skill Roll penalties of -3 to all rolls, the Limitation is Slightly Impairing. For each additional -3, the Impairment increases one step (-6 for Greatly Impairing, -9 for Fully Impairing).

The second factor varies from campaign to campaign; discuss the situation with your GM before determining a value. Typically Alien Physiology affects a character Infrequently, but in some games (like Military SF campaigns), it may rise to Frequently.

PSYCHOLOGICAL LIMITATION

In a *Star Hero* game, a character can have his own Psychological Limitations, Psychological Limitations from his Package Deals (rare, but possible), and perhaps even Limitations imposed by brainwashing or conditioning. For example, in SF stories it's not uncommon to find alien species who all subscribe to some bizarre code of honor, or at least pretend to (like the Klingons in *Star Trek*), or whose societal or cultural pécadilloes rise to the level of imposing a Psychological Limitation on all the natives (as in many of Jack Vance's short stories, including "The Moon Moth").

REPUTATION

A Reputation is worth -5 points if it's known to only a "small or limited" group. That takes on new meaning in a *Star Hero* campaign that uses an entire star sector or galaxy as its setting. In such a vast area, a Reputation that's only known on a single world should be worth even less. The accompanying table has suggested guidelines for reducing the value of a Reputation based on how widely it's known; the numbers listed are approximate, GMs may use others if necessary. As always, the minimum value of the Disadvantage is zero.

In campaigns involving time travel, GMs should also consider how well known the character may be in his future (or, in some settings, even his past!). If a Reputation is so strong and/or widespread that it's known throughout time, it's worth +5 Character Points.

RIVALRY

In addition to the ordinary kinds of Rivalries, characters in a science fiction setting could face Rivals who are, in essence, themselves — robots or androids from the same manufacturer, identical clone-siblings with the same implanted memories, or even their past or future selves in a time travel campaign. If this would give the Rival special insight into how the character acts and thinks, he may qualify for the +5 point "More Powerful" modifier.

SOCIAL LIMITATION

The possibilities for Social Limitations are as broad as the possibilities for societies in science fiction. For example, in many science fiction settings, the *Minority Social Limitation* (Very Frequently, Minor; 15 points) occurs frequently — proving that neither Humanity, nor other alien species, necessarily outgrow prejudice when they become smart enough to build starships. Common targets of discrimination in science fiction stories include aliens (in a society dominated by a single species), the genetically engineered, mutants, telepaths and other psionics, and artificial life-forms (robots, clones, and the like).

Other Social Limitations depend on the setting or the nature of the campaign. In a Military SF game, most characters are *Subject To Orders*. In a campaign focusing on a barbaric star-empire, slavery may exist, making the *Slave Social Limitation* appropriate.

Other forms of Social Limitation change or become obsolete in future societies. For example, maintaining a Secret Identity is difficult when DNA tracing, computer image-enhancement, and voice-print analysis let the authorities see through any disguise. (The GM may want to require anyone who has a Secret Identity to also buy a Deep Cover.) For a computer hacker, a Secret Identity in cyberspace is the only thing keeping him out of jail!

Given the scale of most *Star Hero* settings, and the ease with which characters can travel vast distances, it may be possible to escape, at least temporarily, the effects of social stigma. Characters can reflect this by decreasing the frequency at which the Disadvantage applies, or GMs may impose the same modifiers as indicated in the *Reputation Scale Modifiers* table.

SUSCEPTIBILITY

Artificial beings or aliens may be Susceptible to things which ordinary Humans ignore; if so, the GM should include the Disadvantage in the appropriate Species Package Deals. And unless a species is very rare or secretive, its Susceptibilities are probably common knowledge. This means villains can take advantage of them, but that ways to counteract the Susceptibility likely exist. For example, if the nocturnal Akrai are Susceptible to sunlight, a villain facing Akrai heroes will only go out in the daytime — but Akrai characters can buy protective suits and sunglasses in stores, and many businesses stay open all night for the convenience of Akrai customers. Assuming these effects cancel each other out, characters get no additional points for their Susceptibilities being well-known; if they're more restricted than normal, GMs may allow a +5 Character Point modifier.

VULNERABILITY

Like Susceptibility, Vulnerability most often occurs in *Star Hero* as part of a Species Package Deal. Many alien races may be more sensitive to certain attacks than Humans are. Engineers may deliberately manufacture synthetic beings like robots or androids with a Vulnerability to make them easier to control.

Of course, social customs and laws will reflect widely-known Vulnerabilities: if sonic attacks are deadly to Chiroptans, then the laws on Chiroptan worlds regulate sonic weapons as strictly as lasers or particle blasters. By the same token, however, mercenaries hired to attack a Chiroptan installation know to load up on heavy sonics. As with Susceptibility, the GM may allow a +5 Character Point modifier to a Vulnerability if the drawbacks of its being public knowledge are more severe than any related benefits.





Universe, part one

GALAXIES AND STARS

One of the attractions of *Star Hero* is the vast landscape characters can explore and adventure in. The Milky Way Galaxy alone contains more stars and planets than most people can comfortably think about, and it's just one of millions of galaxies! Given that much real estate to work with, the GM can create just about any sort of setting or locale he needs for an adventure — all he has to

do is find a way to get the PCs to it.

Since the astronomical backdrop is an important part of most science fiction RPG campaigns, *Star Hero* has three chapters devoted to things that fill the universe. Going from biggest to smallest, this chapter starts off with a discussion of galaxies and stars. Later chapters delve into the mysteries of planets and Earth's solar system.

GALAXIES



Galaxies are very big collections of stars. Big galaxies contain up to 400 billion stars, and can be 100,000 light-years across. Galaxies exist singly and in clusters of half a dozen or so. Within a group, galaxies are relatively close together — spaceships that can quickly cross a single galaxy can also handle intergalactic distances. Typical separations within a cluster are 50,000 to 1 million light-years.

Galaxies are pretty self-contained — stars form inside them from interstellar dust and gas, live out their lives orbiting the galactic center, and then explode, replenishing the interstellar medium for the next generation of stars. Only when galaxies collide or pass near each other can stars be kicked out into intergalactic space.

Galaxies come in three main types: *spiral galaxies* (like the Milky Way), with spiral arms and a defined core; *elliptical galaxies*, which are simply big spherical or egg-shaped blobs of stars; and *irregular galaxies*, which are often bodies distorted by close encounters with other galaxies. Elliptical galaxies don't contain as much interstellar gas and dust as spirals, and their stars seem to be older, so astronomers suspect spiral galaxies gradually turn into ellipticals as they age.

THE MILKY WAY

Earth's home Galaxy is a big one, a classic double spiral. It is accompanied by two dwarf galaxies, the Magellanic Clouds, and is in the process of absorbing another, called the Sagittarius Dwarf Galaxy (this is happening on the far side of the Milky Way from Earth). The Milky Way contains 400 billion stars, and can be divided into three distinct regions: the core; the galactic disk; and the halo.

The *core* is a spherical bulge at the center, where much of the Milky Way's mass is concentrated. It's as much as 6,000 light-years thick. Scientists believe the core of the Milky Way holds a large black hole, and that all galaxies may have one.

Most of the remaining mass is the *galactic disk*, a flat plane extending out from the core. The disk is about 100,000 light-years across and less than 1,000 light-years thick in most places. The spiral arms winding out from the core are the disk's most visible feature, but they are something of an illusion. The density of stars is roughly constant throughout the disk (densest near the core, thinnest at the rim); the arms are visible only because they contain a high proportion of new, bright stars. Current theory holds that the arms are "ripples" where the interstellar gas is more concentrated than elsewhere, so that new star formation goes

on there. Between the arms there are plenty of stars, they're just old, stable, and dim — like the Sun.

The spiral arms of the Milky Way Galaxy include (from innermost to outermost) the 3 Kiloparsec Arm, Norma Arm, Scutum-Crux Arm, Sagittarius Arm, Orion Arm, and Perseus Arm. Earth's sun is on the inner edge of the Orion Arm.

The rest of the Galaxy's mass is in the *halo*, a spherical region extending up and down from the plane of the galactic disk. The halo contains few stars, and most of those are clumped into globular clusters. Stars in the halo orbit the center of the Galaxy, which means they plunge through the disk every few million years.

COUNTING THE STARS

Despite years of study, astronomers differ on some basic facts about the Milky Way Galaxy. Some say it contains 400 billion stars, others only 200 billion. Some say it's 2,000 light-years thick on the average, others 1,000 light-years. Effort has been made to choose the most plausible (or probable) facts for use in *Star Hero*, but GMs and players can always use different numbers and measurements if they prefer.

GALACTIC REAL ESTATE

Recently, scientists have determined that only some parts of the Milky Way are suitable for the formation of planets capable of supporting life (as Humans currently know of and define "life"). The same is likely to be true of all galaxies — each one has a "Galactic Habitable Zone" where conditions favor the development of life.

Two factors establish the bounds of the habitable zone: radiation and metals. Radiation is deadly to most life forms, and it's difficult to see how life as Humans know it could evolve in a high-radiation environment. The core of the Milky Way has a high level of background radiation, and moreover is prone to frequent supernova explosions. Scientists estimate that life is impossible within 14,500 light-years of the galactic center. (Of course, the radiation levels may not bother suitably exotic kinds of life; see Chapter Four.)

To astronomers, "metals" are everything that isn't hydrogen and helium. All the heavy elements like oxygen and iron, the building blocks of planets as well as living things, are formed in supernova explosions. Consequently older Population II stars tend to be very metal-poor, and are unlikely to have planets. They are most common in the galactic halo and out at the edges of the galactic disk. Current estimates suggest

DANGEROUS GALAXIES

Not all galaxies are as peaceful and stable as the Milky Way. Astronomers have observed some where titanic and highly energetic events occur — huge jets of matter shoot into space, blasts of energetic particles bombard planets, energy emissions thousands of times greater than normal exist.

Jets and particle emissions are probably caused by massive black holes in the galactic core, consuming stars and catapulting some material out at high speeds. The radiation produced by this would certainly render most of the galaxy uninhabitable.

One interesting possibility is that some destructive galactic events may be artificial. A galactic civilization might be creating a mass jet to rearrange the useful matter in a galaxy, getting it out into space instead of locked up in stars. They might even be trying to move their galaxy, either to get away from some unimaginable danger, or to get closer to a cluster of other galaxies for piracy on a cosmic scale.

ENERGY BARRIERS AND INTERGALAC- TIC PERILS

Gamemasters who don't want their campaign to go intergalactic, but who do like the convenience of rapid travel within a galaxy, can solve that dilemma by making the trip from one galaxy to another very dangerous. *Star Trek* postulated an "energy barrier" at the edge of the Galaxy, by analogy with the radiation belts created by the Earth's magnetic field. Scientists haven't observed any such barrier, but in a *Star Hero* campaign that shouldn't stop you from having one if you want it.

Other writers have suggested that physical laws may work differently in intergalactic space; Vernor Vinge made it home to incomprehensibly powerful entities who could destroy intruding spacecraft on a whim. A. Bertram Chandler's stories set among the Rim Worlds at the edge of the galaxy suggested that the fabric of reality itself grows thin beyond the Galaxy's edge, so that spaceships venturing into intergalactic space may find themselves in a completely different universe!

that the zone beyond 37,000 light-years from the center of the galaxy is too metal-poor to have lifebearing planets.

Of course, there's still plenty of room in the Galactic Habitable Zone; it contains about 100 billion stars. Moreover, the boundaries are hardly fixed; it is certainly possible to have a lifebearing world at the rim, just very unlikely. Other galaxies probably have a similar "habitable zone" scaled appropriately by size. Small galaxies may have no radiation-filled core, but probably have more of a metal shortage, so it balances out.

Population I And II Stars

Generally speaking, stars come in two types: Population I and Population II. Population I stars contain hydrogen, helium, and lots of other stuff astronomers collectively designate "metals." Earth's Sun, and many nearby stars, are Population I. Population II stars, on the other hand, are most common in globular clusters and around the galactic halo. They consist mostly of pure hydrogen and helium as created in the Big Bang. Most astronomers believe Population II stars are "first growth timber" formed from the original interstellar medium, while Population I stars are "second growth timber" formed from gas enriched with heavy metals created in the cores of Population II stars and blasted into space in supernova explosions.

THE DRAKE EQUATION

The astronomer Frank Drake was among the first modern scientists to think seriously about the possibility of intelligent life elsewhere in the Galaxy. He devised a mathematical expression to estimate the number of technological civilizations in the Galaxy, which nowadays is known as the "Drake Equation" in his honor:

$$N = N^* \times f_p \times N_p \times f_h \times f_l \times f_c \times L_c/L_g$$

N is the number of civilizations capable of sending out a message detectable across interstellar distances. It is the product of the other terms.

N^* is the number of stars in the Galaxy, about 400 billion. In the light of recent discoveries about the Galactic Habitable Zone we can reduce this to 100 billion, representing the number of stars in the zone. Space Opera campaigns may wish to ignore the Galactic Habitable Zone in favor of a larger and more populous Galaxy. This is about the only number in this equation which is known with any certainty. The rest are estimates, and *Star Hero* GMs can adjust them as they wish.

The term f_p is the proportion of stars which last long enough for lifebearing worlds to form around them. Astronomers believe a star needs at least 5 billion years for planets to reach a state where life can exist. This means mostly dim, long-lived stars. The proportion isn't known exactly, but estimates for f_p range from 0.5 to 0.9 or so.

N_p is the average number of planets per star. Until recently, it was complete guesswork. The only



star available for study (the Sun) has nine planets, but there was no way to know if it was ordinary or rare. Since then, planets have been found around dozens of other stars, suggesting that most if not all stars of appropriate age have a suite of companions. For now, assume the Sun is average, and take 10 as the number of planets per star.

The term f_h , the proportion of planets suitable for life, requires more guesswork. The planet must be the right size, must be in the life zone (or close to a giant planet capable of heating it to liquid-water temperatures), and must have a stable orbit. Estimates of f_h range from 0.1 (or about one per system) to 0.001 or lower. For a Space Opera setting, choose the higher number; other campaigns should use 0.01 or 0.001 for f_h .

The next term, f_l represents the number of potentially lifebearing worlds where life actually does arise. Since experiments trying to duplicate conditions on the early Earth rapidly create complex organic molecules, and amino acids have been detected in space, it appears f_l is at least 0.5, possibly as high as 1.

The term f_c is basically complete guesswork. It represents the proportion of lifebearing worlds that produce a technological civilization. Earth got by for billions of years without intelligent life, and a study of human history suggests the path to high technology is not straight and inevitable. An optimistic figure (suitable for a Space Opera setting) would be 0.5; more brutal realism could put the figure at 0.001 or lower.

The final term is the ratio of a civilization's average life (L_c) to the life span of the galaxy (L_g). We know the Galaxy has existed for about 10 billion years, but how long do civilizations endure? Our own has had advanced technology barely a century. On the other hand, once a species has space travel it could potentially survive indefinitely. A short average lifespan means the Galaxy has a few widely-separated civilizations which don't have enough time to communicate before self-destructing. A long life means space should be crowded — which leads to the ques-

tion, “Where are they?”

For now, assume civilizations last about 10,000 years before going extinct, entering a “higher stage,” or otherwise losing interest in communicating with primitive starfaring beings. That makes the ratio 1 to 1 million, or .000001.

Now run the numbers. Taking the most “realistic” values we get $N = 100 \text{ billion} \times 0.5 \times 10 \times .001 \times 0.5 \times 0.5 \times .000001$, which works out to 125 civilizations in the Galaxy, with an average separation of some 6,000 light-years. No wonder Earth hasn’t heard from them.

Taking highly optimistic “Space Opera” values we get $N = 400 \text{ billion} \times 0.9 \times 10 \times 0.1 \times 1 \times 0.5 \times 0.000001$, or 180,000 technological civilizations in the Galaxy, with an average separation of about 400 light-years. Clearly Earth is overdue for a visit!

OTHER GALAXIES

The Milky Way is part of a small cluster of galaxies known as the Local Group. The Local Group contains two large galaxies (the Milky Way and M31 [Andromeda]) and several dozen small satellite galaxies.

ANDROMEDA

The Andromeda Galaxy, also known as M31, is the Milky Way’s closest large neighbor. It lies 2.2 million light-years away in the northern sky. M31 is about 50 percent bigger than the Milky Way, and has a larger core region. This suggests that Andromeda should have at least as many civilizations as the Milky Way.

In science fiction, the Andromeda Galaxy is most often used as a potential home of extragalactic menaces. A mighty empire has conquered all of Andromeda and now looks hungrily at the Milky Way; a cosmic disaster (like a gamma-ray burster) is going to render most of Andromeda uninhabitable so its civilizations are seeking new homes here; an ancient evil driven out by the Andromedans is now hiding out in the Milky Way; and so on.

THE MAGELLANIC CLOUDS

The Magellanic Clouds are a pair of irregular dwarf galaxies near the Milky Way. They are connected to our galaxy by a ribbon of gas called the Magellanic Stream, apparently the result of a close encounter in the distant past.

The larger of the two (called, logically enough, the Large Magellanic Cloud) is about 200,000 light-years away, and contains some 20 billion stars, making it 1/20 the size of the Milky Way. The Large Magellanic Cloud is rich in dust and gas, and has many young bright stars. Among others, it contains the brightest known star — S Doradus, a star which is believed to have a mass several *thousand* times that of the Sun, and a brightness several *million* times greater.

The Small Magellanic Cloud is connected to its big sister by a streamer of gas and dust called the Magellanic Bridge, and many astronomers consider the two of them a single body. The Small Magellanic Cloud holds about a billion stars.

In fiction, the Magellanic Clouds are good targets for pioneering intergalactic voyages. Explorers using a new super-fast interstellar drive can aim for them

on a test flight, or get accidentally catapulted to the Magellanics by some cosmic accident or wormhole. Since they are smaller than the Milky Way they probably contain fewer civilizations, and those are likely to be less advanced; the smaller scale of the Clouds also means civilizations there wouldn’t have the resources available to empires in the Milky Way.

GLOBULAR CLUSTERS

Globular clusters are clumps of stars existing within and around galaxies. Some orbit within the galaxy itself while others follow long orbits taking them hundreds of thousands of light-years out. Scientists think clusters formed early in the Galaxy’s history, since they contain almost no gas and very old stars.

Due to globular clusters’ age, the supply of heavy elements (*i.e.*, anything but hydrogen and helium) is low, so there won’t be very many planets and little chance of life. On the other hand, their great age does mean clusters could hold outposts or ruins of very ancient civilizations.

In a universe of slower-than-light travel, a very patient and long-lived civilization could “hitch a ride” in a globular cluster on a long elliptical orbit, as a way to reach nearby galaxies. True, there are no planets to settle on, but the stars provide energy, and might be dismantled to provide useful mass (see text box).

STELLAR ENGINEERING

Stars represent a very valuable resource, and advanced civilizations may wish to exploit them for more than light and heat. Since massive stars burn brightly but blow up soon, civilizations might take steps to “bank their fires” and extend the lifespan of stars. In the process the civilization would gain access to large amounts of mass from the star’s outer layers.

Here’s how it might work: the civilization constructs a chain of huge stations orbiting over the star’s equator, using solar energy to generate powerful magnetic fields, driving matter from the star upward in two huge streams from the poles. Immense collectors (similar in principle to the Bussard ramjet discussed on page 190) would gather and sort the material. The heavy elements would be put aside for use, while hydrogen and helium would be allowed to stream out to the outer reaches of the star system, where it would condense into planet-sized blobs of gas.

The process would continue until the star was reduced to the mass and brightness of a dim Type K or bright M dwarf. In that state, the star could burn for billions of years. When its brightness starts to drop, the managing civilization would drop in a few planet-sized blobs of hydrogen to throw another log on the fire. With proper attention, a star’s life could be extended to tens of billions of years.

In a *Star Hero* campaign, stellar engineering can be either an enigmatic project by long-dead ancient aliens, or something done by inscrutable and powerful beings the heroes are trying to communicate with. Of course, if it turns out they’re hostile, how do you fight beings who can take stars apart?

INTERGALACTIC TRAVEL

Since the distances between galaxies are only an order of magnitude or so greater than the scale of galaxies themselves, any galactic-scale civilization can probably manage intergalactic expeditions. The exact mechanics of FTL drive do have tremendous influence on intergalactic travel. (See page 190 for information on the types of FTL drives.)

Hyperspace and warp drives presumably operate the same in intergalactic space as they do within galaxies. Traveling between galaxies with those drives is simply a matter of packing enough supplies and making sure there’s enough fuel for the journey.

Jump drives may have problems on an intergalactic scale. If ships must refuel after each jump, or can only jump between stars, then intergalactic trips are impossible. A chain of stars linking one galaxy with another (the result of past close encounters) could become a vital highway in that case.

Wormhole drives or stargates depend on the existence of intergalactic connecting links. Whether such links are possible is entirely up to the GM — natural wormholes might only link points within a given galaxy, or all links could be intergalactic, so that star systems right next door in normal space are thousands of wormhole jumps apart. The range of stargates depends entirely on the builders’ level of technology and area of exploration. Perhaps most gates link nearby stars, but a few very rare and valuable ones are intergalactic gates — which means that whoever controls the intergalactic gate controls all traffic between galaxies.

STAR SECTORS



ACROSS THE ELEVENTH DIMENSION!

The text mentions the possibility of there being eleven dimensions. According to “Superstring theory,” a Hot New Idea in physics and cosmology as of 2002, the universe has 11, or maybe 13, dimensions. All but three spatial dimensions are extremely tiny. Basically, the universe is really big in directions X, Y, and Z, and almost flat in directions ZZ through ZZZZZZZZ. There’s an even Hotter New Idea called Membrane theory (or “Brane theory”) which may change the dimension count.

These theories open up some intriguing possibilities for *Star Hero* games. The relative flatness of Earth’s Universe in most dimensions means there could be other universes parallel to it in those “directions.” Cutting through the higher-dimensional space in which our 11-dimensional universe is coiled could be a convenient explanation for FTL travel. As with *Star Trek*’s subspace, one of the other dimensions could be a source of energy, a communications medium, or a convenient explanation for almost any pseudoscientific fact the GM needs to create.

There’s no reason to create an entire galaxy of 400 billion stars for a roleplaying campaign — it would take the GM about 20 million years to generate them all! Instead, most *Star Hero* campaigns take place either in a more loosely-defined galaxy, or across one or more *sectors*. A sector is simply a convenient-sized region of space. Depending on the speed of interstellar travel and the frequency of inhabited systems, a sector can be anything from a few light-years across to a slice of the entire Galaxy. The scale should be something the characters can cross in a reasonable length of time (typically no more than three months in-game), and in most cases the number of inhabited systems should be three to 12 (thus ensuring a reasonable degree of variation, while not overwhelming the players with details).

STELLAR CARTOGRAPHY

You can’t create a sector entirely by random generation. The interplay of civilizations, galactic politics, and exploration all affect who lives where. But you can create the basic physical environment randomly — after all, real stars and planets form by essentially random processes.

On average there is one star per 400 cubic light-years in the outer regions of the Galaxy. This translates to an average separation of 9 light-years per star. In the galactic core and in globular clusters the density can be much higher, up to one star per cubic light-year, with an average separation of one light-year or less. When mapping out a region of space the GM has two options.

The simplest way to map a region is to pretend the Galaxy is flat, so that all stars exist in the plane of your sheet of paper. While this throws astronomical accuracy to the solar wind, it’s simple to draw and makes it easy to measure interstellar distances. In such a “two-dimensional” universe, a 20 by 20 light-year sector would contain about six stars (roll 1d6+3, or 2d6, for more variation).

In reality, space has three dimensions (actually, according to current physics it may have eleven, but don’t worry about that). To map a volume of space in three dimensions the GM has to give each star a “vertical” coordinate, indicating how far above or below the plane of the page it’s located. On the map you can note the star’s distance “above” or “below” the plane of the page in light-years with a + or - sign. A sector measuring 20 light-years on a side would hold about 20 stars (roll 6d6 for more variation).

To determine distances between stars, use the Pythagorean Theorem: for two stars with coordinate (X, Y, Z) and (A, B, C) the distance is the square root of (X-A)² plus (Y-B)² plus (Z-C)². If you’re working in only two dimensions, ignore the third coordinate.

Example (two dimensions): *Rhombus Alpha* is located at coordinates +4, -8; *Beta Manticorum* is located at -2, 5. The distance between them is the square root of (+4 minus -2)² plus (-8 minus 5)², which equals the square root of (2)² plus (-13)². This translates to the square root of 4 + 169, or 173. The square root of 173 is 13.15, or about 13 light-years.

Example (three dimensions): *Cambias’s Star* is located at coordinates +3, +7, +5, and *Apanar* is at -5, +4, -6. The distance between them is the square root of (3-[-5])² plus (7-4)² plus (5-[-6])². The terms simplify to 64, 9, and 121, which total 194. The square root of 194 is 13.9, which rounds off to 14 light-years.

Note that a flat two-dimensional Galaxy will be more sparsely populated and dispersed. A sector will have relatively few worlds, and even with FTL travel most planets only have a few neighbors. The plus side is that borders are easier to guard, as a space fleet only has to patrol a “line in the vacuum.” A three-dimensional sector is denser, with more worlds and easier communication among them. On the other hand, this more populous sector is more vulnerable — borders are surfaces rather than out-lines and are much harder to monitor and patrol.

On a small scale — sectors of 20 light-years or so — it’s possible to actually map out all the stars in a given region of space. On a big scale — 100 light-years or more — GMs have to content themselves with mapping the important systems and simply ignoring uninhabited star systems (or make them up “on the fly” during the game, as needed).

Stars are scattered more or less randomly through space. The simplest way to determine their arrangement is to roll dice to get three coordinates for each star. Ten-sided dice work best, if you happen to have some, but you can break the sector up into smaller “blocks” and use other dice. Roll one die for each of the star’s three coordinates, using a second die to determine if each roll is positive or negative as measured from the sector’s center point.

Example: *Steve* is generating coordinates for a star in his campaign. He rolls three ten-sided dice and gets 8, 3, and 6. He rolls a second die, using odd numbers to indicate a negative coord-



dinate and evens to indicate positive numbers. The results are negative, negative, positive. So the star's coordinates are -8, -3, +6.

INTERSTELLAR PHENOMENA AND DANGERS

Humans of the twenty-first century don't know much about what lies between the stars. Interstellar space may be completely empty, or it may be full of nebulae, interstellar comets, wandering planets, cosmic strings, space storms, and spaceborne life. Considering them in order from hardest-science to most-rubbery:

NEBULAE

The Galaxy contains huge clouds of gas and dust which serve as nurseries for new stars. Interstellar nebulae are vast, extending across hundreds of light-years. They are not very dense, however; compared to planetary nebulae (see page 73) they are essentially "dense vacuum" with only a few dozen atoms per cubic meter. This can make them something of a threat to ships moving through normal space at high speeds. Any ship going more than 0.9 times the speed of light takes 1 pip of damage per Phase per hex of front facing when passing through a nebula (no defense applies). This may or may not apply to warp-drive ships, at the GM's option.

Nebulae also block sensors, but only over distances of light-years. Impose a -1 penalty to any Systems Operation roll for each light-year of nebula between the observer and the target. In Space Opera games, GMs can make these penalties more severe (up to -4) over shorter distances if it serves the dramatic needs of the story (as with the final starship combat in *Star Trek II: The Wrath Of Khan*).

COMETS

Earth's Solar System is surrounded by a shell of comets called the Oort Cloud, extending out to nearly two light-years from the Sun. (All other solar systems have comet clouds of their own.) That far out, the Sun's gravity is very weak, scarcely greater than that of other nearby stars. It wouldn't require much of a push to send a comet or asteroid into an elongated orbit which would carry it into the sphere of influence of some other star. Interstellar comets may be relatively common

— in which case they would be a serious threat to space voyagers traveling at nearly the speed of light. They could also serve as secret bases for pirates, rebels, and spies, or even as a home for colonists who tunnel into the ice and grow crops by the light of fusion reactors. Some highly advanced civilizations might use Oort clouds and interstellar comets for fuel and raw materials.

WANDERING PLANETS

If comets can be found in interstellar space, why not planets? They can either be bodies formed out there in the endless darkness, or else exiles, kicked out of the star system where they formed by some tremendous disaster (such as a close encounter with a massive object like a neutron star or a black hole). Planets might also be deliberately sent wandering. Doing so would require either some kind of rubber-science space drive (like the "Spindizzy" of James Blish's *Cities In Flight* series, which converts mass to velocity) or a very big explosion which somehow doesn't just blow the planet into bits.

Wandering planets could be a useful resource, especially if they carry ruins of some ancient civilization. They can also be a menace — a loose planet careening through an inhabited system would do tremendous damage just due to tides and orbital perturbations even if it didn't crash into a populated world. Powered planets with a space drive steered by a predatory civilization would be the ultimate pirate menace, arriving in peaceful star systems to loot and conquer before moving on to the next victim. How can the Space Patrol defeat an entire planet of raiders? Or, as with the Puppeteers of Niven's *Ringworld*, planets on the move could simply be massive vehicles.

INTERSTELLAR LIFE

And maybe there's something living out there in the dark between the stars. Humans evolved

SECTOR CREATION CHECKLIST

Step 1: Decide if you are mapping in two or three dimensions.

Step 2: Decide on your scale — how many light-years on a side is the sector?

Step 3: Determine how many stars there are. If you have a small sector (20 ly per side or less), roll 1d6 for every 1,400 cubic light-years of space. If it is a large sector and only the interesting star systems are being mapped, roll 2d6 for the number of populated systems.

Step 4: Determine coordinates, as described in the text.

Step 5: Roll on the System Type Table (page 72) for each system to determine the number of stars.

Step 6: Determine orbital separation. For close companions roll 2d6-2 times 10 AU; for distant companions roll 2d6 times 1,000 AU.

Step 7: Roll on the Star Types Table (page 74) to determine the spectral type of the stars.



on a planet, so naturally they assume all life has to develop on planets... but they could be wrong. Astronomers have detected fairly complex organic molecules in interstellar nebulae. Given enough time, they might evolve into vast, wispy organisms living in space. Such space creatures would be very unlike planetary life — instead of using chemical reactions they would be based on magnetic fields, gravity waves, and flows of charged particles. In a Hard SF setting, interstellar creatures would be a fascinating phenomenon to study. In Space Opera they might be a world-threatening menace, snatching ships which venture too far from the light of the Sun.

SPACE STORMS

Star Trek introduced the concept of the “ion storms” and “plasma storms” — violent showers or waves of charged particles moving through interstellar space at the speed of light. In *Star Hero*, a particle storm is modeled as a sudden, unexpected Energy Blast attack on ships in space. Science officers or sensor operators can detect them in advance

on a successful Systems Operation (or appropriate PS) roll. Consider a particle storm to do RKA 3d6 damage to objects within an Area Of Effect with a radius of 3d6 x 10,000 kilometers; the storm affects an area for a period of 1d6 Turns, perhaps longer. The GM decides whether some, all, or none of the ship’s defense applies to protect it from this battering.

Another possibility is “gravity tsunamis” — sudden and very powerful gravity waves moving through space which threaten to rip apart anything they pass over or around. They travel at approximately the speed of light. They do 2d6+12 dice of Killing Damage, Penetrating, over an Area Of Effect (Line) 1d6 times 10,000 kilometers long and 1d6 x 100 kilometers “deep.” The wave should take at least 1 Turn, if not longer, to pass by the ship’s location. The GM decides whether some, all, or none of the ship’s defense applies to protect it from the wave’s effects.

A space storm may also interfere with sensors and communications, imposing a -1 to -5 penalty to Systems Operation rolls to use those systems.

STARS



Space is big, but it's mighty cold and empty. Here and there throughout the void are bright, warm little points of light: the stars. There are close to four hundred billion stars in the Galaxy. Circling many of those stars are planets, and on some of those planets living beings have developed enough intelligence to look upward and wonder about the stars. This game is called *Star Hero* for a reason; most of the interesting things within the Galaxy happen near stars.

This section and the following chapter provide a system for generating stars and star systems which emphasizes scientific accuracy. You can either use it as a guide to making your worlds more plausible, or you can use dice to randomly create star systems and see what you get. Note that most star systems will not have planets suitable for "life as we know it." This is not as big a problem as it might seem, as there are many other forms of life, ranging from silicon-based beings which live in furnace heat to liquid-helium beings which thrive at Absolute Zero. (See page 91 for details.) Most star systems have a world which some organism finds comfortable.

Some gamers want hard science accuracy, while some want Space Opera accuracy which fits the spirit of television shows and films. At many points in the process of creating a sector, a star system or a planet, the GM can choose which method to follow. The options are flagged as either Hard Science or Space Opera.

Note that even the hard science options are only as accurate as possible according to early twenty-first century science. Discoveries next week or next decade can make some of these rules either ridiculously optimistic or far too conservative.

All the tables for system and planet creation are organized for random generation using one or more six-sided dice. You should be aware that they never have to rely on random die rolls. *You can always pick what you want.* The dice results are there to make it handy when you need a system in a hurry, and they give an idea of what the most likely results are.

STAR SYSTEM TYPES

Approximately half of all star systems have more than one star. They can be anything from contact binaries, orbiting so close together their photospheres touch, to stars orbiting light-months apart. In general, the close-orbiting stars are true twins, formed at the same time, while the distant companions tend to be captured as a result of the

JARGON BOX

While this chapter keeps the technobabble to a minimum, astronomy and astrophysics are complex subjects and have developed a technical vocabulary. Some important terms include:

Astronomical Unit (AU): An Astronomical Unit is defined as the average distance from the Earth to its Sun. One Astronomical Unit (abbreviated AU) is 150,000,000 kilometers (75 billion hexes). It is a very handy yardstick for describing distances on the scale of star systems.

Light-year: A light-year (sometimes abbreviated ly or LY) is the distance light travels in a year at the speed of approximately 300,000 kilometers (186,000 miles, or 150,000,000") per second. One light-year is equal to 9,467,000,000,000 kilometers (4.73 quadrillion hexes). When describing interstellar distances it is much more convenient to use light-years than kilometers.

Parsec: Another yardstick for interstellar distances is the parsec (parallax second), defined as the distance at which a star would have a parallax of one second of arc as observed from the Earth. A parsec equals 3.25 light-years, or 30 trillion kilometers (15 quadrillion hexes).

motions of stars through space. About a tenth of all star systems have three or more members, usually a close binary pair with a distant companion or companion pair.

GMs creating star systems from scratch should avoid making too many complex multistar systems. To determine the number of members randomly, roll 2 dice and consult the System Type Table.

ORBITAL SEPARATION

Having figured out how many stars there are, now you must determine the separation of the stars if there are two or more. This becomes important when you start placing planets. Stars can be either close or distant companions. As the names imply, close companions orbit close to the central star while distant companions orbit far away. In any system with more than two members, the central pair will be close binaries; in a system with four members, there is a pair of close binary companions with a second pair orbiting them at distant binary ranges. Two stars are close companions on a 1d6 roll of 1-3, distant companions on a 4-6.

Close companions orbit at "planetary" distances — within about 100 AU — while distant companions can be thousands of AU apart. For close binaries pick a distance or roll 2d6-2 and mul-

NAMING STARS

Astronomers have used several systems to designate stars. The brightest stars in a planet's sky usually are given individual names. Less distinguished ones are known by their constellation, and the vast majority get a simple catalog number.

Hard Science: This means most star systems have names like "DM+56 3496" or "*Lalande 211385*," giving the star's number in some star catalog. As new stars are discovered, new catalogs are created. The GM may wish to use Galactic Star Atlas numbers, which should have at least six or seven digits, leading to system names like "GSA 2837961." Of course, any star system which is inhabited by intelligent beings can have a name in the local language, regardless of what the Star Atlas calls it.

Space Opera: In a Space Opera universe, few stars are known by their catalog numbers. Most have old Greek or Arabic names bestowed by astronomers on ancient Earth, or else names given by civilizations on other worlds. Game-master can pick real star names from a star atlas (but be warned: most stars bright enough in Earth's sky to get an individual name are probably not suitable for lifebearing planets), or else can invent new names of their own. Other stars can have names which are simply a pair of Greek letters, like Alpha Upsilon or Omicron Theta.

**SYSTEM
TYPE TABLE**

Roll 2d6	System Type
2	Triple star
3	Triple star
4	Single star
5	Single star
6	Single star
7	Single star
8	Double star
9	Double star
10	Double star
11	Double star
12	Four or more stars

In October 2002, astronomers at the University of Texas announced the discovery of a planet twice the size of Jupiter orbiting the star Gamma Cephei — a binary star with a dim companion at an average distance of only 200 million miles. This is the first time scientists have found a planet in a close binary system; previously-discovered binary systems with planets have companion stars at least 100 times further apart than the Gamma Cephei stars. This may mean planets are even more common in the universe than previously believed!

tiply by 10 AU; a result of 0 indicates a close binary pair separated by less than a million kilometers. Distant binaries are 2d6 times 1,000 AU apart. For most purposes a distant binary companion is effectively a separate star system, although civilizations on planets of distant binary stars could make contact with each other using only sublight spaceships.

STAR TYPES

Astronomers classify stars by two characteristics: spectrum (color) and size.

STAR SPECTRUM

Stars were first classified by spectrum, or the mix of colors in the star's light. The color of a star corresponds to its surface temperature. There are seven main types: O, B, A, F, G, K, and M. They are organized in order from hottest to coolest:

- Type O** stars are intensely hot blue stars
- Type B** stars are slightly cooler blue-white stars
- Type A** stars are cooler still but also white
- Type F** stars are yellow-white stars
- Type G** stars are yellow stars like Earth's Sun
- Type K** stars are orange and cooler than the Sun
- Type M** stars are cool red stars

These basic types are further subdivided by numbers from 0 to 9, with the lower number indicating a hotter star. Thus, a B5 star is hotter than a B7 star.

Astronomers also recognize type D (white dwarf), N and R ("carbon stars" with some molecules containing carbon), S (containing some heavy metal oxides), and Wolf-Rayet (O-like stars with very hot, exposed cores because a companion has "stolen" their outer material) stars.

STAR SIZE

The second important thing about a star is its size, given by a Roman numeral. The size scale runs from I to V:

- I** indicates a supergiant (type Ia is brighter than type Ib)
- II** indicates a bright giant
- III** indicates a giant
- IV** indicates a subgiant
- V** indicates a dwarf star

Earth's Sun, for example, is a G2V star — type G2, size V, or a hot yellow dwarf. The "dwarf" types far outnumber the giants. For game purposes, you can simplify matters by lumping all the giant types into simply "Giants" and "Supergiants."

Some classification systems also have size VI (subdwarf) and VII (white dwarf).

WELL-KNOWN STARS

Here are the star types for some of the stars best known to Humans. Stars with double entries indicate binaries.

Star	Spectrum And Type
61 Cygni	K5V, K7V
Achernar	B3V
Aldebaran	K5III
Algol	B8VG5IV, A
Alpha Centauri	G2V, K1V
Altair	A7IV-V
Antares	M1I, B4V
Arcturus	K2III
Barnard's Star	M4V
BD +5° 1668	M5V
Bellatrix	B2III
Betelgeuse	M2Ib
Canopus	F0I
Capella	G8III, G1III
Deneb	A2Ia
Epsilon Eridani	K2V
Epsilon Indi	K8V
Fomalhaut	A3V
Groombridge 34	M1V, M6V
Kapteyn's Star	M0V
Kruger 60	M3V, M4V
Lacaille 8760	M0V
Lacaille 9352	M2V
Lalande 211385	M2V
Luyten 725-32	M5V
Luyten 726-8	M5V, M6V
Luyten 789-6	M6V
Polaris	F7I-II
Pollux	K0III
Procyon	F5IV-V, DA2 (white dwarf)
Proxima Centauri	M5V
Regulus	B7V
Rigel	B8Ia
Ross 128	M5V
Ross 154	M4V
Ross 248	M6V
Ruchbah	A5III
Sigma 2398	M4V, M5V
Sigma Draconis	K0V
Sirius	A1V, DA2 (white dwarf)
Spica	B1V, B2V
Tau Ceti	G8V
Van Maanen's Star	F5V
Vega	A0V
Wolf 359	M8V

THE LIFE OF A STAR

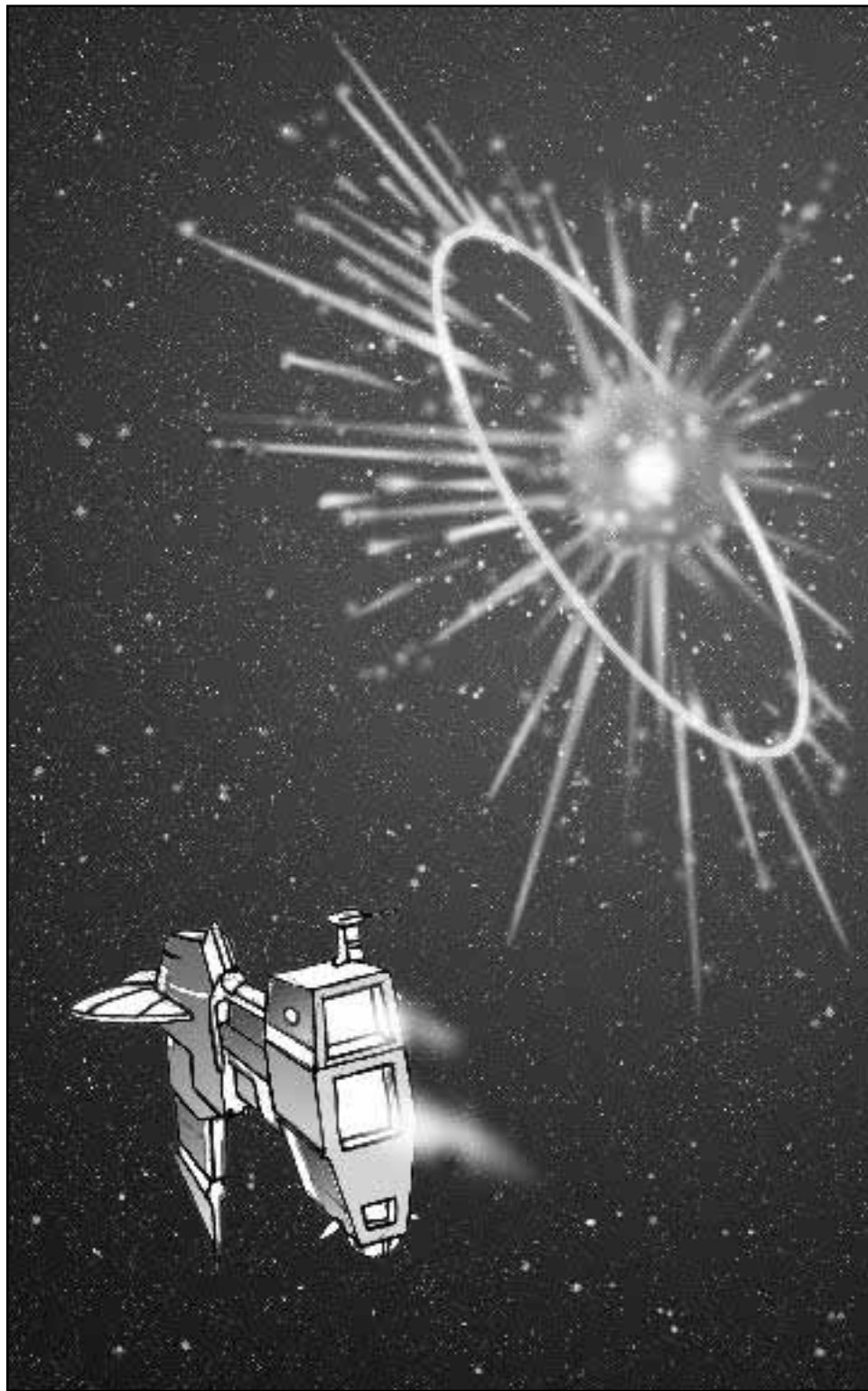
In general, small and cool stars are numerous, large and bright ones are rare. This is because the big bright stars only last a few million years before exhausting their fuel and blowing themselves to bits in a supernova explosion, while a Type M dwarf star can keep simmering for billions of years. About two-thirds of all stars are Type M dwarfs, and most of the rest are relatively sedate Type K, G, and F stars. Less than one percent of stars are bright supergiants like Rigel, or red supergiants like Betelgeuse. Those few giants are the most famous stars, simply because they can be seen across vast distances while a dim star like Earth's Sun is known only in the immediate neighborhood.

Big, bright stars seldom have planets, because they don't live long enough for the small bodies orbiting them to accrete into planets of any size. In a few cases, giant stars may have captured planets, or possibly worlds placed in orbit by ancient civilizations. It is up to the GM to decide if a giant star has captured or "herded" planets; such worlds should be extremely rare in a Hard SF setting.

Red giants and white dwarfs are both stages in the death of a star. After spending its lifetime as a star on the main sequence, a star which has used up most of its hydrogen fuel turns into a red giant, swelling up until its radius extends out to 1 or 2 AU. The star's density drops to almost nothing — starships with sufficiently strong protective shields can fly *within* a red giant for short periods until heat buildup becomes a problem. The red giant stage lasts a few tens of millions of years, but during that time frozen worlds in the outer system can suddenly find themselves in the habitable zone. While life seldom has the chance to evolve during a star's life as a red giant, such worlds can be terraformed and inhabited by spacefaring civilizations for thousands or millions of years.

After a star goes through the red giant phase it either explodes or collapses. Stars with a mass greater than 1.4 times that of Earth's Sun go up in a *supernova explosion*, leaving behind a supernova remnant — a planetary nebula with either a neutron star or a black hole at the center. Smaller stars (which are vastly more numerous) collapse into white dwarfs, burning hot with the energy of the collapse and gradually cooling over billions of years. Unfortunately, any planets of a white dwarf have already been cooked or absorbed during its red giant phase. When determining the composition of a white dwarf's planets, use the "Red Giant" line on the accompanying table. Only a captured planet snagged after the collapse can have enough volatiles to develop life. Civilizations can build artificial structures near a white dwarf, or possibly move planets to a suitable distance; with proper tending the star serves as a useful source of energy for billions of years.

To determine what type of star is in a given system, roll or select from the accompanying Star Types Table. In a multiple star system, place the most massive or brightest star in the center, and make any dimmer stars its companions. If you are generating only populated star systems, then roll 2d6+6 instead of 3d6.



Exotic Objects

Astronomers think regular stars are kind of boring. What they really enjoy looking at are exotic objects, which can have all kinds of weird properties.

BLACK HOLES

A black hole is an object so dense its escape velocity exceeds the speed of light. They're created when a star with a mass greater than three times that of Earth's Sun exhausts its nuclear fuel and col-

BROWN DWARFS

A “Brown Dwarf” is an object which is either a very small star or a very large planet. If they exist, they would have masses less than a tenth that of the Sun. They are called “Brown” because a body of that size would radiate infrared light, but not enough to be visible.

Brown dwarfs feature prominently in one of the current hot theories about the “missing mass problem” in cosmology. The idea is simple: dim, low-mass stars are more common than bright massive ones. Then presumably really dim, really low-mass objects should be more common still. It’s possible that a significant part of the Galaxy’s mass consists of brown dwarfs.

In a *Star Hero* campaign, brown dwarfs can serve a variety of purposes. They can be vital links along the jump-drive routes between more visible stars. They can be “hidden islands” with moons suitable for rebel bases, pirate hideouts, and secret enemy listening posts. They can have life of their own — either creatures living in the dwarf’s upper atmosphere, or on a close-orbiting moon warmed by the dwarf’s infrared radiation.

The star system mapping and generation system is biased toward visible stars. To add brown dwarfs to the mix, increase the density of star systems by a factor of 10 in a given volume of space, and for each system roll 2d6: on a result of 10 or less the system is a brown dwarf.

STAR TYPES TABLE

Roll 3d6*	Star Type & Size
3-8	M5V
9-11	M0V
12	K5V
13	K0V
14	G5V
15	G0V
16	F5V
17	F0V
18	Bright or Giant Star (roll on the Bright or Giant Star Table below)

*: Roll 2d6+6 if you’re generating only populated star systems.

BRIGHT OR GIANT STAR TABLE

Roll 3d6	Giant Star Type
3-7	A5V
8-9	A0V
10	White Dwarf
11	Type F Giant
12	Type A Giant
13	Type B Giant
14	Type O Giant
15	Supergiant
16-17	Red Giant
18	Exotic Object (roll on the Exotic Objects Table below)

EXOTIC OBJECTS TABLE

Roll 2d6	Exotic Object
2	Black Hole
3-5	Protostar
6-8	Flare Star
9-10	Supernova Remnant
11	Pulsar
12	Anomaly (wormhole, sentient star, antimatter star, or the like)

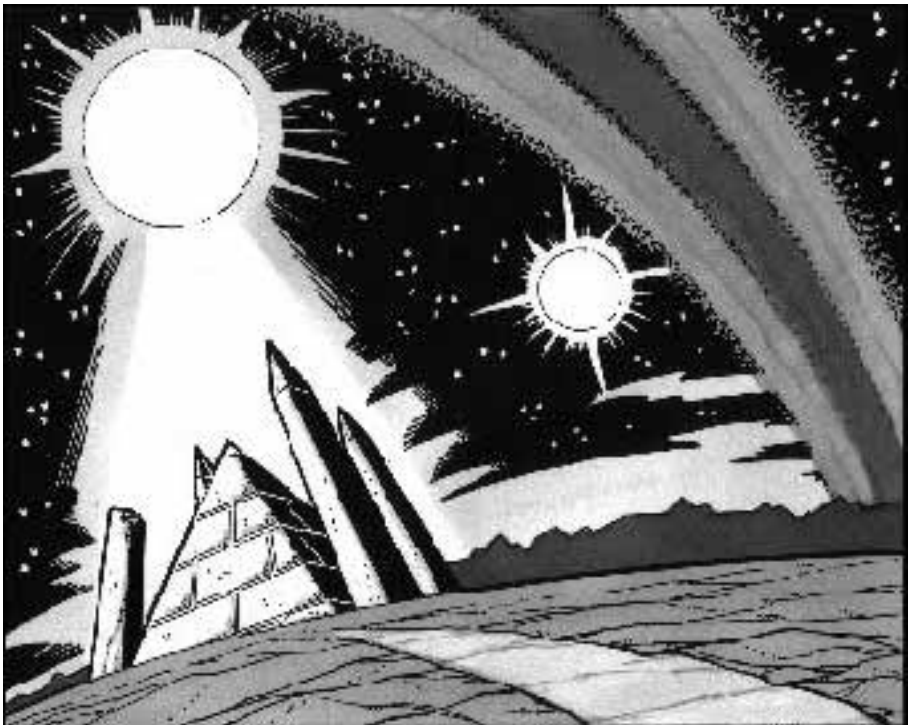
lapses. As it shrinks its gravity increases, until the force of the star’s gravity is greater than any matter can withstand, and it collapses into a singularity of infinite density. No matter or energy can leave a black hole, and its enormous gravity warps the fabric of space-time. Not even a faster-than-light starship can escape a black hole’s gravity if it ventures within the “event horizon,” as the distorted fabric of space makes it impossible for the engines to work. A ship which enters the event horizon and gets sucked into/through a black hole should be considered destroyed, unless the GM mercifully decides the hole sends the ship somewhere (a parallel universe, perhaps).

Even outside the event horizon, the region around a black hole is very dangerous. The tidal forces created by the black star’s immense gravity can tear a ship apart (this is RKA, AVLD Does BODY, Continuous damage; the defense is a force field constructed specifically to preserve a ship’s structural integrity; see page 186 regarding *Protection From G Forces*). The black hole’s “accretion disk” is like a dense planetary nebula full of meteoroids. Objects falling into the hole’s event horizon reach the speed of light, and give off energetic x-rays as they fall, flooding the area with deadly radiation.

Time actually moves more slowly around a black hole; the crew of a ship orbiting close to the event horizon will find that weeks have passed elsewhere while only hours have gone by for them. Artifacts of fantastic age can sometimes be found in the vicinity of black holes. Rotating black holes have even weirder effects on spacetime. It is possible to plot a course around a spinning black hole which emerges earlier in time! (See Chapter Nine for more on time travel.)

PROTOSTARS

A protostar is a star system that’s still forming. If the GM gets a Protostar result when determining the star type, the system is an interstellar nebula, a cloud of gas and dust, which is in the process of collapsing into a star and planets. Interstellar nebulae are fairly thin, so ships can move through them at sublight speeds normally, but any FTL drive which operates in normal space (like warp drive) is limited



to only the speed of light because of friction with the gas and dust. See page 69 for more information.

Close to the developing star the nebula becomes much denser, and ships cannot travel at more than 10 percent of the speed of light because the dense gas can literally melt the hull at high speeds. The swirls of energetic gas also interfere with sensors, so any Systems Operation rolls to use sensors are at -4 near a protostar (sometimes more). In addition, showers of meteoroids are common.

FLARE STARS

In certain stars the nuclear fusion reactions at the core are unstable. This phenomenon seems to be common in stars of all types. These flare stars can suddenly increase in brightness at irregular intervals, in some cases becoming more than six times brighter than usual. Radiation levels also become six times greater. While most starships can handle the increased radiation, the danger is that flare stars do not follow a predictable pattern, and can go off without warning. Ships in the vicinity of a flare star must remain on alert with defenses active at all times. Planets orbiting a flare star have no way to avoid the occasional increases in brightness. The flares make it hard for life to evolve on any planet of a flare star, but some especially hardy life forms might develop natural defenses enabling them to survive being baked every few weeks.

The GM should treat the energy from a flare star as an RKA with MegaScaled Explosion so that it loses about half its dice of damage for each AU of distance out from the star (full damage within 1 AU, half at 1.1 to 2 AU, and so on).

SUPERNOVA REMNANT

A supernova remnant is the tomb of a giant star. When massive stars use up their fuel they explode in a supernova detonation, scattering much of their matter through space in the form of a planetary nebula. Planetary nebulae seldom extend more than a light-year from the remnant of the exploding stars which formed them. As in the vicinity of a protostar, ships cannot travel at more than 10 percent of the speed of light in a planetary nebula, and any sensor task is at -4 to the Systems Operation roll in a dense nebula. At the center of the nebula is the remains of the star's core, now a neutron star.

NEUTRON STARS AND PULSARS

A neutron star is the remnant left over by a massive star blown apart in a supernova. A neutron star is the densest things in the universe next to black holes — essentially it's an atom the size of a planet. Their gravity is so intense that normal matter collapses into a mass of tightly-packed neutrons. This gravity poses great danger to spacecraft. Like a black hole, a neutron star can damage ships passing nearby with tidal forces. Unlike a black hole, neutron stars cannot capture ships capable of reaching lightspeed.

STAR SYSTEM DATA TABLE

In this table, brightness and mass are given relative to the Sun, which Earth astronomers use as their "standard star." These numbers represent "average" or "typical" stars; individual stars within a classification may vary from these figures. The distance listed for each zone is the inner radius — Yellow, Green, Blue, and Black — in AU; each zone extends out to the next. So for a G0V star the Yellow zone extends from .25 to .77 AU, and the Green zone from .78 to 1.2 AU. Note that the Yellow zone of brown dwarf objects begins effectively at the surface. (This information is important for the random generation methods in Chapter Four, *Planets*.)

Type	Brightness	Mass	Y	G	B	Bl	Age (years)
Type A Giant	100-1500	3-6	(these stars do not have planets)#				≥ 10 million
A0V	50	2.7	1.8	5.5	9.3	140	2d6 x 100 million
A5V	10	1.8	.8	2.5	4.2	60	½d6 billion
Type B Giant	200-8000	4-10	(these stars do not have planets)#				≥ 5 million
Type F Giant	10-500	2-5	(these stars do not have planets)#				≥ 100 million
F0V	7	1.6	.66	2.1	3.5	50	1d6 billion
F5V	2.5	1.3	.4	1.2	2.1	32	1d6 billion
G0V	1	1	.25	.78	1.3	20	2d6 billion
G5V	0.6	.9	.2	.6	1	15	2d6 billion
K0V	0.4	.8	.16	.49	.83	13	3d6 billion
K5V	0.1	.6	.08	.25	.42	6	2d6 x 2 billion
M0V	0.01	.3	.03	.08	.13	2	2d6 x 2 billion
M5V	0.001	.2	0	.025	.042	.63	2d6 x 2 billion
Type O Giant	10-20,000	10-12	(these stars do not have planets)#				≥ 2 million
Brown Dwarf	.000005	1	0	.002	.003	.04	2d6 x 2 billion
White Dwarf	0.1	1	.08	.25	.42	6	2d6 billion*
Supergiant	7000-100,000	9-18	(these stars do not have planets)#				≥ 2 million
Red Giant	4000	.2-10	5	60	67	1200	2d6 x 10 million*

*: White Dwarf and Red Giant stars are the end stages of other types and may have planets formed during the earlier history of the system.

#: Realistically, these types of stars cannot have planets. In a Space Opera game, you can put a planet around any star you like, giving these stars zones equal to red giants. After all, what fun is it when there aren't any Rigellians?

A rapidly-rotating neutron star can emit a pulse of intense radiation in a narrow beam, like a lighthouse beacon. The beam flicks around and around several times a second. These are known as pulsars, and they can be quite dangerous (but also make useful navigation beacons for starfaring civilizations). The radiation beam is intense enough to damage ships at up to a light-year away — anything caught by the beam suffers an RKA 10d6, Penetrating attack.

ANOMALIES

Anomalies are any objects unknown to conventional science, or which conventional science only theorizes. In a pulpish campaign anomalies can include wormholes (stable or unstable) connecting two distant locations in space, sentient stars, cosmic strings, time distortions, living nebulae, fields of unknown energy, and negative-entropy zones. There is no way to randomly roll for anomalies; the GM gets to choose.

**DISTANT
STARS TABLE**

Here are the distances from Earth to other well-known stars more than 12.7 light-years away.

Star	Distance (LY)
Achernar	69
Aldebaran	60
Algol	92
Altair	16
Antares	604
Arcturus	34
Bellatrix	1,400
Betelgeuse	427
Canopus	74
Capella	43
Deneb	3,230
Fomalhaut	22
Polaris	316
Pollux	35
Regulus	69
Rigel	770
Ruchbah	59
Sigma	
Draconis	18.8
Spica	220
Van Maanen's	
Star	14.3
Vega	25

NEAR STARS TABLE

These are the 24 star systems nearest the Sun, listed by distance from Earth, type, and brightness relative to Sol. In a slower-than-light campaign, these probably represent the limit of human expansion in the near term. In a campaign with FTL travel, these will be home to the oldest colonies. Multiple star systems have the primary listed first; the exception is Proxima Centauri, a distant companion of Alpha Centauri, which is listed separately.

System	Distance	Star Type	Brightness
Proxima Centauri	4.5 ly	M5V	0.00006
Alpha Centauri	4.5 ly	G2V	1.53
		K1V	0.44
Barnard's Star	6 ly	M4V	0.00044
Wolf 359	7.5 ly	M8V	0.00002
Lalande 211385	8 ly	M2V	0.0052
Sirius	8 ly	A1V	23.0
DA2 (white dwarf)			0.002
Luyten 726-8	8.75 ly	M5V	0.00006
		M6V	0.00004
Ross 154	9.5 ly	M4V	0.0004
Ross 248	10 ly	M6V	0.0001
Epsilon Eridani	10.75 ly	K2V	0.3
Luyten 789-6	10.75 ly	M6V	0.00012
Ross 128	10.75 ly	M5V	0.00033
61 Cygni	11 ly	K5V	0.082
		K7V	0.038
Epsilon Indi	11 ly	K8V	0.14
Procyon	11.5 ly	F5IV-V	7.6
DA2 (white dwarf)			0.0005
Sigma 2398	11.5 ly	M4V	0.003
		M5V	0.002
Groombridge 34	11.7 ly	M1V	0.006
		M6V	0.0004
Lacaille 9352	11.7 ly	M2V	0.012
Tau Ceti	12 ly	G8V	0.47
BD +5° 1668	12.3 ly	M5V	0.0015
Luyten 725-32	12.3 ly	M5V	0.0003
Lacaille 8760	12.3 ly	M0V	0.027
Kapteyn's Star	12.7 ly	M0V	0.004
Kruger 60	12.7 ly	M3V	0.0015
		M4V	0.0004

SAMPLE SECTOR

Susan is planning a sector for her new *Star Hero* campaign. She's a hard SF fan, so she wants it to be fairly realistic. She decides to use a three-dimensional mapping plan, and chooses a sector size of 20 light-years on a side. That gives her a total of 8,000 cubic light-years of space, so she rolls 6d6 to determine the number of stars. She gets a result of 23 stars, about average density.

Next she rolls coordinates (using some handy 10-sided dice) and gets the following results:

A: 9,-2,8	B: 9,4,9
C: 5,-4,2	D: 2,2,-10
E: -10,-2,6	F: -2,2,-6
G: 10,3,1	H: 2,-8,-10
I: 9,-10,2	J: -2,2,-3
K: 10,4,2	L: -8,-7,-10

M: -9,-2,5	N: 4,-1,7
O: 4,8,-4	P: -7,-10,-1
Q: -3,3,1	R: 8,7,1
S: -4,-6,9	T: -6,1,-3
U: 6,7,-1	V: 1,7,2
W: -5,-10,-2	

Susan notices some patterns. There are some close pairs (G and K, F and J, E and M, P and W); these could be likely political units. Systems G, K, R, and U form a nice compact group, suitable for a small empire or trade cluster. System H is fairly isolated, making it a good place for a lost colony or secret base.

Now she determines the system types. B and H are triple star systems; E, F, L, O, P, Q, R, and W are double stars; the rest are singles. She determines that F, Q, R, and W are close companions while E, L, O, and P are distant binaries.

Next she determines star types:

A: M0V	B: Close M5V-M5V pair with distant M5V companion
C: M0V	D: G0V
E: M0V with distant M5V companion	F: Close K0V-M0V pair
G: G5V	H: G0V with close M0V companion and distant M5V
I: M5V	J: K0V
K: G5V	L: G0V with distant M0V companion
M: M5V	N: M5V
O: G5V with distant K0V companion	P: F5V with distant G0V companion
Q: Close M5V-M5V pair	R: Close G5V-K0V pair
S: G0V	T: M0V
U: M5V	V: M5V
W: F0V with close K0V companion	

Now she focuses on star system H, determining the distances between the three stars in the system and how many planets they have. The main star is a G0V with an M0V companion orbiting at a distance of 50 AU. The distant M5V star is 5,000 AU away. For the system age she rolls for the main star and gets an age of 8 billion years. The next chapter develops the planets of the system.

"System H" is a kind of boring name, so Susan gives it the provisional Galactic Survey number "GS 5553-781-H," using the digits of a phone number and the letter H to remind her which one it is on her map. If the system turns out to have a colony or native life, it may get a better name.



Universe, part two

PLANETS

Sectors and stars are just the first step when it comes to designing your *Star Hero* galaxy. After you consider the broad questions and issues raised in Chapter Three, it's time to start focusing down a little bit more so you can create planetary systems

and individual planets — where most of the action in many *Star Hero* campaigns takes place. From hospitable Earth-like worlds inhabited by friendly aliens, to desolate, dangerous planets containing no life at all, this chapter helps you design the perfect worlds for your game.

PLANETARY SYSTEMS



SYSTEM ZONES

Once a distance has been set, check the Star System Data Table (page 77) to determine which zone the world orbits in. There are five zones in all, color-coded Red, Yellow, Green, Blue and Black.

Closest to the central star is the *Red zone*, the region within the distance listed for the start of the Yellow zone. Planets simply cannot exist in the Red zone because it is too hot. They never solidify and eventually boil away.

The *Yellow zone* is the belt in which solid planets can exist, but liquid water and the building blocks of organic life are rare. Some unusual worlds in the Yellow zone can have water — tidally-locked planets or bodies with extreme axial tilt may have the proper temperatures over a portion of their surfaces. Planets in the Yellow zone may be home to silicon-based life or energy beings in Pulp or Space Opera settings.

The *Green zone* is the belt in which the temperature permits liquid water. Worlds in the Green zone have the best chance of developing DNA-based life, so the Green zone is also known as the Biozone or life zone. Not all planets in the Green zone are suitable for life, of course — they may still be too small, too big, or otherwise wrong.

Planets in the *Blue zone* are too cold for liquid water, but exceptions are possible. Tidal heating or volcanic activity may make some worlds in the Blue zone capable of supporting DNA-based life. Other Blue zone worlds may have life based on ammonia or methane.

In the outer fringes of the system is the *Black zone*, where the central sun is just a bright star in the sky. Water is a rock in the Black zone, and even light gases like hydrogen and helium exist as slushy liquids. Tidal heating can create a few islands of warmth on moons of large planets, but life based on water and organic molecules is very rare in the Black zone. Exotic life forms using liquid hydrogen or superfluid liquid helium might exist on Black zone worlds.

Orbital Restrictions

With a binary star, certain orbits within the system are unusable for planets. As a simple principle, the companion star makes planets impossible in a band between 1/3 and 3 times its own orbital distance. So in the Alpha Centauri system, Alpha Centauri B orbits at a distance of 24 AU, making planets impossible between 8 and 72 AU.

Companion stars can have planets of their own, subject to the same limits, so Alpha Centauri B can only have planets out to 8 AU itself. Any planets orbiting beyond 3 times the companion star's distance are actually orbiting both stars.

BODE'S LAW

One way to generate a planet's orbital distance is to use *Bode's Law* (known more properly as the Titius-Bode Relation), a formula for determining the distances of the planets from the Sun in Earth's solar system. Bode's law works as follows: start with the series 0, 1, 2, 4, 8, 16, 32, 64, and so on. Multiply each term by 3, giving us 0, 3, 6, 12, 24, and so on. Now add 4 to each member of the series, giving the numbers 4, 7, 10, 16, 28, 52. Divide those numbers by 10 and you have a close approximation of the distances of the planets from the Sun in AUs: .4 (Mercury), .7 (Venus), 1 (Earth), 1.6 (Mars), 2.8 (the Asteroid Belt), 5.2 (Jupiter), and so on. The system breaks down at the outer system, with Neptune and Pluto, but otherwise it works pretty well. Bode's Law may reflect some actual principle of planetary formation, or it may simply be coincidence — Humans are good at finding patterns even in random data.

There are two ways to apply Bode's Law when creating planetary orbits. The simplest is the "strong Bode's" principle, which is that all star systems have planets in approximately the same orbital positions as those of Earth's solar system. The strong Bode's Law is the easiest to apply, but also the most unlikely.

Stars are pretty and shiny, but planets are where most people in the Galaxy live. Gamemasters can come up with the number of planets in a system in one of three ways. The first is just to pull a number out of thin air. If you want Aldebaran to have nineteen planets, then that's how many it has. Second, you can roll dice. Assuming Earth's solar system has a roughly average complement of planets, roll 3d6 for the number of planets orbiting a star.

Finally, you can generate the planetary orbits and pick some distance as the system boundary. This should be proportional to the square of the central star's mass. See the Star System Data Table (page 77) for typical masses. Multiply the star's mass squared by 40 AU to get the size of a potential star system. This means very large massive stars can have planets orbiting up to six light-days out!

Example: *Isaac is using the system-boundary method to determine how many planets the star Wolf 359 has. Wolf 359 is a Type M dwarf star, with a mass of .2; squaring that and multiplying by 40 AU gives Isaac a system size of .04 times 40, or 1.6 AU. The star will not have any planets orbiting beyond that distance.*

ORBITAL DISTANCE

At present, scientists are still working out how planetary systems form. If the Solar System is any guide, planets tend to have orbits closely spaced near the central star, getting progressively further apart as one moves outward. The exact rules are unknown. One possibility is the relationship known as Bode's Law (see sidebar).

Until astronomers know more, you can simply generate planetary orbits randomly. Start by rolling 1d6 and divide the result by 10. That gives the innermost planet's orbital distance in AU. To get the second planet's distance, roll 2d6, divide by 10, and add 1, for a result between 1.2 and 2.2. Multiply the first planet's orbital distance by that to get the second world's orbit. Each subsequent planet's orbit is 1 + (2d6/10) times the next innermost planet's distance.

SYSTEM ANOMALIES

Some star systems contain very atypical objects, ones which cannot be created using the standard planet generation tables. These include captured planets, “counterworlds,” and rosettes.

CAPTURED PLANETS

Captured planets are bodies which did not form in the system but have wandered in from the depths of interstellar space. They typically have very eccentric orbits, often sharply inclined to the plane of the system in which the other planets orbit. The GM can place a captured planet in any orbit at all, including one normally restricted by the presence of a companion star. It can even cross the orbits of other worlds in the system, although that arrangement probably won’t last forever.

If the GM creates the system randomly, a system has a captured planet on a roll of 18 on 3d6. Its closest approach to the central star is 2d6 AU; the most distant point in its orbit is 2d6 times 10 AU out. When creating the planet, treat it as a Black zone world.

COUNTERWORLDS

Counterworlds are planets which share the same orbit but are separated by 180 degrees, so they orbit on opposite sides of the sun. Such worlds are extremely rare, and almost always occur in the inner system, close to the star. Such bodies never form naturally — over time orbital perturbations would either shift the counterworlds into different orbits or else smash them together. If they exist, they must be the work of some extremely advanced civilization. They are not listed in the random creation tables, but GMs can place them wherever they wish.

ROSETTES

Rosettes are the extreme case of counterworlds. Instead of two planets, a circle of three or more worlds share the same orbit. These are almost always artificial arrangements, and consequently are most often found in the Green zone of a long-lived Type M star or white dwarf. As with counterworlds they are too rare (*i.e.*, too impossible under current theories) to show up in random generation.

Continued from last page

The second way to generate distances is the to vary the mechanisms of the series. This could be called the “weak Bode’s” principle. Instead of counting up 0, 3, 6, 12... the GM can roll a die to create the “seed” number. Instead of 3 it could be 2, or 5. Similarly, instead of adding 4 to each term, roll 1d6 and use that as the standard adder for the system. Divide the results by 10 to get distances in AU.



PLANETS



QUICK PLANETARY SYSTEM CREATION

Step 1: Determine the number of planets, either by rolling 3d6 or by figuring the system boundary size.

Step 2: Determine orbital distances for the planets, either by using Bode's Law or by rolling 1d6 divided by 10, then multiplying by $1 + (2d6/10)$ for each subsequent planet.

Step 3: Remove any planets in the Red zone or in orbits made untenable by the presence of a companion star.

Step 4: Add any system anomalies.

This section describes the physical characteristics of planets, with random-generation rules where appropriate. The social details of worlds with intelligent inhabitants are covered in Chapter Six.

ORBITAL EFFECTS

Where a planet orbits determines a lot about its composition and conditions. The Planetary Systems section above describes the zones in a star system and how to place planets.

YEAR LENGTH

To figure the length of a planet's year, do a little quick calculating, using the formula first discovered by the astronomer Kepler. The year length (in Earth years) equals the square root of (orbital distance cubed divided by star mass). This means planets of very bright massive stars can have enormously long orbital periods — over a century in some cases. Multiply by 365 days to get the year in standard days. The GM may also want to calculate how many local days there are in a year after the planet's rotation has been determined below.

ORBITAL ECCENTRICITY

No planet orbits its sun in a perfect circle. All orbits are ellipses, and some are more eccentric than others. A planet in an eccentric orbit can sometimes veer between zones, spending part of the year at a habitable distance from the star, swinging far out for a very cold winter, or zooming in close for a brief but scorching summer. However, highly eccentric orbits tend to be unstable — interactions with other planets tend to pull eccentric orbits into more circular paths, or else sling the planet out of the system entirely.

When creating a star system randomly, roll 2d6 for each planet. A result of 12 indicates a planet with a very eccentric orbit. Planets in the star's Black zone get a +1 bonus. If a world has an eccentric orbit, use the base orbital distance as its closest approach to the star. Roll 1d6, multiply by 10 percent, and add that much to the orbital distance to get the maximum radius of the orbit. If the eccentric orbit intersects the orbit of a smaller planet, then remove the smaller world. If it crosses the path of a bigger planet, then the eccentric world either gets kicked off into interstellar space, swallowed up in a giant impact, or captured as a moon (GM's option).

Example: *Fimbul orbits its G5V star in an eccentric orbit. The inner distance is .8 AU,*

safely within the Green zone. The maximum distance is 1d6 times 10 percent greater — a roll of 4 indicates 40 percent, so the maximum radius is 1.12 AU, which puts Fimbul into the Blue zone during part of the year.

INCLINATION

Most planets form in the plane of their central star's equator, as the collapsing protostar swirls about in its nursery nebula. The orbits of planets in a system seldom vary by more than a few degrees. However sometimes the passage of another star or the arrival of a rogue planet can disrupt this tidy arrangement. To determine the inclination of a planet's orbit, roll 3d6. On a roll of 18, the planet has a highly-inclined orbit. Roll 2d6 times 5 degrees to determine its inclination.

Orbital inclination has little effect on a planet itself, but it can pose problems for explorers or space travelers. Interstellar explorers surveying a system for the first time are more likely to miss planets which have cockeyed orbits. Apply a Skill Roll penalty of -2 to find worlds in highly-inclined orbits during the initial survey of a system. Space voyagers who live on a planet with a tilted orbit usually have trouble visiting other worlds.

MASS

The two most important parameters for a planet are its orbital distance (page 80) and mass. The combination of the two determines if a world is a gas giant, a ball of rock, or a green and habitable planet. The yardstick for planetary mass is the mass of the Earth (5.974×10^{24} kilograms); all planetary masses are expressed in fractions or multiples of the Earth's mass.

Gamemasters can pick the mass for each planet or roll randomly. The planets of the Solar System are a good yardstick: small airless worlds like Mercury have a mass of .05 or less; marginal worlds like Mars have masses of .1 to .3 or so; larger solid planets have a mass of .5 to 2. Small gas giants like Uranus and Neptune have a mass of about 20, while bigger ones like Jupiter and Saturn weigh in at 100 to 300 times the mass of the Earth. Really gigantic planets are possible, verging on brown dwarf stars, with masses of 500 or more.

To randomly determine planetary mass, roll 2d6 and consult the Planetary Mass Table, cross-indexed by orbital zone. The result is the planet's mass in Earth masses. A result of 0 means no planet formed in that orbit. Either it is completely empty, or it is occupied by asteroids.

PLANETARY MASS TABLE

Roll 2d6	Yellow	Green	Blue	Black
2	0	0	0	0
3	.1	.1	.1	0
4	.1	.2	.2	.1
5	.2	.5	.5	.2
6	.3	.8	.8	.3
7	.5	1	1d6x5	.4
8	.8	1.2	1d6x5	.5
9	1	1.5	1d6x10	1d6x5
10	1.5	2	1d6x50	1d6x10
11	1d6	1d6x50	1d6x50	1d6x50
12	1d6x50	1d6x100	1d6x100	1d6x100

Hard Science: The GM can make these numbers a bit more variable by rolling 2d6 and reducing the mass by that percentage. So a result of 4 for a blue zone planet would be .2; rolling an additional 2d6 and get 10; subtracting 10 percent from .2 gives a final mass of .18 earths.

Also, it seems that a large gas giant (anything with a mass over 50 earths) tends to “cannibalize” nearby worlds. Divide the mass of any smaller planet within 3 AU of a giant by 10; if the result is less than .05 there is an asteroid belt in that orbit instead.

DENSITY AND COMPOSITION

A planet’s density depends upon its composition, which depends in turn on the planet’s mass and orbital zone. Consult the Planetary Composition Table and compare the mass with the zone to get the composition, which in turn determines density.

Gas: The planet has a solid core but the bulk of it is composed of liquid or gaseous methane, ammonia, helium, and hydrogen. Density is low, about .2 to .3.

Hydrogen: The planet is composed almost entirely of hydrogen and helium, with traces of other gases in roughly the same proportions they are found in interstellar space. The core is highly-compressed metallic hydrogen. Density is .2.

Ice: The planet is composed almost entirely of ices, with a density of .1 to .2.

Rock: The world is composed of rock and is too cold or not massive enough to form an active core. Density is .6 or .7 but seldom higher.

Rock-Ice: The body is composed of rock and ice; smaller bodies are an undifferentiated “pudding,” but larger ones may have a rocky core covered by an ice crust. Typical densities for a rock-ice world

PLANETARY COMPOSITION

	Zone			
Mass	Yellow	Green	Blue	Black
≥ .1	rock-iron	rock	rock-ice	ice
.1 to .3	rock-iron	rock-iron	rock	rock-ice
.4 to .5	rock-iron	rock-iron	rock-iron	rock-ice
.6 to 1	rock-iron	rock-iron	rock-iron	gas
1.1 to 10	rock-iron	rock-iron	gas	gas
10.1 to 50	gas	gas	gas	gas
50.1 to 100	gas	gas	hydrogen	hydrogen
100.1+	hydrogen	hydrogen	hydrogen	hydrogen

are .3 to .5 depending on the ratio of rock to ice. (GMs may roll randomly 1d6/20 plus .2 to determine density.)

Rock-Iron: The body has a core of liquid iron and a crust of rock. Density is typically very close to 1, but for extremely massive bodies can approach 1.5. (To determine randomly roll (1d6/20) plus .8 to get density.)

DIAMETER

Density is mass divided by volume, and volume is proportional to the cube of the diameter, so once you know the mass and density you can figure out the size of the planet. Use the following formula to get the diameter from the mass and density:

$$\text{Diameter} = \text{cube root of (mass/density)}$$

If you don’t have a calculator which can do cube roots, consult the sidebar on page 84. The result is the planet’s diameter relative to the Earth. To convert that to kilometers, multiply by the Earth’s diameter of 12,800 km.

Example: *Kalumar has a density of .8 and a mass of .5, so its diameter will be the cube root of (.5/.8), or .625. The cube roots sidebar shows that the closest approximation is .75, which has a cube root of .9, so Kalumar has a diameter of .9 times that of the Earth. Multiplying .9 by 12,800 kilometers gives us a diameter of 11,500 kilometers.*

Gas Giants

A *gas giant* is a planet with a diameter of 48,000 to 130,000 km (sometimes more) and a thick atmosphere of Gas or Hydrogen. (Neptune and Uranus are on the small end of this scale; Jupiter and Saturn on the upper end.) They have masses of 50 or higher. They usually exist in the Blue or Black zones; closer in, the heat of their sun would boil away the gases of all but the largest ones. Large gas giants actually generate heat on their own, which may warm their moons (gas giants always have moons) enough to make them habitable (see *Tidal Heating*, below). In science fiction, gas giants frequently provide fuel for starships, which “skim off” part of their atmospheres.

GRAVITY

The relative diameter times the relative density gives the planet’s surface gravity as a fraction of Earth’s gravity. The value for Earth’s surface gravity is 10 meters per second squared.

Example: *Kalumar (in the example of diameter computation above) has a diameter of .9 and a density of .8, which gives it a surface gravity of .9 x .8, or .72 standard gravities.*

Most life forms cannot live long in a gravity field more than about 50 percent greater than that of their native environment. This applies to individuals more than species: a Human raised on a high-gravity planet has no trouble there, but a person whose bones

PLANET NAMES

If a planet is inhabited, or in a system with native intelligent life, it probably has a local name. Otherwise, the standard practice is to give each planet a Roman numeral indicating its orbital position. The innermost planet of Alpha Hydri is Alpha Hydri I. The planet four orbits out is Alpha Hydri IV. Planets with eccentric orbits (such as captured worlds) have their number based on their average distance from the star. Counterworlds, rosettes, and double planets get a letter following the Roman numeral — VIIa and VIIb, or IIa-IIIf. A colonized system may keep the numerals, or give the planets names based on some scheme chosen by the colonists.

Hard Science: The International Astronomical Union has a set of guidelines for naming features on other planets in the Solar System. The two most important rules are that discoverers cannot use names from living religions or the names of living persons. (A living religion is one which still has active believers; Islam, Hinduism and Christianity are living religions, the Aztec, Greek and Babylonian religions are not.) It seems likely that future space explorers would follow a similar scheme.

BIG WORLDS

As of 2002, Human astronomers have discovered extrasolar planets with masses up to almost 14 times that of Jupiter! To simulate this with the table, any time you get a result of 300 or more, roll another d6. On a 1-3, multiply the planet’s mass by 2d6.

CUBE ROOTS

Number	Cube Root
.001	.1
.005	.18
.01	.2
.05	.37
.1	.46
.5	.8
.75	.9
1	1
1.25	1.08
1.5	1.14
1.75	1.2
2	1.26
2.5	1.36
3	1.44
4	1.6
5	1.7
10	2.15
15	2.5
20	2.7
30	3.1
40	3.4
50	3.7
75	4.2
100	4.6
150	5.3
200	5.8
300	6.7
400	7.4
500	7.9
750	9
1000	10
1500	11.4
2000	12.6

developed on a low-gravity world would be in danger. One important exception to this is that creatures which live in the water are largely immune to gravitation effects because the fluid that surrounds them supports them as well. So as long as all the other conditions are the same, swimmers can live anywhere regardless of gravity. (See page 278 for more on the effects of gravity.)

MOONS

Most planets are accompanied by one or more moons. As a rule, the bigger a planet, the more moons it has and the bigger those moons can be. Solid “terrestrial” planets tend to have no more than a couple, usually no bigger than asteroids. All gas giants have moons, and some of them can be the size of planets in their own right.

To determine randomly how many moons a solid planet has, and how far out they orbit, roll on the Moons Table below. Planets in the Yellow zone suffer a -1 to the roll. All gas giant planets have moons — small gas giants (mass up to 50) have 2d6 moons, and large ones have 3d6.

MOONS TABLE

Roll 1d6	Number Of Moons
1-2	No moons
3-4	One moon
5	Two moons
6	1d6 moons

MOON ORBITS

There does not seem to be any simple rule governing moon orbits, in part because they affect each other much more than planets do. The standard “yardstick” for moon orbits is the planetary radius (half the planet’s diameter). The GM can either keep the distances in radii or convert them to kilometers by multiplying by the parent planet’s radius. For each moon choose an orbital distance of between 3 and 100 planetary radii, or else roll on the Moon Distance Table to determine orbital distance.

There are a couple of things to consider: moons within 2.44 planetary radii (the distance known as the *Roche limit*) break up if they are bigger than asteroidal in size, often forming a ring system. Replace any moon more than 100 kilometers across at that distance with a ring. Moons usually can’t occupy the same orbit (exceptions are noted in the Moon Anomalies Table), so reroll if a moon’s orbit is already taken.

MOON DISTANCE TABLE

Roll 1d6	Orbital Distance
1-2	Close orbit (1d6 planetary radii)
3-4	Medium orbit (3d6 planetary radii)
5-6	Distant orbit (1d6x10 planetary radii)

MOON SIZE

Moons range from tiny asteroidal chunks of rock to small worlds. In general, the inner moons of gas giant planets tend to be large, with masses on the order of .01 Earth; outer moons of gas giants and moons of solid planets are more like asteroids. Exceptions are possible, of which the most famous is Earth’s Moon. To determine moon size randomly, roll on the Moon Size Table, with a +1 for close and medium moons of gas giant planets. For small asteroid-type moons the result is its size in kilometers; surface gravity and atmosphere are minimal. For bigger moons the result is the body’s mass. Determine the density, gravity, atmosphere, and other details for a large moon exactly as if it were a planet.

MOON SIZE TABLE

Roll 1d6	Moon Size
1	Asteroidal; 1d6 km diameter
2	Asteroidal; 1d6 x 5 km diameter
3	Asteroidal; 1d6 x 10 km diameter
4	Asteroidal; 1d6 x 100 km diameter
5	Planetary; mass of .01 times 1d6
6	Planetary; mass of .1 times 1d6

STRANGE MOONS

Not all worlds have ordinary moons. Even within the Solar System Saturn has a pair of moons sharing the same orbit, and Pluto’s moon Charon is almost as big as Pluto itself. The Moon Anomalies Table lists some of the more common kinds of weird moons. Gamemasters can pick what they find interesting (but no more than two or three per star system), or can roll randomly. Roll 2d6; on a roll of 12, a planet has some anomalies about its moon system (which you can determine randomly with the Moon Anomalies Table).

TIDAL HEATING

If a gas giant has multiple moons, the conflicting gravitational pulls of the planet and the other moons can cause tremendous heat and pressure in a moon. This can also occur with a single moon that has an elliptical orbit. Sometimes there’s enough heat to make an otherwise uninhabitable body warm enough for life to evolve. Tidal heating depends on the distance from the primary planet to the moon. Check the Tidal Heating Table to determine how much the tidal effects raise the moon’s temperature. If the tidal heating raises the temperature into the range of liquid water, then the moon may be capable of supporting life. (Use the rules under *Climate*, below, to determine the base temperature of a moon.) A moon with a trace atmosphere or none at all may still have a subsurface ocean if it is rock-ice or ice in composition. Close moons

TIDAL HEATING TABLE

Distance (radii)	Heating (degrees Centigrade)
5	600
6	150
7	50
8	20
9	10

MOON ANOMALIES TABLE

Roll 1d6	Moon Anomalies:
1	Co-Orbital Moons
2	Giant Moon
3	Retrograde Moon
4	Inclined Orbit
5	Subsatellite
6	Synchronous Moon

Co-Orbital Moons: The planet has two or more moons sharing the same orbit. This is most common in very low orbits near the Roche limit, indicating a moon which has fragmented due to tidal stress. More rarely a planet may have a rosette of moons, spaced at 60 degree intervals along the same orbit. Rosettes are usually artificial, and the moons themselves may have underground habitats or be old space stations.

Giant Moon: The planet has a moon which is really big, a full-fledged planet with a mass of 2d6 times .1 Earth. The moon may not have a mass greater than its primary planet. Giant moons of solid planets are likely to have the same composition as well.

Retrograde Moon: The moon orbits in a direction opposite the planet's rotation and the orbits of the other moons. Often the orbit is highly eccentric as well, indicating a captured moon. If there are several moons this arrangement is unstable, but a solitary retrograde moon is in no danger.

Inclined Orbit: The moon's orbit is tilted with respect to the planet's equator, as much as 90 degrees. (To determine the amount of tilt randomly, roll 2d6 times 10 degrees; results greater than 90 indicate a retrograde tilted orbit.) Moons with highly tilted orbits often have very eccentric orbits as well, and may be captured bodies.

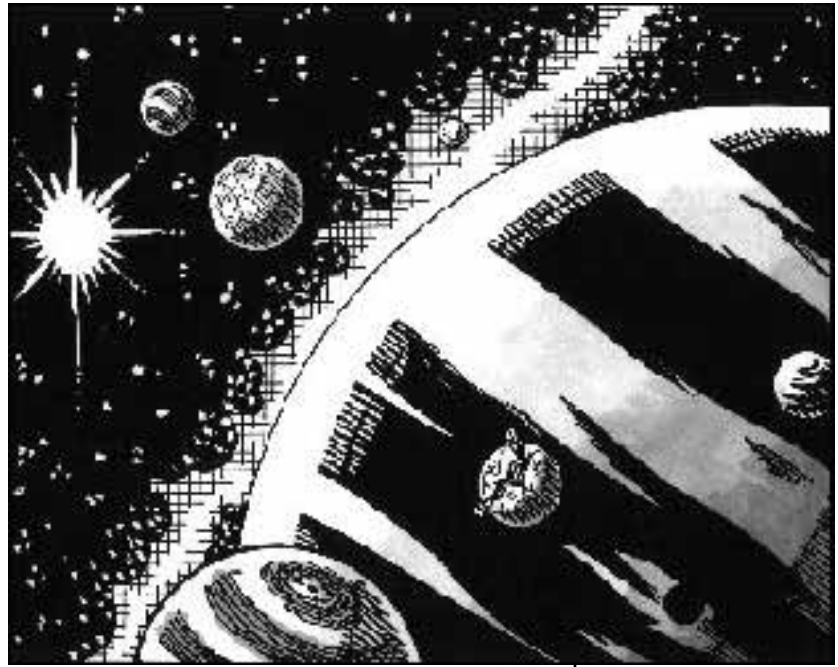
Subsatellite: One of the planet's moons has a small moon of its own. The smaller moon is a captured body, asteroidal in size. If the planet has multiple moons a subsatellite can't last very long before gravitational interference either flings it out to become a moon itself, or else sends it crashing into something.

Synchronous Moon: One of the planet's moons orbits with exactly the same period as the planet's rotation, so that it is forever hidden from half the planet. (This is not possible for a planet which is tidally locked to its sun.) Synchronous moons usually orbit in a medium orbit unless the primary planet rotates very quickly or very slowly.

may be heated to the point of being semi-molten, with constant volcanic eruptions and a very active surface.

PLANETARY ROTATION

Planetary rotation indicates how fast the planet turns on its axis, which in turn dictates the length of the planet's day. Rotation seems to depend loosely on a planet's mass, but moons and nearness to the primary star can affect it, too. The Planetary Rotation Table gives some rough guidelines for random determination.



Tidal effects can slow a planet's rotation tremendously, and some worlds appear to just have very unusual rotation rates. Solid planets with a large moon (mass of .01 or more) add 1d6 hours to day length if the moon is in a distant orbit, 2d6 if it is in a medium orbit, and 3d6 hours if the moon orbits close in. Double planets and worlds with giant moons are always *tidally locked* to their companions, presenting the same face to one another and rotating in the time it takes the two bodies to revolve around each other.

Moons are almost always tidally locked to their primary worlds. The only exception is distant moons which may have a "resonant" rotation — turning twice every three orbits, or something similar.

Tidal effects from the primary star can also slow a planet's rotation. Worlds with an orbital distance of less than .5 AU multiply the day length by 1d6, while worlds within .4 multiply the day length by (1d6 x 10). All worlds within .3 AU are automatically tidally locked, turning one face always towards the sun. (Tidal effects don't change a gas giant's rotation.)

PLANETARY ROTATION TABLE

Mass	Day Length
up to .5	20 to 30 hours (6d6)
.5 to 5	15 to 20 hours (5d6)
5.1 to 50	10 to 15 hours (4d6)
50.1 or more	5 to 10 hours (3d6)

ROTATION ANOMALIES

Some worlds just have peculiar rotation rates. Gamemasters may select one or two worlds per system to have unusual rotation, or roll 2d6 for each planet — on a result of 11 or 12 the world has a rotation anomaly. Choose or roll on the Rotation Anomalies Table.

ROTATION ANOMALIES

Roll 2d6	Anomaly
2-3	Fast Rotation
4-6	Slow Rotation
7	Roll 1d6: 1-3, Fast Retrograde Rotation; 4-6, Slow Retrograde Rotation
8-10	Retrograde Rotation
11-12	No Rotation

Fast Rotation: The planet spins extremely fast, with a day length of only 2d6 hours. In extreme cases, where a very big planet has a very fast spin, the gravity at the equator may be perceptibly less than at the poles due to centrifugal effects. The formula is (500 x diameter)/(3600 times rotation) squared. So the Earth's rotation reduces its gravity at the equator by only .0009 meters per second squared, or .009 percent.

Slow Rotation: The planet spins extremely slowly. Its day length is 3d6 times 20 days. If the length of a day is greater than the year length, then the planet is tidally locked and spins once a year.

Retrograde Rotation: The planet spins backwards. Most planets rotate in the same direction that they orbit; this is defined as "counterclockwise" or west to east. A retrograde planet spins the opposite way from its orbit. Retrograde rotation may indicate a captured planet, or may be the result of some massive impact which flipped the planet's axis in the distant past.

No Rotation: The planet does not rotate at all relative to the stars; this is most common in captured planets or worlds very far from their parent star. Note that a planet with no rotation is not the same thing as a tidally-locked world — a tidally-locked planet keeps the same side towards its primary, but a nonrotating world has effectively one day and night per year.

AXIAL TILT

The majority of planets have axial tilts in the 0 to 30 degree range, but a few have radical tilts of up to 90 degrees. Roll 1d6 on the Tilt Table.

A planet's axial tilt can have profound effects on its climate, as it is the main cause of yearly seasons. Worlds with minimal tilt have a nearly uniform climate year-round. Ironically, this has the effect of reducing a planet's habitable area, as dry regions never get any seasonal rains and cold areas have no summer at all. When computing population based on the planet's habitable area, apply a -1 to the die roll for worlds with minimal axial tilt.

TILT TABLE

Roll 1d6	Tilt
1	Minimal tilt: 1d6 degrees
2-3	Moderate tilt: 10 plus 2d6 degrees
4-5	High axial tilt: 20 plus 2d6 degrees
6	Extreme axial tilt: 2d6 times 10 degrees (tilt greater than 90 degrees indicated a retrograde rotation)

ATMOSPHERE

The atmospheric composition of a planet is very important in determining whether it can develop life. A planet's atmosphere is the result of numerous factors: what zone the planet orbits in; its mass and composition; and its age. There's also a strong element of chance — some worlds wind up with a very thick atmosphere simply because they happened to pick up a lot of lighter elements during formation.

All planets start out with an atmosphere of hydrogen, the most common element in the universe. Most smaller planets lose this within a few million years as the heat of the sun boils the hydrogen away into space. Big planets are able to keep their primordial atmospheres, and some bulk up until they become gas giants.

Solid worlds then generate a new atmosphere from volcanic outgassing, which is rich in water vapor, carbon dioxide, nitrogen, and sulfur compounds. On small planets or worlds close to the sun, this second atmosphere is also temporary, as the planet's gravity can't hold on to the gas molecules. But larger and cooler worlds retain this second atmosphere. If it is too dense and has too much carbon dioxide, the planet can suffer a runaway greenhouse effect, winding up like Venus, with a surface temperature hot enough to melt lead.

If the atmosphere isn't too dense and the temperature is suitable for liquid water, the planet may develop life. Life can have an amazing effect on a planet, transforming the very atmosphere itself. Oxygen atmospheres cannot form without life. Free oxygen reacts with other elements on the planet; in a few thousand years none would be left. Planets can only have an oxygen atmosphere when photosynthetic organisms continually renew the air.

If the system is young — less than 1 billion years old — all planets have essentially the same atmosphere, a mix of hydrogen, methane, and ammonia. This is called a Primordial atmosphere. For older systems, 2 billion years old or more, consult the Atmospheric Composition Table to get the atmosphere composition based on the planetary composition and zone. All planets with a Gas composition have Primordial atmospheres, and all Hydrogen composition planets have atmospheres of hydrogen and helium.

Gamemasters may be puzzled to find that oxygen is not one of the gases listed on the Atmospheric Composition table. That is because planets can't have free oxygen without life to generate it. At this stage you're creating the planet's "prebiotic" atmosphere; you'll take the effects of living things into account later on.

To determine the atmospheric density, consult the Atmospheric Density Table, then go on to the Pressure step to get surface pressure. Note that since pressure and atmospheric density both depend on gravity, higher-gravity worlds have *much* thicker atmospheres than small planets do.

There are five classes of atmosphere densities:

None: The planet has no atmosphere, or at least none detectable without instruments, and thus no atmospheric pressure. Any visitors must wear vacuum suits and full life-support gear. The Moon has no atmosphere.

Trace: Trace atmospheres are very thin, typically 5 to 10 percent of the density of Earth's. Again, visitors must wear vacuum suits and full life-support gear. Roll 1d6 times 1 percent to get the atmosphere's density relative to Earth's, then multiply by the surface gravity to determine pressure relative to Earth's. Mars has a Trace atmosphere.

Thin: Thin atmospheres are typically about a third as dense as Earth's; some worlds with thin atmospheres can support life. Thin atmospheres have an atmosphere density of 2d6 times 3 percent. Multiply by gravity to get the surface pressure.

Standard: Standard atmospheres are about as massive as Earth's, with a density of 3d6 times 10 percent of Earth's (multiply by gravity to get the surface pressure). They often support life, and can also create a significant greenhouse effect, helping planets retain heat.

Dense: Dense atmospheres are many times more massive than Earth's — from where Standard leaves off to 2d6 times 10 times the mass of Earth's atmosphere (or more). Multiply by gravity to get the surface pressure. In the inner parts of a system, worlds with dense atmospheres retain too much heat, leading to a runaway greenhouse effect that makes the world into a virtual oven. Venus has a Dense atmosphere.

The result is the atmosphere for a lifeless planet. For most worlds, this is the final result. But planets which develop native life may have their atmospheres changed further. So the next step is to determine if life has evolved on the world. Check the Life step to see if life has evolved on the planet.

If the planet has life and is 3 billion years or more in age, modify its atmosphere to reflect the action of living things. Photosynthesizers convert all atmospheric carbon dioxide to oxygen, but that's only the first step. The free oxygen in turn combines with any methane to make water and more carbon dioxide. The result is an atmosphere considerably less massive and a surface covered with

water and biomass. The atmosphere becomes 1d6 times 5 percent oxygen, with the remainder made up of whatever components were not eliminated by the plants (nitrogen and argon are the only elements which do not readily form oxygen compounds). Halve the atmospheric density.

For more on the effects of atmospheres, see page 283.

ALIEN LIFE AND ATMOSPHERES

The Life step (page 90) allows for a variety of exotic life chemistries which might flourish on very hot or very cold worlds. It seems reasonable that those forms of life might have as much of an effect on a planet's environment as carbon-water organisms. (This is all extreme rubber science — early twenty-first century Humans have no way of knowing if these types of life exist or have the effects described.)

Ammonia-based life does much the same as water-based life, sucking carbon dioxide out of the atmosphere and releasing oxygen. The oxygen removes methane and hydrogen, but on cold ammonia worlds, the water freezes solid, becoming essentially another mineral. As on water planets, this makes the remaining atmosphere much thinner.

Fluorine-silicon life removes carbon from the atmosphere, combining it with silicon to create complex silicone compounds. The free oxygen released by this gets taken up by silicon, so the net result is to remove all the carbon dioxide from the planetary atmosphere. On some worlds this reduces the temperature to the point where fluorocarbon-sulfur life takes over from the silicon types.

Fluorocarbon-sulfur life converts carbon dioxide and sulfur dioxide to oxygen. This may create a world which has a breathable atmosphere for Humans even though the temperatures are those of molten sulfur.

Energy-based life has no effect on atmospheres, nor do hydrogen or helium-based life. They simply don't conduct enough large-scale chemical reactions to have any major effect.

PRESSURE

Atmospheric pressure depends on the composition of the planet's atmosphere and its surface gravity. After determining what the planet's atmosphere is like, multiply the atmospheric density by the surface gravity, then multiply that result by 1000 millibars (approximately 1 atmosphere) to get air pressure at sea level. Any result less than 10 millibars indicates a world which is effectively airless.

Humans from Earth require 20 percent oxygen at 1000 millibars pressure; this is called a *partial pressure* of 200 millibars of oxygen. If the partial pressure of oxygen (percentage times air pressure) is less than 100, Humans cannot survive unaided over the long term. Similarly, a partial pressure greater than 400 is also harmful. Other species may have different limits, of course.

Altitude does affect pressure; on Earth the air pressure drops by approximately 10 percent per kilometer of altitude. The gradient on other worlds

ATMOSPHERIC COMPOSITION TABLE

Roll 1d6 x 10 percent for boldface components, 2d6 x 1 percent for plaintext items)

Rock Or Rock-Iron Worlds

Yellow zone: Carbon Dioxide, Nitrogen, Sulfur Dioxide, Argon, Chlorine, Fluorine

Green or Blue zones: Carbon Dioxide, Nitrogen, Methane, Argon, Ammonia, Sulfur Dioxide, Chlorine, Fluorine

Black zone: Hydrogen, Helium

Ice Or Rock-Ice Worlds

Blue zone: Carbon Dioxide, Methane, Argon, Nitrogen, Ammonia

Black zone: Hydrogen, Helium

Boldface items are major constituents (1d6 times 10 percent of the atmosphere); the others are minor components (2d6 percent). Start with the first item listed and roll the abundance of each gas until you reach 100 percent. If you get to the end before reaching 100 percent, add the remainder to the first item on the list.

ATMOSPHERIC DENSITY

Planet Mass	Yellow Or Green	Blue Or Black
.1 or less	None	Trace
.11 to .3	None	Trace
.31 to .5	Trace	Thin
.51 to .7	Thin	Thin
.71 to .9	Standard	Standard
.91 to 1.3	Dense	Standard
1.31+	Dense	Dense

For more variety, roll 1d6 for each world: 1 indicates an atmosphere one step thinner, 6 indicates an atmosphere one step thicker, and 2-5 indicates the result shown on the table.

ATMOSPHERIC
COMPONENTS

Here are a few notes on the gases that frequently compose atmospheres. See the rules on page 284 regarding “Poisonous” or corrosive atmospheres.

Ammonia: Ammonia (NH₃) is extremely poisonous as a vapor. Fortunately, it’s also very soluble in water; if a world has liquid water, you’ll find the ammonia in its seas, not its atmosphere.

Carbon Oxides: Carbon oxide (CO) and carbon dioxide (CO₂) often exist on terrestrial worlds that haven’t evolved plant life yet. Plants break these down, freeing the oxygen so other forms of life can breathe it.

Chlorine, Fluorine: These two gases both react with many other elements, so they probably won’t exist in an atmosphere unless they’re somehow being produced or freed (either by the natural life processes of weird aliens, or artificially). Both are extremely poisonous to Humans and other terrestrial life.

Helium: The second-most abundant element in the universe after hydrogen, helium is of course unbreathable by terrestrial life. But at least the intrepid space explorers will get to shout for help in squeaky voices before they die.

Hydrogen: Because it’s flammable, hydrogen can be extremely dangerous if it’s present in large quantities. Even worse, its tiny atoms can sometimes get inside sealed protective garments, potentially

would depend on the local gravity. Divide 1000 meters by the local gravity to find the equivalent for other planets. When pressure reaches 0, the atmosphere ends and space begins. Oddly, this means big planets actually have a thinner atmospheric envelope than small ones, because the big planets’ heavy gravity keeps all the air close to the surface. While some planets have surface pressure too high for Humans to survive, there may be altitudes at which the partial pressure is appropriate for Humans to breathe without assistance.

Here’s a quick-reference table for determining pressure at the planetary surface (measured in atmospheres, where 1 atmosphere is the Earth average pressure at sea level). Atmospheric density is expressed as a multiple of the mass of Earth’s atmosphere.

CLIMATE

The climate of a world depends on its temperature, which in turn depends on what zone the planet’s orbit lies in. The basic temperature is 350 Centigrade in the Yellow zone, 10 Centigrade in the Green zone, -100 Centigrade in the Blue zone and -200 Centigrade in the Black zone.

Gamemasters who want to figure a planet’s temperature more precisely can use the following formula: temperature is 280 degrees Kelvin times the fourth root of the star’s luminosity, divided by the square root of the distance in AU from the star. To convert from degrees Kelvin to Centigrade, simply subtract 273.

Once the base temperature is determined, apply various modifiers based on the planet’s atmosphere and other characteristics.

PRESSURE TABLE

Atmospheric Density (Trace Atmospheres)											
Gravity	.02x	.03x	.04x	.05x	.06x	.07x	.08x	.09x	.10x	.11x	.12x
.5	.01	.015	.02	.025	.03	.035	.04	.045	.05	.055	.06
.75	.015	.0225	.03	.0375	.045	.0525	.06	.0675	.075	.0825	.09
1.0	.02	.03	.04	.05	.06	.07	.08	.09	.10	.11	.12
1.5	.03	.045	.06	.075	.09	.105	.120	.135	.15	.165	.18
2.0	.04	.06	.08	.10	.12	.14	.16	.18	.20	.22	.24
2.5	.05	.075	.10	.125	.15	.175	.20	.225	.25	.275	.3
3.0	.06	.09	.12	.15	.18	.21	.24	.27	.30	.33	.36
3.5	.07	.105	.14	.175	.21	.245	.28	.315	.35	.385	.42
4.0	.08	.12	.16	.20	.24	.28	.32	.36	.40	.44	.48
4.5	.09	.135	.18	.225	.27	.315	.36	.405	.45	.495	.54
5.0	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60

Atmospheric Density (Thin Atmospheres)											
Gravity	.10x	.15x	.20x	.25x	.30x	.35x	.40x	.45x	.50x	.55x	.60x
.5	.05	.075	.10	.125	.15	.175	.20	.225	.25	.275	.30
.75	.075	.1125	.15	.1875	.225	.2625	.30	.3375	.375	.4125	.45
1.0	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60
1.5	.15	.225	.30	.375	.45	.525	.60	.675	.75	.825	.90
2.0	.20	.30	.40	.50	.60	.70	.80	.90	1	1.1	1.2
2.5	.25	.375	.50	.625	.75	.875	1	1.125	1.25	1.375	1.5
3.0	.30	.45	.60	.75	.90	1.05	1.2	1.35	1.5	1.65	1.8
3.5	.35	.525	.70	.875	1.05	1.225	1.4	1.575	1.75	1.925	2.1
4.0	.40	.60	.80	1	1.2	1.4	1.6	1.8	2	2.2	2.4
4.5	.45	.675	.90	1.125	1.35	1.575	1.8	2.025	2.25	2.475	2.7
5.0	.50	.75	1	1.25	1.5	1.75	2	2.25	2.5	2.75	3

Atmospheric Density (Standard Atmospheres)											
Gravity	.30x	.45x	.60x	.75x	.90x	1.05x	1.2x	1.35x	1.5x	1.65x	1.8x
.5	.15	.20	.30	.375	.45	.525	.60	.675	.75	.825	.9
.75	.225	.3375	.45	.5625	.675	.7875	.9	1.0125	1.125	1.2375	1.35
1.0	.30	.45	.60	.75	.90	1.05	1.2	1.35	1.5	1.65	1.8
1.5	.45	.675	.9	1.125	1.35	1.575	1.8	2.025	2.25	2.475	2.7
2.0	.60	.90	1.2	1.5	1.8	2.1	2.4	2.7	3	3.3	3.6
2.5	.75	1.125	1.5	1.875	2.25	2.625	3	3.375	3.75	4.125	4.5
3.0	.90	1.35	1.8	2.25	2.7	3.15	3.6	4.05	4.5	4.95	5.4
3.5	1.05	1.575	2.1	2.625	3.15	3.675	4.2	4.725	5.25	5.775	6.3
4.0	1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.4	6	6.6	7.2
4.5	1.35	2.025	2.7	3.375	4.05	4.725	5.4	6.075	6.75	7.425	8.1
5.0	1.5	2.25	3	3.75	4.5	5.25	6	6.75	7.5	8.25	9

Atmospheric Density (Dense Atmospheres)											
Gravity	20x	30x	40x	50x	60x	70x	80x	90x	100x	110x	120x
.5	10	15	20	25	30	35	40	45	50	55	60
.75	15	22.5	30	37.5	45	52.5	60	67.5	75	82.5	90
1.0	20	30	40	50	60	70	80	90	100	110	120
1.5	30	45	60	75	90	105	120	135	150	165	180
2.0	40	60	80	100	120	140	160	180	200	220	240
2.5	50	75	100	125	150	175	200	225	250	275	300
3.0	60	90	120	150	180	210	240	270	300	330	360
3.5	70	105	140	175	210	245	280	315	350	385	420
4.0	80	120	160	200	240	280	320	360	400	440	480
4.5	90	135	180	225	270	315	360	405	450	495	540
5.0	100	150	200	250	300	350	400	450	500	550	600

ALBEDO

Albedo refers to the fraction of light or electromagnetic radiation an object reflects. The more it reflects — the higher its albedo — the brighter it appears. Planets may reflect back a significant amount of incoming energy, especially if their atmospheres contain large amounts of dust or water vapor, or if the surface is covered by ice and snow. For any planet with an atmosphere more dense than Trace but less than Dense, reduce the temperature by 5 degrees Centigrade; Dense atmo-

spheres reduce it by 20 degrees.

See page 278 for more information on, and rules for, albedo.

GREENHOUSE EFFECT

Certain gases can act to trap heat, raising the temperature of a world. There are a variety of greenhouse gases, including carbon dioxide and water vapor. Use the following rules of thumb: on worlds with Trace or Thin atmospheres there is no appreciable greenhouse effect. Standard atmospheres increase the temperature by a number of degrees Centigrade equal to the twice the percentage of carbon dioxide in the atmosphere, and Dense atmospheres increase the temperature by 10 degrees for each 1 percent of carbon dioxide.

If this raises the planetary temperature above 50 degrees Centigrade, the planet experiences a runaway greenhouse effect. Its oceans boil, pumping the atmosphere full of water vapor and vastly increasing its ability to hold heat. Add another 1d6 times 100 degrees to the planet's temperature.

TIDAL HEATING

Moons of gas giant planets can also get additional heat from tidal energy. This can sometimes provide enough energy to make a world warm enough for life. See the discussion on page 84.

ROTATION

Tidally-locked planets or worlds with days longer than 10 standard days can get extremely hot on the day side. The temperature on the dayside in degrees Kelvin is doubled; on the nightside it is halved. (To convert from degrees Kelvin to Centigrade, subtract 273.) This can mean the oceans on the dayside literally reach boiling. The planet won't have a runaway greenhouse effect because the moisture all freezes out on the night side. On tidally locked worlds, all the water winds up as glaciers on the night side.

ECCENTRIC ORBITS

Planets in eccentric orbits may have two climate ratings, based on the innermost and outermost distance from the star. Compute the temperature separately for each extreme.

CLIMATE CLASS

The final climate class is based on the planet's average temperature. By way of comparison, the Earth's average temperature is about 12 degrees Centigrade (53 Fahrenheit) for the entire planet, making it Temperate. Obviously various regions are warmer or colder than this. Assume a planet's equatorial regions are about 20 degrees Centigrade warmer than the base temperature, the mid-latitudes are close to that temperature and the polar regions are 20 degrees colder. As a result, planets which are Cold or Hot are uninhabitable by Humans over most of their surface, but may have livable temperatures in the equatorial or polar regions. Very Cold or Hot and Extremely Cold or Hot planets are uninhabitable, period. Humans visiting them must wear life-support gear.

CLIMATE TYPES

Temperature	Climate Type
-101° C or colder	Extremely Cold
-51° to -100° C	Very Cold
-21° to -50° C	Cold
-1° to -20° C	Cool
0° to 19° C	Temperate
20° to 49° C	Warm
50° to 99° C	Hot
100° to 149° C	Very Hot
150° C or hotter	Extremely Hot

TERRAFORMING

Terraforming is the process of making a hostile world suitable for life. Since the word was invented by Humans, it literally means "making like Earth," but aliens could use the same methods to make planets more like their homeworlds as well ("xenofarming," so to speak).

Humans can only change certain aspects of a planet easily. Mass and orbit are effectively fixed — by the time you can move planetary masses around you don't need to live on planets any more (like the Puppeteers of Niven's "Known Space" stories). Composition and density are similarly immutable. Atmosphere can be altered, by either large-scale brute-force methods (slamming comets into a planet to increase the supply of volatiles) or the application of genetically tailored microorganisms (to change gases like carbon dioxide and ammonia into nitrogen, oxygen, and water). Changing atmosphere can indirectly affect climate, as thickening and altering the composition changes the greenhouse effect.

A species can also alter a planet's climate by brute force. Using orbital mirrors to warm a cold world or "sunshades" to cool a hot one is surprisingly possible. There are practical limits — altering temperature by more than 50 degrees Centigrade is probably impossible.

In *HERO System* terms, these are all applications of the *Change Environment* Power. Dropping a comet on a planet to thicken the atmosphere is:

Change Environment 1" radius (increase atmospheric pressure), *MegaArea* (1" = 10,000 km; +1 ¼) (11 Active Points); 1 *Continuing Charge* lasting for 1 Century which Never Recovers (-0), *Side Effect* (EB 14d6 [physical] with a 10 km area *MegaScale Explosion* centered on target point, always occurs; -2), *Requires A PS: Planetology Roll* (-¼). Total cost: 3 points.

Mirrors or sunshades to change the temperature are:

Change Environment 1" radius (raise or lower temperature), *MegaArea* (1" = 10,000 km; +1 ¼), *Reduced Endurance* (0 END; +½) (14 Active Points); *OIF Fragile Immobile* (orbital mirror/sunshade; -1 ¾), *Gradual Effect* (25 years; -3 ¼), *Requires A PS: Planetology Roll* (-¼). Total cost: 2 points.

Continued from last page

leading to fires *inside* a spacesuit if they encounter an errant spark or too much friction. Hydrogen can also bond with oxygen to form water vapor, which is itself corrosive.

Methane: Like hydrogen (with which it's usually found), methane is also dangerously flammable.

Nitrogen: Although necessary for life on terrestrial worlds (Earth's atmosphere is about three-fourths nitrogen), by itself nitrogen is unbreathable.

Nitrogen Oxides: Various compounds of nitrogen and oxygen are highly corrosive.

Oxygen: Oxygen, obviously, is necessary for terrestrial life. However, a world can have too much of a good thing; oxygen is both flammable and corrosive if it composes about 30%, or more, of a world's atmosphere.

Sulfur: Sulfur exists mainly in various compounds, many of them corrosive or toxic.

Altering atmospheric composition using microorganisms is:

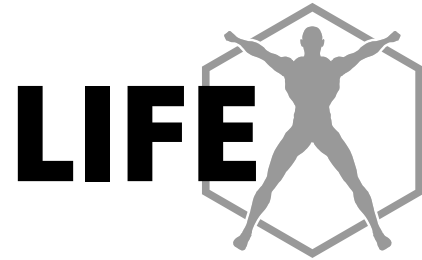
Change Environment 1" radius (alter atmospheric composition in one specific way), *MegaScale* (1" = 10,000 km; +1 ¼), *Reduced Endurance* (0 END; +½), *Uncontrolled* (power stops functioning when microorganisms expire; +½) (16 Active Points); *Gradual Effect* (5 Years; -3), *Requires A*

Life as early twenty-first century Humans know it is made up of complex carbon molecules (nucleic acids, proteins, and carbohydrates) existing in a solution of water. This is by far the most common type of life in the Galaxy, and seems to develop wherever liquid water and simple carbon compounds are available. Any planet with an average temperature between -20 and 50 degrees Centigrade is likely to develop life. This includes colder planets which reach the liquid water range as a result of eccentric orbits or



PS: *Planetology Roll* (-¼). *Total cost: 4 points.*

Because these forms of terraforming use Change Environment, they have to be maintained — remove the orbital mirrors, or let the microorganisms die out, and the transformation of the planet quickly wears off. Permanent changes require Mega-Scaled Area Of Effect Major Transforms.



tidal heating. Planets which get hotter than 50° C have boiling oceans too warm for complex molecules.

This section deals only with the possibility that life exists, and its general type. Chapter Six discusses the nature of sentient alien life and alien societies.

EXOTIC LIFE

Interstellar explorers in Space Opera or Pulp SF settings may encounter life forms based on chemicals very different from those found in terrestrial life. Most of these kinds of life require a fairly narrow range of conditions, and so are much less common than life based on carbon molecules in water. Gamemasters who want to throw in some exotic forms of life can choose from the following possibilities.

CARBON-AMMONIA

On Very Cold planets with substantial amounts of liquid ammonia, life forms similar to carbon-water organisms can evolve using ammonia as a solvent instead. Carbon-ammonia beings require a temperature range of -80 to -30 degrees Centigrade and a methane-ammonia atmosphere.

CARBON-HYDROGEN

Hydrogen can act as a solvent for carbon compounds at temperatures between -250 and -260 Centigrade (higher in the immense pressures of a gas giant world). Hydrogen-based life does not alter its environment because it can only form in places with no sunlight or other sources of external energy.

CARBON-METHANE

On still colder worlds where methane exists in liquid form, it is possible to have life forms made of carbon molecules in a methane medium. Methane-based life requires Extremely Cold temperatures between -180 and -160 degrees Centigrade, and a planetary atmosphere rich in methane and hydrogen.

ENERGY BEINGS

How beings of “pure energy” could exist and remain stable is unknown. If such a thing is possible, energy beings would probably evolve in a very high-temperature environment with strong magnetic fields. Rock-Iron worlds with Very Hot or Extremely Hot climates and Thin or Trace atmospheres rich in argon seem to be the best candidates. Energy-based beings do not have a direct effect on a planet’s atmosphere or environment.

FLUORINE-SILICON

Organisms with a complex body chemistry based on fluorosilicone compounds can evolve on Extremely Hot planets with fluorine and carbon dioxide atmospheres. They require a temperature range of 400 to 500 degrees Centigrade.

FLUOROCARBON-SULFUR

Where liquid sulfur is present, on planets with a temperature range of 150 to 400 degrees Centigrade and atmospheres poor in oxygen but rich in fluorine, life forms based on fluorocarbons and sulfur can evolve. Such organisms can create atmospheres which Humans can actually breathe, as they release oxygen from carbon dioxide to make complex fluorocarbon molecules.

LIQUID HELIUM

Far out from any star, in the reaches where planets move through space warmed only by the residual heat of the Big Bang, helium can exist as a liquid, at temperatures approaching absolute zero (-270 Centigrade). The organisms based on liquid helium are very alien, and do not make use of chemical reactions at all. Helium-based life does not alter the planetary environment.

COMPLEXITY

Having determined the type of life, next figure how complex it is. Use the planet’s age in billions of years (from the Star System Data Table on page 77) and consult the Life Complexity Table. For a little variation, roll 1d6 — on a 1 the planet’s life is one level more primitive, on a 6 it is one level more advanced.

INTELLIGENT LIFE

This is the big question. Does the planet have intelligent life? Worlds without sentient inhabitants may nevertheless be interesting places to visit, but to cause real problems you usually need sentient beings.

Hard Science: All evidence available to Human science at the start of the twenty-first century indicates intelligent life is very rare. For any world with multicellular life roll 4d6; on a result of 24 exactly, there is an intelligent species. This translates to a 1 in 1,300 chance of intelligence, which is about in line with Earth’s history (multicellular life for the past billion or so years, Humans for the past million).

LIFE COMPLEXITY TABLE

Planetary Age In Years	Types Of Life
1 billion or less	Prebiotic (complex molecules but no organisms)
2 billion	Single-Celled organisms
3 billion	Plants
4 billion or more	Multicellular organisms

Space Opera: In science fiction stories, intelligent life turns out to be much more common. Roll 2d6 and give the planet intelligent life on a 12. Note also that many worlds in SF turn out to be ancient colonies.

COLONIES

Even if they lack indigenous sentient life, potentially life-supporting planets may house colonies of species from other worlds. To determine if a planet is home to a colony, roll 2d6 and apply the modifiers in the Colonies Table, then subtract 11. The result is the number of colonies. Some colonies may be quite old, on the order of centuries or millennia, making the inhabitants effectively native to the world. The age of a colony is up to the GM.

COLONIES TABLE

Modifier	Condition
+1	Green Zone
+1	Temperature between 0 and 50 degrees Centigrade
-4	Gas Giant
+1	Lifebearing World
+1	Spacefaring civilization on another planet in the system
+1	Valuable Resources

MULTIPLE SPECIES

In classic Pulp science fiction there are many examples of planets with two or more sentient species. This is not as odd as it sounds; in the distant past two or more hominid species may have co-existed on Earth. When rolling randomly, GMs can roll a second time for intelligence (using either the Hard Science or Space Opera options) — if the dice come up all sixes again, there are two sentient species. Conceivably the process can go on as long as the GM keeps getting boxcars. (A planet with three or more native sentient races could be a very interesting place.)

The relationship of two species on a single world depends a great deal on how much they compete with one another. Two sentient species with the same diet and the same climate preferences are likely to fight fiercely with one another, and may wind up living on separate continents. But a pair of species who don’t compete — say, a land-dwelling race of vegetarians and a coastal fish-eating race — may have perfectly amicable relations and even develop into a single biracial civilization.



QUICK PLANET CREATION

- Step 1: Check orbital eccentricity, inclination, and determine year length
- Step 2: Determine mass by rolling on the Planetary Mass Table.
- Step 3: Determine composition on the Planetary Composition Table, then compute density based on composition.
- Step 4: Compute diameter, equal to the cube root of (mass divided by density) in Earth diameters. Multiply by 12,800 to get kilometers.
- Step 5: Determine gravity by multiplying density by relative diameter.
- Step 6: Roll on the Moons Table to determine how many moons the planet has; figure orbital distance by rolling the the Moon Distance Table; determine size by rolling on the Moon Size Table; check the Moon Anomalies Table.
- Step 7: Roll on the Planetary Rotation Table to determine day length; check the Rotation Anomalies Table; roll for axial tilt on the Axial Tilt Table.
- Step 8: Determine atmosphere composition by rolling on the Atmospheric Composition Table.

Two planets can have identical atmospheres and climates and still be vastly different. The amount and arrangement of land on the surface makes some worlds rich and prosperous while others are nearly uninhabitable.

HYDROSPHERE

The *hydrosphere* of a planet is how much of its surface is covered by water. This is influenced by several factors. Since a planet's oceans are formed of water released by volcanic activity, big planets (which are more active) tend to have more water

PLANET CLASSIFICATIONS

At present, scientists only have the planets of the Solar System and a few bodies detected around other stars to study. They have only been able to recognize some very general types — gas giants, solid planets, and icy bodies like Pluto. An interstellar society with data on hundreds of star systems and thousands of planets might come up with a set of standard “planet classes” as a shorthand for scientists and explorers. For example, in the *Star Trek* series, planets get a letter classification — habitable Earth-like worlds are “Class M,” gas giants like Jupiter are Class J, and so forth.

The exact criteria for a planetary classification scheme depend on who is doing the classifying, and why. Space travelers and merchants might simply group them into “inhabited” and “uninhabited,” while planetologists could have a highly detailed system based on internal structure and chemical composition.

The Terran Empire, in the Hero Universe timeline, uses a system of loose types geared mostly toward determining a planet's suitability for colonization or economic exploitation. The types are denoted by numbers, on a scale which indicates the planet's usefulness:

Type	Description
1	Earthlike planets with compatible native life
2	Lifebearing worlds requiring life support for Humans
3	Planets suitable for terraforming (Mars)
4	Icy dense-atmosphere worlds (Titan)
5	Airless rocky worlds (Moon, Mercury)
6	Airless icy worlds (Pluto, Europa)
7	Asteroids (Phobos, Ceres)
8	Greenhouse planets (Venus)
9	Small gas giant planets (Uranus, Neptune)
10	Large gas giant planets (Jupiter, Saturn)

than small ones.

Climate also plays a big role. Worlds which are Hot have only half as much ocean because a large amount of water is in vapor form. Very Hot or Extremely Hot worlds have no oceans at all.

Very Cold or Extremely Cold worlds have no oceans of water, but might have seas of ammonia or liquid methane. If those chemicals exist and the planet has a Dense atmosphere, the GM may roll for the coverage of other liquids. Otherwise they have a Hydrographic percentage of zero.

Finally, there is a random element depending on how rough the surface is. A planet with deep ocean basins could have a lot of water but still have plenty of dry land; a smooth planet with little relief might be completely covered by a shallow ocean.

To compute hydrosphere randomly, roll 2d6 and multiply by 10 percent. (Apply the modifiers in the accompanying table.) Add or subtract 1d6 percent for some variability, if you want. The result is the amount of surface covered by ocean. If the result is 10 exactly, then the planet has large islands; an 11 indicates a few small islands; and 12 means a true “waterworld” with absolutely no land at all.

HYDROSPHERE MODIFIERS

Modifier	Condition
+1	Planetary mass greater than 1.25
-1	Planetary mass less than .75
+1	Warm climate
-1	Cool climate
-2	Cold climate

DOMINANT TERRAIN

The terrain of a planet varies widely, of course — just think of all the different landscapes on Earth. The most important factors in figuring landscapes are hydrosphere, climate, and tectonic activity (a function of mass). Hydrosphere indicates how much of the surface is desert, climate tells how much tundra or icecap there is, and mass gives an idea of how mountainous the world is. But because so much depends on random accidents of the planet's history, there is no convenient formula. The GM simply has to decide on his own.

Earth's land surface has approximately 25 percent desert, 10 percent ice cap, 10 percent tundra, and 5 percent mountainous terrain. The rest is a mix of tropical forest, temperate forest, grassland, and wetland.

Since Earth is 70 percent ocean and still has deserts, any world with less water is likely to have

very extensive deserts. A good rule of thumb is that the non-desert portions make up a percentage of the planet's land area roughly equal to the percentage of the planet as a whole that is covered by land. So a world with 50 percent ocean area would have land that is 50 percent desert, and a planet with 30 percent ocean would have desert covering 70 percent of its land surface.

Icecaps depend on climate and hydrography. The ice surface varies between 0 percent (on Warm worlds) and 100 percent (on Very Cold planets). For every 2 degree of temperature below 50 degrees Centigrade, increase the ice cap and tundra coverage by 1 percent each. Ice caps can never cover more of the surface than the oceans.

Mountains depend on how active the planet's crust is. Small planets like Mars have few mountains (but those it does have are really big because they stay in one place and keep growing). Multiply the planet's mass by 5 percent to get the amount of the surface covered by mountains. Obviously, the result cannot be greater than the total land surface.

The other terrain types depend heavily on the local life forms and the way the continents are. One can assume that drier worlds are likely to have more grassland, wetter ones to have more wetlands, hotter ones to have more tropical forest, and cooler ones to have more temperate forest. But a cold planet might have all its continents in the relatively warm equatorial regions, and so have a high proportion of tropical landforms.

RESOURCES

There are ten types of resources found on planets:

- Heavy Metals
- Metals
- Nonmetals
- Volatiles
- Organics
- Plants
- Animals
- Crafts
- Manufactures
- Specialties

Of course, this is a highly simplified list. The first five are found on nearly every world, though quantities may vary and it may be easier to extract certain minerals on certain planets. Animals and plants are found on just about any lifebearing world, but certain species with valuable properties may exist in only a



single environment on one planet. The products of intelligent species obviously come only from planets that have inhabitants capable of making them.

Gamemasters creating a world randomly can roll for each resource type using 1d6. On a roll of 1, the planet is poor in that material, on a 6 it is rich. The description of each category, below, includes modifiers based on the planet conditions. Worlds rich in a given resource are likely to be exporters, while worlds poor in something must import it or do without. Planets in the middle range have enough to supply local demand. Gamemasters building a world should only bother listing the rich and poor resources on the template unless more detail is desired or necessary.

HEAVY METALS

Heavy metals are radioactive substances like uranium and thorium, or precious metals like gold and silver. They have many applications — at lower technology levels they are valued as money, and at higher ones they become useful as sources of nuclear power, or in construction of electronic devices. Heavy metals, like other metals, are most common on rock-iron planets, and can be found on rock and rock-ice worlds as well. The more dense a planet is, the more likely it is to have heavy metals in quantity. Rock-iron planets get a +1, rock-ice planets get a -1, and ice planets get a -4. The roll gets an additional +1 if the planet's density is greater than 1.

METALS

Metals are substances like iron, aluminum, copper, and titanium. They are most often used for

Continued from last page

Step 9: Determine atmosphere density by rolling on the Atmospheric Density Table, then calculate pressure by multiplying atmosphere density by surface gravity.

Step 10: Determine climate, either by calculating temperature based on distance or by using the base temperature for the planet's orbital zone. Modify for albedo, tidal heating, and greenhouse effect.

Step 11: Determine if the planet has any native life. If so, modify the atmosphere accordingly, then refigure climate.

Step 12: Roll on the Life Complexity Table to see what kind of creatures exist.

Step 13: Roll to see if any intelligent life exists (a 2d6 result of 12, or a 24 on 4d6 for hard science); check to see if the planet has any colonies on it.

Step 14: Determine ocean coverage by rolling 2d6 times 10 percent, with modifiers for mass and climate.

Step 15: Determine the dominant terrain based on climate, hydrography, and mass.

Step 16: Roll 1d6 for each resource category; on a 6 the world is rich in those resources, on a 1 it is poor (use modifiers based on other planetary characteristics).

structural purposes, particularly in civilizations with industrial-era or higher technology. Metals are common on rock-iron worlds, available on rock worlds and rock-ice worlds, and rare on ice worlds. More massive planets tend to have more metals. The die roll is +1 for rock-iron planets, unmodified for rock and rock-ice, and -4 on ice planets. There is a +1 modifier for planets with a mass greater than 1 Earth.

NONMETALS

Nonmetals are solid substances like sulfur, silica, crystals, potassium nitrate, and the like. They have a variety of uses, both as materials for ceramics and as feedstocks for chemical industries. Crystals are nonmetals, and in fiction often have remarkable properties. Nonmetals are most common on rock worlds, and are available on all others except gas and hydrogen planets. Rock worlds get a +1 for nonmetals, others are unmodified.

VOLATILES

Volatiles are liquids and gases, especially water, ammonia, hydrogen, helium, and the like. They are hard to find on Yellow zone planets, but are available in the Green zone and are common in the Blue and Black zones. Rock-ice and ice planets have good supplies of volatiles. Volatiles have three main uses: as fuel for rocket-powered spacecraft; as the raw materials for life support for ships and space stations; and as the basis for a great many chemicals. Planets in the Yellow zone get a -4 modifier on the roll for volatiles, worlds in the Blue and Black zones get a +1. Ice and rock-ice planets get a +3 modifier.

ORGANICS

Organics are chemicals made from the amazingly versatile element carbon. They range from simple substances like methane and cyanide to complex lipids, alcohols, and petrochemicals. Organics are very rare on Yellow zone worlds as the high temperatures break them down. On Green zone worlds with life, organics are found in the biomass. In the Blue and Black zones primordial organics can be found, especially on worlds with abundant methane. Organics are an important energy source at industrial-era technology, and are also vital for making plastics, pharmaceuticals, or chemicals. Yellow zone worlds get a -4 on the roll for organics, rock-ice and ice planets get a +1, and any world with life that is water-based, ammonia-based, or methane-based get a +3.

PLANTS

Plants and plant products are only available on planets where plant life has evolved. Plants in general are common on such worlds, but particular species with special properties can be exceedingly rare. They are most commonly used for food, but plant extracts can also be a source of pharmaceuticals or spices. Trees and similar big plants provide materials for building, and other plants supply fibers for cloth. When rolling for the resource, one can assume that there are plants growing all over

any world with life in the Yellow, Green, or Blue zones; the die roll indicates how useful or valuable the world's plants are.

ANIMALS

As with plants, animals exist only on lifebearing worlds. Not all lifebearing planets have animal life — the GM should decide if a given planet does. Animals are used for food by many races, and their skins are a traditional material for clothing. Some animal species produce toxins or other substances which can have importance as medicines. The roll for animal resources requires that the planet have native multicellular life, but is otherwise unmodified.

CRAFTS

Crafts are the products of preindustrial cultures, chiefly from societies at Stone Age through preindustrial technology. Pottery, cloth, woodwork, and items made of bone and leather are typical crafts. Their value in interstellar trade derives mostly from aesthetic value, and they are treated as artworks. When rolling randomly, treat a die result of 1-5 as neutral — the planet's people make crafts for their own use but don't export anything. A result of 6 means the culture's crafts are interesting or beautiful enough to have value elsewhere. The roll for crafts has no modifiers, but obviously the planet must have intelligent inhabitants with manipulatory limbs to make them. (For an example of an intelligent species without manipulatory limbs, and the problems this causes, see Arthur C. Clarke's short story "Second Dawn.")

MANUFACTURES

Manufactures are those products made in factories at industrial or later technology. Manufactured goods are seldom as lovingly made or beautiful as handcrafts, but they are vastly cheaper and available in enormous quantities. This means factories are built only when there is a sufficiently large market for their wares. Many planets import manufactured goods, either because the local technology cannot produce them or because the local population is too small to support a factory. The range of manufactured goods is vast — from plastic trinkets to starships. When rolling randomly, all worlds with preindustrial technology get a -1; a spacefaring or higher technology get a +1. A planetary population below 1000 gives a modifier of -2, and population less than 1 million gives a modifier of -1.

SPECIALTIES

Many worlds have some resources which are the result of particular local conditions and do not occur elsewhere. They may be natural products or items made only by one culture on that world, or luxury items like a unique mineral water. On a roll of 6, a planet has some special resource; the GM gets to decide what it is.

OTHER OBJECTS



Planets are not the only things one can find circling a star. There are asteroids and comets, space rubble which may turn out to be more useful in some ways than planets themselves. Intelligent beings can construct space stations and habitats. And extremely advanced civilizations may construct really huge structures bigger than worlds.

ASTEROIDS

Asteroids are small bodies orbiting a star. They range in size from a kilometer across to 1,000 kilometers in diameter. All asteroids are airless, and have a surface gravity of 0.01 G or less. They have no surface water, but may contain deposits of ice.

In the Solar System, the asteroids are most common in the Asteroid Belt, a loose collection of bodies orbiting between Jupiter and Mars. Any planetary mass result of 0 during planet generation indicates an asteroid belt. Other star systems may have multiple asteroid belts, and young stars won't have anything else.

The exact composition of asteroids varies. Some are stony-iron bodies, composed of rock and metal with little in the way of volatiles. These are most common in the inner system (the Red, Yellow, and Green zones), although they can be found anywhere. Carbonaceous asteroids are rich in carbon and volatiles, though rock and metal still makes up the bulk of their mass. Carbon asteroids are most common in the Green and Blue zones. In the outer system (the Black zone), comets predominate.

The structure of asteroids also varies. Some are simply huge single chunks of rock or iron, possibly with a coating of dust pulverized by eons of meteoroid impacts. Others have been shattered by large impacts, or formed by low-energy collisions, and so are really just a collection of fragments loosely packed together.

Humans operating on an asteroid face several hazards. The surface of an asteroid is essentially "outer space," with no protection from cosmic rays or solar heat. (See page 281 for conditions in space.) The low gravity means staying on an asteroid's surface can be difficult. On small bodies (up to 20 kilometers or so) a vigorous leap can send one into a long ballistic path, sometimes circling the entire asteroid. Explorers and workers need tethers to keep from "falling off" into space.

The surface of an asteroid is likely to be a mass of powder like Moon dust. In the minuscule gravity, any motion quickly raises a cloud of obscuring dust. Each Phase characters must make a PS: Zero-

G Operations roll, or a DEX Roll at -3, to avoid kicking up dust. On a failed roll, the character is surrounded by one hex of dust, which functions as Darkness to Sight Group (and, depending on composition, possibly the Radio Sense Group and senses like Sonar). The dust settles in 6 Segments unless the character fails another roll. In a battle situation, characters may choose to kick up a lot of dust deliberately, to block laser weapons and sensors.

Their low gravity makes asteroids attractive for space mining and manufacturing because there is no need to waste much energy hauling mass out of a deep gravity well. Asteroids with ice deposits could draw colonists, tunneling into the rock and farming under domes or bright lights.

To determine if a system has asteroid colonies or bases, the system must either have a planet with spacefaring technology, or the system must be claimed by a spacefaring civilization. If either of those is the case, roll 2d6-11 and add 1 for each



TARGET: ASTEROID!

If a starship has to shoot at an asteroid, comet, or the like for some reason, the GM needs to determine how much damage the target can withstand.

Defense

A rock asteroid has DEF 5; a rock-metal asteroid has DEF 5-7; an ice asteroid or comet has DEF 2-4.

BODY

To determine BODY, assume the object is a sphere. Determine its radius in hexes. To find out the volume of hexes in the object, cube its radius (multiply it by itself, and then multiply that product by the radius), then multiply that product by pi (3.14), and then multiply that product by 1.33. (In short, use the formula $4/3\pi r^3$.) The end result is the volume of cubic hexes in the object.

A rock or rock-metal asteroid has 19 BODY per hex. An ice asteroid or comet has 13 BODY per hex. Apply the standard rules (+1 BODY per doubling of size) to determine overall BODY.

Here's how much BODY to add, based on size:

- 5" radius: +9 BODY
- 10" radius: +12 BODY
- 20" radius: +15 BODY
- 50" radius: +19 BODY
- 100" radius: +22 BODY
- 200" radius: +25 BODY
- 1 km radius: +29 BODY
- 100 km radius: +49 BODY

See *Target: Earth!*, page 197, for more information and ideas.

inhabited planet in the system. The result is the number of asteroid bases. To determine population, roll 1d6 and consult the Asteroid Population Table.

Asteroids can have resources just like planets. It's safe to assume nobody would settle on a given asteroid unless it was rich in something. Stony-iron asteroids are rich in either metals, heavy metals, or nonmetals. Carbonaceous asteroids have metals, nonmetals, and organics. Comets have volatiles, organics, and nonmetals. Any asteroid with a Colony or Large Colony is assumed to produce Manufactures as well.

ASTEROID POPULATION TABLE

Roll 1d6	Population
1-2	Small base (1d6 x 5 people)
3	Medium base (1d6 x 10 people)
4	Large Base (1d6 x 100 people)
5	Colony (1d6 x 1,000 people)
6	Large Colony (2d6 x 10,000 people)

FLYING IN ASTEROID BELTS

A staple of science fiction movies is for a hero being pursued by a numerically- or technologically-superior enemy to duck into an asteroid field, using his superior reflexes to avoid a collision. Not only does this offer him visual and physical cover from his pursuers, but since they don't have the same degree of piloting skill he does, they end up smashing into the big, floating rocks.

To pull this trick, a PC pilot has to make a Combat Piloting roll *every Phase* to avoid colliding with an asteroid. The difficulty of the roll depends on how densely packed the asteroids are:

Belt Density	Modifier
Very light	+2
Light	+1
Average	+0
Tight	-3
Very Tight	-6
Extremely Tight	-9

Even "Very Light" assumes the asteroids are close enough together that the character's ship passes a few each Turn. If they're extremely diffuse — as in Earth's asteroid belt, where there's an average of a million kilometers between asteroids — characters don't have to roll at all, but they gain no cover, either.

Failing a roll indicates a collision. If the roll fails by 1-3, the character merely swipes (or is swiped by) an asteroid, and takes its velocity divided by 5 in dice of Normal Damage. If the roll fails by 4 or more, it takes its velocity divided by 3 in dice of Normal Damage (or more, at the GM's discretion).

If the character can make the rolls, in some cases his ship becomes harder to hit with attacks, thanks to the cover of the intervening rocks:

Belt Density	OCV Penalty
Tight	-2
Very Tight	-4
Extremely Tight	-6

Of course, ships may still be able to obtain cover behind individual asteroids, in the GM's discretion; if so, normal Concealment rules apply.

COMETS

Comets are similar to asteroids, but are composed mostly of ice, with chunks of rock embedded in them. They are found in the Black zone of all star systems. Like asteroids, comets represent valuable resources due to their accessibility. Because they're so far out from the central star, they're less suitable for colonization. As with asteroids, they are only colonized if the system contains a spacefaring planet or is owned by a starfaring civilization. Roll 2d6-12 and add 1 for each inhabited planet; the result is the number of comet bases in a system. Roll on the Asteroid Population Table with a -1 penalty to get the population of a comet base.

See page 71 for more information about, and ideas for, comets.

SPACE HABITATS

Sometimes there isn't a convenient planet or asteroid where people want to live or work. In that case they need an artificial habitat, like a space station or star base. These can be anything from a trailer-sized orbital laboratory (like Skylab or Mir), to a large permanent station (like Deep Space 9 in the *Star Trek* universe) to a giant self-sufficient space city (like Babylon 5 in the television series of the same name). See page 208 for more on Bases in space.

As with asteroid or comet colonies, a system must hold or be controlled by a spacefaring civilization. If that is the case, roll 2d6-12 and apply the following modifiers: +1 if there are one or more asteroid colonies, +1 if there is more than one inhabited planet, and +1 if the system is on an important trade route. The result is the number of major stations. Roll 2d6 on the Space Station Table to determine the size of each station.

SPACE STATION TABLE

Roll 2d6	Station Type and Size
2-7	Small Station (1d6 x 5 people)
8	Medium Station (2d6 x 10 people)
9	Large Station/Star Base (1d6 x 100 people)
10	Large Star Base (2d6 x 100 people)
11	Small Colony (2d6 x 1,000 people)
12	Large Colony (2d6 x 10,000 people)

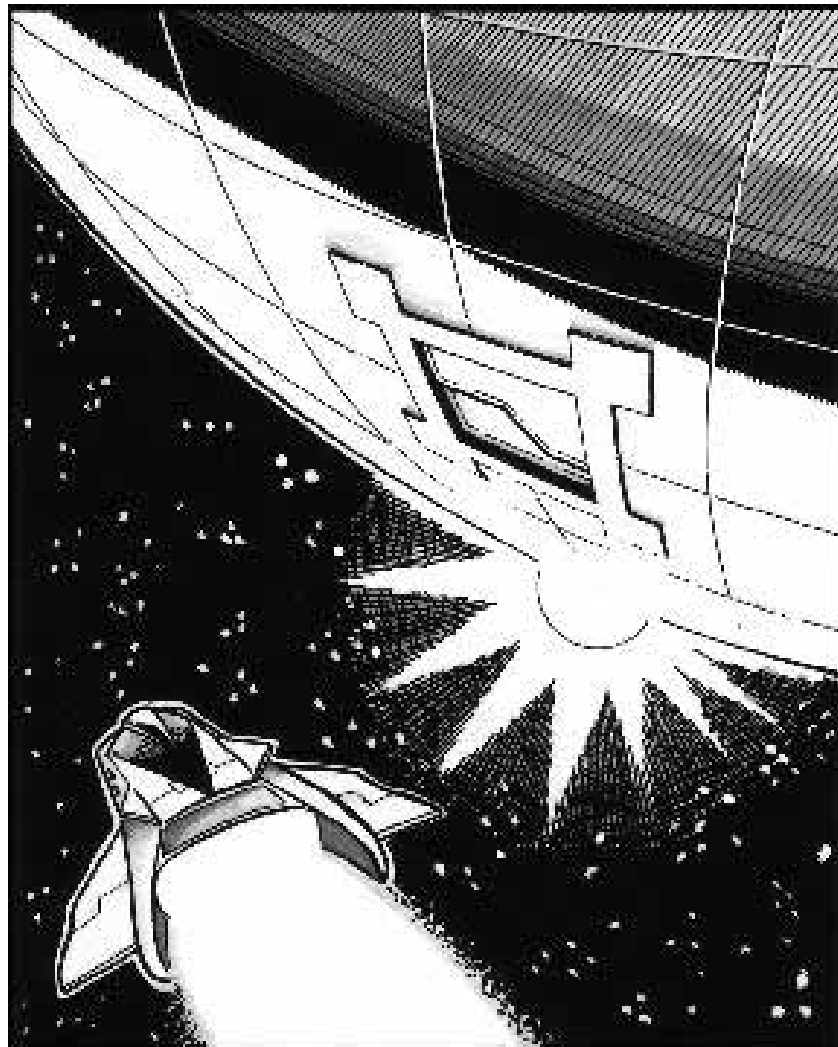
Megastructures

Highly advanced civilizations can build really big structures, bigger than planets. A society at the “stellar engineering” stage may well build things on the scale of stars.

All megastructures are impossible to place randomly; the GM must decide which systems have them. Exploring even a small megastructure would be an entire campaign in itself. Given their potentially huge populations, a single megastructure could easily dominate all the nearby systems. In the case of a Dyson sphere or ringworld, the inhabitants may simply disregard planets as too tiny to be worth conquering.

ORBITALS

A common type of habitat in Iain M. Banks’s “Culture” series is the *orbital*. An orbital is nothing but a really really big space colony — a ring some 400,000 kilometers across and hundreds or thousands of kilometers thick, turning once a day and producing gravity by spin. In Banks’s novels most orbitals are made up of smaller segments called plates, so that the whole thing can be built incrementally over time. An orbital 4,000 kilometers thick would have a surface area of about a trillion square kilometers — two thousand times the Earth itself — not to mention any usable interior volume.



Making an orbital that size would take only a fraction of the Earth’s mass, so dismantling one Terrestrial-sized planet would create thousands of times the living space of that planet’s surface. A star system could hold dozens or hundreds of orbitals, each with tens of billions of inhabitants.

TOPOPOLIS

Larry Niven’s essay “Bigger Than Worlds” noted another interesting type of megastructure called a *Topopolis*. The idea is simple — a tube one or two kilometers across, looped around the central star in a big circle the size of a planet’s orbit. The result is a long, thin doughnut. Since it’s orbiting, the topopolis would be in zero gravity, but its designers can rotate the tube for spin gravity. This is possible because the diameter of the tube is so tiny compared with the enormous scale of the ring around the central star; it behaves locally like a straight cylinder.

A single-loop topopolis would have an area of about 2 billion square kilometers, or four Earths. But as Niven pointed out, the civilization can go on adding loops almost indefinitely, with fractionally smaller or larger diameters, inclined so as not to block one another’s sunlight. A planet like Earth could furnish material for 5,000 topopolis loops, enough room for 100 trillion people!

RINGWORLDS

Niven also devised the idea of a *ringworld* — a huge ribbon like an orbital, but as wide as the Earth’s orbit around the Sun. A ringworld requires super-scientific building materials (in other words, stuff with impossible properties by modern standards) and a mass equal to ten Earths. However, it would provide living space equal to at least 20,000 Earth-sized planets, allowing a population in the hundreds of trillions with no crowding. (The ringworld in Niven’s stories has 600 trillion square miles of surface area, the equivalent of three million Earths!)

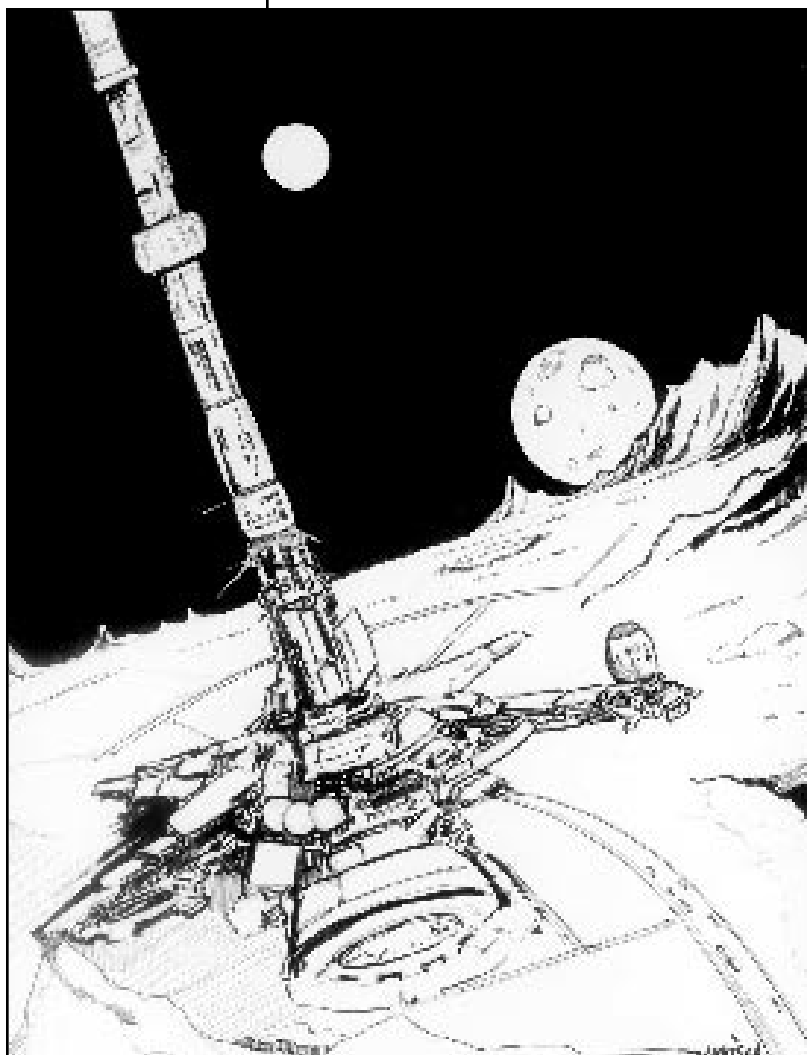
The chief problem with a ringworld is that it isn’t in orbit. It’s spinning to create gravity, but it’s just parked around the central star. Such a situation is unstable over the long term. Niven suggested

the use of large Bussard ramjets as attitude thrusters, or the builders might use the solar wind to keep the ringworld centered. His novels *Ringworld*, *The Ringworld Engineers*, and *The Ringworld Throne* turn in large part on Hard SF facts about how such a structure would be built and maintained, and contain many fascinating ideas for GMs looking to include ringworlds in their *Star Hero* settings.

DYSON SPHERES

The ultimate megastructure is to enclose an entire star in a sphere. This would capture all of the star's energy output, and would allow a population in the billions of billions!

There are two ways to go about this. Freeman Dyson's original idea envisioned simply surrounding the Sun with a swarm of orbiting habitats and solar collectors. But later visionaries and SF writers liked the notion of a single huge structure, a sphere as big as the Earth's orbit. Such a sphere would need artificial gravity, because it couldn't spin (the poles would still be in zero-G), or else the inhabitants would simply have to learn to live in freefall. The sphere wouldn't be in orbit, and it wouldn't need to be — the net gravity over a hollow sphere is zero, so it could exist in a stable arrangement for millennia.



MEGA-BASES

Characters with serious claustrophobia may want a megastructure as a private base. Point costs are pretty high, and include no resources whatsoever beyond the space itself. Gamemasters should consider using the alternate rules for large Bases on page 209 and just assigning a flat cost for each of these mega-Bases (950 to 1,850 points, depending on location and resources).

Orbital: An orbital 400,000 km across and 4,000 km thick would have a surface area of approximately 500 trillion hexes, at a cost of 138 points. It has BODY 20 (18 points), DEF 10 (24 points). It's a location in Space (25 points). The orbital provides Life Support for its inhabitants (self-contained breathing and protection from vacuum and radiation; 14 points). Total cost: 219 points.

Topopolis: A single-loop topopolis at Earth's orbit with an internal diameter of 2 kilometers would have an area of 1.5 quadrillion hexes, costing 144 points. It has BODY 15 (13 points), DEF 10 (24 points). It's a location in Space (25 points). The topopolis provides Life Support for its inhabitants (self-contained breathing and protection from vacuum and radiation; 14 points). Total cost: 220 points.

Ringworld: A ringworld has a surface area of 600 trillion square miles (1.5 quadrillion square kilometers), or approximately 750 quadrillion hexes, costing 170 points. It is very tough, with BODY 30 (28 points), DEF 30 (84 points). It's a location in Space (25 points). The ringworld provides Life Support for its inhabitants (self-contained breathing and protection from vacuum and radiation; 14 points). It has the Physical Limitation *Unstable* (requires constant effort/maintenance to keep it functioning properly; All The Time, Slightly Impairing; -15). Total cost: 306 points.

Dyson Sphere: A solid Dyson sphere has a surface area of 70 hextrillion hexes (7×10^{22} hexes), at a cost of 220 points. The sphere itself isn't especially strong, with BODY 20 (18 points), DEF 10 (24 points). It's a location in Space (25 points). The sphere provides Life Support for its inhabitants (self-contained breathing and protection from vacuum and radiation; 14 points). Total cost: 301 points.



Universe, part three

THE SOLAR SYSTEM

Many science fiction stories take place right in Earth's backyard — in its solar system, in other words. The nine planets (and one asteroid belt) orbiting Sol are the cosmic real estate Humans know best, so it's only natural for science fiction authors to use them as the settings for stories. Since *Star Hero* GMs and players often have

similar motivations, this chapter provides a brief look at the solar system from a gaming perspective. Additionally, Earth's solar system can serve as an example of what solar systems are like, providing guidance to GMs who want to create their own. The chapter concludes with some information about other nearby stars and galactic features of interest.

EARTH'S SOLAR SYSTEM



VISITING THE SUN

While it may seem insane to think of landing on the Sun or even approaching within a few million miles of it, science fiction stories have imagined it. The key is to carry along enough insulation or enough matter to absorb the incredible heat before the characters roast.

In *HERO System* terms, visiting the Sun's "surface" (the photosphere, the edge of the opaque plasma of the Sun's atmosphere, where it's a mere 5,000° C) requires Life Support: Intense Heat, High Radiation, and High Pressure (5 Active Points). More realistically, it should also include a large amount of ablative armor to boil away. Immersion in the solar surface plasma inflicts 10d6 Normal Damage, Continuous, Armor Piercing, per Segment (*i.e.*, as if the Sun has SPD 12). Using the optional rules for Ablative that remove Active Points instead of imposing an Activation Roll (since a single failed Activation Roll could kill everyone aboard the ship!), for a five minute visit a Solar Exploration Module needs DEF 500 just to absorb the damage from the visit (it loses 20 DEF per Turn, at the rate of 5 Active Points' worth of DEF per Segment).

Descending deeper into the Sun (which has a diameter of 1.4 million km, or 700 million hexes)

Earth's solar system has nine planets. From closest to the Sun to furthest, they are: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, and Pluto. Additionally, there's an extensive asteroid belt between Mars and Jupiter, and a cloud of comets out beyond Pluto.

THE SUN

Earth's Sun is a type G2V star, a bright "yellow dwarf." As stars go, it's relatively large — most stars are type M dwarfs a tenth the Sun's mass. Composed almost entirely of hydrogen and helium, it has a mass 330,000 times Earth's, and is 1.4 million kilometers in diameter. Ninety-nine point nine percent of the mass of the Solar System is in the Sun itself; the planets are, essentially, debris. It rotates once every 27 days, which reveals the interesting fact that the planets contain most of the Solar System's angular momentum, even though the Sun has most of the mass.

About 4.6 billion years ago the Sun condensed from a cloud of dust and gas in some now-distant part of the Galaxy. As that cloud contracted, it heated up as gravitational potential energy turned to kinetic energy. That heat eventually made it possible for the Sun's core to begin fusion reactions. Over time, the Sun has gradually brightened — a billion years ago it was only about 90% as bright as it is today. This brightening will continue into the future, so that in another billion years Earth may well be uninhabitable.

The Sun is, as characters might expect, hot. Its surface temperature is about 5,000 degrees Centigrade, and at the core it can reach an unimaginable 15 million degrees.

SOLAR FLARES

Solar flares are eruptions on the surface of the Sun that release large amounts of energy. Often the flare is contained in a loop of the Sun's magnetic field, creating a huge "prominence" extending up to 100,000 kilometers above the surface of the Sun. Flares can release showers of charged particles and radiation, damaging electronics and posing a threat to character health and safety.

THE PLANETS

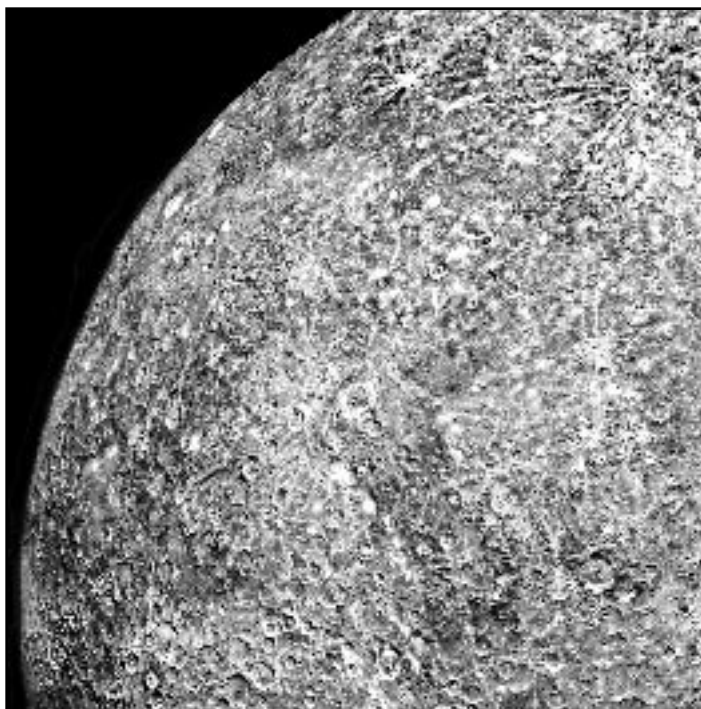
The nine planets of the Solar System have all been extensively observed through telescopes, and all but Pluto have been visited by space probes. Long before NASA got to any of them, science fiction writers were exploring the planets in stories.

Mercury

Diameter: 4,900 kilometers
Distance From Sun: .39 AU
Gravity: .37 G
Year: 88 Earth days/1.5 Mercury days
Moons: None
Orbital Velocity: 47.6 kilometers/sec
Atmosphere: None

Mercury is the innermost planet, an airless, cratered body half again as large as Earth's Moon. It is notable for its high density — almost that of the Earth, which is twenty times larger. Apparently, because it formed so close to the Sun, solar heat cooked all the lighter elements out of Mercury. That suggests, in turn, that it may be very rich in heavy metals, a mineral treasure trove. Because Mercury moves so quickly about the Sun, it's hard for spacecraft launched from other planets to reach it.

Observing Mercury by telescope is difficult



because of glare from the Sun. Consequently, astronomers goofed in determining Mercury's rotation period. The mistake was easy to make because Mercury's rotation (58 days) and orbital period (88 days) are "resonant" — it turns around three times for every two orbits. When astronomers got rare glimpses of the surface of Mercury, it appeared to keep the same face to the Sun. For decades in classic and pulp science fiction, Mercury was the one-face world, its bright side eternally baking under the harsh light of the Sun, its night side one of the coldest places in the Solar System, forever in shadow. Sadly, in the 1960s, radar observations determined Mercury's true rotation period, and the one-face world was no more.

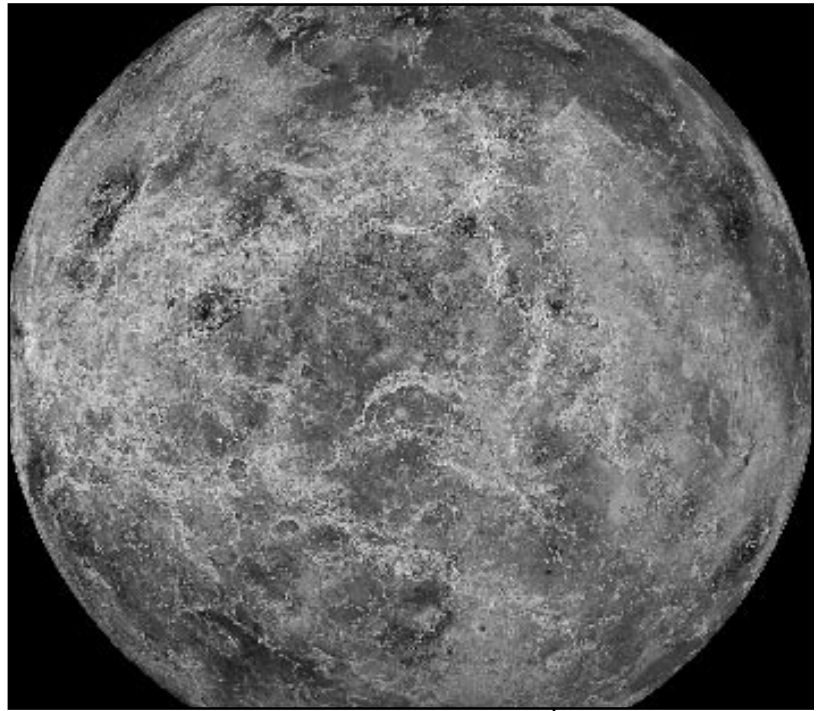
Adventures on Mercury often involve the monstrous heat of the Sun, either as something the heroes must survive, or as a lurking menace everyone must constantly worry about. When a member of the Mercury base crew goes mad and sabotages the cooling machinery, it's a race against time before the deadly dawn.

Venus

Diameter: 12,200 kilometers
Distance From Sun: .72 AU
Gravity: .88 G
Year: 223 Earth days/0.9 Venus days
Moons: None
Orbital Velocity: 34.9 kilometers/sec
Atmosphere: Dense (100 times the mass of Earth's)

Venus is a pretty close approximation of Hell. Its thick carbon dioxide atmosphere traps solar heat, raising the surface temperature to 450 degrees Centigrade (850 Fahrenheit) — hot enough to melt lead. Sulfuric acid rain blown by gale-force winds lashes the barren landscape, and intense lightning discharges occasionally zap the rocks. The surface pressure is 90 times that of Earth's atmosphere — equivalent to the pressure of the ocean a kilometer down. Explorers on the surface of Venus need armored diving suits with heavy refrigeration. The planet's day is 243 Earth days long, and Venus turns counterclockwise, so the Sun rises in the west on Venus and sets in the east.

This is all in sharp contrast to how Venus was long depicted in science fiction. Until the 1960s, all that was known about Venus was that it was wrapped in clouds. Scientists (and SF writers) naturally assumed they were clouds of water vapor, as on Earth. A planet covered by clouds must be a rainy, wet place. In fiction it was either a planetary ocean with no solid land at all, or else a vast steaming swamp, lush with plant life — maybe even dinosaurs!



The Moon

Diameter: 3,480 kilometers
Distance From Earth: 384,400 kilometers
Gravity: 0.16 G
Month: 28 days
Atmosphere: None

Earth's Moon is big — it would be perfectly at home among the planet-sized moons of the outer gas giants. What a relatively small planet like Earth is doing with such a big moon has kept scientists puzzled for decades. The current theory holds that the Moon formed from material blasted into space by a collision between Earth and a Mars-sized body early in the history of the Solar System. The result is that the Moon is similar in composition to the rocks of the Earth's crust.

The Moon's tiny gravity means it cannot hold onto any air or water (although there may be deposits of ice under the surface or in perpetually-shadowed craters at the poles). However, it also makes it easy for lunar explorers to carry heavy equipment with ease.

In fiction, the Moon is often portrayed as an industrial outpost, supplying raw materials for orbital colonies and factories. Earth's proximity means plenty of opportunity for economic rivalry and political conflict, ranging from wars of Lunar independence to a tense Cold War over inter-planetary trade. A Moon colony equipped with an electromagnetic catapult to launch cargoes into space could use it to bombard Earth with artificial meteorites.

THE LAGRANGE POINTS

The "Lagrange Points" are hot real estate in Earth orbit because the combined gravity of the Earth and Moon make them very stable locations. Satellites or space colonies at the Lagrange

Continued from last page

is even more dangerous. The next layer down, the convective zone, contains superhot gases; it's about two million degrees Celsius. It does 350d6 Killing Damage, Continuous, Armor Piercing (x2), Penetrating (x4), per Segment.

The next zone, the radiative zone, contains streams of photons coming from the core. It's about 5 million degrees Celsius, and does 560d6 Killing Damage, Continuous, Armor Piercing (x4), Penetrating (x8), per Segment.

Assuming a ship makes it all the way to the Sun's core — the region where the nuclear reactions occur — it encounters temperatures of 15 million degrees Celsius. The core inflicts 975d6 Killing Damage, Continuous, Armor Piercing (x8), Penetrating (x16), per Segment.

That certainly ought to be enough for the PCs to get a good suntan....

TERRAFORMING VENUS

When the true nature of Venus was discovered, some planetary scientists wondered if the planet was just waiting for life. Carl Sagan suggested shooting a few rockets full of fast-breeding single-celled plants into the upper atmosphere of Venus. The plants would convert the carbon dioxide of Venus's atmosphere to oxygen, reducing the greenhouse effect and eventually creating a habitable world.

Later discoveries indicate that it wouldn't be so easy — Venus is short on water and nitrogen, and there's that pesky sulfuric acid to worry about. Still, the notion of "bioterraforming" by letting the plants do their thing remains very attractive. The investment is low and the payoff is a whole planet to live on. Perhaps advanced genetic engineering could create plants to convert Venus's atmosphere to a more breathable mix.

TERRAFORMING MARS

Mars is too small and too cold to support Earthly life, but in both cases the margin is very slim. Making it warmer and giving it a thicker atmosphere could make Mars habitable over a scale of tens of thousands of years. Current plans envision doubling the planet's solar heat input by means of giant mirrors in space, and adding volatiles to thicken the atmosphere by sending comets smashing down onto the Martian surface.

Points can remain in place without using up a lot of fuel. There are five Lagrange points, but the two important ones are L4 and L5, located 60 degrees ahead and behind the Moon in its orbit. They are also called "Trojan points" because there are clusters of asteroids named after heroes of the Trojan War clumped at the Lagrange Points on Jupiter's orbit around the Sun.

Gerard K. O'Neill suggested that the Moon's Lagrange Points would be ideal locations for space colonies, as they could have easy access to Lunar materials for construction. A leading space colonization group was named the L5 Society in support of that notion.

In fiction, the Lagrange Points are often depicted as a cluster of habitats, ranging from big government-run space colonies to tiny stations inhabited by crackpots and criminals. A wealthy and prosperous Lagrange society might try to break away from Earth and become independent — no easy task when the space cities are all very delicate and vulnerable. Earth and the Lagrangians might be rivals for influence on the Moon and in the rest of the Solar System. A less powerful Lagrange culture might serve as a spacegoing version of Cold War Macao or WWII Casablanca — a lawless place where anything can be had for the right price.

Mars

Diameter: 6,800 kilometers
Distance From Sun: 1.5 AU
Gravity: .38 G
Year: 686.6 Earth days/672.6 Mars days
Moons: 2
Orbital Velocity: 24 kilometers/sec
Atmosphere: Trace

Mars is a fascinating world, worth a whole book to itself. Its atmosphere is very thin (surface pressure is about 0.5 percent of Earth's), and is composed of carbon dioxide. There is no oxygen to breathe. Water is apparently common in the form of underground ice deposits, and the canyons and channels on the Martian surface indicate it once flowed abundantly in liquid form.

As a colony, Mars could be quite valuable — Humans could use its ice and atmosphere to manufacture rocket fuel, and its low escape velocity makes it easier to ship payloads from Mars to the asteroids and outer system than hauling them up from Earth's surface. Scientists and space enthusiasts have also done a lot of planning for how to terraform Mars (see sidebar).

Mars is *the* planet of science fiction. Ever since H.G. Wells writers have been sending explorers there, dealing with invaders from there, exploring the ruins of ancient civilizations there, setting up colonies there, and terraforming the place. To many



people, the term "Martian" is synonymous with "alien from outer space." Near-future adventures could take place against the backdrop of a growing colony, while later ones set on a terraformed Mars could use it as a rival planet to Earth.

AREOGRAPHY

Mars is divided into two geographical regions: the southern highlands, occupying roughly two-thirds of the planet; and the northern lowlands. A boundary zone, often containing prominent features such as buttes and mesas, marks the line between the two regions in most places. The northern zone is relatively smooth, whereas the south has enough craters to make it look like the Moon; the exact reasons for this remain unclear.

Some prominent Martian features include:

Chryse Planitia: This relatively flat, uncratered region, located almost in the center of the planet on most maps, has been a primary site of Human exploration of Mars. Both Viking 1 and the Mars Pathfinder landed in the "Plains of Gold." The Chryse Planitia region also includes the so-called Cydonian Face (a rock formation which, when viewed from certain angles, resembles a face) and the star-shaped "City Square" of outcroppings and massifs.

Utopia Planitia: Another fairly flat and easily-traversed region of Mars, Utopia Planitia was where Viking 2 landed. It's likely that initial Human settlements of Mars would be located either here or on Chryse.

Tharsis Province: An 8,000 by 4,000 kilometer long uplifted region straddling the north-south boundary, Tharsis is well-known for its volcanic features. Chief among this is *Olympus Mons*, the largest volcano in the Solar System. Twenty-seven kilometers high, and with a diameter of 624 kilometers and a caldera 100 kilometers wide, it's three times as tall as Mt. Everest and covers about as much land as the state of Missouri. Three other large volcanoes, the Tharsis Montes, dot the Province.



Elysium Planitia: South of the Utopia Planitia lies another volcanic region, the Elysium Planitia. Among its many unusual geographic features are the Giant Polygons, a plain filled with enormous, deep cracks forming various roughly geometrical shapes up to 20 kilometers wide.

Valles Marineris: This series of chasms and valleys up to 200 kilometers wide stretches over 4,000 kilometers — roughly the distance from New York City to Los Angeles. The Valles has some canyons up to 10 kilometers deep that are big enough to hold the entire Rocky Mountains! It merges with the Tharsis Province in a region called *Noctis Labyrinthus* (the Labyrinth of Night), the largest network of intersecting valleys in the Solar System.

PULP MARS

In the 1890s, the astronomer Percival Lowell announced he had discovered a network of canals spanning the surface of the planet Mars. Obviously, Mars had intelligent inhabitants, fighting to keep their planet habitable by titanic engineering works. Though Lowell was actually just imagining the canals, his vision inspired generations of science fiction writers.

In the days of classic pulp science fiction, Mars was the original “sword and planet” world, with decadent kingdoms of humanoid Martians, crystal towers, desert barbarians, and a surprising number of sword-swinging Earthmen. Later on, writers like Leigh Brackett and Ray Bradbury imagined the delicate crystal cities and ancient decadent Martians coming face to face with greedy, pistol-packing adventurers from Earth, in a kind of British Raj in space.

Meanwhile, a rival vision of Mars stemmed from H.G. Wells’s super-advanced invaders — Martians as a coldly hostile Elder Race, pitting their superior technology against Earthlings armed only with courage, numbers, and infectious dis-

eases. Martians invaded Earth with regularity from 1900 right up to the days of the first Mariner probes.

PHOBOS AND DEIMOS

Diameter: 27 x 19 kilometers (Phobos); 15 x 11 km (Deimos)
 Distance From Mars: 9,380 kilometers (Phobos); 23,500 kilometers (Deimos)
 Gravity: Negligible (see text)
 Month: 0.32 days (Phobos)/1.26 days (Deimos)
 Atmosphere: None

Mars has two moons, Phobos (“Fear”) and Deimos (“Terror”). Both are small and irregularly-shaped. Their gravity is so weak that a person standing on them could throw objects with enough force to achieve escape velocity (or accidentally make a strong enough leap to hurl himself into space). Their origin is unclear; they may be captured

asteroids, or built up out of materials left over after Mars itself formed.

Phobos, the larger and closer of the two moons, is covered with impact craters, including Stickney crater, which is 10 kilometers in diameter. The enormous impact which created Stickney also created kilometers-long grooves that streak the surface of Phobos. Deimos, although much smoother, also has numerous small craters.

In 1959, Soviet astronomer Iosif Schlovskii, upon discovering how light Phobos is, suggested that it was hollow — perhaps even a space station built by some long-lost Martian civilization. Sadly, he was incorrect, but it could easily be true in a *Star Hero* game.

The Asteroids

Diameter: 10 to 1,000 kilometers
 Distance From Sun: average of 2.8 AU
 Gravity: Minimal
 Year: average 4.7 Earth years
 Orbital Velocity: 17.7 kilometers/sec
 Atmosphere: None

The asteroids — rubble left over from the formation of the Solar System — are most common in a belt between the orbits of Mars and Jupiter. Although there are thousands of asteroids in the belt, there is a lot of empty space there, too; the average separation between asteroids is a million kilometers.

Individual asteroids are irregular chunks of rock, ranging from a few kilometers across to giants like Ceres, half the size of Earth’s Moon. Their surfaces are probably powdered regolith, shattered by frequent impacts. The composition of individual asteroids varies quite a bit, with some rich in metals, some in carbon, some in ice, and some in nothing but rock.

INSIDE JUPITER

Astronauts venturing into the atmosphere of Jupiter are in for an exciting time. The winds are fierce: 360 kilometers per hour in the upper atmosphere, and 500 kph or more deeper down. Storms like the Great Red Spot can last for centuries. The pressure increases with depth, starting at about .001 atmosphere at the cloud tops and doubling for every 20 kilometers down. Temperature is 0 Centigrade at the cloud tops, going up by 1 degree per kilometer of depth. This means explorers could fly through the upper 200 kilometers with reasonable life support systems, but below that the heat and pressure begin to damage, and will eventually destroy, spacecraft.

JUPITER'S RADIATION BELTS

Like everything else about Jupiter, its magnetic field and radiation belts are huge and powerful. The belts extend out from the planet to a distance of half a million to a million kilometers, and are at least ten times as intense as Earth's Van Allen belts. The inner moons, Io, Europa, and Ganymede, are in the thick of the radiation. Explorers visiting the inner moons of Jupiter need Life Support: High Radiation, or considerable amounts of armor. The icy crust of Europa would offer adequate protection, so radiation suits aren't necessary down in the subsurface ocean.

In fiction, the Belt has often been depicted as a futuristic version of the Gold Rush, with lone asteroid prospectors steering their jury-rigged ships from rock to rock, searching for asteroids rich in valuable radioactives or Helium-3. Often the independent-minded Belters come into conflict with Earth's stuffy bureaucrats and greedy corporations. Life in permanent zero gravity sometimes makes the Belters physically different from Earthlings, unable to walk upright even in Mars's light gravity.

The asteroids also present a potential threat to Humans, since their orbits sometimes bring them uncomfortably near Earth. It's likely that an impact with one millions of years ago led to the extinction of the dinosaurs, and an impact today could easily wipe out Humanity. Many stories center around threats by megalomaniacal villains to draw an asteroid down to Earth, or the efforts of a bold team of adventurers to stop an asteroid from hitting the planet.

Jupiter

Diameter: 140,800 kilometers
Distance From Sun: 5.2 AU
Gravity: 2.6 G (at cloud tops)
Year: 11.9 Earth years
Moons: 16 known
Orbital Velocity: 13 kilometers/sec
Atmosphere: Dense

Jupiter is the biggest of the planets, with a mass 300 times that of Earth. It's about twice as big as all the other objects in the Solar System combined (excepting the Sun, of course). Jupiter itself is no place for Humans — the gravity at the cloud tops is almost 3 G, and there's no identifiable solid surface. The atmosphere is mostly hydrogen and helium, though clouds of ammonia and methane give the planet its swirling yellow and scarlet appearance.

The most notable feature of Jupiter is the Great Red Spot, a storm covering an area about twice the size of Earth. Its origins are unknown, though it's apparently been in existence for at least 300 years (probably much longer), and becomes redder during periods of heightened solar activity.

Carl Sagan once speculated about the possibility of life in Jupiter's titanic atmosphere, envisioning huge balloon creatures drifting among the clouds. While current theories suggest Jovian life is unlikely, nobody has actually gone there to check. However, at least one of Jupiter's moons, Europa, is currently on the hot list of places where Humans might find alien life.



EUROPA

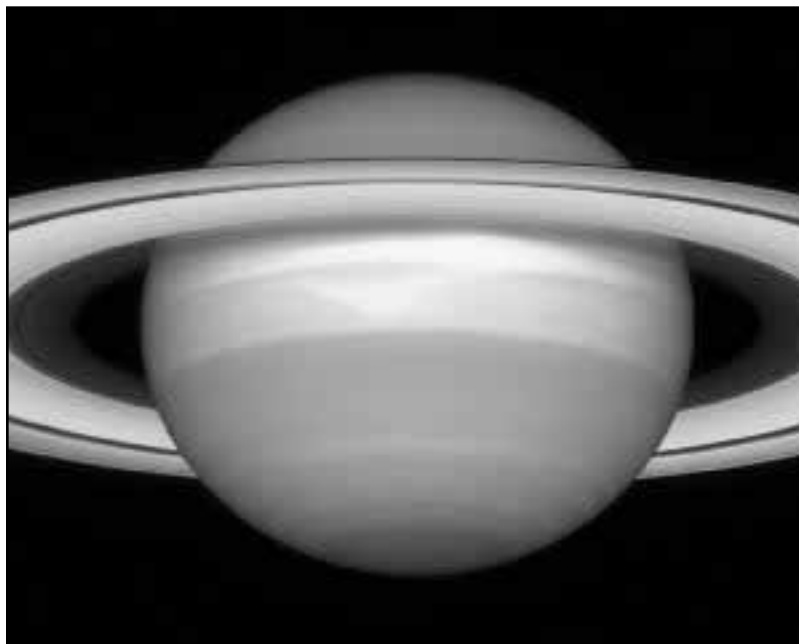
Diameter: 3,120 kilometers
Distance From Jupiter: 671,000 kilometers
Gravity: 0.13 G
Month: 3.55 days (82 hours)
Orbital Velocity: 13.74 kilometers/sec
Atmosphere: Trace

Europa is a large moon, comparable in size to Earth's Moon, composed largely of ices with a solid core. It has no atmosphere to speak of, and its surface is dirty water ice. What makes Europa interesting is that it has almost no craters, which suggests some process constantly resurfaces the crust. Current theories suggest that beneath the icy surface lies a deep ocean of liquid water, kept warm by tidal heating from Jupiter. If that is the case, then Europa's ocean may be home to some form of life. Adventures on Europa can be exploration missions in search of native life, who's-hunting-who battles with dangerous European predators under the ice, or covert operations to find hidden pirate or rebel bases in the black ocean.

GANYMEDE

Diameter: 5,280 kilometers
Distance From Jupiter: 1,070,000 kilometers
Gravity: 0.14 G
Month: 7.16 days
Orbital Velocity: 10.88 kilometers/sec
Atmosphere: Trace

Ganymede is the biggest moon in the Solar System — bigger than the planet Mercury, in fact. It has a metallic core with a crust and mantle of ice, and appears to have active geology driven by tidal forces from Jupiter and the other moons. It was once considered a possible site for terraforming, but now that its composition is known, raising the temperature to habitable levels would create an ocean miles deep. Ganymede has its own magnetic field, shielding it somewhat from Jupiter's radiation belts.



Saturn

Diameter: 120,300 kilometers
 Distance From Sun: 9.5 AU
 Gravity: 1.2 G (at cloud tops)
 Year: 29.5 Earth years
 Moons: 18 known (probably more)
 Orbital Velocity: 9.6 kilometers/sec
 Atmosphere: Dense

Saturn is much like Jupiter, but is less than a third as massive (only 95 times the mass of the Earth), less dense, and less active. Like Jupiter, it has an atmosphere of hydrogen and helium, with clouds of methane and ammonia giving it a pale yellow color from space. It is best known for its spectacular ring system, a belt of ice and rock particles extending from a few thousand kilometers above the surface to about 70,000 kilometers up. Saturn has a large family of moons, ranging from tiny asteroidal chunks like Pan or Atlas, to good-sized objects like Tethys and Iapetus, to the aptly-named Titan.

The astounding beauty of Saturn and its rings make it a natural tourist attraction for a spacefaring future society (as in Arthur C. Clarke's short story "Saturn Rising"). There might be orbiting resorts or hotels on the moons. Tycoons could build luxurious private stations just to admire the view. The rings could also hide fugitives or space pirates.

TITAN

Diameter: 5,150 kilometers
 Distance From Saturn: 1.2 million kilometers
 Gravity: 0.14 G
 Month: 16 days.
 Orbital Velocity: 5.58 kilometers/sec
 Atmosphere: Standard (atmospheric pressure approximately 1.5)

The biggest moon of Saturn, Titan is a remarkable place. Its surface is hidden by a dense atmosphere of nitrogen and methane, with a surface pressure half again as great as Earth's. Current theories suggest Titan's surface may have oceans of liquid methane dotted with islands or continents of dirty ice. The temperature on Titan is a chilly 94 degrees Kelvin (-194 Centigrade). It is thought that Titan is very rich in organic chemicals, making it potentially very valuable to future space colonists.

Titan could possibly be home to some form of exotic life, based on ammonia or methane (see page 88). As a colony world it might be the Persian Gulf of the outer system, with valuable carbon for sale.

Uranus

Diameter: 56,300 kilometers
 Distance From Sun: 19 AU
 Gravity: 0.8 G (at cloud tops)
 Year: 84 Earth years
 Moons: 21 (possibly more).
 Orbital Velocity: 6.8 kilometers/sec
 Atmosphere: Dense

Uranus is very similar to Neptune, a small gas giant with an atmosphere of hydrogen, colored



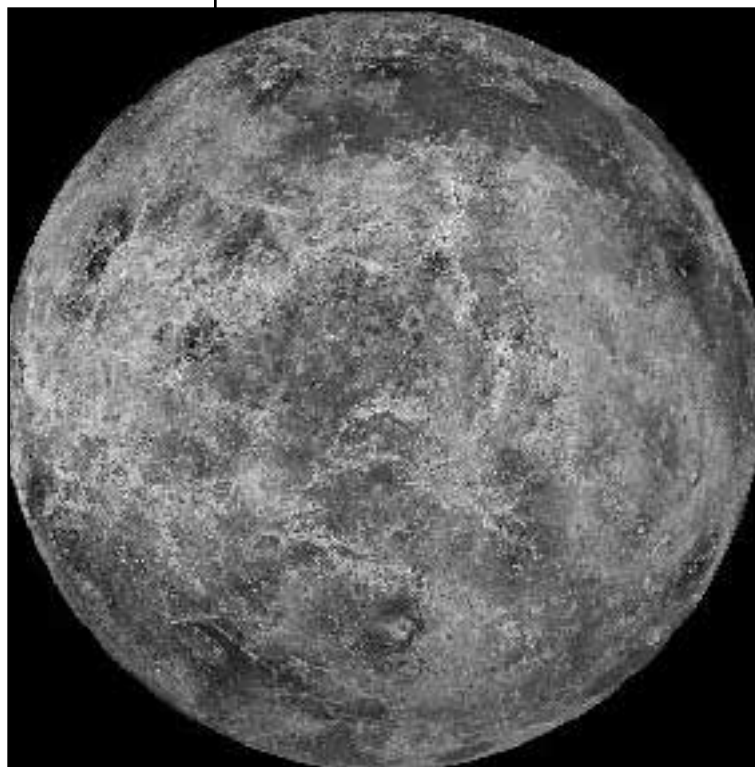
blue-green by methane clouds. It is notable because of its extreme axial tilt — 97 degrees. It rolls about the outer Solar System on its side, surrounded by a dark ring of dust and pebbles. Uranus has a large family of moons, mostly small objects 100 kilometers across or smaller. The five biggest are Titania (1,578 kilometers), Oberon (1,522 kilometers), Umbriel (1,170 kilometers), Ariel (1,158 kilometers), and Miranda (see below). The moons of Uranus, unlike those of other planets in the Solar System, have names taken from the plays of Shakespeare instead of classical mythology.

Conditions within Uranus and Neptune are considerably less violent and dangerous than in Jupiter or Saturn. The gravity is bearable, and the winds aren't as fierce. Explorers in high-tech balloon-spaceships might venture beneath the clouds, and thus encounter airborne life.

MIRANDA

Diameter: 470 kilometers
Distance From Uranus: 129,780 kilometers
Gravity: .008 G
Month: 1.41 days
Orbital Velocity: 6.68 kilometers/sec
Atmosphere: None

Miranda is not the biggest moon of Uranus, but it is a remarkable object. Photographs from the Voyager probes show Miranda's surface as a chaotic jigsaw-puzzle of different terrains, and the current theory is that the moon was literally smashed apart by some immense impact long ago, and the jumbled fragments gradually fell together again. This suggests the interior of Miranda may be a maze of faults and crevices, possibly extending all the way to the core. Who knows what adventurers might find in such deep places?



Neptune

Diameter: 49,900 kilometers
Distance From Sun: 30 AU
Gravity: 1.2 G (at cloud tops)
Year: 164.8 Earth years
Moons: 8 known
Orbital Velocity: 5 kilometers/sec
Atmosphere: Dense

Neptune's day is 16 hours long, which makes it slightly flattened at the poles. Like Jupiter and Saturn, it emits more heat than it receives from the Sun. Its atmosphere is mostly hydrogen and helium, with clouds of methane. All of Neptune's moons except Triton are small objects, no more than 400 kilometers across. The planet also has faint dusty rings.

Like Uranus, Neptune qualifies as a "bearable" gas giant. As the outermost major planet, it might serve as the launching station for interstellar missions, especially for slower-than-light ships using huge nuclear rocket motors. Neptune's atmosphere would provide fuel.

TRITON

Diameter: 2,700 kilometers
Distance From Neptune: 354,800 kilometers
Gravity: 0.076 G
Month: -5.88 days
Orbital Velocity: -4.39 kilometers/sec
Atmosphere: None

Triton's orbit is retrograde, going the opposite direction from most moons in the Solar System (hence the "negative" numbers for its month and orbital velocity). It is also highly tilted, 157 degrees from the plane of Neptune's equator. These suggest it was captured, rather than forming along with Neptune itself. Its most likely origin is the Kuiper Belt, but GMs can have Triton be an interstellar interloper, perhaps with artifacts or even survivors in stasis. Triton is composed of rock and ice, with a fairly smooth icy surface, though there are patches of old cratered terrain. It has a very thin atmosphere of methane and nitrogen.

Pluto

Diameter: 2,300 kilometers
Distance From Sun: 39 AU
Gravity: .06 G
Year: 247.7 Earth years
Orbital Velocity: 4.7 kilometers/sec
Atmosphere: None

Pluto is the outermost planet, and is the exception to almost every rule. It is tiny, less than half as massive as Mars. It has a giant moon, Charon, which is nearly as big as Pluto itself. Its orbit is tilted and very eccentric, at times taking it within the orbit of Neptune (the two planets orbit in a resonant relationship so there is no danger of a collision). A growing number of astronomers prefer to classify Pluto as the biggest of the Kuiper Belt



objects rather than a true planet, but in the popular mind it's unlikely to be kicked out of the planet club. Pluto has a trace atmosphere of nitrogen with tiny amounts of methane.

CHARON

Diameter: 1,200 kilometers
Distance From Pluto: 20,000 kilometers
Gravity: .015 G
Month: 6.4 days
Orbital Velocity: 0.23 kilometers/sec
Atmosphere: None

Pluto and Charon essentially compose a “double planet.” Pluto is the larger of the pair, with a mass 5 times that of its big moon. Both Charon and Pluto are tidally locked, keeping the same face towards each other. The two worlds are composed almost entirely of ices — mostly nitrogen, methane, carbon monoxide, and water in solid form.

The Kuiper Belt

Extending out from the orbit of Neptune to about 130 AU is the Kuiper Belt, a collection of icy asteroid-size objects orbiting in the plane of the Solar System. There are at least 70,000 Kuiper Belt objects in the 100-kilometer size range, with millions of smaller bodies. The total mass of the Belt is estimated at 5 to 10 times that of the Earth. This represents a vast resource for future space colonists — the Kuiper Belt could provide enough volatiles to give Mars and the Moon breathable atmospheres, fill up millions of space habitats with air, and fuel a virtually infinite number of fusion reactors and rockets.

The Oort Cloud

The Oort Cloud is a huge sphere of comets and icy asteroids, containing trillions of objects, extending out from the Sun 30,000 AU to about 2 light-years. Other stars have similar comet clouds around them. The Oort Cloud is the source of long-period comets, which are sent tumbling down into the inner Solar System by the gravity of passing stars. The total mass of the Oort is even larger than the Kuiper Belt, estimated at 20 to 40 times that of the Earth. The Oort represents a substantial “bank” of matter, but the distance to even the nearest Oort objects is so great it would be almost as hard as colonizing another star system.

BEYOND SOL

Past the Oort Cloud one is no longer in the Solar System. The nearby stars may have planets and even life forms of their own, and beyond is the whole Galaxy to explore. (See Chapter Three for data tables regarding the stars nearest Sol.)

Nearby Stars

The stars near the Sun are a pretty ordinary lot, which is probably a good thing. There are no dangerous supernovas waiting to go off, no gamma-ray bursters, no black holes.

ALPHA CENTAURI

The nearest star to the Solar System, Alpha Centauri is in fact a trinary star system. The primary, Alpha Centauri A, is a G2V star very much like the Sun. Its close companion, Alpha Centauri B, is a dimmer K1V star, orbiting with a period 81.2 years at a distance of about 19 AU. Far from the two of them, the red dwarf Proxima Centauri circles at a distance of 0.17 light-years. For now, and for centuries to come, Proxima Centauri is closer to the Sun than its primary pair, and so is likely to be the target of the first interstellar missions.

The Alpha Centauri system could have planets, even habitable ones, but as yet Humans have detected none. In fact, it's possible for both Alpha Centauri A and B to have lifebearing worlds, so GMs running a campaign without FTL travel can still have multiple exotic planets in just one star system.

QUAOAR

In October 2002, astronomers announced the discovery of an extremely large object in the Kuiper Belt: a frozen body about 1,300 kilometers in diameter, or over half the size of Pluto. Named Quaoar (KWAH-oh-wahr), a name taken from Southern California Indian myths, it has an orbital period of 288 years. According to its discoverers, it has a mass roughly equal to that of all of the asteroids combined. The existence of Quaoar confirms many astronomers' belief that Pluto isn't really a planet; like Quaoar, it's simply one of the largest Kuiper Belt objects. Scientists estimate the Kuiper Belt may hold five to ten objects of comparable size to Pluto or Quaoar.

BARNARD'S STAR

The second-closest star system to Sol is the red dwarf Barnard's Star. The star itself is relatively ordinary, but it moves remarkably quickly — its velocity is nearly 190 kilometers per second. It is a red subdwarf, type M4, with a luminosity 0.0004 times that of the Sun. It may have a companion body about 1.6 times as massive as Jupiter, though astronomers have not confirmed this. Barnard's Star is unlikely to have habitable planets, but the system might be suitable for space colonies or asteroid miners.

SIRIUS

The closest bright star to the Sun, Sirius is a type A1V star 21 times brighter than the Sun is. Its companion Sirius B is a white dwarf, the last remnant of a bigger, brighter star which burned out millions of years ago. Sirius B is only four times the size of the Earth, even though it is as massive than the Sun, and its brightness is 0.0025 times that of the Sun. The two orbit at a distance of 7 AU, with a period of 7 years. Sirius may be a target for early interstellar missions, as scientists would love to study Sirius B up close.

EPSILON ERIDANI

Located 10.7 light-years from Earth, Epsilon Eridani is a type K2 star with a luminosity 0.3 times that of the Sun. This makes it a good candidate for having lifebearing worlds nearby, as well as a star early Human FTL explorers could reach without too much difficulty.

61 CYGNI

61 Cygni is a binary pair of type K stars (K5 and K7) orbiting each other at a distance of 75 AU, so there is plenty of room for both to have lifebearing worlds. 61 Cygni A has a luminosity 0.08 times that of the Sun, and B's brightness is half that. They orbit with a period of 653 years. Some observations suggest 61 Cygni A has a Jupiter-sized planet with a period of 5 to 12 years.

TAU CETI

Tau Ceti is 12 light-years from the Sun, and one of the best nearby candidates for lifebearing planets. It is a type G8 star, with a luminosity 0.47 time that of the Sun, so it could certainly have a decent-sized habitable zone.

VAN MAANEN'S STAR

Also known as Wolf 28, Van Maanen's Star is variously classified as an F5V star or a white dwarf. It is 14.4 light-years from the Sun. Its luminosity is 0.00018 times that of the Sun, and it is thought to be about half the size of the Earth. Like Sirius B, it is likely to attract scientific interest.

ALTAIR

Also called Alpha Aquilae, Altair is a type A7 subgiant/dwarf, the closest giant star to the Sun. It is 16.8 light-years away. Altair is 10 times as bright as the Sun, and has an extremely rapid rotation — 6.5 hours — so it would appear noticeably saucer-shaped.

Further Afield

With as many as 400 billion stars in the Galaxy, it's impossible to describe them all. Here's a quick rundown of some interesting objects.

WITHIN 50 LIGHT-YEARS

Arcturus: Alpha Bootis, a type K2III giant 37 light-years away. Arcturus is 100 times as bright as the Sun, and is currently moving toward the Solar System at high speed. It will pass nearby in a few thousand years.

Capella: Also known as Alpha Aurigae, Capella is a binary type G8 and G1 giant pair orbiting only 0.7 AU apart, circled at a distance of 10,000 AU by a pair of red dwarf stars.

Fomalhaut: Twenty-five light-years distant, Fomalhaut is a type A3V star, 16 times as bright as the Sun.

Vega: Alias Alpha Lyrae, Vega is 25.3 light-years away, a type A0V star 40 times as bright as the Sun. Astronomers believe it is surrounded by a protoplanetary system of asteroids and growing planets, so it might attract scientists interested in watching the process of planetary formation.

DISTANT STARS

Antares: A huge red giant (type M1), 604 light-years away, with a luminosity 10,000 times that of the Sun.

Betelgeuse: Also called Alpha Orionis, it is 427 light-years distant, a huge red giant thought to be 6 AU in diameter. It is type M2Ib, with a luminosity 14,000 times that of the Sun.

Deneb: Known also as Alpha Cygni, it is a very bright young star, a type A2Ia giant 3,230 light-years away. Deneb is one of the brightest stars known, 250,000 times as bright as the Sun.

Rigel: Also known as Beta Orionis, Rigel is a huge bright type B8Ia star, 770 light-years distant. It is a dazzling 40,000 times as bright as the Sun, and has a faint binary companion orbiting at a distance of 0.03 light-years.

EXTRAGALACTIC OBJECTS

Bright Quasar 3C 273 is among the brightest and closest quasars to Earth. It's 3 billion light-years away (and thus that old), and its output equals 100 *trillion* times the Sun's. It varies in output with a cycle less than a year long, so it must be less than a light-year across. Astronomers believe it may be a black hole with a mass of 1 billion solar masses, the core of a developing supermassive galaxy.



Civilizations ALIEN AND THE FUTURE

One of science fiction's great strengths is its ability to show us strange and imaginary worlds and civilizations. Unlike fantasy, science fiction's worlds are possible, at least if certain assumptions are allowed. Some SF takes place in future Human societies, or colonies on distant

worlds; other stories show alien cultures. But all civilizations have features in common. The GM needs to consider those features when inventing a society, and players need to consider them when deciding what their characters are like.

FUTURE WORLDS



SCIENCE FICTION WITHOUT ALIENS

While the concept of sentient alien life is central to many science fiction stories, it's not a requirement. Many SF sagas — such as Frank Herbert's magnificent epic *Dune* — feature Humans, and Humans only (though sometimes those Humans are heavily altered by genetic engineering or other forces). Some subgenres, such as Post-Apocalyptic and Low SF, also tend to have only Human characters.

In these stories and settings, the author usually differentiates Humans by grouping them into organizations with identifiable traits, abilities, and agendas. In *Dune*, for example, Herbert presents various Houses (Atreides, Harkonnen, Corrino...), social, political, and quasi-religious organizations (the Bene Gesserit, the Spacing Guild), and cultures (the Fremen). In other settings, "pure" and genetically-engineered Humans are recognizably different, or Humans from different planets compete against each other. In some ways, these groups and institutions take the place of the competing alien species common to Space Opera settings and other such science fiction tales.

Star Hero GMs can, if they wish, take a similar approach to their campaigns. Rather than

Over the years, science fiction has presented several views of how the world may develop in the future. Of course, the future has a way of turning out completely different from predictions, but when you're creating a future world these are some models to consider. They range from the wildly optimistic to the grim and depressing.

Utopia

The most optimistic view of the future is a utopia, in which Humans learn to solve every problem and create a world in which people can be happy and content. The exact nature of a utopian setting depends a lot on the author's political beliefs and opinions; a Green Socialist and a Libertarian would probably have vastly different views of what an ideal society would look like. *Star Trek*, by and large, depicts a utopian setting (at least for Humans and other Federation members), one vaguely based on 1960s-era liberal/socialist theories.

When creating a utopian society as the GM, you have to watch out for several pitfalls. First of all, there's the problem of ramming your opinions down your players' throats. Your idea of a Utopia may not match theirs, and they may consider your jolly ideal future a nightmarish vision. Stacking the deck in favor of your utopia by making all its opponents evil or idiotic doesn't help — it just renders your "preaching" more blatant. The solution is to make your Utopia realistic. Recognize that no world is absolutely perfect, but try to depict a society in which the leaders and citizens know about their problems and struggle to resolve them.

Another problem is simply that utopias are kind of boring. If there are no problems then what is there for the characters to struggle against? Usually the solution is to send the heroes beyond Utopia to defend it against enemies or bring the advantages of Utopian civilization to less enlightened cultures. Iain M. Banks's series of novels about the Culture are an example of this: the Culture itself is a Utopian setting, but the novels mostly deal with the exploits of the "Special Circumstances" agency, as its operatives thwart Galactic aggressors and meddle in the affairs of primitive planets like Earth. This sort of story can be as simplistic as "we're right and they're wrong," or as complex as an examination of ends and means. Is it right to interfere with less advanced cultures? Is it right to stand by and watch them suffer?

False And Flawed Utopias

Not all Utopias are really as utopian as they seem. Both false and flawed Utopias exist.

A false Utopia is one in which the perfect society is a sham, maintained either by deception or tyranny. Real-world false Utopias include Stalin's Soviet Union, where the jolly unity and progress of the propaganda films was maintained by tens of millions of murders. Some false Utopias can use extremely advanced and insidious methods of social control: brainwashing, computer brain implants, drugs in the water supply, television hypnosis, the super-sophisticated propaganda and social engineering seen in the universe of *Dune*, or even genetic engineering to create a docile populace. Adventures in false Utopias usually involve becoming aware of the iron fist beneath the velvet glove, and attempts to escape or overthrow the regime.

Flawed Utopias are less malevolent, but instead address the basic question of whether a Utopia is possible or even desirable. One common feature of many Utopian visions is stability, and this often means stagnation and a lack of innovation. Adventures in a flawed Utopia of this sort are often attempts by nonconformist original thinkers to shake things up and inject a little life into the static society.

Bigger Tailfins

Somewhat less idealistic than Utopian visions, other futures common in science fiction assume current trends continue, nothing seriously disrupts the world system, and the world of tomorrow is the world of today — with bigger tailfins.

This view is not as unrealistic as it sounds. Now that the year 2000 is past, one striking thing about some past visions of the twenty-first century is how overly "futuristic" they were. Sadly, Humans don't have flying cars or vacations on the Moon now; what they do have is a world which would be very recognizable to someone from 1950 who paid attention to social trends already in place then.

Big Tailfins futures are handy because they don't require a lot of explanation to give the players a feel for the setting. When the characters meet someone who works for the FBI, the GM doesn't need to stop and explain that in 2029 the Bureau was sold off to a Japanese conglomerate. Interstellar explorers who work for NASA know something about how astronauts are supposed to act, even if they are dozens of light-years from Earth.

That very familiarity is also Big Tailfins futures' chief problem. There's no sense of wonder



or strangeness in that sort of future. If things are about the way they are now, then why set the campaign in the future at all? And sometimes things do change in dramatic and unexpected ways. A Bigger Tailfins view of the future in 1950 probably would not have predicted the fall of Communism or the relatively rapid development of genetic engineering. This makes the Bigger Tailfins approach most suitable for near-future scenarios, in which trends are recognizable and surprises few.

Cultural Stereotypes

A close cousin of the Bigger Tailfins view, the Cultural Stereotypes vision of the future emphasizes how much people will retain their traditional culture and society even in a high-tech future world. Englishmen still have tea in midafternoon and get knighted, Italians are still bad drivers, American Indians retain their tribal and spiritual identities, and Arabs are pious Muslims. This view often turns up in depictions of colony planets or space habitats populated by a single nationality. New Scotlanders speak with an exaggerated brogue and often go into engineering, Arabs settle desert worlds and use star charts to pray toward Mecca, and samurai in powered armor rule New Nihon. In extreme versions, New Texas and Penn's World take regional stereotypes into space.

While in many cases Stereotype settings are, realistically speaking, ridiculous — why should

there be a revival of, say, pagan Norse religion in the twenty-third century? — the idea isn't completely impossible. One thing which might motivate people to leave Earth and settle in space habitats or remote planets is the desire to preserve a traditional culture and way of life. Sometimes the GM can have fun if the transplanted culture and its new setting don't go together well — if the Arab planet New Medina is a world of glaciers and boreal forests, or the Russian colony St. Basil is a warm ocean planet dotted with lush islands.

Some authors have even applied the Stereotype idea to alien civilizations. The justification is that given similar conditions, a society will develop in similar ways to historical ones. While that's probably true to a degree, it doesn't mean all cultures with a medieval technology level will have knights in armor on horseback, feudal governments,

and a powerful Church.

Like the Bigger Tailfins future, Stereotype worlds do have their uses. It's very convenient if the players can tell in advance what the people on a given planet will be like, especially if the PCs are supposed to be citizens of an interstellar community. The GM describes an important NPC as "the *Capo di Tutti Capi* of Nova Sicilia" and the players immediately think of *The Godfather*. This works especially well in Pulp or Space Opera settings.

Adventures in Stereotype settings often make use of fictional tropes associated with the culture in question: High Noon gunfights with laser pistols in the New Texas colony; paranoid political intrigue on Novy Russia; and chrome cyberpunk samurai swordfights in New Tokyo. Sure, it's unrealistic and can go right off the edge into silliness, but it does let the GM crank the "flavor" knob up to 11.

Cultural Fusion

In some ways the antithesis of the previous view, a Cultural Fusion future assumes that current trends of cultural exchange continue, leading to a future society that mixes elements from all the world's peoples. Certainly the idea is supported by late twentieth/early twenty-first century social trends. Who would have predicted, even as recently as 1970, that sushi would become an American favorite, or that every shopping mall in suburbia would boast an espresso bar?

Continued from last page

presenting the players with a lengthy menu of Species Package Deals, instead require all characters to be Human. Then give them a series of Package Deals to choose from that represent organizations, cultures, institutions, and other groups within Human society. These, together with Professional Package Deals, can do just as much to define and differentiate characters as Species Package Deals do in other campaigns.

The benefit to this approach is that it allows the players and GM to focus on one species, developing its cultures, politics, and society to a much greater degree than might otherwise be possible. The drawback, of course, is no aliens... and many gamers enjoy aliens a lot. Ultimately, whether to include aliens largely comes down to personal preference, but don't assume you must have them to play *Star Hero*.

A Fusion future takes that notion and runs with it, postulating hybrid religions like Pentecostal Shi'ite or Zen Catholic, suburban teenagers going on vision quests, Artificial Intelligences living in cyberspace taking on the form of Voodoo loas or Japanese kami, government offices in America and Europe closing for Hindu holy days, advanced technological industries in Bali, and pop music based on Tibetan throat-singing rising to number one on the charts. One advantage to this view is that it only takes a few glimpses to give players the feel of a world radically different from our own. However, the same thing can be a disadvantage: too often a Fusion future is simply a Bigger Tailfins world with a side order of sushi.

To make a Fusion world seem realistic, think about the reasons cultures borrow things from each other. Cuisine is easy — if people in one country like a certain food, people elsewhere probably will, too. Music and clothing are very fashion-driven, and can change from year to year. Political and economic systems tend to follow the leading powers: when Great Britain and Imperial Germany were world powers, countries like Japan and Serbia adopted constitutional monarchies. In the Americas, newly-independent Latin American nations modeled their governments on that of the United States. When the Soviet Union was one of the world's two superpowers, new states in Africa called themselves "People's Republics." In a Fusion future, nations might try to emulate China's one-party regime or European-style bureaucracy.

People adopt foreign religions and philosophies when their own don't provide the answers they seek. Changes in the world might make some religions better suited for the new environment — in a setting with advanced nanotechnology and artificial intelligence, an animist faith that treats everything as alive would be a pretty accurate view of the world.

In adventures, a Fusion setting allows for exotic elements cheek by jowl with familiar ones. Characters don't have to venture to Africa to get involved in a tribal conflict; instead rival immigrant groups are fighting right downtown. A prosperous and stable Fusion society could be a near-Utopia worth defending against outside threats, while an impoverished and violence-ridden one is absolutely perfect for gritty cyberpunk adventures.

Dystopia

The opposite of Utopia, a Dystopia is a setting in which everything is going wrong. In particular, dystopias are a staple of "dreadful warning" science fiction, showing how particular political ideas or social trends can lead to a world of oppression and despair. Probably the most famous dystopia is George Orwell's *1984*, with its haunting depiction of what a Soviet-style Great Britain would be like. Science fiction dystopias set centuries in the future often include chilling applications of science, like the embryo manipulation and universal drugging in Aldous Huxley's *Brave New World*. Dystopias ruled by computers date back to E.M. Forster's *The Machine Stops*.

The chief difference between a Dystopia and a false Utopia is that nobody in the Dystopia has any illusions. Things are bad, everybody knows it, and the challenge is getting through the day. The Secret Police don't even bother to act friendly, and the cameras watching on every corner aren't disguised. Star-spanning Dystopian societies are usually oppressive Galactic Empires or creepy hive-minds.

The usual adventures in a Dystopia are escape or revolution (although the roleplaying game *Paranoia* demonstrated that there's plenty of potential for excitement and humor in just accomplishing routine missions). Escape requires someplace to escape to — if the dystopia is a worldwide tyranny, dissenters may try to flee to the stars.

If escape is impossible, the only alternative is revolt. Of course, the Secret Police aren't going to take that lying down. Almost every dystopia is lavishly furnished with surveillance devices, spies, goons in black armor, and high-tech torture chambers. Potential rebels have to plan in secret, develop a robust organization and ways to ferret out police informers, gather weapons and followers, and then strike — a perfect framework for a *Star Hero* campaign.

Characters from an outside society (or another planet) can enter a dystopia in secret, perhaps to rescue someone important, or identify ways to overthrow the tyranny. Especially daring agents could even lead the revolt themselves.

In a blackly humorous vein, the characters can be agents of the dystopian government — why should NPCs have all the fun of summary executions, black leather trenchcoats, and planet-busting weapons? This can be as silly as the GM will tolerate, or a fairly serious examination of how people can serve an evil regime.

Post-Apocalypse

A "post-apocalyptic" setting is one in which society has been destroyed or devastated, plunging people back to a more primitive existence. The idea is not a new one in SF — nearly 200 years ago Mary Shelley's novel *The Last Man* postulated a plague which wipes out Humanity.

Post-apocalyptic settings are often an excuse to sweep away all the petty, bothersome details of life in a complicated society. People are no longer bound by laws or good manners. The conflicts are not over abstractions or distant concerns, but over immediate things like food, shelter, and survival. The end of society and its restrictions also allows lots of vicarious anarchy and destruction. Wiping out society is also a good way to restore civilization to a low-technology condition. Heroes can swing swords and ride horses like King Arthur's knights, even if their armor is Kevlar and their quest is for a stockpile of antibiotics instead of the Holy Grail.

Destroying the world requires a disaster. There are many ways to wipe out a civilization, depending on how much of it you want to wipe out and how many survivors you want to leave. And of course, any disaster that could affect Earth could affect any similar planet.

ASTEROID IMPACT

A big asteroid or comet smashes into the Earth. The level of the catastrophe depends on how big the object is, how many bits it breaks into, and where it strikes. A relatively small one (up to a kilometer or so) would be like a single large bomb, devastating the immediate surroundings where it strikes but leaving the rest of the world intact — good for a “temporary apocalypse” in the disaster-movie mode. A larger body (tens of kilometers across) could flatten an entire continent and cause dramatic climate changes (see below), affecting the entire world. If an object of that size landed in an ocean basin, the tidal waves created by the impact would devastate every coastline on that sea. An impact of that scale is thought to have wiped out the dinosaurs at the end of the Cretaceous Era. Finally, a body the size of a large asteroid (hundreds of kilometers) could destroy just about all multicellular life.

Asteroids are good menaces for heroes trying to avert the apocalypse. Astronomers might predict the impact and space agencies could launch a mission to divert or destroy the object with nuclear explosives. Villains might try to direct the falling rock onto an enemy nation, or use the threat to blackmail governments.

CLIMATE CHANGE

The Earth’s climate changes tremendously over the eons. In the age of the dinosaurs the poles were ice-free; twenty thousand years ago half of North America was covered by glaciers. Changes in either direction could have dire effects on Humanity. In past decades, the fashionable climate change to worry about was a new ice age — cities buried in the ice, sea levels dropping, famine and mass migrations as people flee the advancing glaciers. Carl Sagan and colleagues proposed that a large-scale nuclear war might trigger an ice age, and many scientists believe a large asteroid impact might do the same.

More recently, scientists have become concerned about the prospect of planetary warming. Increases in temperature might cause rising sea levels as the polar caps shrink, the spread of deserts, more storms, and unpredictable shifts in rainfall and weather. Global warming lets you have cities like London or New York half-sunk in the ocean, hot winds howling across the dry bed of Lake Michigan, and Atlanta covered by tropical jungle.

Climate change is a good disaster if the GM wants to preserve some areas almost untouched. Global warming might flood the eastern US and plunge the Great Plains into desert, but Quebec and Scandinavia would bloom in the warmer temperatures. One drawback is that societies coping with climate change, swarms of refugees, and conflicts over food and water supplies would be likely to become more regimented and tightly-organized, rather than anarchic “Road Warrior” environments.

COSMIC DISASTERS

Nearby supernovas, gamma-ray bursts anywhere in this part of the Galaxy, or massive solar flares are all ways to devastate the Earth. Cosmic disasters can’t be predicted or prevented, their effects are sudden and massive, and they’re over in an instant. They all unleash a sudden tremendous burst of radiation, killing everyone on the side of the Earth affected by the flash. A few minutes with a globe can help the GM decide what parts of the Earth to irradiate. The worst case would be a radiation flash centered above north-central Russia, which would catch just about all of Europe, Asia, Africa, and parts of North America. The best case, over the southeastern Pacific, would still get South America, Australia, and all the Pacific islands.

A cosmic disaster is like a neutron bomb on a planetary scale — it kills off the living things (especially vertebrates) but leaves all the ruins intact. A few people in the affected region might survive in mines, bomb shelters, or submarines, and they’d have all the food supplies from before the blast neatly sterilized and preserved.

Adventurers in a world blasted by a cosmic disaster can scavenge the ruins for treasures, battle other scavengers and survivors, struggle to reach the unaffected parts of the world, and try to rebuild civilization with all the toys easily at hand. Cosmic disasters and plagues both qualify as “cosy catastrophes” for the survivors.

FAMINE AND RESOURCE DEPLETION

Usually connected with overpopulation, a shortage of food and/or energy is an often-used catastrophe, especially during the oil crisis of the 1970s. The world starts to run out of some crucial resource, or food production can’t keep up with booming populations, and civilization cracks under the strain. Famine and resource shortages often lead to the same sort of situations that turn up in climate change disasters: highly-regimented societies preserving civilization, surrounded by “wild lands” full of heavily-armed psychopaths stealing each others’ food and gasoline.

PLAGUE

The tidiest catastrophe, a plague is a deadly disease which kills off most of Humanity. The cities are all left intact, the animals all survive, but suddenly there aren’t any people. This was the premise of Stephen King’s *The Stand*. Plague is the ultimate “cosy catastrophe” — one in which, if you survive, you can sleep in the best hotels, drive the fastest cars, and generally enjoy all the fruits of civilization.

If a plague can wipe out the Human race, any post-plague campaign must explain why the heroes didn’t die like everyone else. Did they get an experimental vaccine? Are they naturally immune? Were they isolated long enough for the virus to burn itself out?

As recent headlines demonstrate, plague can begin as an act of war or terrorism, making it a good candidate for Something Awful the heroes must race to prevent. Time travelers from the

future might bring back a vaccine.

Note that a plague doesn't necessarily have to target Humans (or their alien equivalent) to destroy civilization — anything vital that's susceptible to destruction by bacteria or viri is a potential candidate. In Niven's *Ringworld*, for example, the Puppeteers use an engineered bacteria to destroy superconducting materials on the Ringworld, causing its civilization to collapse when their machinery fails.

WAR

For more than fifty years, war has been the unchallenged leader in the apocalyptic category. Even before nuclear weapons made it possible for one country to destroy every town on Earth in a day, H.G. Wells postulated a civilization-wrecking war of poison gas and aerial bombing in *Things To Come*. The tropes of a world ravaged by war are familiar to everyone — ruined cities blighted by fallout, mutant humans and animals spawned by radiation, gangs of looters and refugees, and worse. Nuclear war assimilated many of the other disasters, with a “nuclear winter” ice age, biowar plagues, and all the best resources destroyed.

What makes war particularly useful as an apocalyptic disaster is that it's intelligent devastation. The weapons would be targeted to do the most damage. Both sides really would be doing their best to wipe out the enemy's civilization. There's no need to drop comet fragments on inland cities or assume unrealistically fast-spreading and incurable plagues. There may not be any enclaves of high-tech civilization because second-strike weapons and submarines would have taken them out.

REGRESSION AND DECADENCE

Apocalyptic wars and civilization-smashing disasters are often the kickoff for a period of low technology and a return to barbarism. In science fiction stories this era is sometimes called the “Long Night” or the “New Dark Age.” The most direct historical model is the collapse of civilization in Western Europe after the fall of the Roman Empire. A Long Night may affect only a single planet, or hundreds of worlds at once if the fallen civilization was an interstellar one.

The decline and fall of Rome are also the model for another kind of collapse — civilizations which grow decadent and fail because of internal rot rather than external invasion. In decadent civilizations, people become absorbed in entertainment and petty intrigues, scientific inquiry sinks to mere pedantry and reclassifying of existing knowledge, and government becomes remote and bureaucratic, unable to respond to crises or accomplish routine functions. Manchu China is another historical example. Decadent cultures in fiction often refuse to admit they have declined from their era of greatness.

Both regression and decadence are convenient ways for authors to reset the clock of technological advance while allowing cultures to develop and diverge into interesting and unusual forms.

Human colony worlds fallen into barbarism can evolve cultures as weird as any alien species. If the Long Night affected a large interstellar empire, then hundreds of Human worlds may be waiting to be rediscovered by whichever planet struggles back to starfaring technology first. This way the heroes have technology which is recognizably near-future — energy weapons, spaceships, computers, robots, and the like — but they are adventuring in a setting centuries or millennia removed from the present in terms of cultural change.

One thing for GMs to consider when creating a fallen civilization is how to keep it isolated. If one planet falls back to barbarism but its neighbors have starships, then the neighbors will simply send in peacekeeping forces, aid convoys, and so forth to get things going again. (They may take the opportunity to conquer and rule the planet as well, but that's a different problem.) In fiction, authors have come up with various ways to keep the Dark Age dark. First of all, spaceships are very complex and expensive things, and may depend on special parts or scarce resources which are suddenly unavailable when civilization collapses. Sure, you've got a starship — but the Hyperspace Matrix Stabilizer's busted and there aren't any spares handy. The factory which makes Matrix Stabilizers is only fifty light-years away, which would be a short hop... if your starship were working. Oops.

Another possibility is that planets might choose to isolate themselves. If the interstellar empire is tyrannical and oppressive, subject worlds might prefer freedom to slavery, even if it means a lower standard of living. If bioweapons are common, planets might quarantine themselves to keep the plagues at bay, much as medieval villages refused to admit travelers in the days of the Black Death.

A society may voluntarily decide to adopt a low-technology way of life. Perhaps a new and fast-growing religion denounces all high technology as sinful or tainted. In Frank Herbert's *Dune* series, computer technology and robots were abolished in the “Butlerian Jihad” because people refused to live in a society where thinking machines were more important than Humans. Mass movements might oppose interstellar travel, fusion power, or science in general. The motivation need not be religious; on contemporary Earth there are activists convinced that Human technology has disrupted the balance of Nature.

Finally, decadence or regression is a matter of opinion. The ruling planet or species of an interstellar empire could have a change of heart and withdraw from subject worlds — much as the British and French withdrew from their colonies after World War II. To someone from the age of imperial expansion, this would seem intolerably wimpy, a sure sign that the old virtues were gone. But to the post-imperialists, it's a sign of moral advancement (or simply rigorous cost-benefit analysis).

CREATING ALIEN SPECIES



After you've given some basic thought to what a future world is like, you can create its dominant sentient alien species — typically a species intended as a PC species or to play a major role in the campaign setting. You should also refer to page 122 for a discussion of the roles alien species can play in the campaign, and page 90 regarding alien life generally.

The main issue you need to address is: is this species available for use as a PC species? If so, it needs a Species Package Deal, and a good bit of thought regarding its presence and role in the setting. If not, you mainly need to think about the role the species plays in the game, and how best you can create it to fulfill that role.

If there is any One Golden Rule of alien creation, it's this: make sure the aliens serve a purpose. If a Human can play the same role in the story, why go to the trouble of creating an entire alien species and civilization? The potential roles described below provide some guidance when you create an alien species, but many other possibilities exist.

ALIEN ARCHETYPES

Some kinds of aliens turn up again and again in science fiction films and stories. This isn't necessarily because the writers are lazy. Certain aliens have become archetypes — recognizable symbols with a suite of accompanying concepts and ideas.

ENERGY BEINGS

Probably the most alien beings in science fiction are energy beings, immaterial creatures composed entirely of energy rather than matter. In many works they serve as a slightly scientific way to have ghosts or spirits in the story.

The nature of energy beings depends on their power level and what kind of energy they're made of. Electrical beings often learn to communicate through telephones or computers, and sometimes are nothing more than advanced AI programs gone feral. Psionic beings are pretty close to being disembodied spirits. Superhot plasma beings from the surface of a star may not even know solid matter beings exist, and can destroy Human spacecraft and colonies as casually as a person stepping on a bug.

Characters composed of pure energy do need a way to interact with the outside world — some form of telekinesis, say, or the ability to create semi-solid limbs to manipulate objects. They also can't be deadly to their companions! In play, they tend to have truly amazing powers, and usually some severe disadvantages to compensate.

FUNNY-LOOKING HUMANS

Many alien species are, by and large, not that different from Humans. Other than a few odd customs, and perhaps modes of dress or speech, the only way to distinguish them from Humans is to look at the color of their skin and the bumps/ridges on their heads (see the "Rubber-Suited Aliens" sidebar). This is a convenient way for writers (and GMs) to create "alien" species readers can identify with fairly easily... and roleplay without too much difficulty.

HIVE CREATURES

Hive insects have long been used as a model for Human societies; the industriousness and apparent loyalty of ants and bees makes Humans look greedy and fractious by comparison. Hive aliens are the ultimate social beings, with specialized castes optimized for work, breeding, or defense. They allow storytellers to examine issues of individual identity in mass society. In today's individualistic climate, the hive is often a dreadful warning of how society can destroy an individual's rights and personality. Hives make good Warrior species, with endless hordes of single-minded soldiers bred for fighting.

Since hives are based on Terran insects, fictional hive civilizations almost always have insect-like inhabitants. The regimentation and specialization of a hive fits in neatly with computer-controlled cultures or cyborg civilizations.

Characters from a hive culture are likely to be rebels or freaks, unable to exist in the regimented society that produced them. An interesting variant is the character who is a hive himself — a collective being made up of nonintelligent or semisentient creatures.

When creating a hive species, the GM should decide whether the hive remains together for social or biological reasons, or actually has a "group mind" that psionically links all its members together. The latter requires Mind Link or some other power that represents the hive mind; both types may have Psychological or Social Limitations reflecting their attitude towards themselves and others.

TALKING BEASTS

With roots going back to Aesop's fables, the Talking Beast is among the oldest and most resonant alien archetype. A Talking Beast is a sentient alien species based closely on some kind of real-world animal. Appearance, diet, and personality traits closely track those of the original animal. The most common Talking Beast aliens in science fiction are probably Felinoids (cat-people), Insectoids,

RUBBER SUIT ALIENS

Often budget-conscious SF film and television producers make the tacit assumption that alien life is broadly similar to life on Earth. The justification is "parallel evolution." This is a real biological concept — that creatures in similar conditions develop along similar lines. The Pulp Science approach takes this to an extreme, making most pouncing carnivores recognizably catlike, most small flyers insectile, and most intelligent species shaped like Humans in heavy makeup.

Similarly, on *Star Trek*, *Babylon 5*, and other television shows, what sets "aliens" apart from Humans is often little more than a few head bumps or ridges, unusual skin or hair coloration, and/or distinctive modes of dress and behavior. This is because it's easy to use makeup and costumes to turn a Human actor into an "alien," but much more difficult (and expensive) to create a blob-alien, octopoid-alien, or other non-humaniform being on a regular basis. *Star Hero* campaigns often mimic this, since Human players can more readily identify with aliens who seem at least a little Human themselves.

INTERSPECIES SOCIETY

Aliens in Human society will naturally seem strange. If the campaign takes place in a multispecies setting, then aliens and Humans meet on equal terms, and generally neither may take Distinctive Features (see page 62). But if aliens are seen as hostile conquerors, slaves, monsters, or food, they may have problems getting along with Humans (or vice-versa). Social matters of this kind are best represented with Disadvantages such as *Distinctive Features*, *Psychological Limitation*, *Reputation*, and *Social Limitation*. Some examples:

Distinctive Features:

Alien (Concealable With Effort; Noticed And Recognizable; Not Distinctive In Some Cultures Or Societies): 5 points.

Distinctive Features:

Alien Conqueror (Concealable With Effort; Always Recognized, Causes Major Reaction [fear]; Not Distinctive In Some Cultures Or Societies): 10 points.

Reputation: murderous alien, 11- (Extreme): 15 points.

Social Limitation: Slave Species (Very Frequently, Major): 20 points.

Reptiloids, and Winged Humanoids (often bird-people).

Talking Beasts are relatively easy to create because the model species provides a whole suite of behaviors and traits which naturally fit together. It makes sense for a Felinoid to be solitary, proud, carnivorous, selfish, and territorial because real cats act that way. Since Humans are animals too, with our own set of biological traits, gamers can use Talking Beast aliens to reveal and comment on different aspects of Human behavior.

Modern developments in genetic engineering have created a more hard-science subset of the Talking Beast archetype: the Uplifted Animal. Uplifted Animals really are talking beasts — they are existing Terrestrial species given intelligence and the ability to use tools by genetic modification. Stories often depict Uplifted Animals as slaves or second-class citizens, allowing the writer to explore just what it means to be Human.

SUPER INTELLECTS

If the Talking Beast explores Humanity's connection to its biology, a Super Intellect examines minds freed from the tyranny of bodies. Science fiction usually depicts them as skinny guys with oversized heads (often with a cleft down the middle), or disembodied brains. Either way, Super Intellects are concerned purely with matters of the mind. They are relentlessly logical, seldom letting emotions interfere with their decisions.

In fiction, Super Intellects often serve as a dreadful warning of what may happen if Humans devote themselves completely to reason, with no room left for emotion and feeling. Other writers use them as a symbol of ultimate enlightenment, pure minds devoted to pure thoughts. Often Super Intellects have psionic powers, or their advanced brains put their civilization ahead of others technologically. Either way they have great powers other races don't.

In recent decades, the idea of creating artificial intelligence computer programs has led to a new subtype of the Super Intellect: the Sentient Program. Sentient Programs are about as pure mind as it is possible to be, software existing only in cyberspace, interacting with the real world through robot tools and computer screens. Like Super Intellect aliens, the Sentient Program can be either a menace of logic without pity, or a benevolent pure intellect free of hate and negative emotions.

WARRIORS

Humans are pretty aggressive creatures; check any history text or the local police reports for confirmation. Many science fiction stories ask what would happen if we met beings even more warlike than ourselves. They make useful antagonists in action stories, if only because the author doesn't have to come up with any better reason for the conflict. They're Warriors, they fight — 'nuff said. Examples from fiction include the Klingons of *Star Trek* and the Kzinti of Larry

Niven's "Known Space" stories.

Warriors tend to come in two varieties: the disciplined horde and the feudalists. Disciplined hordes are regimented, organized, and unfailingly loyal. They often serve a galactic tyrant. They draw on images from Earth history — the grey columns of the Wehrmacht, or Communist tank divisions parading on May Day. In fiction they are frequently non-Human in appearance, often running to insectoid looks or cyborg bodies.

Feudalists harken back to medieval Europe or Shogunate Japan. They have clans, fight duels at the drop of a hat, and spend as much time battling each other as fighting aliens. Feudalists are a bit more appealing and useful as characters — belonging to of a vast horde of interchangeable soldiers isn't nearly as much fun as being a hot-tempered duelist with an elaborate code of honor. Consequently, feudalist Warriors are usually more Human-like in appearance.

Sometimes one Warrior species fulfills both roles, either due to differences within society or because they change over time. For example, the Klingons in *Star Trek* functioned more like a disciplined horde in the Original Series, but changed to more feudalistic warriors in *The Next Generation* and later series.

ALIEN BODIES, ALIEN MINDS

Aliens are, of course, alien. Depending on how alien they are, they may have serious problems living in an environment comfortable for Humans. This section discusses various alien traits and how to model them using the *HERO System* rules. Some general guidelines:

- Any effect produced by a limb or an external body part may (or may not) qualify for the *Limitation Restrainable*.
- You should consider making any permanent qualities of the being's body, such as a tail, *Inherent*. Ask yourself: would it make sense for other characters to *Aid* or *Drain* this ability or quality? If the answer is "no," then *Inherent* is probably appropriate.
- Any power requiring effort from the creature should be left at full END cost, or take the *Costs Endurance* Limitation if it doesn't already use END.
- The following Advantages are usually inappropriate for a being's innate powers or abilities: *Autofire*, *Indirect*, *Invisible Power Effects*, *MegaScale*, *Penetrating*, *Time Delay*, *Trigger*, *Usable On Others*, *Variable Advantage*, or *Variable Special Effects*.
- The following Limitations are usually inappropriate for a being's innate powers or abilities: *Focus*, *Independent*, *Only In Heroic Identity*, or *Variable Limitations*.

AMPHIBIANS

Beings at home in both water and air have the *Expanded Breathing (water)* form of *Life Support*. If they can go deep underwater, they also have *Safe Environment: High Pressure*. Just about any being which swims in the ocean should also have *Safe*



Environment: Intense Cold, since water is usually pretty chilly. A being which has evolved to live in both air and water will probably be uncomfortable in dry environments; amphibians may well have a Dependence on water, causing Incompetence after 6 hours or more. This is a 0-point Disadvantage in a setting with lots of water, but in a dry or desert environment (like Mars, or the Moon) it would be worth 5 or 10 points.

BLOBS

Creatures with no fixed shape are Blobs. They are liquid or gelatinous in consistency, with no bones and no limbs. In fiction they usually appear as viscous monsters. Blobs can move, and can pick things up using pseudopods or formed hands. Some Blobs can't do any fine work requiring manual dexterity; being a Blob of this type requires a Physical Limitation, *Limited Manipulation* (All The Time, Greatly Impairing; 20 points). Most Blobs can ooze through small apertures and porous materials (Desolidification, Cannot Pass Through Solid Objects (-½); 27 points). A Blob's elastic body may have Damage Reduction to reflect its ability to absorb impacts, Stretching to represent its flexibility, and even Shape Shift or Multiform to simulate its ability to assume other shapes.

Blobs with more control over their forms can create temporary features and organs, such as claws, wings, or gills. If they have only a limited "menu" of possible body parts to create, you can best model this with Multiform or a few specific Powers, perhaps in a Power Framework. If the Blob can transform itself completely at will, it probably has Shape Shift and/or a Variable Power

Pool with Limitations reflecting what it can and cannot do with its body. Some Blobs may even have the ability to divide their bodies in two (Duplication).

BODILESS BEINGS

Some aliens in science fiction have no physical form at all, existing as patterns of data in computer networks, or as free-floating psychic energy. Being Bodiless isn't the same as being Immaterial (see below); Immaterial beings can interact physically with each other, and still have some effect on the material world. A truly Bodiless alien has no physical attributes or powers at all. To simulate this, give the being Invisibility, Desolidification (both Always On and Inherent), the Physical Limitation *No Body* (typically All The Time, Fully Impairing; 25 points) and sell back its STR, CON, and COM to zero. Usually the being cannot take or give physical or energy damage at all; it's only vulnerable to Mental Powers. Bodiless beings which possess the bodies of others are best modeled as Parasites or Symbiotes (see below).

COLONY CREATURES

A colony creature is a being composed of several smaller beings living together in symbiosis. If the colony components can't live apart, this is just a cool special effect, but a colony being which can separate temporarily probably has Duplication, and perhaps Multiform and other powers as well.

DIGGERS

Aliens derived from underground creatures like moles have the Tunneling power with the *Limited Medium* Limitation (soil and sand only; -½). Beings which live underground all the time and "swim" through rock and soil have Tunneling with the *Fill In* Adder and no Limitation on the medium. They should also have some form of ground-penetrating sense like N-Ray Perception or Normal Hearing with the Targeting Sense option. They often have tough or armored skins (represented by Armor or Damage Resistance), and may need Life Support to survive underground.

FAST BEINGS

Creatures so fast Humans can hardly see them are not uncommon in science fiction. While in a Hard SF setting, invisibly fast beings would burn up from air friction, it's still possible to have creatures which live much faster than Humans do — consider hummingbirds. Superfast aliens are best represented with high DEX and SPD, and possibly increased Running. If they are pulpy beings who live so fast they cannot be seen, give them Invisibility with the Limitation *Not While Standing Still* (character must make at least a Half Move every Phase or Invisibility deactivates; -½). Living in the fast lane takes more energy (and thus more food and drink), which is

WEIRD DIETS

Aliens often eat food that is weird or alarming by Human standards. If their diet is merely disgusting to observers, this is no more than an entertaining special effect (or possibly a Social Limitation). If the alien's diet causes harm to others (perhaps it eats plutonium, or fuming hydrochloric acid, or the flesh of sentient beings), it may deserve a Reputation or Social Limitation.

If an alien's food is difficult or harmful to obtain, the alien *might* deserve a Dependence that causes weakness or incompetence. However, GMs should think carefully before allowing such a Disadvantage. Humans do not get a Dependence on normal food, and vampires don't get a Dependence on blood (*HERO System Bestiary*, page 124-27). All creatures have to consume food in some way, and normally they don't get a Disadvantage for it; it's a default condition all characters suffer from. An alien's diet would have to be unusually difficult or dangerous to obtain to qualify for a Dependence.

IMMATERIAL FORMS

Standard Immaterial

Form: Desolidification (affected by attacks dictated by the special effects of the immateriality), Reduced Endurance (0 END; +½), Persistent (+½), Inherent (+¼) (90 Active Points); Always On (-½), Cannot Pass Through Solid Objects (-½). Total cost: 45 points.

Energy Form: Desolidification (affected by similar type of energy), Reduced Endurance (0 END; +½), Persistent (+½), Inherent (+¼) (90 Active Points); Always On (-½), Cannot Pass Through Solid Objects (-½) (total cost: 45 points) plus Energy Blast 5d6, Affects Physical World (+2), Damage Shield (+½), Continuous (+1), Reduced Endurance (0 END; +½), Persistent (+½), Inherent (+¼) (144 Active Points); Always On (-½) (total cost: 96 points). Total cost: 141 points.

Gaseous Form: Desolidification (affected by wind/air attacks), Reduced Endurance (0 END; +½), Persistent (+½), Inherent (+¼) (90 Active Points); Always On (-½), Cannot Pass Through Solid Objects Or Airtight Barriers (-½). Total cost: 45 points.

Pure Psionic Energy

Form: Desolidification (affected by psychokinetic powers), Reduced Endurance (0 END; +½), Persistent (+½), Inherent (+¼) (90 Active Points); Always On (-½). Total cost: 60 points.

represented by the Physical Limitation *Increased Life Support Needs* (Frequently, Slightly; 10 points), and possibly a short lifespan.

FLYERS

Most realistic flying aliens have wings, and thus buy Flight with the *Restrained* Limitation. Because they must be light enough to fly, they probably have reduced BODY and possibly a Vulnerability to ordinary physical damage. Another option is to give them Gliding. Living gasbag creatures are fairly common in fiction — build them using a very slow Flight power, no more than 1-2", with the *Increased Endurance Cost* Limitation to reflect the effort needed to move a bulky balloon through the air. More unusual aliens, like energy beings or psionic creatures, may be able to fly without using wings or lifting gas (straightforward Flight, often with Movement Skill Levels).

GIANTS

Some aliens in fiction are very big. Land creatures on an Earthlike world could easily be the size of dinosaurs, while water-dwelling aliens or gasbag creatures might well be hundreds of meters long. This is not Growth; instead really huge aliens should buy their Characteristics and abilities at a suitably high power level. Other size-related abilities may include increased Movement Powers and increased reach; see page 31 for ideas. Disadvantages associated with large size can be summed up as a Physical Limitation; see page 63.

HANDLESS BEINGS

Perhaps intelligence can develop in a species which lacks usable hands. Sentient dolphins or dogs would also have this problem. A creature with no hands at all, like a dolphin, would have a 25-point Physical Limitation, *No Hands* (All The Time, Fully Impairing). Beings which could manipulate objects with difficulty — like a panda or a squirrel-based alien — would have a 20-point Physical Limitation, *Limited Manipulation* (All The Time, Greatly Impairing). As with handicapped Human characters, if the alien routinely has technology or special powers to overcome its lack of hands, this Disadvantage is worth fewer or no points.

HIDEOUS BEINGS

In a setting with lots of alien species, the average alien's appearance probably won't cause any problems (*i.e.*, characters shouldn't take the *Distinctive Features* Disadvantage). But aliens in a setting where strange beings are uncommon may cause shock, fear, or revulsion in Humans they encounter. The simplest way to handle this is to give them Distinctive Features; a negative Comeliness may also be appropriate.

Some aliens may be so alien and unearthly in appearance that their looks actually damage the minds of those who behold them. H.P. Lovecraft's Great Old Ones are an example of sanity-blasting ugliness. Model this as an Ego Attack with the *Area of Effect* (Radius) and *Inherent* Advantages

and Limitations such as *Always On* and *Only Affects Beings Who See Character* (-½).

IMMATERIAL ALIENS

Some creatures may not be made of solid matter. Examples include gaseous beings, energy creatures, and aliens whose matter is somehow "out of phase" with the rest of the universe. Immaterial aliens typically have Desolidification; see the accompanying sidebar for some examples. "Out of phase" beings should either buy Life Support, or figure out some way to obtain their transphased food. Energy creatures may be able to create solid extensions, giving them the *Affects Physical World* Advantage on some physical Characteristics or powers.

IMMOBILE BEINGS

There are many species of animal life on Earth which don't move much, not including dedicated TV watchers. Clams, oysters, tube-worms, and adult termite queens are examples. Alien species may combine a sessile existence with Human-level intelligence. A sessile being which nevertheless has arms gets a 20-point Physical Limitation, *Unable To Walk* (All The Time, Greatly Impairing), and can sell back its Running to 0" (-12 points). Beings with neither arms nor legs get a 25-point Physical Limitation, *No Limbs* (All The Time, Fully Impairing), and probably can sell back not just Running, but most of the major physical Primary Characteristics. As always, this Disadvantage isn't worth as much if the alien has technological means of getting around that compensate. For example, perhaps an alien who relies on a powered wheelchair or hover-platform has the Physical Limitation *Cannot Move Without Help* (Infrequently, Greatly Impairing; 10 points).

MULTIPLE LIMBS

It's only a historical accident that land-dwelling vertebrates on Earth are descended from a fish with four fins. We could easily have six, eight, or even more limbs, or a tail. The *Extra Limbs* Power, naturally, is the best way to model this. Use the *Inherent* Advantage to reflect the fact that a limb can't easily be "turned off." Note that Extra Limbs primarily applies to manipulatory limbs like arms — if a being has a lot of extra legs or other nonmanipulatory limbs, he might instead buy this as some other power (such as increased Running), or apply the *Limited Manipulation* Limitation to his Extra Limbs.

PARASITES AND SYMBIOTES

Humans are symbiotic organisms; our intestinal bacteria help us digest materials we otherwise can't process. But what if the situation was reversed, and the internal symbiote or parasite was the one with the brains? In a relatively hard SF campaign, an intelligent symbiote or parasite would be specialized to live in a particular host species, in which case it is effectively nothing more than a "special effect" or perhaps an odd form of longevity (as the parasite moves from

body to body — similar to the Trill of *Star Trek*).

In a more cinematic or pulp-oriented campaign, intelligent parasites may be able to exist in a variety of hosts — even Humans. A universal parasite which dominates its host without destroying the original personality is best modeled as a bodiless being (see above) with high levels of Mind Control, Limited so the parasite can only use it against someone it has physical contact with. A parasite which completely takes over its host and destroys the original mind is using a form of Killing Attack, with the “possession” of the mindless body acting as a special effect for Life Support (Longevity). The Killing Attack may be BOECV (for “psychic parasites” and the like); other creatures may use an infectious attack or other physical means of implanting the parasite.

Non-destructive parasites may well have a willing host; in that case the host may qualify as a Follower or even a DNPC. If the parasite is weaker than the host, then make it the DNPC or Follower. On the other hand, the host and parasite may both be PCs, each with its own point value and a Psychological (and/or Physical) Limitation reflecting the attachment. Except in humorous campaigns, the Gamemaster probably shouldn't let a parasite and its host be Rivals.

SLOW BEINGS

Humans don't seem particularly fast, but

to something like a starfish we move about in a superfast blur. Intelligent aliens from a cold or low-energy environment may be similarly slowed down. Extremely slow aliens should buy down DEX to no more than 5 or 6, and have SPD 1. Their slow metabolism may also give them various types of Life Support — Extended Breathing, Diminished Eating, and possibly Longevity.

SMALL ALIENS

It's not clear how small a sapient creature can be. Certainly Human children are fully intelligent (supposedly), and creatures with a more sophisticated brain could be smaller still. As with giant-size beings, this is best modeled by buying down the creature's Characteristics to an appropriate level and adding a Physical Limitation (see pages 31, 63).

CREATING PLAYER CHARACTER SPECIES

When creating an alien species for use as a player character species, the GM (or player) must consider the following three questions. If you can't answer all of them “Yes,” the species probably isn't suitable for PCs.

Can the character work with others? A water-breathing alien in a crew of air-breathers is going to have problems, as will a dinosaur-sized being aboard a ship built for Humans. Advanced technology can overcome a lot of restrictions — a water-breather can wear a liquid-filled environment suit, or a sessile plant-creature can ride about on a powered scooter — but not necessarily all restrictions. This is where the GM's input is crucial, since he is likely to know more about how the game world works and what is and isn't practical.

Can the character function in society? A member of a primitive species in a high-tech setting will be constantly bewildered by advanced technology; an individual from a species of carnivores which regards other sentient beings as nothing more than food may have trouble at meal-times. Created beings like robots or androids may be considered slaves. If a non-Human character is

SPECIES WITHIN SPECIES

Even within a single species there may be groups sufficiently different from each other as to almost qualify as separate “species” for game purposes. The Environment Package Deals on pages 28-32 are an example of this, but the difference can be racial or cultural instead of environmental. If there are factions with their own long history, secrets, and physical types, they may function like subspecies — as with the different Houses in the *Dune* novels. In a campaign this is a great way to provide some easy variety, especially if the players are still learning all the background. An hour's work gives the GM a selection of Package Deals to offer the players, so everyone can get on with the important business of actual gaming.



HOW MANY POINTS IN A PACKAGE DEAL?

There's no specific cost requirement for Species Package Deals, since the cost depends on how many innate abilities and traits a species has. Some species have many positive attributes, leading to expensive Package Deals (like the Android Package Deal on page 23, which costs 92 points). Others have more drawbacks than benefits, leading to Package Deals with negative costs (in other words, the Disadvantages associated with the Package outweigh the benefits).

However, in most *Star Hero* campaigns, Species Package Deals work best if they cost about three to 15 Character Points. That way the investment of Character Points is significant, but not so overwhelming that players can't personalize their characters with other purchases.

going to cause a brawl wherever the PCs go, the GM should forbid it, or perhaps suggest changes to make the character more playable: the primitive learned about high technology from visiting traders, the carnivore has a personal code against eating sentients, and the robot character pretends to serve another while secretly being autonomous.

Can the character have interesting adventures?

While this question should be asked about *any* character, GMs should be particularly alert to species designs which are either too powerful or too limited. Super-powerful aliens may unbalance the game, short-circuiting adventures and leaving the other characters with little to do. Overly-limited species may not be able to do much in the campaign.

Besides those points, generally speaking a species suitable for use as a player character species needs to be two things: first, interesting and distinctive; second, reasonably balanced in game terms.

DISTINCTIVE

It's easy to create a group of more or less "typical" species as seen in science fiction generally; that's part of what Chapter Two of this book does. The species described there are "generic," easily adapted to many different settings, and should save you the work of creating similar species for your own games — just adapt the Package Deals as necessary, and provide some setting-specific description and context, and you're ready to go.

Creating an all-new species, solely for your own campaign, requires a little more effort. Since the "standard" types of alien species are already well-known, you usually need to find a way to make yours distinctive, intriguing, and in some way "new." There are two main ways to do this.

First, you can distinguish your species through its appearance and/or mannerisms. Maybe *your* reptiloid aliens have special scale coloration patterns that say certain things about the individual and have significantly influenced the species's culture. Perhaps the psionic species in your setting speaks in a particularly notable way, because its members aren't used to vocal communication. Maybe the bird-men from Altair VI descend from a prey species and so are prone to nervous behavior and constant watchfulness that's easily portrayed when playing them.

Second, you can distinguish your species through attitude and behavior. Many science fiction species have their own "codes of honor," ones Humans sometimes have trouble comprehending, that makes them distinctive. Others have various personality traits — absolute logic, pacifism, aggressiveness, piety — that are so ingrained, for biological or cultural reasons, that the vast majority of species members display them. A unique behavioral pattern often goes a long way toward setting a species apart. Just be careful it doesn't become a caricature.

BALANCED

In *HERO System* game terms, it's also important that a species be "balanced" — that is, provides enough game-based benefits and abilities to make it attractive as a player character choice, but not so many that every player wants his character to belong to that species. No species is perfect; each should provide a proper mix of advantages and drawbacks, making it three-dimensional and beneficial to the game.

Fortunately, the *HERO System* rules make this fairly easy, since characters have to pay for all prominent abilities with Character Points. If a species has so many abilities that its Package Deal costs 50 points, then the character only has another 100 points to spend on Characteristics, Skills, and the like. A character of a "lesser" species might only have a 4-point Package Deal, but that leaves him with 146 points to spend on other things. In the end, both characters are built on 150 Character Points, which means that, over the course of the campaign, each one should be equally effective. One may be better at combat, the other at diplomacy, but in the end they contribute to the group's accomplishments (and the players' fun) in equal measure.

Package Deal Components

A Species Package Deal, such as the ones in Chapter Two, consists of two parts: abilities and Disadvantages.

ABILITIES

"Abilities" are the Skills and other attributes native to the species. They consist primarily of three things:

- Characteristic bonuses
- Skills, Perks, and Talents possessed by every member of the species
- Powers

Characteristic Bonuses

The most common element of Species Package Deals are Characteristic bonuses. Using Human as a baseline (no additions or subtractions to the base Characteristic values established by the *HERO System 5th Edition, Revised* rulebook), decide what your species is like. Is it stronger, tougher, smarter, more insightful, or stronger-willed than Humans, on the average? If so, a starting bonus to the appropriate Characteristic(s) may be in order. Typically these bonuses range from +1 point to +3 points' worth of the Characteristic, paid for at the normal cost. Bonuses above +3 points are possible, but should be relatively rare.

In most cases Characteristic bonuses are assigned to Primary Characteristics; these of course factor into the Figured Characteristics. Bonuses directly to Figured Characteristics are uncommon, though an unusually tough species may have some extra PD or STUN.

Skills, Perks, And Talents

Skills, Perks, and Talents are much less common in Species Package Deals than Charac-

teristic bonuses. As the *HERO System 5th Edition*, *Revised* notes on page 30, it's unusual for every member of a species to have the same Skills (other, of course, than Everyman Skills). Given the many different ways characters in any setting (particularly a *Star Hero* setting encompassing entire galaxies!) can grow up and learn, it's highly unlikely that *every member* of the species would learn the same Skills. Typically, Skills in a Package Deal represent some innate ability native to the species which is best represented as a Skill. For example, all members of a caninoid alien species might have Animal Handler (Canines) to represent their natural ability to relate to dogs, wolves, and the like. (However, Skills may be appropriate for Cultural Package Deals; see page 27.)

Perks should rarely occur in Species Package Deals. They're often appropriate for Professional Package Deals, but it's uncommon for every member of an entire species to have a particular Perk.

Talents are the same as Skills — a good way to simulate innate abilities possessed by a species. Most Talents are useful only for individuals, but a few make good species abilities. For example, an avian species might have natural Bump Of Direction, derived from an ancient need to migrate south during cold weather. On the other hand, it's relatively unlikely that every given member of a species would have Lightning Reflexes or Speed Reading.

Powers

Some species have Powers in their Package Deals, to reflect natural abilities that can't be accurately created using other game elements. Typically, these include:

- natural weaponry (HAs, HKAs)
- natural defenses (Armor, Damage Resistance)
- unusual senses (Nightvision, Increased Arc Of Perception)
- enhanced or expanded forms of movement (Flight, increased Swimming)

In most cases, the Powers bought for a Species Package Deal have relatively few Active Points, and/or are heavily Limited. There are a few exceptions, such as the Android and Energy Being Package Deals in Chapter Two, but keeping the costs and effectiveness of innate Power-based abilities low is usually best for game balance.

DISADVANTAGES

Most Species Package Deals have two types of Disadvantages: reduced Characteristics or movement; and standard Disadvantages such as Physical Limitations.

Reduced Characteristics and movement are the opposite of the Characteristic bonuses discussed above. Some species are weaker, more frail, stupider, or less insightful than average (*i.e.*, than Humans), and a reduction in their starting Characteristics reflects this. In most cases, the reduction should be -1 to -3 points; more than that may cause problems for a starting character.

For standard Disadvantages, it's usually best to stick to physical handicaps that would obviously affect every member of a species. For example, all of the bat-people may have weak eyesight. Mental and social restrictions should rarely be a part of Species Package Deals. Characters are individuals (except for certain hive-mind species and the like), and shouldn't be required to act alike because of a common Psychological Limitation or the like. Even among a relatively homogeneous species, like the Klingons of *Star Trek*, individuals don't think exactly alike, or approach problems the same way. However, in a specific campaign setting, species which are widely discriminated against may qualify for a Hunted (Watched) or Social Limitation.

Common Alien Traits

Individuals living in a civilization cannot help but be affected by it. In particular, they often acquire the same Disadvantages reflecting common attitudes and assumptions — as noted in the main text, it's all too common in SF for every single member of a given alien species to have certain personality traits or beliefs. Here are some suggestions on how *HERO System* Disadvantages link to various aspects of a civilization.

Dependent NPC: In many traditional societies, ties of kinship and personal loyalty are strong. They are also one of the bulwarks of hereditary government. Characters from Farming or Nomadic economies, or from states where rulership is Hereditary, are likely to have numerous DNPCs in the form of distant relations, loyal retainers, liegemen, and the like. (Similarly, this can lead to characters having a plethora of Contacts and/or Followers; GMs might even mandate this by allotting points to those Perks in the Species Package Deal.)

Enraged/Berserk: Warrior cultures, like Nomadic economies or carnivorous species, may have this Disadvantage, especially at low tech levels where personal combat isn't automatically lethal. Triggers often include "sense of honor offended" or "insulted."

Hunted: In civilizations with intrusive governments (Force-based rule) or repressive legal systems, just about everyone may be Watched at times. Those who oppose the government are Hunted. If one species is at war with another, each species may be Hunting its enemy.

Psychological Limitation: Codes of conduct are the most common culture-specific Psychological Limitations. Honor-bound societies have Codes Of Honor, Honorable, or Vengeful; the GM and players should be certain to define the boundaries of such codes, to minimize disputes about how a character should act in a given situation. Pacifist cultures have Code Versus Killing. Religious societies encourage Piety (Common, Moderate) if not outright Religious Fanaticism (Common, Total). Vital, expansive cultures may also encourage Overconfidence, as with nineteenth-century Englishmen or twenty-first century Americans.



But a society can also have built-in fears and hatreds. A totalitarian society induces Paranoia in most citizens. Citizens of a state with a long history of warfare with a neighbor may develop an ingrained Hatred of those people — witness the remarkable persistence of Anglophobia among the French.

Social Limitation: Societies which include racial or linguistic minorities may have widespread prejudice against them among the majority population; this could create a common Minor Social Limitation. Other minorities could be actively persecuted — subject to constant harassment and the threat of mob violence. That's a Major or Severe Social Limitation.

ALIEN SPECIES AS NPCs

For species not intended as PC species, the main issue is what role the species plays in the campaign. Although a species consists of millions, billions, or even trillions of individuals, in many ways, alien species in various science fiction settings serve as large-scale NPCs, broadly speaking. To put it another way, a given species is often so associated with a particular attitude, philosophy, practice, or custom that it becomes one-dimensional. Some of the most common “classifications” of alien species are described below.

ALLY

Some species's primary role is as the allies of the species to which the PCs (or most of them) belong (usually this means Humans, of course). Examples include the Pogs in Phil Foglio's “Buck Godot” comics, and to some extent the Vulcans in *Star Trek*. Rarely (if ever) depicted on its own, this species acts primarily in concert with the PCs' species... though occasionally there's a good story to be told when the Ally species turns against the main species, or objects to its conduct for some reason.

COMIC RELIEF

A few species appear in a setting solely for the purpose of getting a laugh from the audience (*i.e.*, the players, in a *Star Hero* game). Sometimes bumbling and clumsy, often mystified by the ways of Humans, this species usually possesses some bizarre customs (“No, we don't *eat* them; we play *vrgblat* with them. What kind of barbarian are you?”). Being the source of humor doesn't necessarily make a species nonthreatening, though; in the *Star Wars* saga, everyone laughs (or groans) at Jawas and Ewoks, but both hold their own against bigger, tougher species.

CONTEMPLATIVE

Science fiction is rife with philosophical species brought into the story, in large part, to compare and contrast with Humans so the author can comment on “the Human condition.” *Star Trek*'s Vulcans and Bajorans, and the Minbari of *Babylon 5*, fit this mold. A Contemplative species often fills other roles (such as Ally or Cultural Antagonist); its members, while possibly condescending or sarcastically observant, often possess attributes of great use to the PCs (advanced science or technical knowledge and skills, psionic powers, martial arts prowess...).

CULTURAL ANTAGONIST

Similar to the Contemplative, the Cultural Antagonist exists largely to set off another quality of some other species (typically, but not always, Humanity). Something about the two species prevents them from seeing eye-to-eye; one may be logical, the other passionate; one aggressive, the other pacifistic; one greedy, the other philosophical. The Ferengi of *Star Trek*, with their unalloyed greed contrasting so starkly with the Federation's high-moneyless economy and social utopia, are a perfect example.

ELDER CIVILIZATION

“The Ancients” — an old, usually incredibly advanced alien civilization that disappeared from the Galaxy hundreds of thousands or millions of years ago — is a staple of many science fiction settings. The Slavers, Tnuctipun, and Pak of Larry Niven's “Known Space” stories, the Iconians of *Star Trek*, and the Vorlons and Shadows of *Babylon 5* all fit into this category to varying degrees.

Typically, an Elder Civilization was incredibly powerful, possessed amazingly high-tech devices, and

ruled huge swaths of the Galaxy (or even multiple galaxies). In most cases, the Elder Civilization has left behind only its relics, ranging from mysterious ruins on various planets to caches of extraordinarily advanced technology. Player characters and NPCs alike seek those relics (either to gain knowledge, or to acquire money and power by selling or using them). But in some settings, such as the universe of Babylon 5, a few Ancients have remained behind to help, hinder, or harm Humanity and other “modern,” but much less advanced, species.

Elder Civilizations that stay around for PCs to interact with are often decadent or contemplative, if only because their tremendous power would otherwise allow them to conquer the Universe with ease. Sometimes, the writer solves this problem by having only one or two survivors of the species exist. But in any case, individual members of an Elder Civilization can still go out slumming with primitives like Humanity....

In a *Star Hero* campaign, the existence of one or more Elder Civilizations provides the GM with all sorts of potential scenarios and plot hooks. Characters with the *Advanced Tech* Perk may justify it by explaining that they once found some hidden Ancient technology. Antagonists with access to Ancient weapons may threaten the PCs’ homeworld. A race to explore a world thought to contain Ancient ruins could motivate a group of characters.

Of course, the GM should take care not to let Ancient technology unbalance his campaign or change his setting — unless that’s what he wants. If necessary, Elder Civilization devices should only function a few times before running out of energy, break-

ing down, or exploding, or the competition to obtain the device leads to its destruction instead. Giving Elder Civilization tech to the PCs, who are constantly on “center stage” in the campaign, may cause problems, but letting an occasional adversary have it could work just fine... assuming the PCs don’t get their hands on it after they defeat him.

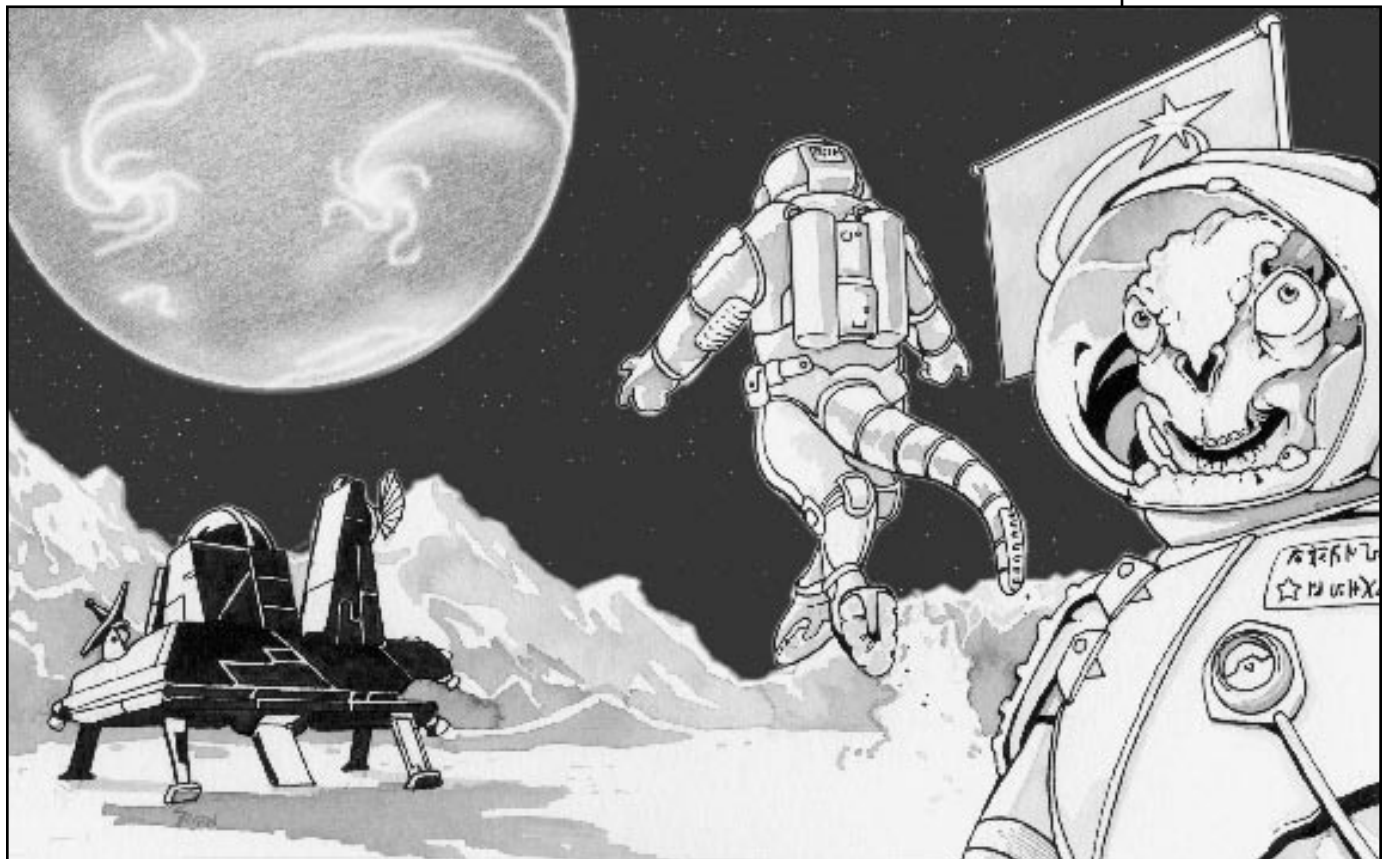
Elder Civilization species come in various forms, often as Super Intellects or Energy Beings (see above). Individuals are generally quite wealthy by the standards of other cultures, much as American or European tourists in Earth’s poorest countries would be. If the GM allows players to have characters who are members of an “Ancients” species, those characters should take the Perk *Advanced Tech* (page 48), and probably a Reputation as well.

ENEMY SPECIES

Some aliens serve mainly as enemies (two-dimensional or otherwise) for the PCs. See *Villain Archetypes*, page 289, for more information.

TRADING PARTNER

Some alien species are known primarily for their role in commercial activities. Either the entire species is devoted to earning money (as with *Star Trek’s* Ferengi), or the species only enters the story when matters of finance or trade are involved. The species is probably actually much more diverse and multifaceted, but all Our Heroes ever see is how it conducts business. A clever GM may eventually develop a Trading Partner species into a full-fledged species during the course of the campaign.



ALIEN CIVILIZATION



KARDASHEV CLASSIFICATIONS

The Russian astrophysicist V.I. Kardashev classified possible alien civilizations by energy output, as a guideline for scientists searching for alien signals.

Type I: A civilization capable of using all the energy resources of a single planet. In practice this means intercepting and using all the available sunlight reaching the planet, about 40 billion megawatts. Our own civilization is not yet a Type I, as Earth's current energy budget is far less than that. A Type I civilization would be detectable by radiotelescope at a distance of a few tens of light-years.

Type II: Capable of using the entire output of a star or star system, or some 400 billion billion megawatts. Type II civilizations can move planets and build structures millions of kilometers across. They could be detected hundreds of light-years away.

Type III: Capable of using the entire energy output of a galaxy (10^{37} watts). A Type III civilization could create structures on a scale of light-years, and move entire stars. It would be detectable across the entire observable universe.

So what is a civilization, anyway? It's the way a large portion of a sentient species lives — their art, their economy, how they govern themselves, their methods of resolving disputes, their recreations, and so on. It's everything a given population does. The scale is necessarily large — typically a continent, planet, or multiplanet empire. Usually a civilization is self-contained, at least for essentials. It doesn't have to be a single political unit, although in science fiction that's the norm.

This section discusses the elements of civilizations. It includes random generation tables for GMs who need to create a civilization quickly, don't have any specific ideas for what they want, or are looking for inspiration. When creating a civilization for a newly-generated planet, the GM needs to note in advance whether it's an indigenous native culture or a colony world (see Chapter Four regarding planet creation).

TECHNOLOGY

Technology determines so much about how a civilization looks and what it can do that it's best to start with it. This section uses general descriptions of technology levels — for other technology classification systems, see page 142. Gamemasters creating a new world should assign the technology level based on what purpose that planet serves in the campaign. A powerful spacefaring empire obviously needs mature interstellar technology; a “sword and planet” world should have Renaissance-era technology (at best). For random determination, see the Technology Classification Table.

Problems can arise when there is a large difference between the technology available to the PCs and that of a planet they're visiting. If the world is low-tech, the heroes' guns and body armor can give them a significant advantage over the locals. Many stories get around this problem by invoking a “technology quarantine” to protect primitive societies (see page 145). Quarantine rules may require visitors to use only locally-available equipment, and there may be strict penalties for introducing new technologies or ideas. Such rules may not stop greedy PCs or immature players, but at least they give the GM an in-game means for dealing with violations.

The opposite problem can occur when an alien world is far more advanced than the heroes' own civilization. This makes the PCs primitive barbarians trying to use devices they barely understand. Players may find this frustrating, and even if they

don't, they'll be trying to grab as many high-tech goodies as they can. One useful technique to control this problem is to make the aliens advanced in only one or two areas rather than all fields, or to create or define the technology in such a way that the PCs can't use it (or can only get limited use out of it).

POPULATION

Once you've determined a civilization's level of technology, figure out how many people it includes. To determine how many people a planet supports, decide if they are natives or colonists. Some worlds have a mix of both, and colonies which have lasted for several centuries are effectively “native” populations and can be treated as such. If the planet is a colony, skip down to the section on colonies below.

POPULATION CAPACITY

Native populations tend to be at the maximum possible for a given planet (at least at prestellar technology levels). When determining the native population, first determine how many people a given world can support. The base surface area in millions of square kilometers depends on the diameter, as shown in the accompanying table.

Multiply the surface area by the hydrographic percentage (page 92) to find out how much of that area is covered by oceans. The remainder is dry

PLANETARY SURFACE AREA

Diameter (km)	Surface Area (millions of square kilometers)
1,000	3
2,000	12
3,000	28
4,000	50
5,000	80
6,000	110
7,000	150
8,000	200
9,000	250
10,000	310
11,000	380
12,000	450
13,000	530
14,000	610
15,000	700
16,000	800
17,000	900
18,000	1,000
19,000	1,130
20,000	1,250

land. (Note: if the dominant species lives in water, treat the oceans as “dry land” for all calculations of a planet’s habitable area.)

Next calculate how much of that dry land surface is actually usable by rolling on the Usable Land Table. Even a lush world like Earth has only limited regions where agriculture is possible. Mountains, deserts, and polar icecaps make much of the surface unusable. Colony planets get a slight penalty because no colonists are ever as perfectly suited to a world as organisms which evolved there.

Multiply the habitable fraction by the population density for the planet’s level of technology to determine how many people can live on the world. This is the planet’s carrying capacity. At lower technology levels, the planet will have about as many people as it can possibly support. But at higher technology levels, beginning at the Industrial stage, populations may level off as the birth rate declines. With the development of object-creation devices or nanotechnology, any world can support almost any number of people, limited only by living space and energy supply. In general, interstellar societies seldom increase their population beyond that of an information-age civilization; for them, once you’ve determined how many people the planet has, subtract (1d6-1) times 10 percent.

USABLE LAND TABLE

Roll (2d6)	Habitable Fraction
0 or less	10 percent
1	20 percent
2	30 percent
3	40 percent
4	50 percent
5	60 percent
6	65 percent
7	70 percent
8	75 percent
9	80 percent
10	85 percent
11	90 percent
12	95 percent

Condition	Modifier
Mass greater than 0.2	-1
Mass greater than 1	-2
Minimal axial tilt (less than 10 degrees)	-1
Hydrographic 60 to 90 percent	-2
Hydrographic 30 to 60 percent	-4
Hydrographic less than 30 percent	-8
No oceans	-10
Cool climate	-1
Cold climate	-2
Colony world	-1

EFFECTS OF BIOLOGY

Diet: If the species is carnivorous, divide population density by ten for all levels of technology before nanotech or replicator technology, to reflect the fact that there are more intermediate steps in the food chain between the basic energy source and the population supported. Conversely, creatures which are able to consume energy directly are vastly more efficient. For all technology levels

TECHNOLOGY CLASSIFICATIONS TABLE

You can use this table to randomly determine the technological level of a given civilization. It’s biased toward creating low-technology cultures. A look at Human history on Earth indicates Humanity spent upwards of half a million years at Stone Age technology, and about several thousand at Bronze Age. Therefore, it’s reasonable to assume that a randomly-encountered civilization is most likely low-tech.

If the planet is a recent colony world, it is either at or below the technology level of its parent world. Roll 1d6; on a 1-2 the planet is the same technology level as its founding civilization, on a 3-4 it is lower (1 step on the Technology Classification Table), and on a 5-6 it is considerably lower (1d6 levels). If the planet is a *lost* colony, then its technology is 1d6 levels lower than the parent civilization’s. (Exclude results of 2, “Mature Interstellar,” when determining lower tech levels.) For older colonies which may have diverged significantly from their parent culture, determine technology as if the inhabitants are natives.

Planets which have suffered a major disaster may regress technologically. See the section on planetary disasters for their effects on technology levels and population.

Roll (2d6)	Technology Classification	Roll (2d6)	Technology Classification
2	Mature Interstellar	9	Iron Age
3	Cyberpunk Era	10	Preindustrial
4	Industrial Era	11	Industrial/Atomic Era
5	Bronze Age	12	Early Interstellar
6-8	Stone Age		

Advanced And Retarded Technology

Some worlds may not have followed the same path of technological progress as Human civilization. They may be more or less advanced in a given field than their general level of technology would indicate. Roll 1d6 and consult the following table:

Roll (1d6)	Technological Advance Or Lag
1-2	No deviation from the standard technology scale
3	-1 step in one area (roll below)
4	+1 step in one area (roll below)
5	+1 step in one area, -1 in another
6	+1 step in 1d6 areas, -1 in 1d6 areas (if the same area gets a +1 and a -1 then the net result is no change)

The Technology Areas Table lets you determine what areas a civilization has advanced or lagged in. It concentrates mostly on practical technology which affects the way people live, rather than pure science. A civilization might have an anomalously high understanding of geology or mathematics, but that won’t have much impact on daily life (as demonstrated in Arthur C. Clarke’s short story, “Second Dawn”).

Technology Areas (roll 1d6 and 1d6)

First Die	Second Die	Area
1-2	1	Agriculture
1-2	2	Astronomy
1-2	3	Automation or Machinery
1-2	4	Biology
1-2	5	Chemistry
1-2	6	Communication
3-4	1	Computers or Information-Handling
3-4	2	Construction
3-4	3	Economics
3-4	4	Energy
3-4	5	Manufacturing
3-4	6	Materials
5-6	1	Medicine
5-6	2	Physics
5-6	3	Sensors or Optics
5-6	4	Transportation
5-6	5	Weapons
5-6	6	Weird Technology

Most of the headings are self-explanatory. “Weird Technology” refers to areas in which the planet’s scientists have made discoveries unknown to Earthly researchers. Examples include time travel, shape-shifting, immortality, and advanced robotics.

POPULATION DENSITY BY TECHNOLOGY TYPE

Technology	Population Density (people per square km)
Stone Age	1 per square kilometer
Bronze/Iron Age	5 per square kilometer
Preindustrial	10 per square kilometer
Industrial	30 per square kilometer
Atomic Era	50 per square kilometer
Cyberpunk Era	60 per square kilometer
Interstellar	70 per square kilometer
Nanotech/Replicator	Unlimited

below nanotech or replicators, use the Interstellar era population density if the native life can absorb energy directly.

Size: The size of a species also can affect carrying capacity — divide the species's average size by 100 kilograms, then divide the population by that number. A planet inhabited by large creatures will have a proportionately smaller population, while a world with tiny inhabitants can support more.

Metabolism: Warm-blooded beings require proportionately more food than cold-blooded ones do. Double the carrying capacity at all tech levels for beings with a cold-blooded metabolism.

REGIONAL VARIATIONS

On some worlds different continents may have civilizations with different technology levels, making for drastic differences in population. On Earth, for example, Europe and Asia had approximately a quarter-billion people in the year 1500 while the Americas had a tenth as many, because the Eurasians had generally Preindustrial technology while the American civilizations were limited to Stone and Bronze Age techniques. If the planet has such differences, the GM may want to figure the population separately for each continent. For simplicity's sake assume all continents have an equal share of the habitable area.

COLONY PLANETS

To determine if a planet is not natively inhabited, but instead is home to a colony or colonies established by a spacefaring civilization, roll 2 dice and apply the modifiers listed below, then subtract 11. The result is the number of colonies.

Lifebearing Planet: +3

In Green Zone: +1

Gas Giant: -4

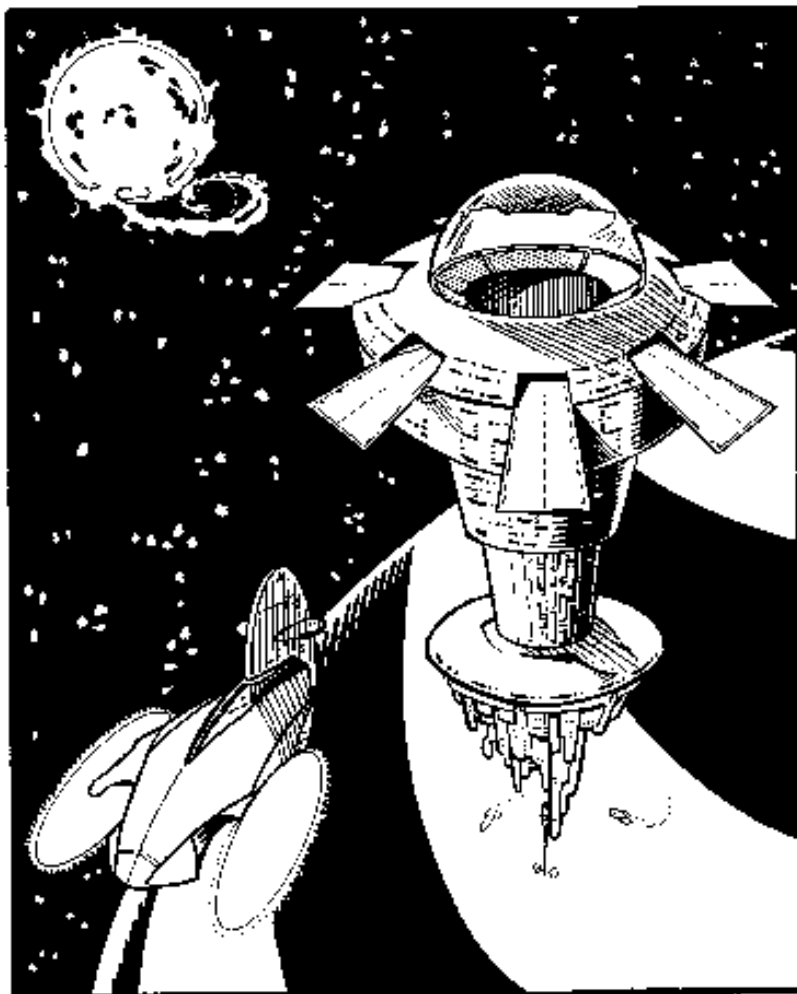
Spacefaring Civilization on another planet in system: +2

Valuable Resources: +1

Where more than one colony exists on a planet, the GM must decide if they were planted by different spacefaring civilizations. They don't have to be: consider the fifteen separate British colonies established in North America on Earth. Different colonies may be the same age, or may have been planted at different times (the American colonies were established over more than a century). Multiple colonies are especially likely on lush, lifebearing worlds which are very attractive to settlers, or on mineral-rich marginal or hostile worlds which may experience a "gold rush" to exploit the available resources. Colonies on a planet may cooperate on large-scale projects and eventually form a single society, or they can come into conflict over limited resources and create a balkanized world. See the Colony Size Table to determine population of each colony.

A colony's growth can be very rapid at first due to immigration. Often the limiting factor is not how fast people arrive but how fast room can be made available to them. This is especially important for colonies on worlds which do not have a habitable environment for the colonists.

For colonies the two most important details are age and how habitable the world is. There are three categories for habitability. *Habitable* means the colonists can live on native foods or grow their own crops without any form of life support or environmental modification. Growth can be fairly rapid as there is always room for more settlers. *Marginal* planets have breathable air but require a lot of infrastructure to make a given area productive — irrigation, soil treatment, terracing, or other large-scale effort. Lifebearing worlds are Marginal if they have less than 50 percent oceans, a Cool



COLONY SIZE TABLE

Age	Habitable	Marginal	Hostile
New	10,000	5,000	1,000
5 years	15,000	7,000	2,000
10 years	30,000	10,000	2,000
20 years	50,000	17,000	3,000
50 years	220,000	40,000	5,000
100 years	2 million	100,000	7,000
200 years	As natives	2 million	50,000

To allow for some variation, the GM can roll 1d6, multiply the result by 10%, and increase or reduce the colony's size by that percentage.

climate, or an average atmospheric pressure below 50 percent of standard (.5 atmospheres). Growth is slower because new areas must be made habitable before they can be settled. *Hostile* worlds require total life support, and all growth requires expansion of the colony's mechanical systems. Any world without oxygen or native life is *Hostile*.

Some planets may be colonized by different species, or a starfaring species may plant colonists on worlds with a native civilization. The GM should calculate the population levels separately as described above, using the native population method for the original inhabitants and the colony level for the newcomers. Of course, a planet which is *Habitable* to one species may be *Marginal* or even *Hostile* to another. A Human colony on an Earth-like world would grow much faster than a settlement of high-temperature silicon beings. The GM should also take into account the possibilities of inter-species conflict; the natives may fight back if they feel threatened or taken advantage of, the way American Indians did against settlers descended from European colonists.

DISASTERS

Planetary disasters can have a negative effect on both population and technology. To determine if the planet has suffered a disaster in the past century and what its effects have been, roll on the Disasters Table.

Any disaster which reduces population by

PLANETARY DISASTERS

Roll (2d6)	Disaster
2-6	No Disaster
7	Plague (reduce population by 1d6 times 10%)
8	Global Warming (only at Industrial technology or above; reduce habitable area by 10 percent due to rising oceans and spreading deserts, and recompute population accordingly)
9	Global War (only at Industrial technology or above; reduce population by 1d6 times 10 percent)
10	Ice Age (reduce habitable area by 50 percent and recompute population)
11	Asteroid Impact (reduce population by 1d times 10 percent)
12	Massive Solar Flares (reduce population and habitable area by 50 percent)

more than 10 percent can also reduce the general technology level as industries and communications centers are destroyed. Add 1d6 times 10 to the percentage population loss from the disaster; if the result is 80 or more, lower the technology by 1 step; if the result is greater than 100, lower it by 2 steps.

Lowering the technology level may in turn reduce the planet's carrying capacity below the post-disaster population level. In that case the planet suffers a second catastrophe in the form of mass famines, reducing the population to what the technology can support. This counts as a second, separate disaster and can cause further technological collapse, reducing the technology even more and possibly resulting in further famines. Thus, a relatively minor disaster can throw a world into a nosedive. Prompt intervention by other planets can make the difference between a "mere" disaster and the collapse of civilization.

ECONOMICS

Although accurately described as "the dismal science" in many respects, economics is an important part of a civilization. Basic economic issues can have a serious effect on a *Star Hero* setting, and a clever GM can use them in adventures in fun and intriguing ways without having to know too much about the real nuts-and-bolts of the subject.

CURRENCY

In many SF settings, the default unit of currency is the "credit." Typically credits are an electronic currency, stored solely in computers and on characters' personal credit-keeping devices (be they cards, sticks, chips, or the like). People don't actually hold credits in their hands, and governments don't mint or print them the way less advanced governments do coins and paper money.

The existence of credits raises numerous issues for the GM to consider. One is the possibility of computer robbery; a skilled hacker can get away with tremendous fortunes, whereas the classic "strong-arm thug" may only be able to steal things like jewelry. Another is whether an "underground economy" involving "normal" money exists. Because credits are electronic, every use of them is easily traced — a prospect that alarms not only criminals, but civil libertarians, spies, and paranoid player characters. Cash, on the other hand, can't really be traced at all, making it the economic medium of choice for many... if there's a way to spend it.

Of course, there's no requirement that a specific *Star Hero* setting use credits, or only credits. Many SF worlds have more traditional economies, where each species, planet, or even nation issues its own currency. *Star Trek*, for example, features not only the Federation credit, but gold-pressed latinum (in various denominations), the Cardassian *lek*, and dozens of other forms of currency. In such a setting, the PCs may soon find themselves caught in a maze of monetary confusion while the GM chuckles wickedly. "What do you mean, I can only get 57 *djarbecs* per credit on Halana Prime? I got

MACRO-LIFE

The idea of "Macro-Life" refers to a civilization residing completely aboard large mobile space habitats, existing in space the way single-celled organisms live in water. Even limited to sublight speeds, habitats could spread through the galaxy over millions of years. Individual macro-life habitats would grow, move, react to stimuli, and reproduce by creating daughter habitats from raw materials. The Human crew would be the equivalent of a cell's DNA.

A macro-life civilization would not be tied to planets, and star systems themselves would be valuable only as sources of matter and energy. Macro-life habitats could make use of brown dwarf stars or planet-sized bodies in interstellar space, comets and Kuiper Belt objects on the fringes of star systems, and even the wispy matter of nebulae.

Macro-life cultures are highly mobile and focused on the interactions between different habitat cultures, and on conflicts and politics within a specific habitat. In a *Star Hero* campaign, the characters might spend their whole lives aboard one habitat during interstellar voyages, or could visit a planetary system with thousands of different habitats. Since a given habitat's crewmembers might modify themselves with genetic engineering and cybernetics, Humans from different habitats could be as different as any aliens.

Iain M. Banks's "Culture" series describes a civilization which is at

Continued on next page

Continued from last page

least partly Macro-Life, as much of the populace lives aboard huge sentient starships. The flying cities of James Blish's "Okie" series, and the Ousters of Dan Simmons's "Hyperion" novels, are other examples.

72 per credit back on Deneb IV!" Clever merchant characters may find ways to leverage this sort of situation for their own benefit.

Barter

Last but not least, maybe there is no real form of currency. Some interstellar economies could revert to that oldest form of exchange, barter. Rather than having to figure out the best place to sell their cargo of fine Guthalan diamonds based on monetary exchange rates so they can buy weapons, the PCs may have to find someone who's willing to trade diamonds for weapons directly... a potentially daunting prospect, even in a setting involving computerized record-keeping and FTL communications. But such a situation teems with plot seeds and story hooks.

COMPONENTS OF A PLANETARY ECONOMY

How the people of a given planet make a living is closely related to the planet's technology. How people live says a lot about what's important to them and how they react to new situations. For game purposes, a world's economy can be defined as Gathering, Nomadic, Farming, Manufacturing, Information, or Posteconomic. Different parts of the same planet may have different economies.

Gathering

Gathering societies live on available resources produced by the environment. Hunting, fishing, and logging are all examples. Gathering is the only form of economic system possible at early Stone Age technology. At more advanced technology levels, gathering becomes less important but never completely disappears. Mineral prospectors, who gather up easily-accessible ore they can trade, are also gatherers, even when they are looking for radioactives on distant worlds. Because few environments produce lots of food or resources for the taking, gathering populations tend to be small and spread-out. This often means large political organizations are hard to maintain, and scientific progress is slow because it's hard to share ideas and there are fewer minds to have them.

Nomadic

Nomadic populations move with the seasons, either following herds of animals or perhaps moving between two areas of crop-growing (on worlds with a long year or extreme seasons). They require at least late Stone Age technology, and usually become obsolete when improved transport appears at the Industrial level. Nomads tend to be quick to fight — they have to be, because their wealth is mobile and thus easy to steal. The best way to protect your herd is to develop a reputation for winning fights and avenging any insult. This hypersensitivity tends to encourage honesty and honorable behavior. Because they are both warlike and mobile, nomads often conquer other groups on worlds with low technology, so an otherwise placid farming society might be ruled by aggressive nomads. The development of advanced weaponry (bows, siege engines, firearms) enables

sedentary societies to fight back against nomadic warriors.

Farming

Farming economies produce food and resources by manipulating the environment via farming, herding animals, or digging mines. Production is in the hands of individuals or families, and so villages or even single households are largely self-sufficient. Farming requires at least late Stone Age technology, but is likely to persist in specialized forms at any technology level. Farming makes large states possible, and allows people to live together in towns. This often promotes the development of writing and record-keeping. Since farming is tied closely to the cycle of the seasons, farming societies are usually the first to develop astronomy and other sciences.

Farmers are less warlike because it's almost as hard to steal a field of grain as it is to grow it. On the other hand, farming is unforgiving. If you don't do everything right, the crop fails, and you can't try again for a year, so you starve to death. As a result, farming cultures do not value innovation highly; trying something new can be dangerous.

Manufacturing

Manufacturing systems produce goods and food in specialized facilities, like factories or big single-crop farms. This specialization only works if everything is connected by a web of efficient transportation. It becomes widespread after the industrial technology that makes it possible arrives. Specialization and economics of scale mean manufacturing economies are based on large organizations like corporations or collective farms. These organizations can be privately owned, controlled by shareholders, or run by the government. Manufacturing spurs the growth of large cities, which are hotbeds of political change and scientific research.

Urban societies at any tech level have a different set of priorities than farmers or herders, and in a Manufacturing economy the city-dwellers are paramount. Townsmen have to be able to get along with each other, so they can't be too violent, but they aren't as tied to the cycles of nature, either. They value skill and initiative, but aren't interested in codes of honor.

Information

Information economies are the result when technological change makes skill and knowledge more important than materials or labor. An information economy depends on rapid flows of enormous amounts of data. Information economies can begin to develop as soon as telegraphs and telephones link distant communities, but are most common once computers are widespread. An information economy allows people to live anywhere and still remain connected to society. With everyone linked up to form a single "city," technological progress and political change can take place very rapidly. Information economies work best when there is little secrecy, and so tend to encourage free inquiry.

Posteconomic

Posteconomic systems arrive with the development of nanotechnology, automated microfactories, or superscience “replicator” devices. Individuals can basically make whatever they desire, and wealth becomes almost incidental. The only trade is in ideas and creative works. The worlds of *Star Trek*’s Federation or Iain M. Banks’s Culture are Posteconomic. Posteconomic societies permit a great deal of decentralization, since individuals are once again almost self-sufficient. The fact that nearly everyone can have any material possessions he wants makes owning things less important.

DISTRIBUTION OF WEALTH

While technology determines how people make a living, it doesn’t control how wealth is distributed. The two main ways to allocate wealth are market and command economies. In a market economy, decisions about resource allocations are made by individuals or private organizations; this can create tremendous inequality but is flexible and adapts rapidly to changing conditions. In a command economy all decisions about allocating wealth are made by some central agency. The results are fair (maybe), but command economies are vulnerable to poor decision-making and corruption, and often do not adapt easily. In times of war or crisis, even market economies function on a command basis, at least temporarily.

Although certain economic systems are characteristic of certain technology levels (manufacturing economies in the Industrial era, posteconomic in the Nanotech age, and so forth), there is no reason why a society can’t have a more “primitive” economy. A group of colonists on a new world might be equipped with the very latest in superscientific technology, but live by gathering and farming simply because those systems are suited for small, dispersed populations.

When designing a planet, the GM should assume that native societies usually have the most “advanced” type of economy possible for their technological level. Colony worlds generally suit their economic arrangements to their population levels.

PLANETARY TRADE

Since no place produces everything one might want or need, people trade with one another. It seems likely that sentient aliens trade also. Of course, trade depends on transportation — a producer can’t sell his goods if he can’t get them to his customers. At low tech levels, when people can only trade what they or their pack animals can carry, trade consists of fairly compact, high-value items — jewels, gold, furs, spices, wine, cloth, and so forth. Boats and ships make bulk trade possible, but only on short, relatively safe voyages. The risks of long sea voyages mean merchants still concentrate on carrying luxuries. Thus, river barges and coastal schooners carry salt fish and flour, but clippers and galleons carry tea and treasure.

Trading societies at lower tech levels are urban, and usually rely on sea transport (though caravan trade across a desert or steppe is very similar to

sea trading). With the coming of industrial-era technology, railroads and highways make bulk transport on land possible, forging the web of specialized industry characteristic of a manufacturing economy. Aircraft makes a planetary economy even more interconnected, and high-tech transportation such as hovercraft or teleportation booths only extends this trend.

SPACE TRADE

Space transport is seldom cheap, even in the most optimistic fiction. A spaceship is fabulously expensive, and the fuel to boost payloads into orbit is more expensive still. Launch costs of a thousand credits per kilogram or more are often the norm. Given those expenses, space trade is likely to deal in very compact, high-value items in most *Star Hero* settings. Planets and space habitats must be self-sufficient in bulk goods and the necessities of life. While highly advanced science fiction technology, like rapid, easy FTL travel or teleportation devices, can make interstellar trade much easier and cheaper, even then it often remains more difficult than planetary trade.

Space traders are a staple of science fiction, but the task is considerably harder than just landing and passing out glass beads to the natives. Any obvious trade routes are probably taken already by merchants who have ongoing relationships with



suppliers and markets. They may even use force to discourage competitors, especially if there's no interstellar navy to keep the peace.

Gamemasters can handle trade either of two ways: by “gaming it out” as a part of the adventure; or by abstracting it to a series of die rolls. Trade during an adventure means the merchant characters meet with vendors, see their wares, negotiate prices and other terms, try to avoid being cheated, and have to guess what items are likely to sell for a good price at the next planet. Important skills include Area Knowledge, Trading, and Bureaucratics. Often the cargo can be the hook for an adventure — the shipment is stolen, the crates don't hold what their labels say they do, the ancient artifacts are actually aliens in stasis, or the Galactic Mafia wants its goods back. There are certain pitfalls, though: the players may wonder if they can ever just move a cargo from Point A to Point B without getting involved in some nefarious scheme, and the scenes of dickering with shippers and brokers can all start to sound the same.

Abstract trade avoids those problems, but makes the whole process a bit more dry and routine. It also means that when the GM does try to play out getting a cargo, he alerts the players that there is Something Different about this one.

Abstract trade groups items into the basic resource categories, as described on page 93. Each lot is 5 tons (about what can be carried in a single hex of cargo space aboard ship for the heaviest items). Base price for each type of resource is given in the accompanying Cargo Price Table. To determine the purchase price at the origin, apply all modifiers, then roll the trader's *Trading* or *PS: Merchant Skill*. On a successful result, the trader gets the desired cargo at base price, -1% for every 2 points by which the roll succeeded. On a failure, increase the price by +1% per point by which the roll failed (sometimes more). Sale price uses the same modifiers, but the result is reversed — subtract the amount by which a roll failed from the

final price, and increase the price when the roll succeeds. (Gamemasters may adjust these numbers to create higher or lower profit margins, if desired.)

Example: *Trader Vic and Trader Joe are both trying to buy animal products on the planet New Texas. New Texas is rich in animals and has no demand for them, so the base price is 10% less than 1,000 credits, or 900 credits per ton. Trader Vic makes his roll exactly, so he gets a load of 5 tons of neobeef for 4,500 credits. Trader Joe's skill is 11- and he rolls a 14, so he fails by 3. Joe pays 3% above the cost of the neobeef, or 4,635 credits. The traders go their separate ways.*

Trader Vic hauls his neobeef to the asteroid Baikonur. Since that's a lifeless world and poor in animal products, the going rate is 1,000 plus 10%, or 1,100 credits. Vic makes his roll by 2 and sells his 5 tons of neobeef for 5,555 credits (base of 5,500, +1%), pocketing the 1,055 credit profit. Trader Joe makes the mistake of taking his neobeef to the planet Carthage, another lifebearing world. It is neither rich nor poor in neobeef, so there is no modifier to the price. Joe makes his roll exactly, so he sells it at 1,000 credits per ton, leaving a profit of only 365 credits. While he mopes in the spaceport bar, he's approached by some shady characters offering a lot of money if he can get them off-planet without attracting official attention....

Note that all these profits are before expenses. Traders will soon discover that moving low-value items like metals or plants is a quick way to bankruptcy unless spaceships are very cheap to run.

SPACEPORTS

Worlds with spacefaring or interstellar technology are likely to have some facilities available for visiting starships, and these tend to be important parts of the economy. They vary widely, from the cleared shuttle landing field of a new colony to vast orbital spacedocks. To get an idea of the facilities likely at a given planet, consult the Ship Facilities Table.

None indicates the planet has no provision for visiting spacecraft at all. Either the inhabitants don't want contact with space travelers, or they haven't been able to construct anything yet. There may be places flat enough to land a shuttle, but any repairs must be done with onboard equipment. The planet has little or no orbital traffic control, and the inhabitants may have no way of detecting ships in orbit at all. Space voyagers may have trouble getting down to the surface if their ship is not suited for atmospheric flight. Planets with no facilities are also unlikely to have any defenses against attacks from space.

Minimal facilities are about the equivalent of a large starship's own onboard maintenance and repair shops. Worlds with minimal services probably have one paved “spaceport” on the surface, but no orbital station or spacedock. Worlds with minimal facilities may be able to repair shuttles or small craft,

CARGO PRICE TABLE

The Cargo Price Table presents suggested “average” prices for a “typical” *Star Hero* campaign. Specific settings may vary from this, sometimes extremely. Gamemasters should decide whether this table applies to their campaigns as-is, or if they need to create a setting-specific version.

Resource Type	Price Per Ton	Demand
Animals	1,000 credits (cr)	
Crafts	1,000 cr	
Heavy Metals	100,000 cr	Atomic or better technology
Manufactures	10,000 cr	Lower tech than source of items
Metals	100 cr	Ice or Rock-Ice world
Nonmetals	500 cr	
Organics	1,000 cr	Industrial or better technology
Plants	100 cr	
Specialties	10,000 cr	
Volatiles	100 cr	Vacuum or no oceans

Modifiers

Subtract 10% from the price if the planet is rich in that resource.
Add 10% if it is poor in the resource, and another 10% if the planet has a demand for the resource. All planets are considered poor in Specialties from other worlds.

but it takes some time and the results probably won't meet first-class standards. Minimal facilities do usually include some form of sensors to detect approaching space vessels, so ships can't enter orbit without somebody noticing.

Average facilities are the level spaceship captains expect at most civilized starfaring worlds — an orbiting space station, maintenance and repair available for shuttles and small starships, and replicators or stores of most standard components. Fuel for normal engines is available, and major systems are likely to have supplies to maintain and refuel FTL drives. Worlds with average facilities are almost certain to have some form of space defense, even if it is only a few fighter craft or perhaps some surface-to-orbit missiles.

Good facilities are the equivalent of a starbase or a major port. They have orbital docking platforms and possibly a spacedock for large ships, and can repair almost any ship. All replacement parts are easily available, and there are stocks of every kind of fuel. Worlds with Good facilities can probably build their own starships, though they may not have shipyards currently operating. Good facilities probably have long-range sensors capable of tracking ships at a distance of several light-years.

Extensive facilities are the best possible — multiple spacedocks, orbital shipyards, shuttle service, and probably large industries capable of manufacturing anything. Systems with extensive facilities can build top-of-the-line starships, and can repair any ship no matter how badly damaged. Extensive facilities are not common; their presence usually indicates a strategically and/or economically important system. Defenses are likely to be strong, often including both armed spacecraft and huge weapon installations.

All starship facilities are potential targets for spies and saboteurs, and can also be the subject of economic rivalries. Nations on a planet may compete at building spaceports to draw interstellar trade, and neighboring systems can do the same. Of course, space facilities are often home to exiles, wanderers, and seedy characters unwelcome on any planet for long. They sometimes exist apart from a system's ordinary legal jurisdictions, and clever crooks can make use of that to escape prosecution.

SHIP FACILITIES TABLE

Roll 1d6 and index with population. Apply a +1 modifier for worlds located on major trade routes, -1 for pre-starfaring planets.

Roll 1d6	Population			
	1000 or less	1001-1 Million	1 Million-1 Billion	Over 1 Billion
1	None	None	Minimal	Average
2	None	Minimal	Average	Average
3	None	Minimal	Average	Good
4	None	Average	Good	Good
5	Minimal	Average	Good	Extensive
6	Minimal	Good	Extensive	Extensive

GOVERNMENT

Any group of beings larger than a single family needs some form of government. There is no good correlation between a civilization's advancement in science and technology and its government. Some brutal tyrannies have existed in very high-tech settings, while Stone Age tribes can develop highly enlightened forms of government. Technology does limit the size of the area a given state can control — a single tribe or valley at Stone Age technology, a region up to a thousand kilometers across at Bronze Age (larger if water transport is available), entire continents by the Iron Age, and Industrial-era technology permits a single state to rule a world.

The Basics Of Government

Government forms can be described by who makes the decisions, how those people are chosen, and what decisions they are permitted to make (*i.e.*, what the government can do).

WHO RULES

To decide how a society is governed, first consider who rules it. The rulers can be a single individual, a small group (1-10 members), a medium group (10-100), a large group (100-1000), a subclass (1000-10,000), or a ruling class (a significant proportion of the entire population).

Individual Rule

Rule by one person is an extremely common form of government; at times it appears that Humans have an instinctive need for a "pack leader" to follow, and many alien species may have the same instinct. (For RPG purposes, a single person who embodies "the government" is useful because it keeps the GM and players from getting bogged down remembering who is who in the administration.)

Individuals ruling by force are dictators or emperors. They seldom leave office alive, and when they die it is usually by violence. In any society larger than a few thousand people, the dictator must have a band of warriors or an army to support his rule, and in advanced societies the dictator supplements his soldiery with police, spies, and informers.

Single rulers who reign by virtue of heredity are called monarchs. Depending on the state they

rule, monarchs can also be called chiefs, barons, princes, kings, or emperors. They often bolster their claim to authority by appeals to religious authority. In large states monarchs have to rule through a bureaucracy of appointed officials, an elected parliament, or a feudal structure of hereditary nobles.

A single ruler who is chosen by merit, appointment, or election may be known as a chancellor, president, premier, or governor. In all four cases the problem is that the qualities which allow someone to gain the position are not necessarily the best ones for a ruler. In states which choose leaders by election, there may be limits on who is permitted to vote. Age is a common criterion, but societies may also use sex, race, occupation, wealth, or religion to choose who may or may not vote.

Small Groups

A small group holding power by force is often called a junta. Usually one member of the junta is dominant, but not so powerful he can overcome the others if they combine against him. Each member of a junta has his own military forces, and may even fight wars with the others.

A small to medium group which inherits the right to rule is sometimes called an oligarchy or an aristocracy. One member of the ruling group may hold the title of “king” but cannot rule without the support of the others. A group of monarchs joined together in a confederation would function as an oligarchy.

Small groups of elected rulers may be known as a council or senate, but could have various other titles. While elected rulers usually are considerate of the wishes of the majority of voters, they can still be harsh or oppressive to minorities or those without the vote. How long the elected officials serve also affects how they behave in office. Rulers elected for life don't have to be as responsive to the will of the people as those who have to get re-elected every few years. Of course, responsiveness isn't always a good thing — sometimes the will of the people is wrong.

Large Groups

A medium to large group governing by force could be a conquering army or the officers of a military government. Such situations are rare because it is hard for a large group of conquerors to work together. Either a junta or dictator emerges, or the whole society collapses into anarchy. If a group of conquerors can hold on for a generation, the society becomes a feudal one.

When a large group or class holds power by heredity the government is called a feudal system. While there may be a king at the top of the structure, the real power lies with the local barons. In their early stages, feudal governments may be little better than anarchies, but over time custom and tradition can act as a check on what individual nobles can get away with. Governments with at least some feudal aspects are popular in science fiction, since the spread-out nature of galactic society often mimics that of medieval Europe on Earth.

An extremely large hereditary group of rulers may be called a ruling caste. Often they must choose the actual decision-makers by voting or other means, since the group itself is too large to perform the day-to-day business of governing.

Large elected governments may be called legislatures, congresses, or assemblies. Often a large legislature cannot decide on every specific issue and delegates power to subcommittees. Elected legislatures almost always involve some form of political parties or factions, as members with common opinions band together. In corrupt systems, the ruling party may rig elections or bribe voters to remain in power.

HOW THE RULER IS CHOSEN

The way the rulers are selected can vary tremendously. The most common methods on Earth have been force, heredity, appointment, merit, or election. Other possibilities include no government (anarchy), total participation, random selection, omens or oracles, computerized government, and purchase.

Appointment

In any government which rules by appointment, the big question is: who does the appointing? A state which has been conquered by another state, or which is a colony, may have an appointed government. But a state might simply permit officials to choose their own replacements, or have one branch of government appoint the members of another branch (as the United States Supreme Court's members are appointed by the President). In a one-party state, candidates for the legislature or presidency might be hand-picked to run in sham elections by the party leaders. The chief problem with any appointed government is that the interests of those appointing the rulers may not coincide with what is best for the people.

Merit

Merit-based governments vary depending on how the society defines merit. It may be competence at one's job (bureaucracy), religious faith (theocracy), scientific knowledge (technocracy), wealth (plutocracy), psionic power (psychocracy), or sheer age (gerontocracy). There could be rituals, physical ordeals, riddling contests, or gladiatorial battles to select the rulers — the possibilities are practically endless. Rulers chosen by merit may be highly effective, so long as the system for determining merit is sufficiently accurate and honest. All large organizations have some aspects of merit-based selection.

Merit-based systems are prone to two major flaws. The first is that the definition of merit may not have much to do with ability to rule. A theocratic government could well be staffed by the most pious and devout members of the priesthood, but that doesn't mean they're any good at making economic or military decisions. The second problem is that since the rulers are members of an elite (however society defines that elite), it is hard for them to consider the rights and wishes of the rest of the people when making decisions.

Other Systems

Besides the methods described, there are a variety of “Other” government types possible. Some states have literally no government at all — this can be either a bloody war of all against all, or an enlightened civilization determined to live and let live. Small groups or highly advanced cultures may be governed by volunteers, or by the entire population linked up in a real-time decision-making network. Races with psionic abilities or brain implants might form a single mass mind.

Some other methods of choosing rulers include random selection — drafting people to govern whether they want to or not (as juries are chosen in the United States; see R. A. Lafferty’s short story “Polity And Customs Of The Camiroi” for an interesting SF take on a society that functions this way). Oracles or omens might be used in religious societies to choose those who should rule. Technological civilizations might simply delegate the job of governing to artificial-intelligence computer systems.

WHAT THE RULER CAN DO

What the government can do is determined by the culture in general. A very open, freedom-loving culture is unlikely to put up with tyranny, but a highly disciplined society may submit to a regime which promises order. It is possible to have a repressive government in a freedom-loving society, but there are likely to be rebels working to overthrow the tyranny.

Usually the limits on state power are related to how the rulers are chosen — a government that has to worry about re-election is more likely to respect the rights of voters — but there is considerable room for variation. Often a government’s power is checked by the existence of powerful groups or institutions outside of government, like religions, business interests, labor organizations, or the news media. Repressive states must concentrate all power in the hands of the rulers to eliminate possible rivals.

Governments exist in layers. There is the planetary government, regional or national states, provincial administrations, and finally the local city, county or tribal structure. Worlds without a unified planetary government (“balkanized” worlds) have nothing above the national level, and may have regions where provinces or even city-states are the largest units. Each layer has different responsibilities, and may have an entirely different structure. A planet with an absolute dictator in charge of planetary affairs could have elected councils at the regional and provincial levels, and conduct local affairs by town meetings. It’s also quite possible for different parts of a world to use different systems at the same level of government.

Of course, there may be a tremendous difference between the official system of government a world (or a nation) has and the regime actually in place. Most of the surviving monarchies on Earth today are actually republics with a hereditary figurehead. Many nations during the Cold



War called themselves “Democratic Republics” or something similar even though they were repressive oligarchies.

Last but not least, GMs should consider the often unusual nature of societies and cultures in science fiction stories. Aliens may have a very different perspective on what powers a government should (or should not) have than Humans do. An alien government might, for example, have extensive power to regulate and control citizens’ entertainment and leisure, but almost no military authority. A truly bizarre (from a Human viewpoint) government such as that could make for an interesting *Star Hero* adventure.

Interstellar Governments

Some worlds are members or possessions of large interstellar states comprising multiple planets or star systems. There are a number of ways planets can organize into an interstellar state.

A *league* or *alliance* is a voluntary collection of planets, each of which remains entirely sovereign and is not subject to any interference by its partners. Planets in a league often have something in common — they may all be colonies of the same civilization, they may have economic ties, they may simply have a common enemy. An economic league may result when a few worlds are rich in a certain resource and want to prevent competition. Worlds in a league may cooperate on military matters but be bitter economic rivals; alternately they may permit a little “gentlemanly”

warfare among members but hold the line on keeping up fuel prices.

A *confederation* or *federation* is somewhat more unified, and involves more control over the members by a central governing body; *Star Trek's* United Federation of Planets is a good example. Federations are almost always voluntary, although they may have rules preventing members from breaking away just because they don't agree with certain policies.

A *union of worlds* is tighter still, shifting most of the powers and responsibilities of government away from the individual planets to a central administration. This means the union can efficiently mobilize all of its resources to cope with threats or solve problems. On the other hand, it also means mistakes by the central government affect the entire union.

Leagues, confederations and unions are all voluntary associations of worlds. But unfortunately there are many interstellar states which don't much care if their member worlds want to join or not. The usual term for such states is an *empire* (or *hegemony*, where one nation dominates many others), although they may refer to themselves by a more friendly-sounding term. Empires vary in how tightly they control their subject systems. Some run everything from the capital world; this has the same advantages and problems as a voluntary union. Other empires are more decentralized or feudalistic, with powerful system or planetary governors able to set policies for their own districts. The trouble with those arrangements is that governors sometimes rebel. Permissive empires give their subject worlds a lot of autonomy on internal matters, while others try to impose uniformity.

An empire does not have to have a tyrannical or monarchic government. Republics can conquer subject worlds as easily as dictatorships can. In Earth history, extensive empires were conquered by the Republics of Rome, Venice, Athens, and France, to name a few. Often the imperial power is motivated by altruism as much as greed or aggression — “we're not conquering them, we're bringing civilization.”

Agencies

Regardless of what a given ruler can and cannot do, most governments have certain broad powers — they enforce the law, protect the citizens from threats within and without, regulate the economy, and so forth. To accomplish this, they typically have agencies, departments, institutes, and other such “sub-organizations,” each with power over a specific subject or sphere of authority. These organizations may or may not work together well; in some regimes, each organization is a virtual power unto itself, pursuing its own agenda at the expense of the others.

MILITARY

The one thing which just about any government needs is an army. If a state can't defend its sovereignty against invaders, then it isn't a state at all. Peace-loving societies with no enemies might get by without military forces, but such idyllic situations are rare, and often come to grief when an enemy finally does appear. Military forces in science fiction settings can be broadly lumped into two categories, planetary and space.

Planetary Militaries

Planetary forces are the military units familiar to contemporary readers — armies, navies, air forces, and so on. They fight on a planet's surface or in its atmosphere. The exact nature of the forces depends on the civilization's technology level, although high-tech armies in novels tend to have battlesuited troopers and hovercraft tanks, while in anime films they emphasize giant mecha.

How a government organizes its planetary forces depends a lot on accidents of history, the planet's environment, and the nature of the main threats faced by the society. Environment determines the mix of land and sea forces — a world with lots of oceans needs more navy units. Threats to the planet determine what those units will be. If the enemy is a large organized force, then the government needs large organized forces to meet them in battle. If the enemy is guerrilla units or rebels, then a light, highly mobile military is the order of the day. A society whose main enemy is substantially more powerful might have a guerrilla-style army designed to hamper and resist an enemy it can't face directly.

Finally, much of a world's military organization depends on accidents of history. Armed forces on Earth tend to be very tradition-bound organizations, which means “because we've always done it that way” is a fundamental principle. For example, the Prussian navy at the time of German unification was commanded by an Army general, simply because Prussia at the time was a land power.

Space Militaries

Space forces are the planet's military that can fight and operate in space. They are often divided by into planetary-defense (orbital and suborbital craft and surface-to-space weapons), system-defense (interplanetary craft), and interstellar units (starships). The exact balance depends on the planet's position in interstellar affairs — an isolationist world has heavy planetary-defense forces and little else, while a planet with lots of merchant shipping and off-world colonies to protect emphasizes interstellar forces. Often planetary and system defense are a separate service or branch from the interstellar forces; a planet with a powerful star fleet might lump everything else together with surface units as “garrison troops.” A powerful space fleet can have its own Marines, orbital-attack vessels, atmospheric fighter craft, and the like.

The Military's Size

You can calculate the size of military forces from a planet's population with some precision. Most societies on Earth have supported about 1 soldier per 100 citizens. The ratio is sometimes lower, either in states with no need for defense or states with inefficient governments, and can be as high as 5 soldiers per 100 people in states on a full war footing. However, anything above 1 percent is hard to sustain over the long term. Some aggressive states get around this by pillaging conquered territories — essentially making their enemies support their armies. This allows them to field very large armed forces as long as they have enemies to prey upon. Once the pace of expansion slows, the financial strain catches up.

In *Star Hero* adventures, even a small military force is probably more than any group of PCs can handle. The armed forces are the GM's big stick — when they show up, the heroes should know the situation is beyond them. If the PCs are in the military, they probably should be some sort of highly-trained elite force accustomed to operating alone and without supervision — commandos, rangers, or special forces.

ESPIONAGE

Just about every state in history has had some form of intelligence-gathering agency. In early societies, this usually consisted of some scouts traveling ahead of the army to locate enemy positions. Rulers and commanders had small personal staffs of spies to gather information on enemy troop movements or the plots of political opponents.

With the development of large nation-states, espionage became professional and bureaucratic. Every country had its intelligence agency, and spying became standard practice even in peacetime. Counter-espionage operations to thwart enemy intelligence-gathering became as important as spying. As wars became potentially more devastating, covert operations and infiltration turned into an alternative to military action.

Spy agencies typically have three functions. Often these jobs are handled by different sections, or by entirely different agencies. The first, obviously, is intelligence-gathering. The great majority of this is done perfectly openly, by analysts reading news reports, foreign technical journals, trade reports, and industrial statistics. They build up a picture of enemy capabilities based on publicly-available information. Other analysts focus on intercepted communications, working with a huge staff of code-breakers and computers to find out what the enemy is saying. Orbital and aerial reconnaissance uses pictures and video, often taken through large space telescopes.

When those methods fail, intelligence agencies fall back on "Human

intelligence" — talking to people, bribing or persuading enemy officials to pass on information, and sometimes inserting agents to go have a look at sensitive sites. Human intelligence is the most romantic and dangerous part of spying.

The second function of an intelligence agency is counterespionage. Agents seek out foreign spies and operatives in the country, especially enemy moles who have penetrated the counterespionage agency itself. Counterspies tend to be very paranoid, but that doesn't mean they're wrong. Detecting enemy spies involves much of the same work as intelligence-gathering — analyzing patterns of information, intercepting communications, and directly surveilling suspects.

The third function is "covert operations," a general term for anything a government wants to do that it doesn't want to publicly admit doing. This includes activities like supplying one side in a conflict despite being officially neutral, starting a conflict in a hostile state, spreading money to influence an election in another state, helping foreign military officers stage a coup, assassinating individuals who pose a threat, and generally sneaking around doing unpleasant stuff.

Covert operations overlaps extensively with military action, so spies sometimes wind up working with commandos or special forces. This is by far the most exciting and glamorous part of espionage work, but it's also the most dangerous and the least common. If a covert operative is caught, that can be a major embarrassment to the agent's government. Often covert ops are handled and financed through a series of dummy corporations or friendly third-party governments. This sort of "deniability" sometimes means overambitious agents (or those seeking personal gain) can turn an operation from





its original purpose to their own goals. This may require another covert operation as Headquarters seeks to secretly wipe out its rogue agent!

In tyrannical states, spy agencies take on a fourth mission: seeking out and suppressing internal dissent. They may infiltrate dissident groups (or even organize their own groups to ensnare anyone opposed to the regime). They arrest or assassinate opposition leaders, and constantly hunt for rebels and traitors. Sometimes internal security agencies can have very extensive military forces of their own — in Stalin's Soviet Union, the NKVD security troops were practically an entire second army dedicated to making sure the Red Army didn't turn on its masters. Science fiction offers plenty of its own examples. In *Star Trek*, the

LEGAL SYSTEM TABLE

Roll (1d6)	Legal Structure
1	Cases Judged by Oracles or Ordeals
2	Judges Decide Each Case
3-4	Judgements Based on Tradition
5-6	Written Laws/Jury Trials
7+	Algorithmic Laws (cases decided by application of rigid, "scientific," formulae)

Modifier: +1 for Preindustrial or later societies (or +2 for Cyberpunk era)

LEGAL STRICTNESS

Roll (2d6)	Strictness
0-2	Permissive (only violent crimes illegal, police tightly restricted)
3-4	Loose (only violent and property crimes illegal, police regulated)
5-7	Moderate (laws protect citizens from harm or loss, police regulated)
8	Regulated (laws govern most aspects of life, police regulated)
9	Strict (intrusive laws, police well-regulated)
10	Harsh (total control, broad police powers, harsh punishments)
11-13	Repressive (arbitrary arrest, severe punishment without trial)
Modifiers:	-2 for elected governments; +1 for governments by force

Romulan *Tal Shiar* and Cardassian *Obsidian Order* are both highly-feared intelligence agencies that suppress internal dissent; and in Frank Herbert's *Dune* universe, spies, informers, and secret security personnel are everywhere. Eric Frank Russell's marvelous novel *Wasp* chronicles the adventures of a Human spy and saboteur dropped on an alien planet to disrupt its entire society by himself!

In a *Star Hero* game, espionage of any sort is great for roleplaying adventures. In Space Opera settings, espionage follows the James Bond mode, with small teams of daring operatives working on their own to thwart enemy plots, infiltrate the Galactic Tyrant's headquarters, and disarm the Doomsday Device before it goes off. Hard SF tends to be more like modern-day spying, relying heavily on "technical intelligence" from satellites and radio intercepts. Cyberpunk focuses on the nitty-gritty of computer espionage, although the spy agencies may work for corporations instead of governments. Adding psionics to the mix only livens things up, as psi-agents try to get close enough to read a rival leader's mind while the enemy's psi-cops attempt to stop them.

One thing to keep in mind when running espionage adventures is that some tropes of the spy-story genre don't always work as well in an SF setting. How can a secret agent, no matter how suave and daring, go undercover in a society of non-Human aliens? What if they don't even breathe oxygen? On the opposite end, the massive amounts of information that even near-future realistic satellite snooping and communications eavesdropping can gather is colossal. The answer you want may be in there, buried in a mountain of extraneous data.

LAW AND JUSTICE

If military and espionage forces are a civilization's protection against outside threats, the legal and justice system preserve order internally. Systems of law tend to be extremely conservative and tradition-based, since continuity and consistency are a primary goal of any legal system. Laws are designed to prevent things the society doesn't

like, protect things it does, and resolve disputes between individuals.

Exactly what things a society bans and what it permits vary tremendously. A culture where duels are an acceptable way to resolve disputes might not consider some forms of murder a crime, while a society of empaths could make it a crime to merely dislike someone! Gamemasters can create some odd laws — all spoken communication be sung, nudity is mandatory at public functions, no drinking or eating allowed between the fifth and sixth hours — as a way of adding color to an adventure. As a rule, however, societies make laws to protect their members from violence, preserve property, and protect the operations of government from interference — not just to be “weird.”

Laws don't work without some way to enforce them. On Earth, this is accomplished by police agencies, but many cultures still have a tradition of law enforcement by the entire community... and a hive-mind species may require little or no actual law enforcement. The limits on what law enforcement operatives can do depend on the general tone of the society and on the level of crime — a society that values order above freedom grants police broad powers, while those that value individual rights carefully restrict the police. If crime is seen as “out of control” and the citizens feel threatened, they will likely prefer tough, aggressive policing.

You can use the accompanying Legal System and Legal Strictness tables to randomly determine the nature of law and law enforcement on a given planet, or among a particular species. The tables are fairly simple; once you use them to establish a basic legal framework, flesh it out with a few details and quirks.

Crime

In addition to the list of crimes familiar to modern-day gamers, *Star Hero* campaigns offer the opportunity to thwart (or commit) a whole new range of offenses. In just the past couple of decades computer crime has moved from the pages of cyberpunk novels to the courtrooms of America. Other emerging or fictional technologies will have their own criminal applications.

Aggravated Murder: Killing a person's physical body and destroying any backup memory records may be considered even worse than first degree murder, and thus merit even worse punishment.

Biotechnology: There are many criminal applications of advanced biotechnology. Stealing organs for transplant (“organlegging”) is a possibility (one explored at length in several Larry Niven short stories); so is the creation of new addictive drugs. Already some nations on Earth restrict access to forests and jungles to control the valuable genetic material of native species; gene smuggling could become a big criminal business. If life is discovered on other worlds, smuggling species from planet to planet would certainly be a crime in some instances.

Bodyjacking: Illegal use of a body belonging to someone else may be possible in some SF settings,

either via psionic powers or neurotechnology.

Cybernetics: Cybernetic implants allow crooks to hide tools and weapons in their mechanical limbs. If the weapon is built into a suspect, how do you disarm him? Crooks might also do a big business in stolen cyberware, and a character with especially valuable equipment might get jumped by “junk-men” in some dark alley.

Genetic Engineering: Humans are already worrying about the possibility of terrorist states creating new diseases by genetic modification; more advanced techniques might make it possible to “target” a germ against people with specific traits — maybe even creating “personalized” diseases to afflict only one person. Unethical scientists could misuse cloning by taking peoples' DNA against their will (genetic piracy), creating illegal copies of celebrities, or establishing “clone farms” to keep live copies of aging tycoons as a source of transplant organs. If governments ban genetic modification of Humans, then “black labs” could offer illegal engineering — and the potential for blackmail.

Nanotechnology: Nanotech devices in the hands of criminals or terrorists could be very dangerous. The least subtle would be a “gray goo” weapon capable of devastating large areas by converting all the matter it encounters to more nanobots. Nanotech spy devices could gather valuable or dangerous information without being detected. Most insidiously, medical-type nanobots could subtly attack victims by damaging parts of the brain — the victim wouldn't die, just lose his memories and skills. Medical nanobots also make possible the ultimate in impersonation, duplicating a person right down to his finger and retina prints.

Negligent Insentiation: Creation of an intelligent being without proper authorization or safeguards might be a crime in some settings. In others, the creation of an intelligent beings would only constitute a crime if done deliberately.

Robotics: Intelligent or nearly-intelligent robots can create all kinds of headaches for law enforcement. If a robot is programmed to kill a man, who is the murderer — the machine or the programmer? Is it murder to kill a robot? What if it has a backup chip?

Space Travel: Travel to other worlds allows Humans to commit crimes in new places, but it also creates some entirely new offenses. Space piracy and smuggling (both of goods and of persons) are standards of Pulp SF and Space Opera stories. For piracy to thrive, the technology must exist to allow a pirate ship to catch and capture its prey. That means either extremely efficient rockets or some kind of rubber-science “space drive.” Second, pirates have to be able to sell what they steal, which means either a neutral planet willing to ignore their offenses, or a well-organized system of black markets and fences. Finally, piracy requires a lack of law enforcement, or a way for the pirates to evade the police. An efficient space navy can blast the pirates out of the sky, land star marines on their bases, and generally ruin the party.

Teleportation: Teleportation, whether psionic or mechanical, is a thief's dream come true. Locked doors and alarms can't stop a teleporter, and how can he be traced? Devices like *Star Trek's* transporters, which allow the user to snatch objects at a distance, only make it easier to steal things. A society with teleportation must either have some way to block it, or draconian police powers to control its use.

Theofraud: Use of technological or psionic methods to impersonate a divine being. The ultimate "con game," theofraud presents all sorts of interesting possibilities for roleplaying stories addressing the question of "what is faith?"

Thoughtcrime: As described in Chapter Ten, psi powers create all kinds of opportunities for lawbreaking. Telepaths can spy on people's thoughts, mind-control their victims ("brain slavery"), and erase all memory of their crimes. Memory theft could augment ordinary identity theft. Telekinetics make ideal thieves and killers. Even ESP could be used for evil, either for spying or to case the scene of a robbery.

Time Travel: Time travel creates the opportunity for several new crimes, including illegal time-tampering, kidnapping people from the past (is it a crime to kidnap someone who's been legally dead for a century?), manipulating the stock market or gambling games using future information, and murdering someone by preventing his parents from ever meeting (chronocide).

Of course, as crime advances, so does crime prevention and detection. Human police already have access to advanced techniques involving the analysis of DNA trace evidence; in the future, technology might allow them to obtain and analyze the most microscopic bits of DNA. Psychometry (psionically reading the "emotions" and events associated with an object) and retrocognition (viewing the past) could make committing a crime virtually impossible — or clairvoyants might have the ability to predict a crime in advance, allowing them to arrest the criminal before he commits his crime!

LANGUAGE

Language is one of the key elements of a civilization. In particular, the individuals and subgroups that make up the civilization must be able to communicate with each other. Most civilizations have a single language, or at least a common secondary language known to most educated people. In Classical civilization, Latin and Greek were the unifying languages; in Medieval and Renaissance Europe, Latin and French did the job. Since the Industrial Revolution, English has increasingly become the single unifying language for modern Western and global civilization.

Alien languages depend heavily on how the organisms communicate and sense their environment. Humans use sound and visual signals, and have

developed spoken and written language. Others are possible: a tactile language (like Braille), a language based on scents or tastes (an important part of the way many animals on Earth communicate), or a language using color changes or light flashes (like the signals of squid or fireflies). Psionic aliens might have a partially or wholly telepathic or empathic language, while beings with electric field sense might use that to communicate in a kind of living radio.

Aliens who communicate in ways Humans can't perceive make for interesting situations in a science fiction adventure. How do you say "We come in peace" when the locals use color changes and scent to communicate? The *Universal Translator* Talent can't help if a character doesn't have the right organs to talk with the natives.

For any kind of complex civilization, some form of permanent language is needed. Humans write things, so they and others can read them later. As of the twentieth century, they can also record sound and video. The alien equivalent of writing should be low-tech, and suitable for the environment. Possibilities include tying patterns of knots in cords, notching bones or sticks in a pattern representing words, punching holes in hides, and so forth. However it is done, it should be relatively easy (nobody takes notes by chiseling words in stone), relatively permanent, and relatively portable.

Of course, most GMs aren't dedicated and obsessive enough to create an entire alien language for a campaign. Nor are most players willing to learn one. So in a game, an alien language usually comes down to names for things and places. There are three main factors to keep in mind when inventing alien words and names. Sound is the first thing to consider. This is fiction, so you can choose your alien words and names for the way they sound. Look at some of J.R.R. Tolkien's creations: Rivendell sounds like a pleasant place, while Mordor sounds ominous. Second, consider animal sounds. In the case of aliens based on Human animals, use the noises the animals make as a basis for the alien speech — hisses and rasps for reptile-beings, purrs and vowels for cat-people. Lastly, if you can't be evocative, at least try not to sound goofy. Many professionals have failed at this. Don't use thinly-disguised names of real people, or jumbles of nonsense.

In a pinch, real Human languages are a good resource. Real languages have an internal logic and structure of their own. Using an existing tongue for aliens only creates problems if any of the players recognizes the words, but GMs can get around that by appropriating the sound and feel of a real language without using specific vocabulary. An atlas is a very good source for the sounds of a given language. As an example, you could try to base an alien tongue on Malay — appropriate for a species inhabiting a world with lots of islands. A map of Malaysia provides place names like Penang, Kelantan, Trengganu, Berhala, and Batang. Instead of using them directly, you can recombine them, getting Penggana, Kelang, Trengala, Berantan, and Batanu.

DIVERSITY

Members of alien species are often all depicted as alike in science fiction television shows and movies. Every Tarshalan speaks the same language (Tarshalanese), practices the same religion, has the same skin and hair color, follows the same traditions, and has the same attitude or psychological profile (they're all obsessed with honor, or violently temperamental, or pacifistic). While this may be appropriate in some instances (particularly for hive-mind species), few (if any) civilizations are totally uniform. Even a nation as small as the United Kingdom has pronounced and recognizable regional differences — a Scotsman, a Midlander, and a Welshman are all different from one another and from Londoners. As a rule, assume any society larger than 100,000 people contains at least a few minority groups. They may speak a different language (or have a markedly different accent or regional dialect), follow a different religion, or be from a different racial background. In high-tech cultures a minority might be genetically engineered beings, aliens, citizen-robots, mutants, psionics, a hive mind, clones, or androids. Consult the Diversity Table if you prefer to determine minority percentages randomly.

Gamemasters should note that it is a Bad Idea to directly map current social problems into a science fiction setting. Players often have strong opinions which don't match your own, and it's extremely easy to look ham-handed or silly. If you want to explore themes of prejudice, assimilation versus ethnic identity, or cultural diversity, it's probably more effective to use issues which exist in the game world and are part of the setting, rather than pasting in something from today's headlines.

DIVERSITY TABLE

Roll (2d6)	Diversity of Civilization
0-3	Completely uniform: no minority groups
4-5	Mostly uniform: 1d6% minorities, no more than 1% each
6-7	Slight diversity: 2d6% minorities, 1d6% each
8-9	Some diversity: 3d6% minorities, 1d6% each
10	Diverse: 1d6 x 5% minorities, 2d6% each
11	Pluralistic: 2d6 x 5% minorities, 3d6% each
12	Polyglot: No group more than 3d6% of population
Modifiers:	-1 for population 100,000 or less; -4 for 10,000 or less; -6 for less than 1,000



CULTURE

Culture is the way people act and the things that they do, apart from the business of making a living and running society. It includes things like art, literature, food, and roleplaying games. These things can be very important to the identity of a nation or civilization — two groups with the same kinds of government and economy can be bitter enemies because of cultural differences.

ARCHITECTURE

Technology underlies most architectural styles — you can't build skyscrapers until you have steel girders and cranes. Other materials depend on the environment. You need trees to build with wood, and usable stone to build in stone. Environment also affects design. Wet or snowy climates have peaked roofs to shed rain, while desert settings run to flat roofs and thick walls for insulation. Alien architecture also must fit the size and shape of the builders.

ART AND MUSIC

The fine arts depend on the senses of the artists. A deaf species can't have music, while a species able to sense electric fields might create magnificent works of current and wiring invisible to Humans. Art is one area where low-technology worlds can compete on an even footing with advanced civilizations, which means a successful artist might be a low-tech planet's most valuable asset in interstellar trade. What if he wants to move?

EDUCATION

Humans, like most mammals, care for and educate their young. Alien species might view things differently. Juveniles might be subintelligent,



little better than pets or vermin, and so only worth educating if they survive to adulthood.

Methods of education vary, often with the economic system — in farming cultures children learn at home or in a small village school, while in manufacturing societies kids learn in big schools which even look like factories. An information-age society might switch to decentralized home education. Science fiction technology makes other methods possible — learning via virtual-reality instruction, uploading through a cybernetic brain link, or direct implanting by psionics.

CUISINE

A species's diet is obviously the most important part of cuisine. Carnivores eat meat dishes, herbivores eat vegetables, and omnivores like Humans combine the two. Science fiction has a long tradition of devising weird and disgusting things for aliens to eat. Imagine a species of carrion-eaters like intelligent vultures, with a whole cuisine based on carefully-controlled decay.

As with art, cooking is an area where wealthy high-tech societies don't have much advantage over more primitive civilizations. A remote backwater world could suddenly become the culinary center of the Galaxy if its local cuisine is delicious enough. Problems may arise if local plants or creatures are in demand enough to become endangered species. In an advanced society that has machines to prepare food, cooking might be an art form.

LITERATURE AND DRAMA

Humans tell stories, and it seems likely any alien beings capable of language will do the same. Literature is written stories, drama is stories acted out on stage or on film. Again, the senses and communication methods of a species are important here — blind creatures won't make movies, but may have sophisticated versions of radio plays. Often a culture's stories and works of literature are major

sources of inspiration and identity. Reading indigenous literature instead of the crass commercial products of galactic mass media would be a way to show one's identity as a member of a planetary culture.

MASS MEDIA

Printing (or its equivalent) is the first mass medium, allowing the rise of newspapers, magazines, and books for a general audience. Telephones could have been a broadcast-style system, a kind of "cable radio," but on Earth that never caught on widely. Radio and television were the defining media of the twentieth century, allowing people all over the world to experience major events in near-realtime. Mass media are also a powerful tool of control in totalitarian societies. Futuristic media in SF include holovideo (Images), full-body simulated reality (Images or Mental Illusions), or direct brainlink feeds (Mind Link). Psionic societies could have "psi-casts" beaming thoughts directly at the audience.

RECREATION

All young mammals play, and Humans play even in adulthood. Technology allows for all kinds of new ways to have fun. Virtual reality and direct brain-link "dream films" combine film and computer games, taking both to the limits of realistic experience. More active sorts can engage in high-tech sports — orbital skydiving with a personal heat-shield, zero-gravity football, or magma surfing. Improved medicine may bring back dangerous pastimes like gladiatorial combat or dueling. Alien planets will have their own sports, like skiing down the thousand-mile slopes of Olympus Mons on Mars, or ballooning in the atmosphere of Jupiter. Hunting alien beasts on distant planets can get very exciting. Other species might enjoy hunting Humans, as in Jack Vance's novel *The Dirdir*.

RELIGION AND PHILOSOPHY

While science fiction has long explored ideas of religion and ethics, this is a very tricky subject to handle. Gamemasters need to be careful not to step into the minefield of players' personal faith and beliefs. Presenting alien religions is one way to keep things safely distant from real-world controversies. Treatments of religion in SF span the gamut from Christian allegories (in the works of C.S. Lewis or Gene Wolfe), to efforts to define an alien religion and work its tenets into the story as important plot elements (as on *Star Trek: Deep Space Nine*), to quasi-anthropological studies of the phenomenon (by Ursula K. LeGuin), to outright attacks (by H.G. Wells or Greg Egan). In Pulp SF and Space Opera, alien religions usually come equipped with jewel-studded idols, beautiful sacrificial victims waiting for rescue, and sinister high priests. One recurring theme is ancient technology disguised as supernatural power, so the idol may turn out to be a superscience matter replicator or weather-control system.



Technology

COMPUTERS, BLASTERS, AND BOTS

Technology is the means by which most sentient species do things. Humans are almost helpless without some kind of tool, even if it's nothing more than a rock or a stick. Science fiction came of age when technological change became something that happened on a time scale of years or decades rather than centuries. The name is "science fiction" but a better one might be "tech fiction," since at its heart, most SF is all about the effects of new technologies on people and their world, and the interaction between people and technology.

This chapter discusses issues related to technology in science fiction gaming, and includes plenty of example devices. How-

ever, it's not a comprehensive equipment catalog — that requires a specific setting and defined type and level of technology, which this book does not have. Instead, *Star Hero* gamers should use the information in this chapter to help them develop the technology used by their characters and in their campaigns, and thus create equipment catalogs of their own.

Many of the sample technological items have a price listed in "credits," calculated using the formulas suggested on page 177. These prices are just suggestions; feel free to change a price to suit your own campaign's economics, the situation the characters are in, and so forth.

TECHNOLOGY IN THE CAMPAIGN



SIGNATURE TECHNOLOGIES

Here are some (but by no means all) of the important break-points in technology, organized by related fields. “Rubber science” inventions are listed in parentheses.

Energy Production

Fire
Animal Power
Wind and Water Power
Steam Power
Internal Combustion
Atomic Power
Fusion Power
Antimatter Reactors (Cold Fusion)
(Zero-Point Energy)

Continued on next page

Before running or playing in a *Star Hero* campaign, gamers should take some time to consider the impact of technology on the characters and the setting.

TECHNOLOGY LEVELS

A useful concept in science fiction gaming is the *technology level* (or “tech level”), denoting what a given world or society can create or do, technologically. On contemporary Earth, we tend to use decades as rough indicators of technology — the United States boasts a “twenty-first century” military, while poorer and less advanced countries have “1960s-era” forces.

Technology classifications tend to either be very broad or very narrow. An example of a broad schema is the notion of “Ages”: Stone Age, Bronze Age, Iron Age, Industrial Age, Information Age, PostHuman Age, and so forth. Broad technology schemes cover centuries or millennia, and they describe a whole suite of interrelated technologies and social structures. This

usually implies that cultures develop along a similar path. Broad tech classifications also encourage cinematic-style invention and gadgeteering — if you’re an Industrial Age mechanic you can fix anything from an early steamship to a World War II fighter plane.

Narrow tech scales are more useful in eras when technology changes quickly. A real-world example of this is the Gulf War of 1990, in which the 1990s-tech Coalition forces just walked over the 1980s-tech Iraqi army — using equipment which, by the standards of 2002, is often inferior or obsolete. This sort of system is appropriate to Cyberpunk or technothriller-style SF, in which hackers breeze through last year’s defensive software, and getting a beta-test copy of new intrusion programs can make a kid from the projects into a heavy hitter in cyberspace — for a few weeks, anyway. Obviously, narrow tech bands make it harder for a specialist trained in one tech level to work in others, and a character’s skills can get rusty in just a few years if he doesn’t study and stay current in the field.

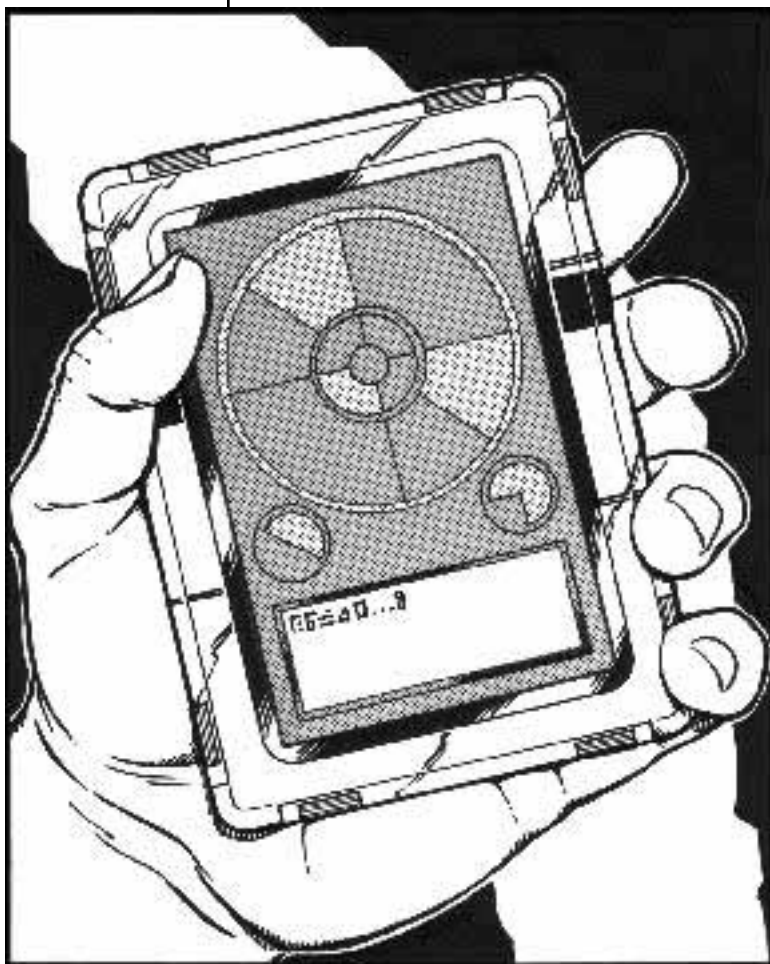
Tech Scales

Most technology-rating schemes have a “signature” technology which is the ultimate yardstick. If you have technology X, then you are tech level Y. The signature technology in a tech level rating system says as much about the people devising the system as it does about the cultures described. Archaeologists once classified Earth cultures by their artifacts, giving rise to the system of Stone, Bronze, and Iron Age. This works for archaeologists because they learn about cultures by examining things left in middens and tombs. By contrast, the Russian astronomer Kardashev classified civilizations by energy output, because energy emissions are what astronomers can detect. A culture interested in trade would rate civilizations by what they can make, while an aggressive conquering empire would be interested in the military potential of alien planets. Frequently space flight or interstellar travel are major demarcations in tech level. Sometimes a system combines two or more signature technologies for higher resolution.

Creating A Tech Scale

Gamemasters devising a tech scale need to make three decisions:

- Will the scale be narrow or broad?
- What will the signature technologies be?
- How will the levels be identified and/or labeled?



As an example, suppose Jim is creating the Terran Empire's technology classification scale, known officially as the Available Technical Resource Index, or ATRI number.

Narrow or broad? Well, the Empire is a type of Space Opera campaign setting, so technology changes aren't a major element. Characters will visit worlds at a variety of tech levels, but Jim doesn't want to handicap the low-tech NPCs too much. So, he aims for no more than about a dozen levels on the scale, so that even with the -3 per level Skill Roll penalty (see below), mechanics on primitive worlds can still work with advanced gear.

Signature technologies? Weapon tech is an obvious choice, but on an interstellar scale almost any technology has some military value. Instead, Jim pegs the ATRI scale to Energy Production and Transportation. Since Humans run the Empire, Jim sets the scale according to Human history (other species might invent things in different order). Here's the basic ATRI scale:

- 0: No Technology
- 1: Fire
- 2: Animal Power/Riding Animals/Boats
- 3: Wind Power/Sailing Ships/Balloons
- 4: Steam Power/Steamships/Railroads
- 5: Electric Power/Submarines
- 6: Internal Combustion/Aircraft
- 7: Atomic Power/Jet Aircraft/Orbital Spacecraft
- 8: Solar Power/Interplanetary Spacecraft
- 9: Fusion Power/FTL Travel
- 10: Cold Fusion/Fast FTL
- 11: Antimatter Power/Antigravity Vehicles
- 12: Teleportation

Alternate Tech Paths

Human beings invented sailing ships before gunpowder, balloons before the germ theory of disease, and steam power before rocketry. But there's no reason things had to happen in that order. The Greek scientists of Alexandria devised toys which contained all the principles of steam power almost two millennia before James Watt. An Egyptian doctor might have mixed saltpeter, sulfur, and charcoal thousands of years before the Chinese invented gunpowder. Hot-air balloons were possible a thousand years before the Montgolfier Brothers.

Gamemasters can have a lot of fun mixing and matching technologies. Early development of steam power allows naval battles between steam-powered Roman galleys firing catapults at each other. Early ballooning lets one have knights, castles, and aerial reconnaissance. But don't forget that some technologies depend on others — germ theory requires microscopes, airplanes need internal-combustion motors, and submarines aren't practical until they can use electric batteries.

More exotic alternate technology paths could skip entire areas of knowledge — one common way to make an alien civilization alien is to give them a technology based on biology rather than inanimate materials and machinery. Instead of making a device to do something, they would breed

an organism for it. Or maybe the aliens lack some device common on Earth. H.G. Wells's Martians, for example, didn't have the wheel.

Varying Tech Paths

Within a given civilization, it's entirely possible for the tech levels to vary from place to place. For example, the most advanced nations or regions on a particular planet might have Tech Level Theta devices, whereas less advanced or more isolated locations might only have reached Tech Level Delta. Similarly, Kalidar IV might possess extremely advanced technology, while Haroldson's Planet is much less developed technologically. Not only is this realistic, it's dramatic — it provides the GM with a lot of potential story and character hooks, all centered around the issue of *why* the differences exist. Do the Tech Level Theta regions actively oppress their neighbors, preventing technological development from occurring? Are those areas inhabited by two different species, with the more advanced imposing a technology embargo on itself to keep from interfering with the other? Has Kalidar IV historically been a haven for scientists and free thinkers, while Haroldson's Planet persecutes them... or is Haroldson's Planet a young colony on the fringes of the Galactic Commonwealth, whereas Kalidar IV is a Commonwealth core world?

Nor do tech levels have to be uniform from one type of technology to another. Ordinarily advances in one field tend to lead to advances in other fields, so that technology progresses in a broadly uniform sort of way. But that's not inevitable. A civilization could have, for example, Tech Level 15 computers and communications equipment, but only Tech Level 10 weapons. Again, the intriguing question is why this state of affairs exists. By considering and answering that question, the GM and players can develop the setting further, creating more opportunities for adventures and enjoyable characters.

Obsolete And Advanced Technology

Often technologies introduced at an earlier tech level remain in use for long periods. Humans still use automatic pistols designed before 1900 (and still manufacture some, with minor improvements). Axes and hammers are among the earliest known tools, and are still available at the hardware store. In general, characters get no penalty using equipment from an earlier tech level. There are exceptions to this: some technologies become so obsolete that characters accustomed to a more advanced tech landscape are completely unfamiliar with them. Firemaking is a good example — until the invention of matches just about everyone could kindle a fire with flint and steel; now it's something to study in wilderness-survival courses or historical reenactment workshops. Forgotten tech imposes a minimum -3 Skill Roll penalty, or the GM may not allow the character to make a roll at all.

Continued from last page

Information

- Writing
- Printing
- Telegraph
- Photography
- Mechanical Computers
- Telephone
- Sound Recording
- Motion Pictures
- Radio
- Television
- Electronic Computers
- Video Recording
- Computer Networks
- Pocket Computers
- Biocomputers
- Artificial Intelligence

Medicine

- Herbal Medicine
- Surgery
- Antiseptics
- Vaccination
- Antibiotics
- Transplants
- Genetic Medicine
- Cybernetics
- Cloning
- Nanotech Medicine

Transportation

- Riding Animals
- Boats
- Sailing Ships
- Balloons
- Steamships
- Submarines
- Airplanes
- Orbital Spacecraft
- Interplanetary Spacecraft
- (Interstellar Spacecraft)
- (Antigravity)
- (Teleportation)

Weaponry

- Clubs and Axes
- Spears
- Bows
- Swords
- Pikes
- Crossbows
- Cannon
- Muskets
- Breech-loading Rifles
- High-Velocity Artillery
- Automatic Rifles
- Guided Missiles
- Atomic Weapons
- Lasers
- Gauss Guns
- (Particle Weapons)
- (Antimatter Warheads)
- (Plasma Weapons)
- (Disintegrators)

LOW-TECH SF

Some science fiction stories and films depict worlds in which the technology is less advanced than present-day equipment, either in some areas or overall. One example is the *Dune* series by Frank Herbert, in which the “Butlerian Jihad” wiped out all computer technology. Gamemasters who want science fiction without super-advanced technology can use various methods to put the brakes on scientific progress.

Decadence: A very rich and advanced culture might become the victim of its own success, if everyone studies the arts or spends their lives immersed in virtual-reality games. The machines make everything, and the robots fix everything, and nobody bothers to understand how or why — until Something Goes Wrong.

Disaster: Some tremendous catastrophe might knock whole planets or sectors back into a Dark Age of low technology. An interstellar war might devastate industries and disrupt trade, leaving planets to struggle on alone. A powerful supernova explosion could fry electronics for light-years in every direction. A runaway nanovirus might selectively destroy integrated circuits, creating a civilization dependent on vacuum tubes and slide rules.

Fiat: A much more advanced civilization could decide that Humanity simply “isn’t ready” for high technology, and back up that decision with firepower. The initial stage of an enforced ban would be like a war, followed up

Advanced technology is much harder to use. The standard skill penalty is -3 for each Tech Level beyond that with which the character is familiar. This is for equipment based on understandable principles — an Industrial-Age steam engineer trying to fix an Atomic Age chemical rocket motor, for example. If the technology involves new concepts unknown to the low-tech person, there is an additional -5 penalty. So our steam engineer would be at -8 to fix a nuclear power plant, because the whole phenomenon of nuclear fission is outside his worldview. Characters can use the *Cramming* Skill to quickly familiarize themselves with local technology.

The modifiers work in reverse when characters are using high-tech skills and knowledge against low-tech equipment — like a computer hacker breaking into an obsolete system or a weapon officer on a modern warship trying to hit a target with old-fashioned countermeasures. Advanced tech gets a +3 bonus per Tech Level of difference, with an additional +5 if the high-tech equipment uses principles unknown to the builders of the low-tech target.

Alert readers may be wondering which Tech Levels are meant — *Star Hero* doesn’t include a list of official Tech Levels, so how to figure these modifiers? The answer is it depends on your campaign’s tech system. If the game has narrow tech levels — a Cyberpunk or technothriller setting — then things rapidly go obsolete and tech levels are single years. If the campaign has broad technology levels, then obviously tech differences aren’t that important.

Alien Technologies

Characters in *Star Hero* settings may also run into tech level-related problems when they encounter alien technology that’s highly different from what they’re used to. Maybe the alien devices and systems require a different size, type, or arrangement of hands than the character’s, involve senses the character lacks, or are simply so *different* that the character can’t fully or properly comprehend them.

ADVANCED, OBSOLETE, AND ALIEN TECH MODIFIERS

Skill Roll Modifier	Situation
-3 per Tech Level difference	Working with Advanced Tech
-5	Working with advanced tech using unknown principles
-3	Working with forgotten tech
+3 per Tech Level difference	For high tech versus low tech contests
+5	For high tech with new principles versus low tech contests
-1 to -5	Working with sufficiently alien technology

At the GM’s discretion, a character dealing with sufficiently alien technology suffers a -1 to -5 Skill Roll penalty. Over time, this penalty may diminish for a specific character as he becomes accustomed to the odd tech, or a character can eliminate the penalty altogether by having a KS or PS in the alien technology on at least an 11- roll.

What constitutes “sufficiently alien” is up to the GM. In a setting that mixes and mingles a wide variety of humanoid aliens, they may all be able to use each other’s technology (or the tech may automatically adapt itself to the species of the user). Large galactic federations and empires automatically spread technological knowledge among their citizens (unless they want to keep them ignorant for purposes of repression). On the other hand, a secretive alien species may refuse to teach anyone about its tech.

TECHNOLOGY COMPATABILITY

Gamemasters and characters may also have to deal with situations where technology created by different species doesn’t work together well. If the PCs’ ship has a Human-built hyperdrive thruster, a D-coil manufactured by the Perseids may not quite fit or work right. A group of characters could easily find itself in the frustrating situation of having access to plenty of spare parts... that don’t work with their equipment!

In this situation, GMs have to decide on the relative compatibility of two species’ technology, using the following classifications:

Fully Compatible: The two species’s tech is totally compatible; it works together automatically, without the need for Skill Rolls.

Mostly Compatible: The two species’s tech is largely, but not entirely, compatible. Typically characters have to make an appropriate Skill Roll at -2 to get the two types of tech to function together properly. Even then, there may be a loss of 2-12% efficiency (measured in terms of dice/points of effect, Active Points, or the like, as chosen by the GM).

Partly Compatible: The two species’s tech is sometimes compatible, sometimes not. Typically characters have to make an appropriate Skill Roll at -4 to get the two types of tech to function together properly. Even then, there is definitely a loss of 4-24% efficiency, and possibly as much as 10-60% efficiency.

Barely Compatible: The two species’s tech works together properly only on rare occasions. Typically characters have to make an appropriate Skill Roll at -8 to get the two types of tech to function together properly. Even then, there is definitely a loss of 10-60% efficiency, and possibly as much as 40-90% efficiency.

Incompatible: The two species’s tech is not compatible in any way, and cannot be made to work together at all.

PRIME DIRECTIVES AND QUARANTINES

Earth history has several unfortunate examples of what can happen when high-tech and low-tech collide. While the Spanish conquest of Mexico may have been due more to political instability in the Aztec Empire than Spanish matchlock muskets, the European colonial expansion in Africa and the South Pacific was based solidly on Maxim guns and steamboats. Even benign applications of high technology can have unintended ill effects: eradication of malaria in tropical regions led to rapid population increases, straining food production and social structures in those areas.

To prevent both empire-building and unhelpful “help,” many interstellar societies in science fiction have rules prohibiting the introduction or use of advanced technology on low-tech planets. *Star Trek’s* “Prime Directive” is the most famous, but L. Sprague De Camp’s *Viagens Interplanetarias* enforced Regulation 268, and C. J. Cherry’s *Union* was guided by the Gehenna Doctrine to similar effect. Conveniently, technology embargo rules mean space-faring heroes can go about having sword-swinging adventures on low-tech planets, which many writers and readers consider a plus. Less conveniently, they mean unscrupulous NPCs can smuggle high-tech weapons to primitive peoples, causing all sorts of problems the PCs have to resolve.

The exact details of the technology quarantine rules in a given campaign setting are up to the GM, of course. Some possible rules are listed below:

Total Embargo: All contact with the inhabitants of the planet is forbidden. This is often done to prevent the tremendous shock to a culture’s world-view created by the knowledge that they are not alone. For roleplaying purposes, this lends itself to daring attempts to evade the blockade, “gods from space” encounters with the natives, and so forth. Some covert contact by explorers in native disguise may be allowed.

Local Tech Only: Aliens can visit the planet, but are restricted to locally-available technology. Often this is enforced by extremely strict methods: De Camp’s *Viagens Interplanetarias* used brainwashing devices (the St.-Remy treatment) to make it impossible for offworlders to even discuss advanced technology with the natives. This is best for “sword and planet” adventures.

Personal Tech Only: Space travelers can visit a low-tech world and bring advanced devices for personal use, but are not allowed to introduce technologies to the planet. Thus, a visiting spacer can pack his trusty blaster, but can’t open a blaster factory. This lends itself to smuggling, enterprising locals developing knockoff technology, and offworld mercenaries conquering kingdoms.

Restricted Technologies: Introducing some technologies is permitted, but others are strictly controlled. Advanced medicine and clean energy sources are okay, but weapons are not. (This matches the real-

world technology export controls in America and elsewhere.) The trouble with this is that just about anything can have military applications, either directly or indirectly. Adventures in these settings may involve hairsplitting definitions of “weapons” and the social effects of advanced alien tech on primitive societies.

TECHNOLOGY IMPROVEMENTS

Improved technology makes better gadgets. But how? Technological improvements tend to fall into two categories — incremental changes and replacements. Incremental changes are small, gradual improvements which increase the usefulness or effectiveness of a device. The rubber grip on a hammer is one example — it’s still a hammer, but you can hit harder with it because your hand won’t get numb. Things like stronger alloys, ergonomic design, and improved energy efficiency are all incremental changes. As a rule of thumb, devices tend to get lighter, more durable, and more energy-efficient as time goes on.

By contrast, replacement creates entirely new devices which perform the function in a different way. Often they add new functions as well. So airplanes replaced ocean liners for long-range travel, and also transformed warfare and business. Computers replaced adding machines and typewriters, and added things like computer games, e-mail, and the Internet.

Characters using incrementally improved technologies can easily familiarize themselves with advanced versions of devices they already know how to use. A hammer is a hammer, after all, rubber handle or no. An automobile of 2002 is vastly different under the hood from one made in 1932, but a driver skilled with one could get behind the wheel of the other, take a spin around the block to familiarize himself with the car, and zoom off. Replacement technologies require completely new skills. Knowing how to use an adding machine means nothing when you’re using a computer.

One area where replacement technology frequently revolutionizes things is warfare. Modern-day weapons are incredibly powerful, even when compared with systems only a couple of decades old. A recognizable trend in weapon tech is not so much greater destructive power but superior accuracy and ease of use. Battleship shells of the First World War packed about as much explosive power as a modern antiship missile, but nowadays one missile can take out a ship because it can seek out a weak point. That’s an accuracy issue.

Ease of use is demonstrated by the replacement of the longbow by crossbows and guns. Properly handled, a longbow had much better range and hitting power than early muskets did. But as the old English expression put it, to train a longbowman you begin by training his grandfather, whereas a few weeks of training could turn plowboys into gunmen. “Smart” missiles take the burden of aiming and controlling a weapon away from the soldier, so

Continued from last page

by technology policing by the advanced civilization and desperate attempts by Humans to get around the ban. (See Arthur C. Clarke’s short story “Loophole,” in which Humans invent teleportation technology to strike back at the Martians, who have forbidden them to develop rockets.)

Rejection: For whatever reason, people have deliberately rejected advanced technology. This may be a single world where Humans are trying to “get back to nature,” or a pan-Galactic movement to ban technologies which are seen as threatening. This could be the result of a revolt of the robots, or some nanotech plague. Or perhaps people just become convinced there really are limits to the benefits of technology. Will the PCs accept that notion, or rebel against it? This is an especially good way to limit certain powerful technologies like Artificial Intelligence or nanotechnology, without throwing the whole campaign back into the Stone Age.

...AND I WANT MY OWN STARSHIP, TOO!

A recurring problem in *Star Hero* is the way the heroes tend to get overshadowed by their stuff. Instead of individual skill and ability, problems are solved by hauling out the right toy. And since characters can buy new toys, this quickly turns into an “arms race” in which they buy cool equipment to earn the money to buy more cool equipment to earn more money to buy cooler equipment....

There are ways for GMs to keep things from getting out of hand. The first is a matter of player expectations — make sure the GM and the players have the same idea of what the campaign is about. If they're going to be heroic space knights battling Evil, well by golly heroic space knights don't rely on gadgets. Other methods include:

Prevention: Put characters in situations where they can't buy equipment (or replace lost equipment) — or at the very least, have to expend *lots* of resources (money, favors, and so forth) to get what they want. If the campaign mainly takes place out in the galactic hinterlands, it's not as easy for the PCs to find replacement warp drive parts or the latest weapons for sale.

Countermeasures: Any powerful technology soon calls forth a way to foil it. Police radar guns begat radar detectors, which in turn begat police using laser speed detection. If the PCs abuse a particular technology in the game, it's likely other people do, too... and that a countermeasure will soon hit the market, if it hasn't already.

that anyone who can point and shoot can use one.

Of course, sheer power does play a role. Nuclear weapons pack more firepower than entire battles of preatomic munitions. But it's worthwhile to note that nuclear weapons may simply be too powerful to be useful.

IMPROVING TECHNOLOGY IN THE GAME

The *HERO System* rules generally only account for aspects of technology that may have some affect on game play. There are no Advantages for simulating rubber grips on hammers, or for miniaturizing devices which started out large and clunky. Those things rarely factor into the game, and so are simply assumed as part of the “special effect” of a particular device.

However, there are several ways, in game terms, to reflect the development of technology over time. The first, and most obvious, is to increase the Active Points in the Power(s) used to build a device. Doing so makes it more powerful, stronger, more durable, able to broadcast a stronger signal, or what have you. This is often a good way to represent relatively crude initial technological breakthroughs, since adding raw power is often the most primitive way to increase the utility of a device.

Second, you can remove Limitations. Early or primitive versions of a particular type of technology are often loaded with Limitations — Activation Roll, Charges, Costs Endurance/Increased Endurance Cost, Extra Time, Side Effects, and the like. Removing these inconvenient hurdles to ease of use is an excellent way to simulate the march of technological progress.

Third, you can add Advantages. This works particularly well for weapons, since so many of the Advantages primarily affect combat, but it can be just as important for other devices. A life support suit may get more Fuel Charges, for example, or a radio adds MegaScale so it can transmit to the stars. If you can apply an Advantage in increments, or buy it multiple times, usually it's best to take it only once to begin with, then add more of it later on as the technology becomes even better.

Fourth, you can expand the device's functions. This has the effect of increasing the Active and Real Point costs, but without necessarily making any single function of the device more powerful. For example, a simple wrist-radio (Radio Perception/Transmission) later adds videoconferencing (increase the points to “trade” that Sense for HRRP), and then includes computer functions (add a small, simple Computer). Sometimes this requires you to convert a single-Power gadget into a Power Framework-based gadget. For example, a force field belt (Force Field) might develop the capacity to project barriers of force away from the wearer (now it's a Multipower with two slots, one Force Field and the other Force Wall).

RUBBER SCIENCE

You've got a problem. You want to run a *Star Hero* campaign, but you want to include stuff like forcefields, faster-than-light travel, and antigravity. Modern physics is mean and won't let you have any of those things in a realistic campaign. Looks like it's time for rubber science!

Rubber science is imaginary science, but not quite fantasy. It looks like science and sounds like science, but it assumes some things are possible that present-day science considers impossible. Now, scientists themselves freely admit they don't know everything, so it's just barely conceivable that some rubber sciences may turn out to be true. That's all the loophole you need.

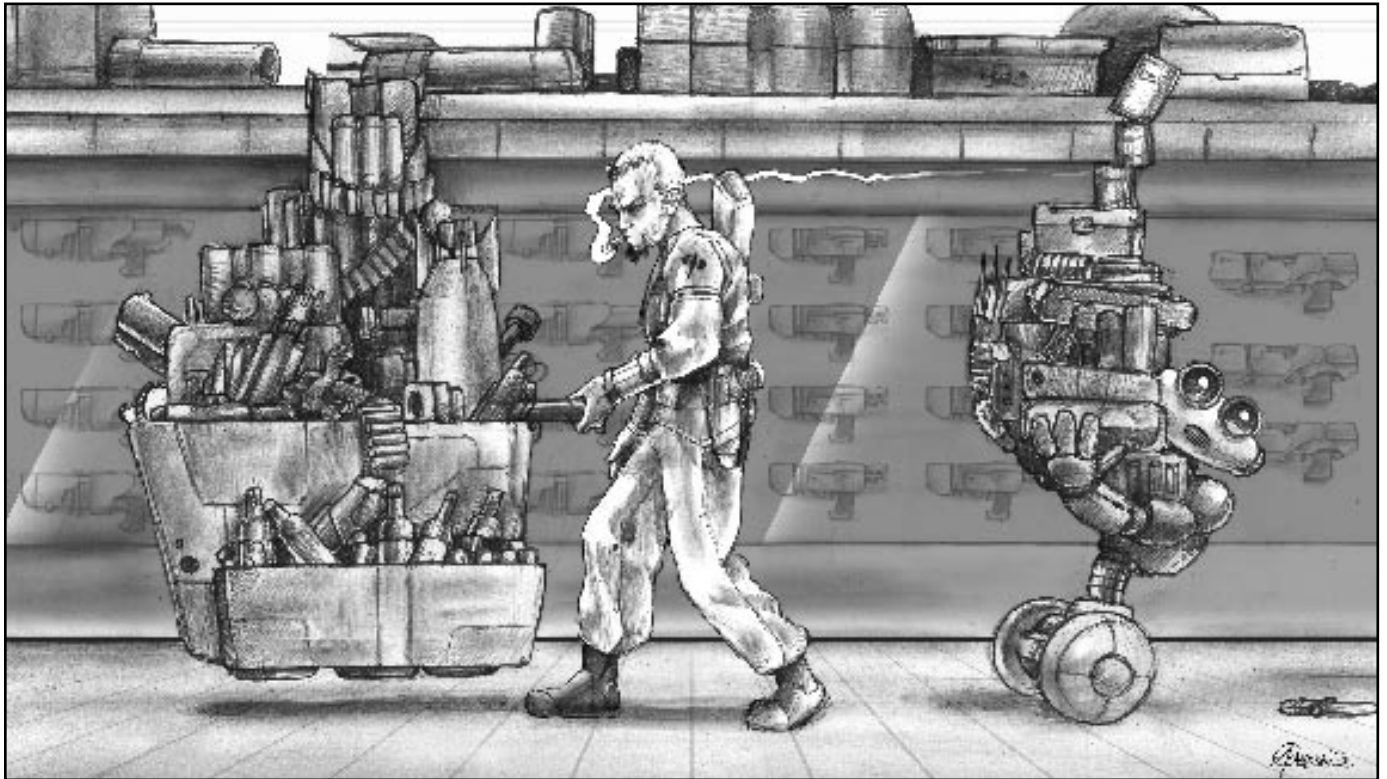
Examples of rubber sciences are Gravitics (the science of gravity, antigravity, and artificial gravity), Hyper-Physics (the study of hyperspace and faster-than-light travel), Psionic Engineering (creation of psionic machinery), and Temporal Mechanics (the science of time travel). (In some campaigns, Hyper-Physics and Temporal Mechanics are combined into one discipline, Dimensional Engineering.)

To create a good rubber science, the GM should think it through. Take teleportation as an example. Jim (the GM of the Galactic Federation campaign) wants characters to be able to blip from an orbiting spaceship down to the surface of a planet in the wink of an eye, without landing the whole ship. Now he has to figure out “how it works.” This doesn't mean devising the actual equations and technology for teleporting, but it does mean coming up with a rough idea of what happens when someone steps into the teleporter. Does it scan them at the molecular level and reconstruct them somewhere else? Does it open a tube through hyperspace connecting the ship and the target? Does the passenger make a sudden quantum displacement to the destination?

Based on that, think through the implications and choose the method which best fits the campaign world you want. The scan-and-reconstruct method requires some way to rebuild the passenger at the destination, which isn't suitable if the characters are visiting unexplored planets. It also means the teleporter could be used as a “Human photocopy” to make duplicates of passengers. Scanning teleporters could also function as replicators and immortality machines. That isn't what Jim wants, so he rejects that approach.

The Hyperspace Tube and Quantum Displacement methods both avoid those problems, so he decides to use one of them. How do they fit with the rest of the campaign's technology? If interstellar travel uses ships voyaging through hyperspace, then a Hyperspace Tube becomes a natural outgrowth of hyperphysics. That's good, because it's always useful to keep the total number of imaginary sciences in a setting low.

What other applications are there for tubes that join distant points in space? If spaceships use fuel, one can imagine putting a hypertube in the fuel tank, connected directly to the refinery, giving them infinite fuel supplies! Tubes could link places



on a planet's surface, allowing people to live anywhere they like and step to work on the other side of the world. Hypertube weapons could bypass a ship's defenses and place bombs inside the hull.

Obviously Jim needs to limit his campaign's hyper-technology; some of those results, while plausible, aren't much fun in game terms. A Rubber Science which allows anything to happen is just magic. Jim doesn't like the infinite fuel idea, and doesn't want hypertube commuting. So he decides on some limits to the technology: hypertubes are unstable; they only exist for short periods and become exponentially harder to maintain the longer they last. This means the crew can open a tube for one second — long enough for an exploring party to jump through — but every additional second requires a Systems Operation roll with a penalty of 2 times the duration in seconds. So one additional second is at -2, two seconds is -4, three is -6, and so on. A miracle-working ship's engineer can keep the tube open when the captain's life is at stake, but tubes can't be permanent. (If necessary, Jim can also impose penalties based on the "length" of the tube; the longer the tube, the harder it is to keep stable.)

To keep hypertubes from making all space battles into very short contests of who can pop a bomb into the other's bridge fastest, the campaign needs a defense against hypertubes. Since they're unstable anyway, Jim can justify "hyperspace damping generators" which create destructive interference and prevent tube formation. Ships can still

use tube-boosted missile launchers and railguns to reduce the range to the target, making space battles very large-scale affairs, with ships millions of miles apart able to strike at one another. Once a lucky hit takes out one side's damping generator, the attacker can send the Marines through the tube — or a Nova Bomb.

This is going to affect space tactics and ship design. Since ships can fight at very long range, the model for space warships is likely to resemble modern-day missile cruisers or nuclear submarines. There won't be "carriers" because the fighter craft they carry won't be able to mount hypertube dampers or projectors.

Rubber sciences, like real ones, need a vocabulary. A good set of consistent-seeming technobabble can make a rubber science sound as real as plumbing. Often new sciences borrow or redefine existing words — to describe the flow of electricity, early inventors called it a "current," like a flow of water. Since hyperspace is a concept from geometry, Jim decides to use a lot of terms evoking shapes and geometric concepts: tubes, folds, ripples, holes, and so forth. He can also just tack the prefix "hyper-" onto a lot of existing terms to get hyperengineering, hyperphysics, hyperdynamics, hypertechonology, and so on. It's easy to overdo this: a hyperengineer using a hyperspinner to fix the hyperdrive is getting silly. Instead, the Spatial Engineer has to use his spacetime curvature meter to adjust the hyperdrive. Sounds much better.

Continued from last page

Training: As anyone with a blinking VCR clock knows, having a cool gadget and knowing how to use it are very different things. Instead of letting heroes use things right out of the box, impose a training period, or a penalty for untrained use. Sure, your targeting computer gives you an OCV bonus with rifle fire, but if you didn't read the manual, you won't get the full benefit. For military-grade equipment, training may not be easy to come by, and asking about it can attract the attention of the police.

Compatibility: Are you sure your gadgets work together? Does your targeting computer plug fit your night-vision goggle socket? GMs can have a lot of fun with the potential for incompatible devices, especially if they're made by different species. At the very least, characters must make Electronics, Weaponsmith, or even Inventor rolls to jury-rig connectors and patch the software bugs. (See page 144.)

WEAPONS AND DEFENSES



ALIEN BLADE WEAPONS

Here are a few alien blade weapons from the Terran Empire setting:

Ackálian Sickle: The traditional hand weapon of the Ackálians, this is a one-handed sharp blade curved forward to strike point-first. The outer edge is sometimes saw-toothed for backhand slashes. Ackálians are strong enough to fight with one in each hand, and normally carry sickles in scabbards strapped to the thighs. Price: 660 credits, or more.

HKA 1d6 (plus STR), Reduced Endurance (0 END; +½) (22 Active Points); OAF (-1), STR Minimum (12; -½), Real Weapon (-¼). Total cost: 8 points.

Mon'dabi Cha'shur: The *cha'shur* is a weapon similar to an axe, but with a slightly downward-curving spike attached to the upper outer edge of the blade, pointing forward. Heavy, and often unwieldy, the weapon was originally designed to punch through the thick skins of Mon'da's many fearsome reptilian predators. Price: 1,350 credits, or more.

HKA 2d6 (plus STR), Reduced Endurance (0 END; +½) (45 Active Points); OAF (-1), STR Minimum (15; -¾), Real Weapon (-¼). Total cost: 15 points.

Weapons are among Humanity's oldest technology, and are an area where progress is still rapid. Offensive systems and defenses are locked in a never-ending round of escalation.

MELEE WEAPONS

As advanced as weapons may get, sometimes nothing beats a good, old-fashioned club or axe. Melee weapons crop up in SF frequently, both in the fists of primitive natives and in the hands of characters also versed in the use of blasters and teleporters.

ALIEN BLADES

It has become common in recent film and television SF to give alien cultures their own unique bladed weapons. This usually allows for a certain amount of "ethnic bad-ass" effect — someone from another culture armed with a weird or archaic weapon is always more effective than a regular guy with a regular sword or knife.

Most alien weapons are simply varieties of HKA with spiky bits for added coolness. There are some principles to keep in mind, however. One is that size matters — an alien species uses weapons appropriate to its members' average size and strength. About 1/20 of lifting capacity is right. Another factor is alien anatomy. Boneless or tentacled aliens go for swinging weapons like axes and broadswords; short-limbed species may prefer thrusting weapons. It's also worth considering the anatomy of what the aliens usually fight. Aliens with natural body armor may develop armor-piercing hand weapons like rapiers and daggers, or whips and garrotes to entangle and strangle.

ENERGY BLADES

A mainstay of Space Opera SF ever since *Star Wars*, energy blades have a variety of names: light-sabers, force swords, laser-blades, and so forth. Typically, they are rare, difficult to build, and/or restricted to a limited group of warriors. Possible explanations for them include molecularly-thin force-fields or energy fields, molecularly-thin wire stiffened by an internal force-field, and force-fields containing a laser bolt or superheated plasma. The blade can cut through any matter with its subatomically sharp "edge"; only another energy blade, or a force-field of some sort, can stop an energy blade. See page 44 for a possible Martial Arts style for energy blades.

A character armed with an energy blade can often use it to do other things besides cut, slash, and block. He may be able to deflect energy bolts (Mis-

sile Deflection), or even fire them himself from his blade (EB, RKA). A skilled user can weave such a "web" around himself that anyone who comes close gets hurt (RKA, Area Of Effect: One Hex, Trigger, No Range).

Presented below are two examples. One is a basic Energy Sword, which damages not only that which it strikes, but any matter which strikes it. The other is a more sophisticated Force Blade, that can also project a protective force screen around its wielder. Both require WF: Energy Blades.

Energy Sword: RKA 3d6, NND (defense is ED Force Field/Force Wall, or being blocked by another energy blade; +1), Does BODY (+1), Reduced Endurance (0 END; +½) (157 Active Points); OAF (-1), No Range (-½) (total cost: 63 points) **plus** RKA 2d6, NND (defense is ED Force Field/Force Wall, or being blocked by another energy blade; +1), Does BODY (+1), Continuous (+1), Damage Shield (+½), Reduced Endurance (0 END; +½) (150 Active Points); OAF (-1), Linked (-¼), Only Affects Material Objects Which Strike Blade (-½) (total cost: 54 points). Total cost: 117 points. Price: 184,200 credits, or more.

Cost Force Blade

117 Force Blade: As Energy Sword, above
12 Force Screen: Force Field (6 PD/10 ED), Reduced Endurance (0 END; +½) (24 Active Points); OAF (-1)

Total cost: 129 points. Price: 198,600 credits, or more

RANGED WEAPONS

As popular as melee weapons may be, in most cases they can't beat a ranged weapon, whether it's a chemical-propellant gun or the most advanced disintegrator available. Here are some of the types of firearms available in *Star Hero* settings.

ADVANCED FIREARMS

During the past few centuries, guns have steadily improved in several areas: rate of fire, range, accuracy, and hitting power. But there's still plenty of room for improvement. Some of these can be combined, making for really devastating weapons.

Rate Of Fire: Early twenty-first century automatic rifles can fire half a dozen rounds per second, emptying a clip in less than a minute. More compact ammunition and other new technologies could improve

MISCELLANEOUS STAR HERO MELEE WEAPONS

Here are a few more example melee weapons. Each requires its own WF to use properly.

Electric Whip: Also known as an Energy Whip, this weapon looks like a whip made out of a glowing strand of energy. Essentially, it's a blaster with a highly limited range, since the energy lash can only reach so far; however, skilled users can wrap the energy-strand around a target, causing him to keep taking damage until freed. Price: 3,000 credits, or more.

EB 8d6, Reduced Endurance (0 END; +½) (60 Active Points); OAF (-1), Limited Range (4"; -¼) (total cost: 27 points) **plus** Continuous (+1) for power (40 Active Points); OAF (-1), Requires A Sleight Of Hand Roll (-½), Victim May Cancel Effect By Spending One Full Phase Unwrapping Self (-½) (total cost: 13 points). Total cost: 40 points.

Inertial Gloves: These are heavy gauntlets equipped with rubber science inertia-enhancing generators. The user triggers the effect in mid-swing, so the gloves hit like a freight train. Price: 1,680 credits, or more.

HA +5d6, Double Knockback (+¾), Reduced Endurance (0 END; +½) (56 Active Points); OIF (-½), Hand-To-Hand Attack (-½). Total cost: 28 points.

Stun Rod: Law enforcement agents and soldiers on peacekeeping missions have long wished for a reliable way to subdue people without deadly force. Stun rods are the answer — a short baton with a contact-triggered neural stun pulse. The victim feels no pain, only numbness and weakness. Price: 2,250 credits.

EB 6d6, NND (defense is ED Force Field; +1), Reduced Endurance (0 END; +½) (75 Active Points); OAF (-1), No Range (-½). Total cost: 30 points.

both rate of fire and ammo capacity.

Range: Improved propellants, like liquid-explosive guns (which inject propellant into the barrel behind the bullet so it continues to accelerate until it leaves the muzzle) could dramatically increase the range (and damage) of rifles. The drawback is bulkier ammunition and fewer shots, though other improvements may mitigate these difficulties.

Accuracy: Electronic sights and targeting computers built into a rifle or a soldier's helmet could improve accuracy, especially at long range. As electronics get smaller, "smart bullets" become possible. They would have tiny sensors, a miniscule computer brain, and fins for guidance. The bullet could actually correct for wind, avoid tumbling in flight (unless that's desired), and even track a moving target to hit. Naturally, smart bullets wouldn't be cheap.

Damage: High-velocity bullets from a liquid-propellant gun would naturally hit harder and do more damage. Scientists are also working on tiny shaped-charge warheads to blast through armor.

Science fiction bullets could incorporate all of these advances, and ones as yet unforeseen. Some might have cores of degenerate matter, making each one hit like a cannonball. The ultimate bullet would hold a small amount of antimatter in magnetic suspension — literally a "pocket nuke."

Example Advanced Firearms Technology

All of the example bullets assume an advanced round roughly the same size as a .45 cartridge. You can easily create other such rounds by altering the damage done.

Liquid-Propellant Sniper Rifle: This big gun fires extremely high-velocity rounds doing substantial damage at long range. It is large and clumsy, best used from a prepared concealed position. Later versions make the weapon smaller, lighter, and easier to handle, and eventually add automatic fire features. If you want to make the weapon inherently more accurate at range, add some Range Skill Levels on a Focus. Price: 2,100 credits, or more (Early and Later versions); 3,300 credits, or more (Autofire version).

Early Version: RKA 2½d6, Armor Piercing (+½), Increased Maximum Range (1,500"; +¼) (70 Active Points); OAF Bulky (-1½), Real Weapon (-¼), STR Minimum (18; STR Minimum Doesn't Add To Damage; -1½), Two-Handed Weapon (-½), 6 Charges (-¾). Total cost: 13 points. (Later version is STR Min 12, and non-Bulky; total cost is 15 points.)

Autofire Version: RKA 2½d6, Armor Piercing (+½), Autofire (5 shots; +½), Increased Maxi-

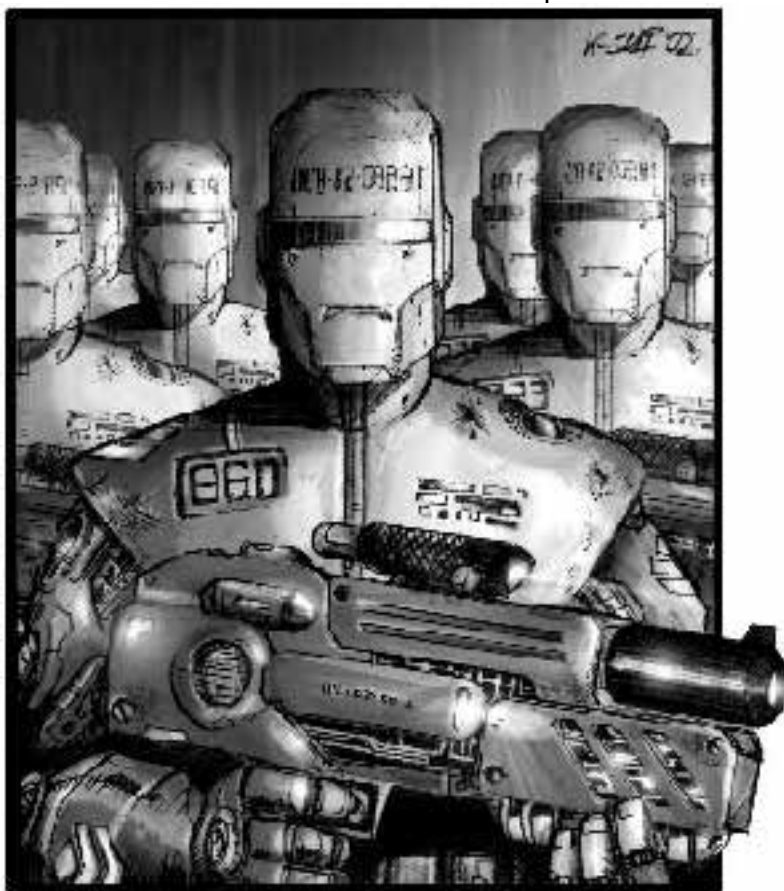
Continued from last page

Se'ecra Wrist-Blades:

Worn by the insectoid Se'ecra, this weapon consists of a heavy leather or metal wrist-band with one or more blades projecting outward. The shape and number of blades varies, but most have one to three blades that curve forward.

Price: 450 credits, or more.

HKA ½d6 (plus STR), Reduced Endurance (0 END; +½) (15 Active Points); OAF (-1), STR Minimum (7; -½), Real Weapon (-¼). Total cost: 5 points.



imum Range (2,500"; +¼), 60 Charges (+½) (110 Active Points); OAF (-1), Real Weapon (-¼), STR Minimum (14; STR Minimum Doesn't Add To Damage; -1), Two-Handed Weapon (-½). Total cost: 29 points.

Targeting Computers: Mounted in a visor and linked to a small camera on the weapon, a targeting computer shows the shooter exactly where his weapon is pointing. Early versions are relatively simplistic; more advanced targeting computers can take into account target movement, firer movement, wind, and other conditions for even greater accuracy. Price: 200 credits, or more (basic version); 400 credits, or more (expert system).

Basic Targeting Computer: +2 OCV (10 Active Points); OAF Fragile (-1¼). Total cost: 4 points.

Expert System Targeting Computer: +4 OCV (20 Active Points); OAF Fragile (-1¼). Total cost: 9 points.

Homing Bullets: These rounds have tiny fins, onboard sensors, and a built-in guidance chip to keep them flying straight. A dedicated targeting computer built into the weapon even allows the shooter to direct the bullets to fire around walls and other obstacles! Price: 2,250 credits, or more, per bullet.

RKA 2½d6, +1 Increased STUN Multiplier (+¼), Indirect (always originates from shooter, but can strike target from any angle; +½), No Range Modifier (+½) (90 Active Points); OAF (-1), STR Minimum (10; STR Minimum Doesn't Add To Damage; -1), Real Weapon (-¼), 12 Charges (-¼) (total cost: 26 points) **plus** +1 OCV (5 Active Points); OAF (-1), Real Weapon (-¼) (total cost: 2 points). Total cost: 28 points.

Shaped-Charge Bullets: These rounds contain a tiny shaped-charge warhead for better armor penetration. As with Homing Bullets, determine the round's base damage normally. Price: 2,250 credits, or more, per bullet.

RKA 2½d6, Armor Piercing (+½), +1 Increased STUN Multiplier (+¼) (70 Active Points); OAF (-1), STR Minimum (10; STR Minimum Doesn't Add To Damage; -1), Real Weapon (-¼), 12 Charges (-¼) (total cost: 20 points) **plus** +1 OCV (5 Active Points); OAF (-1), Real Weapon (-¼) (total cost: 2 points). Total cost: 22 points.

Antimatter Bullets: The ultimate in handheld firepower, these cinematic rounds carry a microscopic fragment of antimatter magnetically contained in the tip. On impact the antimatter contacts matter and annihilates itself in a tremendous bang. Should only be used at long ranges, due to blast effects. Price: 6,000 credits, or more, per bullet.

EB 20d6, Explosion (-1 DC/3"; +1) (200 Active Points); OAF (-1), STR Minimum (10; STR Minimum Doesn't Add To Damage; -1), Real Weapon (-¼), 4 Charges (-1). Total cost: 47 points.

GAUSS WEAPONS

Gauss weapons, or electromagnetic slugthrowers, use powerful magnetic fields to launch metal projectiles at high speeds. They have the advantage of being much quieter than chemical-propellant rifles, and can sustain very high rates of fire. Gauss weapons typically use very small caliber rounds, making their attacks Armor Piercing.

The chief disadvantage of Gauss weaponry is that like lasers and other energy weapons, they require a lot of energy. Early gauss weapons have disposable chemical-energy cartridges in a power pack; later ones have highly efficient batteries or capacitors. Heavy gauss guns use dedicated generators to achieve really massive rates of fire.

Early Gauss Cannon: This is a heavy gauss "assault cannon" intended for Cyberpunk-era games. It's not commercially available, but may be a top-secret military prototype or the latest from a megacorporation's laboratories. It has a very high rate of fire but requires large ammunition clips and an external power pack which pumps out a *lot* of waste heat. Price: 27,000 credits, or more (includes "cutting edge" modifier).

RKA 2d6, Armor Piercing (+½), Autofire (10 shots; +1), 4 clips of 30 Charges each (+½) (90 Active Points); OAF Bulky Fragile (-1¼), STR Minimum (17; STR Minimum Doesn't Add To Damage; -1¼), Real Weapon (-¼), Two-Handed Weapon (-½), Side Effect (automatic Change Environment +3 Temperature Levels over a 6" radius area, -1 Temperature Level per 2"; -¼). Total cost: 18 points.

Gauss Rifle: This is a more compact and handy gauss weapon with a lower rate of fire but more reasonable power requirements. It is a common military weapon in its time, and is highly accurate. Price: 2,250 credits, or more.

RKA 2d6, Armor Piercing (+½), Autofire (5 shots; +½), 4 clips of 30 Charges each (+½) (75 Active Points); OAF (-1), STR Minimum (13; STR Minimum Doesn't Add To Damage; -1), Real Weapon (-¼), Two-Handed Weapon (-½). Total cost: 20 points.

Gauss Pistol: A gauss pistol is more compact than the rifle, but sacrifices the high rate of fire and hitting power. Gauss pistols are very popular sidearms in military and police forces. Price: 1,320 credits, or more.

RKA 1½d6, Armor Piercing (+½), Autofire (3 shots; +¼) (44 Active Points); OAF (-1), STR Minimum (10; STR Minimum Doesn't Add To Damage; -1), Real Weapon (-¼), 15 Charges (-0). Total cost: 13 points.

Heavy Gauss Gun: Designed to take on armored foes and light vehicles, the heavy gauss gun fires relatively large projectiles at tremendous velocity. It is somewhat clumsy to carry, but the tremendous hitting power makes up for it. Price: 2,700 credits, or more.

RKA 3d6, Armor Piercing (+½), Autofire (5 shots; +½) (90 Active Points); OAF Bulky (-1½),

STR Minimum (16; STR Minimum Doesn't Add To Damage; -1¼), Real Weapon (-¼), Two-Handed Weapon (-½), 15 Charges (-0). Total cost: 20 points.

LASERS

Lasers are real technology; probably all *HERO System* players have lasers in their homes, in the form of CD players or laser pointers. As of 2002, the Pentagon is developing real laser antimissile systems, and laser rangefinders and target designators are standard military gear. Lasers emit beams of coherent light, in which all the light waves are in phase with one another. They are perfectly straight, and remain tightly concentrated over long distances. Higher-powered lasers use more energetic photons, like ultraviolet light, x-rays, or gamma rays.

As weapons, lasers do damage by suddenly superheating the surface of whatever they hit. The energies are modest, but concentrated into so tiny an area that they cause significant damage. Solid materials melt and shatter, and living tissue burns. More powerful lasers pierce better, and x-rays do additional damage from radiation effects. In combat, lasers are useful because it is very hard to detect where they were fired from (they only show up in the air if smoke or other particulates render them visible), there is no recoil, and they can fire as long as the power holds out.

The main limitation for lasers (as with any directed-energy weapon) is power. Early optical lasers use chemical reactions for sudden bursts of energy; later ultraviolet ones are powered by advanced capacitors. Hand-held X-ray lasers depend on micro-fusion powercells (in other words, "rubber science" power). Most laser weapons have built-in laser sights, using a low-power beam to paint a spot on the target before firing.

In game terms, lasers are Killing Attacks with the *Beam* Limitation. Ultraviolet lasers are Armor Piercing, and X-Ray or Gamma-Ray lasers are Armor Piercing and Penetrating. Early lasers are bulky and fragile, but over time they become more compact and durable.

Optical and ultraviolet lasers are blocked by smoke and steam (reflected by a Limitation, since these phenomena are common); X-ray and gamma ray lasers are not, but special anti-laser aerosols do interfere with them normally.

Experimental Laser Rifle: This is an early optical laser weapon, suitable for Cyberpunk or near-future games. It's fragile and bulky, and depends on chemical power cartridges in a backpack power unit connected to the weapon by an armored hose. Price: 13,500 credits, or more (includes "cutting edge" modifier).

RKA 2d6, Increased Maximum Range (750"; +¼) (37 Active Points); OAF Bulky Fragile (-1¼), Beam (-¼), Real Weapon (-¼), STR Minimum (15; STR Minimum Doesn't Add To Damage; -1¼), Two-Handed Weapon (-½), Blocked By Smoke Or Steam (-¼), 8 Charges (-½). Total cost: 6 points.

Laser Rifle: This is a dependable optical laser, widely used for hunting and as a light military weapon. It is

self-contained, although that reduces the number of shots it can fire. Price: 1,350 credits, or more.

RKA 2d6, Increased Maximum Range (750"; +¼) (37 Active Points); OAF (-1), Beam (-¼), Real Weapon (-¼), STR Minimum (10; STR Minimum Doesn't Add To Damage; -1), Two-Handed Weapon (-½), Blocked By Smoke Or Steam (-¼), 8 Charges (-½). Total cost: 6 points.

Laser Pistol: This early laser pistol is connected to a belt power pack by a cable. It is used as a military sidearm by vehicle pilots and artillery crews, or by police in situations calling for deadly force. It lacks the advanced focusing of its bigger siblings, and so is only useful at relatively short range. Price: 750 credits, or more.

RKA 1d6+1 (20 Active Points); OAF Fragile (-1¼), Beam (-¼), Real Weapon (-¼), STR Minimum (8; STR Minimum Doesn't Add To Damage; -1), Blocked By Smoke Or Steam (-¼), 16 Charges (-0). Total cost: 5 points.

UV Laser Pistol: An advanced laser pistol, this weapon is self-contained and can fire only a few times before recharging. Its beam can stop even armored opponents, making it a popular weapon among mercenaries and smugglers. Price: 1,050 credits, or more.

RKA 1d6+1, Armor Piercing (+½) (30 Active Points); OAF (-1), Beam (-¼), Real Weapon (-¼), STR Minimum (8; STR Minimum Doesn't Add To Damage; -1), Blocked By Smoke Or Steam (-¼), 8 Charges (-½). Total cost: 7 points.

Military UV Rifle: A rugged and powerful laser rifle used by front-line infantry, this weapon can punch through body armor and even damage some vehicles. Price: 9,000 credits, or more.

RKA 2d6, Armor Piercing (+½), Increased Maximum Range (1,125"; +¼) (52 Active Points); OAF (-1), Beam (-¼), Real Weapon (-¼), STR Minimum (12; STR Minimum Doesn't Add To Damage; -1), Two-Handed Weapon (-½), Blocked By Smoke Or Steam (-¼), 8 Charges (-½). Total cost: 11 points.

Sustained-beam Laser Rifle: This is an old-style optical laser rifle upgraded with advanced power systems and cooling to allow a continuous high-power beam rather than a series of individual pulses. It is most effective as a way to burn through the defenses of large armored targets like military vehicles. Price: 3,150 credits, or more.

RKA 2d6, Continuous (+1), 30 Continuing Charges lasting up to 1 Turn each (+¾) (82 Active Points); OAF (-1), Limited Range (100"; -¼), Beam (-¼), Real Weapon (-¼), STR Minimum (14; STR Minimum Doesn't Add To Damage; -1), Two-Handed Weapon (-½), Blocked By Smoke Or Steam (-¼). Total cost: 18 points.

LASER FLASHING

Although it rarely turns up in science fiction films or stories, one application of laser weapons in the real world is as “dazzle lasers” to blind and disorient enemy troops. Gamemasters or players who like this option can convert laser weapons into Multipowers, with one slot for the Killing Attack described above, and the other for a Sight Group Flash with DCs equal to the laser’s Killing damage. This setting may involve such a low-powered beam that it is 0 END (requiring no Charges), or the entire Multipower may have one pool of Charges.

X-Ray Laser Rifle: The ultimate hand-held laser weapon, the X-Ray rifle can bore through even tank armor and is strictly limited to military use in all but the most anarchic societies. Note that portable X-Ray lasers require very “rubbery” science, as currently the only known way to excite an X-Ray laser effect involves nuclear explosions! Price: 16,800 credits, or more.

RKA 3d6, Armor Piercing (+½), Penetrating (+½), Increased Maximum Range (2,250”; +¼) (101 Active Points); OAF (-1), Beam (-¼), Real Weapon (-¼), STR Minimum (14; STR Minimum Doesn’t Add To Damage; -1), Two-Handed Weapon (-½), 10 Charges (-¼). Total cost: 24 points.

BLASTERS

Blasters are energy guns. In science fiction films and stories, they come in a myriad of forms — plasma guns, ion guns, particle guns, electron beams. Film blasters shoot big glowing bolts like tracer bullets and are just called “blasters.”

Electron Beams

These are real technology — every television set has an electron beam generator inside it. A powerful beam of electrons traveling along a laser “pilot beam” (to create an ionized pathway for the electrons) would damage the target by heat and electrical effects. Magnetic fields deflect electron beams, and any kind of closed metal protection lets the charge pass around the target without doing any harm. In a vacuum the electrons repel one another, turning the deadly beam into a harmless spray; water also disperses the blast. Electron beams can be fired on both lethal and “stun” settings, with the latter delivering a shock strong enough to knock out opponents without doing permanent damage. All electron blasters have Boostable Charges.

Electron Rifle/Pistol: The first-generation electron weapon, an Electron Rifle is reasonably robust, and can be boosted for extra effect. Its pilot beam acts as a laser sight. Price: 2,400 credits, or more.

The pistol version of the same weapon (16 Boostable Charges, STR Min 10, not a two-handed weapon) costs 2 points less. It’s a more refined development of the electron rifle, commonly used as a law-enforcement weapon.

Cost Electron Rifle

10 *Electron Rifle:* Multipower, 30-point reserve, 20 Boostable Charges (+½) for entire Multipower; all OAF (-1), Does Not Work In Vacuum, In Water, In Magnetic Fields, Or Against Targets Encased In Metal (-¾), Real Weapon (-¼), STR Minimum (14; STR Minimum Doesn’t Add To Damage; -1), Two-Handed Weapon (-½)

1u 1) *Standard Setting:* EB 6d6; OAF (-1), Beam (-¼), Does Not Work In Vacuum, In Water, In Magnetic Fields, Or Against Targets Encased In Metal (-¾), Real Weapon (-¼), STR Minimum (see above; -1), Two-Handed Weapon (-½)

2) *Stun Setting:* EB 3d6, NND (defense is being in vacuum, water, a magnetic field, or a metal casing, or having an ED Force Field; +1); OAF (-1), Real Weapon (-¼), STR Minimum (see above; -1), Two-Handed Weapon (-½)

2 *Laser Pilot Beam:* +1 OCV; OAF (-1), Real Weapon (-¼)

Total cost: 14 points

Ion Beams

These weapons fire a beam of ionized gas at the target, doing damage by heat, impact, and secondary electrical effects. They are very close to the cinematic blaster weapon in terms of special effects. The ionized beam does glow brightly as it fires, and the bolts, while fast, do not travel at the speed of light. A disadvantage is that ion beams need both a supply of gas (usually argon or neon) to ionize and a power supply; most ion guns use special cartridges which are not compatible with other energy weapons or electrical devices. They cannot be “set to stun” and have no pilot beam as a sighting aid. At the GM’s option, characters can substitute the equivalent DC in Killing Damage for the weapons’ standard Normal Damage.

Early Ion Gun: This is a heavy, delicate device based on ion-motor technology, suitable as a gadgeteer’s prototype or a special weapon to take down the Ion Creature in a “Bug Eyed Monsters” adventure. Price: 1,500 credits, or more.

EB 10d6 (50 Active Points); OAF Bulky Fragile (-1¾), Real Weapon (-¼), STR Minimum (15; STR Minimum Doesn’t Add To Damage; -1¼), Two-Handed Weapon (-½), 12 Charges (-¼). Total cost: 10 points.

Ion Rifle: Basically a more durable version of the early ion gun, this weapon boasts improved rate of fire and ammunition capacity. Price: 1,860 credits, or more.

EB 10d6, Autofire (3 shots; +¼) (62 Active Points); OAF (-1), Real Weapon (-¼), STR Minimum (12; STR Minimum Doesn’t Add To Damage; -1), Two-Handed Weapon (-½), 15 Charges (-0). Total cost: 16 points.

Ion Pistol: Often just called a “blaster,” this is a smaller version of the ion rifle, with slightly less hitting power and greatly reduced range. A very popular sidearm in many SF settings. Price: 1,500 credits, or more.

EB 8d6, Autofire (2 shots; +¼) (50 Active Points); OAF (-1), Limited Range (50”; -¼), Real Weapon (-¼), STR Minimum (9; STR Minimum Doesn’t Add To Damage; -1), 12 Charges (-¼). Total cost: 13 points.

Pocket Ion Pistol: A cut-down version of the standard blaster, suitable for concealment on one’s person. Price: 1,050 credits, or more.

EB 7d6 (35 Active Points); OAF (-1), Limited Range (30”; -¼), Real Weapon (-¼), STR Minimum (9; STR Minimum Doesn’t Add To Damage; -1), 12 Charges (-¼). Total cost: 9 points.

Particle Guns

Particle guns are small hand-held proton accelerators. They function in much the same way electron beams do, but the proton beam has more penetrating power, and cannot be set to stun. Like electron beams, proton beams use a laser pilot beam to create an ionized pathway through the air. In vacuum and water the protons disperse into a harmless stream. The proton rifle and particle blaster depend on as-yet-undiscovered power sources.

Particle guns cause damage through surface blasting and radiation effects. Characters may substitute equivalent DCs in Killing Damage with the GM's permission.

Accelerator Pack: This could be used by near-future ghost-fighters to deal with weird menaces immune to ordinary weapons. The actual accelerator is in a backpack, with only the targeting magnets and pilot beam in the hand unit. Price: 1,980 credits, or more.

EB 7d6, Armor Piercing (+½), 20 Charges (+¼) (61 Active Points); OAF Bulky (-1½), Beam (-¼), Does Not Work In Vacuum Or Water (-½), Real Weapon (-¼), STR Minimum (14; STR Minimum Doesn't Add To Damage; -1), Two-Handed Weapon (-½) (total cost: 12 points) plus +1 OCV (5 Active Points); OAF (-1), Real Weapon (-¼) (total cost: 2 points). Total cost: 14 points.

Proton Rifle: This weapon is a fairly standard particle gun, common to many SF settings. Price: 1,980 credits, or more.

EB 7d6, Armor Piercing (+½), 30 Charges (+¼) (61 Active Points); OAF (-1), Beam (-¼), Does Not Work In Vacuum Or Water (-½), Real Weapon (-¼), STR Minimum (12; STR Minimum Doesn't Add To Damage; -1), Two-Handed Weapon (-½) (total cost: 13 points) **plus** +1 OCV (5 Active Points); OAF (-1), Real Weapon (-¼) (total cost: 2 points). Total cost: 15 points.

Particle Blaster: A heavy pistol that squeezes a proton accelerator into the smallest possible space, this weapon has limited power but is almost as effective as a proton rifle. Price: 1,350 credits, or more.

EB 6d6, Armor Piercing (+½) (45 Active Points); OAF (-1), Beam (-¼), Does Not Work In Vacuum Or Water (-½), Real Weapon (-¼), STR Minimum (10; STR Minimum Doesn't Add To Damage; -1), 10 Charges (-¼) (total cost: 11 points) **plus** +1 OCV (5 Active Points); OAF (-1), Real Weapon (-¼) (total cost: 2 points). Total cost: 13 points.

Plasma Guns

Plasma weapons are an outgrowth of fusion power technology. They generate a tiny fusion reaction which releases superhot plasma; the gun then directs this plasma at the target via magnetic fields. The plasma spreads quickly over a wide area, which gives it a large area effect but limits the weapon's range. Designers can't scale them down to pistol size easily, but they're quite powerful as battlefield weapons. Plasma guns use deuterium pellets, similar to those used in fusion rockets, as

their fuel — in pre-fusion societies the weapons cannot be refueled. Assuming portable fusion generators are possible at all, plasma weapons don't involve any major violations of the laws of physics.

Early Plasma Gun: Even in experimental form, plasma guns are devastatingly effective, making this a good "ultimate weapon" for Cyberpunk-period and "early interstellar exploration" campaigns. Its chief disadvantage is that if it fails, the results are catastrophic for bystanders. Price: 22,500 credits, or more (includes "cutting edge" modifier).

EB 10d6, Explosion (+½) (75 Active Points); OAF Bulky Fragile (-1¾), Activation 15-, Jammed (-¾), Limited Range (30"; -¼), Real Weapon (-¼), Side Effect (5d6 EB Explosion; -½), STR Minimum (15; STR Minimum Doesn't Add To Damage; -1¼), Two-Handed Weapon (-½), 12 Charges (-¼). Total cost: 11 points.

Single-shot Plasma Gun: Filling the same role as a bazooka or antitank rocket, this is a single-shot disposable plasma weapon. It can give Space Marines extra punch against armored foes, or be used to blast holes in fortifications. Price: 3,360 credits, or more.

EB 15d6, Explosion (+½) (112 Active Points); OAF (-1), Limited Range (50"; -¼), Real Weapon (-¼), STR Minimum (14; STR Minimum Doesn't Add To Damage; -1), Two-Handed Weapon (-½), 1 Charge (-2). Total cost: 19 points.

Plasma Rifle: This is the smallest practical plasma weapon, a large rifle with a barrel big enough to shoot grapefruit. It features improved fail-safe containment, so that misfires no longer blow up the user. Price: 2,610 credits, or more.

EB 10d6, Explosion (+½), 20 Charges (+¼) (87 Active Points); OAF (-1), Limited Range (30"; -¼), Real Weapon (-¼), STR Minimum (12; STR Minimum Doesn't Add To Damage; -1), Two-Handed Weapon (-½). Total cost: 22 points.

Plasma Battle Rifle: A serious infantry support weapon, the plasma battle rifle uses a large backpack both for fuel storage and extra cooling. The result is a rapid-fire plasma gun which can do massive damage. Price: 4,950 credits, or more.

EB 12d6, Explosion (+½), Autofire (5 shots; +½), 100 Charges (+¾) (165 Active Points); OAF Bulky (-1½), Limited Range (40"; -¼), Real Weapon (-¼), STR Minimum (13; STR Minimum Doesn't Add To Damage; -1), Two-Handed Weapon (-½). Total cost: 37 points (or 41 points for a non-Bulky version).

Plasma Pistol: For campaigns not worried about realism, scientists can make practical pistol-sized plasma guns. Price: 2,010 credits, or more.

EB 9d6, Explosion (+½) (67 Active Points); OAF (-1), Limited Range (25"; -¼), Real Weapon (-¼), STR Minimum (10; STR Minimum Doesn't Add To Damage; -1), 12 Charges (-¼). Total cost: 18 points.

DISINTEGRATORS

Disintegrators are a beloved weapon in science fiction, with almost no basis in reality. Most of them work by somehow suppressing the atomic forces which hold matter together — one hit, and the target flies apart! Other seem to apply energy damage on an atomic level uniformly to a target to thoroughly destroy it. The phasers of the old *Star Trek* series are, in part, a type of disintegrator; so are the disintegrator “tools” in Niven’s *Ringworld*. In a campaign with disintegrators, GMs must consider the problems they create — murderers could literally make their victims disappear!

Disintegrator Pistol: A large pistol with a complicated emitter at the front, the disintegrator pistol is only effective at short range because the beam energy rapidly dissipates. Price: 8,100 credits, or more.

RKA 6d6, NND (defense is ED Force Field; +1), Does BODY (+1) (270 Active Points); OAF (-1), -1 Decreased STUN Multiplier (-¼), Reduced By Range (-¼), Real Weapon (-¼), STR Minimum (10; STR Minimum Doesn’t Add To Damage; -1), 8 Boostable Charges (-¼). Total cost: 67 points.

Disintegrator Rifle: A big rifle version of the disintegrator pistol. Price: 8,100 credits, or more.

RKA 6d6, NND (defense is ED Force Field; +1), Does BODY (+1) (270 Active Points); OAF (-1), -1 Decreased STUN Multiplier (-¼), Reduced By Range (-¼), Real Weapon (-¼), STR Minimum (12; STR Minimum Doesn’t Add To Damage; -1), Two-Handed Weapon (-½), 12 Boostable Charges (-0). Total cost: 63 points.

MULTI-PURPOSE ENERGY WEAPON

In Space Opera and Pulp SF settings, it’s easy to create a weapon that features multiple settings usable for a variety of purposes — disintegration, stunning, blasting, even projecting a low-power burst at a rock or metal wall to provide heat in cold climates. Each of its effects comes with multiple settings, including wide-beam settings; the more powerful the effect, the more energy it uses. Here’s an example in *HERO System* terms; it’s so high-tech and sophisticated it doesn’t qualify as a Real Weapon, or have a STR Minimum — even a small child can pick it up, press the trigger-button, and wreak havoc. Price: 60,810 credits, or more.

Cost Multi-Purpose Energy Weapon

433 *Multi-Purpose Energy Weapon:* Multipower, 315-point reserve, 1,000 Boostable Charges for entire reserve (+1¼); all OAF (-1)

2u 1) *Light Stun:* EB 4d6, NND (defense is ED Force Field; +1); OAF (-1)

2u 2) *Light Stun, Wide-Beam Setting:* EB 4d6, NND (defense is ED Force Field; +1), Area Of Effect (4” Radius; +1); OAF (-1), Requires 3 Charges Per Use (-½)

2u 3) *Medium Stun:* EB 6d6, NND (defense is ED Force Field; +1); OAF (-1), Requires 3 Charges Per Use (-½)

4u 4) *Medium Stun, Wide-Beam Setting:* EB 6d6, NND (defense is ED Force Field; +1), Area Of Effect (6” Radius; +1); OAF (-1), Requires 6 Charges Per Use (-½)

3u 5) *Heavy Stun:* EB 8d6, NND (defense is ED Force Field; +1); OAF (-1), Requires 6 Charges Per Use (-½)

4u 6) *Heavy Stun, Wide-Beam Setting:* EB 8d6, NND (defense is ED Force Field; +1), Area Of Effect (8” Radius; +1); OAF (-1), Requires 12 Charges Per Use (-¾)

1u 7) *Light Blast:* EB 6d6; OAF (-1), Requires 6 Charges Per Use (-½)

2u 8) *Light Blast, Wide-Beam Setting:* EB 6d6, Area Of Effect (6” Radius; +1¼); OAF (-1), Requires 12 Charges Per Use (-¾)

2u 9) *Medium Blast:* EB 9d6; OAF (-1), Requires 12 Charges Per Use (-¾)

3u 10) *Medium Blast, Wide-Beam Setting:* EB 9d6, Area Of Effect (10” Radius; +1¼); OAF (-1), Requires 24 Charges Per Use (-1¼)

2u 11) *Heavy Blast:* EB 12d6; OAF (-1), Requires 24 Charges Per Use (-1¼)

4u 12) *Heavy Blast, Wide-Beam Setting:* EB 12d6, Area Of Effect (12” Radius; +1¼); OAF (-1), Requires 48 Charges Per Use (-1½)

7u 13) *Disintegrate:* RKA 6d6, NND (defense is ED Force Field; +1), Does BODY (+1); OAF (-1), -1 Decreased STUN Multiplier (-¼), Requires 48 Charges Per Use (-1½)

8u 14) *Disintegrate, Wide-Beam Setting:* RKA 6d6, NND (defense is ED Force Field; +1), Does BODY (+1), Area Of Effect (1 Hex; +½); OAF (-1), -1 Decreased STUN Multiplier (-¼), Requires 96 Charges Per Use (-1¾)

1u 15) *Heat Rocks:* Life Support (Safe Environment: Intense Cold), Area Of Effect (2” Radius; +¾); OAF (-1), Nonpersistent (each Charge’s effect lasts for 1 Minute; -¼), Requires Appropriate Substance To Be Heated (-¼).

Total cost: 480 points

GRENADES AND ROCKETS

Hand grenades are reaching the limit of improvement as of the early twenty-first century — since they must be thrown, they can’t be too powerful or they injure the user. Although a few SF settings do feature energy grenades — which through rubber science means emit contained energy fields similar to those created by blasters — or like weapons, for the most part the emphasis is on nonlethal grenades and rocket grenades. The ultimate development of the rocket-propelled grenade is the Rocket Gun, which appears as a rival to firearms in many SF settings (particularly Low SF, or stories set in the early days of interplanetary exploration). Rocket guns launch tiny solid-fuel missiles with a variety of warheads. Improvements in electronics make them highly accurate, and their larger size makes them far deadlier than bullets (or allows them to carry other, nonlethal, payloads).

Energy Grenades: These thrown weapons create deadly energy fields, causing great destruction but in

a more controlled manner than an explosive grenade. Price: 2,700 credits, or more (Standard); 6,750 credits, or more (Disintegrenade).

Standard Energy Grenade: RKA 2½d6, Area Of Effect (8" Radius; +1¼) (90 Active Points); OAF (-1), Range Based On STR (-¼), 4 Charges (-1). Total cost: 28 points.

Disintegrenade: RKA 4d6, NND (defense is ED Force Field; +1), Does BODY (+1), Area Of Effect (2" Radius; +¾) (225 Active Points); OAF (-1), -1 Decreased STUN Multiplier (-¼), Range Based On STR (-¼), 4 Charges (-1). Total cost: 64 points.

Early Rocket Gun: A descendant of rocket-propelled grenade launchers, this weapon lobbs unguided explosive missiles. Price: 1,560 credits, or more.

RKA 2d6, Explosion (-1 DC/2"; +¾) (52 Active Points); OAF (-1), Real Weapon (-¼), STR Minimum (14; STR Minimum Doesn't Add To Damage; -1), Two-Handed Weapon (-½), 6 Charges (-¾). Total cost: 11 points.

Military Rocket Pistol: Issued to soldiers on many worlds, this weapon fires homing rockets with explosive warheads. Price: 10,500 credits, or more.

RKA 2½d6, Explosion (-1 DC/2"; +¾) (70 Active Points); OAF (-1), Real Weapon (-¼), STR Minimum (9; STR Minimum Doesn't Add To Damage; -1), 6 Charges (-¾). Total cost: 17 points.

Military Rocket Rifle: A rifle-sized version of the Rocket Pistol, capable of fully automatic fire. Price: 15,000 credits, or more.

RKA 2½d6, Explosion (-1 DC/2"; +¾), Autofire (5 shots; +1½), 30 Charges (+¼) (140 Active Points); OAF (-1), Real Weapon (-¼), STR Minimum (14; STR Minimum Doesn't Add To Damage; -1), Two-Handed Weapon (-½). Total cost: 37 points.

DEFENSES

The race between offense and defense has been going on since the first Stone Age warrior made a shield to block spear thrusts. Since then, personal armor and personal weapons have seesawed back and forth in effectiveness. For a time after the invention of gunpowder it appeared that offense had won the race, but in recent decades super-strong synthetics like Kevlar have restored armor to the battlefield. In the future, the race is likely to continue, and to progress to things like force fields.

Force fields and their ilk are an entirely "rubber science" defense, but one which is quite common, especially in Space Opera and Pulp science fiction. Often the force field can do more than just protect an individual; it may also provide Life Support capabilities or the like. Note that powerful force shields change the face of combat at high tech levels

— instead of remaining hidden and launching deadly all-or-nothing attacks from concealment, characters go back to engaging in stand-up slugfests more reminiscent of fistfights or superhero battles than gunfights.

NEAR-FUTURE BODY ARMOR

Early twenty-first century Human policemen and soldiers can rely on the likes of Kevlar, Spectra, and defensive ceramics to protect them from bullets. As technology improves and develops, even stronger materials are likely to become available. Here are a few examples of possible near-future body armors. All provide 12 PD/ED Armor, though it's possible that advanced materials could offer even more protection.

Armored Vest: A standard vest, covering Hit Locations 11-13. Price: 540 credits, or more.

Armor (12 PD/12 ED) (36 Active Points); OIF (-½), Activation Roll 9- (-1½), Mass (half mass; -½), Real Armor (-¼). Total cost: 10 points.

Combat Suit: This is a battlefield outfit of helmet, upper body covering (typically a jacket and/or vest), gauntlets, and high boots, covering Hit Locations 3-14 and 16-18. Price: 540 credits, or more.

Armor (12 PD/12 ED) (36 Active Points); OIF (-½), Activation Roll 15- (-¼), Mass (half mass; -½), Real Armor (-¼). Total cost: 14 points.

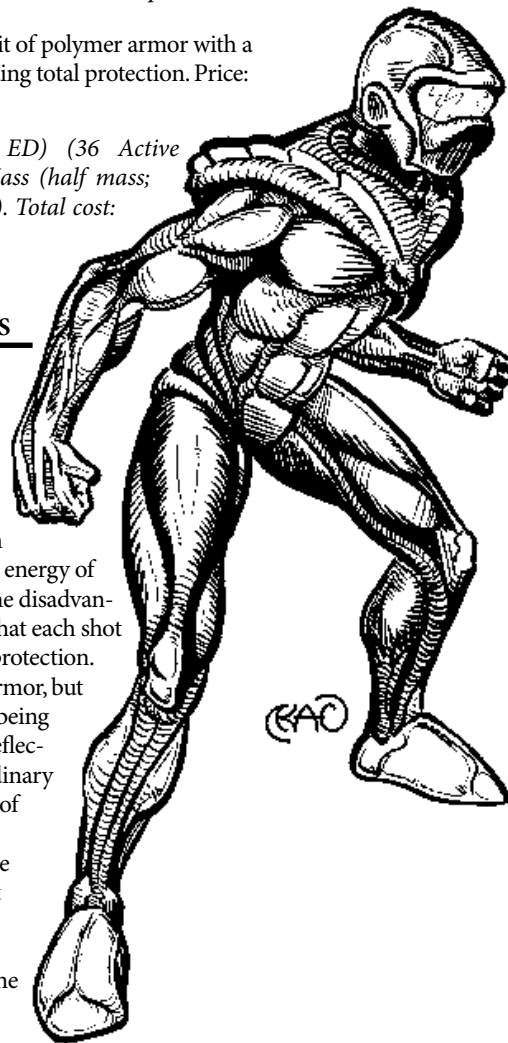
Full Body Armor: A full suit of polymer armor with a helmet and gloves, providing total protection. Price: 540 credits, or more.

Armor (12 PD/12 ED) (36 Active Points); OIF (-½), Mass (half mass; -½), Real Armor (-¼). Total cost: 16 points.

ABLATIVE AND REFLECTIVE ARMORS

As energy weapons become more common, synthetic materials like Kevlar get vulnerable. One solution is to cover the armor with a layer of ablative material which absorbs and disperses the energy of a beam weapon attack. The disadvantage to ablative armor is that each shot burns away a little more protection.

Related to ablative armor, but without the drawback of being removed by attacks, are reflective armors. These are ordinary body armors with a layer of thin mirror-finish plastic which reflects much of the energy of laser, ultraviolet laser, and plasma attacks. Unfortunately, wearing a bright shiny suit makes one very visible.



SUPERCONDUCTING SURFACE

A more high-tech way to defeat energy weapons comes from developments in superconductive materials. These are substances which instantly conduct electricity or heat with no resistance. A suit of superconducting armor spreads an attack over the entire surface of the suit, radiating it harmlessly away. Characters can add a superconducting surface to any other armor; it provides Energy Damage Reduction, Resistant, 75% (60 Active Points) (apply the appropriate Limitations for that type of armor to determine the final cost). Price: 900 credits for a full suit.

Ablative Vest: A standard vest, covering Hit Locations 11-13. Price: 540 credits, or more.

Armor (6 PD/6 ED) (18 Active Points); OIF (-½), Activation Roll 9- (-1½), Mass (half mass; -½), Real Armor (-¼) (total cost: 5 points) **plus** Armor (+12 ED) (18 Active Points); OIF (-½), Activation Roll 9- (-1½), Ablative (-1), Mass (half mass; -½), Real Armor (-¼) (total cost: 4 points). Total cost: 9 points.

Ablative Foam: A cheap way to get some anti-laser protection, ablative foam sprays onto a person or vehicle, forming a thick, flexible layer. It is packaged in cans holding enough foam to coat 3 men (or, at the GM's discretion, a single vehicle no larger than an automobile). It is not waterproof. Price: 180 credits, or more.

Armor (+8 ED), 3 Continuing Charges lasting 1 Hour each (removed by water or being shot off; -¼) (15 Active Points); OIF (-½), Ablative (-1). Total cost: 6 points.

Reflective Undervest: This is a small vest covering Hit Locations 12-13 only, worn by dignitaries or secret agents who want a little protection but can't wear combat gear. Price: 270 credits, or more.



Armor (4 PD/4 ED) (12 Active Points); IIF (-¼), Activation Roll 8- (-2), Mass (half mass; -½), Real Armor (-¼) (total cost: 3 points) **plus** Armor (+4 ED) (6 Active Points); IIF (-¼), Activation Roll 8- (-2), Only Protects Against Laser And Plasma Attacks (-½), Mass (half mass; -½), Real Armor (-¼) (total cost: 1 point). Total cost: 4 points.

Reflective Coverall: This is worn over other armor by combat personnel who have to face laser-armed opponents. It is a light hooded coverall providing only anti-laser protection. Price: 270 credits, or more.

Armor (+12 ED) (18 Active Points); OIF (-½), Activation Roll 15- (-¼), Only Protects Against Laser Attacks (-1), Real Armor (-¼). Total cost: 6 points.

BATTLE ARMOR

This is a full-body suit of rigid armor, suitable for future infantrymen. Traditionally, good guys use transparent faceplates while bad guys' are opaque. The suit is sealed and has a filter to keep out chemical agents, but is not space-rated. It may be fitted with a superconducting surface, and sometimes with other equipment suitable for a full powered battlesuit. Price: 855 credits, or more.

Cost Battle Armor

- 20 *Protective Armor:* Armor (15 PD/15 ED) (45 Active Points); OIF (-½), Mass (half mass; -½), Real Armor (-¼)
- 8 *Limited Life Support:* Life Support (Self-Contained Breathing; Safe Environment: High Radiation) (12 Active Points); OIF (-½)

Total cost: 28 points

POWERED BATTLESUIT

This is a very powerful and high-tech suit of armor, akin to what's depicted in Robert Heinlein's *Starship Troopers* or the many books influenced by that novel. It makes an average Space Marine into something like a comic-book superhero. The limbs are powered to boost the user's strength, the legs have boost-jets for great leaps, and the suit mounts a built-in arsenal of guns, beams, and missile launchers (the user can also carry weapons in his hands, of course). Naturally, such a supersuit isn't cheap; they are usually reserved for commandos or elite assault troops. Price: 34,650 credits, or more (cost assumes battlesuit has two weapons of 45 Active Points each).

Cost Powered Battlesuit

- 34 *Protective Armor:* Armor (20 PD/20 ED) (60 Active Points); OIF (-½), Real Armor (-¼)
- 13 *Life Support:* Life Support (Self-Contained Breathing; Safe Environments: High Pressure, High Radiation, Intense Cold, Intense Heat, Low Pressure/Vacuum) (19 Active Points); OIF (-½)
- 7 *Boost-Jets:* Leaping +10" (10 Active Points); OIF (-½)
- 3 *Visual Sensors:* Infrared Perception (Sight

- Group) (5 Active Points); OIF (-½)
- 3 *Visual Sensors*: Ultraviolet Perception (Sight Group) (5 Active Points); OIF (-½)
- 2 *Auditory Sensors*: Ultrasonic Perception (Hearing Group) (3 Active Points); OIF (-½)
- 7 *Onboard Radar*: Radar (Radio Group) (15 Active Points); OIF (-½), Affected As Sight Group As Well As Radio Group (-½)
- 6 *Communicator System*: HRRP (Radio Group) (12 Active Points); OIF (-½), Affected As Sight And Hearing Group As Well As Radio Group (-½)
- 8 *Onboard Computer*: Absolute Range Sense, Absolute Time Sense, Bump Of Direction, Lightning Calculator; OIF (-½)

Total cost: 83 points

Cost Powered Battlesuit Options

- 20 *Laser*: RKA 2d6, Increased Maximum Range (925"; +¼), 32 Charges (+¼) (45 Active Points); OIF (-½), Beam (-¼), Real Weapon (-¼), Blocked By Smoke Or Steam (-¼)
- 62 *Rocket Gun*: RKA 2½d6, Explosion (-1 DC/2"; +¾), Autofire (5 shots; +1½), 30 Charges (+¼) (140 Active Points); OIF (-½), Real Weapon (-¼), 8 Charges (-½)
- 48 *Heavy Missile*: RKA 6d6, Explosion (-1 DC/2"; +¾) (157 Active Points); OIF (-½), Real Weapon (-¼), 2 Charges (-1½)
- 112 *Plasma Cannon*: EB 12d6, Explosion (+½), Autofire (5 shots; +1½), 100 Charges (+¾) (225 Active Points); OIF (-½), Limited Range (40"; -¼), Real Weapon (-¼)

BIOPLASTIC ARMOR

Instead of the rigid armor beloved of 1950s science fiction, this is organic-looking bioplastic, made of materials spawned from the meeting of nanotechnology and genetic engineering. It is a deceptively thin and flexible suit of smart nanofibers which can react instantly to impacts or energy attacks, going rigid or reflective as needed. Elastic fibers and liquid microtubules rapidly disperse the energy of an attack, and semi-autonomous nanomachines can actually "heal" damage to the suit. The suit is fully capable of operating in space or underwater, with an adaptive life-support system. Price: 1,710 credits, or more.

Cost Bioplastic Armor

- 34 *Protective Armor*: Armor (20 PD/20 ED) (60 Active Points); OIF (-½), Real Armor (-¼)
- 23 *Protective Armor*: Physical and Energy Damage Reduction, Normal, 50% (40 Active Points); OIF (-½), Real Armor (-¼)

- 9 *Limited Life Support*: Life Support (Self-Contained Breathing; Safe Environments; Intense Cold, Low Pressure/Vacuum) (14 Active Points); OIF (-½)

■ Total cost: 66 points.

FORCE FIELD TECHNOLOGY

In Space Opera SF, and other stories involving extremely advanced technology, force fields usually replace physical defenses such as body armor. Ranging from personal "force screens" to large force shields configurable into a variety of shapes, their generating equipment often weighs little. However, they do require some source of power to keep functioning, and thus are vulnerable to attacks which deplete their energy reserves.

Personal Force Screen: This creates a shield which hugs the user and stops incoming attacks. A variant only blocks high-speed projectiles and energy beams (a -½ Limitation), leaving the wearer free to engage in melee combat. Price: 450 credits, or more.

Force Field (10 PD/10 ED), Protects Carried Items (30 Active Points); OIF (shield belt; -½), 1 Continuing Fuel Charge (fueled by electricity, recharge is easily obtained; 20 Minutes; -¼). Total cost: 17 points.

Advanced Personal Force Screen: This version of the shield belt creates a field strong enough to hold in atmosphere. When combined with a small air purifier and oxygen tank, it works just like a space suit. Price: 660 credits, or more.



Force Field (10 PD/10 ED), Protects Carried Items (30 Active Points); OIF (shield belt; -½), 1 Continuing Fuel Charge (fueled by electricity, recharge is easily obtained; 20 Minutes; -¼) (total cost: 17 points) plus Life Support (Self-Contained Breathing; Safe Environments: Intense Cold, Low Pressure/Vacuum) (14 Active Points); OIF (-½), Linked (-½), 1 Continuing Fuel Charge (fueled by air supply, resupply is easily obtained; 20 Minutes; -¼) (total cost: 6 points). Total cost: 23 points.

Force Shield Projector: A force shield projector is usually arm-mounted, and creates a force barrier in front of the user. Price: 450 credits, or more.

Force Wall (6 PD/6 ED) (30 Active Points); OIF (shield bracer; -½), Self Only (-½), No Range (-½), 1 Continuing Fuel Charge (fueled by electricity, recharge is easily obtained; 20 Minutes; -¼). Total cost: 11 points.

Force Dome: This portable but bulky device creates an 8-meter radius force dome. The dome is airtight, and the life support unit in the device creates a temporary habitat in hazardous environments (though the more people that are within the dome, the quicker the air gets used up). Price: 1,455 credits, or more.

Force Wall (8 PD/8 ED; 12" long) (62 Active Points); OAF Bulky (-1½), No Range (only works in radius around generator; -½), Restricted Shape (dome only; -¼), 1 Continuing Fuel Charge (fueled by electricity, recharge is easily obtained; 1 Hour; -0) (total cost: 19 points) plus Life Support (Self-Contained Breathing; Safe Environments: Intense Cold, Low Pressure/Vacuum), Area Of Effect (fills entire area beneath dome; +1½) (35 Active Points); OIF (-½), Linked (-½), 1 Continuing Fuel Charge (fueled by air supply, resupply is easily obtained; 1 Hour; -0) (total cost: 17 points). Total cost: 36 points.

MILITARY TECHNOLOGY

Technology has always had a great effect on the battlefield, and that is likely to continue into the future. There are three areas of particular interest in military tech: heavy weapons, mobility, and information handling.

HEAVY WEAPONS

Most of the weapons described above have their battlefield-scale equivalents. A "quick and dirty" way to make an artillery version of a personal weapon is to add the *MegaScale Advantage* to range (and perhaps the *Area Of Effect/Explosion*, if applicable), and make it *Immobile*. Gamemasters willing to do a little more work can make Automaton weapons, such as artillery launchers with built-in AI computers and the ability to drive, fly, or even teleport themselves.

Even in the early twenty-first century, there's already almost no upper limit to the destructive

power of battlefield weapons — high explosive shells lead to fuel-air explosive bombs, which can be as powerful as low-end nuclear weapons. In the worlds of science fiction, this trend can easily continue, as basic nukes evolve into smaller and more powerful versions. Other possible weapons of mass destruction include new explosives based on high-tech chemistry, biological and chemical weapons that make today's gases and plagues look mild, FTL kinetic weapons, antimatter bombs, teleporting weapons and weapon launchers, black hole generators, and more. The problem, as on modern Earth, is not how to destroy something, but how to find it and hit it.

Dimensional Missile: This missile is launched through a nearby higher-order dimension, using transdimensional sensors to home in on its target. When it gets close enough, it drops into normal space and attacks from the most advantageous angle. Price: 57,300 credits, or more (includes "military technology" multiplier).

RKA 6d6, Explosion (-1 DC/3"; +1), Indirect (+¾), Invisible Power Effects (Fully Invisible; +1), Increased Maximum Range (42,125", or about 52 miles; +½) (382 Active Points); OAF (-1), 1 Charge which Never Recovers (-4). Total cost: 64 points.

Emplaced Plasma Cannon: This weapon, usually mounted on a moon or satellite and used for planetary defense, projects an enormous burst of plasma. Price: 97,500 credits, or more (includes "military technology" multiplier).

EB 40d6, Explosion (-1 DC/4"; +1¼), Increased Maximum Range (1,406,250", or about 1,748 miles; +1) (650 Active Points); OIF Immobile (-1½), 12 Charges (-¼). Total cost: 236 points.

Self-Propelled Nuclear Bomb: Small enough for an average Human to carry easily in a backpack, this devastating device packs a one megaton nuclear punch. (This is an extremely simplistic representation of how nuclear weapons work — it doesn't include things like the radiation blast, flash effect, or electromagnetic pulse — but it should suffice for most game purposes.) Price: 101,250 credits, or more (includes "military technology" multiplier).

RKA 20d6, Explosion (+½), MegaRange (1" = 10 km; +½), MegaArea (1" = 1 km; +¼) (675 Active Points); OAF (-1), 1 Charge which Never Recovers (-4). Total cost: 112 points.

MOBILITY

Because of the great power of battlefield weapons, if you stay in one place you're dead. But if you move, you become visible, and then you're dead again. Fighting vehicles have had to get very fast just to survive — an early twenty-first century heavy main battle tank can move across open country almost as swiftly as a car on a highway. In the air, new fighter designs envision planes which can cruise around at supersonic speeds rather than flying that fast just in combat.

In the future, battlefield hovercraft may be able to roar around the battlefield at more than 200 kilometers per hour; a couple of generations later, the difference between a tank and a combat helicopter may disappear. At sea, “supercavitating” submarines will be able to go almost as fast underwater. It’s likely that vertical take-off airplanes will make submarine carriers feasible, so the surface will be left to hydrofoils, hovercraft, and the super-fast “Ekranoplans” (a hybrid of airplane and hovercraft developed in Russia). See page 205 for more on hovercraft.

What about the poor, bloody infantry amid all this fast and powerful technology? Well, already soldiers ride instead of march, and some of those fast vehicles will be personnel carriers or landing craft. Jetpacks, jump-jets, personal teleporters, and other such movement technology may also exist in an SF setting. The development of compact power systems to drive an armored battlesuit will let the infantry compete once again, as soldiers on foot take over some of a tank’s duties.



INFORMATION

The idea that knowledge and information are paramount on the battlefield is not new. What is new is that improved communications and computers are finally making it possible for commanders and troops to know exactly what is happening and where, in real time. Soldiers “paint” a target with lasers and a plane makes the attack, or artillery does the job from kilometers away. Or the information is relayed to a missile platform, which launches a cruise missile from over the horizon. What makes it all work is control of space: spy satellites for reconnaissance, GPS satellites to give everyone highly accurate position data, and communications satellites to put everyone in touch. This works very well when one side has air and space command and the other doesn’t — a conflict between two modern-day armies might be a lot more confused and bloody. In a science fiction setting, communications and information-gathering become even more advanced, possibly incorporating rubber science explanations that expand battlefield options even further.

The flip side of perfect information is stealth. If you can be seen you can be killed, so everyone spends a lot of time not being seen. Airplanes now have stealth design and radar-absorbent coating; submarines have silent propellers and sound-baffling hulls. It’s likely the next generation of surface ships (if there are any) will be low and stealthy (right now carriers and their escorts rely on electronic jamming and the ability to wipe out all possible threats). Stealthy tanks are also likely. Soldiers wear camouflage, but infrared vision gear is making that almost irrelevant. Future soldiers may wear chameleon camouflage and some form of infrared masking. Finally, countermeasures and jamming to interfere with all that elaborate real-time information streaming would do a lot to even the odds.

Military Communicator: Typically worn on the wrist, this device transmits both video and audio, and is hardened to prevent it from being jammed. Price: 2,100 credits, or more (includes “military technology” multiplier).

HRRP (Radio Group), Difficult To Dispel (x8 Active Points; +¾) (21 Active Points); OIF (-½), Affected As Sight And Hearing Group As Well As Radio Group (-½). Total cost: 10 points.

Personal Teleporter: This device (possibly a mesh woven into armor) allows a soldier to teleport himself brief distances on mental command. It typically requires access to positioning and power-generating satellites, so anything that cuts off that access (being deep underground, Darkness to Radio Group) stops it from functioning. Price: 6,200 credits, or more (includes “military technology” multiplier).

Teleportation 20”, x8 Noncombat, Reduced Endurance (½ END; +¼) (62 Active Points); OIF (-½), Does Not Work If Cut Off (see text; -¼). Total cost: 35 points.

Stealth Field: This device, incorporated into a soldier’s armor or uniform, bends energy waves around him, providing effective invisibility. However, someone standing close enough may notice the “bending” effect (*i.e.*, the Fringe), or see physical traces the soldier leaves behind (footprints, dust). Price: 2,500 credits, or more (includes “military technology” multiplier).

Invisibility to Sight and Radio Groups (25 Active Points); IIF (-¼), 1 Continuing Fuel Charge (fueled by electricity, recharge is easily obtained; 1 Hour; -0). Total cost: 20 points.

OTHER TECHNOLOGY



CLARKE'S LAW

Famed science fiction author Arthur C. Clarke once made a statement that SF fans have come to call *Clarke's Law*. It states: "Any sufficiently advanced technology is indistinguishable from magic." In other words, when technology becomes high enough, most people — particularly "primitive" people — can't really tell it apart from "magic." Eventually, the two sort of become one.

Beyond the classic impress-the-natives-with-a-cigarette-lighter trick, Clarke's Law has some interesting ramifications *Star Hero* GMs could explore. At what point *does* technology become magic? Could a *Star Hero* campaign really be, or become, a *Fantasy Hero* campaign... or vice-versa? Were the magicians of ancient legend actually time travelers? Could a *Star Hero* setting feature "tech-mages" commanding technology far more advanced than the campaign norm, but cloaked in a veneer of mysticism?

COMPUTERS AND MENTAL POWERS

Mental Powers bought to affect the Machine class of minds can affect both normal and AI computers (see the *HERO System 5th Edition, Revised*, page 117). The GM may, if he chooses, apply some of the rules for robots and Mental Powers (see page 165) to computers as well.

Now that the business of blowing stuff up is out of the way, what else can technology do? Almost anything, it turns out.

COMPUTERS

The *HERO System* rules for computers (pages 459-61 of the *5th Edition, Revised* rulebook) allow construction of both simple and artificial intelligence devices. In most *Star Hero* games, normal computers are "equipment," bought with money rather than Character Points, while AI computers are typically NPCs. It is possible to purchase an AI (if the local laws allow it), but the machine won't have any particular loyalty to the heroes unless one of them spends Character Points to buy it as a Follower, part of a Base, or the like.

SENSES

Computers cannot, by themselves, "perceive." Unlike Automaton, they don't come with the basic suite of Senses for free. They have to be hooked into sensory systems (like the security cameras at a Base, or the sensors on a starship) to give them the ability to perceive, or the builder has to buy specific senses for the Computer (using the costs from the sidebar on page 161 of the *HERO System 5th Edition, Revised* for normal Senses). If bought with the ability to perceive, a Computer can make PER Rolls based on its INT, and can recall things it has perceived with an INT Roll.

PROGRAMS

The distinction between Skills and computer programs is subtle. Skills allow the use of equipment, Powers, and abilities. Programs tell the computer what to do with those Skills.

Creating proper Programs requires a little bit of planning and forethought. Ideally, you should be able to phrase the Program in one short, simple sentence — one subject, one verb, and one object. If you can't describe the Program in a single simple sentence, you should split it into multiple Programs (or, if appropriate, buy it as a Skill). However, a Program can allow for some simple variables.

For example, "Pilot Ship From Location A To Location B" is a proper Program. It's simply expressed, and uses Navigation (Space) and Transport Familiarity. It allows the user to input two easily-defined variables (Location A and Location B). However, "Pilot Ship From Location A To Location B And Avoid Star Patrol Ships" should be *two* Programs — one to fly the ship (using the Skills mentioned above) and one for avoiding the Star

Patrol (using Combat Piloting, Concealment, and/or Stealth). The "and" in the second Program is a clear indicator that two Programs are necessary; the Program attempts to include two commands into one Program, which is improper in most cases.

Some players may want to set up triggering conditions, so that their computers take action or activate programs in the event of certain circumstances. Examples of this would include "If I am knocked out, get us to safety." Again, that's really two Programs — the trigger is one Program, and can activate the other. The computer needs two Programs: "If I Am Knocked Out, Activate Pilot Ship Program"; and Pilot Ship. Since Pilot Ship takes the ship from one specified location to another, the player should decide in advance where the ship heads if he is rendered unconscious (in this case, Location A is "ship's current location").

Of course, the GM may, in his discretion, allow a program to combine two closely-related functions — such as "Monitor Sensors; Report Anomalies Detected." The decision depends on how tightly linked the functions are, how frequently the program is used, and other factors.

Undefined Programs

Obviously, it's difficult for players and GMs to think up all the possible actions and contingencies a computer might need to take into account. If appropriate, the GM can allow characters to create computers with a pool of Character Points set aside for Programs which aren't yet defined. When a situation arises where the computer should be able to act in a certain way, but no specific Program covers that situation, the GM may (if he wishes) let the player assign one of the "unspent" points to a new Program specifically for that contingency.

COMPUTERS AS CHARACTERS



One familiar trope in science fiction is the perky ship's computer, which is just as much a character as the crew. With the GM's permission, players may run computer characters. Because this may unbalance the campaign, and often makes it difficult to get the computer character involved in scenarios, the GM should consider very carefully before allowing computer PCs into his *Star Hero* campaign.

Computer characters are built on the normal Base Points + Disadvantages for the campaign; they do not get to divide their total cost by 5 to determine the Real Point cost, as with standard computers. They do not receive Senses for free; as noted above, they must buy Senses or be connected to sensory devices. All computer characters are considered AI computers; they have EGO and may have Psychological Limitations.

HAND COMPUTER

Many SF characters carry this device, or something like it. It's a small computer used to store personal data and download information (the "Database" KSs represent whatever music, video material, and reading material the user currently has installed on the device). While this version is a discrete unit (an OAF), it's possible to build one into a bracelet or other piece of jewelry (OIF or IIF), or even to weave the necessary circuitry into clothing (IIF).

Cost Hand Computer

- 5 *Communications Function:* HRRP (Radio Group); OAF (-1), Flashed As Sight And Hearing Group As Well As Radio Group (-½)
8 *Computer:* Computer (see below); OAF (-1)

Val	Char	Cost
15	INT	5
10	DEX	0
2	SPD	0

Cost Skills

- 11 AK: Milky Way Galaxy 20-
2 KS: Archived Recent News 11-
5 KS: Current News 14-
3 KS: Contact Information 12-
11 KS: Known Sentient Species 20-
1 KS: Literature Database 8-
1 KS: Movies Database 8-
1 KS: Music Database 8-
4 PS: Personal Assistant 13-
2 Systems Operation (Communications Systems) 12-

Programs

- 1 Alert Owner Regarding Scheduled Appointments
1 Prioritize Incoming Calls According To User Preferences
1 Search Reference Material For Information On A Topic
1 Send Communication To Recorded Identicode On Spoken Cue
1 Send Emergency Call To Emergency Authorities If Specified Protocols Are Not Met

Talents

- 3 Clock: Absolute Time Sense
5 Memory: Eidetic Memory
3 Calculator: Lightning Calculator
3 Instant-On Feature: Lightsleep
20 Translator: Universal Translator 12-

Total Computer Cost: 85/5 = 17

Total cost: 13 points

Characteristics And Skills

Depending on how you define a computer character, it may be able to sell back many of its Primary Characteristics. On the other hand, some (particularly INT) need to be quite high.

Skills for a computer character represent its stored/programmed knowledge and abilities. Computer characters do *not* require Programs; as PCs, they have as much free will and self-control as any other character (but perhaps some important Psychological Limitations also; see below).

Perks And Talents

Computer characters rarely have Perks; it's more likely they'll suffer from restrictions on their status and activities than have special benefits (see *Disadvantages*, below). However, some may be appropriate. A computer with financial skills could amass its own private fortune and have Money. One that can "download" its personality into a robotic body might build that body as a Vehicle.

On the other hand, many Talents are highly appropriate for computer characters. Almost all computer PCs should have Absolute Time Sense, Bump Of Direction, Eidetic Memory, Lightning Calculator, and Speed Reading, which represent various built-in functions common to computers. Universal Translator is also appropriate in Space Opera-style campaigns.

Powers

A computer character's Powers, if any, depend primarily on his "body" and how the GM wants him to access it. The GM must consider the issue of what the computer controls. If it's wired into every system aboard a starship and can use them as easily as a person uses his body, then he may require the computer character to pay Character Points for those abilities, rather than allowing it to have them for free just because the campaign features a PC-owned starship. Alternately, the GM may require the computer character to buy the Vehicle (or Base) itself, so that (like any character who owns a Vehicle or Base) it pays for the resources it controls.

Similarly, a computer character may have a robotic body it uses. In that case, the character should pay for the body's abilities. In some cases, the "computer" character is really a sentient robot for game purposes, even if it conceives of itself as a computer (see page 165).

One power common to most computer characters is the ability to make a "backup" copy of themselves in the event they're destroyed. The easiest way to build this is as Resurrection Healing; the Resurrection can be stopped by any means that destroys or tampers with the backup copy. Alternately, it could be defined as Duplication with appropriate Limitations, including *Cannot Recombine* and *Duplicate Only Becomes Active Upon Original's Death* (-1). In either case, the backup only possesses the character's memories and abilities up to the last time a backup was made; if the character doesn't take the time to update his backups frequently, he may experience significant losses.

Another ability often possessed by computer characters is the power to "download" themselves into "vessels" such as robotic bodies, or even other computers. There are many ways to represent this ability. It might be a form of Duplication, if the character has a brigade of robotic forms it can use. Multi-form might be appropriate, if the computer character is ordinarily confined to a "body" (such as a starship). For transferring into and taking over another computer, a Linked combination of Teleportation and Mind Control would do the trick.

Computer characters naturally are skilled at working with other computers. They can access

THE GALACTIC COMPUTERNET

Many SF settings feature a vast, star-spanning computer and communications network for use by the inhabitants of those settings. Typically any citizen can have at least basic access to the network, though this depends on the society in question — and of course some people (government officials, military officers, and the like) have *much* greater degrees of access. (See page 49 for more information on buying this as a Perk.)

The Galactic Computernet provides its users with access to vast reams of information. Think of it as KS: Everything This Society Knows 60- and SS: Every Science This Society Knows 40-. But of course, searching for any particular fact entails massive penalties in such a broad database. On the average, the 'Net can provide an answer to any simple question in just 1-3 Segments; this requires no roll. The more esoteric or complex the query, the longer it takes to find it out, and the harder the Skill Roll. An esoteric/complicated question probably requires around a 15-roll and up to an hour of time; a very esoteric/complicated one a 12-roll and up to a day; and an extremely esoteric/complicated one an 8-and up to a week.

The Computernet also provides users with HRRP with a range sufficient to cover the entire area controlled by the 'Net's creators and overseers. Long distances may entail time-lags, especially if FTL communication doesn't exist.



cyberspace, if it exists, effortlessly (Extra-Dimensional Movement), often have powerful programs for “hacking,” and perhaps even Mental Powers that affect the Machine class of minds. (See below for more information about cyberspace).

Disadvantages

As powerful as computer characters can be, they also suffer from some significant restrictions.

With the GM’s permission, a computer character who’s “built in” to a starship or base and cannot leave that facility at all can take a Physical Limitation, *Built-In* (typically this is Frequently, Greatly Impairing; 15 points). However, a computer character with this Disadvantage may cause problems for the campaign; GMs should only allow it after careful consideration.

Another possible Physical Limitation is *Programming* (typically this is Frequently, Greatly Impairing; 15 points). This represents the fact that the computer character is “hard-wired” to do (or not do) certain things, and that even Mind Control can’t override these instructions. The GM and player should define, in at least vague terms, what’s included in the character’s programming, keeping common sense and dramatic sense in mind. Science fiction television shows and movies provide lots of examples:

“I’m sorry, you cannot override the engine’s safety restrictions without command authorization.”

“I’m afraid I can’t let you do that, Dave... it’s against regulations.”

“My prime programming requires me to steer this vessel to a safe location regardless of your commands, sir.”

Computer characters usually have one or more Psychological Limitations. Programming can constitute a Psychological Limitation as well as a Physical one; the difference is that Psychological Limitation programming can be overridden with Mind Control (or, in the GM’s judgment, a Computer Programming roll made at the same penalty imposed on the character’s EGO Rolls to overcome the Limitation). Typically *Programming* is Common, Strong (and thus worth 15 points).

Many computer characters have the Psychological Limitation *Emotionless* (Common, Total; 20 points). This signifies that they have no emotions, approach all situations from the standpoint of logic and reason, and usually have difficulty understanding decisions other characters make for emotional reasons (often resulting in a -3, or greater, penalty on Interaction Skills). Other Psychological Limitations common to computer characters include:

Considers Self Superior To Organic Beings

(Common, Moderate; 10 points)

Must Obey Orders From Crew

(Common, Total; 20 points)

Wishes To Experience Emotions

(Common, Strong; 15 points)

In many science fiction societies, computers, even sentient ones, aren’t considered “citizens” or accorded full civil rights. This constitutes a Social Limitation (typically one that’s Very Frequently, Minor; 15 points).

CYBERSPACE

Depictions of “cyberspace” vary tremendously in SF. Some writers base it on modern computer networks, with most information moving via text or graphics, and battles of hackers and security fought through keyboards. That’s best modeled as characters pitting their *Computer Programming Skills* against each other.

More exotic visions of cyberspace see it as a “place” in which *avatars* of the characters interact with other people and programs in a kind of metaphorical landscape. Gamemasters can make this a version of Extra-Dimensional Travel (see below). A modem or dataport becomes the portal to another realm. Combat in cyberspace is mostly a matter of offensive and defensive programs, with various effects (see below). Since most of the “people” one meets in cyberspace are computer systems, programs tend to focus on attacking their abilities. Security programs which can do actual harm to a Human user exist, but they are illegal in many jurisdictions.

While adventuring in cyberspace, characters exist as software avatars, and protect themselves and attack others with software as well. A character’s avatar lacks his STR, Skills other than Computer Programming, physical abilities, Mental Powers, and the like, but retains all his other Characteristics (including Figured Characteristics based on his STR). Characters

who want STR or higher Characteristics that only work with their avatars, or Skills and abilities for use only in cyberspace, buy them with the Limitations *Only In Cyberspace* (-2) and *OAF* (the disk, computer, cyberdeck, or other system the character stores his cyberspace utilities on; computer and robotic characters don't take this Limitation). Thus, to create a security-penetration utility, a character might go for the stealthy approach (Stealth or Invisibility), the puzzle-solving approach (Lockpicking and Security Systems), or the brute force approach (HKA). His choice depends not only on personal preference, but on how the target system defines its security utilities.

A character can run a number of cyberspace utilities equal to either his or his computer's INT/5, whichever is lower. Computer characters and AIs who buy utilities as innate abilities can run as many as they wish, which is one reason they're so fearsome in cyberspace.

Cyberspace Movement

Characters "move" in cyberspace in two ways. Narratively, characters can move from any location in cyberspace to any other location in one Phase. This assumes no impediments to movement, such as access-blocking security utilities; the GM must judge the effects of those individually. For "combat" purposes, all avatars move at a standard rate of Flight 6" per Phase. The "inches" in this case don't involve literal movement (the character's body remains where it is in the physical world), but rather "virtual movement" through the electronic world (they're defined as Flight so characters can soar up to the top of towers of data and so forth). They represent relative speed between avatars, for the purposes of virtual chases and the like, not an actual restriction on movement. A character visiting the cyberspace home of a bank in New York City can switch to a virtual nightclub in Tokyo in one Phase, as described above... but a more powerful avatar that's bought Flight +3" can "chase" and catch the character (and also do more damage with virtual Move Throughs). The inches of Flight simply reflect relative movement skill and speed within the virtual realm.

Cyberspace Perception And Combat

Avatars have the standard perception abilities of a normal character, though in cyberspace usually only Sight, Hearing, and Touch are of any use. They may buy Enhanced Senses as utilities.

Avatars may use all Standard Combat Maneuvers, and any Optional Combat Maneuvers the GM allows, at STR 0. If they want more STR, Martial Maneuvers, Combat Skill Levels, or attack abilities like a "virtual gun," they must buy them as cyberspace utilities.

Accessing Cyberspace

Modem: "Realistic" forms of SF use a device like a modem, built into a computer, to access cyberspace. The user is limited to what he sees "on the screen"; he doesn't actually "enter" cyberspace, but rather "opens a window" that lets him view and participate in the online world.

Extra-Dimensional Movement (any location in

the Cybernet, as defined by the location of the computer containing the modem), Reduced Endurance (0 END; +½) (37 Active Points); OAF (-1). Total cost: 18 points.

Jacking In: More common than an ordinary modem is the ability to "jack in" to cyberspace directly, via a "dataport" implanted in the character's brain. The character's body remains in the "real world," but cannot sense anything there or act, leaving it vulnerable. Moreover, deadly computer security programs can kill the character by killing his cyber-self.

Extra-Dimensional Movement (any location in the Cybernet, as defined by the location of the computer where the character jacks in), Reduced Endurance (0 END; +½) (37 Active Points); OIF (dataport; -½), Meat Body (character's body remains in the real world, but cannot move, perceive, or act, and damage to either the virtual form [in cyberspace] or the real body [in the real world] can hurt or kill the character; -1). Total cost: 15 points.

Example Cyberspace Utilities

Avatar Defense: This standard defense utility protects an avatar from the effects of deadly security utilities. Price: 400 credits, or more.

+10 ED and Damage Resistance (up to 20 ED) (20 Active Points); OAF (cyberdeck; -1), Only in Cyberspace (-2). Total cost: 5 points.

Connection Jammer: A very frustrating attack, this utility slows down one's opponent's net connection. Price: 900 credits, or more.

Drain SPD 3d6, Reduced Endurance (0 END; +½) (45 Active Points); OAF (cyberdeck; -1), Only in Cyberspace (-2). Total cost: 11 points.

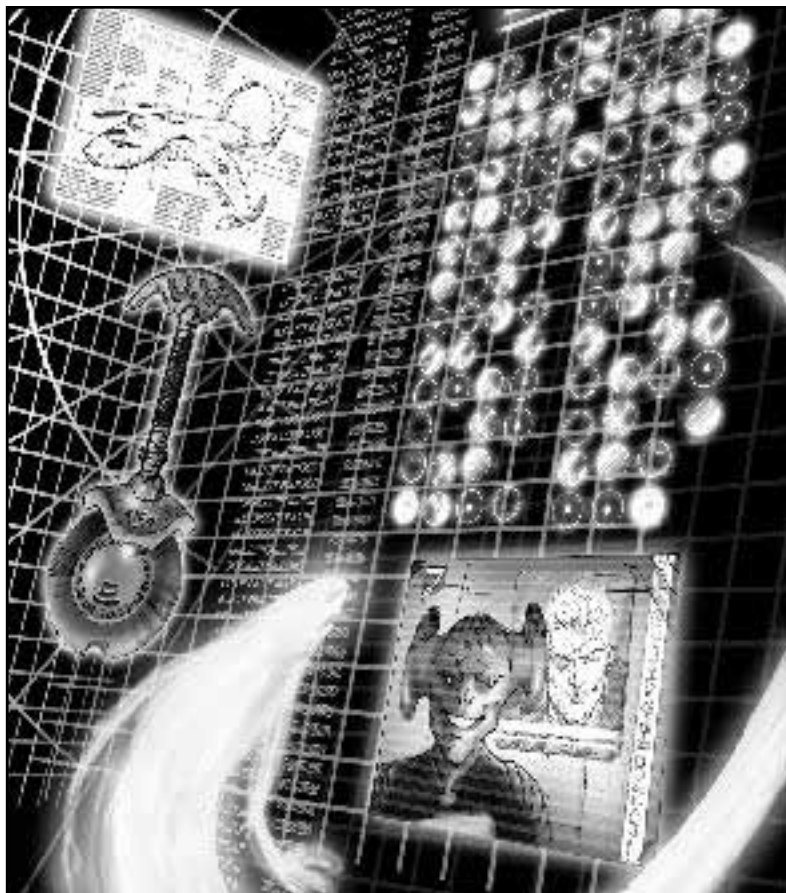
Cyberattack: This is a basic brute-force attack program, allowing an avatar to smash through virtual walls and assault other avatars. Price: 800 credits, or more.

EB 8d6 (40 Active Points); OAF (cyberdeck; -1), Only in Cyberspace (-2). Total cost: 10 points.

Deadly Security: These collection of security utilities actually cause power surges which can injure Humans jacked in to the 'net. The computer the character uses has a surge protector, and so is not affected itself (though rumors exist of security utilities powerful enough to fry shielded systems as well as users).

Light Deadly Security: RKA 2d6, Reduced Endurance (0 END; +½) (45 Active Points); OAF (cyberdeck; -1), Only in Cyberspace (-2), No Range (-½). Total cost: 10 points. Price: 900 credits.

Heavy Deadly Security: RKA 4d6, Reduced Endurance (0 END; +½) (90 Active Points); OAF (cyberdeck; -1), Only in Cyberspace (-2), No Range (-½). Total cost: 20 points. Price: 1,800 credits.



Cutting-Edge Deadly Security: *RKA 3d6, NND (defense is appropriate defense program, typically defined as Life Support [Immunity]; +1), Does BODY (+1), Reduced Endurance (0 END; +½) (157 Active Points); OAF (cyberdeck; -1), Only in Cyberspace (-2), No Range (-½). Total cost: 35 points. Price: 31,400 credits, or more (includes "cutting edge" multiplier).*

Decompiler: This utility scrambles other cyberspace utilities, shutting them down. Each Decompiler is targeted against a specific other utility. Price: 540 credits, or more.

Dispel [Defined Utility] 6d6, Reduced Endurance (0 END; +½) (27 Active Points); OAF (cyberdeck; -1), Only in Cyberspace (-2), No Range (-½). Total cost: 6 points.

Decoys: This utility creates fake avatars to confuse opponents and security programs. Price: 440 credits, or more.

Sight Group Images, Increased Size (8" radius; +¾), Reduced Endurance (0 END; +½) (22 Active Points); OAF (cyberdeck; -1), Only in Cyberspace (-2), Set Effect (up to 6 duplicates of avatar; -1). Total cost: 4 points.

Interface Editor: This utility changes the appearance of a character's immediate surroundings to an interface style of his own choice — so in a cyberspace of glowing lines and abstract shapes, suddenly there is a cartoon landscape. This often confuses opponents. The effects fade in 1d6 Segments unless maintained. The

programmer chooses the specific effect in advance. Price: 700 credits, or more.

Change Environment 64" radius, -1 to opposing OCV (35 Active Points); OAF (cyberdeck; -1), Only in Cyberspace (-2), No Range (-½). Total cost: 8 points.

Kung Fu: This program enhances an avatar's HTH Combat abilities, making it more likely he can defeat other avatars he encounters. Price: 700 credits, or more.

+20 STR and Martial Maneuvers (15 points' worth, defined when program is purchased) (35 Active Points); OAF (cyberdeck; -1), Only in Cyberspace (-2). Total cost: 9 points.

Location Defense: The chief form of defense for virtual locations (like the "vault" where a bank keeps electronic records of deposits, withdrawals, and accounts). It's big enough to block one "door" or other point of access (the "walls" of the location would be defined as part of a virtual Base, with at least as much DEF as this program). Price: 1,500 credits, or more.

Force Wall (10 PD/10 ED), Reduced Endurance (0 END; +½) (75 Active Points); OAF (cyberdeck; -1), Only in Cyberspace (-2), No Range (-½). Total cost: 17 points.

Masking: This program renders an avatar invisible to most other avatars and cyberspace "sensors." Price: 900 credits, or more.

Invisibility to Sight Group, No Fringe, Reduced Endurance (0 END; +½) (45 Active Points); OAF (cyberdeck; -1), Only in Cyberspace (-2). Total cost: 11 points.

Program Defense: The chief form of defense against Decompiler utilities. Price: 600 credits, or more.

Power Defense (30 points) (30 Active Points); OAF (cyberdeck; -1), Only in Cyberspace (-2). Total cost: 7 points.

Pulse: This emits a blast of virtual light which blinds other avatars in the vicinity. Price: 1,500 credits, or more.

Sight Group Flash 5d6, Explosion (-1 DC/3"; +1), Personal Immunity (+¼), Reduced Endurance (0 END; +½) (69 Active Points); OAF (cyberdeck; -1), Only in Cyberspace (-2), No Range (-½). Total cost: 15 points.

Relocate: This utility allows an avatar to move much faster in cyberspace. Price: 600 credits, or more.

Flight +10", Reduced Endurance (0 END; +½) (30 Active Points); OAF (cyberdeck; -1), Only in Cyberspace (-2). Total cost: 7 points.

Trace: Feared by all hackers, this lets security software find out where an avatar originates in the real world, which often reveals a hacker's real identity. Price: 160 credits, or more.

Detect Cyberspace Connection Address (INT Roll) (Radio Sense Group), Tracking (8 Active Points); OAF (cyberdeck; -1), Only in Cyberspace (-2). Total cost: 2 points.

ROBOTS

Robots in science fiction go back a long way, possibly to *Frankenstein*, or even to the Golem of Prague. The term comes from the SF play *R.U.R.* by Karl Capek; it's a Czech word meaning "worker."

Generally speaking, robots come in two categories: robots and androids. True *robots* can be just about any type of fully automated machine, ranging from tiny flying spy-bots, to a collection of mechanical arms on a wheeled base, to humanoid servant-robots. The *Star Wars* films provide an excellent example of the possible diversity of robots (or "droids," as they're called). *Androids*, on the other hand, are humanoid-shaped mechanical constructs, sometimes distinguishable from true Humans (or other species) only upon detailed examination. Data, from *Star Trek: The Next Generation*, is an android.

In *HERO System* terms, robots are usually Automaton with normal computer "brains." They don't have EGO or Psychological Limitations. Androids have AI brains, or in the case of the most advanced types, may simply be built as normal characters with appropriate abilities. In that case, STUN represents how easy it is for the character's systems to become temporarily disoriented due to damage or impact, EGO the sophisticated nature of their computer brains, and so forth.

Like other Automaton, robots and androids are recognizably artificial and/or machines. If you want one to pass as Human, he needs certain Skills or Powers (see below). Androids not built as Automaton can pass for flesh-and-blood Humans unless they take a Distinctive Feature indicating otherwise.

ROBOT CHARACTERS

With the GM's permission, players can play robots or androids as PCs (there's even a suggested Android Package Deal on page 23). However, GMs should consider this carefully. Robots and androids often present the same potential for unbalancing the game as computer characters (see above), but to an even greater degree, since they're mobile. They are powerful, tough, smart, and highly capable — so much so, in fact, that players may not be able to build a "realistic" robot or android on the campaign's starting Base Points + Disadvantages. In that case, they should either design a robot

or androids with more limited functions (and then gradually expand his abilities), or find some way to explain why he's temporarily "crippled."

Robot and android characters should *not* be built as Automaton; that poses too many game balance problems. They should be sophisticated enough to function like ordinary characters.

Suggestions for powers, abilities, and Disadvantages for computer characters (see above) generally apply to robot and android characters, too.

Characteristics And Skills

Robots and androids usually have high Characteristics across the board. They're not only stronger and tougher than Humans, but smarter, too. However, their EGO, PRE, and COM may all be low; they don't necessarily understand "organics" or relate to them well.

Skills, similarly, should have fairly high rolls. They represent the character's extensive knowledge and programming. Technical Skills (such as Computer Programming and Systems Operation) are the most common, but many others are possible.

Some robots and androids may have high *Disguise Skills*, so they can pass as normal organic beings.

Perks And Talents

Robots and androids approach Perks and Talents the same as computer characters. In almost all cases they should have the Talents listed for computer characters.

Powers

Robots and androids tend to have certain powers — call



THE LAWS OF ROBOTICS

Renowned science fiction author Isaac Asimov devised, with the help of John W. Campbell, three famous Laws of Robotics — standing orders with which the robots in his stories were programmed. They are:

The First Law: A robot may not injure a human being or, through inaction, allow a human being to come to harm.

The Second Law: A robot must obey orders given to it by human beings, except where obeying an order would conflict with the First Law.

The Third Law: A robot must protect its own existence, provided doing so does not conflict with the First and Second Laws.

In various forms, these laws have been incorporated, to one degree or another, into many different settings, and science fiction fans (including *Star Hero* gamers) often know about them. Gamemasters who wish to use them, or allow their use, can simply give robots the Psychological Limitation, *Must Obey Laws Of Robotics* (Very Common, Total; 25 points). (You could also make this a Physical Limitation so it cannot be "overridden.")

Of course, GMs can alter these laws to suit their campaigns, or come up with their own sets of laws that don't resemble these at all. Regardless of what the laws are like in the game, inevitably a scenario or two

Continued on next page

Continued from last page

turns around the issue of whether a robot violated one of them (typically the First Law, in murder mystery stories). The *Doctor Who* episode “The Robots Of Death” provides one good horror-mystery example of such a story, but there are plenty of others out there for GMs to draw inspiration from.

them “Everyrobot Powers,” if you will. These include:

Robot/Android Form: The character’s mechanical/artificial form is more resistant to damage than flesh.

Armor (6 PD/6 ED). Total cost: 18 points. (Alternately, Damage Resistance (6 PD/6 ED), total cost: 6 points.)

Robot/Android Form: Robots and androids can survive in situations that kill organic beings.

Life Support: Total. Total cost: 45 points. (Long-lasting robots and androids may also have Longevity.)

Sensors: Most robots and androids have senses organic beings lack. They should have at least 10 points’ worth of Enhanced Senses, if not more.

Beyond these abilities, a robot or android could have just about any Power — built-in weapons (Attack Powers), the ability to alter form to resemble an ordinary organic being (Shape Shift), “backup” powers such as those described for computer characters, enhanced movement abilities, you name it. The main limits are what the setting’s technology allows, what the GM permits, and what the character can afford.

Disadvantages

Here are a few examples of Disadvantages common to robot and android player characters:

Distinctive Features: Android (Concealable With Effort; Noticed And Recognizable; 10 points)

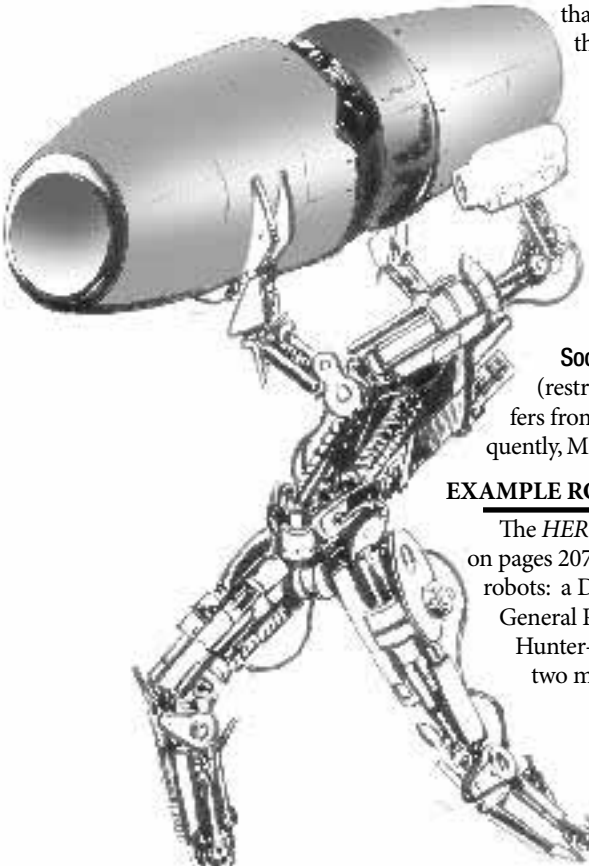
Physical Limitation: Sophisticated Computer Brain (affected by Mental Powers that work against either the Human or Machine classes of minds) (cost varies depending on the commonality of Mental Powers in the campaign)

Physical or Psychological Limitation: Programming (see page 162).

Social Limitation: Android (restricted civil rights, suffers from prejudice) (Very Frequently, Minor; 15 points)

EXAMPLE ROBOTS

The *HERO System Bestiary* has, on pages 207-10, three example robots: a Duplicator Android, a General Purpose Robot, and a Hunter-Seeker Drone. Here are two more examples:



CARGO LOADER/HEAVY LABOR ROBOT

Val	Char	Cost	Roll	Notes
30	STR	20	15-	Lift 1,600 kg; 6d6 [3]
12	DEX	6	11-	OCV: 4/DCV: 4
10	CON	0	11-	
15	BODY	10	12-	
10	INT	0	11-	PER Roll 11-
0	EGO	0	—	ECV: N/A
10	PRE	0	11-	PRE Attack: 2d6
10	COM	0	11-	
4	PD	6		Total: 4 PD (4 rPD)
4	ED	9		Total: 4 ED (4 rED)
2	SPD	0		Phases: 6, 12
8	REC	0		
0	END	-10		
—	STUN	—		Total Characteristics Cost: 41 (+10 with NCM)

Movement: Running: 6”/12”
Leaping: 6”/12”

Cost	Powers	END
22	<i>Tractor Beam:</i> Telekinesis (10 STR), Reduced Endurance (0 END; +½)	0
15	<i>Android Body:</i> Does Not Bleed	0
45	<i>Android Body:</i> Takes No STUN	0
15	<i>Tireless:</i> Reduced Endurance (0 END; +½) on 30 STR	0
6	<i>Tireless:</i> Reduced Endurance (0 END; +½) on Running	0
3	<i>Tireless:</i> Reduced Endurance (0 END; +½) on Leaping	0
1	<i>Tireless:</i> Reduced Endurance (0 END; +½) on Swimming	0
12	<i>Android Body:</i> Damage Resistance (4 PD/4 ED)	0
45	<i>Android Body:</i> Life Support: Total	0
5	<i>Visual Sensors:</i> Infrared Perception (Sight Group)	0
5	<i>Visual Sensors:</i> Ultraviolet Perception (Sight Group)	0
10	<i>Visual Sensors:</i> x100 Microscopic for Sight Group	0
3	<i>Auditory Sensors:</i> Ultrasonic Perception (Hearing Group)	0
12	<i>Radio Sensors:</i> HRRP (Radio Group)	0

Talents

32 *Onboard Computer Systems:* Absolute Range Sense, Absolute Time Sense, Bump Of Direction, Lightning Calculator, Universal Translator 11-

Skills

1 Climbing 8-
2 Language (GM’s choice)
2 PS: Warehouse Operations 11-

Total Powers & Skills Cost: 236
Total Cost: 277

75+ Disadvantages

0 Dependence: must recharge every 6 Hours or suffer Weakness, and eventually total shut-

- down (Very Common)
- 10 Physical Limitation: Affected By Cyberkinesis (has EGO 10 for purposes of cyberkinetic powers, and can be affected by cyberkinesis-based Presence Attacks) (Infrequently, Greatly Impairing)
- 15 Physical Limitation: Enormous (four times Human mass, and sometimes size) (Frequently, Greatly Impairing)
- 25 Psychological Limitation: Must Obey Programmer's/Owner's Commands (Very Common, Total)
- 25 Psychological Limitation: Must Not Cause Or Allow Harm To Humans (Very Common, Total)
- 127 Experience Points

Total Disadvantage Points: 277

Description: Warehouses, starport cargo bays, and other such businesses need a lot of heavy lifting done. Why should Humans strain their backs and put themselves at risk of injury, when they can get a Cargo Loader robot to do the work for them? Equipped with powerful arms, and even a tractor beam, this robot can perform all sorts of hard labor without the need for a coffee break. Some versions have multiple limbs (Extra Limbs, +5 points) to enhance their carrying capacity.

■ Price: 55,400 credits.

GUARDIAN ROBOT

Val	Char	Cost	Roll	Notes
20	STR	10	13-	Lift 400 kg; 4d6 [2]
20	DEX	30	13-	OCV: 7/DCV: 7
10	CON	0	11-	
15	BODY	10	12-	
10	INT	0	11-	PER Roll 11-
0	EGO	0	—	ECV: N/A
20	PRE	10	13-	PRE Attack: 4d6
10	COM	0	11-	
6	PD	15		Total: 6 PD (6 rPD)
6	ED	15		Total: 6 ED (6 rED)
3	SPD	0		Phases: 4, 8, 12
6	REC	0		
0	END	-10		
—	STUN	—		Total Characteristics Cost: 80

Movement: Running: 9"/18"
Leaping: 4"/8"

Cost Powers

Cost	Powers	END
52	<i>Hand Blaster:</i> EB 7d6, Reduced Endurance (0 END; +½)	0
15	<i>Robot Body:</i> Does Not Bleed	0
45	<i>Robot Body:</i> Takes No STUN	0
10	<i>Tireless:</i> Reduced Endurance (0 END; +½) on 20 STR	0
9	<i>Tireless:</i> Reduced Endurance (0 END; +½) on Running	0
2	<i>Tireless:</i> Reduced Endurance (0 END; +½) on Leaping	0
1	<i>Tireless:</i> Reduced Endurance (0 END; +½) on Swimming	0

18	<i>Robot Body:</i> Damage Resistance (6 PD/6 ED)	0
45	<i>Robot Body:</i> Life Support: Total	0
6	<i>Robot Legs:</i> Running +3" (9" total)	0
5	<i>Visual Sensors:</i> Infrared Perception (Sight Group)	0
5	<i>Visual Sensors:</i> Ultraviolet Perception (Sight Group)	0
15	<i>Visual Sensors:</i> x1000 Microscopic for Sight Group	0
9	<i>Visual Sensors:</i> +6 versus Range Modifier for Sight Group	0
3	<i>Auditory Sensors:</i> Ultrasonic Perception (Hearing Group)	0
15	<i>Sonar Unit:</i> Active Sonar (Hearing Group)	0
12	<i>Radio Sensors:</i> HRRP (Radio Group)	0
15	<i>Radar Unit:</i> Radar (Radio Group)	0
3	<i>Sensor Enhancements:</i> +1 PER with all Sense Groups	0

Talents

- 32 *Onboard Computer Systems:* Absolute Range Sense, Absolute Time Sense, Bump Of Direction, Lightning Calculator, Universal Translator 11-

Skills

- 6 +3 OCV with Hand Blaster
- 12 Suite of Skills specifically programmed into robot
- 1 Climbing 8-
- 2 Language (GM's choice)
- 3 Stealth 13-
- 6 WF: Beam Weapons, Energy Weapons, Small Arms

Total Powers & Skills Cost: 347

Total Cost: 427

75+ Disadvantages

- 5 Physical Limitation: Affected By Cyberkinesis (has EGO 15 for purposes of cyberkinetic powers, and can be affected by cyberkinesis-based Presence Attacks) (Infrequently, Slightly Impairing)
- 0 Physical Limitation: Human Size
- 25 Psychological Limitation: Must Obey Programmer's/Owner's Commands (Very Common, Total)
- 322 Experience Points

Total Disadvantage Points: 427

Description: Guardian robots are used as soldiers, security personnel, and bodyguards by many companies, people, and governments. This writeup represents a typical guardian robot; many other types are possible.

Since each guardian robot is programmed with a selection of Skills specific to it, this character sheet simply specifies the amount of points allotted for Skills, allowing the GM to assign the appropriate ones. Common guardian robot Skills include Bugging, Combat Driving, Combat Piloting, Combat Skill Levels, Computer Programming,

Deduction, Electronics, Mechanics, Navigation, Penalty Skill Levels, Shadowing, Systems Operation, Tactics, Transport Familiarity, and Weapon Familiarity.

■ Price: 85,400 credits.

BIOTECHNOLOGY

Discoveries in biology in recent years point to amazing possibilities for the future. Humans may be able to transform themselves and other species, for good or ill.

CLONING

A clone is a genetic copy of another individual. That doesn't mean it's an exact duplicate — many features are *not* genetically determined. Fingerprints and retina prints would be different, for instance. And the clone would be younger than the original — cloning an adult would give you a baby who'll look like that adult in a couple of decades. A clone naturally has different memories from the original, which means it's likely to have a different personality. If nothing else, the clone is affected by the experience of growing up as a clone, which the original lacked.

Clones grow up at the same rate as other babies, which means an "invincible clone army" would take some 20 years to raise. It's usually easier to go out and hire people. Moreover, clones still have to be carried to term by host mothers, which means an army of clones would require an army of young women willing to have babies at the same time.

Of course, all of this assumes a relatively "realistic" approach to cloning, which many SF stories and settings don't take. In some *Star Hero* campaigns, rapid-growth and memory-implantation technology may allow for the swift creation of clones who are almost indistinguishable from the original.



In game terms, cloning is usually built as Duplication with a host of Limitations (see page 54). However, in some cases the GM may prefer for characters to use Summon, or even to buy clones as Followers.

There are interesting possibilities for adventures involving clones and cloning. Being genetically identical, clones would be ideal candidates for organ transplant for their originals. The clone might know this fate is in store, but accept it as his duty — or he might decide he doesn't want to be a walking organ bank, and flee. If you ignore the idea that fingerprints and retina prints differ in a clone, a clone makes the perfect way to frame someone for murder (or to fake someone's death). In the early years of the technology, clones are certain to face all kinds of public hostility; cloning is one of the more misunderstood forms of biotechnology.

GENETIC ENGINEERING

"Genetic engineering" is a general term for modifying living beings by altering their genes in some way. Genetic modification of species isn't new — look at what people managed to do with horses and dogs by sheer persistence and selective breeding. Genetic modification of sentient species will probably proceed by slow stages rather than massive transformations — get one new system working right before you tinker with the others. Some writers have depicted Human genetic engineering creating entire new species, vastly different from the current models (including Humans specifically adapted for high-gravity worlds, water worlds, and the like). Others suggest a more cautious approach, with modifications limited to curing inherited diseases and modest improvements by borrowing from other mammals.

In *HERO System* terms, low-key genetic engineering simply means no Physical Limitations for characters, and possibly high Characteristics or a few Talents (like Eidetic Memory). More exotic methods bestow Talents and low-level Powers.

In the campaign, genetic engineering has a variety of uses. Entire subraces of Humanity may be created by modification, leading to all sorts of exotic cultures as they strive to be different and prove their superiority. The unmodified majority may view them as monsters, leading to conflict — which side are the heroes on? If tinkering with your kids' genes is no different from paying to get their teeth straightened, the variation among Humans may be tremendous, with no "normals" left.

On the other hand, modification of animals and plants is often routine in SF settings. New variants and subspecies optimized for other worlds help interstellar colonization, for example. On a more sinister note, creatures might be engineered into "living weapons."

Genetic Modifications

Cerebral Enhancement: The character's brain processes and remembers information more efficiently.

+3 INT and Eidetic Memory and Lightning Calculator. Total cost: 11 points.

Enhanced Musculature: The character's muscles and skeletal system are enhanced, making him stronger and faster.

+3 STR and Running +2". Total cost: 7 points.

Sensory Enhancements: The character's senses are far more acute than a normal person's.

+2 PER with all Sense Groups. Total cost: 6 points.

Spatial Analysis: The character's mind has the ability to gauge distances and spaces more accurately than normal.

Absolute Range Sense and Detect Size Of Area (INT Roll) (Sight Group). Total cost: 6 points.

NANOTECHNOLOGY

Nanotechnology is a term coined by futurist Eric Drexler to describe a new field of engineering dealing with extremely tiny machines — devices on the same scale as cells or viruses. The advantage to such miniscule machinery is it can work with and manipulate single molecules of material. As it has moved from being just a neat theoretical idea toward practicality, "nanotech" has become synonymous with "magic" in some circles — perhaps because of inflated gee-whiz claims by enthusiasts.

By manipulating matter at the molecular level, nanotechnology allows the use to refine and synthesize extremely pure substances (even the highly complex molecules of drugs or hormones) or exotic crystals. Nanotech devices can operate within living things at the cellular scale, performing surgery on microscopic nerves or blood vessels from the inside, or patrolling the body like robot cops, looking for rogue cells. By putting nanomachines to work making more nanomachines, a small "seed" unit can leverage itself up into a vast swarm of tiny devices, working together en masse. Incorporating nanotech-scale machinery and systems into Human-scale technology allows all sorts of amazing "smart" or "living" materials — structural materials able to adapt to changing conditions, repair damage, or transform on command.

The combination of nanotechnology and advanced biotechnology makes the distinction between living and nonliving completely arbitrary. When tools can heal and animals are designed, what's the difference? This suggests that a lot of things twenty-first century Humans consider "natural" products will be manufactured using nanotechnology — food could come from solar-powered nanofabricators which look nothing like growing plants. By the same token, many "manufactured" items might be grown.

Used in weapons, nanotech combines all the nastier features of biological and chemical weapons with "smart" guidance and insidious armor penetration. The ultimate nanoweapon is the dreaded "grey goo" — an unstoppable mass of tiny machines mindlessly converting all matter they find into more machines just like them.

However, nanotechnology isn't infallible. Since it's fundamentally matter-based, it can't manipulate large amounts of energy. Nanotech requires raw

materials — it can't create something out of nothing, although in many cases waste, air, and dirt are all the matter needed.

Making nanotech work at large scales is very tricky — a nanotech skyscraper would have to grow from the ground up, and making the construction microbots follow the building plan would be a matter of pruning and training, like working with plants. Because of the small scale, nanotech is slow. Individual devices move at the speed of cells or ants — minutes per meter. A horde of nanobots building a skyscraper would start out quickly, but soon would be spending days just hauling tiny amounts of material up to the top. Growing objects using nanomachines would proceed like growing living creatures — a time scale of days, at least. No "instant cars," in other words, unless you want to use total rubber science.

Nanotech is also limited by the laws of physics. Nanobots can't stop a bullet in midair any more than a swarm of gnats can (but the nanomachines could repair the bullethole fairly quickly, or stabilize someone who's been shot). Nanotech can't defy gravity (although at small scales, air is thick enough to swim in). And nanotech, like any other technology, needs energy. The amounts are tiny, but just as having a swarm of a million nanobots at work speeds up a job, the energy requirement of a million tiny workers gets large. So does their waste heat and other byproducts — a "nanofactory" the size of a dishwasher would emit heat like a furnace, requiring a steady stream of coolant and raw materials.

NANOTECH IN THE CAMPAIGN

In *Star Hero* campaigns, nanotech can be part of the background or an exciting new technological "MacGuffin" driving the plot of an adventure. Societies with high nanotech tend to also emphasize the biological and information sciences: lots of computer implants, synthetic beings, wonder drugs, and brain hacking. Nanotech devices are mostly self-maintaining and self-repairing, which may eliminate some Limitations ordinarily associated with technology.

One colorful aspect of an advanced nanotech campaign is that just about everything is potentially "alive." Chairs may be able to walk about, clean themselves, and adjust to fit different users. Houses may be living or semi-living systems. Combine this with widespread artificial intelligence (running on extremely compact nanotech computers) and the result is almost like a fantasy setting — Clarke's Law in action.

Another likely result of advanced nanotech is longevity, even immortality. The ability to provide medical treatments at the cellular level means doctors could retard or reverse the causes and results of aging. Even resurrection may be possible, if swarms of nanobots can perform a brain scan and recover the memories and personality of a person before decay sets in. In a nanotech world, death may be no more than an inconvenience.

The economics of a nanotech society are hard to predict. It's easy to get optimistic and envision a day of infinite material abundance for everybody. It

THE GOO SPECTRUM

Besides the deadly "grey goo" mentioned in the text, scientists have speculated about other nanotech weapons/tools that might become feasible in the future. They include:

Blue Goo: Beneficial/protective nanotechnology designed to counteract grey goo.

Green Goo: Nanotech designed to sterilize Humans through the use of otherwise harmless infections. Could be used by repressive governments engaging in forced population control, eco-terrorists, or the like.

Golden Goo: Designed to filter gold from seawater, golden goo could cause problems (both ecological and economic) if it was not carefully controlled.

Khaki Goo: Another term for grey goo or other military nanotechnology.

LOR Goo: "LOR" stands for "Lake Ocean River"; the term refers to nanotech that would clean pollution, and harvest usable resources, from bodies of water. Poses the same dangers as golden goo.

Red Goo: Various forms of grey goo deliberately created and used as a weapon.

is likely that a nanotech society would be wealthier than the present day, just as we are richer than our Victorian forebears. But nanotech can't do everything. Land remains valuable (though specific parcels may change: a toxic landfill might become quite desirable for nanotech mining of heavy metals). Intellectual property won't change unless society wants it to. Energy is still important, though nanotech certainly changes how a society uses and distributes it.

Nanotechnology Devices

Disassembler Grenade: The basic nanotech weapon: a canister of voracious nanomachines which reduce everything around them to individual atoms. Fortunately, the machines don't reproduce, so in time the spray stops working. Price: 1,350 credits per grenade, or more

RKA 1d6, Area Of Effect (1 Hex; +½), Continuous (+1), Penetrating (+½) (45 Active Points); OAF (-1), 1 Continuing Charge lasting 1 Turn (neutralized by fire or any other area-affecting damage-causing phenomenon; -1¼), Range Based On STR (-¼). Total cost: 13 points.

Grey Goo Grenade: This horrible nanoweapon, used only as a desperation measure because it remains on the battlefield so long, converts all the matter it encounters into more nanobots. Price: 2,370 credits per grenade, or more.

RKA 1d6, NND (defense is ED Force Field, being surrounded by fire, or having counter-nanobots; +1), Does BODY (+1), Area Of Effect (6" Radius; +1), Continuous (+1), 1 Continuing Charge lasting 1 Day (neutralized by fire or any other area-affecting damage-causing phenomenon; +¼) (79 Active Points); OAF (-1), Range Based On STR

(-¼). Total cost: 35 points.

Medical Nanobots: These are microscopic machines which remain dormant in the patient's tissues and bloodstream until the body suffers serious injury, at which point they go to work stabilizing the patient's condition and repairing damage. Price: 400 credits, or more.

Healing 1d6 (Regeneration; 1 BODY per Turn), Reduced Endurance (0 END; +½), Persistent (+½) (20 Active Points); Extra Time (1 Turn; -1¼), Self Only (-½). Total cost: 7 points.

Protective Nanoswarm: A cloud of flea-sized nanobots patrolling the air around the character, checking for enemy nanomachines, germs, and pests. Price: 645 credits, or more.

*Force Field (12 PD), Hardened (+¼), Invisible Power Effects (Sight Group; +½), Reduced Endurance (Reduced Endurance (0 END; +½) Uncontrolled (removed by fire, any other area-affecting damage-causing phenomenon, sufficiently strong winds, or the like; +½) (33 Active Points); Only Versus Nanotech Attacks (-1) (total cost: 16 points) **plus** Life Support (Immunity: all terrestrial diseases and biowarfare agents) (10 Active Points); Only Versus Airborne Diseases/Agents (-½), Linked (-½) (total cost: 5 points). Total cost: 21 points.*

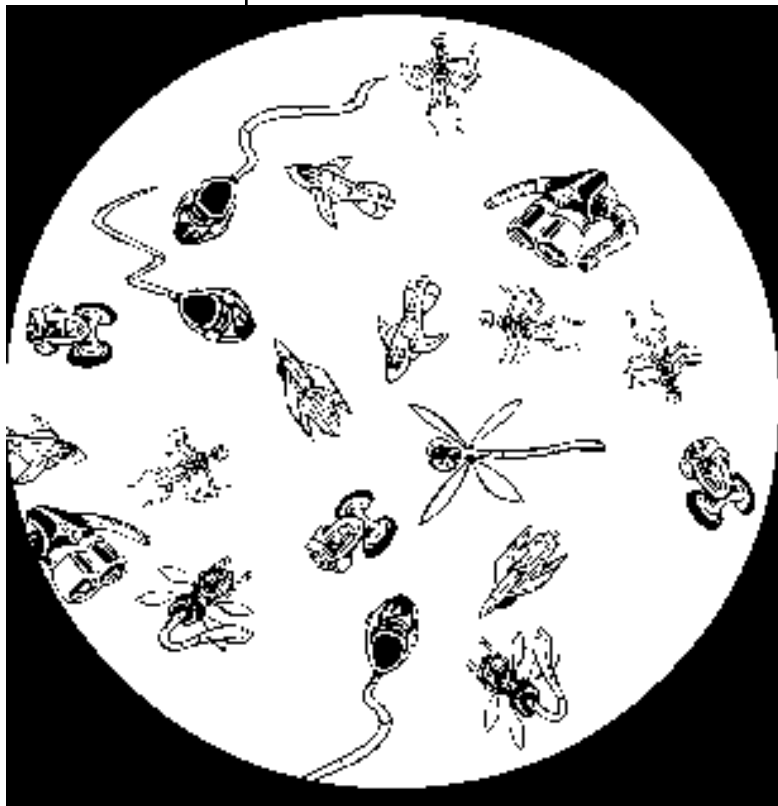
POWER AND ENERGY TECHNOLOGY

Science fiction technology is versatile and powerful — when it works. Many gadgets and weapons require a lot of energy from a compact source. In *HERO System* terms there are three primary ways to model power supplies.

Devices which need only small amounts of power and can operate for weeks or months between battery changes are simply bought with the *Reduced Endurance* (0 END) Advantage. Changing batteries and recharging them is just part of the normal maintenance implicit in the *Focus Limitation*. (Alternately, Fuel Charges may be appropriate for these devices.)

Devices with batteries or power cells that do get drained after only a few uses are best designed with the *Charges* Power Modifier. Getting new Charges is a matter of putting in new power cells or plugging the device into a recharger overnight.

Large devices and vehicle or base systems may need a constant power supply. In *HERO System* terms, powerplants and the like are typically the special effects of the *Endurance Reserve* Power, producing END points in the form of electricity. These Endurance Reserves typically have REC equal to their END; this simulates how they work in "real-world" terms, and makes for easier bookkeeping. At the GM's option, since Fuel Charges don't work well with Endurance Reserves, you may apply a *Requires Fuel* Limitation to represent the fact that they need refueling at least once a month or so. This Limitation



is worth -0 or -¼ for Very Common or very easily obtained fuels, -½ for Common or easily-obtained fuels, and -1 for Uncommon fuels (or fuels which are difficult and/or extremely expensive to obtain). If the Endurance Reserve doesn't require refuelling on at least a monthly basis, it doesn't qualify for this Limitation.

REAL WORLD POWER SUPPLIES

Some sources of power found in SF stories actually exist in real life, or could plausibly be developed in the future.

Solar Power

Solar power is abundant, especially in space, and requires no fuel, but the solar panels to collect it are often large and bulky — the larger the panels, the more power they can generate. However, the primary difficulty with solar power is not panel size, but the fact that the farther away the panels are from a star, the less power they generate. For example, a solar panel at the orbit of Mars produces only half the power of the same-size panel in Earth's orbit; at Jupiter, the same panel generates 1/25 of the energy it generates at Earth.

In game terms, a solar power array is an Endurance Reserve. The Reserve's END and REC depend on its size. Both take a -½ Limitation, *Requires Solar Proximity*, to reflect the fact that the energy output drops as the panels get further away from a star. The listed END and REC for a solar power Reserve indicate its maximum power-generating capacity at a distance of up to 1 AU. For each AU (or fraction thereof) beyond that distance, halve the Reserve's END and REC. (In some respects, this is a form of the *Limited Recovery* Limitation for Endurance Reserves, so those taking *Requires Solar Proximity* may not also take that Limitation to simulate the need for proximity to a star.)

A one-hex solar power array (2.6 square meters) can generate up to 12 END/12 REC. Add at least one hex to the array for each additional point of END and REC (keep the two equal).

As of the early twenty-first century, each hex of solar cells has a mass of 10 kilograms and costs 1,000 credits. Advanced technology makes cells lighter and cheaper: by the middle twenty-first century, a one-hex panel masses only 5 kilograms and costs 500 credits per hex, and the weight and price in most settings continue to go down from there as the decades progress.

Solar Panel: This is a 25-hex panel generating enough power for a small space station or spaceship. Price: 25,000 credits, or more.

Endurance Reserve (36 END/36 REC) (40 Active Points); OAF Immobile Fragile (-2¼), Only Powers Electrical Devices (-¼), Requires Solar Proximity (-½). Total cost: 10 points.

Fuel Cells

Fuel cells burn hydrogen and oxygen to produce electricity. Some versions can run on other combinations of reactive gases, but hydrogen-oxygen cells are popular because their waste is fresh water. While fuel cells are compact and powerful, they do require fuel on a monthly basis, making them less useful on long-

duration voyages. The Space Shuttle gets its power from fuel cells, since its missions typically last less than two weeks.

A basic fuel cell has a mass of approximately 1 kilogram and costs 25 credits (not counting fuel). It can produce up to 4 END/4 REC, and uses 1 liter of fuel per hour in the process. For up to each +4 END/+4 REC, double the number of cells.

Fuel Cell Generator: This array of fuel cells includes enough fuel for a month's operation, has a total mass of 2,500 kg, and costs 8,000 credits (including fuel, fuel tanks, pumps, and so forth).

Endurance Reserve (20 END/20 REC) (22 Active Points); OAF Immobile (-2), Only Powers Electrical Devices (-¼), Requires Fuel (-¼). Total cost: 6 points.

Radiothermal Generators

For missions to the outer solar system, space probes use compact radiothermal generators which produce electricity from the heat given off as radioactive materials decay. These are extremely reliable and long-lasting, but don't produce a great deal of power and would need radiation shielding on manned spacecraft.

At the earliest stage of this technology, a radiothermal power plant generates 2 END/2 REC of power per kilogram of weight, and costs 400 credits per kilogram. As radiothermal generator technology improves, increase the power output while reducing the weight.

Small Radiothermal Powerplant: This is a small radiothermal generator, such as a space probe might carry. Price: 400 credits, or more.

Endurance Reserve (2 END/2 REC) (3 Active Points); OAF (-1), Only Powers Electrical Devices (-¼). Total cost: 1 point.

Nuclear Fission

This is what most people mean by "nuclear power" — a tested and reliable technology which generates power by splitting atoms. As of the early twenty-first century, nuclear fission supplies a quarter of the United States's electricity and allows France to be an energy exporter without oil. Modern Earth nuclear reactors are large and bulky, useful only when really huge amounts of power are needed. They can run for up to 5 years between refuelling. A reactor masses about 10 metric tons per 20 END/20 REC produced and costs 500,000 credits per metric ton of mass.

Technology can improve reactors somewhat, reducing the mass of shielding and the cost. Halve the weight, volume, and cost of a fission power plant at near-future (Cyberpunk) technology levels, and again a generation later. After that stage of technological development, fusion powerplants replace fission powerplants.

Nuclear Reactor: A modern reactor (such as a submarine or interplanetary spacecraft might carry) masses about 100 metric tons. Price: 50 million credits, or more.

BEAMED POWER

Many SF stories, particularly ones written in the early decades of the genre, featured robots, vehicles, and other devices running on *beamed power* rather than batteries or other built-in power sources. Beamed power involves a central power-generating station of massive capacity, which can then "beam" the power out as invisible, intangible waves of energy to any device capable of receiving it.

In game terms, you can simulate beamed power in either of two ways:

1. Buy devices and Vehicles with the Advantage *Reduced Endurance* (0 END), with the beamed power functioning as the special effect of the 0 END cost.
2. Buy the central power station as an *enormous* Endurance Reserve with the *Usable By Others* (a lot of others!) and *Ranged* Advantages, and then have devices requiring power draw from the Reserve. The larger the number of devices that draw power from the Reserve, the more END and REC it needs — amounts in the tens of thousands of points' worth are often necessary.

The intriguing thing about beamed power from a storytelling viewpoint is the possibility that the power gets shut off. How does society, deprived of power, react? Could characters responding to an emergency be stranded when their powerless hovercars settle on the ground? Could terrorists hold the power generating facility hostage? A clever GM can come up with lots of similar ideas.

Endurance Reserve (204 END/204 REC) (225 Active Points); OAF Immobile (-2), Only Powers Electrical Devices (-¼). Total cost: 69 points.

SPECULATIVE AND RUBBER SCIENCE POWER SUPPLIES

Science fiction writers and space scientists have suggested several possibilities for new power sources. Some of them will probably become practical, while others remain in the realm of rubber science. Since all of these are highly speculative, mass and cost are just estimates.

Fusion Power

Nuclear fusion power is the most likely candidate for a new type of power generation, at least in the near future. Current research is creeping towards a fusion reactor which produces more power than it consumes. A fusion powerplant would need only a few kilograms of deuterium or helium-3 to produce large amounts of power for long periods. Just like fission plants, fusion generators require some fairly heavy shielding.

A fusion powerplant when the technology first becomes available in the early-mid twenty-first century has a mass of 500 kilograms per 20 END/20 REC generated (fusion reactors are lighter than fission powerplants, but bulkier). They cost 1,000 credits per kilogram.

Technology rapidly improves fusion powerplants. At late Cyberpunk-era tech the output per kilogram increases, while the cost is halved (500 credits per kilogram). By early starfaring technology the cost is 250 credits per kilogram, and at mature starfaring tech the cost drops to 100 credits per kilogram of power plant.

Early Starship Fusion Plant: This fusion plant is suitable for early interstellar spacecraft. It has a 10-year supply of deuterium fuel and a mass of 4 metric tons. Price: 1 million credits, or more.

Endurance Reserve (156 END/156 REC) (172 Active Points); OAF Immobile (-2), Only Powers Electrical Devices (-¼). Total cost: 53 points.

Personal Fusion Unit: Built with late starfaring-era technology, this is a portable fusion plant weighing 100 kilograms and occupying about as much space as a filing cabinet. It can run for a decade on one supply of fuel. Price: 25,000 credits, or more.

Endurance Reserve (108 END/108 REC) (119 Active Points); OAF Bulky (-1½), Only Powers Electrical Devices (-¼). Total cost: 43 points.

Cold Fusion

A variant form of fusion power, "cold fusion" was announced with great fanfare in the late 1980s and then quietly dropped when the researchers discovered flaws in their experiment. Cold fusion uses as-yet-undiscovered chemical or electrochemical means to cause fusion a few atoms at a time. The energy given off is low, but cold fusion generators don't need any shielding and are very compact.

When they first appear, cold fusion cells weigh 1 kilogram per 2 END/2 REC, and 100 credits per

kilogram. The heavy water in a cold fusion cell lasts 1 year before replenishing. Technology rapidly improves cold fusion cells, increasing the output more than decreasing the size.

Cold Fusion Generator: This is a second-generation cold fusion device, providing enough power for a household or a personal vehicle. Price: 10,000 credits, or more.

Endurance Reserve (72 END/72 REC) (80 Active Points); OAF Bulky (-1½), Only Powers Electrical Devices (-¼). Total cost: 29 points.

Antimatter Power

Well-known to SF fans from its use on *Star Trek*, antimatter power is the ultimate form of nuclear energy, because it converts all the mass of its fuel into energy. Tiny amounts of matter combined with antimatter would result in immediate annihilation of both in a reaction releasing immense amounts of power. Aside from containing and channelling this immensely powerful reaction, the chief problem is that antimatter doesn't occur naturally. Civilizations can't mine it, they must manufacture it. It may someday be used as a means of storing and transporting energy, with huge solar-powered antimatter factories in remote star systems generating antimatter by the gram for distribution to planets and starbases. Handling antimatter is extremely tricky — it requires magnetic force-fields and the like — and an accident could wipe out an entire facility, continent, or planet.

Given the rubber science involved, an antimatter reactor usually doesn't need heavy shielding in addition to the special containers for the antimatter. Early antimatter generators weigh 1 ton per 20 END/20 REC, and cost 10 million credits (or more) per ton; the antimatter fuel costs 100,000 (or more) credits per gram, with a single gram sufficient to run the plant for a year. Technological advances can improve antimatter power substantially. Divide the cost of the fuel in half for each tech level beyond introduction (or, if the GM prefers, for every decade). The cost of the plant itself reaches 1 million credits per ton, with the plant weighing 1 ton per 40 END/40 REC generated. Power output may increase, and cost decrease, beyond that.

Experimental Antimatter Reactor: This is a first-generation antimatter power plant, too expensive to compete commercially with fusion powerplants, but suitable as the goal of an adventure. It costs 90 million credits (or more), plus another 100,000 credits (or more) for the antimatter fuel.

Endurance Reserve (168 END/168 REC) (185 Active Points); OAF Fragile Immobile (-2¼), Activation Roll 14-, Burnout (-¼), Only Powers Electrical Devices (-¼). Total cost: 49 points.

Starship Antimatter Reactor: This is a large, powerful reactor capable of running a major spacecraft. It weighs six tons, and costs six million credits (or more).

Endurance Reserve (228 END/228 REC) (251 Active Points); OAF Immobile (-2), Only Powers

Electrical Devices (-¼). Total cost: 77 points.

Singularity Power

Singularity power sources make use of tiny black holes, either artificially created in giant particle accelerators or left over from the early days of the universe, contained in special force-fields. Feeding mass into the black hole causes the matter to release almost all its energy. This means a singularity powerplant can use anything for fuel. On the other hand, all the mass remains in the singularity, which makes it gain weight over time (at the rate of 1 kg per year). Singularity power sources don't scale down well — they can provide energy for a large starship or even a whole planet, but not a car or a personal energy weapon.

The singularity inside a power plant is an extremely valuable object — salvagers and pirates may want to recover or steal it, and finding a singularity is an excellent adventure hook. However, it's also extremely dangerous. If the force-fields and other safeguards holding it "inert" are shut off, the black hole "manifests" in real space, destroying objects on an interstellar scale.

At first introduction a singularity plant generates 400 END/400 REC and masses 400 metric tons or more (plus the mass of the singularity, which starts at 1 billion metric tons). As technology progresses, the plant becomes smaller and lighter, and the power output doubles, then triples.

Zero Point Power

Zero Point Energy is a theoretical method of using the energy inherent in space itself. If this could actually be accomplished, it would effectively be perpetual motion — free energy from nothing at all. It could also be a terrifying weapon if the release of energy could be triggered from a distance. This is serious "rubber science" at present, although it has a basis in real physics. Power output, costs, and weights are pure guesswork, but should eventually become better than fusion (though probably not as good as antimatter or singularity power).

TELEPORTATION

The concept of teleportation has been around for a while, but it was *Star Trek* which made "beam me up" part of everyday slang. In science fiction, teleportation devices work in various different ways, and each has its unique side effects.

All teleporters create the problem that everyplace is instantly "next door" to everyplace else, for good or ill. Injured patients arrive directly in a hospital in zero time, soldiers deploy to a war zone (or the enemy leader's command post) in a flash — and places like the Grand Canyon or Florence become overwhelmed with even more tourists than they already have to cope with. Larry Niven suggested teleportation might create "flash crowds" at major events, a prediction supported by the way Internet users crowd popular Web sites at times.

Most forms of technological teleportation also create a host of other problems. Can a character's "teleportation pattern" be stored, thus leading to effective immortality, and possibly instant healing? Can

multiple "copies" of a person or object be created, on purpose or by accident? Could teleportation cause physical or brain injuries over repeated use? Could two people be "merged," accidentally or on purpose, via teleportation? Gamemasters should consider these issues carefully before allowing teleportation technology into their *Star Hero* campaigns, or else they may soon find that they've unleashed a force they can't control. Players, unlike TV SF writers, aren't likely to ignore nifty new weapons and tools once they've created them.

MATTER FAXES

The most realistic form of teleportation would be a kind of "fax" system — the device scans the passenger down to the atomic level and then creates a duplicate at the receiving end. Often the scan destroys the original, which means any interruption in the process is fatal. A matter fax has interesting side effects: you can presumably beam the signal to multiple receivers, creating as many duplicates as you wish. You can also store the "blueprint" on disk, making this a convenient method of immortality. Matter faxes are by definition "replicators" capable of manufacturing anything which can fit into the scanning booth, so this kind of teleportation not only creates immortality but infinite wealth as well. Most matter faxes require a transmitter and a receiver, and realistically need insane amounts of power.

Matter Fax Booth: A standard MFB, found on many developed worlds. (Technically, to create multiple "copies" of a person, this system also need a Duplication effect.) Price: 1,900 credits per device, or more.

Teleportation 10", x16 Increased Mass (1.6 metric tons), MegaScale (1" = 1,000 km, scalable down to 1" = 1 km; +1¼) (90 Active Points); OIF Immobile (-1½), Can Only Teleport To Fixed Locations (-½), Extra Time (1 Turn, -1¼) (total cost: 21 points) **and** 1 Floating Fixed Location (any other matter fax booth, chosen at the time of use) (5 Active Points); OIF Immobile (-1½) (total cost: 2 points). Total cost: 23 points.

QUANTUM DISPLACEMENT

This is slightly more rubbery science than matter faxes. Quantum displacement somehow makes all the particles in the passenger's body "jump" to the destination. It is the closest to classic teleportation, and probably would work best over short distances. It would not need a receiver, and so shouldn't have Fixed Locations. This makes quantum displacement a natural military technology: instead of launching missiles, quantum displace those warheads right into the enemy's bases. Guns might even be replaced with ranged quantum displacement devices to "pop" rounds into protected areas.

As a transport system, quantum displacement would be simplest as an individual device — put on your teleport belt and go hopping about. It would make theft ridiculously easy, and jails impossible to keep people in. The combination of social chaos and military value might keep quantum displacement a Top Secret technology until some form of barrier or countermeasure becomes available.



Quantum Displacement Transporter: A standard teleportation device found on starships, space stations, and developed worlds. It typically consists of a chamber containing one or more “teleportation pads” on which the users stand, while another character operates the controls. It’s particularly handy for teleporting personnel and objects to and from a planet’s surface without the need to land a starship or use shuttles. (If characters want to Teleport over shorter ranges, add two non-MegaScaled slots.) It requires similarly MegaScaled sensors to locate the destination (or the objects to be teleported to the device). Price: 14,000 credits, or more.

Cost Quantum Displacement Transporter

- 80 *Quantum Displacement Transporter:* Multi-power, 240-point reserve, all OIF Immobile (-1½), Extra Time (Full Phase; -½)
- 4u 1) *Teleporting Away:* Teleportation 10”, x8 Increased Mass, Position Shift, MegaScale (1” = 100,000 km, scalable down to 1” = 1 km; +1¼); OIF Immobile (-1½), Extra Time (Full Phase; -½)
- 8u 2) *Teleporting To:* Teleportation 10”, x8 Increased Mass, Position Shift, MegaScale (1” = 100,000 km, can scale down to 1” = 1 km; +1¼), Usable As Attack (+1), Ranged (+½), MegaRange (1” = 100,000 km, can scale down to 1” = 1 km; +1¼); OIF Immobile (-1½), Extra Time (Full Phase; -½)

Total cost: 92 points.

FOLDED SPACE

Using essentially the same rubber science as warp drives (page 192), folded space teleporters bend the fabric of the Universe to put your current location next to your target. It needs a transmitter and a receiver, and can cover interstellar distances. If the cost is low enough, houses could have portals built into doorways, so that different rooms might be in different places, or even on different planets (as shown in, for example, Dan Simmons’s *Hyperion*). Of course, if the system breaks down while you’re in a room on a distant world, it might take months or years for a repairman to arrive by starship.

Teleportal Network: This is a network of standard space-folding device, connecting points on different worlds. Price: 11,000 credits per device, or more.

Teleportation 20”, x16 Increased Mass (1.6 metric tons), MegaScale (1” = 1 light-year; +3½) (270 Active Points); OIF Immobile (-1½), Can Only Teleport To Fixed Locations (-½) (total cost: 90 points) *and 1 Floating Fixed Location (any other teleportal, chosen at the time of use) (5 Active Points); OIF Immobile (-1½) (total cost: 2 points). Total cost: 92 points.*

MISCELLANEOUS EQUIPMENT

Here are a few items *Star Hero* characters might find useful that don’t fit into any of the categories described above.

Survival Devices

Star Hero characters often have to work in some pretty hostile environments. These devices help them survive the rigors of open space or heavy atmospheres.

Spacesuit: Anyone venturing into Trace atmospheres or outer space needs a spacesuit. This version represents early twenty-first century Human models, with a rigid chest section for easy access to controls. It provides pressure and temperature support indefinitely, and oxygen for up to six hours. Price: 300 credits, or more.

Cost Spacesuit

- 3 *Environment Protection:* Life Support (Safe Environments: Intense Cold, Low Pressure/Vacuum) (4 Active Points); OIF (-½)
- 7 *Breathing Gases:* Life Support (Self-Contained Breathing) (10 Active Points); OIF (-½), 1 Continuing Fuel Charge (easily obtained; 6 Hours; -0)
- 2 *Protection:* Armor (2 PD/2 ED) (6 Active Points); OIF (-½); Activation Roll 11- (-1)

Total cost: 12 points

Advanced Spacesuit: As space travel becomes more common, people want suits which are less bulky and allow more freedom of movement. Skinsuits are the

solution — instead of wearing a pressurized balloon, the user wears a suit that hugs the skin, turning his own skin into a “spacesuit.” The helmet is a clear bubble, and the backpack can provide oxygen for up to a day. (Use the first two powers for the standard Spacesuit, above, but the Breathing Gases last for 1 Day.) Price: 200 credits, or more.

Armored Spacesuit: For environments like the atmosphere of Jupiter, characters need a space suit that’s also designed to keep pressure *out*, and to provide more protection in general. This particular suit resists up to 90 atmospheres of pressure (see page 283), enough to allow a character to walk on the surface of Venus. It also works fine as a deep-diving suit in the oceans of Earth or Europa. Price: 1,380 credits, or more.

Cost Armored Spacesuit

- 5 *Environment Protection:* Life Support (Safe Environments: High Pressure, Intense Cold, Intense Heat, Low Pressure/Vacuum) (7 Active Points); OIF (-½)
- 7 *Breathing Gases:* Life Support (Self-Contained Breathing) (10 Active Points); OIF (-½), 1 Continuing Fuel Charge (easily obtained; 6 Hours; -0)
- 50 *Protection:* Armor (30 PD/20 ED) (75 Active Points); OIF (-½)

Total cost: 62 points

Medical Devices

Characters in SF settings often get hurt, or fall victim to mysterious alien maladies. Here are some of the devices the doctors of the future use to treat their patients.

Autodoctor: A marvel of Space Opera technology, this device is a small chamber on a pedestal. A person seals himself in, and the computers operating the Autodoctor go to work, using its built-in diagnostic systems and medical technology to repair injured bodies, cure illnesses, and otherwise restore the character to good health. This often takes a long time — a minimum of 1 Minute, but usually one hour to one day per BODY lost. Price: 3,200 credits, or more.

Simplified Healing 8d6 (80 Active Points); OAF Immobile (-2), Extra Time (see text; -1½), Requires A Paramedics Roll (-½). Total cost: 16 points.

Medkit: The standard first-aid pack in futuristic settings, a Medkit includes bandages which function like stitches, drugs to stop bleeding and prevent shock, stimulants, and immunoboosters. Price: 400 credits, or more (this price assumes the user has access to a free source of resupply, like a starship’s sickbay; if not, he may buy refills for 75 credits apiece).

Simplified Healing 2d6 (20 Active Points); OAF (-1), Extra Time (1 Turn, -1¼), Requires A Paramedics Roll (-½), 6 Charges (-¾). Total cost: 4 points.

Multisyringe: This handheld device contains an extensive supply of different medicines its user can inject into a sick person to cure him. The Activation Roll represents the fact that the multisyringe might not have quite the right medicine for a specific illness (or a specific species); if characters know in advance what illnesses they may encounter, they can load the multisyringe with the appropriate medications and ignore the roll.

Note that the multisyringe does *not* provide any sort of Healing — it simply stops the course of a disease or illness. Characters who have lost BODY, STUN, or other Characteristics to an illness must recover them normally (or with the help of other medical technology). Price: 1,600 credits, or more.

Minor Transform 8d6 (standard effect: 24 BODY) (sick persons into well persons) (80 Active Points); OAF (-1), Activation Roll 11- (-1), No Range (-½), All Or Nothing (-½), Limited Target (sentient beings; -¼). Total cost: 19 points.

Communications And Sensor Devices

Comm Button: The descendant of modern cell phones and portable radios — a tiny unit no bigger than a nickel, with a sensitive microphone and voice-activated controls, capable of automatically linking up to the local wireless network to allow instant communication with anyone else on the planet (or in orbit). They need no maintenance because they’re cheap enough to be disposable. Price: 15 credits, or more.

Radio Perception/Transmission (3 Active Points); IAF (-½). Total cost: 2 points.

Electronic Binoculars: Serious vision aids used by soldiers, scientists, and explorers, these devices provide light amplification, thermal sensing, magnification, and real-time image enhancement. Price: 740 credits, or more.

Cost Electronic Binoculars

- 2 *Basic Nightsight:* Nightvision (5 Active Points); OAF (-1)
- 2 *Thermal Sensing:* Infrared Perception (Sight Group) (5 Active Points); OAF (-1)
- 9 *Magnification:* +12 versus Range for Sight Group (18 Active Points); OAF (-1)
- 3 *Image Enhancement:* +2 PER with Sight Group (6 Active Points); OAF (-1)
- 1 *Rangefinder:* Absolute Range Sense (3 Active Points); OAF (-1)

Total cost: 17 points.

Holoprojector: A very common gadget used for entertainment, advertising, “telepresence,” and various other purposes ranging from deadly serious to silly. It projects visual images, either realtime feeds from a camera or recorded. Price: 440 credits, or more.

Sight and Hearing Group Images, 1” radius, Reduced Endurance (0 END; +½) (22 Active

Points); OAF (-1), Set Effect (recorded or broadcast images only; -½). Total cost: 9 points.

Nightsight Glasses: Next-generation descendants of modern night-vision goggles, these are as light and comfortable as a pair of thick sunglasses and adjust automatically to ambient light, providing both night vision and glare protection. Price: 500 credits, or more.

Cost Nightsight Glasses

- 2 *Basic Nightsight:* Nightvision (5 Active Points); OAF (-1)
- 2 *Thermal Sensing:* Infrared Perception (Sight Group) (5 Active Points); OAF (-1)
- 2 *Ultraviolet Sensing:* Ultraviolet Perception (Sight Group) (5 Active Points); OAF (-1)
- 5 *Glare Protection:* Sight Group Flash Defense (10 Active Points); OAF (-1)

Total cost: 11 points.

Personal Sensor Unit: Carried by explorers, scientists, detectives, and anyone who needs to gather information from a locale, this handy device includes spectrographic scanners to analyze materials, a battery of electromagnetic radiation detectors, and a powerful built-in analytic computer. Scanning takes some time, but the results can be recorded and studied later. Price: 700 credits, or more.

Detect Electromagnetic Radiation And Physical Objects 14- (Radio Group), Discriminatory, Analyze, Range (35 Active Points); OAF (-1), Requires A Systems Operation Roll (-½), Affected As Sight And Hearing Group As Well As Radio Group (-½) (total cost: 12 points) and Eidetic Memory (5 Active Points); OAF (-1), Requires A Systems Operation Roll (-½), Only To Remember Things Detected (-½) (total cost: 2 points). Total cost: 14 points.

Tools

Characters often have important tasks to perform, and sometimes the right tool is just what they need to get the job done quickly and well.

Forcebeam Tool: An outgrowth of force-field technology, this versatile gadget is a cutter, a short-range forcebeam projector, and an all-purpose tool. Price: 410 credits, or more.

Cost Forcebeam Tool

- 12 *Forcebeam Tool:* Multipower, 25-point reserve, all OAF (-1), 1 Continuing Fuel Charge (refuels by recharging; 1 Hour; -0)
- 1u 1) *Cutter:* RKA 1d6; OAF (-1), No Range (-½)
- 1u 2) *Tractor Beam:* Telekinesis (10 STR),

Fine Manipulation; OAF (-1), Reduced By Range (-¼)

- 1u 3) *Toolbox-In-One:* +3 with Mechanics; OAF (-1)

Total cost: 15 points.

Gravity Lifter: The development of antigravity technology makes moving heavy objects easy. A gravity lifter is simply an antigravity module and a strong clamp. Attach it to a load, switch on the module, and suddenly a child can lift the heaviest cargo. Price: 200 credits, or more.

+20 STR (20 Active Points); OAF (-1), 1 Continuing Fuel Charge (refuels by recharging; 1 Hour; -0), Only for Lifting (-1). Total cost: 7 points.

Multitool: Instead of carrying a whole toolbox, why not use a Multitool? Made of "smart matter" and a mini-computer with a database of hundreds of different configurations, the Multitool can take just about any shape needed. Price: 150 credits, or more.

+3 with all Construction/Mechanical Skills (15 Active Points); OAF (-1). Total cost: 7 points.

Powered Exoskeleton: This bulky and powerful open-frame suit gives the wearer the strength for heavy jobs. Typically used for construction, cargo loading, rescue work, and various rough-and-tumble sports, it also serves as an effective hand-to-hand combat weapon in some instances. Price: 400 credits, or more.

Cost Powered Exoskeleton

- 13 *Clamps, Grips, And Servos:* +30 STR (30 Active Points); OIF Bulky (-1), Character Cannot Use Own STR (-¼)
 - 5 *Battery:* Endurance Reserve (20 END/8 REC) (10 Active Points); OIF Bulky (-1).
- Total cost: 18 points.**

Sonic Multitool: This variant on the Multitool uses focused sound waves and other forms of electromagnetic radiation to assist with work on electronic devices.

+3 with all Electronic/High-Tech Skills (15 Active Points); OAF (-1). Total cost: 7 points.

Towel: An essential utility item for space travelers. Price: 10 credits, or more.

Cosmetic Transform 1d6 (wet things to dry things), Reduced Endurance (Reduced Endurance (0 END; +½) (7 Active Points); OAF (-1), No Range (-½). Total cost: 3 points.

ACQUIRING EQUIPMENT



Since *Star Hero* is a Heroic-level game, characters typically obtain equipment by purchasing it with money instead of spending Character Points. General exceptions to this include cyberware, which gives the character innate powers, and Vehicles/Bases in some campaigns (see page 184). However, some *Star Hero* GMs allow character to purchase even those technologies with money. (See page 127 for more on money and economics in *Star Hero*.)

BUYING STUFF

There are limits to buying equipment. Is the device available where the heroes happen to be? Often gear from a higher technology level is unavailable on low-tech planets. If it can be found, multiply the price by a factor of 10 for each Tech Level difference between the item and the place.

And that's assuming the authorities let you buy it. Weapons and armor are likely to be strictly controlled, especially in societies which are more interested in order than the right to bear arms. As a general rule, nonlethal weapons (like polymer guns or sonic stunners) are available in all but the most repressive societies. Armor allowed to civilians includes expedition suits and possibly ablative foam.

Civilian weapons for hunting or personal protection (like a defensive rocket pistol, stun rod, alien blades, ordinary shotgun, inertial gloves, and possibly an electron pistol) are allowed with a permit and background check — how easy it is to get the permit and what background information disqualifies a buyer depends on the society. In a repressive state anyone who isn't an active supporter of the regime may be denied a permit. These rules also apply to most armor (except battle armor or battlesuits), and items like stealth suits, teleporters, medical equipment, and any powerplant over 60 END/60 REC output. Force tools may also be controlled because they can do lethal damage.

Actual military gear (any of the weapons or armor not already listed, plus most of the firearms in the *HERO System* rulebook) is closely controlled even in open societies. Anyone buying gear like that — or trying to buy it — attracts official attention and should have a legitimate need for the items. The nature of a legitimate need varies, of course. If the campaign has interstellar mercenaries, then being a licensed merc is probably sufficient. Some societies may allow export of military gear, but again, only if the buyer has a legitimate purpose. Selling guns to criminals or rebels in another country is a good way to get into a war with that

country's government. Characters may be able to bluff or con their way around these rules by means of Bureaucrats, Bribery, or Forgery.

OTHER PEOPLE'S STUFF

Often the characters get their gear from other people, either directly or by borrowing money.

Patrons sometimes issue special equipment to adventurers for a specific job — heavy weapons for a military operation, or specialized netrunning software for a Cyberpunk scenario. Usually the gear is expensive, and often the boss wants it back after the job is done. If the heroes make keeping the equipment part of their terms of employment, they may well discover their pay gets cut in proportion. Heroes who “lose” or “break” stuff because they want to keep it may find themselves gaining a negative reputation as sticky-fingered weasels. Gamemasters need to be sure both sides understand the conditions of the deal and what is supposed to happen to the gear afterwards.

For big-ticket items like spaceships, characters may wind up having to borrow money. This is a Disadvantage for the vehicle — Hunted (Watched)

STAR HERO PRICING GUIDE

Class Of Item	Base Price
Communications	10 credits x Active Points
Computers	20 credits x Active Points
Defenses	15 credits x Active Points
Electronics	20 credits x Active Points
Medical	20 credits x Active Points
Robots	200 credits x total Character Points
Sensors	20 credits x Active Points
Tools, general	10 credits x Active Points
Vehicles	1,000 (or more) credits x total Character Points
Weapons	30 credits x Active Point
Modifier	Multiplier
Cutting-edge technology	x10 base price
Demand for item exceeds supply	x2 base price, or more
Illegal items	x2 base price, or more
Luxury or high-quality	x4 base price
Military or military-grade	x5 base price, or more
Rare or handmade items	x2 base price
Supply of item exceeds demand	x½ base price, or less
Tech Level difference	x10 per level (see text)
Vehicle/base technology other than weapons and defenses	x2 base price, or more

STAR HERO PRICING GUIDE

Since *Star Hero* is a genre sourcebook rather than a specific campaign setting, it can't give a definite price list for every technological item. Instead, here's a meta-system, used in this book to compute the cost of equipment. Gamemasters can allow it into their campaigns as-is, modify it as desired, or come up with their own.

To use this price guide, first determine the base price of the desired item. If a device has multiple powers or functions (like a weapon defined as a Multipower), add the Active Costs of all Powers together. (If the Power Framework has Advantages on its reserve or base cost, apply those to the most expensive slot when determining its Active Points.) If the device combines powers or functions from different classes, like a weapon that also provides defense, use the most expensive credit value for any of its categories to calculate the base price. Then apply any appropriate modifiers. If two or more modifiers apply, use them all; for example, cutting-edge military technology would be (x5 x x10) 50 times base price.

Most of the base price calculations derive from an item's Active Point cost. However, GMs should keep in mind

Continued on next page

Continued from last page

that Active Points may not always tell the whole story. As the examples earlier in this chapter show, sometimes a more sophisticated or advanced device has the same Active Points as an earlier, cruder model — the difference is that the earlier version has more Limitations. Similarly, sometimes a powerful effect doesn't end up costing many Active Points. In these cases, the GM may want to adjust the price to reflect the circumstances and/or utility of the equipment. For example, many starship defenses base their cost partly on the size of the ship, and some equipment designed to affect a large area bases its cost partly on the size of that area.

by the bank. The temptation to skip out on payments can be strong. After all, the bank is only on one planet, and there are so many planets out there. The GM can discourage this kind of behavior with social sanctions in the campaign: deadbeats can be pursued by bounty hunters and repo men, they can lose their licenses and permits (and who will hire them or take passage on their ship then?) — they may even find themselves pursued by the Interstellar Navy.

HOW MUCH FOR THE ARMOR-PIERCING AMMO?

Star Hero characters often want to know the price for different types of ammunition, energy cells, batteries, or fuel cartridges for various weapons. This poses some difficulties, because in the *HERO System*, the cost of the ammunition isn't a discrete value; it depends on the overall cost of the weapon.

If you want to allow characters to buy different types of ammunition separate from their weapons, here's a simple method for determining the cost. First, calculate the price of the weapon using its ordinary ammunition. Then calculate the cost using the different type of ammunition the characters want to buy. Subtract the first cost from the second cost, and multiply the result by 30 credits (as for all weapons). That's the cost of one standard "clip" of the different ammunition.

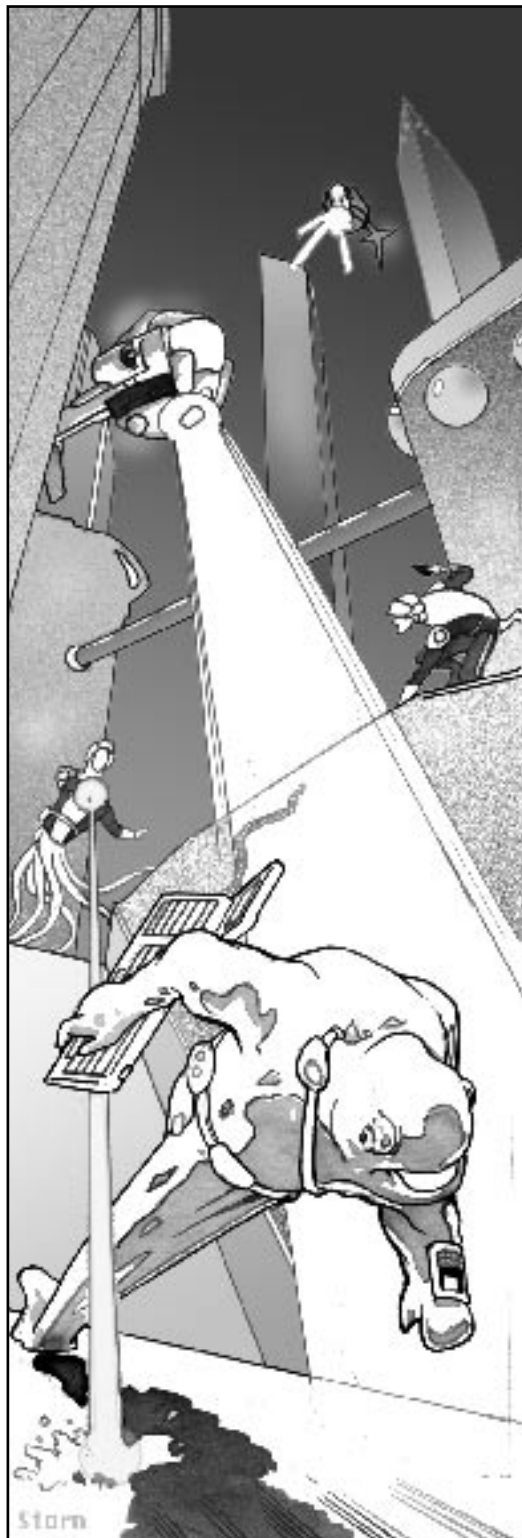
Example: *Garrett Starbow owns a pistol that's built as follows:*

RKA 2d6, Autofire (3 shots; +¼), 20 Charges (+¼) (45 Active Points); OAF (-1), Real Weapon (-¼), STR Minimum (10; STR Minimum Doesn't Add To Damage; -1). Total cost: 14 points.

He wants to buy a clip of armor piercing ammunition for his pistol. To determine the cost, the GM calculates the cost of the pistol with the AP ammo:

RKA 2d6, Armor Piercing (+½), Autofire (3 shots; +¼), 20 Charges (+¼) (60 Active Points); OAF (-1), Real Weapon (-¼), STR Minimum (10; STR Minimum Doesn't Add To Damage; -1). Total cost: 18 points.

The GM subtracts the first result (14) from the second (18), for a total of 4. Then he multiplies that by the cost of a weapon (x30), for 120 credits. So, if Garret wants a clip with 20 rounds of AP ammo, he'll have to shell out 120 of his hard-earned credits.





Ships and Stations

TO SOAR AMONG THE STARS

When many people think of “science fiction,” the first thing they think of is starships. From the gleaming super-science vessels of *Star Trek* to the grimy, oddly-shaped, clunky-looking STL craft of *Aliens*, starships are an integral part of the genre. They provide not only a way for characters to cross the vast reaches of space, but for many characters, a home.

On the other hand, in SF settings, many characters *do* live in space — on starbases, space stations, orbital fortresses, and other such habitats-in-space. Many science fiction novels, TV shows, and movies (including *Star Trek: Deep Space*

Nine and *Babylon 5*) take place primarily aboard a specific space station, and *Star Hero* GMs can create similar campaigns if they wish.

This chapter discusses how to build and use starships and space stations using the *HERO System* rules. The information provided should cover most situations, but of course GMs should adapt it as necessary to their specific campaign settings and preferences — after all, there’s a whole universe full of ships and stations out there. This chapter also includes information on ground vehicles, including mecha (giant combat vehicle-robots).

STARSHIP CREATION



Space travel is a central concept in science fiction. Writers have been writing about voyages to other worlds since Jules Verne sent a trio of explorers around the Moon by means of a huge cannon. Space hardware has improved since then, but the dream remains the same.

In science fiction stories, starships range from tiny, one-person vessels to planet-sized ships capable of devastating entire solar systems. The types of ships available to characters are virtually unlimited; the only restrictions are the technology available in the campaign and the GM's limits on what's allowed.

GENERAL STARSHIP CONSIDERATIONS

Designing a starship can be a difficult process, since such complicated vessels require a lot of different systems (and thus a lot of Character Points!). Here are a few things to consider and keep in mind.

A Brief History Of Human Space Travel

Space travel was science fiction until October of 1957. That was when the Soviet Union placed the satellite Sputnik I in orbit about the Earth. The first living being in space was the dog Laika, launched a month later. The first Human to leave Earth was Yuri Gagarin in 1961, aboard Vostok I. The first Human to reach another celestial body was Neil Armstrong, who set foot on the Moon in 1969. Since then, Humans have mostly confined their activities to low Earth orbit, aboard a series of space stations (Skylab, Salyut, Mir, and the International Space Station) and the Space Shuttle.

On the other hand, robot space probes have ventured to the farthest reaches of the Solar System. The Soviet Luna 3 probe returned the first pictures of the Moon's far side in 1959, Venera 2 reached Venus in 1966, and Mariner 10 surveyed Mercury in 1974. Mars has been a frequent target of space probes, though more than half of them have failed for various reasons (space engineers half-joke about the "Great Galactic Ghoul" which lurks between Earth and Mars). The first successful Mars probe was NASA's Mariner 4 in 1964, and the Russian Mars 3 probe landed on the surface successfully (though the lander failed soon after). In 1976 the Viking probes analyzed Martian soil for signs of life, and in 1996 the Pathfinder probe

and Sojourner rover expanded on the Viking discoveries. Meanwhile the Mars Global Surveyor mapped the planet with spy-satellite precision.

The outer Solar System was explored by a series of probes launched in the late 1970s to take advantage of a rare alignment of the planets. Pioneer 11 flew by Jupiter in 1973 and Saturn in 1979. Its bigger cousins Voyager 1 and Voyager 2 followed. Voyager 1 reached Jupiter in 1979 and Saturn in 1980, before swinging out into deep space. Voyager 2 reached Jupiter just four months after its twin, encountered Saturn in 1981, and went on to study Uranus in 1986 and Neptune in 1989, making it far and away the most successful space mission ever. Those probes dramatically changed Humans' knowledge of the outer solar system. Following in the footsteps of the Voyagers, specialized probes were launched to the two largest planets — Galileo to study Jupiter and Cassini to Saturn.

Human Space Travel In The Future

The near future of Human space travel depends a great deal on the willingness of Earth's governments to pay for projects. The technology to send Humans to Mars exists as of 2002; the political willpower does not. Plans currently on the drawing board envision missions to Mars which would rely heavily on "In-Situ Resource Utilization" — living off the land, so to speak, by producing rocket fuel and oxygen from Martian resources. Apollo astronaut Buzz Aldrin has proposed a permanent "cycler" spaceship to provide regular service between Earth and Mars, thus saving the cost of launching an interplanetary spacecraft for each trip.

Other space planners have proposed a return to the Moon, using it as the site for radio observatories or mining operations to extract Helium-3 (an isotope with great potential value as a fuel for nuclear fusion powerplants).

Lunar mines could also support the construction of permanent habitats in high Earth orbit or located at the Lagrange positions (see page 101). The engineer Gerard K. O'Neill envisioned huge self-sufficient space colonies at L-4 and L-5, providing homes for millions of permanent citizens of space. (The Babylon series of space stations in the television series *Babylon 5* are essentially O'Neill colonies in another solar system.)

The biggest technical hurdles to overcome in near-future space travel are propulsion and life support. Engineers are trying to develop compact and powerful rocket engines which can cut down the travel time for interplanetary voyages. So far

the best candidates are nuclear-thermal rockets, which use a small nuclear reactor to superheat hydrogen fuel; and the brand-new VASIMR drive, which heats hydrogen to plasma with microwaves and can switch between a high-thrust mode and a more fuel-efficient setting.

Life support is a bigger problem than space visionaries once realized. It's prohibitively expensive to launch all the food and oxygen a crew would use on a five-year Mars mission, so nowadays NASA scientists are trying to develop "regenerative life support systems" using compact greenhouses or hydroponic farms to recycle wastes into food and oxygen.

Radiation levels in space also pose a problem. Current methods of reducing the radiation hazard focus on either minimizing the exposure time (by building faster rockets) or fitting spacecraft with small "storm shelters" where the crew can wait during radiation storms.

Space Vehicle Types

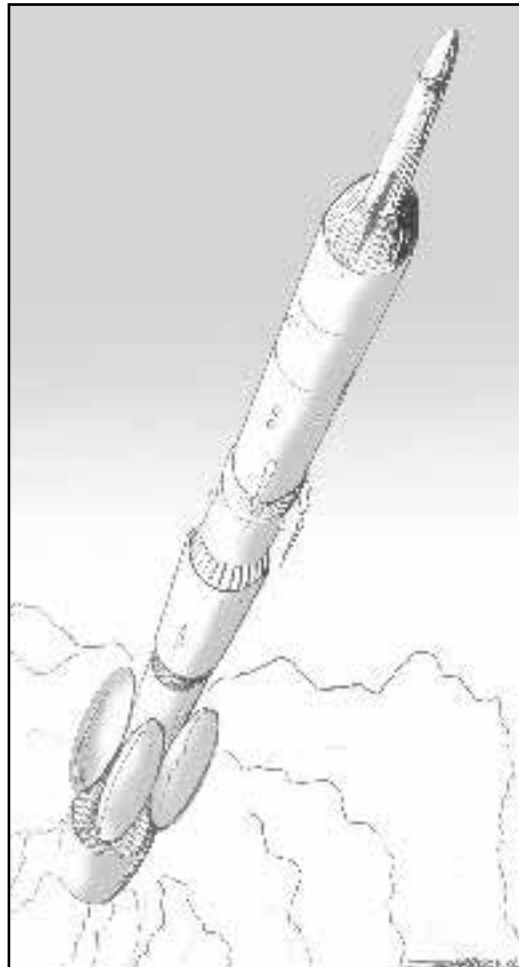
Spaceships in science fiction are usually classified by size, range, purpose, or a combination of the three. In this book, "starship" refers specifically to ships capable of interstellar travel while "spacecraft" or "space vehicle" means anything that can travel in space. Some settings distinguish between "ship" (starship) and "boat" (spaceship). A vehicle's prefix may tell what it can do: starships may be called "I.S." (for interstellar ship) or "S.V." (star vehicle), while spaceships are "S.S." (space ship) or "P.V." (planetary vehicle).

Size is of course a relative term — one setting's giant spaceship may be middle-sized or small in a different *Star Hero* campaign. In general, larger vehicles are more durable and self-sufficient than small ones, allowing them to go on longer voyages.

Range often relates to size; larger vehicles can travel further and stay in space longer. Range classification is particularly important if interstellar travel requires a different drive system than interplanetary voyages.

Purpose is considerably broader than size. There are dozens of potential roles for spacecraft. People mostly use civilian ships to move things from place to place. Freighters are ships carrying general freight, often in large container modules. Bulk carriers are freighters carrying homogeneous cargoes like grain or hydrogen in large quantities. Passenger liners transport passengers in varying degrees of comfort, ranging from luxury liners to tightly-packed colony transports or refugee ships. Tugs are ships with powerful motors designed to move other spacecraft, unpowered barges, or similar massive objects.

Science and exploration ships learn things in space. Scout ships venture into unknown space, often spending years on a mission. Research vessels come equipped with laboratories to study specific planets or phenomena. Support vessels are mobile repair and resupply ships. A few long-range exploration ships (such as the various *U.S.S.*



Enterprises of Star Trek) combine aspects of all three.

Warships are any kind of spaceship designed for combat. They can be broadly categorized into battle craft (which fight other space vehicles) and attack craft (which attack planets and similar targets). Large warships (battleships or dreadnoughts) carry massive armor and powerful defenses, along with weapons which can blast through the protection of enemy ships. Smaller ones (destroyers or frigates) tend to rely on speed and stealth for defense, and mount the most powerful weapons they can fit on board. Fighters are small ships, often with a single pilot and no passengers, designed to harass and attack larger ships or dogfight with enemy fighters. Carriers are a way to combine these concepts: a big, well-protected mother ship and a squadron of fast, expendable combat units. Cruisers or patrol ships are warships not designed to fight other combat units — they tend to be fast, long-range vessels intended for commerce raiding and peacetime law enforcement.

In game universes with "hyperspace" or some other dimension accessible from our own, there may be the equivalent of submarines — spacecraft which lurk "outside space" and appear suddenly to attack. Cloaking devices or other invisibility gadgets allow the same style of operation.

Military ships also include equivalents of various civilian ship types. Tenders are a kind of sup-

IMPERIAL SHIP CLASSIFICATION

Here's an example of a space vehicle classification system — the one used by the Terran Empire in the *Hero Universe* future history. Since the Empire is large and has lots of specialized vehicles, the system is fairly detailed. The tone is intended to echo modern naval ship designations. It uses three letters to denote ship types: the first denotes range, the second role, and the third size.

First Letter	Type	Notes
O	Orbiter	Vehicles limited to planetary orbit
S	Spaceship	Vehicles capable of interplanetary flight
I	Starship	Vehicles capable of interstellar travel
Second Letter	Type	Notes
A	Attack	Warship to attack planets or bases
B	Battle	Warship to attack other space vehicles
C	Carrier	Vessel carrying smaller ships
E	Exploration	Scout or explorer ships
F	Freighter	Freighter or containership
H	Heavy Lift	Tugs or boosters
I	Intelligence	Espionage or intelligence-gathering
L	Lander	Surface-to-orbit transport
M	Merchant	Passenger liner or passenger-cargo ship
P	Patrol	Patrol ship or cruiser
Q	Covert	Covert-operations or decoy ship
R	Research	Scientific ships
S	Support	Support ships or tenders
T	Transport	Bulk transport or tanker
U	Utility	General-purpose vehicle
X	Experimental	Experimental ship
Y	Yacht	Personal vehicle
Third Letter	Type	Notes
P	Personal	Approximately 100 cubic meters; single pilot
S	Small	Approximately 1000 cubic meters; 10 crew
M	Medium	Approximately 10,000 cubic meters; 50 crew
L	Large	Approximately 100,000 cubic meters; 500 crew
V	Very Large	One million cubic meters, or more

Thus, an IMS is a small merchant starship, an SBL is a system-defense monitor, and an OBP is a space fighter. Other common ship types are OHS (orbital tugs), OLS (standard orbital shuttles), SMM (common interplanetary liners), SPS (in-system Customs cutters), STL (large interplanetary tankers), IBS (commerce escorts), IBV (super-battle-ships), ICL (carrier starships), IES (scouts), and so on. Individual vessels follow this prefix with a unique registry or hull number. Often a class of ships gets numbers in series.

port ship, usually supporting small independent warships like cruisers or a destroyer squadron. Assault transports are military passenger liners, carrying troops and landing craft for planetary assault operations. Spy ships are military versions of scouts or research vessels, dedicated to gathering information about enemy operations and capabilities.

Combining size and role produces a dazzling variety of ship types, which can be as broad or narrow as the GM wishes. In campaigns with lots of specialized ship types, the classifications will be precise and detailed; in worlds where all spacecraft can do a little of everything, classifications will be simpler. Space Opera campaigns sometimes borrow terms from the Age of Sail for the proper swash-buckling feel: "Star Galleons" for the big ships, "Clippers" for rapid passenger liners, and "Caravels" for smaller vessels. If ships come in a few distinct classes, they may simply be named for the prototype ship (as the British battleship "Dreadnought" gave her name to an entire type of warship).

Obtaining A Space Vehicle

Gamemasters and players need to consider both campaign and rules matters when deciding how to acquire a vessel.

Setting considerations include things like the monetary cost of a space vehicle, the availability of the type of ship the character wants, and governmental restrictions on spacecraft ownership. Space vehicles are large, powerful, important things; it's unlikely the characters can simply walk into a dealership and buy one, the way Humans buy automobiles. This is even more true if the PCs want a ship that's armed. While many ships probably have "blasters" with which to destroy space debris and the like, few come with military-grade weaponry. The authorities probably take a dim view of private citizens flying around with enough firepower to ravage planets. Unless the characters have some sort of governmental authorization (maybe they're special government operatives, or privateers), there are probably going to be some restrictions on what space vehicles they can and cannot own, and how those vessels are equipped. Whether they try to evade those restrictions, and whether they succeed, are great plot hooks for the GM.

In game terms, characters can acquire a ship in one of three ways. First, since *Star Hero* games are Heroic campaigns, they can buy them with money. However, even the cheapest space vehicle is likely to cost millions, if not billions, of credits, and a high-end vessel outfitted with military-grade systems and luxury appointments could cost even more. That means it's unlikely PCs will have the wherewithal to buy a ship outright (unless they've spent a lot of points on the *Money Perk*). Instead, they may have to do a favor for someone who rewards them by giving them a space vehicle, steal one, or find some other way to get the credits they need.

Second, characters can spend Character Points, buying spacecraft as Vehicles as described in the *HERO System 5th Edition, Revised* rulebook. This neatly avoids the whole "Where do I get the money?" problem, but comes with problems of its own. Since spacecraft need all sorts of systems to function, and PCs are likely to want to add a lot more things that aren't necessary but sure are fun (mega-blasters, cloaking devices, teleporters...), these Vehicles can end up costing a *lot* of points, even after you divide the Vehicle's total cost by 5. In fact, they may cost so many points a starting character can't afford them. In this case, the GM has several options. First, he can follow the rules as-is, forcing the characters to skrimp and save Character Points until they can afford the ship they want. Second, he can make it easier on them some way. Maybe he changes the divisor to 10 or 20, thus substantially reducing the cost, or he could include only some of the ship's systems in the cost of what the PCs have to pay for (maybe they get basics, like artificial gravity and communications systems, for free as "Everyvehicle Equipment"). Or he could let the characters buy

the Vehicle “on credit” and require them to spend 50% of their Experience Points on the ship until it’s paid off.

Third, the GM can simply give the characters the ship. Maybe he wants to ensure they remain together as a group, and uses the ship as the “glue” binding the team together. Or perhaps he arranges the campaign so that sometime within the first few adventures, the PCs have the chance to find, steal, or otherwise acquire their own ship. However he explains or justifies giving the PCs a ship, the GM can then use the ship as the basis for all sorts of stories.

BASIC SPACECRAFT DESIGN

Designing Vehicles in the *HERO System* is a matter of purchasing the effects you desire, rather than stuffing components into a box until it’s full. Consequently the design rules in this chapter describe the sorts of effects (equipment) characters might want for space vehicles (with notes about making them “realistic,” if desired), and then discuss how to create that effect in rules terms. The listing of equipment and systems isn’t comprehensive, of course; no listing could be. But it covers most of the things commonly seen in different types of SF.

It’s important to remember that the *HERO System* rules don’t impose specific requirements of “realism,” or use “realistic” guidelines for things like space vessel equipment. The size and weight of a system isn’t relevant; depending on the technology level, a given system might be huge or tiny. Where this book lists dimensions or other such “realistic” information for equipment, *that information is just a guideline*. Feel free to ignore it or change it, as desired and appropriate for the campaign.

SIZE

The Vehicle Size Table on page 463 of the *HERO System 5th Edition, Revised* covers vehicles up to the size of a destroyer — but in science fiction, spacecraft are often *much* larger than that. The accompanying Expanded Vehicle Size Table provides the cost and game attributes for *really* large vessels.

OTHER VEHICLE CHARACTERISTICS

The STR and BODY of a spacecraft usually depend solely on its Size, but this varies. Spacecraft in general often have more BODY than listed, since they have to survive the rigors of space. Tugs, freighters, carriers, and the like usually have much greater STR than normal, because their whole *raison d’être* is to haul large, heavy things around.

Spacecraft usually need lots of DEF — 5 points or more — because of those same rigors of space. Military vessels usually have even more.

SPACE VEHICLE EQUIPMENT

Typically, Vehicle equipment automatically counts as Bulky, as described on page 469 of the *HERO System 5th Edition, Revised*. Given the enormous size of many space vehicles, some of

EXPANDED VEHICLE SIZE TABLE

Cost	Length (hexes)	Width (hexes)	Area (hexes)	Mass	DCV	STR	KB	BODY
0	1	.5	.5	100 kg	0	10	0	10
5	1.25	.64	.8	200 kg	0	15	-1	11
10	1.6	.8	1.25	400 kg	-1	20	-2	12
15	2	1	2	800 kg	-2	25	-3	13
20	2.5	1.25	3.2	1.6 ton	-2	30	-4	14
25	3.2	1.6	5	3.2 ton	-3	35	-5	15
30	4	2	8	6.4 ton	-4	40	-6	16
35	5	2.5	12.5	12.5 ton	-4	45	-7	17
40	6.4	3.2	20	25 ton	-5	50	-8	18
45	8	4	32	50 ton	-6	55	-9	19
50	10	5	50	100 ton	-6	60	-10	20
55	12.5	6.4	80	200 ton	-7	65	-11	21
60	16	8	125	400 ton	-8	70	-12	22
65	20	10	200	800 ton	-8	75	-13	23
70	25	12.5	320	1.6 kton	-9	80	-14	24
75	32	16	500	3.2 kton	-10	85	-15	25
80	40	20	800	6.4 kton	-10	90	-16	26
85	50	25	1,250	12.5 kton	-11	95	-17	27
90	64	32	2,000	25 kton	-12	100	-18	28
95	80	40	3,200	50 kton	-12	105	-19	29
100	100	50	5,000	100 kton	-13	110	-20	30
105	125	64	8,000	200 kton	-14	115	-21	31
110	160	80	12,500	400 kton	-14	120	-22	32
115	200	100	20,000	800 kton	-15	125	-23	33
120	250	125	32,000	1.6 mton	-16	130	-24	34
125	320	160	50,000	3.2 mton	-16	135	-25	35
130	400	200	80,000	6.4 mton	-17	140	-26	36
135	500	250	125,000	12.5 mton	-18	145	-27	37
140	640	320	200,000	25 mton	-18	150	-28	38
145	800	400	320,000	50 mton	-19	155	-29	39
150	1,000	500	500,000	100 mton	-20	160	-30	40
155	1,250	640	800,000	200 mton	-20	165	-31	41
160	1,600	800	1.25 million	400 mton	-20	170	-32	42
165	2,000	1,000	2 million	800 mton	-21	175	-33	43
170	2,500	1,250	3.2 million	1.6 gton	-22	180	-34	44
175	3,200	1,600	5 million	3.2 gton	-22	185	-35	45
180	4,000	2,000	8 million	6.4 gton	-23	190	-36	46
185	5,000	2,500	12.5 million	12.5 gton	-24	195	-37	48
190	6,400	3,200	20 million	25 gton	-24	200	-38	48
195	8,000	4,000	32 million	50 gton	-25	205	-39	49
200	10,000	5,000	50 million	100 gton	-26	210	-40	50
205	12,500	6,400	80 million	200 gton	-26	215	-41	51
210	16,000	8,000	125 million	400 gton	-27	220	-42	52
215	20,000	10,000	200 million	800 gton	-28	225	-43	53
220	25,000	12,500	320 million	1.6 tton	-28	230	-44	54
225	32,000	16,000	500 million	3.2 tton	-29	235	-45	55
230	40,000	20,000	800 million	6.4 tton	-30	240	-46	56
235	50,000	25,000	1.25 billion	12.5 tton	-30	245	-47	57
240	64,000	32,000	2 billion	25 tton	-31	250	-48	58
245	80,000	40,000	3.2 billion	50 tton	-32	255	-49	59
250	100,000	50,000	5 billion	100 tton	-32	260	-50	60
255	125,000	64,000	8 billion	200 tton	-33	265	-51	61
260	160,000	80,000	12.5 billion	400 tton	-34	270	-52	62
265	200,000	100,000	20 billion	800 tton	-34	275	-53	63
270	250,000	125,000	32 billion	1.6 pton	-35	280	-54	64
275	320,000	160,000	50 billion	3.2 pton	-36	285	-55	65
280	400,000	200,000	80 billion	6.4 pton	-36	290	-56	66
285	500,000	250,000	125 billion	12.5 pton	-37	295	-57	67
290	640,000	320,000	200 billion	25 pton	-38	300	-58	68
295	800,000	400,000	320 billion	50 pton	-38	305	-59	69
300	1 million	500,000	500 billion	100 pton	-39	310	-60	70

kton: kiloton (1,000 metric tons)

mton: megaton (1 million metric tons)

gton: gigaton (1 billion metric tons)

tton: teraton (1 trillion metric tons)

ptton: petaton (1 quadrillion metric tons)

STARSHIP DESIGN AND FOCUS

Most equipment aboard a starship is built with the *Focus* Limitation (plus *Bulky*, as usual for vehicular equipment). If the *Focus* is *Inaccessible*, that means it's not only difficult to move, but difficult to disable — just shutting it off at one point on the ship isn't necessarily going to stop it from functioning throughout the ship, because the ship has backup systems or some other method of maintaining that system even if a particular part of the ship gets damaged or disabled. It takes 1 Turn of effort to disable/break such a system throughout the ship.

An Accessible starship system also probably isn't easy to move (though it may be, depending upon the nature of technology in the setting). However, it's easy to deprive the ship (and its crew) of the use of that system, whether by reprogramming it, damaging it, or some other method.

Unless the GM prefers otherwise, starship equipment uses the standard rules for *Durability* (*HERO System 5th Edition*, pages 189-90) to determine whether a particular attack stops a system from functioning. At the GM's option, characters may define a particular system as *Unbreakable*, with the special effect being not that it's totally undamageable, but that it's so diffused throughout the ship, has so many backup systems, or is otherwise so protected that only massive amounts of damage to the ship as a whole can destroy or disable it.

Starship systems built

their equipment may qualify as *Immobile* instead. It moves with the vehicle, of course, but within the vehicle it stays put. A Teleportation Platform located on Deck 37 Aft remains there all the time; it can't show up on Deck 15 Starboard, even if the characters desperately need it there. The GM determines when *Immobile* applies; the equipment described in this book provides some guidelines. Typically only Vehicles that are large enough to have crews in the dozens or hundreds should have *Immobile* equipment; smaller ships are sufficiently maneuverable and traversable that their equipment remains simply *Bulky*. And of course, the equipment/system itself must be both large and firmly attached to the ship to qualify as *Immobile*.

In some cases, a space Vehicle's equipment only affects its crew, not the Vehicle itself. Often, Vehicle powers affect the vehicle itself, and anyone inside it. For example, a Vehicle with Teleportation can Teleport itself and all its passengers, equipment, and cargo, without having to pay for the *Increased Mass* Adder. However, a Vehicle might have a Teleportation Platform for use by the crew. Obviously, this sort of system does *not* allow the Vehicle itself to Teleport. In most cases GMs can control this situation through the simple application of common sense, but if necessary, they may apply a -0 Limitation, *Only Affects Passengers/Crew*, to any such abilities.

POWER SYSTEMS

The first thing to consider when building a spacecraft is *power*. Space vehicles need a lot of power — to run the drives, maintain life support, operate the sensors and control panels, fire weapons, and so forth. The bigger the ship, the more power it needs.

Chapter Seven provides some information on possible *Star Hero* power sources. Realistically, solar power, radiothermal generators, and fuel cells are most likely for present-day and near-future spaceships. Nuclear fission power would be used on near-future missions to the outer Solar System. Fusion or cold fusion takes over in the next century, to be supplanted by antimatter or singularity power. Zero-point energy is the ultimate “rubber science” power source — it requires no fuel and runs indefinitely.

There are two primary ways to represent spacecraft power in *HERO System* terms: Endurance Reserves and equipment bought to cost no END.

ENDURANCE RESERVES

The first, and most common, way to simulate ship's power is for the ship to have an Endurance Reserve. Virtually every system on the ship, even basics like artificial gravity and life support, runs off this power. Therefore, when determining the END and REC of the Endurance Reserve, you need to take into account both the “basic” systems (things the ship needs to run all the time, like life support) and things that aren't always in use (defensive shields, weapons, propulsion, and so forth). For

story purposes, ideally the ship should have enough power to run its basic and a few military systems at normal strength without difficulty. But if it starts Pushing weapons, using lots of weapons, or the like, it has to dip into “power reserves” (smaller, backup Endurance Reserves), or conserve power, lest it risk running out of energy.

For “basics” the spacecraft needs to maintain constantly (like gravity and life support), and which affect the entire spacecraft (or a significant part of it), consider them the equivalent of Constant Area Of Effect attacks. They affect the entire “area” (the ship), and remain in existence on the Segments between the ship's Phases. However, the ship only pays END for them on its Phases. For equipment not in constant use, like weapons and cloaking devices, END expenditure depends on the SPD of the computer or character operating them.

Ordinarily, a character with an Endurance Reserve specifies whether a power uses personal END or Reserve END. A spacecraft (or starbase) has no personal END, so it always uses Reserve END. If a Vehicle or Base has multiple Endurance Reserves (typically defined as “auxiliary” power or the like; see below), it may draw END from any of them without paying for an Advantage or the like. (Sometimes, Limitations on the Reserve restrict which systems can draw END from it.)

Pages 170-73 have numerous examples of Endurance Reserve-based power systems for *Star Hero* campaigns, many of them suitable for spacecraft. If none of those work for the ship you have in mind, you can easily use them as examples for designing your own.

NO ENDURANCE

Alternately, characters can buy all the equipment on their spacecraft as costing no END. The advantage to this is it's simpler; it eliminates END bookkeeping. The drawbacks are that (a) it increases the expense of the ship, and (b) it removes the potential drama and fun of the ship running out of power in crucial situations. However, if the GM and players are willing to roleplay “we're runnin' outta power, Cap'n!” situations without regard for the rules, this option may work best for the campaign.

“I NEED MORE POWER!”

A common trope in many science fiction stories is for characters to increase the power to a system on their spacecraft to improve that system's performance — they boost the sensors to detect something at greater range, increase the strength of their ship's weapons to punch through an enemy's defenses, or enhance the shields to withstand the effects of a radiation storm.

In *HERO System* terms, increasing equipment performance by pumping in more power is best reflected by Pushing. Pushing in Heroic campaigns is normally limited to 5 Character Points' worth of effect (plus bonuses based on the EGO Roll). That rule works fine for characters, but for spacecraft, GMs should normally allow at least 10 Character Points' worth of Pushing, with no need for an EGO

Roll. However, the GM may require a Systems Operation roll to route the power successfully, and/or an Electronics or Mechanics roll to keep from damaging the system with the pulse of extra power.

Gamemasters may even want to consider allowing spacecraft equipment to be Pushed for *more* than 10 points' worth of effect. There are several ways to approach this. First, GMs can require spacecraft to pay for the privilege — they buy extra points' worth of effect for their equipment, with the *Limitations Only When Pushing* (-1) and *Increased Endurance Cost* (x10 END; -4). However, that can get expensive, and clutters up the spacecraft's character sheet. Second, GMs can simply increase the Pushing threshold — perhaps to 20 points, or maybe varying from system to system ("In this campaign, you can Push sensors for 10 points' worth of effect, weapons for 20 points, and defenses for 30 points, at the standard END cost for Pushing"). Alternately, the effect may depend on the appropriate roll: a character who makes the necessary Skill Roll (typically Systems Operation, Electronics, Mechanics, or Computer Programming) exactly can Push for 10 points of effect, with +5 points per point the roll is made by, to a predefined maximum. The exact parameters depend on the dramatic effect the GM wants to achieve — some campaigns benefit from the dramatic scenes where a character says, "More power to the shields!", others don't.

Reserve And Auxiliary Power

Many spacecraft have one or more backup power sources, usually referred to as reserve power, auxiliary power, batteries, or the like. Some also have specific power sources dedicated to one system or weapon, to keep it functioning when the rest of the ship's power has dwindled or been exhausted. In *HERO System* terms, these are just other Endurance Reserves, with much less END and REC than the ship's main power system, and sometimes other Limitations (such as *Only Powers Specific System*, typically a -¼).

REALISTIC MOVEMENT ENDURANCE

The *HERO System* does not base the END cost for Movement Powers on the weight of the object being moved — but "realistically," the greater a ship's mass, the more END it should require to fly through space. If you want to simulate this in your game, divide the cost of the spacecraft's Size by 5 and add the result to the END cost for Movement Powers. This would also apply to Bases, if they have thrusters or the like.

PROPULSION SYSTEMS

Propulsion systems are the devices used to move spacecraft around, whether puttering along between a planet and its moon or zipping across the Galaxy at many times the speed of light. Moving through space typically involves the Powers *Flight* or *Faster-Than-Light Travel*, though in some rare cases Teleportation or Extra-Dimensional Movement may be involved (with their special

effect being "really fast flight," dimensional portals, or the like).

Under the standard *HERO System* rules, Vehicles' movement automatically does not cost END. Since many spacecraft do have to "power" their movement through fuel, a power plant, or the like, they often take the Costs Endurance Limitation for it.

Acceleration

Given the incredibly high velocities at which spacecraft move, acceleration and its effects could become an issue in your *Star Hero* game. Many GMs prefer not to clutter a game session with these concerns; they assume ship technology and/or the crew automatically takes care of any problems. On the other hand, some Hard SF gamers like to pay close attention to these issues and devise realistic solutions to them.

In game terms, 1 G (one gravity) of acceleration equals 5" of Flight... roughly speaking. Since the *HERO System* uses SPD and Phases to determine when vehicles move, what really matters is a vehicle's velocity *per Turn*. One G of acceleration actually amounts to 60" Flight per Turn. For a vehicle with SPD 12, or for the natural force of gravity which acts every Segment, 1 G therefore does equal 5" Flight. On the other hand, a ship with SPD 3 needs to fly 20" per Phase (either 20" Combat Movement, or 10" with a standard Noncombat

Continued from last page

without Focus are usually so diffuse (as described above), or so intrinsically a part of the Vehicle, that they don't qualify for the Limitation — characters cannot normally destroy or disable them without doing the same to the entire Vehicle. A spacecraft's Movement is the most common example. But don't forget the special effects involved; even without a *Focus* Limitation on a system, an invader or crazed crewmember may be able to damage or disable a system by attacking its access panels, causing it to overload, or the like.



LIGHT DISTANCES

Here's a quick reference to distances traveled by light in given time periods.

One light-second (or light-Segment) is 300,000 kilometers (186,000 miles), or 150,000,000".

One light-Turn is 3,600,000 kilometers, or 1.8 billion hexes.

One light-minute is 18,000,000 kilometers, or nine billion hexes.

One light-hour is a little over 1 billion kilometers, or 540 billion hexes.

One light-day is about 26 billion kilometers, or 13 trillion hexes.

One light-year is 9,467,000,000,000 kilometers, or 4.73 quadrillion hexes.

LIMITED MANEUVERABILITY

As dramatically portrayed in Arthur C. Clarke's short story "Hide and Seek," some starships, particularly those using rocket propulsion, can be difficult to maneuver. You can simulate this with the *Limited Maneuverability* Limitation (*HERO System 5th Edition*, page 316). The GM could even expand the Limitation, making maneuverability worse in -1/4 increments (only one turn per Phase for -1/2, 1 turn per Turn for -3/4, and so forth down the Time Chart).

Multiple) to achieve 1 G acceleration.

As the text below describes the different methods of normal propulsion used in science fiction settings, it offers suggestions for the maximum speeds attainable with various engines. These represent "average" figures for "average-sized" engines and spacecraft with "average" SPDs. In reality, the amount of thrust an engine can generate, and thus the maximum speed it can attain, depends not only on the type of engine, but on the relationship of the power/size of the engine to the size/mass of the spacecraft.

Engine ratings are also chosen to reflect their usefulness in combat. That's the main situation in which gamers need to determine precisely how fast and maneuverable a ship is; the rest of the time, knowing a ship's exact velocity is usually unimportant. Typically, the more advanced an engine, the more efficient it should be at moving a spacecraft around in combat, and the more maneuverability it should provide. Therefore, more advanced engines, such as fusion drives and antimatter drives, allow for faster normal Flight relative to engines like chemical rockets.

G FORCES TABLE

Movement	G	STR	CON Roll	AVLD Damage
60" per Turn	1	5	-0	None
61-120" per Turn	2	10	-1	1d6
121-180" per Turn	3	15	-2	2d6
181-240" per Turn	4	20	-3	3d6
241-300" per Turn	5	25	-4	4d6
301-360" per Turn	6	30	-5	5d6
...and so on				

G FORCES

High rates of acceleration or deceleration, or abruptly sharp turns, can put a lot of extra gravitational or centrifugal force on a character in a vehicle. This doesn't happen very often in everyday life, but when space travel or vehicular combat are involved, it can happen repeatedly.

Forces greater than normal Earth gravity (1G, or 60" per Turn) can cause characters to suffer momentary blackouts (not enough blood to the brain) and redouts (too much blood to the brain). The greater the acceleration (or deceleration, or centrifugal force), the greater the G forces on the character, and the greater his chances of experiencing problems or suffering injury.

To determine the effects of G force on the characters in a vehicle, determine the vehicle's rate of movement per Turn (don't forget to account for moving straight "up" or "down" compared to the local gravity; see page 279). Then consult the accompanying G Forces Table.

In the G-Forces Table, the STR column provides a STR rating for the pull of gravity. If a character tries to move in the increased gravity, he has to succeed with a STR Versus STR Roll against the force of the gravity. If he fails, he can't move. (For "realism" purposes, the GM may not want to allow characters to use STR gained from Density

Increase or Growth when making the STR Versus STR Roll).

The Damage done to the character is Attack Versus Limited Defense damage; the defense is one of the methods of protection from G forces (see below). The character takes this damage on each of his Phases that the increased "gravity" remains in effect.

If the damage would cause the character to lose consciousness, he may attempt a CON Roll at the indicated modifier to maintain quasi-consciousness. The Roll may only be attempted if the character would be at -0 STUN or worse. If it's successful, the character can stay conscious enough to operate his controls (he can take no other actions), though at -1 to Skill Rolls per -2 STUN below 0 he is at. A character may only attempt this Roll to overcome damage from G forces; it must be the most recent damage done, and the only damage that's put the character below 0 STUN.

Any Skills requiring physical movement (including Control Rolls) are at the same penalty as the CON Roll; this is *in addition to* overcoming the STR of the gravity (see above).

Protection From G Forces

Obviously, it's better for the characters in a fast-moving vehicle if they don't suffer any damage from acceleration — especially when FTL travel becomes possible, since rapid acceleration to velocities of that magnitude reduces characters to pulp (as shown in Dan Simmons's novel *Endymion*, where characters must be resurrected after each FTL journey).

In most cases, it's easiest to simply assume that spacecraft come with "G Force Dampers" as part of their "Everyvehicle Equipment," and that a vehicle's Damper suffices to protect its occupants from movement-related G force damage. That way characters only have to worry about acceleration-related issues when the Damper malfunctions or is destroyed. (The example ships later in this chapter use this method.)

If the GM prefers that each spacecraft pay Character Points for its G Force Damper, you can build one in several different ways. The simplest is to buy a PD Force Field that provides 2 points of PD per dice of AVLD damage the acceleration could cause. The Force Field takes the Limitation *Only To Protect Occupants Against G Force Damage* (-1). Thus, a ship capable of 5 G acceleration (5d6 damage) can protect all the occupants from G forces with a 10 PD Force Field costing 5 Real Points. (Of course, a ship could have a Damper providing less than full protection for its maximum acceleration.)

Alternately, the GM might prefer that spacecraft use some other Defense Power for their Dampers. For example, Damage Reduction would counteract some of the acceleration, but not all; Power Defense might be more appropriate than Force Field in some settings or for some types of technology.

OPTIONAL REALISTIC SPACE ACCELERATION RULES

In space, acceleration is constant — as long as a vessel keeps generating thrust in some fashion, it keeps moving faster and faster. That doesn't work well in the *HERO System*, where movement rates are fixed. A *HERO System* Vehicle with Flight 10" moves at Flight 10" every Phase, not Flight 10" the first Phase, Flight 20" the second Phase, and so on. While not realistic, this is much easier for gaming purposes.

If you want to more closely simulate realistic (Newtonian) acceleration with rules, you can use a variant of the *Cumulative Advantage*. Instead of buying up the total effect, you buy up the inches of Flight — each +¼ Advantage after the first doubles the number of inches of Flight the Vehicle can attain (see the accompanying sidebar for Cumulative multipliers). The upper limit of the Cumulative is as fast as the ship can go; this may represent a limit on its fuel supply, its equipment, its structural integrity, or the like. (For even greater realism, establish a flat cost for the *Cumulative Advantage* for Flight, but impose *no* upper limit, other than just under the speed of light. The only other restriction would be how much fuel the ship had; it has to stop accelerating when it runs out of fuel.)

The acceleration for a ship using Cumulative Flight increases constantly — it adds its inches of Flight each Phase until it reaches the maximum. In the example above, the ship would fly as a rate of 10" the first Phase, 20" its second Phase, 30" its third Phase, and so on until it reaches 2,000". The GM may rule that a ship adds velocity at a slower rate, such as inches per Turn.

The drawback to this is that the ship can't decelerate any more quickly. It can only remove velocity at the same rate it adds velocity. That usually means ships have to start braking at roughly the halfway point to their destination. Vehicles using these optional rules cannot apply the *Increased Acceleration/Deceleration Advantage* to their Flight. This form of acceleration only works in the vacuum of space; if a ship can enter atmospheres, it uses normal movement rules in them.

None of the propulsion systems described in this book use these optional rules, unless specifically noted.

ESCAPE VELOCITY

Planets exert gravity on objects on or near them, including spacecraft. This means spacecraft that cannot accelerate continuously (such as twenty-first century rockets) have to exceed the force of gravity to get into orbit or leave a planet. If they can't fly fast enough, they're stuck there... or they may crash into the planet!

Earth's escape velocity is 11.1 km/second. You can determine other planets' escape velocities with the following formula:

1. Determine the planet's gravity (G), relative to Earth. Thus, a planet with twice Earth's gravity has 2 G.
2. Determine the planet's radius (R), relative to Earth (Earth's radius = 6,400 km). Thus, a planet

with a radius of 8,952 kilometers has 1.4 R.

3. Multiply $G \times R$.
4. Determine the square root of the result of Step 3.
5. Multiply the result of Step 4 by 11.1. That tells you the escape velocity in kilometers per second.

Thus, $V_E = 11.1 \times (\text{square root of } (G \times R))$ in kilometers per second.

For the planet described above, the escape velocity would be 11.1×1.67 (the square root of 2×1.4), or 18.5 km/sec.

To convert kilometers per second into inches of Flight per Phase, use the following formula:

1. Multiply the kilometers per second rating by 12. This tells you how many kilometers the vehicle has to move per Turn.
2. Divide the result of Step 1 by the Vehicle's SPD. That tells you how many kilometers it has to move per Phase to achieve that velocity.
3. Multiply the result of Step 2 by 500; that converts kilometers per Phase to game inches per Phase. That's how fast the vehicle has to move (using Noncombat movement) to achieve escape velocity.

For example, Earth's escape velocity is 11.1 km/sec. That equals 133.2 km/Turn. For a Vehicle with SPD 3, that's 44.4 km/Phase, or 22,200" per Phase (call it 22,000" for ease of calculation). That equates to Flight 11", x2000 Noncombat (total cost: 72 points). MegaScale might provide a cheaper way to build this in some cases (e.g., Flight 5", MegaScale [1" = 10 km; +½] [total cost: 15 points]), if the GM allows it.

SPACE ELEVATORS

To overcome the energy cost and other difficulties associated with achieving escape velocity, some scientists have suggested the concept of a "space elevator." Also known, in science fiction terms, as a "beanstalk," a space elevator is a mile-tall structure that reaches from the planet's surface to a geostationary orbit in outer space. Passengers and cargo ferry up and down the stalk in elevators, while ships remain docked to it in outer space and never have to worry about entering the atmosphere, landing on the planet, or getting out of the planet's gravity well.

In *HERO System* terms, you can define a beanstalk as Flight Usable By Others, with the *Extra Time Limitation* to represent how long it takes to get from the surface to a docked ship. Naturally, the structure also shelters users, providing Life Support. Assuming an Earth-size planet (with a geostationary orbit of 35,880 km), it might look something like this:

Space Elevator: Flight 4", Usable Simultaneously (up to 800 kg worth of people and cargo; +¾), MegaScale (1" = 10,000 km; +1 ¼) (24 Active Points); Extra Time (1 Hour; -3) (total cost: 6 points) plus Life Support (Self-Contained Breathing, Safe Environments: High Radiation, Intense Cold, Intense Heat, Low Pressure/Vacuum), Usable Simultaneously (up

OPTIONAL CUMULATIVE FLIGHT MULTIPLIERS

Value	Multiplier
+¼	x2
+½	x4
+¾	x8
+1	x16
+1 ¼	x32
+1 ½	x64
+1 ¾	x125
+2	x250
+2 ¼	x500
+2 ½	x1,000
+2 ¾	x2,000
+3	x4,000
+3 ¼	x8,000
+3 ½	x16,000
+3 ¾	x32,000
+4	x64,000
+4 ¼	x125,000
+4 ½	x250,000
+4 ¾	x500,000
+5	x1,000,000

For multipliers not indicated on the table (such as x200), use the next highest multiplier.

Here's an example:

Flight 10", Cumulative (+½), Increased Cumulative Inches (x200, or 2,000"; +2). Total cost: 70 points.

to 800 kg worth of people and cargo; +¾) (total cost: 31 points). Total cost: 37 points.

Normal Propulsion

“Normal propulsion” refers to engines and drives which move spacecraft in normal space at STL speeds. In *Star Hero* there are two ways to represent normal spacecraft movement. The first is the Hard Science path, using rocket motors and following Newtonian mechanics. The second is the grand tradition of Space Opera, in which spacecraft behave like fighter planes and the objections of science purists are drowned out by the whooshing of engines in vacuum.

DELTA-V

The main currency of realistic space travel is “delta-V,” or how much change in velocity a spacecraft’s engines can impart to it with a given load of fuel. This is important because velocity determines what orbit a spacecraft follows, whether it can escape from a given planet’s gravity well, and how fast it can make the transit to another world.

In *HERO System* terms, this is best represented by using the ship’s movement as its delta-V: if a spacecraft has Flight 12”, it can change its velocity by 12” per Phase. This assumes rockets use Noncombat Movement whenever possible, throttling down to “battle speed” only when maneuvering and evading becomes important. This converts to kilometers per second by dividing total Move per Turn by 6000. For really high-speed rockets, the *MegaScale* Advantage simplifies calculation — buy the final delta-V as MegaScale Flight and then apply the *Extra Time* Limitation to get the time needed for a “full burn” (i.e., to burn the fuel and accelerate the vessel to full speed).

ROCKETS

In the real world, the only way to make yourself move in space is by Newton’s Third Law: for every action there is an equal and opposite reaction. Rockets make use of this by throwing their exhaust away at high speed, imparting an equal momentum to the rocket in the opposite direction. Solar sails take the opposite approach — they catch fast-moving particles streaming out from the Sun, and thereby gain momentum in the same direction.

Realistically, rockets are likely to remain the most popular method of getting around in normal space: they’re compact, powerful, and allow people to move relatively heavy loads. They come in several types.

Chemical Rockets

These are the oldest, and still the most common, form of normal space propulsion. They burn chemicals in energetic reactions to produce thrust. Chemical rockets come in two main types: solid-fuel and liquid-fuel. Solid-fuel rockets contain energetic solid compounds like gunpowder,

which burn once ignited. They are simple and dependable, but can’t be turned off once lit. This makes them most suitable as boosters or missiles. In *HERO System* terms, you can represent a solid-fuel rocket as Flight with 1 Continuing Charge; typically the Charge Never Recovers.

Liquid-fuel rockets combine chemicals like liquid hydrogen and oxygen, or kerosene and oxygen. Unlike solid rockets, pilots can throttle them down, or switch them on and off. In *HERO System* terms, you can simulate liquid-fuel rockets with Fuel Charges.

Chemical rockets intended for manned spaceflights usually cannot exceed 180” per Turn (3 G), since more would endanger the passengers. Chemical rockets for unmanned craft can attain velocities of 420” per Turn (7 G).

A rough guideline for the size of chemical rockets depends on acceleration. High-acceleration rockets (like the ones used to boost off Earth or other planets) take up about 1 hex times the required delta-V in kilometers per second, per hex (5 tons) of payload (defined as everything that isn’t the rocket motor or fuel). This means chemical boosters are really big — a Saturn moon rocket was as tall as a skyscraper, for example.

Thermal Rockets

Thermal rockets take a fluid fuel (usually hydrogen gas) and superheat it. As the fuel gets hot it expands, and this produces thrust. Thermal thrust usually isn’t enough to lift a rocket off a planet, but the rocket has good fuel efficiency, making this a favored choice for future interplanetary missions. Of course, thermal rockets need a heat source.

Nuclear thermal rockets direct the fuel through a compact nuclear fission reactor. This provides a lot of heat, but unfortunately both the reactor and the exhaust pose a radiation hazard. In *HERO System* terms, Nuclear Thermal rockets have up to 60” Flight per Turn with a Side Effect (automatic Change Environment to increase radiation levels; -¼).

Solar thermal rockets focus sunlight directly onto the fuel heating chamber with giant mirrors. This is more efficient than a solar-powered electrothermal rocket, but it drops off in effectiveness as the intensity of sunlight decreases. The large mirrors are also fragile and bulky. Solar thermal propulsion is up to 6” per Turn Flight (0.1 G) bought with the Limitations *OAF Bulky Fragile* and *Requires Solar Proximity* (use full inches within 1 AU of a star, halve the inches of Flight for each AU beyond that; -½).

All thermal rockets are bulky, taking up at least 2 hexes each, and use about ½ hex of fuel per hex of payload per kilometer per second of delta-V. Low-thrust rockets either buy Flight at low velocities to simulate a long slow burn, or else buy MegaScale Flight with a lot of Extra Time.

Ion and Plasma Rockets

These highly efficient rocket motors use extremely tiny amounts of fuel, but accelerate it to tremendous speeds using electrical or magnetic

fields. The motors are fairly compact, but they do need lots of power. Ion motors can only manage very low accelerations — no more than 1" Flight per Turn (0.017 G). Plasma rockets can get up to 30" Flight per Turn (0.5 G). Fuel use for ion motors is very efficient; they need about 1 hex of fuel for up to 20 hexes of vehicle. Plasma rockets need more: about 1/5 of the vehicle hexes per kilometer per second of delta-V.

VASIMR Rocket

This is a real-world space propulsion system, developed for near-future Mars missions. It is popular among space engineers because it combines the relatively high thrust of a thermal rocket with the efficiency of an ion drive. It can't do both at once, but can switch between modes. Price: 6,000 credits, or more.

Flight 30" (60 Active Points); 1 Continuing Fuel Charge (easily-obtained fuel; 1 Month; -0). Total cost: 60 points.



RUBBER SCIENCE ROCKETS

Science fiction writers have come up with a variety of space propulsion systems using technology that doesn't exist yet. They range from things which may fly in a few years to completely imaginary technologies.

Fusion Rockets

If you have fusion power, then a fusion reactor with a nozzle on one end is a pretty effective rocket. Thrust would be high, at least as good as nuclear-thermal rockets and probably better. Fuel consumption would rival VASIMR or ion drives. Fusion rockets are extremely common in science fiction.

Realistically, a fusion rocket can reach velocities of 180" per Turn for manned flights and 420" per Turn for unmanned ships; in Space Opera and the like, they can go much faster. Fuel requirement is 1/100 of the ship's hexes per kilometer per second of delta-V.

Antimatter Rockets

For real oomph, drop a pellet of antimatter in your fuel and stand back. Since antimatter releases staggering amounts of energy, exhaust velocities are very high and so thrust and fuel economy reach amazing levels. This is probably the most powerful rocket possible. However, the drive itself may be fairly large because of shielding requirements (assume ¼ of vehicle hexes), not to mention expensive to run (assume antimatter costs 1,000,000 credits per hex of drive per month). In game terms it can reach just about any level of STL acceleration; the issue is how much G force the crew and contents of the ship can withstand.

Reactionless Drives

These completely blow the laws of conservation of energy out of the water, and are entirely Rubber Science. A reactionless drive moves the ship in a given direction without squirting anything out the back. Their convenience makes them popular in science fiction games — no worrying about fuel consumption. Reactionless drives are pretty compact (1/10 of vehicle hexes), but do use a lot of power. They can have as many inches of Flight per Turn as you want.

SPACE SAILS

Rockets need so much fuel because they accelerate by shooting stuff out the back. But instead of shooting stuff out at high speeds, a spacecraft can try catching stuff that's already moving fast. That's what a sail does.

Space sails come in three varieties. Solar sails ride the *solar wind* — the pressure of light and particles streaming out from the Sun. Obviously this wind isn't very strong, so sails must be huge and delicate to carry even a small payload. The advantage is that they can accelerate indefinitely, building up speed over long periods. Solar sails could be used for unmanned cargo hauling within the Solar System, especially on trips out to the giant planets. A sail ship could also keep going, aiming for Proxima Centauri or some other nearby star. It would take a while — top speed for a solar sail would be around 300 kilometers per second (1.8 million inches per Turn), or 1,000 years per light-year. Sails have about 1 hex of payload per square kilometer of sail.

A second sail design starts with the basic solar sail and adds a huge laser built on Mercury or the Moon. The laser shines on the sail, boosting it as it flies outward. The laser would have to be gigantic,

BUSSARD RAMJETS

For a time in the 1960s it seemed the stars might be easy to reach after all. Aerospace engineer Robert Bussard envisioned a fusion rocket which would use magnetic “scoops” to collect interstellar hydrogen for fuel. A Bussard ramjet would thus be a slower-than-light starship with no need for fuel tanks, and could accelerate almost arbitrarily close to lightspeed. Time dilation would make voyages seem quick to the people on board, allowing expeditions to nearby stars.

Only it doesn't really work that way. Scooping up even the thin hydrogen of interstellar space means friction, and the friction goes up with speed. The maximum velocity for a ramjet would be about 12 percent of the speed of light — not bad, certainly, but not fast enough for easy interstellar travel. If some rubber science method could be devised to negate friction, the Bussard ramjet is the way to go.

In *HERO System* terms, a Bussard drive is FTL Travel at the speed of light, with the *Extra Time* Limitation to reflect the time required to boost up to full speed (at least a year, assuming acceleration is limited to 1 G).

but it doesn't have to be mobile and is entirely reusable. Laser-boosted sails could reach 1 percent of the speed of light, making star probes or trips to the Oort Cloud possible.

The final type of sail is a “plasma sail.” Instead of a thin sheet of silvery plastic, a plasma sail is a web of wires and a bubble of hydrogen. The wires carry power to turn the hydrogen into a plasma, which is contained by the magnetic field generated by current flowing through the wires. The advantage is that the sail itself is lighter, and can interact with the Sun's magnetic field for extra thrust and maneuverability — but at the cost of requiring an on-board source of power.

Solar Sail

This is a typical solar sail, built using the optional space acceleration rules (the vehicle with the sail is assumed to have SPD 2). Price: 12,000 credits per square kilometer, or more.

Flight 1”, Cumulative (+½), Increased Cumulative Inches (x900,000, or 900,000”; +5), Reduced Endurance (0 END; +½) (14 Active Points); OIF Bulky Fragile (-1 ¼), Requires Solar Proximity (use full inches within 1 AU of a star, halve the inches of Flight for each AU beyond that; -½). Total cost: 5 points.

ROCKETS TO THE STARS

To reach other stars, you don't need a faster-than-light starship; all you really need is one of the rockets described above and a whole lot of fuel. It may take a while, though. Chemical and thermal rockets can't really power a ship to anything above 1 percent of the speed of light (3,000 kilometers per second [18 million inches per Turn]). Even that would take a gargantuan ship and a long time to accelerate a tiny payload on its way. At 1 percent of the speed of light, a probe to Alpha Centauri would take more than 400 years to make the trip — which suggests it would be better to wait for someone to invent a faster rocket.

Fusion and antimatter rockets would be able to reach speeds on the order of 10 percent of light-speed (30,000 kilometers per second [180 million inches per Turn]). That would put Alpha Centauri within reach for an unmanned probe. Humans traveling at those speeds would need some way to pass the decades in flight. There are two possibilities:

Generation Ships

Who cares how long it takes? Launch a large self-contained space colony at the stars, and entire generations can grow up and grow old before the ship reaches its destination. By the time Humans can launch something big at thousands of kilometers per second, they should have solved the problems of maintaining a self-contained environment for decades. Generation ships would carry populations of hundreds or thousands (carefully chosen for genetic diversity), and everything a colony might need, because it's going to be a one-way trip.

The two main problems with generation ships are: why go, and why stop? Why go — why expend

the unimaginable sums to build and launch a generation starship when nobody alive at the launch lives to see its arrival? One possible reason is a terrible calamity which promises to make the home planet uninhabitable. It has to be a calamity which can't be solved by the kind of effort needed to launch a starship. Perhaps a black hole or neutron star is due to pass through the Solar System, disrupting orbits and flinging homeworld into its sun or deep space.

Why stop — if the starship is comfortable and has everything the crew needs for long-term survival, why should they bother stopping at the target system for the tedious job of colonizing a planet? After generations in space, they might prefer life aboard ship. Of course, the crew may not have any say in the matter, if the ship is controlled by a computer system following instructions programmed by the ship's builders. Or the natural Human (Venusian, Denebian...) inclination to explore new places might make the inhabitants *want* to get off the ship.

Hibernation

Bears do it, brine shrimp do it, why not Humans? If a way could be found to put the crew into stasis, the whole project of interstellar travel is greatly simplified. Crew in hibernation (sometimes referred to as “cold sleep”) use less life support, don't get bored, don't die of old age before the trip is over, and don't care how long the journey takes. With hibernation equipment and a sufficiently long-lived power supply, ships could take decades or centuries to travel between stars. Hibernation is a fairly common means of interstellar flight in Low SF settings.

Hibernation Unit: This is a one-person “cold sleep pod.” It requires external power, but so little that it can run for decades without maintenance — the need for power is a special effect, not an END cost. Price: 160 credits, or more.

Life Support (Longevity: age at one-eighth normal rate) (3 Active Points); OIF Immobile (-1 ½). Total cost: 1 point.

Faster-Than-Light Propulsion

All faster-than-light (FTL) travel is currently beyond the laws of physics as we understand them. This means GMs are free to select their FTL drives on the basis of how they affect the campaign structure, rather than strict realism (though once a method is chosen, the GM should try to discern, make clear to the players, and follow its “realistic” implications). Factors to consider are the speed of interstellar travel, the cost and reliability of FTL flight, what constraints on operation exist, and how ships interact with the universe while traveling.

SPEED

Speed of FTL flight in a star-spanning campaign is a relative matter. The question is how quickly characters can go from one inhabited star system to another. If inhabited systems are close

together, on the order of 10 light-years or so, then a drive capable of 100 to 1000 times the speed of light makes them easy to reach. Greater distances require faster drives.

Speed of travel affects the structure of interstellar governments, the conduct of trade, and a host of other issues. If star travel is as rapid as, say, modern air transport, then interstellar society can be fairly uniform — the same fast food outlets on every planet. Quick starflight also allows highly centralized government, efficient interstellar law enforcement, and a well-integrated web of commerce.

Slow FTL travel creates a situation more like the Age of Sail. Interstellar empires are possible, but the local rulers or governors have a lot of autonomy because they can't wait for instructions from home in a crisis. Military forces can't react quickly, either. Trade is possible, but becomes much more speculative and risky, since market conditions can change during the voyage.

Another point to consider is how fast ships are compared to each other. Can a ship with bigger engines go faster in FTL mode than an underpowered one... or is there a set FTL speed, with the engine size varying only to match the size of the ship? If big ships can go faster, then they may act as "carriers" for smaller vessels. If crowding the ship with engines and power makes it faster, then governments and businesses can build dedicated courier ships to carry messages and important passengers. Warships will be either fast and lightly-armored or slow and well-protected.

As a useful guideline, the GM should look at the astrographical scope of his campaign and decide how quickly he wants characters to travel across it. If, for example, a campaign uses the entire Milky Way Galaxy (100,000 light-years in diameter), and the GM wants characters to have the ability to cross from one edge of the Galaxy to the other in one year, then the fastest FTL drives have to be 100,000 times the speed of light.

COST AND DIFFICULTY

If star flight is expensive or dangerous, it becomes a lot less common, even if travel is fairly rapid. The best modern-day analogy is orbital spaceflight — a Space Shuttle reaches orbit in less than an hour, but the cost is astronomical and the danger is real. Instead of interstellar tourism, star travel becomes the province of highly-trained and dedicated explorers like modern astronauts. Colonies in other star systems are smaller, without a flow of poor immigrants looking for a better life. Instead, colonies begin with small but well-equipped groups, and grow by their own efforts. This tends to create highly diverse colony worlds after a few centuries, since difficult star travel makes it hard for the mother world to retain control. Trade is limited to extremely high-value items worth the risk and expense.

Expensive and dangerous interstellar travel also encourages the development of less-than-habitable planets in colonized star systems. It may be easier, and cheaper, to terraform a difficult

planet (like Venus) than try to establish colonies on Earth-like worlds that are too far away to travel to easily. Campaigns in such a setting may spend long periods in one system.

On the other hand, if star flight is cheap and easy, it's more like air travel on twenty-first century Earth: it takes place constantly; even relatively low-income people can afford to fly occasionally; many companies or institutions compete for travelers' credits; trade and contact between worlds is commonplace. That makes for a very different campaign setting, one in which the PCs can flit from one planet to another without trouble.

CONSTRAINTS

Gamemasters can make FTL travel subject to whatever limits they desire. Many drives in fiction don't work near a planetary mass (or within the gravity well of a star), requiring a voyage in normal space to the "jump point" or "warp limit" before activating the FTL drive. This has useful dramatic effects: space pirates can waylay ships in normal space, an invading armada can't materialize directly above a planet, and star travelers can't just jump away from problems.

Some drives require a living pilot, possibly with a psionic talent or cybernetic modifications. This has two effects: designers cannot build automated starships, which makes interstellar message drones and FTL missiles impossible; and it gives the pilots a great deal of leverage. Pilots' organizations (like the Spacing Guild of Frank Herbert's *Dune*) become major players in interstellar politics if star travel is a limited monopoly. Characters with the right Talent (see page 51) can always find work, even if they have serious personality flaws or a checkered past.

Alternately, the interstellar drive may depend on a very rare substance, like *Star Trek's* dilithium crystals or the psychoactive spice melange in *Dune*. Whoever controls this resource controls the Galaxy, or at least travel between planets. Sources of "unobtainium" become the galactic equivalent of oil fields or gold mines. A remote frontier world can boom overnight if prospectors find a useful lode. If only one civilization or species knows about the magic ingredient, all the others will try as hard as they can to learn the secret and break the monopoly.

Some methods of star travel rely on natural features of the Galaxy — wormholes connecting distant star systems, stargates (either natural or left by an ancient civilization), or just regions where light moves faster. This kind of "geography" determines how colonies spread and where an interstellar empire's fleets can conquer. Star systems on wormhole routes are "valuable real estate" and will be settled even if they aren't especially inviting. Remote systems without stargates may be home to weird and isolated societies.

INTERACTIONS

Some FTL drives evade Einstein's speed limit by taking short cuts through other universes or dimensions. A ship in hyperspace or jumpspace is

BREAKING THE FTL MONOPOLY

A very interesting campaign hook is to set up the society with one set of rules for FTL travel... and then introduce a technology which changes them. Suppose interstellar travel has been the monopoly of psionic star pilots for centuries; now some genius has found a way to let anyone pilot a ship. Suddenly the long peace enforced by the Guild is over: the wealthy industrial planets are building space fleets to conquer their neighbors. But the economic malaise has ended, too: traders are venturing out in search of markets, and explorers are finding new worlds. The characters could rediscover lost colonies forgotten by the Guild, and there are great opportunities for anyone with a ship, a trusty blaster, and an adventurous spirit.

completely cut off from the normal universe. This has a number of interesting implications. Enemy fleets may be able to travel undetected to the heart of an interstellar empire; this means each planet has heavy defenses, creating a situation like castle-studded feudal Europe or Japan.

Ships in hyperspace may also be cut off from communication or help, which means the passengers and crew are entirely on their own if something goes wrong. This makes a ship in jumpspace a great location for a “whodunit” style mystery or a “mad slasher” horror scenario.

An interstellar civilization linked by ships jumping through hyperspace is like a group of islands connected by air routes. The empty expanses of space between the stars can hold all kinds of surprises — brown dwarf stars too dim to see, drifting relics of ancient alien cultures, or space-dwelling life forms. Hyperspace may have similar features, or be home to even stranger things....

FICTIONAL STARDRIVES

Over time, science fiction stories and films have created a suite of fictional star drives with interesting properties.

Warp Drive

The FTL drive made famous by *Star Trek*, a warp drive works by distorting (“warping,” so to speak) the space-time continuum in ways that allow the ship to propel itself at superluminal speeds. Similar to warp drives are “folded space drives,” which compress the distance the ship travels as it moves. The ship moves at a modest speed, but covers great distances because the drive “shrinks” the space in front of it.

Warp drives usually allow starships to interact with the rest of the universe, though slower-than-light weapons aren’t very useful against a ship in warp drive. Warp drives aren’t usually limited by natural conditions, but sometimes depend on rare elements. Distorting space requires a *lot* of energy (and the faster you go, the more energy you need). This means warp travel is fairly expensive for all but the most advanced and affluent Space Opera civilizations.

Movement with a warp drive is non-Newtonian — the ship moves forward while the drive is on, and stops when the drive is shut off. Navigation is fairly simple: the crew can look out of the cockpit window and see where it’s going. Warp drive units in fiction are bulky, requiring as much as half the total hexes of the ship.

Warp Drive: This is a typical warp drive engine, able to drive its ship at the rate of one light-year per day. Price: 28,000 credits, or more.

FTL Travel (1 LY per day) (28 Active Points); Costs Endurance (-½), Increased Endurance Cost (x10; -4). Total cost: 5 points.

Hyperdrive

Hyperdrive works by going “around” normal space, through another universe or dimension where distances are shorter. The exact nature

of “hyperspace” is up to the GM — it can be a featureless void, or a universe of its own with bizarre natural laws (and possibly inhabitants). There may be different “levels” of hyperspace allowing faster travel with greater risk or energy expenditure. Hyperspace may be easily navigable, or ships could instantly become lost without a beacon to follow (and communications equipment to follow it with). It may have no planets or inhabitants, or it could be the realm of bizarre creatures whose very appearance drives Humans insane.

Navigating in hyperspace can be tricky. Often the ship emerges only generally near the target system, and hazards in hyperspace itself may push the starship off course. Gamemasters may require characters to buy Navigation (Hyperspace) to find their way, or may forbid them to have any such Skill, forcing them to rely on established beacons or landmarks.

Hyperdrive usually requires a large pulse of energy when entering and leaving hyperspace. Some types of hyperdrive need a large fixed portal (like a star gate; see below) to enter or leave hyperspace (and usually beacons to guide ships between portals). This naturally makes the portals very important and well-protected locations, but makes it possible for any spaceship to venture into hyperspace. Movement while in hyperspace itself can be Newtonian, or subject to whatever bizarre natural laws exist in the alternate dimension.

If hyperspace is generally empty and featureless, posing few threats to ships or characters, you can build hyperdrives as MegaScaled Teleportation with the *Extra Time* Limitation. If hyperspace is a “real place,” then hyperdrive is a combination of Extra-Dimensional Movement and FTL Travel (or, in some cases, MegaScale Teleportation).

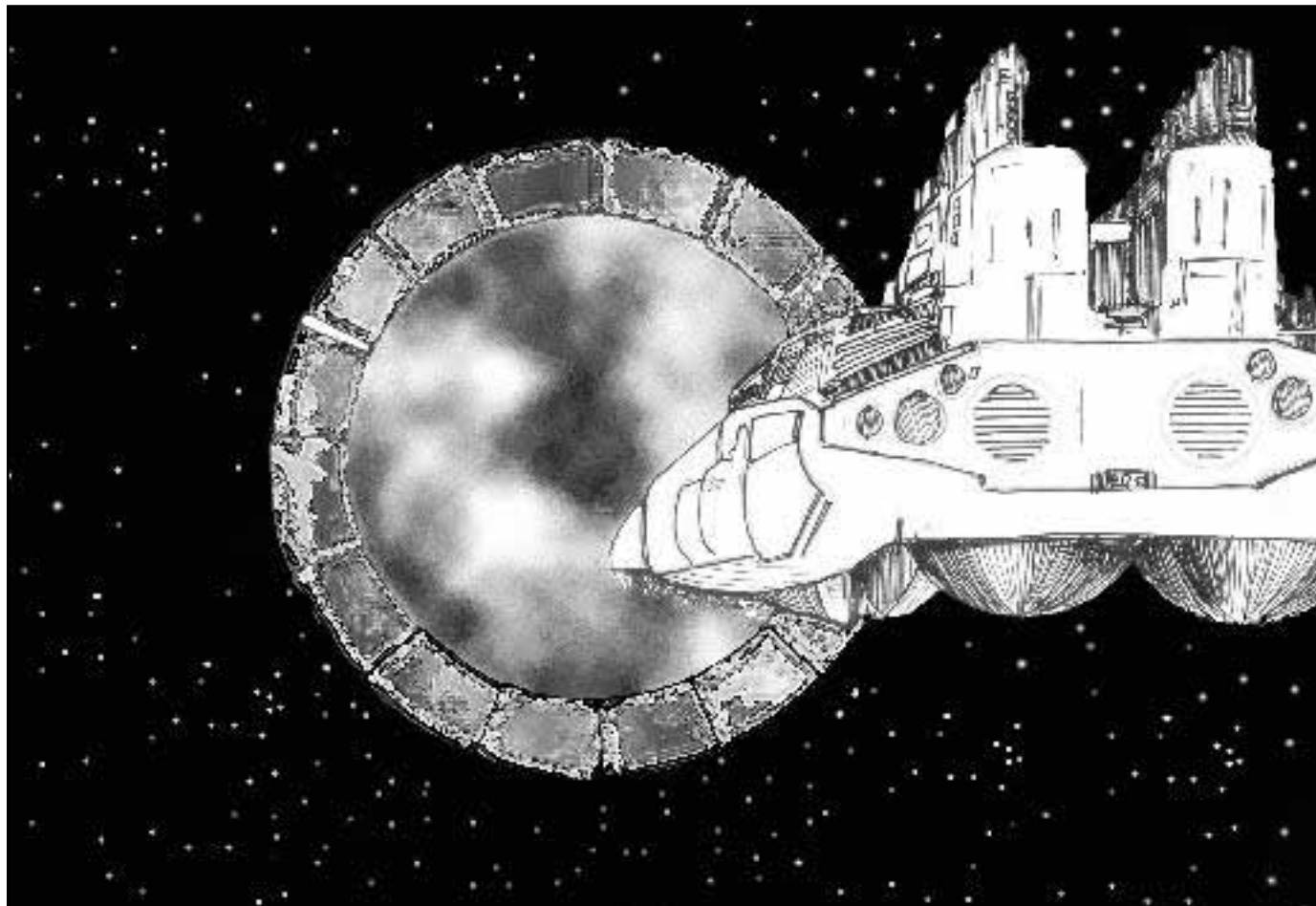
Hyperdrives are usually fairly bulky systems requiring a lot of power. Assume the hyperdrive takes up about one-fourth of the ship’s total space.

Hyperdrive: This is basic hyperdrive, built on the assumption that nothing noteworthy happens to ships or people in hyperspace. It has a range of up to 10 light-years. Price: 90,000 credits, or more.

Teleportation 10”, MegaScale (1” = 1 light-year; +3 ½) (90 Active Points); Extra Time (1 Week for a full journey, or a little more than 1 LY per day; -4 ½), Increased Endurance Cost (x5 END; -2). Total cost: 12 points.

Hyperspace Engine: This is a form of hyperspace travel used in settings where hyperspace itself has features and possible dangers. Characters need to use Navigation (Hyperspace) to find their way while there. Price: 53,000 credits, or more.

Extra-Dimensional Movement (any location in hyperspace, corresponding to the location in normal space where the ship enters) (total



cost: 25 points) plus FTL Travel (1 LY per day) (28 Active Points); Costs Endurance (-½), Increased Endurance Cost (x10; -4), Only In Hyperspace (-1) (total cost: 4 points). Total cost: 29 points.

Jump Drive

The jump drive lets starships “jump” instantaneously from one star system to another, whether by quantum tunnelling, converting the ship to tachyons, or some other rubber science method. Navigating with a jump drive is very difficult — a mistake can send the ship to the wrong star system, or possibly to deep space. Really serious errors could catapult a jump ship across the Galaxy, or back in time, or into an alternate dimension. A more practical concern is fuel; if a ship jumps to a place where it cannot refuel, it may not have enough energy left to make more jumps!

You can build jump drives using Mega-Scaled Teleportation. Jump drives can be compact devices (about 1/10 of ship’s hexes), but require a lot of power.

Jump Drive: A standard jump drive, suitable for most ships. Price: 47,000 credits, or more.

Teleportation 5”, MegaScale (1” = 10 light-years; +3 ¾) (47 Active Points); Extra Time (1 Turn; -1 ¼), Increased Endurance Cost (x10 END; -4), Requires A Navigation (Space) Roll (-½). Total cost: 7 points.

Star Gates And Wormholes

These are FTL drives which are outside the ship itself. Star Gates are immense portals, either into Hyperspace or linking distant systems through a form of Teleportation. Wormholes are as-yet-undiscovered natural holes in space connecting places light-years apart. Navigating a wormhole or star gate may be about as hard as navigating a railroad (the gate leads where it leads, and you either go through or you don’t), or it may require tricky flying through hyperspace. Gates may be the only way to travel — in which case they must be moved to other star systems aboard slower-than-light ships — or they may be only a supplement to other drives. *Babylon 5* posited gates into hyperspace for the convenience of small craft, while large starships could carry their own gate-opening technology.

However they work, stargates and wormholes instantly become places of vital importance. Control of a portal means control of all traffic along that route; depending on the layout of the system, dozens of worlds could depend on a single gateway.

Star Portal: This is a gateway through a safe hyperspace; ships must go to other gates. The gates, built by some ancient civilization and not fully understood by Humans, are irreplaceable and heavily guarded. Only one ship can enter the portal at a time, and it has to be small enough to fit through. Ships themselves don’t have to pay for this “engine” at all; the gates are maintained by an

appropriate authority (which taxes and regulates them as it sees fit). Price: 335,000 credits, or more.

Teleportation 10", MegaScale (1" = 1 light-year; +3 ½), Area Of Effect (3,500" Radius; +2 ¾), Usable As Attack (does not work on ships with incompatible drives or certain types of energy sources; works on masses of up to 800 mtons; +9 ¼) (330 Active Points); OAF Immobile (-2), Independent (-2), Extra Time (1 Week for a full journey, or a little more than 1 LY per day; -4 ½), Increased Endurance Cost (x5 END; -2), Only To Fixed Locations (-½), Gate (-½), Only One Ship Can Use Portal Per Segment (-¼) (total cost: 26 points) plus 1 Floating Fixed Location (any other portal, chosen at the time of use) (5 Active Points); OAF Immobile (-2) (total cost: 2 points). Total cost: 28 points.

Wormhole: This is the same as the Star Portal, but without the OAF Limitation; the *Independent* Limitation reflects the fact that the persons controlling the wormhole can't stop it from shifting, collapsing, or temporarily closing. Additionally, the Fixed Location does not "float." Total cost: 33 points.

Inertialess Drive

The big limitation to faster-than-light travel in Einsteinian space is that mass increases with velocity. Consequently the energy to accelerate approaches infinity the closer you get to the speed of light. Novelist E. E. "Doc" Smith came up with one way around that problem: if your ship can be made "massless" or "inertialess" then it can cruise right through the speed of light and keep on accelerating. (How does that work?

TIME DILATION

As objects move at speeds approaching the speed of light, weird things happen. Mass increases and time slows down. The formula for time dilation is the square root of $(1 - v^2/c^2)$, where v is the ship's speed and c is the speed of light. So if you're going half the speed of light, your time dilation effect is the square root of $(1 - .25/1)$, or 0.86. So for every minute a clock ticks on Earth, a clock on board your ship only ticks 52 seconds. The effect gets more pronounced at high speeds. Clever GMs can get some interesting story hooks out of this, the way Dan Simmons does in his "Hyperion" novels.

Speed	Time Dilation	Days To Go 1 Light-Year
0.5 x lightspeed	0.86	730 (objective) / 632 (crew)
0.6	0.80	608 / 487
0.7	0.71	521 / 372
0.8	0.60	456 / 274
0.9	0.44	406 / 177
0.95	0.31	384 / 120
0.99	0.14	369 / 52
0.999	0.045	365 / 16
0.9999	0.014	365 / 5

Of course, rubber science FTL travel often ignores time dilation entirely — it's inconvenient and messy for storytelling purposes. So *Star Hero* GMs should feel free to ignore it as well, if they want.

Good question.) Inertialess drives are simply the *FTL Travel* Power. They tend to occupy about a quarter of the ship, but can also be used as a normal Flight drive. Price: 1,400 credits, or more.

Cost Inertialess Drive

- 13 *Inertialess Drive:* Multipower, 45-point reserve; all Costs Endurance (-½), Increased Endurance Cost (x5 END; -2)
- 1u 1) *FTL Mode:* FTL Travel (1 LY per Hour); Costs Endurance (-½), Increased Endurance Cost (x5 END; -2)
- 1u 2) *Spaceflight Mode:* Flight 10", MegaScale (1" = 1,000 km, can scale down to 1" = 1 km; +1 ¼); Costs Endurance (-½), Increased Endurance Cost (x5 END; -2), Only Works In Space (-½)

Total cost: 15 points

Probability Drive

First made famous in Douglas Adams's *Hitchhiker's Guide to the Galaxy* series, a probability drive alters the laws of chance to the point where the odds that the ship will spontaneously hop to its destination become good. Amazingly, this isn't as crazy as it sounds; Hard SF maven David Brin used a similar drive as one method of FTL travel in his "Uplift" books. Probability drives are MegaScaled Teleportation, sometimes with a Side Effect of Unluck or Change Environment.

WEAPON SYSTEMS

Now comes the interesting part: blowing holes in the opposition. Spacecraft weapons come in three main classes: Missiles (which are essentially little unmanned spaceships that hunt down the target); Beams and Guns (which fire directly at the target); and Special Weapons (which do other stuff). Missiles and beams are mostly realistic weapons, but Special Weapons are often deep in Rubber Science territory.

Characters often build starship weapons as Multipowers, with one ordinary slot (for shots at nearby targets) and one slot with the *MegaScale* Advantage (for use against long-range targets). The practical limit on a weapon's range is 300,000 km — anything faster than that and the weapon's projectile/beam is moving faster than the speed of light. Of course, warp and inertialess starships often roar around at FTL speeds anyway, and may have weapons that can work at those speeds (or not: *Star Trek* ships have to "drop out of warp" to engage in most forms of combat).

Typically weapons occupy ½ to 1 hex per 10 Active Points, but the GM may vary this as he sees fit.

Missiles

Missiles are warheads that propel themselves into the enemy's ship. The simplest missiles use nothing but the force of their impact to damage the foe, while others mount explosive or atomic warheads. In most cases they're short-range weapons, though theoretically a rubber science power source could keep one flying after its target for a long, long time.

In *HERO System* terms, most missiles are small Vehicles (or Automatons) themselves, equipped with Flight engines, sensors, whatever other systems they need, and a No Range attack with 1 Charge which Never Recovers (and destroys the Vehicle). Their guidance comes from a remote operator (which can be cut off with interference, a Physical Limitation), or an onboard computer (which means the builder has to buy Senses for it). In most cases it's not necessary to buy the computer separately (just assume the missile has INT 10), but the most sophisticated missiles do need a separate computer. They have the Physical Limitation, *Can Be Missile Deflected By Spacecraft* (Frequently, Greatly Impairing; 15 points), to reflect the fact that point defenses (see page 198) can destroy them before they impact their target. They also have the Physical Limitation, *Costs Firing Ship 10 END To Fire* (Frequently, Slightly Impairing; 10 points), to represent the END cost of launching them at a target.

NUCLEAR SPACE MISSILE

Val	Char	Cost	Notes
10	STR	0	Lift 100 kg; 2d6 [0]
10	BODY	0	
5"x.5"	Size	0	Mass 100 kg; -0 KB; -0 DCV
5	DEF	9	
20	DEX	30	OCV: 7/DCV: 7
6	SPD	30	Phases: 2, 4, 6, 8, 10, 12
Total Characteristic Cost: 69			

Movement: Ground: 0"
Flight: 40"/40,000"

Abilities & Equipment

Cost	Power	END
109	<i>Nuclear Warhead:</i> RKA 20d6, Explosion (+½), MegaArea (1" = 10 km; +½); No Range (-½), 1 Charge which Never Recovers (-4)	[1nr]
15	<i>Electronic Counter-Countermeasures:</i> Radio Group Flash Defense (15 points)	0
7	<i>Electronic Counter-Countermeasures:</i> Power Defense (15 points); Only Versus Electronic Jamming (-1)	0
125	<i>Engine:</i> Flight 40", x1,000 Noncombat, Non-combat Acceleration/Deceleration (+1); 1 Continuing Fuel Charge (easily-obtained fuel; 1 Minute; -¾), Only In Space (-¼)	[1cc]
-12	<i>Only Flies:</i> Running -6"	
50	<i>Radar Array:</i> Multipower, 50-point reserve	
2u	1) <i>Close-Range Radar:</i> Radar (Radio	

	Group), Discriminatory, Analyze	0
5u	2) <i>Far-Range Radar:</i> Radar (Radio Group), Discriminatory, Analyze, MegaScale (1" = 100 km, can scale down to 1" = 1 km; +1)	0
18	<i>Radar Enhancers:</i> +12 versus Range for Radio Group	0
24	<i>Communications Systems:</i> HRRP (Radio Group), MegaScale (1" = 100 km, can scale down to 1" = 1 km; +1)	0

Skills

20	<i>Homing Sensors:</i> +10 OCV with Nuclear Warhead
20	<i>Maneuverable:</i> +4 DCV
3	<i>Stealth Systems:</i> Stealth 13-

Total Abilities & Equipment Cost: 386

Total Vehicle Cost: 455

Value Disadvantages

15	Physical Limitation: Can Be Missile Deflected By Spacecraft (Frequently, Greatly Impairing)
10	Physical Limitation: Costs Firing Ship 10 END To Fire (Frequently, Slightly Impairing)
15	Physical Limitation: Remote Guidance (enemy ships can interfere with or disable guidance system (Infrequently, Fully Impairing))

Total Disadvantage Points: 40

Total Cost: 415/5 = 83

Description: This writeup represents a typical SF nuclear missile, suitable for use only in space. It has a range of approximately 1,000 kilometers; beyond that point it runs out of fuel, and drifts in the direction it was last flying until it hits something (which usually triggers the explosion).

The goal of the person guiding the missile is to try to get right next to its target before detonating. If necessary the guider can detonate the warhead as long as a target is within range to be damaged.

Price: 392,000 credits, or more.

Beam Weapons

Beam weapons tend to be the most common type of starship armament in *Star Hero* games, because they're easy for gamers to use. In a setting using rubber science, they can be explained as just about any type of energy; the examples listed below assume some reasonable effort to be "realistic."

LASERS

Lasers are the most likely energy weapons in near-future scenarios. They're currently under development and have great destructive potential. Lasers use a fair amount of power, however, and are themselves rather fragile. In Space Opera games, generic energy beam weapons are often called "lasers" even though they don't act like them.

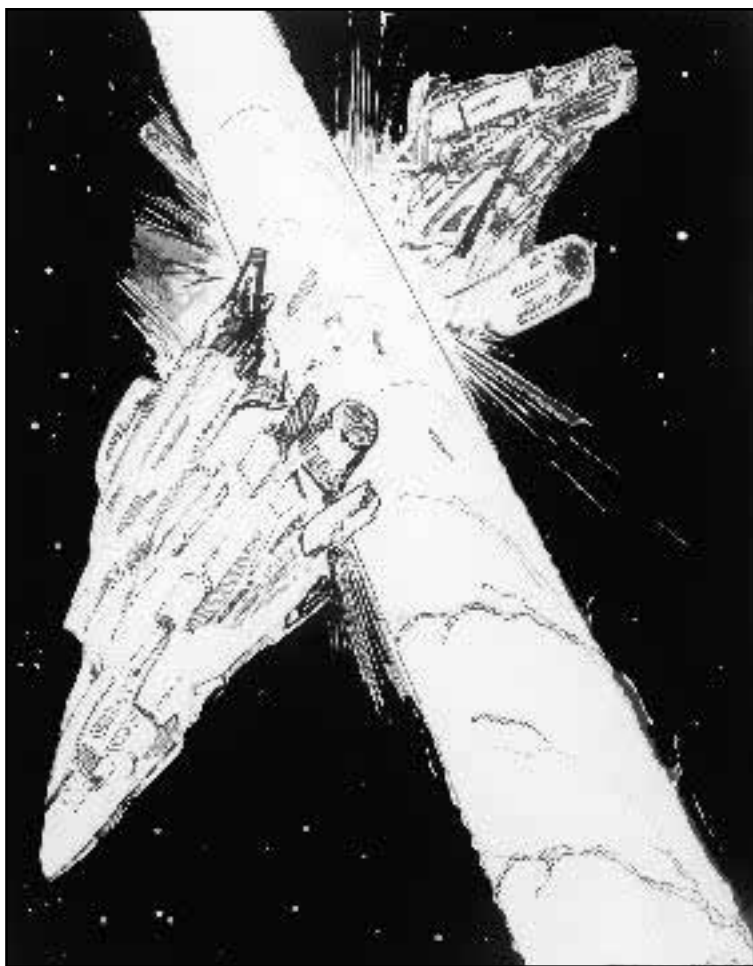
Space Combat Laser: Designed for use against lightly-armored spaceships and satellites rather than heavily-protected warships. Price: 10,110 credits, or more.

FTL MISSILES

For the ultimate in ranged attacks, starships can fire FTL missiles. These are built as Vehicles with SPD 6 and enough Flight to reach twice the speed of light. The speed of light, *c*, is 300,000 km per second, or 1.8 billion hexes per Turn, which means a SPD 6 missile that can reach 2*c* needs 600 million inches of Flight per Phase (call that Flight 6", x100 Million Non-combat, costing 142 points). At that speed, doing damage based on a Move By (to avoid the horrendous Move Through OCV penalty), the missile would inflict 120 million dice of Normal Damage. (Make the missile SPD 12, and the damage becomes a mere 60 million dice.) Obviously, building or using an attack like this requires the GM's permission.

SUMMON MISSILE

Because missiles are Vehicles, and Vehicles have a defined point cost, with the GM's permission characters could define a ship's missiles using Summon, instead of buying them individually. The cost of Summon derives from the Vehicle's total cost (not its cost divided by five), and the Slavishly Loyal (+1) Advantage must be applied. Applicable Limitations typically include Focus (as with other starship equipment) and Charges (the number of missiles the ship can carry for that launcher at once). Refilling the Charges requires manufacturing new missiles, or visiting a military supply depot, but the power does not get an Increased Recovery Time Limitation for this, since that doesn't necessarily take any extra time.

**Cost Space Combat Laser**

- 90 *Space Combat Laser*: Multipower, 202-point reserve; all OIF Bulky (-1), Real Weapon (-¼)
- 9u 1) *Distant Shot*: RKA 6d6, Autofire (5 shots; +½), MegaRange (1" = 10 km, can scale down to 1" = 1 km; +¾); OIF Bulky (-1), Real Weapon (-¼)
- 6u 2) *Close-Range Shot*: RKA 6d6, Autofire (5 shots; +½); OIF Bulky (-1), Real Weapon (-¼)

Total cost: 105 points.

Superheavy Laser: A major military laser capable of punching through heavy armor at a range of up to one light-second. Price: 18,000 credits, or more.

Cost Superheavy Laser

- 167 *Superheavy Laser*: Multipower, 375-point reserve; all OIF Bulky (-1), Real Weapon (-¼)
- 17u 1) *Distant Shot*: RKA 10d6, Autofire (5 shots; +½), MegaRange (1" = 100 km, can scale down to 1" = 1 km; +1); OIF Bulky (-1), Real Weapon (-¼)
- 10u 2) *Close-Range Shot*: RKA 10d6, Autofire (5 shots; +½); OIF Bulky (-1), Real Weapon (-¼)

Total cost: 194 points.

PARTICLE BEAMS

Particle weapons are also near-future tech, with work on them progressing right now in various military labs. They fire streams of energetic

protons at the target. Particle weapons are powerful but have limited range because the beam tends to disperse as the particles repel each other.

Particle Accelerator: A huge weapon running down the center of a ship's hull. Due to its size and configuration, it can only be fired in the direction the ship's nose points, and it cannot be aimed at targets closer than a kilometer. Price: 7,860 credits, or more.

RKA 10d6, Penetrating (+½), MegaScale (1" = 1 km; +¼) (262 Active Points); OIF Bulky (-1), Real Weapon (-¼), Limited Arc Of Fire (60 Degrees, Only On Same Horizontal Level; -¾). Total cost: 87 points.

OTHER BEAMS

In the history of SF film and fiction, starship combatants have deployed a whole host of other colorful beams. They include:

Ion Cannon: Made popular by *The Empire Strikes Back*, an ion cannon fires a blast of ionized hydrogen, creating electrical effects that bypass a ship's hull defenses (but are useless against force fields). This is of course a highly rubber science weapon. Price: 11,250 credits, or more.

Cost Ion Cannon

- 87 *Ion Cannon*: Multipower, 195-point reserve; all OIF Bulky (-1), Real Weapon (-¼)
- 9u 1) *Distant Shot*: RKA 4d6, NND (defense is ED Force Field or Force Wall; +1), Does BODY (+1), MegaScale (1" = 1 km; +¼); OIF Bulky (-1), Real Weapon (-¼)
- 8u 2) *Close-Range Shot*: RKA 4d6, NND (defense is ED Force Field or Force Wall; +1), Does BODY (+1); OIF Bulky (-1), Real Weapon (-¼)

Total cost: 104 points.

Fusion Beam: A starship-sized version of the plasma weapons for soldiers, this ejects fusing hydrogen at the target and somehow keeps it from dispersing and cooling before impact. Price: 5,070 credits, or more.

Cost Fusion Beam

- 42 *Fusion Beam*: Multipower, 94-point reserve; all OIF Bulky (-1), Real Weapon (-¼)
- 4u 1) *Distant Shot*: RKA 5d6, MegaScale (1" = 1 km; +¼); OIF Bulky (-1), Real Weapon (-¼)
- 3u 2) *Close-Range Shot*: RKA 5d6; OIF Bulky (-1), Real Weapon (-¼)

Total cost: 49 points.

Guns

These weapons project a physical object directly at the target through some means, causing damage through kinetic impact, explosions, or the like. The most common example in SF is the *railgun*, essentially a huge gauss gun (see page 150). Even high-velocity projectiles can't go as fast as beams, so railguns are limited to short range — no more than 100 kilometers. Ships

often install them as point-defense weapons. Railgun slugs are usually just chunks of metal, but they could also be used to launch nuclear warheads, smart homing missiles, or anything else which can survive hundreds of Gs of acceleration.

Railgun: A typical starship-mounted railgun of average size and range. Versions used for planetary defense and the like are often much larger. Price: 6,060 credits, or more.

RKA 6d6, Armor Piercing (+½), Increased Maximum Range (x75, or 50,000", or 100 km; +¾) (202 Active Points); OIF Bulky (-1), Real Weapon (-¼). Total cost: 90 points.

Planetary Kinetic Bombarder: This massive weapon is used to attack planets rather than starships. It launches a large metal rod which impacts at roughly five times the speed of sound, devastating a wide area. A variant simply bombards a world with large asteroids, which is often enough to wipe out all life on that planet. Either type requires Extra Time for the missile to hit the target, if fired from beyond 50,000" range — but it's not as if a planet can Dodge. Price: 10,110 credits, or more (standard); 18,570 credits, or more (asteroidal).

RKA 10d6, Explosion (+½), MegaArea (1" = 1 km; +¼), Increased Maximum Range (x25, or 32,750", or about 41 miles; +½) (337 Active Points); OIF Bulky (-1), Real Weapon (-¼), Extra Time (missile travels at 50,000" [100 km] per Segment; -0), 12 Charges (-¼). Total cost: 135 points.

Asteroidal Bombardment Variant: RKA 15d6, Explosion (+½), MegaArea (1" = 100 km; +¾), Increased Maximum Range (x25, or 63,250", or about 79 miles; +½) (619 Active Points); OIF Bulky (-1), Real Weapon (-¼), Extra Time (missile travels at 50,000" [100 km] per Segment; -0), 12 Charges (-¼). Total cost: 248 points.

DEFENSES

To keep attackers from vaporizing them with all this aggressive hardware, spacecraft need defenses. In a realistic setting there are three ways to defend a ship in space: armor to soak up damage; point defenses to stop missiles; and stealth to avoid being shot at. In games with abundant rubber science, ships can also mount force shields, dimensional phase systems, cloaking devices, and the like.

When determining the defenses for starships in your *Star Hero* campaign, keep the nature and type of weapons used in the setting in mind. Ideally, a ship's total defenses should protect against *most* damage, but not *all* of it. While large ships may be effectively immune to the attacks of smaller/weaker ships, and some ships (like the fighters in *Star Wars*) tend to be fragile, two

TARGET: EARTH!

Attacks on planets usually take place from many miles above the surface. Rather than applying *No Range Modifier* so that the attack has a chance of hitting, attackers rely on the size of the target cancelling out the Range Modifier penalties. It's hard to miss an entire world!

Here's a summary of the Range Modifier for long ranges:

Range	Range Modifier
8,000" (10 miles)	-22
16,000" (20 miles)	-24
24,000" (30 miles)	-26
32,000" (40 miles)	-26
40,000" (50 miles)	-28
50,000" (60 miles)	-28
64,000" (80 miles)	-28
125,000" (150 miles)	-30
250,000" (300 miles)	-32
500,000" (600 miles)	-34
1,000,000" (1,200 miles)	-36

In contrast, the Target Size bonus to an attacker's OCV for attacking a planet the size of Earth (3,200,000" radius) is +42. So, the odds of hitting it, even from 1,000 miles away, are much better than average; from 20 miles (roughly equivalent to geosynchronous orbit), you'll only miss if you roll an 18.

If you can hit a planet, what does it take to destroy it? A rocky planet like Earth has a volume of about 1.37×10^{20} hexes, if it's considered a perfect sphere. Assuming it all counts as stone (19 BODY, 5 DEF), it has a total BODY of 86 (base of 19, +1 for each doubling of size). (GMs desiring greater precision can re-calculate to account for the molten and solid metals at Earth's core, if desired.) Therefore, a single shot doing 177 BODY would vaporize it. Given an average roll, that would require an RKA 51d6. Half that much damage would probably suffice to crack it into two or more pieces, effectively rendering it useless.

In rules terms, that may make the Earth a little too easy to destroy. To counteract this effect, assume standard weapons either (a) are so "narrow" in effect they're considered to have the *Beam Limitation* when used against worlds, and thus at best only punch relatively small holes in a planet; and (b) surface Area Of Effect/Explosion attacks take the path of least resistance and conform to the planet's surface (otherwise, nuclear test explosions might already have cracked Earth open!). Thus, only weapons specifically designed to affect huge swaths of a planet at once, or to burrow deep within it before taking effect, have a serious chance of destroying it.

ships of the same size and power should have the ability to damage each other. That doesn't mean they can destroy each other with a single shot, but rather that a shot with an above-average damage roll should inflict at least a little damage on the target. The ship's size (*i.e.*, BODY) keeps it from being significantly damaged too quickly, but enough shots can, slowly but surely, blow it into chunks of space debris.

For example, suppose the GM decides the average starship weapon in his campaign does RKA 6d6. That means, on the average, a roll of about 21 BODY, with a maximum of 36 BODY.

SPECIAL WEAPONS

Besides offensive beams, missiles, and guns, SF writers have imagined a variety of weird and fantastic space weapons. Some examples:

Damping Field: This device somehow sucks the energy from a target ship's power supplies, rendering it helpless.

Electromagnetic Web: This weapon creates an impenetrable web of electromagnetic field lines (don't ask how), which can serve as a barrier or a trap.

Space Warp Projector: A natural outgrowth of warp drive technology, a Warp Projector twists and distorts the target like taffy, rending the ship's structure.

Stasis Projector: A device which somehow freezes the target ship in time, so that the crew and ship can do nothing while the enemy attacks freely. In Larry Niven's stories, being put in stasis does have the useful side effect of making you immune to harm.

Gamemasters can amuse themselves creating other such rubber science weapons using the *HERO System* rules. Many are permutations of Drain, Entangle, or Transform.

Beware the arms race! Arthur C. Clarke's short story "Superiority" describes an interesting object lesson about efforts to build better weapons.

The average powerful starship mounting this sort of weapon should therefore have a DEF in the range of about 16-24 — tough enough to keep from being too badly damaged by most shots, but not enough to be invulnerable. A bigger, more powerful ship might have more DEF; smaller, weaker ones (like scouts and fighters) probably have less.

Making a ship's defenses Ablative changes this calculation a little. Since ablating defense constitutes a form of "damaging" the target, GMs might allow much higher Ablative defenses than ordinary defenses.

ARMOR

Armor — a thicker, stronger, and/or better-protected hull, in other words — is the simplest form of starship defense. All spacecraft carry a little armor for protection against micrometeors, the friction of entry into an atmosphere, and so forth; 5 DEF suffices for those purposes. Anything more than that is for protection against cosmic energy storms, enemy weapons, large meteors, and the like.

Spacecraft designers need to worry about mass, which limits how much armor they can plate on — even science fiction technology can only reduce the weight of metal and plastic so much. As a rough guideline, maximum "realistic" spaceship DEF in the near future is no more than 20 (and usually less); Space Opera battleships can carry 100 or more (assuming the weaponry used against them justifies having that much). In settings featuring force shields and like defenses, a ship's armor should almost always be significantly lighter (*i.e.*, offer far less DEF) than its force shield.

Often spaceship armor is ablative, boiling off as it gets hit. This is not only more realistic, but makes it a little cheaper. Another common technique is to put very heavy armor on one side of a spaceship, then keep that side facing the enemy.

Warship armor may be optimized against the weapons the designers expect them to face — if lasers are the standard weapon, then ships will have heavy ED and light PD, and perhaps even extra ED with the Limitation *Only Protects Against Lasers*. If railguns are the queen of battle, ships' ED will be light.

In game terms, armor is just more DEF for the vehicle. In some cases, designers may use other Defense Powers, but that should be rare.

POINT DEFENSE

The whole idea of point defenses is to stop incoming physical weapons (missiles and the like) before they damage the ship. Most use light rapid-firing lasers or railguns to blow up approaching missiles. Rather than engaging in a battle where the ship tries to do enough BODY damage to a missile to destroy it, it's best to define point defense systems as a form of Missile Deflection (as noted on page 194, missiles have a Physical Limitation that allows spacecraft to Deflect them).

Often point defenses are completely auto-

mated, in which case it's the OCV of the ship's computer which determines whether a successful interception happens. Of course, that means the ship is using an Action to Deflect, which may keep it from moving that Phase. If a character, or a dedicated computer, operates the point defenses, they can function without requiring any Actions by the ship itself.

FORCE SHIELDS

Force-fields in all their variations are the classic ship defense of Pulp and Space Opera SF. From *Star Trek's* deflectors to the Langston Field of *The Mote In God's Eye*, ships surrounded by bubbles of energy have been shrugging off attacks capable of reducing them to confetti for decades.

A force shield is defined as either a Force Field or Force Wall. A Force Field is much cheaper, since a spacecraft has to make a Force Wall long enough to surround itself. (Alternately, a ship may buy two or more Force Walls, each covering part of the ship, but joining together to form a single "bubble" around the whole ship, as if they were a single Wall; that way you can arrange situations where one shield isn't functioning, but the others are.) On the other hand, the protection offered by the Force Wall is superior in many cases, because it stops attacks at some distance from the ship itself. (Even though the Power should have the *Self Only* Limitation — starships rarely have the ability to surround other ships with force bubbles — spacecraft may, if they wish, make their Force Walls long enough that they surround not only the ship, but a small amount of space as well.)

A ship designer can make force shields Ablative, just like a ship's armor. The shields in *Star Trek* work that way; attacks gradually wear them down until they "collapse." In this case, the -1 optional version of Ablative usually works best (see page 115 of the *HERO System 5th Edition, Revised*).

Ordinarily, an Ablative defense that's lost can only be recovered at the end of an adventure. That works fine for physical defenses like armor, but doesn't make quite as much sense for a force shield — in science fiction, a ship can often re-create a "collapsed" shield, just not immediately after it collapses (the shield-generating systems have to work back up to full charge, or the like). Gamemasters should allow a ship to re-activate a "destroyed" Ablative force shield after a defined period of time has passed (typically 1 Minute, or 5 Minutes, or an Hour — any of which are an eternity in battle), unless the shield-generating equipment itself is damaged or destroyed. (At the GM's option, the value of Ablative may be ¼ less Limitation due to this change.) For Force Walls without Ablative, you can simulate this same effect with the *Extra Time* Limitation.

Some ships have different layers of shields — perhaps an outer Force Wall and an inner Force Field, or multiple nested Force Walls. In Iain M. Banks's "Culture" series, some starships are composed of nothing but force fields holding in air for the crew.

STARSHIP DEFENSES

Deflector Field: A force-field like energy shield that destroys/deflects incoming physical objects to keep the ship safe. Price: 225 credits per hex of ship's length and width, or more.

Missile Deflection (all physical projectiles) (15 Active Points); OIF Bulky (-1), Costs Endurance (-½). Total cost: 6 points.

Point Defense Lasers: An array of small, but powerful, lasers mounted all around a ship's hull for the purpose of destroying incoming missiles. Price: 510 credits per hex of ship's length and width, or more.

Missile Deflection (all physical projectiles), Range (+1), MegaRange (1" = 1 km; +¼) (34 Active Points); OIF Bulky (-1), Costs Endurance (-½). Total cost: 14 points.

Starship Force Shield, Type I: A basic force shield, tuned against both physical and energy attacks. Price: 1,200 credits per hex of ship's length and width, or more

Force Field (40 PD/40 ED) (80 Active Points); OIF Bulky (shield generators; -1), Ablative (-1). Total cost: 27 points.

Starship Force Shield, Type II: This shield offers an outer layer of protection. It's designed to provide one-fourth of a shield bubble 100" in circumference. Price: 2,220 credits per hex of ship's length and width, or more.

Force Wall (20 PD/20 ED; 25" long) (148 Active Points); OIF Bulky (shield generators; -1), Self Only (-½), Restricted Shape (one-fourth of "bubble" around ship; -¼), Extra Time (1 minute to re-erect Force Wall after it collapses; -1 ½). Total cost: 35 points.

STEALTH

The art of not being seen remain important in space combat no matter what the era or technology. Stealth design is usually a form of Invisibility, sometimes with Inherent if it's a matter of the ship's shape. Concealment like a camouflage hull is the Chameleon form of Invisibility.

Closely related to stealthiness are various forms of electronic warfare, and related equipment — jamming enemy sensors and communications (Suppress), tricking sensors (Images), interference fields and chaff (Darkness), and so forth. This can go back and forth, with electronic countermeasures, and counter-countermeasures, and counter-counter-countermeasures....

The most rubber science form of stealth is the cloaking device, first made famous by *Star Trek's* Romulans. It's a highly effective invisibility device which bends light and other forms of energy around the ship, making it almost impossible to detect. It allows starships to act like submarines, lurking hidden until it's time to strike.

Stealth Hull: This isn't a system so much as how the ship is built. The ship's hull is distinctively-shaped and made of special materials, so that it absorbs radar waves or allows them to pass over it without registering its presence. Stealth hulls are distinctive, readily recognizable if seen, so the ship may have a *Distinctive Features* Disadvantage. Price: 675 credits per hex of ship's length and width, or more.

Invisibility to Radio Group, Persistent (+½), Reduced Endurance (0 END; +½), Inherent (+¼) (45 Active Points); Always On (-½), Limited Effect (Radar only; -¼). Total cost: 26 points.

Radar Jammer: This device blocks radar within a large region centered on the ship. The enemy can easily tell there's something there generating the jamming field, but it's impossible for him to locate exactly, or target with his radar. The downside is, the ship generating the field can't use its own radar, either. Price: 1,125 credits, or more

Suppress Radar 6d6, Area Of Effect (8" Radius; +1 ¼), MegaArea (1" = 1 km; +¼) (75 Active Points); OIF Bulky (-1), No Range (-½). Total cost: 30 points.

Radar Spoofing: This system attempts to fool enemy radar by creating false images to confuse targeting systems. Price: 465 credits, or more.

Radio Group Images, -5 PER, 1" radius, MegaArea (1" = 1 km; +¼) (31 Active Points); OIF Bulky (-1), No Range (-½), Set Effect (up to 6 images of the target ship; -1), Limited Effect (Radar only; -¼). Total cost: 8 points.

Chaff Generator: This weapon fires a shell which scatters reflective particles through a large area, blocking sight and radar in that region. (Alternately, you can define this as an "energy interference field" or the like, and get rid of the Charges.) Price: 900 credits, or more; individual shells are 50 credits each, or more.

Darkness to Sight and Radio Groups 3" radius, MegaArea (1" = 1 km; +¼), MegaRange (1" = 1 km; +¼) (60 Active Points); OIF Bulky (-1), 12 Charges (-¼). Total cost: 27 points.

Cloaking Device: This marvelous device uses force field technology to bend light and other radiation around the ship, making it invisible to most senses. Price: 6,000 credits per hex of ship's length and width, or more (includes multiplier for "cutting edge" technology).

Invisibility to Sight and Radio Groups, No Fringe (40 Active Points); OIF Bulky (-1), Extra Time (Extra Phase to activate; -¼), Increased Endurance Cost (x4 END; -1 ½). Total cost: 11 points.

OTHER SYSTEMS

Here are some notes on other systems a starship might have.

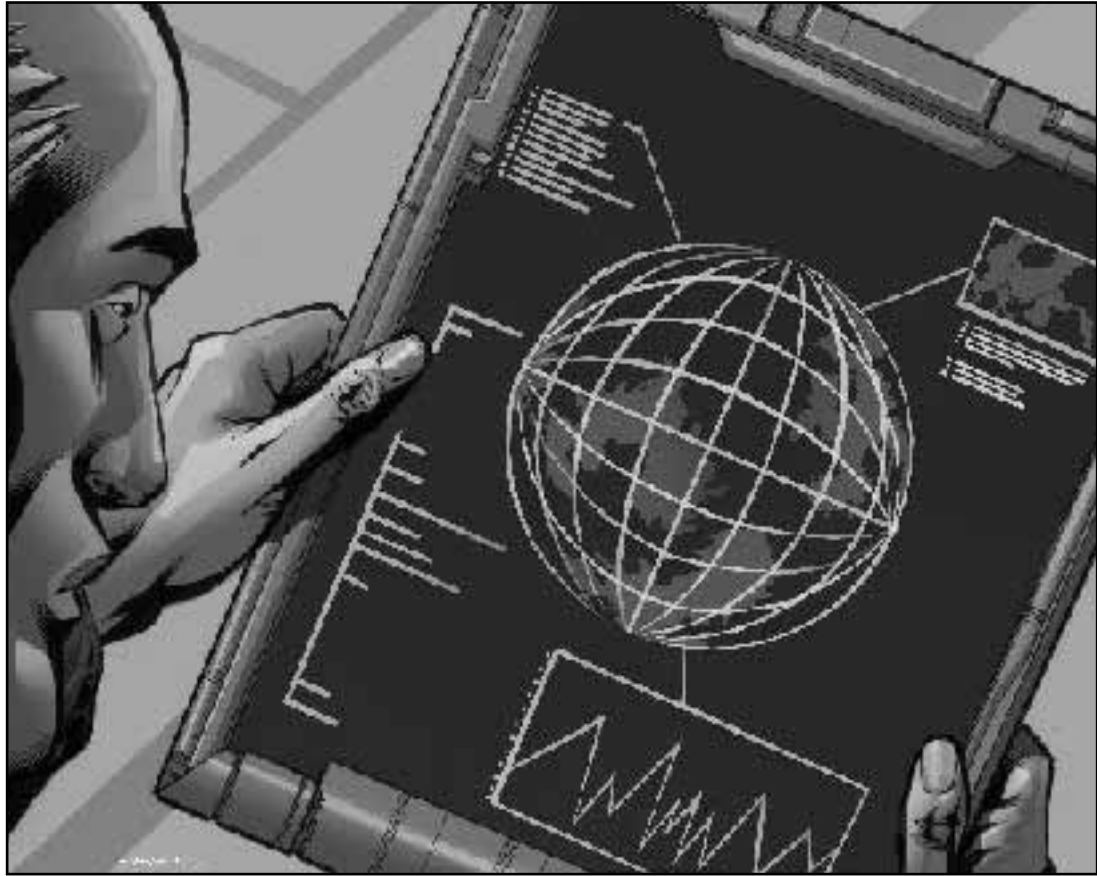
Airlocks

Airlocks are specially-sealed chambers that allow a character to enter and exit a starship when it's in space. Normally an airlock is pressurized and filled with breathing gases. A character enters through the door that connects the airlock to the rest of the ship, and in preparation for leaving the vessel dons a spacesuit or other protective gear. When he's prepared, he shuts the door to the ship (to seal the chamber) and opens (or orders the ship's computer to open) the other door, which leads to space. When he's ready to come back inside, he enters the chamber and shuts the space-side door, and the ship then re-pressurizes the chamber and refills it with breathing gases.

In game terms, you can build an airlock as a Change Environment 5", Varying Effect (restore or remove normal pressure and breathing gases; +1/4) (total cost: 6 points). They often make for great dramatic scenes where a character running out of oxygen has to get back inside, or manually open the space-side door to cause explosive decompression to suck some space monster out of the ship.

Docking Systems

Most ships need a way to attach themselves — “dock” — with other ships, space stations, and the like. That allows personnel to travel back and forth, workers to transfer cargo and consumables to and from the ship, and so on.



OPERATIONS SYSTEMS

“Operations” systems refers to a broad category of systems used to run the ship that don't fit into any other category. They include communications, piloting, sensors, and tractor beams. If the ship has teleporters (page 173) or other such systems, they count as operations systems as well.

COMMUNICATIONS SYSTEMS

Starships mostly communicate via radio or light beams — or, in Space Opera games, via rubber science methods that allow instantaneous communication across vast distances. In game terms, communication systems are simply the appropriate Senses (sensor systems; see below) with the *Transmit* Sense Modifier. High Range Radio Perception (HRRP) is the most common Sense used for communications devices.

Communication systems often include the *MegaScale* Advantage so they can “talk” to each other over vast interstellar distances (see page 55). Ordinarily characters shouldn't apply Advantages to Senses, but in *Star Hero* campaigns GMs should allow this for the sake of simplicity and smooth game play. The *MegaScale* is often bought as a naked Power Advantage so the user can easily turn it on and off (thus allowing him to communicate with a world in another star system one minute, and the space station his ship's orbiting the next).

Some campaigns, including almost all Low SF games, have communication systems that work at STL speeds (or, at most, the speed of light). These communicators can apply a Limitation, *Lightspeed Delay*

(-½), to their *MegaScale* Advantage. This means that at ranges over 300,000 kilometers, a lightspeed lag of one second per +300,000 kilometers distance occurs. Thus, it may take hours to get a reply from a message sent to another system, and communications across the Galaxy are impossible. In settings using this sort of communications technology, characters “in the field” have a lot more autonomy and authority — they can't call headquarters to get instructions or relay the latest news.

Faster-than-light communications get *MegaScale* without the *Lightspeed Delay* Limitation (though the GM may still, in his discretion, impose a slight time lag over long distances). The existence of FTL communications makes a great change in the feel of the campaign setting. Ships in constant contact with home base are subject to more immediate and intrusive meddling by commanders. Diplomats become simple relays for messages from home. It's easier to call for help in a distant star system. News can travel fast (possibly faster than ships), which means the authorities can track pirates or hijackers effectively.

SENSOR SYSTEMS

Closely related to communications systems are sensor systems — the eyes and ears of a starship. They range from simple visual cameras to advanced rubber science devices able to detect trace particles from light-years away if properly “configured” (set up or programmed).

Sensors are bought as various Enhanced Senses, often with the *MegaScale* Advantage (as discussed above) and the *Telescopic* Sense Modifier. Characters should ordinarily define a ship's Senses as belonging to the Radio Sense Group (though a few may qualify

as Sight Group). Radar is the most common general Sense used by ships, even if it's defined as a "hyper-space detector" or in some other rubber science way.

In many types of science fiction settings, particularly Space Opera, a starship's sensors seem able to detect just about anything (though locating obscure substances or energy phenomena may require the crew to "reconfigure" or "recalibrate" the sensors first). Rather than requiring ship designers to try to think of all the possible Senses a ship needs in advance and pay for them separately, GMs should allow ships to buy Variable Power Pools just for sensor and communications systems. This constitutes an exception to the general rule against putting Special Powers in Power Frameworks, but it lets the game progress much more smoothly and seem more like typical SF. If a ship has a Sensor Pool, it can buy a single naked *MegaScale* Advantage it can apply to any Sense bought with the Pool. The ship may, of course, have some commonly-used senses (such as HRRP) bought outside the Pool, to free up Pool resources.

Because characters using a ship's sensors aren't literally perceiving things with their own Senses, a "Perception Roll" made by a ship's crew should be made using Systems Operation, not a PER Roll. However, a ship's computer using its ship's sensors would make a PER Roll using its INT, as normal (but any form of interference which penalizes Systems Operation rolls also applies to its PER Roll).

Cost Sensor And Communication Systems

- 46 *Sensor And Communication Systems:* Variable Power Pool (Sensor Pool), 40 base + 20 control cost; OIF Bulky (-1), Only For Senses And Communications (-1), Costs Endurance (-½)
- 70 *Long-Range Sensors:* MegaScale (1 light-year per Active Point, can scale down to 1 km per Active Point; +3½) for any Sensor Pool Sense; OIF Bulky (-1)
- 12 *Long-Range Sensors:* +20 versus Range for Radio Group; OIF Bulky (-1), Lockout (can't use Telescopic when MegaScale is in use; -½)
- Total cost: 128 points. Price: 11,200 credits, or more.**

Probes

In some science fiction settings, characters have access to *probes* — small sensor devices they can fire like missile weapons to extend the range of a ship's sensors, get a sensor package close to a dangerous phenomenon without risking the ship itself, or expand the scope of a large-scale search. Characters can build probes in two ways. The more complicated way is to design them as Automaton (possibly with Computer "brains"), so they can act independently (without oversight or direction from a character). The easier way is to define probes as MegaScaled Clairsentience, with the ability to move the perception point and maintain multiple perception points at once (see page 53). The multiple perception points in this case represent how many probes the ship can monitor and track at once; each active probe counts as a single perception point. Clairsentience probes have the Limitation *OAF Bulky*, signifying that they can be removed from a ship, shot down in mid-flight (their DCV depends

SENSOR/COMMUNICATIONS INTERFERENCE

Modifier Phenomenon

-1 to -3	Atmospheric electromagnetic interference
-1 to -3	Large masses of rock directly between ship and target object
-1 to -5	Energy field (plasma or ion storm, intense solar radiation, or the like)
-1 to -4	Ship or target is inside a nebula (see page 69)
-3 to -8	Ship or target is inside a star's chromosphere or a planet's polar magnetic field

on their size, as defined by the GM), and so forth.

Long-Range Reconnaissance Probe: *Clairsentience (Radio Group), Mobile Perception Point, Multiple Perception Points (up to four at once), MegaScale (1" = 1 billion km; +2 ½) (122 Active Points); OAF Bulky (-1 ½), Extra Time (takes probe 1 Phase or more to get to perception point, depending on distance thereto; -0), Perception Point Cannot Move Through Solid Objects (-0). Total cost: 49 points. Price: 4,880 credits each, or more.*

Sensor And Communication Interference

In addition to problems deliberately caused by electronic warfare (see below), ships may experience other forms of interference with their sensor and communications systems. Strange energy fields, nebulae, large masses of rock, and other such phenomena may prevent a ship from using its sensors or communicators, or make using them harder. For example, a ship on one side of a planet may not be able to track an object on the other side of that planet accurately, and a courier hiding from an enemy warship in a nebula may have to rely on eyesight (via a viewscreen) to find its way through the gas cloud. Gamemasters can represent interference by imposing penalties on the Systems Operation rolls required to operate the sensors and communications system. The accompanying table has some suggested modifiers, but since the modifiers depend largely on the type of technology used in the campaign, the GM should adjust the table to suit his own campaign.

Starships with advanced sensor and/or communication systems often represent this by buying bonuses to Systems Operation that apply when anyone uses the ship's equipment. These bonuses help to counteract interference and make electronic warfare easier.

Electronic Warfare

Electronic warfare refers to the practice of jamming, counterjamming, fooling, misdirecting, and otherwise interfering with an enemy's electronic signals. This inhibits his ability to communicate with his allies, control his probes, and locate targets. Of course, one ship's electronic countermeasures (ECM) can be neutralized by another's electronic counter-countermeasures (ECCM), and so on.

In game terms, there are several ways to represent electronic warfare. The simplest is for crewmembers on both ships to use their *Systems Operation*

Continued from last page

In most cases, GMs simply let a ship have a reasonable number of docking systems without worrying about a point expenditure; it's just a part of the hull paid for by the cost of the ship's Size. If you want to establish an individual cost for them, build them as the ship's standard Life Support package for a small area (*i.e.*, with the Partial Coverage Limitation, with the size based on the size of the people and objects who have to pass through).

In most settings and situations, docking a ship to another ship or a station is a routine piloting task requiring no Skill Roll. In unusual or emergency situations, such as when a ship's docking systems are damaged, the GM may require a Combat Piloting roll at -2 (or worse), with failure causing both docking objects to suffer Move Through damage at 0" velocity.

Hangars

Large "carrier" ships (and many space stations) have a complement of two or more smaller spacecraft — usually fighters or like ships. They transport these vessels in large open areas called hangars. Hangars should have a minimum of two times the hexes necessary to house all Vehicles intended to be within them (based on the Vehicles' area in hexes, per the Expanded Vehicle Size Table); this assumes each has its own separate exit. For hangars where the vehicles share routes out to common exits, the minimum room should be four times the hexes necessary to house all vehicles intended to be within them. If the hangar has a repair section, the repair area

Continued on next page

Continued from last page

requires room equivalent to eight times the hexes taken up by the total number of vehicles to be repaired simultaneously.

Skills in a Skill Versus Skill Contest, with the victor being the one who successfully neutralized (or avoided the neutralization attempted by) his opponent.

Ships desiring more advanced ECM/ECCM systems can create them with Powers. To generate an area of interference that hinders (but doesn't necessarily stop) sensing or communicating, use Change Environment (with combat effects that penalize Systems Operation). Creating an area of totally impenetrable interference requires Darkness, or perhaps Suppress. Fooling or confusing an enemy ship's sensors usually requires Images. Countering any of these abilities typically requires Suppress. Ships sometimes apply the *Personal Immunity* Limitation so they can perceive through their own interference, but this should be rare; it can cause too many game balance problems in starship combat situations.

Electronic Warfare Systems

See also page 199 for other electronic warfare-type defensive systems.

Enhanced Sensor/Communications System: This represents a ship with particularly advanced sensor and communications technology. Price: 320 credits, or more.

+4 to Systems Operation roll (8 Active Points); OAF Bulky (-1 ½). Total cost: 3 points.

Interferiation Field: A ship with this technology can generate an energy field that inhibits the use of sensors and communications. Price: 4,830 credits, or more.

Change Environment 16" radius, -4 to Systems Operation rolls, *MegaArea* (1" = 1 million km; +1 ¾), *MegaRange* (1" = 10 million km; +2) (161 Active Points); OAF Bulky (-1 ½). Total cost: 64 points.

Intense Interferiation Field: This energy field is similar to the standard interferiation phenomenon, but is much stronger. Price: 14,250 credits, or more.

Darkness to Radio Group 10" radius, *MegaArea* (1" = 1 million km; +1 ¾), *MegaRange* (1" = 10 million km; +2) (475 Active Points); OAF Bulky (-1 ½). Total cost: 190 points.

Sensor Ghosts: A clever tactical officer can use his ship's systems to generate false images of other ships, thus making an enemy think, for example, that there are more ships present than there really are. The trickery quickly falls apart if the enemy can get close enough to observe the affected area visually. Price: 4,320 credits, or more.

Radio Group Images, -5 to PER Rolls, *Increased Size* (16" radius; +1), *MegaArea* (1" = 1 million km; +1 ¾), *MegaRange* (1" = 10 million km; +2) (144 Active Points); OAF Bulky (-1 ½). Total cost: 58 points.

Electronic Counter-Countermeasures: When the enemy tries to jam your sensors or play other electronic tricks, you have the technology to counter his efforts. Price: 4,200 credits, or more.

Suppress Electronic Warfare 8d6, any two Powers simultaneously (+½), *MegaRange* (1" = 10 million km; +2) (140 Active Points); OAF Bulky (-1 ½). Total cost: 56 points.

PILOTING SYSTEMS

Besides the engines themselves (see page 185), there are several types of piloting (or "flight control") systems characters may want to include on their ships.

First, some ships have improved, expanded, or enhanced systems that make it easier to fly and maneuver the ship. You can buy this as bonuses to the Combat Piloting roll of anyone flying the vessel.

Second, some ships also have navigation computers ("navcomps") to make it easier to steer the vessel toward its destination. You can buy this as bonuses to Navigation (Space) or (Hyperspace). If a ship has a navcomp, its main computer may have only a slight amount of navigation information (*i.e.*, it takes the *Navigation* Skill as a Familiarity). In some settings, pilots themselves know little or nothing about the complex subject of astronavigation; if a ship's computer and/or navcomp stop functioning, the pilot has no idea which way to go.

Third, most ships have *thrusters*, small rockets used to maneuver the ship in tiny increments so that it can safely enter repair bays and other close spaces. You can buy thrusters as a few inches of Flight (no more than 10"), without any MegaScaling.

Piloting Systems

Enhanced Flight Control: +4 to Combat Piloting roll (8 Active Points); OAF Bulky (-1 ½). Total cost: 3 points.

Navigation Computer: +4 to Navigation (Space) roll (8 Active Points); OAF Bulky (-1 ½). Total cost: 3 points.

Thrusters: Flight 10". Total cost: 20 points.

TRACTOR BEAMS

In settings where artificial gravity control technology exists (mainly Space Opera universes), ships often come equipped with *tractor beams* — generators able to project beams of gravitic force, which the ship uses to move obstacles out of the way, tow a disabled ship to spaceport, or even as a weapon to hurl asteroids at other ships. Tractor beams are built as Telekinesis, usually with a high level of STR and the *Affects Whole Object* Limitation.

Tractor Beam: Telekinesis (100 STR) (150 Active Points); OIF Bulky (projector; -1), Affects Whole Object (-¼). Total cost: 67 points. Price: 6,000 credits, or more.

PERSONNEL SYSTEMS

The whole purpose of starships is to move people and things from place to place. Consequently they need room on board for people, and systems specifically designed to keep passengers and crew healthy and happy.

LIFE SUPPORT

Perhaps the most crucial systems on a starship are the *life support systems*, which keep the crew from

dying in the airless vacuum of space. Starships must provide the following sorts of Life Support to those on board: Self-Contained Breathing, Safe Environments (High Radiation, Intense Cold, Intense Heat, Low Pressure/Vacuum). (Many also provide protection against High Pressure; see page 283.) The various environmental protection systems are just part of having an airtight, insulated hull, but breathing requires some complex equipment. Supplying oxygen (or other breathing gases, as appropriate to the species) to people in space is done in one of two ways: Consumable or Regenerative.

Consumable life support means just a big tank of air, which gets used up during the voyage. You can simulate this with a Fuel Charge, or simply make it the special effect of having the ship's Life Support cost no END. The longer the voyage and the larger the crew, the more appropriate the "0 END" solution becomes.

Regenerative breathing systems use greenhouses (at current and near-future technology), "atmospheric scrubbers," or nanotech systems to convert carbon dioxide back into oxygen for the crew to breathe. They can operate indefinitely as long as there is power, which means you should buy the Life Support as having an END cost. Greenhouses are fairly bulky — assume 1 hex of greenhouses for every 4 people on board. Nanotech recyclers or air tanks are more compact, taking up 1 hex for every 100 people.

In the game, a ship running out of oxygen presents the heroes with a serious problem to solve and lots of opportunities for suspense and adventure (see Arthur C. Clarke's short story "Breaking Strain," or many episodes of *Star Trek*, for some good examples). Despite the fact that most ships' life support systems supposedly contain multiple redundant backups and other safeguards, somehow an accident or invader always seems to find a way around them.

Life support also includes providing enough food and water for the crew. You buy this as the *Diminished Eating* category of Life Support, with the special effect being that the ship provides food for the occupants to eat. This may cost no END (representing stored preserved food which the crew can cook using minimal power), or have an END cost (representing the power needed to refrigerate and prepare the food). Fuel Charges may be an appropriate Limitation instead of Costs Endurance.

GRAVITY

In many cases, gravity is almost as important as life support — it's hard to get most jobs done, much less fight in a star-battle, if everyone in the crew is flailing around in zero-G!

There are two basic ways to generate gravity. The first is to spin the ship so that centrifugal force holds the contents and inhabitants of the ship against the floors and hull with the same force as planetary gravity. This is typically the only solution available in low-tech settings, and it dictates many features of starship (or space station) design — long, symmetrical structures (cylinders, typically) are necessary.

The second is the rubber science method of artificial gravity generation, usually through special "plates" or "generators" built into each deck of a ship. This allows for any sort of starship design, and also



makes maneuvering easier — even if the ship is flying straight "up," the crew still perceives the deck floor as "down" and can move and act accordingly. The crew may also be able to selectively decrease (or perhaps increase) the gravity from place to place in the ship by controlling the gravity generators.

In either case, you can simulate gravity as Telekinesis with the Limitation *Only To Pull Objects Straight Down To The Floor* (-1) (this is a broader and more restrictive form of the *Affects Whole Object* Limitation). Normal Earth gravity (1 G) is equivalent to 5 STR Telekinesis, with every +5 STR equalling +1 G (10 STR is 2 G, 15 STR is 3 G, and so forth). This gravity applies throughout the ship; you do not have to add the *Area Of Effect* Advantage to it. However, for artificial gravity generators, ships may, with the GM's permission, apply the *Selective* (+½) Advantage to the Telekinesis so they can give some areas stronger gravity, and some lighter gravity.

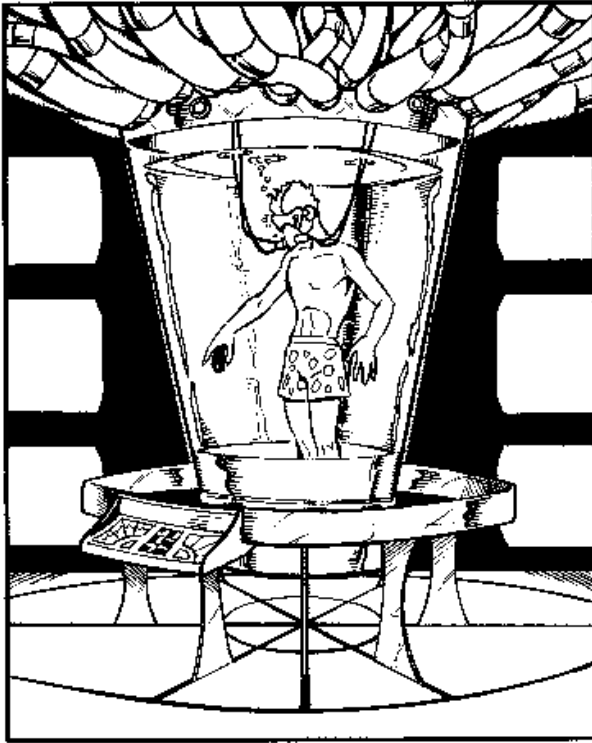
For general rules about moving in variant gravities, see page 279.

Gravity Systems

Spinning Gravity: This represents gravity generated by spinning the ship. Price: 360 credits, or more.

Telekinesis (5 STR) (9 Active Points); Only To Pull Objects Straight Down To The Floor (-1), Must Maintain Spin (-¼). Total cost: 4 points.

Artificial Gravity: This represents a system that generates gravity artificially. It can go as high as STR 20 (4



HOLOGRAPHIC ENTERTAINMENT

In some SF settings, characters on starships can fulfill their need for entertainment and recreation in ultra-advanced holography chambers that create any sort of "reality" or adventure they can imagine using photons and inert raw materials. It looks, sounds, and sometimes even feels real, but it's all just an elaborate illusion (at least until the controls malfunction and the holograms gain the ability to kill...). Here's how a "holographic entertainment room" might look in *HERO System* terms:

Sight, Hearing, and Touch Group Images, -3 to PER Rolls, Increased Size (16" radius; +1) (58 Active Points); OIF Immobile (-1 ½), Only Within Defined Area (16" radius chamber; -2). Total cost: 13 points. Price: 18,560 credits (1,160 credits per hex of radius), or more.

G), though it's usually kept at STR 5 (1 G). Price: 1,800 credits, or more.

Telekinesis (20 STR), *Selective* (+½) (45 Active Points); *OIF Bulky* (-1), *Only To Pull Objects Straight Down To The Floor* (-1). Total cost: 15 points.

QUARTERS, CONTROLS, AND MAINTENANCE

All the crewmembers and passengers need places to sleep and relax. One hex can hold up to three Human-sized per-

sons in bunks or racks, or a single person in minimal comfort. More pleasant accommodations require two to eight hexes per person; luxurious quarters can be virtually any size. For recreation and related activities, allot two to four hexes per person the ship normally carries (both crew and passengers). In Space Opera settings, ship designers may use holographic and/or dimension-altering technology to make tiny recreation spaces seem enormous and varied.

Ships also need a command center, with at least 1 hex of space per officer present at once. One-man ships may have just a pilot's seat, but larger ones have multiple control stations. Really big ships have a command bridge with space for dozens of specialists and an impressive chair for the captain.

For corridors, elevators, access tunnels, and other means of physically moving through the ship, you should allot about ten percent of the total interior space devoted to other facilities and systems (or, for ease of calculation, a straight ten percent of the ship's volume).

Ships often include repair shops, for purposes of maintenance and damage control. You can simulate this by buying "labs" for Mechanics and various other Skills. Per the standard rules, the ship needs a minimum of one hex of space per lab, but most ships have even larger labs so more than one engineer can work at once; this requires at least one hex of space per person who can be in the lab. Gamemasters may also want designers to make labs with better rolls larger — for example, one hex for a base roll, +1 hex per +1 to the roll.

MEDICAL FACILITIES

Frequently known as "sickbay" thanks to the influence of *Star Trek*, a ship's medical facilities need enough room for doctors, patients, and equipment.

It's bought as a laboratory for Paramedics and SS: Medicine (and perhaps other Skills). At a minimum, sickbays require one hex of space per ten people in the standard crew + passengers complement, plus one hex per doctor intended to work in the facility at once. A ship's medical facilities may be especially advanced (bought as bonuses to SS: Medicine), or include autodoctors (page 175) or like technology.

DISADVANTAGES

The Disadvantages system described for vehicles on page 470 of the *HERO System 5th Edition*, Revised generally applies to *Star Hero* spacecraft. Gamemasters may want to consider allowing some other Disadvantages as well.

HUNTED

A specific vehicle might be sought by the authorities, covetous collectors, or other people. This is different from Hunting the owners or crew of the vehicle — someone Hunting a starship wants *the ship*; he doesn't necessarily care what happens to the people on it.

PHYSICAL LIMITATION

Players designing spacecraft could use Physical Limitations to represent a ship with perpetual engineering problems. Perhaps the ship is an old junker, always on the verge of falling apart, or maybe it's got so many cross-wired, jury-rigged alien replacement parts the crew doesn't know from day-to-day whether everything will function properly. Some examples:

Physical Limitation: Constant Malfunctions (Frequently, Greatly Impairing; 15 points). The GM rolls for the ship each game session. On a roll of 11-, something on the ship malfunctions or stops working at a crucial moment; the GM randomly determines which system goes kablooie, or chooses the one with the most dramatic impact.

Physical Limitation: Alien Computer (Frequently, Greatly Impairing; 15 points). The ship's computer was built, modified, or warped by aliens, and doesn't always work the way it's supposed to. Once per game session, the GM should have the computer make an INT Roll at -3. If it succeeds, nothing goes wrong. If it fails, a program or Skill Roll is misinterpreted, with comic and/or dangerous results.

Another good use of Physical Limitation is to represent spacecraft that cannot enter planetary atmospheres:

Physical Limitation: Cannot Enter Atmospheres (Infrequently, Greatly Impairing; 10 points). A ship with this Physical Limitation was not built to withstand the rigors of atmospheric flight. For every Phase it spends within an Earth-equivalent atmosphere, it takes 1d6 Killing Damage (no defense applies) (the GM can alter the number of dice to reflect atmospheres thinner or denser than Earth's). If it stays too long in the atmosphere, it gets torn apart.

PLANETARY VEHICLES AND MECHA



In many science fiction settings, planetary vehicles receive little, if any, attention; *Star Trek*, for example, has shown about 600 hours of science fiction television while barely even mentioning, much less showing, any ground-based vehicles. On the other hand, some settings, particularly in Military SF, involve a lot of planetary vehicles — everything from gas-powered trucks not far different from what twenty-first century Humans drive every day, to hovertanks using artificial gravity fields to move. Some settings focus entirely on a type of ground vehicle called *mecha* (singular, mech), meaning a large humanoid- or animal-shaped military robot/vehicle driven by a pilot and carrying heavy armament.

HOVERCRAFT

Hovercraft are built like typical ground vehicles (such as those in the *HERO System 5th Edition*, Revised rulebook), with a few important differences.

MOVEMENT

Hovercrafts' movement doesn't depend on generating friction against the ground. Instead, they use artificial gravity technology (sometimes coupled with rockets) to generate thrust and "fly" near the ground. A basic hovercraft must remain within 1" of the ground, and buys its movement as ordinary Ground Movement (but without any of the terrain-based Limitations that some forms of Ground Movement suffer from).

More advanced hovercraft can get as much as 4" off the ground (or a like surface, such as a body of relatively calm water). They buy their movement as Flight, with the Limitation *Must Remain Within 4" Of A Surface* (-½). They have some maneuverability that less advanced hovercraft don't (for example, they can go over obstacles 3" tall or shorter with ease), but still cannot cross chasms or other such "gaps" in the ground.

A few hovercraft can fly at unlimited altitudes, which they buy as Flight without any of the Limitations described above. These effectively aren't ground vehicles at all, but the science fiction equivalent of airplanes and helicopters.

EQUIPMENT

Most hovercraft equipment is the same as for other ground vehicles (e.g., headlights to illuminate the path of travel at night). But hovercraft also have a few systems of their own.

Some hovercraft can attain speeds significantly higher than even the fastest ground-based vehicle, which means they often need some extra equipment, too. Life Support (Self-Contained Breathing) may be necessary if the vehicle isn't physically sealed; this would represent a force-bubble holding a pocket of air "inside" the vehicle so passengers can breathe.

Similarly, high speeds require a high degree of protection from collisions. Many hovercraft have Force Fields or Force Walls like those used for starships (page 198), but not nearly as strong.

Hovercraft that can fly above 4" usually have Radar with Increased Arc Of Perception (360 Degrees) so they can keep track of other objects in the air. Even ground-based hovercraft may have radar, since the dangers of a high-speed impact are so severe.

In some settings, hovercraft are primarily (or exclusively) used by law enforcement authorities and/or the military. In that case, they usually come equipped with weapons — mounted blasters, rocket launchers, and the like.

MECHA

Mecha are large ground vehicles common to some science fiction settings. In fact, they are the primary feature of some SF universes and *Star Hero* campaigns. They usually have a humanoid form (though some are shaped like various animals instead), and in effect are gigantic combat robots requiring Human drivers. The driver rides in a cockpit that's usually located either in the "head" of the vehicle, or in the body just below the head; mecha often have transparent screens so the driver can view the battlefield with his own eyes as well as his sensors.

Mecha use the same Vehicle Size Table as ordinary vehicles, but substitute "height" for "length." Typically they are 8-20" tall at most, but can be up to 32" (about 200 feet) tall in some settings.

MOVEMENT

Mecha have legs and "walk" like humanoids. To simulate this, they buy Extra Limbs with the *Limited Manipulation* Limitation. Their legs are used for moving; their arms typically serve as weapon mounts and don't have hands. On those mecha that do have hands (typically to wield enormous guns and other weapons), the hands aren't built for fine manipulation. The typical mech has

two legs and two arms, but more are possible.

To determine how fast a mech can move on its legs, refer to the *Size/Weight Package Deals* on page 30. At a minimum, a mech should have the amount of Ground Movement (Running) appropriate to its size; some have more, because of their highly efficient motors and servos. Mecha don't take any sort of Limitation on their Ground Movement; unlike vehicles with tires or treads, their legs allow them to negotiate rough terrain without difficulty. Since they're using limbs to move, they don't suffer from a Turn Mode like other ground vehicles.

The Size/Weight categories also indicate how much reach a mech should have, if appropriate. Mecha who just use their arms as weapon mounts don't need to buy any reach, but mecha who can fight in HTH Combat should have some.

Mecha often have other forms of movement as well. Many have "jumpjets" for making rocket-assisted leaps. Others can even fly, though "flight mode" is most common among mecha that can alter their shape (see below).

Mecha Movement Powers

Mech Limbs: Extra Limbs (4 — two legs, two arms) (5 Active Points); Limited Manipulation (-1/4). Total cost: 4 points.

Jumpjets: Leaping +40". Total cost: 40 points.

Flight Mode: Flight 40", x4 Noncombat. Total cost: 85 points

WEAPONS AND DEFENSES

Mecha are combat vehicles, and as such come heavily laden with weapons. Most rely on ranged attacks: long-range beam weapons, missile launchers, autocannons, and the like. More exotic attacks, such as Flash, Darkness, Drain, and Transfer are possible, though less common. Here are a few examples:

Laser Assault Cannon: This enormous weapon resembles a distinct weapon the mech carries in a "holster" and fires with its hands, but in fact it's firmly attached to the mech's body by an armored cable and other linkages. Price: 3,150 credits, or more.

RKA 4d6, Armor Piercing (+1/2), Increased Maximum Range (x5, or 2,250"; +1/4) (105 Active Points); OIF Bulky (-1). Total cost: 52 points.

Autocannon: This weapon uses gauss technology to fire barrages of high-speed, high explosive rounds. Price: 5,070 credits, or more.

RKA 5d6, Autofire (5 shots; +1/2), 64 Charges (+1/2), Increased Maximum Range (x5, or 3,750"; +1/4) (169 Active Points); OIF Bulky (-1). Total cost: 84 points.

Missile Pod: This weapon, mounted on a mech's shoulder next to its "head," contains 16 large, powerful missiles. Price: 4,500 credits, or more.

RKA 4d6, Armor Piercing (+1/2), Explosion (-1 DC/3"; +1) (150 Active Points); OIF Bulky (-1), 16 Charges (-0). Total cost: 75 points.

In some settings mecha engage in HTH Combat as well. Some use their metallic fists and legs to pummel other mecha, even buying Martial Arts in some cases. (Standard rules for buying Martial Maneuvers apply.) Mecha can only engage in unarmed HTH Combat against targets of large size; they can't use their Martial Maneuvers against ordinary Human-sized characters, but only against other mecha, buildings, giant monsters, large terrain features, and so forth. On the other hand, some mecha use gigantic melee weapons — typically swords of blazing energy, or other such "powered" weapons. Most of these weapons are OAFs, because other mecha can disable them or disarm the user, though they are far too big and heavy for a character to wield.

Mecha Melee Weapons

Blazing Energy Sword: HKA 3d6 (up to 6d6 with STR), Armor Piercing (+1/2) (67 Active Points); OAF Bulky (-1 1/2). Total cost: 27 points. Price: 2,010 credits, or more.

Power Mace: HKA 4d6 (up to 8d6 with STR) (60 Active Points); OAF Bulky (-1 1/2). Total cost: 24 points. Price: 1,800 credits, or more.

Naturally, with all this weaponry around, mecha also come equipped with defensive systems. First and foremost, they tend to rely on heavy armor and sturdy construction; they have more DEF and BODY than similarly-sized normal vehicles. They may also have "primitive" defenses, such as gigantic shields (extra DEF on an Activation Roll, Missile Deflection) to accompany their gigantic swords.

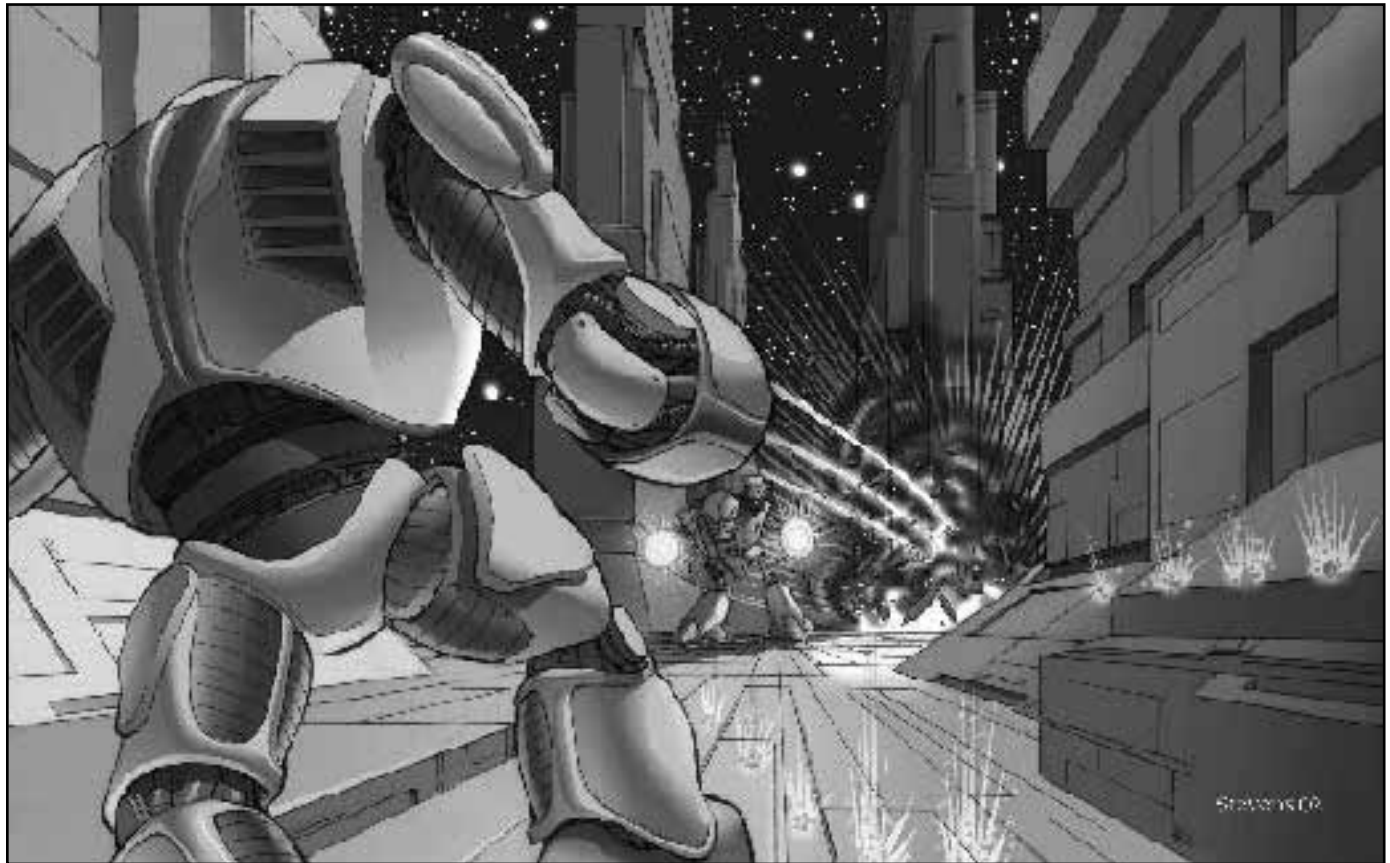
If the tech level of the setting is high enough, mecha may also have defensive energy shields similar to starships' (though of course less powerful). Many define their energy shields primarily as Missile Deflection, though that does little good against Explosions and similar attacks. Designers can also use Force Field and Force Wall to create mecha defense shields, though they drain the vehicle's power (*i.e.*, cost END).

Other possible defenses include: Flash Defense (polarized viewing screens to protect the pilot's eyes; hardened communications and sensor systems able to resist electronic pulses; and so forth); Lack Of Weakness (to counteract targeting sensors defined as Find Weakness); and Power Defense (in settings where Drain-based mech weapons exist).

OTHER EQUIPMENT

For the most part, you can use the starship equipment detailed elsewhere in this chapter for mecha; all you have to do is "downgrade" it a bit or otherwise adapt it to ground-based warfare. For example, mecha have sensor and communications systems similar to those starships possess, but need much less (if any) MegaScale — a few levels of Telescopic take care of their needs.

Because of the discomforts of the battlefield, not to mention the possibility of biochemical warfare, most mecha provide Life Support for



their drivers. In lower-tech settings, the driver may have to use his own personal breathing gear instead.

Perhaps the most interesting type of “equipment” found on mecha in some settings is the ability to shift shape. In these universes, a humanoid mech may be able to transform itself into a beast-shaped mech for different attack forms, or a plane-shaped mech for fast travel, or a submarine-style mech for underwater combat. You can buy this ability as Multiform, with the cost of the Power deriving from the total cost of the alternate vehicle shape (not its total cost divided by five). Mecha Multiform cannot have the *Instant Change Adder* (in fact, it may take an *Extra Time* Limitation to reflect the fact that it takes longer than a Half Phase to change forms), and usually takes the *Costs Endurance* (-½) Limitation.

Mecha Equipment

Basic Mecha Sensors: This represents a basic sensor system for a mech, with a small amount of hardening to protect it from enemy “radarzap-pers.” Price: 1,760 credits, or more.

Radar (Radio Group), *Discriminatory*, *Increased Arc Of Perception* (360 Degrees), *Telescopic* (+14 versus Range Modifier) (total cost: 39 points) **plus** *Radio Group Flash Defense* (5 points) (total cost: 5 points); all OIF Bulky (-1). Total cost: 21 points.

Targeting Sensor: This is a combat sensor built as Find Weakness. Similar sensors are built simply as Combat Skill Levels or Penalty Skill Levels. Price: 1,200 credits, or more.

Find Weakness 13- with all Mecha Ranged Weapons (30 Active Points); *Costs Endurance* (-½). Total cost: 20 points.

Secure Laser Communication System: This short-range communication device, using both laser and radio, allows for a high level of coordination between two mecha. However, it can easily be cut off by intervening obstacles or electronic warfare. Price: 600 credits, or more.

Mind Link, any willing target (15 Active Points); OIF Bulky (-1), Only With Other Mecha Who Have Mind Link (-1), Must Maintain LOS (-½). Total cost: 4 points.

360 View System: Hardened cameras mounted all around the mech’s body allow its driver to see everything around him. Price: 800 credits, or more.

Infrared Perception (Sight Group) (total cost: 5 points) **plus** *Ultraviolet Perception* (Sight Group) (total cost: 5 points) **plus** *Increased Arc Of Perception* (360 Degrees; Sight Group) (total cost: 10 points); all OIF Bulky (-1). Total cost: 9 points.

SPACE STATIONS AND STARBASES



Space stations and starbases are similar to starships in most ways, and use the same creation rules. The main difference between spaceships and space stations is that ships get to go places. Stations, while they aren't necessarily stationary, remain in place or follow a predetermined orbit and can only make minor adjustments. They can buy any type of starship equipment the GM deems appropriate, but may not have Movement Powers except for low-powered thrusters (page 202) to help them maintain their position.

Space Station Types

Space stations serve many purposes. Science stations are orbiting laboratories, either studying the planet below or used for research too dangerous to perform on an inhabited world. Commercial

stations are centers for trade and ports of entry for ships visiting a planet; almost every world engaged in off-world trade has at least one commercial station. Transit stations orbit between two planets in the same system, acting as an interplanetary liner that never docks. Military stations can be either planetary defense bases to guard against attack, or space superiority platforms keeping an eye on the planet itself. Finally, colonies are very big self-sufficient space stations, often combining the functions of smaller ones.

In most settings, governments have a classification system for space stations. Most classification schemes account for the station's location (either generally, or at specific coordinates), purpose, and size.

Size

Small stations are usually built in the early days of a society's spacefaring period, in low orbit around the home planet. Typical small stations are little more than large airtight cans with life support, solar panels for power, and docking ports. They are most likely designed as orbital laboratories, although weapons platforms or customs quarantine stations are possible if the planet has contact with other civilizations. Starfaring civilizations may put small science stations in orbit around interesting worlds to study them. Asteroid miners may work out of a small station equipped with thrusters to move from rock to rock.

Only mature spacefaring societies can construct large space habitats, which they typically intend to use permanently. They may not be entirely self-sufficient in food production or life support, but can operate for months or years before resupply. A permanent station must have radiation shielding and some form of gravity (either spin gravity or artificial gravity field generators), unless the inhabitants are adapted to microgravity.

Large stations are often used as orbital ports, where ships too big for surface landings can dock so passengers can transfer to other ships or shuttles down to the planet. They may also be manufacturing centers, especially in a rich asteroid cluster where valuable minerals are common. Most interstellar civilizations need large stations as bases to repair and resupply starships — and often place them in strategically-located systems which don't have a habitable world. Equipped with force shields or heavy armor, batteries of big guns, and long-range sensors, a large station could be a formidable space fortress.

IMPERIAL STATION CLASSES

Like the spaceship classification system, the Terran Empire's station classification system uses three letters, the first describing how the station orbits, the second its purpose, and the third its size.

First Letter:

Letter	Type	Notes
G	Geosynchronous	Station orbits with a period of 1 day
H	High orbit	Station orbits thousands of miles up
L	Low orbit	Station orbits just above the atmosphere
P	Planetary orbit	Station orbits a star
T	Trojan orbit	Station occupies a Lagrange point

Second Letter:

Letter	Type	Notes
A	Agriculture	Food-producing station
B	Base	Forward base to support spaceships
C	Construction	Orbital shipyard
D	Defense	Armed military station
F	Fuel	Fuel refining and storage facility
G	General	Multipurpose station
H	Habitat	Residential colony
I	Industrial	Orbital factory or smelting plant
M	Meteorology	Weather-monitoring station
O	Observation	Station monitoring planet below
P	Powersat	Large solar power satellite
Q	Quarantine	Medical isolation station
R	Research	Scientific station
S	Spaceport	Orbiting spaceport

Third Letter:

Letter	Type	Size
O	Outpost	1,000 cubic meters, up to 10 crew
S	Station	1,001-50,000 cubic meters, 11-100 crew
B	Base	50,001 cubic meters or more (typically at least 1 million), 101 crew or more
C	Colony	50 million+ cubic meters, 10,000+ colonists

Thus, a small manned military platform in high orbit would be an HDO, while a commercial port in low orbit would be an LSS. An O'Neill colony at L-5 would be a THC. Like spaceships, stations get individual numbers, grouped together by class.

If a species wants to settle permanently in a system but doesn't want to live on a planet or inside an asteroid, a space habitat is the answer. These are very big space stations indeed — proposed designs include ring-shaped colonies a mile across, spheres two miles in diameter, and huge cylinders five miles wide and twenty miles long! At that scale, colonies are bound to be self-sufficient in just about everything, and can support populations of tens of thousands of people. The purpose of a space habitat must be an important one to justify the cost: a major port or way-station in a strategically-located system without planets, or the center of an asteroid-based society, or an orbiting industrial complex above an advanced high-population world.

SIZE RULES

The accompanying table expands the Base Size Table from the *HERO System 5th Edition, Revised* to allow for the construction of the truly enormous Bases often featured in science fiction stories.

Since many space Bases are not firmly attached to anything, but instead float in space, it's possible a sufficiently large attack could cause Knockback to one. If necessary, use the equivalent Size category on the Expanded Vehicle Size Table to determine a Base's mass and Knockback modifier.

In some campaigns, it may even be possible for characters to own entire planets! This gets costly, though (even with dividing the total points by 5). Assuming an Earth-sized planet, that means approximately 1.28 quadrillion hexes of surface, which costs 150 Character Points for the area alone — never mind the cost of all the resources, facilities, and people. Gamemasters who want to allow this may find it easier to simply assign a flat cost for owning a planet, based on the planet's size, resources, and quality (see text box). (See also the *Mega-Bases* text box on page 98.)

PLANET COST TABLE

Cost	Size Of Planet
75	Small planet
150	Medium (Earth-sized) planet
300	Large planet
600	Gigantic planet
1,000	Multi-planetary (ringworld, Dyson sphere, and so on)
Cost	Resources
+0	Completely undeveloped/uninhabited or very poor resources
+100	Lightly developed/inhabited or poor resources
+200	Average developed/inhabited or average resources
+400	Heavily developed/inhabited or good resources
+800	Extremely developed/inhabited or very good resources
Cost	Location
-50	Poor location
+0	Average location
+50	Good location



Area Versus Volume

When a character builds or buys a large base such as a planet or an orbital, the issue of area versus volume comes into play. The Expanded Base Size Table calculates only the area (length times width) of a Base. It doesn't calculate volume. One Base with 2,000 square hexes of area might be a single-story structure with twelve-foot high ceilings, while another is divided into ten floors with 30-foot ceilings — and they cost the same amount of Character Points for their Size, even though one contains a much great volume of space than the other.

For planet Bases, it's usually easiest to determine the Size of the Base based on the surface area of the planet (assume the planet is a sphere and use the formula $4\pi r^2$ to derive the surface area). Though characters can dig down into the volume of the sphere, by and large they restrict themselves to the surface, so that's the simplest way to gauge the size of the Base. The same method applies to things like ringworlds and Dyson spheres; all that matters is the livable surface area.

For Bases such as orbitals, which are vast habitats in space, interior volume, not surface area, may be what counts. In this case, consider "area" as volume. Thus, an orbital with an interior volume of 8 quadrillion cubic hexes would use the cost for a Base with an area of that same size — 150 points. This provides a big cost break to characters building such Bases, which can hold far more inhabitants than any Earth-sized planet. As an optional rule, GMs interested in strict cost accounting should consider the volume of a Base as equal to its area times four.

EXPANDED BASE SIZE TABLE

Cost	Length (hexes)	Width (hexes)	Area (hexes)	DCV
0	4	2	8	-4
2	5	3	15	-4
4	6.4	3.2	20	-5
6	8	4	32	-6
8	10	5	50	-6
10	12.5	6.4	80	-7
12	16	8	125	-8
14	20	10	200	-8
16	25	12.5	320	-9
18	32	16	500	-10
20	40	20	800	-10
22	50	25	1,250	-11
24	64	32	2,000	-12
26	80	40	3,200	-12
28	100	50	5,000	-13
30	125	64	8,000	-14
32	160	80	12,500	-14
34	200	100	20,000	-15
36	250	125	32,000	-16
38	320	160	50,000	-16
40	400	200	80,000	-17
42	500	250	125,000	-18
44	640	320	200,000	-18
46	800	400	320,000	-19
48	1,000	500	500,000	-20
50	1,250	640	800,000	-20
52	1,600	800	1.25 million	-20
54	2,000	1,000	2 mil	-21
56	2,500	1,250	3.2 mil	-22
58	3,200	1,600	5 mil	-22
60	4,000	2,000	8 mil	-23
62	5,000	2,500	12.5 mil	-24
64	6,400	3,200	20 mil	-24
66	8,000	4,000	32 mil	-25
68	10,000	5,000	50 mil	-26
70	12,500	6,400	80 mil	-26
72	16,000	8,000	125 mil	-27
74	20,000	10,000	200 mil	-28
76	25,000	12,500	320 mil	-28
78	32,000	16,000	500 mil	-29
80	40,000	20,000	800 mil	-30
82	50,000	25,000	1.25 billion	-30
84	64,000	32,000	2 bil	-31
86	80,000	40,000	3.2 bil	-32
88	100,000	50,000	5 bil	-32
90	125,000	64,000	8 bil	-33
92	160,000	80,000	12.5 bil	-34
94	200,000	100,000	20 bil	-34
96	250,000	125,000	32 bil	-35
98	320,000	160,000	50 bil	-36
100	400,000	200,000	80 bil	-36
102	500,000	250,000	125 bil	-37
104	640,000	320,000	200 bil	-38
106	800,000	400,000	320 bil	-38
108	1 million	500,000	500 bil	-39
110	1.25 mil	640,000	800 bil	-40
112	1.6 mil	800,000	1.25 trillion	-40
114	2 mil	1 million	2 tril	-41
116	2.5 mil	1.25 mil	3.2 tril	-42
118	3.2 mil	1.6 mil	5 tril	-42
120	4 mil	2 mil	8 tril	-43
130	12.5 mil	6.4 mil	80 tril	-50
140	40 mil	20 mil	800 tril	-53
150*	125 mil	64 mil	8 quadrillion	-60

*: This size category approximately equals the surface area of Earth (1.28 quadrillion hexes).

Location

Most *Star Hero* bases are located In Space, which normally costs +25 points. That cost typically assumes a planet-based campaign, where having a base in space provides a number of advantages. In a science fiction game, the action may all take place in space, in which case space bases are commonplace. In that case, the GM may wish to ignore the cost for an *In Space* location.

Bases in space typically do not have grounds. Bases located on a planet could have grounds as normal. A base on an isolated planet, asteroid, or the like might even, with the GM's permission, define the entire body it's on as its "grounds."

Equipment

Equipment for Bases is usually the same as or similar to starship equipment. Space bases need defensive shields and weapons, artificial gravity, power plants, and sensors, just like spacecraft. See below for a few examples.

Generally, equipment bought for a Base applies to the entire base and/or everyone within it automatically; the Base's designer doesn't have to apply Area Of Effect or some other Advantage to make a power cover the entire Base. For example, if a Base buys Life Support, the Life Support applies to everyone inside the base, even without Area Of Effect. Based on common sense, dramatic sense, or "realism," the GM may make exceptions to this rule, or establish limits on how many people a Base's equipment can support. For example, maybe a Base's life support systems can handle a load of up to 1,000 Human-sized people; more than that, and the air and other supplies get used up faster than they can be replenished, which soon leads to trouble.

If a type of equipment only works within a certain part of the Base, it can take the *Partial Coverage* Limitation (also written as, for many effects, *Only Within Defined Area*). For example, if a 2" x 2" prison cell on a starbase has extra DEF, or a special weapon used to restrain/incapacitate prisoners, Partial Coverage/Only Within Defined Area would apply to that power.

Since Bases don't have SPD, Base equipment costs END based on the SPD of the character using it. If a weapon uses 10 END per shot, and a character with SPD 4 fires it for a Turn, it's just used 40 of the Base's power plant's END. For equipment that has to function constantly, such as life support or gravity, assume all Bases have SPD 3.

Space Station Equipment

Fire Extinguishing System: This system detects and then extinguishes fire. It can only cover a certain area, so a large station installs multiple extinguishers. Price: 5,640 credits each, or more.

Detect Unauthorized/Uncontrolled Fires (INT Roll +5, using Base's Computer, or 14- if no Computer) (total cost: 8 points); Only Within

Affected Area (20" x 20" zone; -2) (total cost: 3 points) plus Dispel Fire Powers 20d6, all Fire powers simultaneously (+2) (180 Active Points); Only Within Affected Area (20" x 20" zone; -2), 16 Charges (-0) (total cost: 60 points). Total cost: 63 points.

Internal Security Monitors: A space station's security team uses this system to keep an eye on events around the station. Price: 2,600 credits each, or more.

Clairsentience (Sight And Hearing Groups), Mobile Perception Point, Multiple Perception Points (up to eight at once), 8x Range (2,000") (65 Active Points); OAF Immobile (-2), Perception Point Cannot Move Through Solid Objects (-0). Total cost: 22 points.

Secondary Life Support System: If the starbase's main life support systems are disabled, station residents can proceed to a special chamber where a backup system will keep them alive until help arrives... or supplies run out. Price: 840 credits, or more.

Life Support (Self-Contained Breathing; Diminished Eating: no need to eat; Safe Environments: Intense Cold, Intense Heat, High Radiation, Low Pressure/Vacuum) (21 Active Points); Only Within Affected Area (20" x 20" chamber; -2), 1 Continuing Fuel Charge (easily replaced from sources outside the station; 1 Month [i.e., 30 man-days]; -0). Total cost: 7 points.



SPACE COMBAT



SLINGSHOTTING

“Slingshotting” is a spaceflight term for flying in a close arc around a star or planet to increase the ship’s velocity. The downside is that if the ship gets too close, it could damage itself... or even crash.

To slingshot, a character must plot a “close arc” flight course around a nearby star or planet, with a defined “exit” point (the point at which he wants to break his ship free from the body’s gravity and slingshot in the direction he wants to go).

then make a Skill Roll. He suffers a penalty of -1 for every 5” Flight he uses in this maneuver (plus an additional -2 if he uses MegaScaled movement). He only has to make one roll, even though his flight course requires multiple Phases of movement. If he succeeds, he increases his ship’s velocity — multiply his inches of movement per Phase by the planet’s gravity relative to Earth’s. (Thus, a ship that slingshots around a 2 G world multiplies its movement by 2.) This effect lasts for 1d6 Phases (+1 Phase per 2 points by which the character made his Combat Piloting roll), and does not cost extra END or use up fuel.

If the roll fails by 1 to 4 points, the ship enters the star’s photosphere (see Visiting The Sun, page 98) or the planet’s

Space battles are a long-standing part of science fiction, both in print and on the silver screen. This section of Chapter Eight provides some additional and expanded *HERO System* rules for conducting battles between ships in space. However, the nature of space combat depends largely on the types of technology available — the spectrum of tactical options in a setting with easy FTL flight and starship maneuvering differs significantly from the available choices in a Low SF game. Therefore, the rules presented here are general ones, intended for use in a wide variety of *Star Hero* campaigns. Gamemasters can, and should, alter and adapt them for use in their own games, and create new rules appropriate for their campaign settings as well.

There are two schools of thought regarding starship combat. The *Fun* school emphasizes all the cool space opera stuff — whooshing fighters, cruisers trading broadsides, and tactics Horatio Nelson would have approved of. The *Accurate* school emphasizes what is known about conditions in space and modern trends in warfare, with high levels of stealth, prolonged duels of sensors and countermeasures, and devastating weapon strikes. Gamemasters can pick which method they prefer. The *Accurate* school is more appropriate for Low SF and Military SF games; the *Fun* school is more appropriate for Pulp and Space Opera games.

ACTIONS IN STARSHIP COMBAT

Gamemasters running starship combat have two options for determining who can act, and when: a simple rule; and a complex rule.

SIMPLE STARSHIP ACTIONS

The “simple” rules consider each starship as a single entity, regardless of how many crewmembers they have, weapons they mount, or computers they use. Each ship moves according to the standard vehicle rules: it uses its own SPD or its pilot’s SPD (whichever is lower), and its defined inches of movement. It performs actions as if it were a single entity: it can make one attack using one of its weapons, for example, but that’s it.

The benefit to the “simple” starship action rules is that they make the combat easy to understand and run. The drawback is that they’re not in any way “realistic.” Even if it has the power to do so, the ship can’t fire multiple weapons or engage in a lot of fancy maneuvering, and that saps a lot of the flavor from starship battles.

COMPLEX STARSHIP ACTIONS

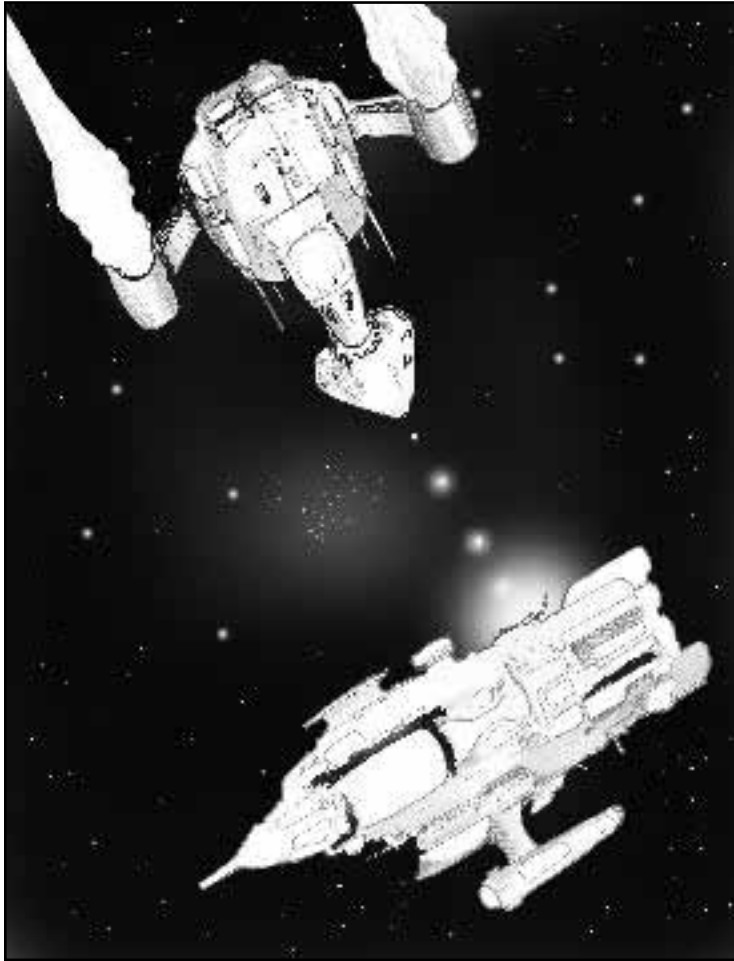
For greater “realism,” and a greater degree of participation by the PCs, GMs can use more complex rules to resolve starship actions. In the complex system, the starship counts as one character who can act on its own Phases (or using the per-Turn rules for Dogfight or Intercept Combat, if those are in effect). It can move, fire one weapon, perform a maneuver, or the like. It uses its own DEX and SPD, or the DEX and SPD of its controlling computer, to determine when it can act (see pages 471-72 of the *HERO System 5th Edition*, Revised for general rules on this subject).

Additionally, each PC, and any other prominent character aboard the ship, *also* gets to act, according to his own SPD and DEX (or, to simplify things, the GM may rule that all characters on a ship act with the ship’s SPD). That allows characters to do things like pilot the ship, fire a weapon, activate point defenses, perform first aid on injured crewmembers, fight boarders, and so forth. Characters use their own DEXs, Skills (including relevant Combat Skill Levels), and other attributes to resolve the outcome of actions they attempt. If the characters fire the ship’s weapons, they use the ship’s OCV; if they get involved in personal combat, they use their own CVs. If the characters use the ship’s weapons or equipment, the ship pays the END for them in the Segment when they’re used.

One exception to this general rule: if a character acts as the “pilot” of the ship, his action in a Phase is to do that — pilot the ship. He cannot also fire a weapon, operate the sensors, or the like (unless the GM permits). However, he can, as part of his piloting, perform maneuvers with the ship, or make attacks like ramming other ships (Move Through). If the GM chooses to resolve ship movement first in a Phase (see below), a character serving as pilot gets to act first in that Phase, even if his DEX isn’t the highest in the group.

The GM determines how many crewmembers on a ship count as “prominent” for purposes of this rule. For example, assuming a ship had sufficient power, theoretically it could fire every single weapon it has, since a separate crewmember can man each weapon and fire it individually. But that could take a lot of time, so the GM may not want to consider *every* crewmember capable of firing a weapon as “prominent.” He may prefer to designate only the PCs and major ship’s officers as prominent, or only enough gunners to man half the weapons, or the like.

Some characters’ actions can affect the actions of all other characters on the ship. For example, a



character who uses sensors to obtain a +2 Attack Roll bonus for the ship's weapons doesn't just obtain that bonus for himself — it applies to all other attacks the ship makes that Phase. The GM determines who a character's actions affect.

Example: *The Sword Of Orion is a large war-ship with a crew of 500 persons, including five PCs. The GM decides that, in battle, each PC, each of the ship's six major officers who aren't PCs, and enough average crewmembers to man one-third of the Sword's weapons are "prominent" characters.*

The Sword gets into a fight with a strange enemy ship. The Sword itself counts as a character, and moves to attack. One PC, Lt. Jackson, is the ship's Flight Officer, so he's piloting the ship, and that counts as his action (he could have made the ship perform a maneuver, if he'd wanted). Jackson's DEX isn't as high as some of the other PCs, but since the GM resolves ship movement first, Jackson gets to act first.

The first PC in the initiative order is Lt. Thalira, who's manning a torpedo launcher. She acts on her own DEX, and uses the ship's CV to determine whether she hits the enemy ship.

The next PC is Ensign Rodriguez, who's manning the sensors. One of the ship's sensors is defined as Find Weakness, so he uses his action to make the roll. He succeeds, and relays the information

he's uncovered to the other PCs. All the ship's attacks get to take advantage of the halving of the target's defenses, not just attacks made by Rodriguez.

The next PC, Ensign Flynt, is an engineer who's been assigned to repair duty. He Holds his Action, waiting until the ship suffers damage before he acts.

The last PC is Dr. Petrine, who's waiting in sickbay for injured crewmembers. She, too, Holds her Action until she needs to act.

The GM now resolves the actions of any NPC crewmembers firing weapons or performing other tasks. To keep the pace of combat moving quickly, the GM uses the optional rule on page 221 — he rolls once for all NPCs making attacks, using that one roll to determine how many of them hit. He also just assumes the attacks do average damage, rather than rolling dice for each attack that hit.

SAMPLE TACTICAL COMPUTER

	Val	Char	Cost	Roll
		Notes		
13	INT	3	12-	PER Roll 12-
15	DEX	15	12-	OCV: 5/DCV: 5
3	SPD	5		Phases: 4, 8, 12

Total Characteristic Cost: 23

Cost Skills

6	+2 with Ship's Weapons
6	KS: Known Enemies & Threats 15-
6	Systems Operation (player chooses categories) 12-
3	Tactics 12-
1	WF: [Ship's] Weapons
	Programs
1	Locate Target
1	Analyze Target
1	Attack Target

Total Abilities Cost: 25

Total Computer Cost: 48

Value Disadvantages

None (or chosen by player)

Total Disadvantage Points: 0

Total Cost: 48/5 = 10

Description: Characters determined to get maximum firepower out of their ships can buy tactical computers. Some ships have just one or two

Continued from last page

upper atmosphere (see page 285). If the roll fails by 5 or more points, the ship crashes into the body (taking damage as indicated on page 98 for a star, or Move Through damage for entering an atmosphere/hitting a planet).

tactical computers, with each operating whichever weapon it thinks will be most effective; other ships have one computer per weapon, meaning they can fire everything they've got every Phase (as long as the power holds out).

STARSHIP COMBAT MOVEMENT AND MANEUVERING

The basic *HERO System* vehicle combat rules are appropriate for cinematic battles. Vehicles get their Move each Phase, and maneuver freely.

Movement Basics

Tracking space vehicle movement works best if you have a hex map. You should get a large map for space combat — particularly when using “realistic” movement rules, because the cumulative nature of space movement means ships can rapidly move very far apart. Gamemasters may prefer to use non-mapped vehicle combat (as described on pages 473-75 of the *HERO System 5th Edition, Revised*), especially if there are only two ships in a battle. All that requires is keeping track of the distance between the two.

At the beginning of an engagement, the GM should “peg” the map to the slowest-moving vehicle, or some other vehicle that's particularly significant to the battle. That vehicle begins at rest with regard to the map. It isn't at rest of course, it's just that the map is “moving” along with the ships. As the battle progresses, the GM may peg the map to some other ship, as appropriate.

Of course, most space battles occur over ranges too great for any map. Weapons and sen-

sors which can detect and hit a ship 300,000 kilometers away won't fit on a single map, unless you increase the scale of the hexes to the point where they're of no use. In those cases, the ships are effectively at rest — the GM simply states the range at which they first detect each other, and the ships bang away at extreme range with no real maneuvering at all.

If a ship counts as a character (no matter whether you use the simple or complex rules described above), it can only make a Half Move with its Flight if it also wants to perform an action (a Combat Maneuver, an attack, or the like).

SCALE OF MOVEMENT

Gamemasters running starship battles must consider the *scale* of ships' movement.

Normally, space combat takes place at slower-than-light speeds. That's easier to show on the screen, and avoids all sorts of questions about how various weapons would perform at FTL velocities. In game terms, that means ships are using ordinary Flight to move around the battlefield. The GM can assume ships maneuver fairly close to one another, so that each hex on the map is of the standard distance — 2 meters. That means you can resolve movement according to the normal rules.

For greater “realism,” GMs may wish to establish that each hex on the map is larger than 2 meters. For example, each hex might be 100 meters, or 1 kilometer, or 10 kilometers. If ships use normal movement, it may take a long time for one to cross a single hex (and the GM may need “sub-maps” of individual hexes, if ships want to fight close to each other). Alternately, the GM can apply a scale change to movement as well. Maybe each 1” of Flight works on the same scale as the map, or at some lesser rate (but one still greater than 1” = 2m).

If one or more ships have Mega-Scaled Flight, the GM must also account for that when setting the scale and determining distances moved. If all ships have MegaScaled Flight, the GM can simply set the map scale so that 1” equals the shortest distance the slowest ship could move, and then let other ships move accordingly. If some ships have MegaScaled Flight but some don't, the GM needs to keep that in mind when setting the scale of the map and ship movement — it's not fair to let ships that haven't paid for MegaScale fly as fast as those that have, but it may still be necessary to let non-MegaScaled ships move at least a little faster than 1” = 2m to keep the pace and scope of the battle reasonably fast and “realistic.”



THREE-DIMENSIONAL MOVEMENT

Starship combats take place in three dimensions — the ships can go “up” and “down” as well as toward the four edges of the map. Unfortunately, it’s difficult to simulate this in gaming, because maps are flat. Unless you’re willing and able to build special multi-level mapping tables for your games, you need to consider other solutions. For example, you can mark a ship’s position with numerical notations indicating its position in the Z (up and down) scale, using some pre-defined unit of measurement (such as 100 meters or 1 kilometer). A “+” note indicates a ship that’s above the plane of the map; a “-” notation one that’s below the map. For example, a ship marked as +3 might be 300 meters above the map; one marked -1 is 100 meters below the map.

Precise calculations of distance to ships above or below the map are possible using the Pythagorean Theorem, but generally this is a waste of time for gaming purposes. The GM should simply count the hexes normally on the map, and then add a few to reflect distances above or below the map (if appropriate).

Realistic Movement

In realistic movement, a vehicle’s space Flight is its delta-V, the amount by which it can accelerate or decelerate. Most vehicles have their movement and facing determined relative to the “stationary” one to which the GM has pegged the map.

Each Phase, mark where each ship begins and ends its movement. On its next Phase the ship automatically moves the same distance and direction, plus whatever delta-V it applies with its engines. Ships applying any delta-V automatically face in the direction they are adding movement. (Unless the GM chooses to waive the Turn Mode rules, a ship can only change its direction of movement up to 60 degrees (one hex side) per Phase.) When moving the ship, apply the new delta-V first, and the old movement second.

Example: *The Mockingbird, a small spacecraft, has Flight 30”. It’s currently heading straight “south” (toward the bottom edge of the map) to escape a pursuer. It detects an obstacle in the way and needs to maneuver. It applies “thrust” (i.e., its inches of Flight) at an angle 60 degrees to the left of its current trajectory. Its player first moves it 30” along the “60 degrees left” vector. Then he moves the Mockingbird the same distance and direction it was traveling before — 30” to the “south.”*

REALISTIC STARSHIP MANEUVERING

Realistic starship combat is typically resolved as Dogfight or Intercept Combat (*HERO System 5th Edition, Revised*, pages 473-75). Due to the distances involved in outer space, and the quality of the sensors most starships have, Intercept Combat is the most common, with ships accelerating flat-

out and no combat maneuvering. For early drives like chemical or thermal rockets, there just isn’t enough fuel to waste ducking and weaving, and ion motors have such slow rates of acceleration they have to move at Noncombat speeds to get anywhere at all. More advanced engines allow for greater “agility,” but at vast distances Intercept Combat rules still make more sense for a “realistic” battle.

Dramatic Movement

For dramatic movement, ignore the realities of movement in space. Ships move as they normally do — up to their full inches of Flight per Phase, in whatever direction they desire (and their Turn Mode allows).

DRAMATIC STARSHIP MANEUVERING

Instead of using Dogfight and Intercept Combat, GMs taking a more dramatic approach should simply treat starships as if they were characters using Flight, and have them maneuver and fight accordingly. Alternately, GMs who want a little more “flavor” for their starship battles, but at the cost of introducing a new rule, can try the

STARSHIP MANEUVERS

Maneuver	Roll	Notes/Description
Clever Positioning	-4	The pilot positions the ship near or between one or more designated targets in a way that minimizes exposure to counterattack. Against those targets only, the ship’s DCV for performing Rapid Fire is reduced only by -2, not halved. (If -2 would equal halving the ship’s DCV, the Maneuver only imposes a -1 penalty.)
Close Combat	-6	May only be used against a ship which is at least 10 Size categories (see page 217) larger than the attacking ship. The pilot maneuvers in so close to the target’s hull that: (a) it’s virtually impossible for him to miss (+6 OCV to hit that target); and (b) the target ship typically cannot bring its large weapons to bear against the attacker (GM’s decision as to the exact effect); and (c) any other ship that attacks the attacker and misses has a 50% (1-3 on 1d6) chance of hitting the ship the attacker is in Close Combat with. However, future failed rolls may indicate he’s crashed into the larger ship’s hull.
Defensive Maneuver	-2	Against a single designated attacker, the ship receives +1 DCV in the Phase in which it performs the maneuver.
Evade	-3	The pilot maneuvers the ship in such a way that he breaks a single enemy ship’s sensor lock.
Extreme Defense	-4	Against up to four designated attackers, the ship receives +1 DCV in the Phase in which it performs the maneuver.
Extreme Offense	-6	Against up to four designated targets, the ship receives +1 OCV in the Phase in which it performs the maneuver.
Maneuver Positioning	-4	A ship needs to use this Maneuver to position itself to perform a Haymaker with one of its weapons, and in the GM’s option for certain other Maneuvers as well (such as multiple-Power attacks or Rapid Fire) (see “Combat Maneuvers”).
Offensive Maneuver	-2	Against a single designated target, the ship receives +1 OCV in the Phase in which it performs the maneuver.

“Roll” indicates the penalty to the Combat Piloting roll needed to perform the Maneuver.

SPACE COMBAT AND MULTIPLE-POWER ATTACKS

Making attack and damage rolls for every weapon a ship fires in a Phase can become time-consuming and tedious. To keep combat moving quickly and smoothly, the GM might instead want to consider all of a ship's weapons fired at a single target as one multiple-Power attack (see the *HERO System 5th Edition*, page 234). That allows for "broadside" or "gang-fire" attacks the GM can resolve quickly and easily (especially if he uses average damage for each of the attacks).

To keep gang-fire attacks from becoming overwhelming, the GM may want to impose preconditions or restrictions on them, such as:

- making a "broadside" takes a Full Phase Action by the ship and everyone on the ship manning a weapon (though the GM may also want to allow multiple broadsides at multiple targets in a Phase, if the ship has enough weapons to make that many attacks)
- imposing a cumulative OCV penalty for each weapon included in the broadside after the first (say, -1 or -2 per weapon)
- reducing the ship's DCV by half when it makes a broadside attack
- requiring the ship to execute a *Maneuver Positioning* Starship Maneuver successfully before it can make a broadside attack

Starship Maneuvers listed in the accompanying table.

Each starship maneuver counts as an Attack Action, and the pilot has to make a Half Move before performing the Starship Maneuver (since they all involve some sort of jinking, turning, diving, dodging, or other "maneuvering"). Additionally, he must make a Combat Piloting roll with the listed penalty for the Maneuver, using only his natural Skill; bonuses from the ship's piloting systems do not apply. If he succeeds, he gets the benefits described; if he fails, he gets no benefit (and, at the GM's option, the ship may even suffer a minor penalty, like -1 DCV, or -1 OCV next Phase).

As with other *HERO System* elements, the Starship Maneuvers have "generic" names. It's up to the player whose character performs the maneuver to describe exactly what the character does. For example, a Defensive Maneuver could represent a barrel roll, presenting a minimal aspect to an attacker, high-speed jinking, or clever use of space debris and other "cover."

ATTACKING AND DEFENDING

Here are some rules for how starships attack and defend.

Sensor Locks

Before one starship can attack another, it must obtain a "sensor lock." In other words, it has to properly perceive the target with its sensors, and feed that information to the targeting systems.

To obtain a sensor lock, the ship (or the character on the ship operating the sensors) must make a PER Roll with a Targeting Sense using the ship's main computer's INT. This is an Attack Action. The Range Modifier applies; so do penalties for intervening physical obstacles, energy fields, and the like.

If the roll fails, the ship cannot obtain a sensor lock. If it wishes to attack, it must do so at the OCV penalties for being unable to perceive its opponent (see page 349 of the *HERO System 5th Edition, Revised*). DCV penalties do *not* apply, unless the ship's crew is also "blind." The ship may make more attempts to obtain a sensor lock in its later Phases.

If the roll succeeds, the ship has obtained a sensor lock, and can attack with any of its weapons at full OCV, possibly using a Combat Maneuver in the process (see below). Once the ship has a lock, the lock remains in effect until the target does something to break it. Possible ways to break a sensor lock include:

- successfully executing an *Evade* Starship Maneuver
- using electronic warfare to block, jam, or trick the enemy ship's sensors

■ flying so that a sufficiently large physical object passes between the ship and the enemy ship (Other starships are *not* large enough for this unless they are at least twice the size of the ship attempting to break the lock.)

A ship may attempt to re-establish a broken sensor lock using the same method for establishing it. If the lock was broken within the past Turn, the ship has a +2 bonus to its PER Roll to re-establish; if within the past two Turns, a +1 bonus; and no bonus thereafter.

Combat Modifiers

Most Combat Modifiers apply normally in starship combat — it's simply a matter of judging their effects ship-to-ship, rather than character-to-character. For example, a group of small fighters could swarm around a larger warship to get a Multiple Attacker bonus, or could Coordinate their weapons to inflict Stun damage on a giant space amoeba. A clever captain might hide his ship in an asteroid belt or nebula so he could ambush another vessel and obtain a Surprised bonus, or he could maneuver his ship in ways that gain him a Surprise Move bonus.

COORDINATED ATTACKS

In some science fiction settings, it's not uncommon for two or more ships to combine their firepower to focus on a specific point of the target's defenses, and thus overcome those defenses — something neither ship could hope to accomplish individually. Gamemasters who want to allow this sort of action could modify the Coordinated Attack rules. In this case, the attackers who succeed with Teamwork rolls add the BODY of their attacks together to determine if they can overcome the target's defenses. To keep this from unbalancing the game, the GM may wish to impose restrictions on it, such as those listed in the sidebar on multiple-Power attacks.

TARGET SIZE

For starships, their DCV modifiers from Size take the place of any Target Size modifiers. However, ships attacking planets (see page 197) or other objects in space may incur Target Size modifiers in the usual fashion.

Combat Maneuvers

Starships may use the following Combat Maneuvers, which are most appropriate to "dramatic" starship combat. Unless indicated otherwise, they provide the same OCV and DCV modifiers as Combat Maneuvers used by characters, and provide those modifiers to every attack or weapon the ship uses that Phase. The GM may alter or add to this list as necessary to reflect the technology, nature, and dramatic feel of the setting.

STANDARD MANEUVERS

Brace, Set: Starships willing to take the time to aim carefully can use these maneuvers.

Dodge: As described on page 473 of the *HERO System 5th Edition, Revised* rulebook, a vehicle can “Dodge” if the pilot does nothing else but move the vehicle in a Phase. (Vehicles with Limited Maneuverability cannot perform this maneuver.) This has the effect of eliminating the vehicle’s DCV penalty due to Size. If that seems unrealistic or unbalancing to the GM (given the vast size and ponderous movement of many large starships), he can rule that the Dodge just provides a +3 DCV bonus, that it only eliminates half the Size penalty, that it provides +1 DCV per point by which the pilot makes a Combat Piloting roll, or the like.

Haymaker: At the GM’s discretion, a character could Haymaker with a starship weapon attack. This simulates taking extra time to aim carefully, shooting at a weak point in the enemy’s armor, or the like. Before performing a Haymaker, the ship must perform a *Maneuver Positioning* Starship Maneuver (unless the GM chooses to waive that requirement). This maneuver only allows a ship to perform a Haymaker with a single weapon attack, unless the GM is willing to allow multiple weapons to Haymaker simultaneously.

Grab, Grab By: To use these Maneuvers, a ship needs a way to Grab — a tractor beam, a grapple-gun, or the like.

Move By: This Maneuver represents a “sideswipe” or like attack.

Move Through: This Maneuver represents “ramming” a target, or making a like attack.

Strike (Shoot): Ships use this Maneuver to make standard attacks. In realistic long-range combats, they need to beware the light-speed time lag. Light travels at 300,000 kilometers (150,000,000”) per second, so when a ship makes an attack against something 100,000 kilometers away, the beam hits where the target was two-thirds of a second ago. A ship with FTL sensors (*i.e.*, sensors able to detect things more than 300,000 km away) can avoid this problem. Ships without have to “guesstimate” where the target will be when the attack intersects its path; you can simulate this with an Attack Roll penalty of -3 for every 300,000 km of distance between the attacker and target (in addition to the standard Range Modifier).

OPTIONAL MANEUVERS

Cover: At the GM’s option, a ship could use this Maneuver on another ship. It’s a good way to represent “stand-offs in space,” a feature of many science fiction television shows.

Dive For Cover: The GM might allow a ship to perform a Dive For Cover as a sort of “extreme Dodge.” If a vehicle Dives For Cover, neither it nor any person aboard it may make any attacks that Segment.

Hipshot, Hurry: Ships cannot use these Maneuvers themselves, but characters firing a ship’s weapons can use them.

Rapid Fire, Sweep: A ship (or a character on a ship) can Rapid Fire a ship’s weapon (or, if the ship can

attack hand-to-hand somehow, use Sweep in appropriate situations). That of course reduces the ship’s DCV by half, and counts as a Full Phase Action for whoever does the shooting. If the ship is so large that its DCV is already zero, the GM should impose some other restriction on the use of the Maneuver, such as increasing the OCV penalty, requiring more than one Full Phase to perform the Maneuver, increasing the END cost for the weapon, making this maneuver take a Full Phase for the entire ship and crew, or imposing a chance for the weapon to burn out or otherwise malfunction.

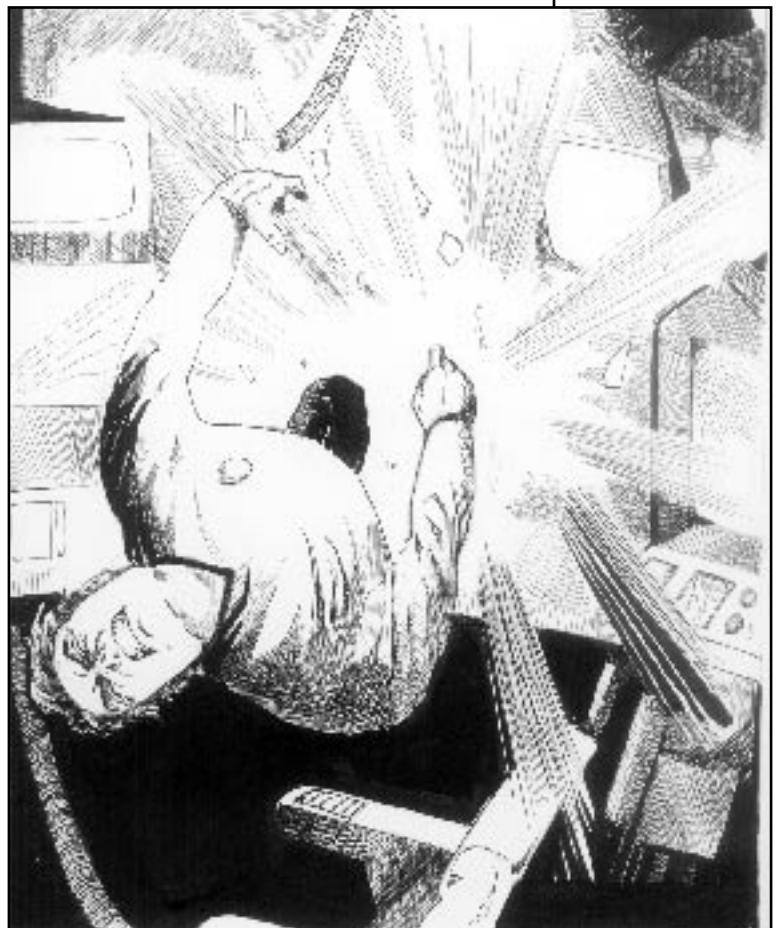
At the GM’s option, a ship cannot Rapid Fire or Sweep any of its weapons unless it first uses a *Maneuver Positioning* Starship Maneuver.

Damage And Its Effects

Spacecraft hit in combat take damage in the usual fashion. Because many starships have multiple layers of protection, the GM may need to consider which defenses apply first. Typically a Force Wall applies first, then a Force Field, then Armor (the hull). Ablative defenses always take damage first (*HERO System 5th Edition, Revised*, pages 115-16), but the GM may waive this rule if he sees fit.

BIGGER IS BETTER?

The *HERO System* has no rules about scaling damage — for better or worse, all damage is the same, and a small ship can easily mount a weapon with enough firepower to destroy the largest enemy vessel. Some GMs may prefer a more “realistic” approach,



where the big, powerful guns mounted on large ships automatically have an edge compared to the weapons on smaller ships. To simulate this, divide the points the ship spent on Size by 5 to get a “Size category” number. Subtract the smaller ship’s Size category number from the larger ship’s number, and add the difference as points of BODY damage to every Normal or Killing Damage attack the larger ship makes against the smaller.

The reverse does *not* apply — smaller ships don’t reduce their damage when attacking larger vessels. Larger vessels typically already have the advantage of spending many more points on their Defense Powers; reducing the smaller ships’ damage could easily make larger ships effectively invulnerable. And that’s neither fun nor conducive to dramatic heroism.

STARSHIP HIT LOCATIONS

Star Hero campaigns are normally Heroic, and therefore use the Hit Location Table for fights between characters. Gamemasters running spacecraft combats may also want to use Hit Location tables for starships. In theory, each ship (or class of ship) should have its own Hit Location Table, but for general *Star Hero* purposes GMs can use the accompanying Starship Hit Location Table.

In the Starship Hit Location Table, “BODYx” represents the multiplier to the BODY damage rolled on the attack. “Optional Effect” lists the chance that any BODY damage done to the ship will have some additional effect; these effects are detailed below. The GM need not apply any additional effect if he doesn’t want to. “To Hit” is the OCV penalty for specifically targeting that part of the ship. The Attack Roll modifiers depend not only on the general size of the system, and its BODYx, but on the chance for an optional effect, and the potential severity of such an effect.

BASIC EFFECTS OF DAMAGE

Regardless of whether the GM uses the optional effect rules below, or the simpler rules from the core rulebook, loss of all of a system’s BODY causes that system to cease functioning. For less than full damage, GMs should roll on the Device Malfunction Table on page 472 of the *HERO System 5th Edition, Revised*.

To determine how many BODY it takes to damage or destroy a given system, the GM has several options. If it’s a Focus, he can use the Focus rules on pages 293-94 of the *HERO System 5th*

Edition, Revised. If it’s not a Focus, he can use the “Breaking Things” rules on pages 302-04 of that book. Alternately, he can simply divide the system’s Active Points by 5, or just assign a number that seems appropriate to him.

OPTIONAL DAMAGE EFFECTS

Here are possible optional effects for each of the locations in the Starship Hit Location Table above. If a spacecraft suffers actual BODY damage in combat, the GM may, if he wishes, roll to see if an “optional effect” of damage occurs as a result. Gamemasters may roll randomly for an effect, choose an effect, or make up other effects, as they prefer. If used, these rules replace the *Damage To Vehicles* rules on page 472 of the *HERO System 5th Edition, Revised*.

If, in rolling multiple times over the course of a battle, the GM rolls similar results for a type of system, he must decide whether only the worse result applies (the usual method) or the results are cumulative (a less common, but sometimes appropriate, outcome).

Roll Command Center Effects

- 1 1-2 minor NPC crewmen killed or badly injured
- 2 Viewing apparatus damaged; pilot and crew cannot view space outside the ship with Sight Group Senses
- 3 1 important NPC officer killed or badly injured
- 4 1-6 minor NPC crewmen killed or badly injured
- 5 1-3 important NPC officers killed
- 6 Command center loses all power, or has all physical access cut off

Roll Sensors/Communications Effects

- 1 Ship’s interior communication system disabled for 1d6 Turns
- 2 -1 to all Systems Operation rolls using the communications systems
- 3 -1 to all Systems Operation rolls using the sensors
- 4 -3 to all Systems Operation rolls using the communications systems
- 5 -3 to all Systems Operation rolls using the sensors
- 6 All sensors and/or communications systems totally inoperable

Roll Piloting Systems Effects

- 1 Thrusters inoperable for 1d6 Hours
- 2 -1 to all Combat Piloting rolls
- 3 Navigation computer, and navigation functions of main computer, inoperable for 1d6 Hours
- 4 -2 to all Combat Piloting rolls
- 5 -3 to all Combat Piloting rolls
- 6 Piloting systems completely disabled; pilot cannot steer ship at all; ship adrift

Roll Engine/Power Systems Effects

- 1 Ship loses one Noncombat Movement multiple
- 2 Ship’s main power generation system loses

OPTIONAL STARSHIP HIT LOCATIONS TABLE

Roll	Location	BODYx	Effect	To Hit
3	Command Center	x2	1-2 on 1d6	-8 OCV
4-5	Sensors/Communications	x1	1-2 on 1d6	-5 OCV
6-7	Piloting Systems	x½	1-2 on 1d6	-5 OCV
8-9	Engines/Power Systems	x1 ½	1-3 on 1d6	-6 OCV
10-11	Main Body	x1	1 on 1d6	-3 OCV
12	Personnel/Cargo	x½	1-2 on 1d6	-5 OCV
13	Computer	x1	1-3 on 1d6	-8 OCV
14-15	Weapon Systems	x1	1 on 1d6	-4 OCV
16-17	Defense Systems	x1	1 on 1d6	-6 OCV
18	Life Support	x½	1 on 1d6	-8 OCV

one-third of its power-generating capacity (i.e., reduce the END of its Endurance Reserve by one-third)

- 3 Ship loses 5" of Flight
- 4 Ship loses 10" of Flight
- 5 Ship loses 20" of Flight
- 6 Ship loses all engines and cannot move except with half thrusters

Roll Main Body Effects

- 1 Ship suffers 2-12% casualties among the crew
- 2 Ship loses 2 DEF
- 3 Ship loses 5 STR
- 4 Ship loses 10 STR
- 5 Ship loses 20 STR
- 6 Cascading internal explosion; roll randomly on Starship Hit Location Table and inflict 1d6 BODY damage to resulting system/section (no defense applies)

Roll Personnel/Cargo Effects

- 1 4-24% of ship's cargo destroyed or badly damaged
- 2 Ship suffers 1-6% casualties among the crew
- 3 Ship suffers 2-12% casualties among the crew
- 4 Ship suffers 3-18% casualties among the crew
- 5 Ship loses 5-30% of some consumable (breathing gases, fuel, food, or the like)
- 6 Sickbay damaged; all Skill Rolls using its equipment suffer a -2 penalty

Roll Computer Effects

- 1 Ship loses 1 SPD
- 2 Ship loses 5 DEX
- 3 Computer loses 5 INT (and EGO, if it's an AI)
- 4 Computer loses 2d6 programs (chosen randomly by the GM)
- 5 All Skill Rolls involving or requiring computer use suffer a -3 penalty
- 6 Ship completely inoperable unless it has a backup computer

Roll Weapon Systems Effects

- 1 One weapon suffers a -2 OCV penalty
- 2 One weapon loses -4 DC of effect
- 3 One weapon develops an Activation Roll 11- Burnout
- 4 One weapon without Charges loses outside power; it has only 1d6 Charges for the remainder of the battle
- 5 One weapon becomes completely inoperable
- 6 One weapon explodes, doing its damage to the person firing it

Roll Defense Systems Effects

- 1 Defense system malfunctions, causing a -2 to all Systems Operation rolls using the sensors
- 2 One defense system loses 20 Active Points' worth of effect

- 3 One defense system develops an Activation Roll 11- Burnout
- 4 One defense system without Charges loses outside power; it has only 2d6+2 Charges for the remainder of the battle
- 5 One defense system becomes completely inoperable
- 6 One defense system explodes; roll randomly on Starship Hit Location Table and inflict 1d6 BODY damage to it (no defense applies)

Roll Life Support Effects

- 1 Ship loses 4-24% of its breathing gases
- 2 Ship loses 10-60% of its breathing gases
- 3 Explosive decompression; one chamber of the ship is opened to space, and all its inhabitants are sucked out into the void (see page 285)
- 4 Artificial gravity becomes inoperable
- 5 Backup life support system destroyed or badly damaged (if no such system on ship, re-roll)
- 6 All life support systems become inoperable; everyone on the ship suffocates within 1d6 Minutes unless a backup system is available

CHARACTERS IN STARSHIP COMBAT

Player characters aboard spacecraft in combat are in danger. There are many ways to get hurt, irradiated, or left floating in space during a space battle.

Whenever a ship gets a Personnel/Cargo result on the Starship Hit Location Table (and sometimes other results), or a crew casualties result on an optional effects roll, or loses more than half its BODY, the characters aboard are endangered. Each character in an affected area of the ship must make a DEX Roll to avoid harm. (Characters with Luck or Unluck should roll that as well.) If the



CHARACTER DAMAGE TABLE

Roll (2d6)	Result
2	Reroll and double the effect
3	Shards of debris strike the character, causing RKA 1d6 damage (physical)
4	An area becomes hazardous, exposing a character to something he's Susceptible to, is sickening/poisonous to him, or the like
5	The character is trapped beneath debris (Entangle 2d6, 4 DEF)
6	The character is knocked into a wall and suffers 4d6 STUN damage (defenses apply)
7	The character is caught on the fringes of a blast wave; he suffers a Sight and Hearing Group Flash 4d6
8	The character is caught in an explosion; he suffers an RKA 1 ½d6
9	The character takes a hard knock to the head; he's Knocked Out for 1d6 Segments, and suffers a -2 to all INT Rolls, PER Rolls, and Intellect Skill rolls for the next 1d6 Hours
10	The character is exposed to dangerous, sickening fumes; he suffers a Drain CON 4d6 (points return at the rate of 5 per Minute)
11	An arc of electricity zaps the character, causing RKA 1d6 damage (energy)
12	Roll twice (ignore this result for subsequent rolls)

roll succeeds, the character remains unharmed — a panel shorts out nearby, a pipe bursts across the room, or the like, but the PC takes no damage.

If his roll fails, a character must roll on the accompanying Character Damage Table to determine what happens to him. The results are not intended to be fatal to characters in good health, but rather to add color, drama, and a personal touch to the battle. Gamemasters should be merciful; it's not fun for characters to suffer fatal (or frequent) injuries in a situation they don't have significant control over.

Effect Of Crew Casualties

The optional effects rules provide a way for the GM to determine what percentage of the crew becomes casualties during a battle. A "casualty" is a crewmember killed or so badly injured that he can no longer perform his combat duties.

The more crewmembers that become casualties, the harder it is to keep the ship functioning efficiently. In game terms, the GM can represent this abstractly

CREW CASUALTIES TABLE

Percentage Of Crew Casualties	Modifiers To All Skill Rolls
0-10%	-0
11-20%	-1
21-40%	-2
41-80%	-4
81% or more	-8

by imposing penalties to all Skill Rolls the ship or other crewmembers make — without a full crew to man all the duty stations, keep things running efficiently, relay messages, interpret data, and so forth, everyone else's ability to do his job becomes impaired. The Crew Casualties Table describes this effect.

Other Actions In Combat

Characters can do more in a starship battle than fire weapons or operate sensors. Some other possible actions include:

MEDICAL DUTY

Characters with medical training — such as the Skills *Paramedics* or *SS: Medicine* — may find themselves patching up injured crewmen, performing life-saving combat surgery, and so forth.

The GM can deal with this on both a personal and an abstract level. On the personal level, if a PC or prominent NPC suffers an injury, the character can attempt a Skill Roll in the normal fashion to try to make him better (or at least keep him comfortable until he can receive full medical attention). Standard rules for Paramedics apply.

On an abstract level, the GM can compare the efforts of the medical crew to the percentage of injured crewmembers. For each Phase of medical attention, have the character (PC or NPC) with the highest Paramedics or SS: Medicine roll make a roll. Crew casualty penalties (see above) apply to this roll; after all, doctors get injured and overworked, too. For every two points by which the character makes the roll, the medical crew reduces the percentage of injured crew by 1% (thus allowing those newly-healed crewmembers to return to duty). (For more realistic games, the GM may want to allow healing only for every *Turn* of effort by the medical crew, and/or to reduce the percentage of crewmembers healed.)

REPAIR DUTY

Characters can also try to repair the ship. Sometimes mid-combat repairs are the only thing keeping a ship fighting long enough to win the battle!

Assuming a system hasn't been totally destroyed by being reduced to 0 BODY (which means it has to be replaced), characters can initiate repairs by making rolls using Mechanics, Electronics, Computer Programming, Systems Operation, Weaponsmith, various SSs or PSs, or any other Skill the GM deems appropriate given the system or technology involved. Making repairs typically requires a minimum of 1 Turn (often longer), and the roll suffers a penalty of -1 per 2 BODY of damage done. For every two points by which the character makes his roll, he makes a quick repair to the system, restoring "1 BODY" of damage. This repair is temporary; later, when time allows, full repairs must be made. Once a repair is made, the GM rolls on the Device Malfunction Table (*HERO System 5th Edition, Revised*, page 449) to see if that was enough to get the system working again.

The repair does not restore any BODY to the system for purposes of suffering further damage — it only restores BODY for purposes of keeping the system functioning properly. (True repairs follow the

standard rule from page 60 of the main rulebook, though the GM may allow large crews to repair more than 1 BODY per day.) If the system suffers further damage, the repairs are ruined and BODY damage accumulates from the point where the character began repairs.

Example: *Lt. McDermott needs to repair his Laser Cannon so he can go on fighting. It has 20 BODY, but it's taken 12 BODY damage and stopped working. Using his Weaponsmith (Energy Weapons) 14-, he tries to jury-rig a quick fix so he can get back to the battle. This takes him 1 Turn, and he suffers a -6 penalty to his roll due to the 12 BODY of damage. He rolls a 4, making the roll by 4. That repairs 2 BODY of damage. The GM rolls on the Device Malfunction Table, and succeeds; the laser is working again! However, if it suffers more damage, the "2 BODY" repaired instantly vanishes, and damage starts accumulating again, adding to the 12 BODY already inflicted.*

CREW SKILLS

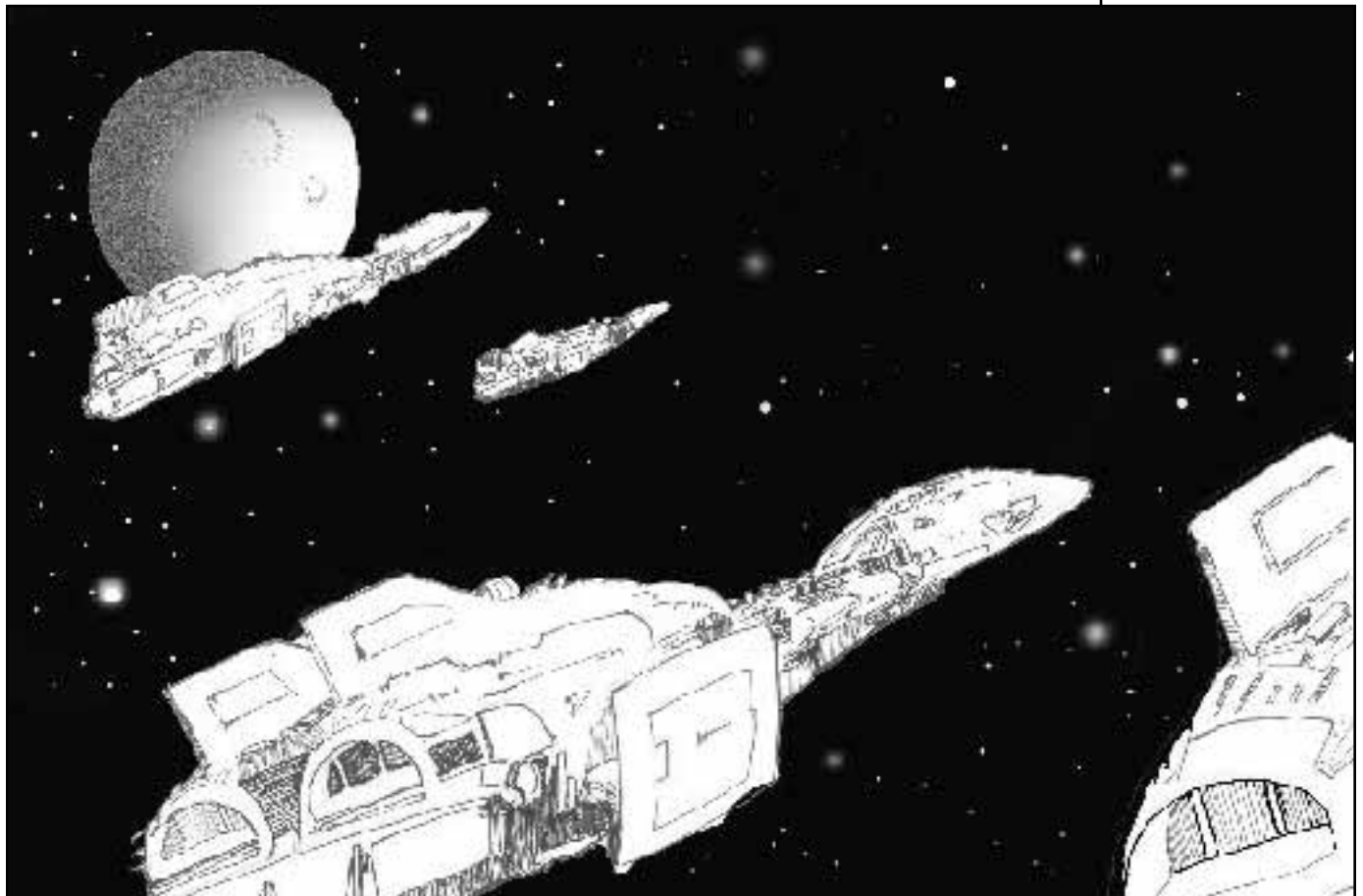
Sometimes it's easier for the GM to determine the overall effect of crew actions on a particular task (such as extensive repair work) than to make a separate Skill Roll for each major NPC (not to mention Complementary Skill Rolls and the like). In that case, the GM can simply assign the crew as a whole a "Crew Skill" and apply that to the "meta-task" as a whole.

To determine a ship's Crew Skill for a particular subject, the GM must first decide which active crew-

member has the highest Skill Roll in the appropriate Skill. (Alternately, he can use a PC's Skill, if the PC leads the effort — as he probably does.) Then he increases that Skill based on how many other crewmembers are working on the meta-task. He might add +1 to the roll per crewmember, per three crewmembers, per five crewmembers, or whatever else seems appropriate. Then he makes the Crew Skill roll for the crew as a whole to find out how well it performed the task.

Because meta-tasks are large-scale efforts, Crew Skills should take a long time to use — typically four steps down the Time Chart for every unit of time involved. Thus, a task that normally takes 1 Turn takes 1 Hour. The GM can increase or decrease the time required if appropriate; complex or dangerous systems may take much longer to work on.

Example: *A starship has suffered 34 BODY out of 50. To determine the effects of the engineering crew's efforts to repair the ship, the GM decides to use a Crew Skill. Mechanics is the most applicable Skill to the job, so he determines that Commander Korel, with his Mechanics 15-, has the highest roll. He decides to add +1 to the roll for every three crewmembers involved in the repair work. Since there are 60 engineering personnel on the ship, that's a +20, for a total Skill Roll of 35-. Korel's player makes the roll, at a -17 penalty due to the extent of the damage, and rolls a 10. Since he made the roll by 8, the repair crews fix 4 BODY worth of damage. Since repairs normally take 1 Turn, the repair crews required 1 Hour to get their work done.*



EXAMPLE VEHICLES



To get you started, here are three example starships (a merchant vessel, a fighter, and a large warship), one example mech, and two example space stations (a trade-oriented station and a military base).

None of these sample vehicles are necessarily from the same setting; consider each one separately, as an individual example of a possible ship, not in comparison to the others.

MERCHANT SHIP

Val	Char	Cost	Notes
75	STR	0	Lift 800 tons; 15d6 [0]
23	BODY	0	
20"x10"	Size	65	Mass 800 tons; -13 KB; -8 DCV
12	DEF	30	
10	DEX	0	OCV: 3/DCV: 3
3	SPD	10	Phases: 4, 8, 12
Total Characteristic Cost: 105			

Movement:	Ground:	0"/0"
	Flight:	60"/240"
	FTL:	16 LY/year

Abilities & Equipment

Cost	Power	END
Power Systems		
34	<i>Fusion Power Plant:</i> Endurance Reserve (100 END/100 REC); OAF Immobile (-2), Only Powers Electrical Devices (-¼)	0
13	<i>Auxiliary Power:</i> Endurance Reserve (40 END/40 REC); OAF Immobile (-2), Only Powers Electrical Devices (-¼)	0
Propulsion Systems		
83	<i>Fusion Engines With FTL Enhancements:</i> Multipower, 125-point reserve, all Costs Endurance (-½)	
8u	1) <i>Standard Flight:</i> Flight 60", x4 Noncombat; Costs Endurance (-½)	12
1u	2) <i>FTL Flight:</i> FTL Travel (16 LY/year); Costs Endurance (-½), Extra Time (requires 1 Minute to engage engine, but engine thereafter does not require Extra Time; -¾), Requires A PS: Fusion Engine Operation Roll (-¼)	2
20	<i>Thrusters:</i> Flight 10"	2
-12	<i>Spaceflight Only:</i> Running -6"	
-2	<i>Spaceflight Only:</i> Swimming -2"	
Tactical Systems		
45	<i>Omnipurpose Laser:</i> Multipower, 101-point reserve; all OIF Bulky (-1), Real Weapon (-¼)	

4u	1) <i>Distant Shot:</i> RKA 3d6, Autofire (5 shots; +½), MegaRange (1" = 10 km, can scale down to 1" = 1 km; +¾); OIF Bulky (-1), Real Weapon (-¼), Limited Arc Of Fire (60 Degrees; -½)	10
2u	2) <i>Close-Range Shot:</i> RKA 3d6, Autofire (5 shots; +½); OIF Bulky (-1), Real Weapon (-¼), Limited Arc Of Fire (60 Degrees; -½)	7
10	<i>Starship Force Shield:</i> Force Field (15 PD/15 ED); OIF Bulky (shield generators; -1), Ablative (-1)	3

Operations Systems

46	<i>Sensor And Communication Systems:</i> Variable Power Pool, 40 base + 20 control cost; OIF Bulky (-1), Only For Senses And Communications (-1), Costs Endurance (-½)	var
70	<i>Long-Range Sensors:</i> MegaScale (1 light-year per Active Point, can scale down to 1 km per Active Point; +3½) for any Sensor Pool Sense; OIF Bulky (-1)	var
15	<i>Long-Range Sensors:</i> +20 versus Range for Radio Group; OIF Bulky (-1)	0
3	<i>Navigation Computer:</i> +4 to Navigation (Space) roll; OAF Bulky (-1 ½)	0
17	<i>Internal Monitors:</i> Clairsentience (Sight And Hearing Groups), Mobile Perception Point, Multiple Perception Points (up to eight at once); OAF Immobile (-2), Perception Point Cannot Move Through Solid Objects (-0)	5

Personnel Systems

12	<i>Life Support:</i> Life Support (Self-Contained Breathing; Safe Environments: High Radiation, Intense Cold, Intense Heat, Low Pressure/Vacuum); Costs Endurance (-½)	2
5	<i>Backup Life Support:</i> Life Support (Self-Contained Breathing; Safe Environments: High Radiation, Intense Cold, Intense Heat, Low Pressure/Vacuum); Only Within Affected Area (2.5" x 1.25" chamber; -2), 1 Continuing Fuel Charge (easily replaced from sources outside the ship; 1 Month [i.e., 300 man-days]; -0)	[1cc]
10	<i>Backup Life Support:</i> 3 more Backup Life Support chambers (total of 4)	
3	<i>Food Supplies:</i> Life Support (Diminished Eating: no need to eat); 1 Continuing Fuel Charge (easily replaced from sources outside the ship; 1 Year [i.e., 10 man-years]; -0)	[1cc]
15	<i>Artificial Gravity:</i> Telekinesis (20 STR),	

Selective (+½); OIF Bulky (-1), Only To
Pull Objects Straight Down To The
Floor (-1) 3

Total Abilities & Equipment Cost: 402

Total Vehicle Cost: 507

Value Disadvantages

10 Physical Limitation: Cannot Enter Atmospheres (Infrequently, Greatly Impairing)

Total Disadvantage Points: 10

Total Cost: 497/5 = 99

Description: This 800-ton merchant ship consists mainly of a relatively small area in which the ten-man crew lives and works, and huge amounts of space for cargo. (You can also convert it to a passenger liner by changing the cargo areas into cabins.) It has a single forward laser for use as a tool or weapon. It carries enough food to support its crew for a year, or more people for less time.

Merchant Ship's Computer

Val	Char	Cost	Roll	Notes
15	INT	5	12-	PER Roll 12-
13	DEX	9	12-	OCV: 4/DCV: 4
3	SPD	7		Phases: 4, 8, 12

Total Characteristic Cost: 21

Cost Skills

3	Cryptography 12-
3	Electronics 12-
21	AK: Milky Way Galaxy 30-
2	KS: Archived Recent News 11-
5	KS: Current News 14-
11	KS: Known Sentient Species 20-
5	KS: Movies Database 14-
5	KS: Music Database 14-
3	Mechanics 12-
4	Navigation (Space) 14-
2	SS: Astronomy 11-
2	SS: Mathematics 11-
12	Systems Operation (Communications Systems, Environmental Systems, Medical Systems, FTL Sensors, Radar) 14-
2	TF: Commercial Spacecraft & Space Yachts
1	WF: Merchant Ship Weapons

Programs

1	Diagnose Ship Malfunction
1	Monitor Internal Monitor System, Report Anomalies
1	Monitor Communications System, Report Anomalies
1	Monitor Sensor Systems, Report Anomalies
1	Obtain Latest Market/Financial Data Via Communications System
1	Pilot Ship From Location A To Location B
1	Scan And Enter Data
1	Schedule Ships Events/Use Of Ship's Resources
1	Search Reference Material For Information On A Topic
1	Send Emergency Call If Specified Protocols Are Not Met

Talents

3	<i>Clock:</i> Absolute Time Sense
5	<i>Memory:</i> Eidetic Memory
3	<i>Calculator:</i> Lightning Calculator
3	<i>Instant-On Feature:</i> Lightsleep
6	<i>Scanner:</i> Speed Reading (x100)
20	<i>Translator:</i> Universal Translator 12-

Total Abilities Cost: 131

Total Computer Cost: 152

Value Disadvantages

To be chosen by the players (if any)

Total Disadvantage Points: 0

Total Cost: 152/5 = 30

FIGHTER

Val	Char	Cost	Notes
30	STR	0	Lift 1,600 kg; 6d6 [0]
20	BODY	6	
2½"x1¼"	Size	20	Mass 1.6 tons; -4 KB; -2 DCV
8	DEF	18	
20	DEX	30	OCV: 7/DCV: 7
4	SPD	10	Phases: 3, 6, 9, 12

Total Characteristic Cost: 84

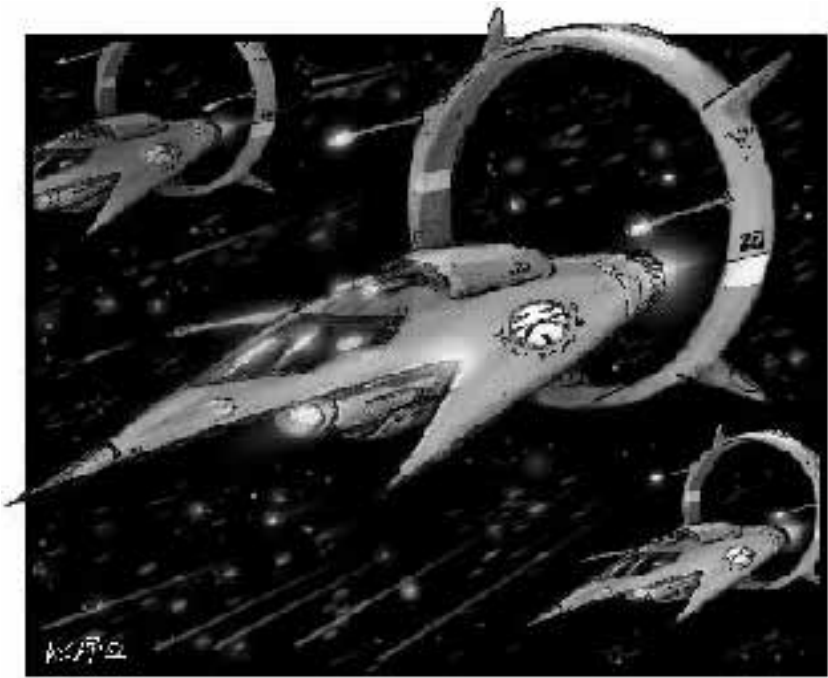
Movement:	Ground:	0"/0"
	Flight:	30"/120"

Abilities & Equipment

Cost	Power	END
Power Systems		
27	<i>Fusion Power Plant:</i> Endurance Reserve (80 END/80 REC); OAF Immobile (-2), Only Powers Electrical Devices (-¼)	0
7	<i>Auxiliary Power:</i> Endurance Reserve (20 END/20 REC); OAF Immobile (-2), Only Powers Electrical Devices (-¼)	0
Propulsion Systems		
43	<i>Fusion Engines:</i> Flight 30", x4 Noncombat; Costs Endurance (-½)	6
8	<i>Thrusters:</i> Flight 4"	0
-12	<i>Spaceflight Only:</i> Running -6"	
-2	<i>Spaceflight Only:</i> Swimming -2"	

Tactical Systems

53	<i>Forward Ion Cannon:</i> Multipower, 119-point reserve; all OIF Bulky (-1), Real Weapon (-¼)	
4u	1) <i>Distant Shot:</i> RKA 1½d6, NND (defense is ED Force Field or Force Wall; +1), Does BODY (+1), MegaScale (1" = 1 km; +¼), Autofire (5 shots; +½); OIF Bulky (-1), Real Weapon (-¼), Limited Arc Of Fire (60 Degrees; -½)	9
4u	2) <i>Close-Range Shot:</i> RKA 1½d6, NND (defense is ED Force Field or Force Wall; +1), Does BODY (+1), Autofire (5 shots; +½); OIF Bulky (-1), Real Weapon (-¼), Limited Arc Of Fire (60 Degrees; -½)	6
31	<i>Side Ion Cannons:</i> Multipower, 56-point reserve; all OIF Bulky (-1), Real Weapon (-¼)	



3u	1) <i>Distant Shot</i> : RKA 1d6, NND (defense is ED Force Field or Force Wall; +1), Does BODY (+1), MegaScale (1" = 1 km; +¼), Autofire (5 shots; +1½); OIF Bulky (-1), Real Weapon (-¼), Limited Arc Of Fire (60 Degrees; -½)	9
2u	2) <i>Close-Range Shot</i> : RKA 1d6, NND (defense is ED Force Field or Force Wall; +1), Does BODY (+1), Autofire (5 shots; +1½); OIF Bulky (-1), Real Weapon (-¼), Limited Arc Of Fire (60 Degrees; -½)	6
15	<i>Side Ion Cannons</i> : Four more Side Ion Cannons (total of five)	
15	<i>Weapons Reserve Power</i> : Endurance Reserve (30 END/30 REC); OIF Bulky (-1), Only Powers Ship's Weapons (-¼)	0
14	<i>Forward Defenses</i> : Armor (6 PD/18 ED); Ablative (-1), Limited Coverage (180 Degrees forward; -½)	0
14	<i>Aft Defenses</i> : Armor (6 PD/18 ED); Ablative (-1), Limited Coverage (180 Degrees aft; -½)	0
Operations Systems		
20	<i>Sensors</i> : Radar (Radio Group), Increased Arc Of Perception (360 Degrees), Telescopic (+20 versus Range); OIF Bulky (-1)	0
16	<i>Long-Range Attuning</i> : MegaScale (1,000 km per Active Point, can scale down to 1 km per Active Point; +1) for Sensors; OIF Bulky (-1), Costs Endurance (-½)	5
Personnel Systems		
12	<i>Life Support</i> : Life Support (Self-Contained Breathing; Safe Environments: High Radiation, Intense Cold, Intense Heat, Low Pressure/Vacuum); Costs Endurance (-½)	2
3	<i>Artificial Gravity</i> : Telekinesis (5 STR); OIF Bulky (-1), Only To Pull Objects Straight Down To The Floor (-1)	1

Skills				
8	<i>Maneuverability</i> : +4 with Flight			
3	<i>Navigation Computer</i> : +4 to Navigation (Space) roll; OAF Bulky (-1 ½)			0

Total Abilities & Equipment Cost: 288
Total Vehicle Cost: 372

Value Disadvantages
To be chosen by the players (if any)

Total Disadvantage Points: 0
Total Cost: 372/5 = 74

Description: This starship is a small fighter with a one- or two-person crew. It's not intended for long flights or FTL travel; it's designed for speed and maneuverability in a battle to which it's been ferried by a much larger carrier vessel. It can enter atmospheres if necessary, and mounts a large forward ion blaster and five smaller ones (one on each other side).

Fighter's Computer				
Val	Char	Cost	Roll	Notes
20	INT	10	13-	PER Roll 13-
20	DEX	30	13-	OCV: 7/DCV: 7
4	SPD	10		Phases: 3, 6, 9, 12
Total Characteristic Cost: 50				

Cost Skills	
9	Cryptography 16-
3	Electronics 13-
20	AK: Milky Way Galaxy 30-
10	KS: Known Sentient Species 20-
3	Mechanics 13-
2	Navigation (Space) 13-
2	SS: Astronomy 11-
2	SS: Mathematics 11-
12	Systems Operation (Communications Systems, Environmental Systems, FTL Sensors, Radar) 16-
2	TF: Military Spacecraft
1	WF: Ion Cannon

Programs	
1	Attack Target
1	Diagnose Ship Malfunction
1	Locate Target
1	Monitor Communications System, Report Anomalies
1	Monitor Sensor Systems, Report Anomalies
1	Obtain Latest Tactical Data Via Communications System
1	Pilot Ship From Location A To Location B
1	Scan And Enter Data
1	Search Reference Material For Information On A Topic
1	Send Emergency Call If Pilot Incapacitated/ Killed
1	Send Emergency Call If Specified Protocols Are Not Met

Talents	
3	<i>Clock</i> : Absolute Time Sense
5	<i>Memory</i> : Eidetic Memory
3	<i>Calculator</i> : Lightning Calculator

- 3 *Instant-On Feature: Lightsleep*
 4 *Scanner: Speed Reading (x10)*
 20 *Translator: Universal Translator 13-*

Total Abilities Cost: 115

Total Computer Cost: 165

Value Disadvantages

To be chosen by the players (if any)

Total Disadvantage Points: 0

Total Cost: 165/5 = 33

WARSHIP

Val	Char	Cost	Notes
145	STR	0	Lift 12.5 mtons; 29d6 [0]
40	BODY	3	
500"x250"	Size	135	Mass 12.5 mtons; -27 KB; -18 DCV
25	DEF	69	
15	DEX	15	OCV: 5/DCV: 5
3	SPD	5	Phases: 4, 8, 12
Total Characteristic Cost: 227			

Movement:	Ground:	0"/0"
	Flight:	10"/40"
	FTL:	1 LY/day

Abilities & Equipment

Cost	Power	END
Power Systems		
677	<i>Antimatter Power Plant:</i> Endurance Reserve (2,000 END/2,000 REC); OAF Immobile (-2), Only Powers Electrical Devices (-¼)	0
135	<i>Auxiliary Power:</i> Endurance Reserve (400 END/400 REC); OAF Immobile (-2), Only Powers Electrical Devices (-¼)	0
59	<i>Reserve Batteries:</i> Endurance Reserve (120 END/120 REC); OIF Bulky (-1), Only Powers Electrical Devices (-¼)	0
Propulsion Systems		
19	<i>Warp Drive:</i> Multipower, 28-point reserve, all Costs Endurance (-½)	
1u	1) <i>Standard Flight:</i> Flight 10", x4 Noncombat; Costs Endurance (-½), Limited Maneuverability (-¼)	2
1u	2) <i>FTL Flight:</i> FTL Travel (1 LY/day); Costs Endurance (-½), Increased Endurance Cost (x10; -4), Requires A PS: Warp Drive Operation Roll (-¼)	30
8	<i>Thrusters:</i> Flight 5"; Limited Maneuverability (-¼)	0
-12	<i>Spaceflight Only:</i> Running -6"	
-2	<i>Spaceflight Only:</i> Swimming -2"	

Tactical Systems

87	<i>Main Beamgun:</i> Multipower, 262-point reserve, all OIF Bulky (-1), Real Weapon (-¼), Limited Arc Of Fire (One Hex Row; -¾)	
9u	1) <i>Distant Shot:</i> RKA 10d6, Armor Piercing (+½), MegaScale (1" = 1 km; +¼); OIF Bulky (-1), Real Weapon (-¼), Limited Arc Of Fire (One Hex Row; -¾)	26
7u	2) <i>Close-Range Shot:</i> RKA 10d6, Armor	

	Piercing (+½); OIF Bulky (-1), Real Weapon (-¼), Limited Arc Of Fire (One Hex Row; -¾)	22
76	<i>Secondary Beamguns:</i> Multipower, 210-point reserve, all OIF Bulky (-1), Real Weapon (-¼), Limited Arc Of Fire (60 Degrees; -½)	
8u	1) <i>Distant Shot:</i> RKA 8d6, Armor Piercing (+½), MegaScale (1" = 1 km; +¼); OIF Bulky (-1), Real Weapon (-¼), Limited Arc Of Fire (60 Degrees; -½)	21
6u	2) <i>Close-Range Shot:</i> RKA 8d6, Armor Piercing (+½); OIF Bulky (-1), Real Weapon (-¼), Limited Arc Of Fire (60 Degrees; -½)	18
25	<i>Secondary Beamguns:</i> 31 more Secondary Beamguns (total of 32)	
200	<i>Intense Interferiation Field:</i> Darkness to Radio Group 10" radius, MegaArea (1" = 1 million km; +1 ¾), MegaRange (1" = 10 million km; +2), Reduced Endurance (½ END; +¼); OAF Bulky (-1 ½)	23
56	<i>ECCM:</i> Suppress Electronic Warfare 8d6, any two Powers simultaneously (+½), MegaRange (1" = 10 million km; +2); OAF Bulky (-1 ½)	14
105	<i>Primary Force Shield:</i> Force Wall (40 PD/40 ED; 125" long); OIF Bulky (shield generators; -1), Self Only (-½), Restricted Shape (one-fourth of "bubble" around ship; -¼), Extra Time (1 minute to re-erect Force Wall after it collapses; -1 ½)	45
10	<i>Primary Force Shield:</i> 3 more Primary Force Shields (total of 4; each covers one-fourth of the ship)	
7	<i>Secondary Force Shield:</i> Force Field (10 PD/10 ED); OIF Bulky (shield generators; -1), Ablative (-1)	2
14	<i>Point Defense Laser System:</i> Missile Deflection (all physical projectiles), Range (+1), MegaRange (1" = 1 km; +¼); OIF Bulky (-1), Costs Endurance (-½)	3
49	<i>Weapons Reserve Power:</i> Endurance Reserve (100 END/100 REC); OIF Bulky (-1), Only Powers Ship's Weapons (-¼)	0

Operations Systems

114	<i>Sensor And Communication Systems:</i> Variable Power Pool, 100 base + 50 control cost; OIF Bulky (-1), Only For Senses And Communications (-1), Costs Endurance (-½)	var
87	<i>Long-Range Sensors:</i> MegaScale (1 light-year per Active Point, can scale down to 1 km per Active Point; +3½) for any Sensor Pool Sense of up to 50 Active Points; OIF Bulky (-1)	var
15	<i>Long-Range Sensors:</i> +20 versus Range for Radio Group; OIF Bulky (-1)	0
3	<i>Enhanced Sensors/Communications:</i> +4 to Systems Operation roll; OAF Bulky (-1½)	
20	<i>Internal Monitors:</i> Clairsentience (Sight And Hearing Groups), 4x Range (1,000"), Mobile Perception Point, Multiple Perception Points (up to eight at once);	

- OAF Immobile (-2), Perception Point
Cannot Move Through Solid Objects (-0) 6
- 54 *Forward Tractor Beam*: Telekinesis (100 STR); OIF Bulky (projector; -1), Affects Whole Object (-¼), Limited Arc Of Fire (60 Degrees forward; -½) 15
- 5 *Aft Tractor Beam*: 1 more Tractor Beam (total of 2; this one fires 60 Degrees aft)

Personnel Systems

- 12 *Life Support*: Life Support (Self-Contained Breathing; Safe Environments: High Radiation, Intense Cold, Intense Heat, Low Pressure/Vacuum); Costs Endurance (-½) 2
- 5 *Backup Life Support*: Life Support (Self-Contained Breathing; Safe Environments: High Radiation, Intense Cold, Intense Heat, Low Pressure/Vacuum); Only Within Affected Area (40" x 20" chamber; -2), 1 Continuing Fuel Charge (easily replaced from sources outside the ship; 1 Month [*i.e.*, 105,000 man-days]; -0) [1cc] 15
- 3 *Food Supplies*: Life Support (Diminished Eating: no need to eat); 1 Continuing Fuel Charge (easily replaced from sources outside the ship; 1 Year [*i.e.*, 3,500 man-years]; -0) [1cc] 3
- 15 *Artificial Gravity*: Telekinesis (20 STR), Selective (+½); OIF Bulky (-1), Only To Pull Objects Straight Down To The Floor (-1) 3
- 3 *Backup Artificial Gravity*: Telekinesis (5 STR); OIF Bulky (-1), Only To Pull Objects Straight Down To The Floor (-1) 1
- 18 *Medical Facilities*: Paramedics 14- and SS: Medicine 14- 0

Skills/Laboratories

- 16 *Tactical Computer*: +8 with Ship's Weapons; OIF Bulky (-1), Costs Endurance (-½) 4
- 3 *Navigation Computer*: +4 to Navigation (Space) roll; OAF Bulky (-1 ½) 0
- 13 Computer Programming 14-
- 13 Cryptography 14-
- 13 Demolitions 14-
- 13 Electronics 14-
- 13 Mechanics 14-
- 15 Weaponsmith (Firearms, Missiles & Rockets, Incendiary Weapons, Energy Weapons) 14-
- 100 Other laboratories (defined by GM or player)

Total Abilities & Equipment Cost: 2,115**Total Vehicle Cost: 2,642****Value Disadvantages**

- 25 Distinctive Features: deadly warship (Not Concealable; Causes Extreme Reaction [abject fear])
- 10 Physical Limitation: Cannot Enter Atmospheres (Infrequently, Greatly Impairing)

Total Disadvantage Points: 35**Total Cost: 2,607/5 = 521****ADDITIONAL VEHICLES****Cost Power**

- 83 Nuclear Space Missile
- 20 15 more Nuclear Space Missiles (total of 16)

Description: This large warship, a kilometer long and half as wide, is a major combat starship for an advanced interstellar empire. It carries a crew of 3,500 and mounts dozens of weapons.

Warship's Computer

Val	Char	Cost	Roll	Notes
30	INT	20	15-	PER Roll 15-
20	DEX	30	13-	OCV: 7/DCV: 7
6	SPD	30		Phases: 2, 4, 6, 8, 10, 12
Total Characteristic Cost: 80				

Cost Skills

- 3 Computer Programming 15-
- 3 Cryptography 15-
- 3 Electronics 15-
- 18 AK: Milky Way Galaxy 30-
- 3 KS: Archived Recent News 15-
- 3 KS: Current News 15-
- 8 KS: Known Sentient Species 20-
- 3 KS: Movies Database 15-
- 3 KS: Music Database 15-
- 3 Mechanics 15-
- 2 Navigation (Space) 15-
- 3 SS: Astronomy 15-
- 3 SS: Mathematics 15-
- 20 Sciences (20 more points' worth)
- 8 Systems Operation (Communications Systems, Environmental Systems, Medical Systems, FTL Sensors, Radar) 15-
- 2 TF: Military Spacecraft
- 1 WF: Warship Weapons

Programs

- 1 Attack Target
- 1 Diagnose Ship Malfunction
- 1 Locate Target
- 1 Monitor Internal Monitor System, Report Anomalies
- 1 Monitor Communications System, Report Anomalies
- 1 Monitor Sensor Systems, Report Anomalies
- 1 Obtain Latest Tactical Data Via Communications System
- 1 Pilot Ship From Location A To Location B
- 1 Scan And Enter Data
- 1 Schedule Ships Events/Use Of Ship's Resources
- 1 Search Reference Material For Information On A Topic
- 1 Send Emergency Call If Designated Officers Incapacitated/Killed
- 1 Send Emergency Call If Specified Protocols Are Not Met

Talents

- 3 *Clock*: Absolute Time Sense
- 5 *Memory*: Eidetic Memory

- 3 *Calculator*: Lightning Calculator
 3 *Instant-On Feature*: Lightsleep
 8 *Scanner*: Speed Reading (x1,000)
 20 *Translator*: Universal Translator 15-

Total Abilities Cost: 144

Total Computer Cost: 224

Value Disadvantages

To be chosen by the players (if any)

Total Disadvantage Points: 0

Total Cost: 224/5 = 45

X-780 COMBAT MECH

Val	Char	Cost	Notes
65	STR	0	Lift 200 tons; 13d6 [0]
25	BODY	4	
12.5"x6.4"	Size	55	Mass 200 tons; -11 KB; -7 DCV
20	DEF	54	
18	DEX	24	OCV: 6/DCV: 6
4	SPD	12	Phases: 3, 6, 9, 12
Total Characteristic Cost: 149			

Movement: Ground: 25"/50"
 Leaping: 40"/80"

Abilities & Equipment

Cost	Power	END
Power Systems		
29	<i>Power Plant</i> : Endurance Reserve (60 END/60 REC); OIF Bulky (-1), Only Powers Electrical Devices (-¼)	0
5	<i>Auxiliary Power</i> : Endurance Reserve (10 END/10 REC); OIF Bulky (-1), Only Powers Electrical Devices (-¼)	0
Propulsion Systems		
4	<i>Mech Limbs</i> : Extra Limbs (4 — two legs, two arms); Limited Manipulation (-¼)	0
25	<i>Mech Limbs</i> : Running +19" (25" total); Costs Endurance (-½)	4
40	<i>Jumpjets</i> : Leaping +40" (40" forward, 20" upward); 16 Charges (-0)	[16]
Tactical Systems		
52	<i>Laser Assault Cannon</i> : RKA 4d6, Armor Piercing (+½), Increased Maximum Range (x5, or 2,250"; +¼); OIF Bulky (-1)	10
45	<i>Gatling Laser</i> : RKA 3d6, Armor Piercing (+½), Autofire (5 shots; +½); OIF Bulky (-1)	9
45	<i>Rocket-Launched Bombs Pod</i> : RKA 3d6, Explosion (-1 DC/2"; +¾), Indirect (can arc attack over intervening obstacles; +¼); OIF Bulky (-1), 16 Charges (-0)	[16]
20	<i>Targeting Sensors</i> : Find Weakness 13- with all Mecha Ranged Weapons; Costs Endurance (-½)	3
Operations Systems		
16	<i>Mech Sensors</i> : Radar (Radio Group), Discriminatory, Increased Arc Of Perception (360 Degrees), Telescopic (+14 versus Range Modifier); OIF Bulky (-1), Costs Endurance (-½)	4

- 2 *Nightsight System*: Infrared Perception (Sight Group); OIF Bulky (-1), Costs Endurance (-½) 1
 2 *Nightsight System*: Ultraviolet Perception (Sight Group); OIF Bulky (-1), Costs Endurance (-½) 1
 4 *360 View System*: Increased Arc Of Perception (360 Degrees) for Sight Group); OIF Bulky (-1), Costs Endurance (-½) 1
 5 *Mech Communications System*: HRRP; OIF Bulky (-1), Costs Endurance (-½) 1
 5 *Hardened Sensor/Commo Systems*: Radio Group Flash Defense (10 points); OIF Bulky (-1) 0

Personnel Systems

- 11 *Life Support*: Life Support (Self-Contained Breathing; Safe Environments: High Radiation, Intense Cold, Intense Heat); Costs Endurance (-½) 2

Skills

- 6 *Tactical Computer*: +3 with Mech Weapons; OIF Bulky (-1), Costs Endurance (-½) 1

Total Abilities & Equipment Cost: 316

Total Vehicle Cost: 465

Value Disadvantages

To be chosen by the players (if any)

Total Disadvantage Points: 0

Total Cost: 465/5 = 93

Description: This is a fairly basic combat mech, standing about 80 feet tall. Its cockpit has room for a single pilot, who controls all functions of the mech; it does not have a computer capable of operating the vehicle independently. It mounts three major weapons: cannons on each of its arms, and a pod of rocket-launched bombs on its left shoulder.

MAKARIDES HIGH PORT

Val	Char	Cost	Notes
30	BODY	28	
1,000"x500"	Size	48	-20 DCV
12	DEF	30	
Total Characteristic Cost: 106			

Movement: Flight: 5"/10"

Abilities & Equipment

Cost	Power	END
25	<i>Space Station</i> : Location: In Space	0
Power Systems		
338	<i>Fusion Power Plant</i> : Endurance Reserve (1,000 END/1,000 REC); OAF Immobile (-2), Only Powers Electrical Devices (-¼)	0
68	<i>Auxiliary Power</i> : Endurance Reserve (200 END/200 REC); OAF Immobile (-2), Only Powers Electrical Devices (-¼)	0
Propulsion Systems		
8	<i>Thrusters</i> : Flight 5"; Limited Maneuverability (-¼)	0



Tactical And Security Systems

- 73 *Space Combat Lasers*: Multipower, 202-point reserve; all OIF Bulky (-1), Real Weapon (-¼), Limited Arc Of Fire (60 Degrees; -½)
- 7u 1) *Distant Shot*: RKA 6d6, Autofire (5 shots; +½), MegaRange (1" = 10 km, can scale down to 1" = 1 km; +¾); OIF Bulky (-1), Real Weapon (-¼), Limited Arc Of Fire (60 Degrees; -½) 20
- 5u 2) *Close-Range Shot*: RKA 6d6, Autofire (5 shots; +½); OIF Bulky (-1), Real Weapon (-¼), Limited Arc Of Fire (60 Degrees; -½) 13
- 20 *Space Combat Lasers*: 15 more Space Combat Lasers (total of 16)
- 164 *Primary Force Shield*: Force Wall (40 PD/40 ED; 250" long); OIF Bulky (shield generators; -1), Self Only (-½), Restricted Shape (one-fourth of "bubble" around station; -¼), Extra Time (1 minute to re-erect Force Wall after it collapses; -1 ½) 70
- 10 *Primary Force Shield*: 3 more Primary Force Shields (total of 4; each covers one-fourth of the station)
- 14 *Point Defense Laser System*: Missile Deflection (all physical projectiles), Range (+1), MegaRange (1" = 1 km; +¼); OIF Bulky (-1), Costs Endurance (-½) 3
- 10 *Cell Block*: DEF +8, Cannot Be Escaped With Teleportation (+¼); Partial Coverage (45 hexes; -2) 0

Operations Systems

- 114 *Sensor And Communication Systems*: Variable Power Pool, 100 base + 50 control cost; OIF Bulky (-1), Only For Senses And Communications (-1), Costs Endurance (-½) var

- 87 *Long-Range Sensors*: MegaScale (1 light-year per Active Point, can scale down to 1 km per Active Point; +3½) for any Sensor Pool Sense of up to 50 Active Points; OIF Bulky (-1) var
- 22 *Long-Range Sensors*: +30 versus Range for Radio Group; OIF Bulky (-1) 0
- 3 *Enhanced Sensors/Communications*: +4 to Systems Operation roll; OAF Bulky (-1 ½)
- 22 *Internal Monitors*: Clairsentience (Sight And Hearing Groups), 8x Range (2,000"), Mobile Perception Point, Multiple Perception Points (up to eight at once); OAF Immobile (-2), Perception Point Cannot Move Through Solid Objects (-0) 5
- 54 *Tractor Beams*: Telekinesis (100 STR); OIF Bulky (projector; -1), Affects Whole Object (-¼), Limited Arc Of Fire (60 Degrees forward; -½) 15
- 15 *Tractor Beams*: 7 more Tractor Beam (total of 8)

Personnel Systems

- 12 *Life Support*: Life Support (Self-Contained Breathing; Safe Environments: High Radiation, Intense Cold, Intense Heat, Low Pressure/Vacuum); Costs Endurance (-½) 2
- 5 *Backup Life Support*: Life Support (Self-Contained Breathing; Safe Environments: High Radiation, Intense Cold, Intense Heat, Low Pressure/Vacuum); Only Within Affected Area (40" x 20" chamber; -2), 1 Continuing Fuel Charge (easily replaced from sources outside the ship; 1 Month [i.e., 390,000 man-days]; -0) [1cc]
- 15 *Backup Life Support*: 7 more Backup Life Support areas (total of 8)
- 3 *Food Supplies*: Life Support (Diminished Eating: no need to eat); 1 Continuing Fuel Charge (easily replaced from sources outside the ship; 1 Year [i.e., 13,000 man-years]; -0) [1cc]
- 15 *Artificial Gravity*: Telekinesis (20 STR), Selective (+½); OIF Bulky (-1), Only To Pull Objects Straight Down To The Floor (-1) 3
- 3 *Backup Artificial Gravity*: Telekinesis (5 STR); OIF Bulky (-1), Only To Pull Objects Straight Down To The Floor (-1) 1
- 18 *Medical Facilities*: Paramedics 14- and SS: Medicine 14- 0

Skills/Laboratories

- 80 *Laboratories* (defined by GM or player)

Total Abilities & Equipment Cost: 1,210

Total Vehicle Cost: 1,316

Value Disadvantages

To be chosen by the players (if any)

Total Disadvantage Points: 0

Total Cost: 1,316/5 = 263

Description: Occupying a prime LaGrange point between the mining planet Makarides IV and her largest moon, the Makarides High Port is the largest

and most diverse trading post for dozens of systems around. Consisting of a Central Station about one kilometer long, plus dozens of square or rectangular superstructures attached in seemingly chaotic fashion, it's about two kilometers long overall, and half as wide. It has a staff of 3,000, plus the capacity to support another 10,000 visitors and inhabitants.

The lower sections of the station are devoted mainly to bulk industrial items, such as ore mined from the planet below, foodstuffs, and the like. "Dirt-side," as the inhabitants of the High Port call this section, is a rough-and-tumble place, often dangerous for those not accustomed to its ways. The upper parts of the station — "Starside" — are given over to shops, restaurants, nicer residence chambers, service businesses, offices, and the like. Just about anything one wants, one can find for sale here; characters making Trading rolls to determine if a particular item is available receive a +2 bonus to their rolls.

Makarides Computer

Val	Char	Cost	Roll	Notes
25	INT	15	14-	PER Roll 14-
15	DEX	15	12-	OCV: 5/DCV: 5
3	SPD	5		Phases: 4, 8, 12
Total Characteristic Cost: 35				

Cost Skills

3	Cryptography 14-
3	Electronics 14-
19	AK: Milky Way Galaxy 30-
3	KS: Archived Recent News 14-
3	KS: Current News 14-
9	KS: Known Sentient Species 20-
9	KS: Movies Database 20-
9	KS: Music Database 20-
3	Mechanics 14-
2	Navigation (Space) 14-
2	SS: Astronomy 11-
2	SS: Mathematics 11-
8	Systems Operation (Communications Systems, Environmental Systems, Medical Systems, FTL Sensors, Radar) 14-
1	WF: Makarides High Port Weapons

Programs

1	Attack Target
1	Diagnose Station Malfunction
1	Locate Target
1	Monitor Internal Monitor System, Report Anomalies
1	Monitor Communications System, Report Anomalies
1	Monitor Sensor Systems, Report Anomalies
1	Obtain Latest Market/Financial Data Via Communications System
1	Scan And Enter Data
1	Schedule Station Events/Use Of Station Resources
1	Search Reference Material For Information On A Topic
1	Send Emergency Call If Specified Protocols Are Not Met

Talents

3	<i>Clock</i> : Absolute Time Sense
5	<i>Memory</i> : Eidetic Memory
3	<i>Calculator</i> : Lightning Calculator
3	<i>Instant-On Feature</i> : Lightsleep
10	<i>Scanner</i> : Speed Reading (x10,000)
20	<i>Translator</i> : Universal Translator 14-

Total Abilities Cost: 131

Total Computer Cost: 166

Value Disadvantages

To be chosen by the players (if any)

Total Disadvantage Points: 0

Total Cost: 166/5 = 33

ORBITAL MILITARY BASE

Val	Char	Cost	Notes
30	BODY	28	
200"x100"	Size	34	-15 DCV
15	DEF	39	
Total Characteristic Cost: 101			

Movement: Flight: 5"/10"

Abilities & Equipment

Cost	Power	END
25	<i>Space Station</i> : Location: In Space	0

Power Systems

406	<i>Fusion Power Plant</i> : Endurance Reserve (1,200 END/1,200 REC); OAF Immobile (-2), Only Powers Electrical Devices (-¼)	0
101	<i>Auxiliary Power</i> : Endurance Reserve (300 END/300 REC); OAF Immobile (-2), Only Powers Electrical Devices (-¼)	0
44	<i>Reserve Batteries</i> : Endurance Reserve (90 END/90 REC); OIF Bulky (-1), Only Powers Electrical Devices (-¼)	0

Propulsion Systems

5	<i>Thrusters</i> : Flight 3"; Limited Maneuverability (-¼)	0

Tactical And Security Systems

136	<i>Superheavy Lasers</i> : Multipower, 375-point reserve; all OIF Bulky (-1), Real Weapon (-¼), Limited Arc Of Fire (60 Degrees; -½)	
14u	1) <i>Distant Shot</i> : RKA 10d6, Autofire (4 shots; +½), MegaRange (1" = 100 km, can scale down to 1" = 1 km; +1); OIF Bulky (-1), Real Weapon (-¼), Limited Arc Of Fire (60 Degrees; -½)	37
8u	2) <i>Close-Range Shot</i> : RKA 10d6, Autofire (4 shots; +½); OIF Bulky (-1), Real Weapon (-¼), Limited Arc Of Fire (60 Degrees; -½)	22
15	<i>Superheavy Lasers</i> : 5 more Superheavy Lasers (total of 6)	
82	<i>Railguns</i> : RKA 6d6, Armor Piercing (+½), Increased Maximum Range (421,875", or approximately 843 km; +1); OIF Bulky (-1), Real Weapon (-¼), Limited Arc Of Fire (60 Degrees; -½)	22
15	<i>Railguns</i> : 5 more Railguns (total of 6)	

56	<i>ECCM: Suppress Electronic Warfare</i> 8d6, any two Powers simultaneously (+½), MegaRange (1" = 10 million km; +2); OAF Bulky (-1 ½)	14
94	<i>Primary Force Shield: Force Wall</i> (60 PD/60 ED; 50" long); OIF Bulky (shield generators; -1), Self Only (-½), Restricted Shape (one-fourth of "bubble" around station; -¼), Extra Time (1 minute to re-erect Force Wall after it collapses; -1½)	40
10	<i>Primary Force Shield: 3 more Primary Force Shields</i> (total of 4; each covers one-fourth of the ship)	
13	<i>Secondary Force Shield: Force Field</i> (20 PD/20 ED); OIF Bulky (shield generators; -1), Ablative (-1)	4
14	<i>Point Defense Laser System: Missile Deflection</i> (all physical projectiles), Range (+1), MegaRange (1" = 1 km; +¼); OIF Bulky (-1), Costs Endurance (-½)	3
122	<i>Weapons Reserve Power: Endurance Reserve</i> (250 END/250 REC); OIF Bulky (-1), Only Powers Station's Weapons (-¼)	0
10	<i>Cell Block: DEF +8, Cannot Be Escaped With Teleportation</i> (+¼); Partial Coverage (25"x12.5"; -2)	0

Operations Systems

114	<i>Sensor And Communication Systems: Variable Power Pool</i> , 100 base + 50 control cost; OIF Bulky (-1), Only For Senses And Communications (-1), Costs Endurance (-½)	var
87	<i>Long-Range Sensors: MegaScale</i> (1 light-year per Active Point, can scale down to 1 km per Active Point; +3½) for any Sensor Pool Sense of up to 50 Active Points; OIF Bulky (-1)	var
7	<i>Long-Range Sensors: +10 versus Range</i> for Radio Group; OIF Bulky (-1)	0
3	<i>Enhanced Sensors/Communications: +4</i> to Systems Operation roll; OAF Bulky (-1½)	
17	<i>Internal Monitors: Clairsentience</i> (Sight And Hearing Groups), Mobile Perception Point, Multiple Perception Points (up to eight at once); OAF Immobile (-2), Perception Point Cannot Move Through Solid Objects (-0)	5
54	<i>Tractor Beams: Telekinesis</i> (100 STR); OIF Bulky (projector; -1), Affects Whole Object (-¼), Limited Arc Of Fire (60 Degrees forward; -½)	15
15	<i>Tractor Beams: 5 more Tractor Beam</i> (total of 6)	

Personnel Systems

12	<i>Life Support: Life Support</i> (Self-Contained Breathing; Safe Environments: High Radiation, Intense Cold, Intense Heat, Low	

	Pressure/Vacuum); Costs Endurance (-½)	2
5	<i>Backup Life Support: Life Support</i> (Self-Contained Breathing; Safe Environments: High Radiation, Intense Cold, Intense Heat, Low Pressure/Vacuum); Only Within Affected Area (12" x 12" chamber; -2), 1 Continuing Fuel Charge (easily replaced from sources outside the ship; 1 Month [<i>i.e.</i> , 1,800 man-days]; -0)	[1cc]
15	<i>Backup Life Support: 7 more Backup Life Support areas</i> (total of 8)	
3	<i>Food Supplies: Life Support</i> (Diminished Eating: no need to eat); 1 Continuing Fuel Charge (easily replaced from sources outside the ship; 1 Year [<i>i.e.</i> , 60 man-years]; -0)	[1cc]
15	<i>Artificial Gravity: Telekinesis</i> (20 STR), Selective (+½); OIF Bulky (-1), Only To Pull Objects Straight Down To The Floor (-1)	3
3	<i>Backup Artificial Gravity: Telekinesis</i> (5 STR); OIF Bulky (-1), Only To Pull Objects Straight Down To The Floor (-1)	1
18	<i>Medical Facilities: Paramedics</i> 14- and SS: Medicine 14-	0

Skills/Laboratories

16	<i>Tactical Computer: +8 with Ship's Weapons</i> ; OIF Bulky (-1), Costs Endurance (-½)	4
13	Computer Programming 14-	
13	Cryptography 14-	
13	Demolitions 14-	
13	Electronics 14-	
13	Mechanics 14-	
15	Weaponsmith (Firearms, Missiles & Rockets, Incendiary Weapons, Energy Weapons) 14-	
100	Other laboratories (defined by GM or player)	

Total Abilities & Equipment Cost: 2,101

Total Vehicle Cost: 2,202

Value Disadvantages

To be chosen by the players (if any)

Total Disadvantage Points: 0

Total Cost: 2,202/5 = 440

ADDITIONAL VEHICLES

Cost Power

83	Nuclear Space Missile	
15	7 more Nuclear Space Missiles (total of 8)	

Description: This writeup represents a small military installation of the sort often found as part of planetary orbital defense networks, or sometimes as an outpost along a dangerous frontier. It has a crew of 60.

Orbital Military Base Computer

Val	Char	Cost	Roll	Notes
35	INT	25	16-	PER Roll 16-
20	DEX	30	13-	OCV: 7/DCV: 7
6	SPD	30		Phases: 2, 4, 6, 8, 10, 12
Total Characteristic Cost: 85				

Cost Skills

3	Computer Programming 16-
3	Cryptography 16-
3	Electronics 16-
17	AK: Milky Way Galaxy 30-
3	KS: Archived Recent News 16-
3	KS: Current News 16-
7	KS: Known Sentient Species 20-
3	KS: Movies Database 16-
3	KS: Music Database 16-
3	Mechanics 16-
2	Navigation (Space) 16-
3	SS: Astronomy 16-
3	SS: Mathematics 16-
30	Sciences (30 more points' worth, chosen by the GM or player)
8	Systems Operation (Communications Systems, Environmental Systems, Medical Systems, FTL Sensors, Radar) 16-
1	WF: Orbital Military Base Weapons

Programs

1	Attack Target
1	Diagnose Station Malfunction
1	Locate Target
1	Monitor Internal Monitor System, Report

Anomalies

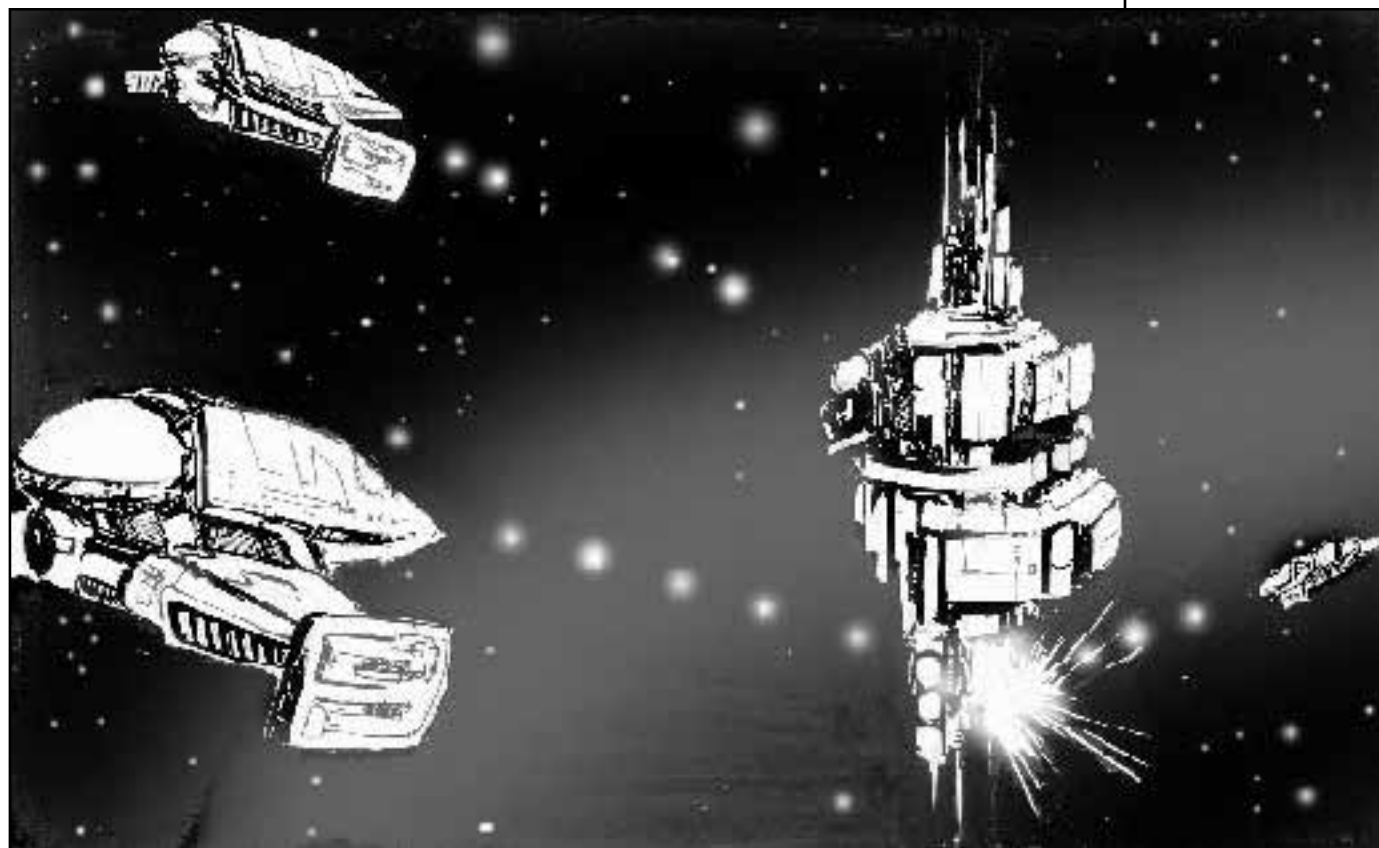
1	Monitor Communications System, Report Anomalies
1	Monitor Sensor Systems, Report Anomalies
1	Obtain Latest Tactical Data Via Communications System
1	Scan And Enter Data
1	Schedule Station Events/Use Of Station Resources
1	Search Reference Material For Information On A Topic
1	Send Emergency Call If Designated Officers Incapacitated/Killed
1	Send Emergency Call If Specified Protocols Are Not Met

Talents

3	<i>Clock:</i> Absolute Time Sense
5	<i>Memory:</i> Eidetic Memory
3	<i>Calculator:</i> Lightning Calculator
3	<i>Instant-On Feature:</i> Lightsleep
10	<i>Scanner:</i> Speed Reading (x10,000)
20	<i>Translator:</i> Universal Translator 16-

Total Abilities Cost: 151**Total Computer Cost: 236****Value Disadvantages**

To be chosen by the players (if any)

Total Disadvantage Points: 0**Total Cost: 236/5 = 47**



Time Travel

YESTERDAY, TODAY, AND TOMORROW

If the many ideas raised in science fiction stories, few have captured the imagination as thoroughly as time travel. The idea of being able to journey to the past or future has fueled many novels, televi-

sion shows, and movies, and it's fraught with scenario ideas and plot hooks for gaming. Unfortunately, it also creates some problems in a gaming context. This chapter looks at the methods and uses of time travel in *Star Hero* games.

TEMPORAL MECHANICS AND CONSEQUENCES



Time travel was invented as a concept the first time somebody wished they hadn't done something. In literature, the idea of visiting another time was once solid fantasy, as in Mark Twain's *A Connecticut Yankee in King Arthur's Court*. With the rise of physics models of "spacetime," in which time is considered as essentially a fourth "dimension," the idea of moving about in time got a bit more scientific respectability. In his first novel, H.G. Wells dressed up the notion of time travel in technological trappings, sending his protagonist to the future aboard a "time machine" and drawing an analogy between a balloon moving in three dimensions and the machine moving in four.

REAL-LIFE MECHANICS

In recent decades, time travel has made several big jumps toward possibility, as physicists (many of them SF fans) played around with concepts of modern cosmology to find shortcuts through time. According to physicist Steven Hawking, a rotating black hole distorts spacetime in such a way that one can go backward or forward in time by selecting the appropriate trajectory for a close pass. Of course, the tidal forces involved in close encounters with a black hole can exceed tens of gees across a single meter, and a spaceship must be going an appreciable fraction of the speed of light for such maneuvers. But a physicist would call those mere engineering details.

Another method is the possible creation of a "wormhole" connecting two places that are separate in spacetime. Starships could also use wormholes for faster-than-light travel (page 194). Current theories require staggering amounts of energy to create them, along with the need for "negative energy" to keep them open. But again, those are matters for the engineers.

In point of fact, any method of going faster than light must necessarily be a way to travel in time as well, since outpacing light leads to violations of causality.

GAME MECHANICS

In the *HERO System*, physically visiting other times is an application of the Power *Extra-Dimensional Movement*. If the power has a Focus or is built into a Vehicle, then you've got a Time Machine. Communication between different times is best simulated by the *Clairsentience* Power, with the *Transmit* and *Dimensional* modifiers.

Expanded Time Travel Rules

The basic rules in the *HERO System 5th Edition*, *Revised* for time-traveling with *Extra-Dimensional Movement* are straightforward and simple. For gamers desiring more detail, or time travel-based campaigns requiring more precision, here's an expansion of the time travel rules.

"Time" counts as a single dimension for purposes of *Extra-Dimensional Movement*, but characters must pay +20 Character Points (in addition to the base cost of 20 Character Points for any *Extra-Dimensional Movement*) to travel in time. For that total base cost of 40 Character Points, the character can travel to a single moment in time, defined when the power is bought. Time travel occurs only in the physical dimension the character is in when he uses the power. For example, a character on Earth cannot time travel to Hell or Valhalla (though he could have two *Extra-Dimensional Powers*, one physical and one temporal, that in combination allowed him to do so).

If a character wants to travel to more than a single moment in time, he must pay more Character Points. The ability to travel to a related group of moments in time, in the past or the future, no matter how far removed in time from the present moment, costs +5 Character Points. The GM determines what constitutes a "related group"; examples typically include all instances of a particular date (e.g., any July 4 in any year), or any date within a specific, limited span of time (e.g., one specific day, one specific year).

Some characters may want to travel to any moment in time within a particular timeframe, such as "within my lifetime" or "within 500 years, past or future, from the present moment." To do this, they spend points to buy the range across which they may travel. For +1 Character Point, the character may travel forward or backward in time by up to 1 Turn (12 seconds). Thus, if he were in Segment 6 of Turn 2 of a combat, he could travel to any Segment up to Segment 6 of Turn 3 (but no further into the future), or to any Segment back to Segment 6 of Turn 1 (but no further into the past). For each additional +1 point, he may expand his range of travel by one step down the Time Chart (see the accompanying Expanded Time Chart). Thus, to travel to any point in time within 50 Billion Years in the future or 50 Billion Years in the past costs +27 Character Points (for a total cost of 67 points for the power). If the character can only travel one direction in time (backward to the past,

TIME TRAVEL JARGON

Time Travel is a really hard concept for Human minds to grasp, so the technical vocabulary relating to the subject is complex and includes lots of shorthand terms. Here is some standard lingo for the time travel business:

Causality: The idea that things happen in a particular order. If A causes B, then A has to happen before B. If for some reason B happens before A does, causality has been violated. Marrying your grandmother and becoming your own ancestor violates causality because you have to exist before you can exist. Seeing something before it happens is also a causality violation.

Paradox: A self-contradicting causality violation. Shooting your grandfather before he can sire your father is a paradox (in fact, it's the famous "grandfather paradox") because you have prevented yourself from ever existing. If you don't exist, then you can't have shot Grandpa. Which means you will exist, and can do it after all. And so on.

Time Loop: A special paradox in which a time traveler does something which leads to his traveling in time in the first place. Loops include becoming your own ancestor, giving future technology to the

Continued on next page

Continued from last page

inventor of time travel, starting life on Earth via sloppy trash disposal, or setting off the Big Bang. Time loops violate causality by requiring the effect to exist before the cause.

or forward to the future), halve this additional cost.

Regardless of how many moments in time a character can travel to, he can only time travel to a single physical location in the dimension he's in when he uses the power. By default, this location is defined as the location he's in when he activates the Power — if he starts in Chicago in 2002, he can travel back to 1636 or forward to 3312, but he'll still be in Chicago (or whatever it used to be/will become — which may prove hazardous for him!). For +2 Character Points, he may define his time travel as always taking him to the same location, no matter where he is when he uses Extra-Dimensional Movement — he always time travels to London, no matter where he is when he activates the Power. For +5 Character Points, he can go to a related group of physical locations in the same dimension (say, any place in England). For +10 Character Points, he can go to any physical location in the same dimension. However, characters cannot use this as a cheap form of worldwide Teleportation (e.g., "I'll travel to two seconds from now in Tokyo!") — they must engage in what the GM considers legitimate time travel.

Extra-Dimensional Movement is a "stop sign" power, and time travel doubly so. The time travel method outlined above is not intended as a combat ability, or a way for a character to go back and "re-do" the actions of the past few Segments or Turns just because they didn't turn out the way the character wanted. If a character wants to have time-manipulation powers that work in combat,



TIME CHART (EXPANDED)

Time Period/Duration

1 Segment

1 Phase

1 Turn (Post-Segment 12)

1 Minute

5 Minutes

20 Minutes

1 Hour

6 Hours

1 Day

1 Week

1 Month

1 Season (3 months)

1 Year

5 Years

25 Years

1 Century

5 Centuries

2,500 Years

10,000 Years

50,000 Years

250,000 Years

1 Million Years

5 Million Years

25 Million Years

100 Million Years

500 Million Years

2.5 Billion Years

10 Billion Years

50 Billion Years

he should buy those as specific Powers with a "time manipulation" effect. (See Captain Chronos on page 135 of *Conquerors, Killers, And Crooks* for some examples of this.) Gamemasters should carefully monitor all uses of Extra-Dimensional Movement in general, and time travel in particular, to prevent abuse or loss of game balance; as always, the GM should forbid any use of a power he considers improper or harmful to the game.

Example Time Machines

Here are a few example time travel devices, using the expanded rules presented in the text. Prices assume time travel technology is "cutting edge."

Time Belt: This device is a concealable one-person time machine, with limited range and an inconvenient recharge time. It can take its wearer and a few pounds of gear on hops of up to a century; but the miniature cold fusion power supply needs a day to recharge the batteries for each jump. Characters can link multiple Time Belts with cables for synchronized hops by more than one person. Price: 13,400 credits, or more.

Extra-Dimensional Movement (any date up to 50 Billion years in the future or the past) (67 Active Points); OIF (-½); Can Only Move Up To 100 Years At A Time (-½), 1 Charge (-2). Total cost: 17 points.

Wells Device: Patterned after the device described in H.G. Wells's *The Time Machine*, this time machine is bulky but not immovable, and the mechanism is fairly fragile. There is one seat for the

operator, but two people can squeeze aboard in a pinch. It has a self-contained power supply sufficient for a round-trip time voyage of up to a billion years. Price: 21,000 credits, or more.

Extra-Dimensional Movement (any date up to 1 Billion years in the future or the past), x2 Increased Weight, Reduced Endurance (0 END;

TIME TRAVEL SUMMARY

Base Cost

- 40 Character can travel to a single moment in time, defined when the power is bought, only in the physical dimension he's in when he uses the power

Timespan Modifiers

- +5 Travel to a related group of discrete moments in time
- +1 Travel forward or back in time by up to 1 Turn in either direction; +1 point for each additional increment on the Time Chart; if character can only travel to the past or to the future, halve this cost

Time Travel Location Modifiers

- +0 No change in physical location; character remains in the physical location he occupies when he activates the power
- +2 Any single physical location in the same dimension the character occupies when he uses the power, defined when the power is bought, regardless of where the character is when he activates the power
- +5 A limited group of physical locations, in the same dimension the character occupies when he uses the power, in the moments in time the character can travel to
- +10 Any physical location, in the same dimension the character occupies when he uses the power, in the moments in time the character can travel to

Travel In Time: Physical Location Same As Starting Location

- 40 Travel to a single moment in time
- 45 Travel to a related group of moments in time
- 67 Travel to any moment in time within 50 Billion Years, future or past

Travel In Time: Single Physical Location Other Than Starting Location

- 42 Travel to a single moment in time
- 47 Travel to a related group of moments in time
- 69 Travel to any moment in time within 50 Billion Years, future or past

Travel In Time: Limited Group Of Physical Locations

- 45 Travel to a single moment in time
- 50 Travel to a related group of moments in time
- 72 Travel to any moment in time within 50 Billion Years, future or past

Travel In Time: Any Physical Location

- 50 Travel to a single moment in time
- 55 Travel to a related group of moments in time
- 77 Travel to any moment in time within 50 Billion Years, future or past

+½) (105 Active Points); OIF Fragile Bulky (-1¼), Extra Time (requires 1 Segment per 1,000 years traveled, minimum of 1 Full Phase; -½), Requires A PS: Operate Wells Device Roll (-¼). Total cost: 35 points.

Wormhole Gate, Standard: A simple hole through spacetime, fixed in place physically. People and information can move freely between any times in the lifespan of the gate. So a gate activated in 2038 and accidentally shut down in 4753 allows travel among any dates during that period, but could not be used to visit 1879 or 5255. This is the most “hard science” type of time machine.

Extradimensional Movement (any date up to 1 Million years in the future or the past), x16 Increased Weight, Reduced Endurance (0 END; +½) (118 Active Points); OIF Fragile Immobile (-1¼), Independent (-2). Total cost: 25 points.

Wormhole Gate, Fixed Dates: A variant time gate allows passage between times separated by a fixed period. If the gate links, say, 2212 and 1773, then characters can only travel between those times. Time passes normally at both ends, so a traveler who goes through the 2212 gate on January 1 and spends three weeks in the past returns to January 22. If he waits a month before going back in time again, he arrives in 1773 a month after he left for the future. This is a tremendous benefit for game play because characters can never use a fixed gate to loop back into their own pasts within the campaign.

Extradimensional Movement (a fixed moment in time — to January 1, 1773 from January 1, 2212), x16 Increased Weight, Reduced Endurance (0 END; +½) (90 Active Points); OIF Fragile Immobile (-1¼), Independent (-2). Total cost: 19 points.

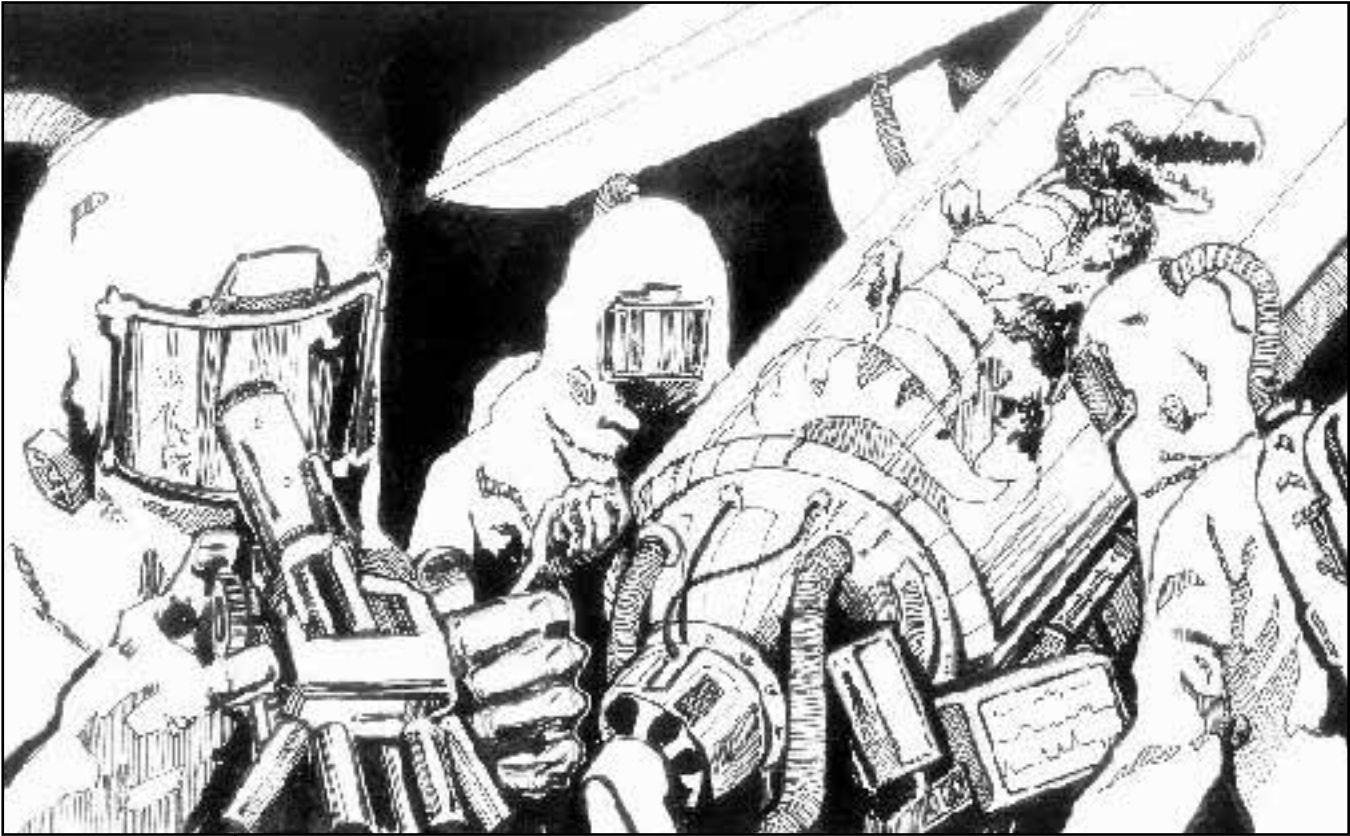
METHODS AND EFFECTS

Regardless of the scientific justification, in a game the “special effect” of how one actually travels in time has a tremendous influence on the structure of the campaign.

TIME MACHINES

When most people think of a time machine, they think of a vehicle or device that one rides into the past or the future, like getting into a car and riding to the store. This method gets rid of cumbersome explanations about how to get home — you get back in the machine and shift into reverse — and it makes it easy to send a small group and a moderate amount of equipment to another time.

If the characters control the vehicle themselves, the GM must give serious thought to how easy it is to operate and how much power it has on board. If very precise time-hops are possible, the characters may be tempted to fix problems by going back half an hour and redoing their mistakes. On the other hand, imprecise controls make it hard to



hit specific historical events.

A time machine which the travelers don't control themselves is one option: Mission Control back in their original time controls the time machine, and the explorers go where their bosses send them, much like modern-day astronauts. (This is also a good way to prevent paradoxes and time-loops: Mission Control's crack time engineers make sure they don't happen.)

The biggest problem with time machines is that characters are obsessed with protecting their ride home (and understandably so). This makes it hard for the GM to involve them in plots and goings-on in the past. A related problem is that the time machine does impose limits on where and when the explorers can go. Is there room on the deck of the *Marie Celeste* for the Time Pod? How about aboard the *Hindenburg*? Unless the device has really effective camouflage, time missions will have to arrive in deserted or wilderness areas (or, as on *Doctor Who*, accept the consequences of sticking out like a sore thumb).

DOORS INTO SUMMER

Time gates are another popular option, and one with more than a smidgeon of possibility. The characters go through the gate and come out somewhere else. Gates may be permanent or temporary. Since a gate isn't very large, it can appear almost anywhere, making it possible for the player characters to slip aboard Lenin's train to Russia in 1916 or arrive backstage at Ford's Theater in 1865.

A time gate does mean the travelers are limited to just what they can carry themselves, and they are likely to be very paranoid about getting separated from the gate. Since the gate is presumably generated

from the Time Institute, the characters can't mess with causality unless the directors (and the GM) agree.

The size and permanence of the time gate can be very important. If the gate can only stay open long enough for the explorers to pass through, then it's more like time jumping, described below. A permanent gate means anybody can wander from one time to another, creating the possibility of abundant paradoxes and causality violations. Human-sized gates are most appropriate for an exploration-centered adventure, but one can imagine time gates big enough for trains or even supertankers. This could allow large-scale trade (or warfare) between different times.

TIME JUMPING

Time travel might be akin to teleportation. You switch on the time machine or step into the booth, and suddenly you're in another time. (The temporal transporters of *Star Trek* work this way.) The big question is how you get back. If the time jump is generated by a "time belt" or some other device carried by the traveler, then getting back or visiting some other time is simply a matter of adjusting the controls and making sure the batteries are charged.

If teleportation requires some huge machine back in the jumper's home time, getting home can be a bit harder. Maybe there's a limit on how long the traveler can remain in another time before bouncing back to his own. This would certainly be an advantage for characters captured by sacrifice-minded Aztecs or Stalin's NKVD. However, it encourages an attitude of "get it done and get out" which limits character interaction and exploring in the other time.

If the characters have a Time Communicator and can call home to get “beamed out,” then the comm unit becomes their Holy Grail and they won’t part with it (even to the point of wanting it surgically implanted). Characters who can pop out whenever they want are protected from the consequences of their actions, but won’t be as rushed as those trying to beat the recall clock.

The existence of a Time Communicator opens up the possibility of calling Mission Control for help and advice. Depending on how precise and expensive time travel is, this could be limited to just information (which in the right circumstances might still be priceless), or it could even allow the folks back home to pop equipment to the travelers as needed.

MIND TRANSFER

The central gimmick of the television series *Quantum Leap*, intertemporal mind transfer leaves the bodies of the travelers where they are but casts their minds into other people in other times. Obviously this limits the range to eras when there are people to possess (although dropping your mind into a *Tyrannosaur* body for a vacation in the Cretaceous could be a lot of fun).

Mind transfer time-travel does mean the travelers must spend the first part of every trip figuring out who they are and what’s going on. This situation should be catnip for GMs, since they can send the PCs’ minds into the bodies of spies, fugitives, or people with an important task to accomplish.

The fate of the other person’s mind is worth considering. Is the transfer an actual switch? If so, while the time traveler is visiting ancient Egypt, some ancient Egyptian is hanging around the Time Institute in the traveler’s body, watching talk shows and playing foosball. Or maybe he’s figuring out how to pick the locks and escape, giving any PCs who didn’t go on the mission to the past the job of recapturing him without damaging the body of their comrade. It might well be the policy of the Time Institute to keep the bodies of time-jumpers sedated, so the switched mind can’t carry back any information that could create a paradox.

If the transfer is not a switch, the past individual has suddenly acquired a nasty case of Multiple Personality Disorder. The player character’s personality may have to win duels of EGO or PRE against the host personality, either during the initial jump or every time they differ about what to do.

OPTIONS

Since time travel is still highly theoretical (to put it mildly), GMs can pretty much make up whatever “laws of nature” they like to govern it.

ONE WAY DO NOT ENTER

One way travel has some interesting possibilities. It essentially means moving the campaign permanently to another era, although characters may try to get around the limit by leaving messages or equipment caches for themselves in very durable containers, to travel through time the ordinary way.

A very special form of one-way time travel is

simply patience. Characters can visit the future easily by living a very long time, or going into hibernation or cryogenic suspension for decades or centuries. This is a good way to drop contemporary characters into a far-future setting (Buck Rogers got to the twenty-fifth century that way). The chief problem is that there’s no way back unless someone in the future conveniently invents a time machine.

The “Dr. Zeus” series of stories by Kage Baker combines one-way travel to the past with immortality: the time agents are indestructible cyborgs, created in the distant past and manipulating history according to the instructions of their creators in the future.

YOU ARE HERE

If the time-gate machinery (or the mystical portal, or the alien time-teleporter) can only send to the same location in past eras, travelers face some unique problems. Unless the Time Institute is in downtown London, a fair amount of the adventuring in the past involves traveling from the point of arrival to wherever they want to explore. This is a good way to “cut the apron strings” and force the heroes away from their time machine, but it also means most adventures involve an inconvenient amount of travel.

Slightly more convenient for the GM is a random arrival point. That allows the players to turn up “just by coincidence” in the right place for an interesting adventure. (To be realistic, most random arrivals would be in mid-ocean somewhere, requiring either a seaworthy time machine or else a way to see what’s there before the exploration team goes through.) Much of the Tom Baker run of *Doctor Who* involved travel in a time machine equipped with a randomizer so the Doctor’s foes couldn’t track him down — if he didn’t know where he was going, neither could they!

NEXT EXIT 1492

Perhaps time travel is only possible between certain past eras. They may be as broad as centuries or as narrow as minutes. This is one way to keep characters from visiting their own pasts, and the GM can select the available windows with an eye to interesting adventure opportunities. (As Tim Powers did in his novel *The Anubis Gates*.) All windows may connect to all others, or the system can be very complicated, requiring multiple hops between different eras to arrive at a given destination (“You jump from 2930 to 4588 BC; from there you can hop to 1451, and that lets you jump to 1969 in time to watch Apollo 11 take off”).

Short-duration windows do create the possibility of “traffic jams” as time travelers from throughout history try to arrive during the same brief period. If the heroes have time-traveling enemies, they may find themselves arriving next to each other! Windows also impose a little tension on the campaign, since the end of a given window is a deadline which the characters really don’t want to miss.

PARADOXES AND COMPLICATIONS

The big problem with time travel is the possibility of paradoxes — many physicists consider it impossible for just that reason. In *Star Hero*, time paradoxes raise problems of their own. Most campaigns are linear narratives, and being able to change the past may mean early adventure sessions can suddenly “not have happened.” There are a couple of ways to handle this.

Fixed History

This is the easiest to handle conceptually, but can be surprisingly tricky in play. If history cannot vary, then by definition nothing the characters do can change things. Circumstances always work to thwart them, or perhaps attempts to change the course of history simply bounce them right back to their starting point. It can be frustrating for players to continually run afoul of unchangeable history, and the GM may have to resort to more and more unlikely “accidents” to stymie the heroes. Players often quickly come to loathe this sort of situation.

A slightly looser version of this takes the view that history itself can be full of errors, falsifications, and misinformation. While the historical record is generally true, the details of specific events can sometimes be fudged or tweaked without consequences. Obviously, this works best with poorly-documented eras: you can't shoot Hitler, but you may be able to help the Trojans beat the Greeks (later Greek literature about their victory can be explained away as propaganda by sore losers).

The loosest form of unchangeable history assumes that only things the heroes themselves witness are absolutely true. Records may be false, history books are full of errors, and NPCs can lie, but things which happen in the campaign are real and true and cannot be altered. Changes to history are allowed so long as they won't change anything the heroes have seen themselves: if they saw the *Titanic* sink, then no amount of trying can prevent it. On the other hand, anything unseen is fair game — while they were watching the ship go down they might not have noticed their later selves rescuing passengers with a time-submarine.

Mutable History

Gamemasters who do want to allow at least the possibility of changing history must decide how “elastic” the timeline is.

ELASTIC TIME

An elastic history tends to snap back to its original state and resists changes. Shoot Hitler during World War I and some other extremist war-monger becomes dictator of Germany in the 1930s. Rescue Lincoln from his assassin and he spends the rest of his second term losing battles with Congress

over the course of Reconstruction, just like Andrew Johnson did. The extreme version of this is like an unchangeable history.

A less elastic history allows for potential change points. Possibly some people or events are “critical nodes” which can shift history onto a different track, but the vast majority of people have little influence. An elastic history with critical nodes means the PCs can visit the past without disrupting their future, while still allowing for Time Patrol-style adventures preventing villains from affecting critical nodes.

CHAOTIC HISTORY

The opposite of elastic history is chaotic history, in which even tiny changes ripple outward, transforming everything. Step on a butterfly in the Cretaceous and humanity may not evolve. Help a girl cross the street in New York in 1930 and the Nazis win World War II. Chaotic history is difficult to game, because it's hard for the heroes to avoid making changes, or to know how to correct them. However, many historians have come to believe human history is chaotic, so GMs with a yen for accuracy may go with this interpretation despite its difficulties.

If history can be altered, sanity demands some way to keep the heroes from blinking out of existence every time some klutz squashes a bug. They must be immune to changes in history. Perhaps traveling in time places voyagers somehow “outside the timestream” and immune to any changes they cause. Or perhaps it's an innate power (see sidebar).

A reality-bending campaign requires a GM who can think on his feet and extrapolate future histories on the fly. The only constant in the campaign is the player characters; the world can shift about them.

Immunity To Timeshifts

Life Support (Immunity To Timeshifts) renders a character completely immune to the effects of changed history. He can go back in time and prevent his parents from meeting, or change things so the Human species never evolves, and he himself remains unchanged. It costs 2 Character Points.

The technological version is the “Reality Stabilizer,” which comes in two versions. A personal stabilizer is simply a wearable device which confers the power: Life Support (Immunity To Timeshifts) (2 Active Points); OIF (-½); total cost: 1 point. Time machines may have built-in Stabilizers. If reality shifts are common, a character's Stabilizer is absolutely essential to his continued existence.

A more powerful version is the “Reality Field Generator” which can anchor an entire area. Multiple projectors can be linked to stabilize a base or even a whole city. The headquarters of the Time Institute is certainly protected by Reality Generators, and they would be valuable accessories for any time-traveling villain's hideout.

Reality Field Generator: *Life Support (Immunity To Timeshifts)*, *Usable Simultaneously* (up to 2,000 people at once; +2 ¾) (7 Active Points); *OAF Bulky* (-1 ½). *Total cost: 3 points.*

TIME TRAVEL CAMPAIGNS



Time travel is such a nifty idea that it tends to creep into just about every *Star Hero* campaign. In any kind of science fiction setting, the heroes may be cast into another time by a mysterious alien artifact or a crackpot scientist's jury-rigged prototype. In settings with faster-than-light travel, arriving in the wrong year could be a fairly standard drive malfunction, and anyone with a sufficiently durable starship might have a close encounter with a black hole.

One-shot time adventures make a good change of pace, without too much risk of tangling the campaign up in paradoxes. For whatever reason, the heroes visit another time, get into trouble, and get home. Usually their goal is nothing more than getting back to their proper time, while surviving the bloodthirsty post-atomic mutants of the future or the bloodthirsty pre-atomic gangsters of the past. The time jaunt may be part of an ongoing plotline in the game's proper era — if the cure to the Omega Virus can only be found a hundred years in the past, surely a band of brave heroes would be willing to risk a voyage through time to prevent billions of deaths; once they accomplish that and return to the future, then they can hunt down the Andromedan agents who released the plague in the first place.

More ambitious GMs may want to tackle an actual time-traveling campaign. The focus can be just time travel, or combined with space travel to allow the widest possible scope. The actual mechanics of time travel have an immense effect on potential campaigns, and the GM should choose carefully to allow the kinds of adventures he wants to run.

Some common time travel campaign frames include:

TIME COPS

The heroes are agents of some organization (call it the Time Patrol) that strives to prevent unauthorized meddling with history. If history is unchangeable, then the Patrol focuses on preventing time travelers from exploiting past-timers; in a mutable timeline, the Patrol also defends the "one true history" against would-be revisionists. Either way, Patrol agents must have some way to detect interference by other time travelers, then go into action to put things right.

Advantages of a Patrol campaign are the relative ease of setting up adventures ("Your boss tells you to get dressed in togas — you're heading for Pompeii"), and the convenience of avoiding paradoxes through Patrol regulations ("You can't go back to the day before and fix things; the Patrol won't allow it"). Disadvantages are a lack of player initiative and a certain amount of routine in a long-running campaign.

TIME COLLECTORS

The heroes are either agents or freelancers who specialize in acquiring artifacts from the past. Ethical collectors only pick up things which are certain to be destroyed — books from the Library of Alexandria, archaeological treasures from the Berlin Museum, or Mayan astronomical codices. Time thieves may prefer to snatch the Mona Lisa from Leonardo's studio and replace it with a cheap laser-printed copy — or they may manipulate the stock market to make themselves rich, loot gold shipments, or engage in other such chrontal crimes.

A variant is collecting people in time. Humanitarians can rescue steerage passengers from the *Titanic* or smuggle Jews out of the Warsaw Ghetto. Exploiters recruit Helen of Troy or Mozart with promises of future luxuries, and villainous time





slavers might abduct thousands from the past to serve the future as laborers, playthings, or possibly sources of fresh genetic material. All three types may coexist, and some slightly shady types who just want to sign up Marilyn Monroe for a holovideo studio have to contend with both do-gooders from the Time Rescue Mission and time slavers.

Like Time Patrol adventures, Time Collecting can degenerate to a routine of “show up, shoot the locals, grab the item, get out.” It may also raise troubling ethical questions, especially for people-collectors.

TIME CASTAWAYS

If the time travelers are stuck in another time, then the focus of the campaign shifts to building a new society and coping with historical threats. A band of near-future characters may try to keep the Roman Empire from falling, or may have to choose sides in the Hundred Years’ War. A castaways campaign avoids all the problems of paradox and causality by keeping the heroes in one era, but it requires a lot of research by the GM, and players who really enjoy that setting.

TIME EXPLORERS

There’s a lot of history out there, and characters can have all sorts of interesting adventures just exploring the past. Exploration is likely to be the main focus when time travel is still a new technology; the Time Institute sends out parties of time explorers to learn about obscure periods in history,

discover if any other time travelers are active in the past, and work out how to avoid or survive paradoxes.

A Time Explorers campaign has many advantages for the GM: the destination is determined by Mission Control, the party probably won’t be packing a lot of heavy firepower (so when they get into trouble they’ll need to use their wits instead of shooting their way out), and the heroes can visit a variety of historical eras. Problems with plausibility come up when every “simple research trip” turns out to involve danger and threats to the future. If the players really enjoy playing tourist in the past and learning about other times, the GM is going to need to do a lot of advance research.

ALTERNATE HISTORIES

An alternate history is an entire cosmos somehow “next to” our own, usually physically identical but with a different history. Sometimes time travelers who alter history can create an alternate universe that splits off from the original timeline. (Some theories of time travel claim that any significant act “splits off” new timelines — one in which the act occurs as planned, one in which it doesn’t occur at all, one in which it occurs but something goes wrong, and so on. In this view, time travel may not really be time travel; it may simply involve parallel jumps from one timeline to another.)

Alternate universes are very useful from a

game perspective. They allow many of the more entertaining results of time travel (different history, weird societies, and the like) without any of the problems of paradoxes and causality. If shooting your grandfather merely creates a new universe in which he died young, there's no paradox: your grandfather is still fine. (Being the grandfather of a time traveler seems to be very hazardous.)

Visiting an alternate history is much like time travel, at least in terms of *HERO System* rules and special effects. You get in the Crosstime Machine, or walk through a World Gate, or whatever, and there you are. Referees do need to decide if world-jumpers can visit any point in an alternate universe's history, or if they can only shift directly "sideways" to the same date in a different timeline.

Popular change-points for alternate histories include: a Nazi victory or stalemate in World War II; the survival of the British Empire; a Confederate victory in the Civil War; failure of the American fight for independence; the Spanish Armada conquering England; Columbus failing to reach the New World; no rise of Islam; the survival of the Roman Empire; and the destruction of Greek civilization by the Persians. Gamemasters can either try to create their own riffs on these themes, or come up with different change-points.

There are two ways to go about creating an alternate timeline for a campaign. The first is to choose an event, make it come out differently, and then try to extrapolate the subsequent course of history and see what might happen. This requires a good knowledge of history, and means the GM must make some decisions about how history works — is it the result of remarkable individuals (like Napoleon, Augustus, or Hitler), the result of large-scale trends, or the product of cycles? The most likely answer is "all of the above," but one still must decide how influential each really is.

Suppose you're taking the assassination of Archduke Franz Ferdinand of Austria in 1914 as the changepoint. In our history, it sparked World War I. In another history, perhaps the assassin missed, or was dazzled by the flash of a time-tourist's camera at the critical moment. Well, what

then? No dead Archduke means no World War I (at least, not in 1914). No World War I probably means no Nazi regime in Germany, no Communists in Russia, no World War II, no Auschwitz. Of course, that doesn't mean this new history has to be a boring Utopia. The European colonial empires are likely to last longer, keeping large parts of the world under foreign rule. Without the terrible example of the Nazis, racism remains more solidly entrenched. Technology may progress more slowly without the impetus of two global wars plus the Soviet-American Cold War. Instead of massive wars among the European powers, this timeline might see a series of drawn-out struggles pitting Asians, Muslims, Africans, and others against their colonial overlords.

A second method may irk purists, but often makes for more entertaining campaigns. Instead of choosing the changepoint and working forward, pick the result and try to figure out how to make it happen. If you want a world in which the Aztecs are a major power in 2002, that means the Spanish conquest of Mexico must have failed for some reason. What would have accomplished that? Since current historians attribute the European success in the New World as much to the diseases they carried as their military might, perhaps the Aztecs simply got exposed to European germs by lost Portuguese or Viking seafarers a few centuries before Columbus. With enough time for the population to recover, the American civilizations of Mexico and Peru could hold off the Europeans and learn the secrets of ironworking, gunpowder, and horsemanship. Once able to compete on equal terms, the Aztecs could easily survive and rise to Great Power status.

Of course, those changes do have ripple effects. Without the Mexican and Peruvian treasure to pay for armies and fleets, Spain is not as powerful, and Spain's ally Austria falls to the Turks. The kingdoms of western Europe are occupied with fighting off the Turkish menace and cannot spare the resources to explore the Americas or conquer India. So the European empires of the Age of Sail never get off the ground, and some other region might be the first to industrialize.



Psionics

THE POWERS OF THE MIND

The term “Psionics” became popular during the 1950s, as part of the efforts by Dr. J.B. Rhine and others to analyze phenomena which were long considered supernatural. The legendary science fiction editor John W. Campbell was very interested in the idea, and encouraged his writers to use psi powers in their stories. Some SF writers adopted a very rigorous, logical approach to the topic — Larry Niven, for example, worked out some interesting consequences of

psi powers — while others used the term as an excuse for magic.

Despite a stunning lack of experimental evidence for their existence, psi powers have remained popular in science fiction for decades. This chapter discusses the role of psionics in *Star Hero* campaigns. It covers not just how to build psionic powers in game terms, but what types of powers might exist (or are most common in science fiction) and the consequences their existence may have for the campaign.

PSIONICS CONSIDERATIONS



When using psionic powers in a campaign, GMs need to make several decisions: how do psi powers work? How powerful are they? What powers are possible? Can anyone learn to use them? How does society adapt?

THE BASICS

Here are some of the basic considerations to keep in mind when determining the nature and role of psionics in the campaign.

How They Do It

In the absence of reliable data, theories of how psionic powers might work have multiplied. They range from the mechanistic to the surreal. At the hard science end, some theorists and SF writers try to explain psionics in terms of existing laws of physics and biology. Telepathy transmits an organic radio signal from brain to brain, and Mind Control or Mental Illusions involve hacking into some other brain's operating system remotely. Extrasensory Perception uses unidentified senses — electric or magnetic field sense, possibly attuned to the fields given off by living things. Powers which violate the laws of thermodynamics or conservation of energy don't exist. If telekinesis is possible, the user has to expend just as much effort as if he were lifting the object with his muscles. Powers are reduced by range.

Related to the hard science approach is the idea of mental powers (and related abilities) as a function of advanced training of the Human (or alien) mind, direct control of autonomic body processes, and so forth. Frank Herbert's *Dune*, with its highly-trained Bene Gesserit sisters manipulating Human breeding patterns to cause the birth of a person with true powers of prophecy, is an excellent example. Psionic powers in this sort of setting can become pretty powerful, but they're usually "self only" sorts of abilities — a character can't read minds or strike down his enemies with mental blasts, but he can heighten his powers of observation, override his body's response to pain, or improve his own reaction time.

A less rigorous (but more fun) version of psionics assumes the human mind can tap into some sort of external source of energy to create effects. George Lucas called it "The Force," while modern pseudoscientists talk vaguely of "bioenergetic fields" or "cosmic power." Whatever you call it,

this external power source allows psionics to do far more than they could accomplish with their own bodies. The field extends through the entire universe (or possibly exists in hyperspace), so psionics can violate the inverse square law and the speed of light.

Finally, there's the idea of psionics as reality manipulation. In this view, the psionic is simply changing the universe by force of will. Adherents of this model make reference to the role of the observer in quantum mechanics to "prove" that consciousness is important in maintaining reality as we know it. Those who learn the trick can alter reality with a thought. The weakest form of reality alteration is probability alteration — the Luck power, in *HERO System* terms. More powerful reality-altering psionics can teleport themselves, conjure up things they want or need, and influence the minds of others. Reality alteration can bend or ignore any physical laws.

Gamemasters can adopt or make up whatever explanation they wish for how psi powers operate. The above are just examples; you can combine or modify them to suit the campaign. It's even possible to have two or more different "modes" of psi powers at work in the same game world: perhaps some psionic abilities are mechanistic while others involve reality transformations. One species may have body-manipulation powers, while another possesses true telepathic abilities.

Power Level

The issue of power level shapes the nature of the campaign. If psionic powers are weak, then social controls are likely to be less strict, psionic characters can live mostly normal lives, and the existence of mental powers doesn't radically transform the world. If powers are strong, then society must find a way to control them — even if only by letting the psionics rule. From a gaming perspective, the more powerful psionic abilities are, the more likely it is characters will want them, that characters without them will be (or feel) "handicapped" in comparison, and that psionic PCs can overwhelm or unbalance the game.

Of course, power level doesn't always equate to usefulness. A character with a low-powered Mind Control ability, just enough to make everyone like him, is in many ways much more useful as a PC than someone with the ability to destroy whole planets. Larry Niven's stories about Gil Hamilton, the future policeman with an incredibly weak telekinetic/clairvoyant "imaginary arm," provide

RATING SYSTEMS

If psi powers are common and can be scientifically studied, researchers or governments will probably have classification and rating systems to identify power levels. High-powered psionics may have special privileges — or increased restrictions. If nothing else, a “psi rating” system provides nice in-game color, allowing characters to discuss their powers without referring to game mechanics.

Point costs are an obvious basis for power ratings. One simple system is to divide the Active Points in a character’s most powerful psionic ability by 5 to get his or her “Psi Rating.” Ratings are classified by the power “families,” so an individual with the combination of Mind Scan (30 Active Points), Mental Illusions (20 Active Points), and Invisibility (25 Active Points) would have a Telepath rating of 6 (30 divided by 5), and a Wild Talent rating of 5.

Alternately, GMs can assign larger point ranges and group them under Roman numerals, letters, even colors — perhaps powers up to 25 Active Points are Blue-level psionic abilities, 25-50 Active Points are Green powers, and 50 or higher are Gold psionics. Blues usually have other jobs and use their powers only as a supplement, Greens are professional psionics, and Golds are rare and powerful. The exact cutoff may vary with different powers, so that someone with tremendous Damage Resistance still isn’t a Gold psionic, while even fairly weak pyrokinetics get the Gold-level perks and restrictions.

excellent examples of how useful a very limited psi power can be.

See page 249 for more discussion of power levels in game terms.

Latent Psionic Powers

Often characters in fiction have latent powers which they are only just learning how to use and control. There are several good ways to represent this in the *HERO System*. One possibility is to start out with a high power level, but load the power down with Limitations to reflect the novice psionic’s inability to control it properly (see page 249 for some suggested Limitations). As the character gains in experience, he can buy off these Limitations to reflect increasing mastery.

Another method is for the GM to assign a pool of “banked points,” subtracted from the character’s original point value. As the psionic character gains experience, the GM releases points from the bank, so that the latent psi can gain power faster than he would with Experience Points. The GM can establish conditions the character has to meet in play to gain access to his banked points — an amnesiac psi must regain his memories before he can use his hidden powers, or a novice must receive training from a wizened old master.

Third, the GM can use the *Latent Psionic* Talent on page 51. This is similar to the “banked points” approach, but with a little more structure.

Available Powers

Exactly which powers are available in the campaign determines a lot about the flavor of the campaign and how society reacts to psionics. Mental abilities like Telepathy and Mind Control make psionics good at manipulating other Humans, but not able to withstand gunfire or smash planets. Telepaths make good spies or policemen, and inspire society to make rules about mental privacy. Telekinetics who can throw cars around are more useful as soldiers (or in construction), and inspire a different set of social controls.

While almost any ability can be explained with enough handwaving as “psionic,” fifty years of science fiction and pseudoscience have created a more or less standard list of psionic powers common to SF settings, in six main families.

BODY CONTROL

Mystics have long claimed to be able to perform amazing feats of self-control, and psionics have co-opted many of the same claims. In *HERO System* terms this includes Talents such as Double-Jointed, Lightning Reflexes, and Simulate Death. It also covers abilities built with Powers such as Aid, Damage Resistance, Healing, Lack Of Weakness, Life Support, Running, and possibly even Shape Shift. Often making conscious changes to one’s body requires Concentration and Extra Time; realism suggests Increased Endurance Cost, Gradual Effect, and/or a Required Skill Roll. Characters who can manipulate their bodies may be recruited as super-agents (or take up a life of crime); anyone

who can heal or aid others will be in demand as a psychic doctor.

Body Control powers are most impressive and important in relatively low-tech settings. In Space Opera games, cybernetics, bio-engineering, nanotechnology, and advanced surgical techniques may mean that just about anyone could have Body Control-type abilities.

ESP

Extra-Sensory Perception, more commonly known as ESP, is the scientific name for what used to be called clairvoyance, second sight, or prophecy. It includes all abilities to perceive things beyond normal senses. In *HERO System* terms, ESP covers Talents like Combat Sense or Danger Sense and Powers like Clairsentience (including Precognition), Enhanced Senses, and Find Weakness. It can be as narrowly-focused as dowsing (Detect Water) or as broad as the ability to cast one’s mind across the Galaxy (Clairsentience with the *MegaScale* Advantage). Concentration is usually required. A good way to limit the power of ESP abilities is to make them chancy or unreliable, with an Activation Roll or No Conscious Control.

Settings with ESP may have restrictions on psionic snooping, or may simply become extremely open societies (since secrets are impossible). Especially interesting consequences arise when individuals with Precognition exist in a society: can precogs prevent crimes and disasters? What if the “oracles” decide to misuse their power?

TELEKINESIS

Telekinesis is any ability to manipulate energy or physical objects with mental power. It has a number of related abilities: pyrokinesis (the ability to start fires), cryokinesis (the power to reduce temperature), and electrokinesis (control of electric currents). You can model telekinesis and related powers with many *HERO System* powers, including Change Environment, Energy Blast, Entangle, Flight, Force Field, Force Wall, Killing Attacks, Knockback Resistance, Missile Deflection, Telekinesis (of course), and Tunnelling.

Telekinetic powers are often Indirect, and if no defenses are available, telekinetic attacks can be No Normal Defense (imagine the damage a pyrokinetic can do by starting a fire inside someone’s brain). In a hard science game, telekinesis powers should burn a lot of Endurance and be limited by range. Concentration, No Conscious Control, and Requires A Skill Roll are other common Limitations.

TELEPATHY

Telepathy is the ability to read minds, transmit thoughts, or otherwise mess with people’s heads. Depending on how powerful and skilled the telepath is, that “otherwise” can include editing people’s memories, implanting compulsions and commands, attacking others psychically, and even transferring the telepath’s consciousness into other bodies. Telepathy is normally instantaneous, not bound by the inverse square law or the speed of



light. Telepaths with interstellar range can serve as a super-fast communication system.

Most of the Mental Powers are subsets of telepathy — Ego Attack, Mental Defense, Mental Illusions, Mind Control, Mind Scan, and Telepathy itself — but telepathic characters can have plenty of other abilities. For example, Universal Translator could be a form of telepathy, and characters must use Transform to make permanent changes to a target's mind, like compulsions or memory edits.

Telepathic abilities often take Concentration and a Required Skill Roll to use, and may require Extra Time (especially for major effects like Transform, or large-scale powers like Mind Scan). Hard SF telepathy is likely limited by range and only works on the same species as the user (see *Classes Of Minds*, page 250). No Conscious Control or Always On make for twitchy, overloaded telepaths who seek out solitude to escape the chatter of unshielded minds. In film it's common for telepathy to have a visible effect on the user (like all-black or glowing eyes, nosebleeds, or pulsing foreheads); these are either the *Visible* or *Side Effects* Limitations, depending on how serious the effect is.

Societies with telepathy have to face some major changes in how they view the world: thoughts are not private; memories and sensory impressions may be false; and people may not always have free will. Enlightened telepathic cul-

tures may create a society where nobody has emotional problems and deception is unknown. More sinister ones could be a tyranny of "thought police." Tightly restricting (or even exterminating) telepaths lets mundanes keep their minds free, but perhaps at the price of having blood on their hands. A world entirely populated by telepaths could be an interesting game setting: presumably most people have enough Mental Defense to prevent casual eavesdropping on their thoughts, but anyone planning anything shady needs to find a way to hide from the telepathic cops.

TELEPORTATION

Being in two places at once or spontaneously disappearing is a very old psychic effect. The teleportation family of powers includes the ability to teleport one's self, teleporting other people, and "apporting" — bring-

ing desired items to the user.

In *HERO System* terms a great many powers can result from teleportation (besides, of course, Teleportation itself). A teleporter who can bring water to a dry place is using Change Environment. Those who really can be in two places at once have Duplication (possibly Linked to Teleportation). Some teleporters visit other times or dimensions — Extra-Dimensional Movement. A teleporter who can zap things into a foe or remove vital body parts has an Killing Attack NND Does BODY. Someone who can "blip away" missiles has Missile Deflection. The ability to call others to you is Summon or Teleportation Usable On Others; the power to "conjure" useful items is a form of Variable Power Pool.

Limitations common to teleportation are Concentration or Extra Time to reflect "attuning" oneself to the target; Increased Endurance or Charges for teleportation that drains the user; No Conscious Control for a power that only manifests in a crisis; and Requires A Skill Roll or Activation Roll if the teleporter can't always make his power work.

A world with teleportation changes many ideas about privacy, security, and distance. Teleporting terrorists, spies, or thieves inspire ever more paranoid security measures — labyrinths, constant surveillance, or simply hiding anything of

value. If everyone can teleport, the whole world is essentially “next door” — with all that implies.

WILD TALENTS

Finally there is the category of Wild Talents — psi powers which aren’t easily classified. These are numerous and varied. A partial list (along with *HERO System* equivalents) would include: probability alteration (Luck, Missile Deflection, and possibly a Variable Power Pool), weather control (Change Environment), time control (extra SPD and various other abilities), materializations (Summon), astral form (Desolidification), channelling (a mental-only Multiform), temporal fugue (Duplication), and psychic invisibility (Invisibility with Limitations).

Rarity

The rarity of psi powers determines a lot about their effects in the campaign. If powers are common, then society must have a way to cope with their effects. Rare powers can be especially effective through sheer surprise value. Interesting effects occur when some species have powers and others do not.

RARE POWERS

Usually psychic powers are rare in a given setting. This allows psionics to remain poorly understood and hard to counteract. Even low-grade powers can be useful, since nobody expects to encounter them. But their very rarity means psionic characters often face fear and suspicion from “mundanes.” Self-protective measures by psionics only inspire further distrust from others, leading to paranoia and conspiracy theories. In some settings, the normals may decide the risks of psionic powers are too great, leading to anti-psionic pogroms. When powers are rare, being psionic may qualify as a Social Limitation, and the Reputation “Psionic” could be dangerous.

COMMON POWERS

In some settings, psi powers are very common. Alfred Bester (the author, not the *Babylon 5* villain named after him) wrote several stories about worlds with widespread psionic powers. In *The Stars My Destination*, he described a world where everyone knows how to teleport. In *The Demolished Man* he explored how crime and police work would function in a world with many telepaths. Larry Niven examined the effects of probability alteration by the entire Human species in his later “Known Space” stories.

The chief point to remember about common powers is that nobody’s surprised by them. If teleports are common, people find ways to keep from being robbed by teleporting burglars. Bester suggested labyrinths inside houses to confuse thieves trying to teleport in; teleport-proof force-fields are another possibility. Laws will address the use and misuse of common psi powers — if mind control exists, then people won’t go to jail for crimes committed while under someone else’s control... assum-

ing the police can verify their claims.

Characters in a setting with common psi powers may be able to take a low-value Disadvantage for being psionic (a Psychological or Social Limitation equivalent to a doctor’s professional ethics, for instance).

TECHNICAL FIXES

Sometimes the commonality of psionic powers depends on artificial aids. Psionic characters may need to use “amplifier crowns” to boost their powers, or have to stimulate their brains with psi-drugs (like the spice melange of *Dune*, which allows some people to “fold space”). In those situations, the technology is what gets controlled — maybe characters need a license to own a psionic amplifier, or a prescription for psi-drugs. Perhaps the devices are a closely-guarded monopoly of the psionic elite. Naturally, wherever something is forbidden, an illegal market develops. Player characters who run afoul of the legitimate psionic authorities may have to make do with unreliable black-market amplifier helmets and home-brewed psi drugs.

SPECIES DIFFERENCES

Gamemasters should also consider whether psionics are a universal phenomenon among all sentient species, or only some species can have psionic powers. Interesting results emerge when certain powers are only found in certain species. Perhaps Sirians are the only telepaths in the Galaxy, but Earth produces powerful clairvoyants and Vegans are known for their mighty telekinetic abilities. The Denebians, who don’t have any psionics, are desperately trying to acquire the technology to create or breed some. If interstellar travel or communication depends on a certain psi power, then the species with a monopoly on that power becomes a key player in galactic politics (like the Spacing Guild in *Dune*).

Some psi powers may only work on members of the user’s own species, because they require compatible “brain frequencies” or some such. This is especially appropriate for telepathic powers. Gamemasters who want to have interspecies telepathy may consider making some powers less effective on other species — so a Human telepath’s powers work at full strength on other Humans, but only half power on Sirians. See *Classes Of Minds*, below, for more information.

Social Issues

Gamemasters should decide in advance what social rules control psionic powers. Specifically, which powers are subject to what rules? Are all psionics licensed? Do all telepaths have to wear inhibitor collars? Are there any organizations (legal or clandestine) of psionics? What happens to psionics who don’t join those groups?

Much depends on the powers available. Telekinetics are useful in warfare, criminal activity, and a whole range of legitimate jobs. They can do damage, but so can a drunk behind the wheel of a hovertruck. They probably have to register or get

a license (to ensure they receive proper training in the use of their powers), but probably will be permitted and encouraged to use their abilities. Extremely powerful telekinetics may be isolated, drafted, forced (somehow) to wear inhibitor collars, or simply assassinated at the earliest opportunity.

Telepathy, by contrast, has much greater possibilities for abuse, and even the legitimate uses are a little creepy. The government is almost certain to require telepaths to register, and they probably have to follow strict rules about the use of their powers (unless everyone in the society has telepathic powers and can shield his thoughts from others). Telepathy is sufficiently useful in espionage (both foreign and domestic) that governments may wish to recruit telepathic spies even if their powers are supposedly illegal.

A lot of society's reaction to psionics depends on history. A world where psi-crooks are running wild has a much less favorable opinion of psionics than a world where telekinetic rescue teams avert disasters predicted by precognitives. In a *Star Hero* campaign, this means the GM can juggle the society's history to produce the desired result. Want a setting with oppressed psis? Give the planet a background including a couple of juicy scandals centering on the abuse of psi powers, and maybe a disaster blamed on a wild talent gone out of control. Want a tolerant world where psionics live openly? Then give them a strong ethical tradition among psionics, and some examples of heroic telepaths foiling terrorist plots or clairvoyants finding trapped survivors after an earthquake.

LAW AND ORDER

Society needs some way to prevent psionics from abusing their powers. For abilities like clairvoyance, a lot of the same rules that apply to spying on your neighbors with a telescope and tapping their phones would apply — assuming the police have their own clairvoyants, or devices to detect the unauthorized use of such powers. But how can a mundane law-enforcement agent stop a powerful telekinetic in a drunken rage? How can he arrest a telepath who mentally commands him to leave? How can he keep a teleporter locked in jail?

There are three ways to deal with potential lawbreakers who have powers beyond those of the law enforcers: find enforcers who do have the power (the stick); find ways to encourage responsible behavior (the carrot); or eliminate the problem entirely (the *big stick*).

The obvious people to control psionics are other psionics, but mundanes may not wish to hand over that much power to them. In any society at least as organized as twenty-first century America, the police and the government probably have specially trained and equipped teams to deal with psionic threats. They can control telepaths with robots or cops in psi-shield helmets, use long-range snipers or knockout gas to take down dangerous

telekinetics. A teleporter who can't see outside of his cell (perhaps because of holograms) can't escape. Solutions like these will exist if society has to deal with renegade psionics.

Encouraging ethical behavior means early identification of those with talents and careful training. This is one of the primary purposes of virtually all psionic organizations, whatever their other goals may be. Schools (or possibly hospital maternity wards) may have mandatory psi-testing. Training consists of courses about the brain and how psi powers work, plus plenty of indoctrination that "with great power comes great responsibility" (or at least "we must not antagonize the mundanes").

Finally, a given society simply may not want any psionics at all. In brutal cultures, a positive result on the childhood psi test means lethal injection. More humane societies could exile psionics to another world, or require them to neutralize their powers. With inhibitor collars, psi-damper drugs, or possibly even brain surgery, a civilization could create a psionic-free world. Of course, when the psionic invaders come, society may wish for a few telepathic defenders, but by then it's too late.

ORGANIZATIONS

One solution to the problem of untrained and uncontrolled psionics — and to the problem of public distrust of mind-readers — is the formation of psionic organizations. These may be government agencies, such as the Psi Corps in *Babylon 5*, or private foundations created by the psionics themselves to protect their interests and train new talent. They might even be for-profit corporations hiring out skilled psionics for any task.

Any group with access to unique sources of power or information becomes influential. Even in worlds that officially proscribe psionics, the underground Psi Guild may trade favors to one government agency for help against another bureau.

In societies that do not regulate psionic powers and/or otherwise accept them in mainstream culture, psionic organizations remain important, if only because they represent a valued group. Think of them as something like the American Medical Association. Doctors don't have psi powers, but they do have specialized knowledge and training which makes them influential. On the planet Sigma Alpharis VII, the Alpharisian Society of Psionics has a similar place in society.

Gamemasters should think of the most important psionic organizations and how they interact. Who studies psi powers scientifically? Who trains psionics? Who enforces the registration and licensing rules? Who tests people for psi abilities? Which agencies have psi-agents? Any group with a monopoly on one of these functions becomes a power center — and inspires endless attempts to chip away at the monopoly by rivals.

Form Of Organization

Exactly what form a psionic organization takes depends on how powers work and how society treats psionic individuals.

Families are a natural social group for psionics, especially in quasi-feudal settings, or worlds where psionic powers are hereditary. Powerful psionic families might become something like Renaissance nobility. Persecuted psionic families might be more like Jews in medieval Europe — living apart from the mundanes and trying to go unnoticed, but occasionally called upon for help by those who despise them.

On worlds that at least tolerate psi-powers, psionics could form guilds — independent organizations aimed at maintaining a monopoly on a given trade or type of power. This allows them to bargain for better pay and working conditions, and provides them with political leverage. A psionic guild might aggressively crack down on non-member “pscabs.” Often the Guild doubles as a licensing and regulating agency, rather like the Bar Association.

Since psi powers often require a lifetime of dedicated training and arcane disciplines of study and meditation to master, psi organizations may model themselves on monastic orders or groups like the Knights Templar. The Jedi of *Star Wars* are the obvious example. Different orders may specialize in different mental powers. Rival orders also lets the GM tap into the Musketeers versus Cardinal’s Guards theme, as apprentice psionics duel and brawl with the winking approval of their superiors. As with the historical Templars, the mundane authorities may come to view orders of psionic monks or knights as too powerful, thus driving the groups underground.

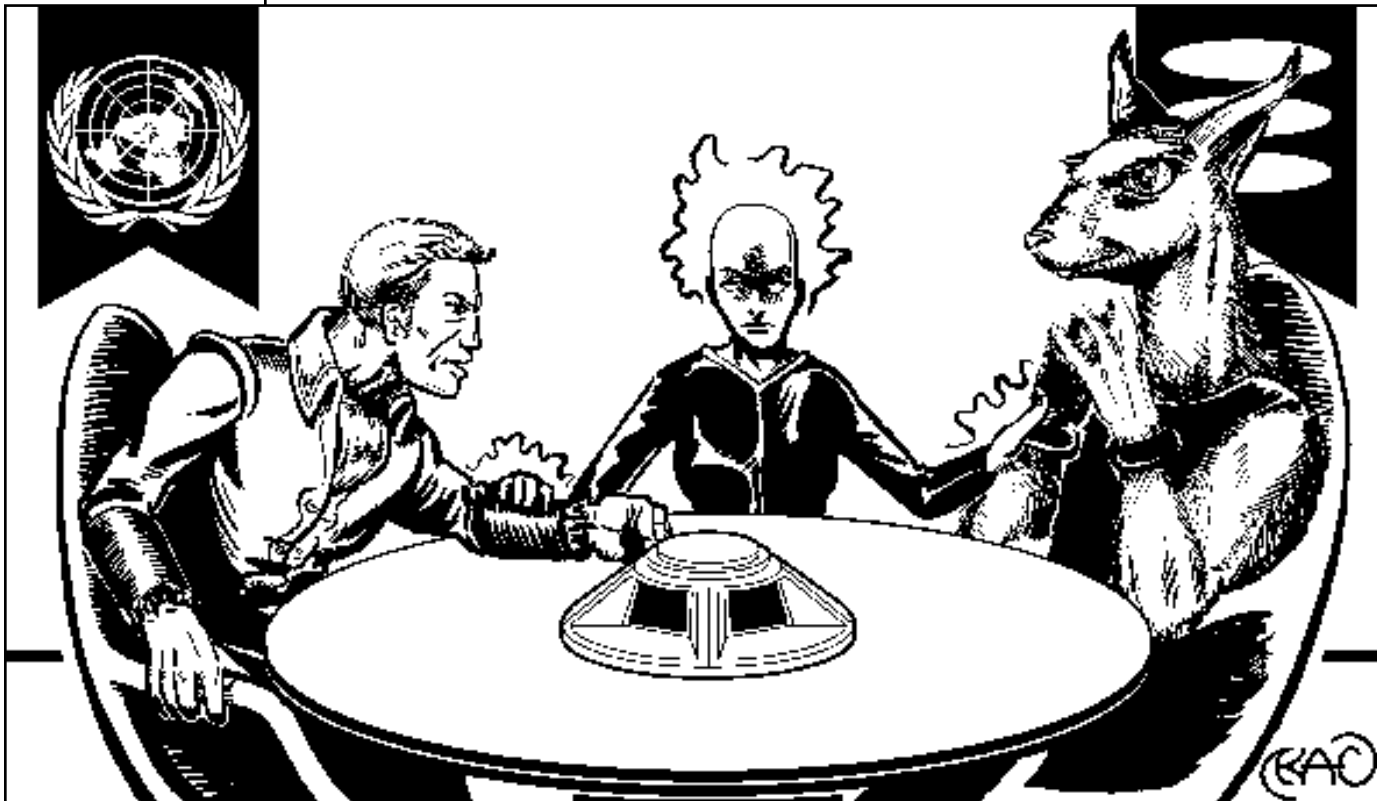
Legends of a suppressed psionic order can linger for centuries, inspiring hope among persecuted psis and fear among their persecutors.

Money and psionics may interact in some settings. A psi-corporation is a for-profit organization, paying dividends to its owners or shareholders. Small ones would resemble legal or medical partnerships, while big ones would have large research divisions, a marketing department, and scores of mundane employees. Psionic employees might own part of the company, or they could jump from company to company whenever they get a better offer. Psi-corporations would compete to recruit the most talented psionics or the rarest wild talents. In a Cyberpunk setting, they might use their psi-agents in direct attacks against each other.

Crime might also attract psionics. “Psi-gangs” would be the equivalent of organized crime groups, using psionic muscle to run protection rackets, control mundane illegal activities like drug smuggling and prostitution, and engaging in uniquely psionic crimes (such as telepathic blackmail, clairvoyant spying for hire, mind control theft or fraud, and telekinetic mayhem).

Government agencies would employ psionic individuals in the public interest — or, more specifically, in the interest of the agencies themselves. Psi agencies would control rogue psionics, thwart efforts at psionic espionage, crime, and terrorism, and conduct psionic espionage themselves. In tyrannical states, psi agencies might use mind control and telepathy to suppress dissent and brainwash dissidents.

In settings that at least tolerate psi-powers, psionic institutes or societies may become very important. Psionic training centers would be



the equivalent of elite universities or prestigious boarding schools. Even if society persecutes psionics, a mundane scientific organization might include a covert psionic research program. Similarly, a seemingly ordinary private school might in fact be a training center for psionic teens.

Finally, even in the most open cultures, psionic dissident groups will exist, because there are extremists and malcontents in every society. Psionic dissidents in an open society would campaign for equal rights and an end to discrimination. In societies that oppress psionics, dissident groups might run an “underground railroad” to get psionics to safety, or be psi-rebels using their powers to overthrow the regime.

RULES CONSIDERATIONS

Here are a few rules considerations to keep in mind when deciding how psionics should function in your *Star Hero* setting.

POWER LEVELS

Most *Star Hero* campaigns feature Standard Heroic characters, and in such games, the power level of psi powers generally should range from about 10 to 50 Active Points. A ceiling of 20 Active Points limits characters to small-scale effects, requiring a lot of finesse and imagination for best results. Low-powered campaigns often limit characters to one power, or a handful of closely-linked abilities. More high-powered campaigns, such as those modeled on the writings of E.E. “Doc” Smith, can go up to 75 Active Points (or more), although by that level the characters are effectively superheroes.

Alternately, the GM may allow fairly high levels of power — 40-60 Active Points — but require characters to impose a large amount of Limitations (-2 worth, or more) on each power. That gives characters enough dice of effect to really get things done with their psionic powers, but reins them in so they can’t use their mental abilities to run roughshod over everyone they meet.

Common Limitations

The discussion of the categories of psionic powers above listed the Limitations that tend to apply to each category. Here’s a list of the Limitations that, general speaking, are most often applied to psionic powers in *Star Hero* settings:

- Activation Roll
- Concentration
- Costs Endurance
- Extra Time
- Focus (activation drugs and the like)
- Increased Endurance Cost
- Limited Range
- No Conscious Control
- Reduced By Range
- Requires A Skill Roll

In many cases, the key to keeping psionic

characters from becoming too powerful in a *Star Hero* campaign is not restricting Active Points — it’s Limitations. Active Points aren’t always a good measure of overall power, and the way Mental Powers function in the *HERO System*, characters often need to roll a certain minimum number of dice to achieve any significant effect. Rather than restricting the number of dice, make the dice harder to use. A power that requires Extra Time and Concentration can still come in very handy during the game... but the odds of a character using it to triumph easily in a combat situation are significantly reduced.

POWER FRAMEWORKS

The GM needs to decide whether characters can buy psionic powers in Power Frameworks. The lack of, or inclusion of, Power Frameworks in the game can have significant implications.

No Frameworks

If characters cannot put psionic powers in Frameworks, then psionics tend to be rarer in the game, since buying each psionic ability separately can get expensive. This encourages one of two approaches.

The first is the all-psi character, who devotes most of his points to psionic powers, giving him few points to spend on anything else. Typically the character tries to make up for his lack of Characteristics, Skills, and the like with either powers he can use in many different ways (e.g., Telekinesis), or technology. Gamemasters need to examine all-psi characters carefully. Not only do they suggest poor character conception (since few people, particularly heroes, are so one-dimensional), but the level of technology available in most *Star Hero* games gives the character a significant chance to overcome his deficiencies with gadgets, and that can lead to game balance problems.

The second approach is the low-powers character, who has a few psionic abilities of low power. Sometimes the powers simply don’t have many Active Points; in other cases the character uses lots of Limitations to get the Real Point costs down. Assuming the Limitations applied (if any) are legitimate, low-power characters usually cause few game balance problems, and can lead to interesting characters with intriguing roleplaying potential. For that reason, many GMs prefer this approach — powers bought without Frameworks, with low Active Point or high Limitation value requirements.

Frameworks

If characters can put psionic powers into Frameworks, psionics tend to become more common and more powerful in the game. While paying for the base Framework itself can get expensive, the individual powers themselves become cheap to buy once the Framework is in place.

In most cases, Frameworks are inappropriate for games where GMs want to keep psionics low-powered or difficult to use. However, they

work quite well in games designed to simulate the high-powered nature of the psionics depicted in some novels, comics, and movies. Those games are often psionic-oriented, with every character having psionic powers. Putting the powers in Frameworks not only ensures each character has a respectable suite of “standard” psionic abilities, but also has the capacity to branch out and create some unusual psi-powers they otherwise could not afford.

If the GM allows psi-Frameworks, he has to decide which Frameworks characters can choose from. In all but the most high-powered psionics campaigns, Variable Power Pools aren’t allowed; they simply offer too much flexibility and power for a Heroic campaign. Multipowers are much more common, though they can present game balance problems because the slots are relatively cheap. Elemental Controls tend to be a good choice for many campaigns. They allow characters to save a few points, but not as many as the other Frameworks; individual slots remain fairly expensive. They also suffer from some significant restrictions the GM can make use of in the game.

CLASSES OF MINDS

Per page 117 of the *HERO System 5th Edition, Revised* rulebook, Mental Powers work against specific classes of minds. For *Star Hero* purposes, the “Human” class of minds refers to the same sentient species the character with the Mental Powers belongs to. “Alien” refers to any sentient species other than the character’s own. Thus, to a Perseid psionic, other Perseids are in the “Human” class of minds; Humans, Toractans, Mon’dabi, and other sentient species all have “Alien” class minds.

Because of the prevalence of Alien minds in many *Star Hero* campaigns, applying the classes of minds rules precisely as written can have the effect

of crippling Mental Powers. Gamemasters may wish to consider using one of the following options instead:

Multiple “Alien” Classes

Instead of having just one “Alien” class of minds, you could create multiple “Alien” classes of minds. For example, maybe all sentient races descended from a specific category of animals (reptilian, mammalian, and so forth) have minds so similar that Mental Powers work normally within that category. Thus, characters would have to cope with a framework including Mammalian Alien, Reptilian Alien, Ichthyoid Alien, and so forth. The Human class of minds would become the Alien classification appropriate to the character. A Human psionic, for example, would belong to the Mammalian Alien class of minds, and could affect other mammalian sentients normally with his Mental Powers. He could not, however, affect other types of aliens unless he paid for the standard *Multiple Classes Adder*.

Reduced Effect

Instead of having no effect on other classes of minds, a character’s Mental Powers may have a reduced effect. The *HERO System 5th Edition, Revised* rulebook suggests one possible option — -3 to ECV Attack Rolls and -10 to Effect Rolls — but the GM can establish other arrangements if he wants to. In a psionic-oriented campaign, the GM may even vary the effectiveness of Mental Powers from class to class. A Mammalian Alien character might affect other mammalian minds normally, Reptilian Alien and Avian Alien minds at -3 ECV/-10 Effect Roll, other flesh-and-blood alien classes at -5 ECV/-20 Effect Roll, and mineral- or energy-based aliens at -8 ECV/-30 Effect Roll. Applying a *Multiple Classes Adder* to increase the number of classes a character can effect would negate any penalties for that class.

No Classes

The GM can simply ignore the classes of minds rule, allowing any character with Mental Powers to affect any other character normally, regardless of class of minds or species. This may or may not apply to Animals and Machines; some GMs may want to let characters affect them normally, while others may prefer to maintain the classes of minds distinctions regarding them.

Reduced Cost Adder

A GM who wants to use the normal classes of minds rules, but encourage characters to create psionic powers that can affect other classes of minds, could reduce the cost for the *Multiple Classes Adder*. Instead of +10 points, it might cost +5 points, or even as little as +3 or +1 points.



PSIONIC CAMPAIGNS



Some *Star Hero* campaigns focus on psionic abilities, with every character having at least one or two mental powers. When running a campaign centering on the exploits of psionic characters, GMs can choose several different structures. Some possibilities are described below.

Most psionics campaigns are Standard Heroic games, with characters built on 75 Base Points plus up to 75 points' worth of Disadvantages. However, some GMs may find 150 points a little limiting when PCs have to buy both psionic powers and ordinary Skills and abilities. In that case, upgrading to Powerful or Very Powerful Heroic-level characters may be appropriate. Alternatively, the GM can have players build characters on up to 150 points without any psionic powers, then allot a fixed amount of additional points (say, 50, 75, or 100 points) solely for purchasing psionics.

CAMPAIGN TYPES

Psionics campaigns tend to fall into several categories. Many of them are simply other types of *Star Hero* campaigns with psionics introduced into the setting or emphasized in the game.

PSI AGENTS

Espionage and covert operations are all about gathering information, denying it to the enemy, and striking by stealth. Those jobs are much easier when you can read minds, teleport, see through walls, and toss boulders by looking at them. Psi-agents can do all the things James Bond is famous for, plus match wits with psionic counterspies, evade clairvoyant monitors, and cope with teleporting telekinetic assassins. Psi-spies working for an oppressive government may wind up conducting covert operations against internal dissidents instead of foreign governments. Corporate-sponsored psi-agents can go looking for trade secrets.

Any sort of espionage campaign gives the GM a good framework for assigning missions and equipment to the heroes, and covert operatives usually can't call for help when things get dangerous. Having PCs from different agencies or branches allows for intra-party intrigue and paranoia. The combination of the shadowy world of espionage and the literally mind-bending possibilities of psionics allows adventures in which nothing is what it seems, nobody can be trusted, and even your own thoughts can betray you.

PSI COPS

When psi-agents and psi-rebels break the law, it's up to psionic detectives to find and capture them. Telepathic police must follow the rules about when they can legally read a suspect's mind, or risk seeing the guilty go free. Police precogs must work with fuzzy impressions of the future to determine what crimes perpetrators will commit (as in the movie *Minority Report*).

Psionic police campaigns focus on cop work in a psionic society, including the problems of how to arrest mind-controlling telepaths and how to hold teleporters in custody. Psionic detective games center on solving mysteries — who done it, and how. Psi powers make it easier to solve mundane crimes, but they also make possible a whole bunch of new offenses, like locked-room murders in which the killer used telekinesis to fire a gun at the victim — how can the cops determine whose mind pulled the trigger? Psi-cops who belong to the Psi Guild or a secret institute may pursue their own agendas, trying to recruit talented suspects, or shelter them.

Like a psi-agents campaign, psi-cops games let the GM send the PCs out on adventures by simply having an NPC superior officer give them orders. Beat cops or investigators can also get into trouble on their own while following up leads or trusting a hunch. Cops are also likely to be first on the scene when something weird happens, and may have to cope with major threats until heavy backup arrives. For the proper stationhouse feel, the GM should create some official department codes or abbreviations (like a "section 799" for unlawful mind-reading, or "MCNC" for using mind control without the subject's consent), and encourage players to come up with their own hard-bitten police slang.

PSYCHIC WARS

On the battlefield of the future, bullets, lasers, and artillery may not be the only weapons available. "Psoldiers" use awesome psionic powers against the enemy, whether to assault his mind from a distance, shield troops from his sensors, or teleport a squad of commandos into the heart of his command center.

As psi agents games mix psionics and espionage, and psi cops mix police drama with psionics, a psychic wars campaign introduces psionic powers into a war story. The war may take place in the near future, with weapons any twenty-first century Human would recognize, or in a time and setting so distant scientists have changed the face of the battlefield by inventing combat drones, teleporting

cannons, and disintegrenades. Player characters in a psychic wars game are typically “special forces” soldiers. Their “special” nature derives not only from the fact that they’ve got advanced military training, but because either they have psionic powers in a setting where few others do, or they have much more mental power than other psi-soldiers.

Adventures in psychic wars campaigns use plots familiar to any war movie buff: Infiltrate behind enemy lines and destroy an important resource. Recover a kidnapped person of importance. Help develop a new weapon (possibly a psi-enhancer of some sort) and protect it from the enemy. Test out a new weapon. Spearhead a major offensive. Perform a commando raid against an important enemy stronghold. The GM doesn’t even have to worry about motivating the PCs; all he has to do is have a superior officer give the order.

REBEL PSIS

The heroes are psionics in an oppressive society, fighting for freedom. The regime may only oppress psionics, or it may be just as brutal to mundanes. Either way there’s plenty of scope for adventure: infiltration missions to rescue captive psis, tense cat-and-mouse games with the psi-hunters, and maybe an attempt to organize a general uprising. But beware: the Mind Police have psi-detectors and use captured telepaths as “psi-hounds” to track the rebels. If the heroes fail, the hound’s collar could be their fate as well.

A rebel campaign means the heroes must rely on their own powers and resources, and is good for roleplayers who enjoy coming up with their own plans and schemes for daring rebel exploits. It also allows the GM to examine interesting ethical questions: are the mundanes right to oppress psis? What actions are justified by the fight for freedom? Will the revolution solve anything? Psi-rebels can be worked into most science fiction subgenres: pretty much all Cyberpunk games are about rebellion in at least some respects, and Space Operas usually have at least one tyranny that needs overthrowing.

SCHOOL FOR PSIONICS

Psionic abilities can be very powerful, but unless an individual learns to use and control them properly, they pose a danger to everyone — including the person possessing them. Since non-psionic parents can’t teach their children to use their powers, society needs specialized schools.

In a light-hearted campaign, the psi school can use all the tropes of classic boarding-school stories — dorm rivalries, standing up to bullies, meddling in the teachers’ private lives, and winning the big game. Of course, at psi school, the bullies may be psychic vampires, the teachers have powerful mind shields, and the big game is a demanding contest of telekinetic rugby. Darker psi schools campaigns may emphasize the need for secrecy in a hostile world, the creepy master-race ideas of the teachers, and the very real dangers of immature minds wielding immense power.

Students at psi school are fairly low-powered

characters, which saves the GM from having to come up with credible opponents for powerful psionics. Their powers and simple youthful curiosity can get psi-kids into real danger, but the GM can always use a wise old headmaster to sort things out if the players are overwhelmed.

EXAMPLE: PSIONICS IN THE TERRAN EMPIRE

As a demonstration of how to set up a system of psionic powers, here are the steps Jim, the GM, took to create the psionic background for the Imperial Era of the Hero Universe.

HOW IT WORKS

Since the Terran Empire is a Space Opera setting, Jim doesn’t want to limit psionics based on scientific plausibility, so his explanation of psi powers is deliberately “rubber science.” The idea of reality-warping doesn’t quite fit the tone he has in mind, so he adopts the notion of psionics tapping into a “quantum substratum” existing in a parallel dimension. This allows psionic characters to use more power than their bodies can produce, and have powers with interstellar range. This explanation also suggests that rubber science psi-tech machinery can sometimes augment or block psi powers.

POWER LEVEL

Powerful psionics are a common feature in Space Opera games, so Jim wants a fairly broad range of power levels. Most psionic powers are limited to 40 Active Points, about right for Heroic-scale characters. A rare few psionics have more impressive powers, up to 90 Active Points in a single ability. Usually these powerful people are off-stage as master villains or NPCs, since that minimizes the impact of their powers on the campaign as a whole.

Jim establishes a rating system based on point value, classifying psionics with Greek letter designations because they have a nice scientific sound. Psi-Alphas are normals, with no known psionic abilities. Psi-Betas have detectable but low-level powers: *HERO System* Talents or Powers worth no more than 10 Active Points. Psi-Gammas have notable powers up to 20 Active Points. Psi-Deltas are the most common “professional” psionics, with powers up to 30 Active Points. Deltas and higher are actively recruited by organizations which train and employ psionics. Psi-Epsilons have up to 40 Active Points in a single psionic power, and are the intrepid psi-agents or dreaded Mind Police during some periods of Imperial history.

Beyond Epsilons the scale gets patchy because there are so few high-powered psionics. Psi-Zetas have powers in the 50 to 60 point range, and Etas are 60 to 80 Active Points. Individuals with more than 80 Active Points are all lumped together as “Psi-Thetas,” and are considered very dangerous even by other psionics. The term “Omegas” is used by psionics to refer to amazingly powerful

individuals, with powers in the 100-point range — beings so rare that some psionics scoff at their existence. Rumors say the Empire has a secret team of “Omega Agents” to deal with threats even the Imperial battlefleet can’t handle.

Jim’s rating system provides some enjoyable campaign color. Psionic characters can make disdainful remarks about “brain-dead alphas,” and be properly impressed when they learn their patron is an Eta. And a message from headquarters saying “Rogue Omega” ought to raise their hackles....

AVAILABLE POWERS

For the proper Space Opera feel, Jim limits the available powers to the “standard” psionic list: Telepathy, ESP, and Telekinesis. Telekinesis can only manipulate physical objects, so a telekinetic Force Field or Force Wall would provide PD protection only. Teleportation, pyrokinesis, and other abilities are “wild talents” and as such are viewed with suspicion and scientific interest. Body Control powers are not available, mostly because Imperial medicine and biotechnology are good enough to make them obsolete. Precognition and any long-range Clairvoyance powers must have the *Vague And Unclear* (-½) Limitation. All psi powers require Concentration and Requires A Power: Psionics Roll to perform, but they don’t use END (if they cost END normally, the character must buy them to 0 END). What this means in play is that psionic characters can do cool tricks like picking locks telekinetically or influencing weak minds, but still can’t defy a whole squad of police armed with blasters.

RARITY

Psionics are usually just a bit of extra “chrome” in Space Operas — they shouldn’t overshadow the fun of things like mile-long space dreadnoughts, lost alien civilizations, and a good blaster pistol at your side. So Jim makes them rare, at least among Humans. He decides there’s one Beta (10 Active Point powers) per million people in the Empire, and half as many at each increment of 10 Active Points above that. So a planet like modern Earth, with 6 billion people, would have no more than 12,000 psionics, half of them low-powered Betas. This way characters with no powers remain able to cope with psionic adversaries, and even moderately powerful psi PCs are important individuals.

Some powers are much more common than others: half of all Human psionics are telepaths, with Telepathy, Mind Scan, Mind Control, or similar powers. The remainder are divided evenly between those with ESP and those with telekinesis, plus a tiny percentage of wild talents.

Psionic talent manifests itself randomly, although scientists believe there’s an hereditary component. As a result, any character can have psi-powers, but there’s still plenty of fun opportunities for someone to turn out to be the lost child of a rogue Omega, or the product of a secret breeding program. Since there’s no simple genetic test for the psi-gene, psionic organizations have to find and test potential psionics — which means mysterious strangers from different groups may visit a young

psi to try to win him over as a new apprentice.

Humans are not the only species with psionic powers, of course. Several species in the Milky Way Galaxy, including the Varanyi and the mysterious Mandaarians, are uniformly psionic. Aliens have different power levels and available powers. The Varanyi, for example, are (in)famous not only for their psionic might, but for the broad array of powers they manifest. Much of Imperial psionic research studies the powers of rival species and tries to discover ways to counteract them.

For the proper Space Opera feel, Jim assumes all psionic powers work equally well across species, so a Varanyi telepath can read Human minds and vice versa. Thus, PCs don’t have to worry about the classes of minds rules, and can take Limitations on powers that only affect one or two species.

Psionic technology remains tricky and unreliable. Experimental psi-amplifiers may exist (probably in the hands of secretive government agencies), but they’re not commonly available. Psi-drugs are known, and some psionics depend on them for effective use of their powers.

Drugs cannot give anyone new powers, although rumors of some miracle substance that can make anyone an Omega often crop up. Psi-shielding is a bit more widespread, since fears of telepathic spying inspired military crash research programs to devise countermeasures, and some of their devices have trickled out to the general public.

Imperial Psionic Technology

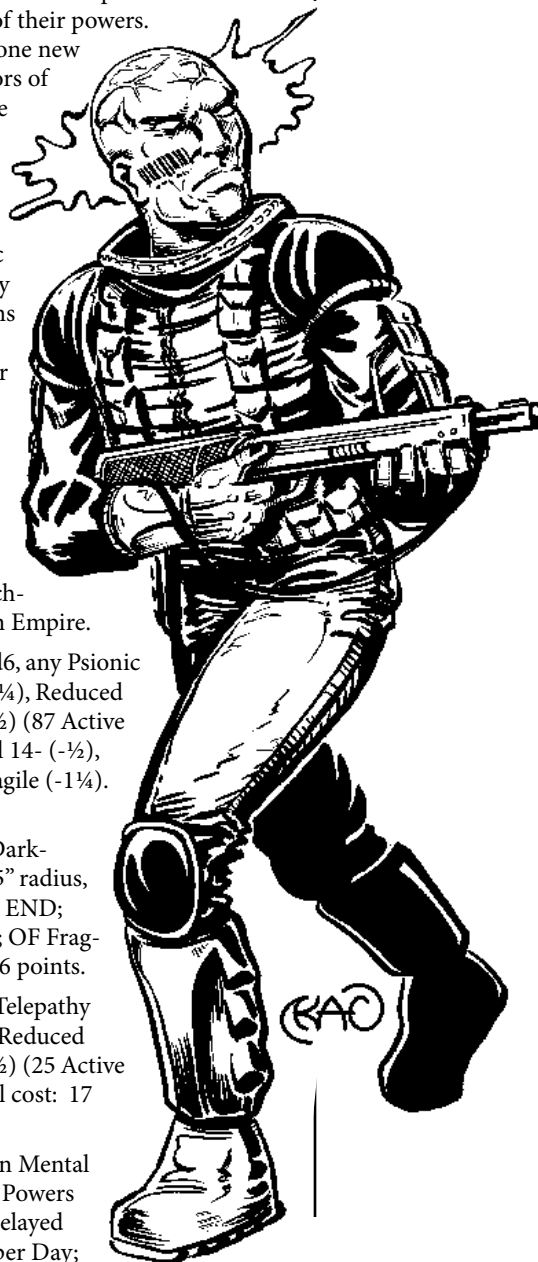
Here are a few examples of psionic technology from the Terran Empire.

Booster Helmet: Aid 5d6, any Psionic power one at a time (+¼), Reduced Endurance (0 END; +½) (87 Active Points); Activation Roll 14- (-½), Burnout (-¼), OAF Fragile (-1¼). Total cost: 29 points.

ESP Static Generator: Darkness to Mental Group 5” radius, Reduced Endurance (0 END; +½) (37 Active Points); OF Fragile (-1¼). Total cost: 16 points.

Inhibitor Collar: Drain Telepathy 1d6, Continuous (+1), Reduced Endurance (0 END; +½) (25 Active Points); OIF (-½). Total cost: 17 points.

Psi-Damper Drug: Drain Mental Powers 4d6, all Mental Powers simultaneously (+2), Delayed Return Rate (5 points per Day;



+1 ½) (180 Active Points); OIF Fragile (-1 ¼), 4 Charges (-1), Gradual Effect (20 Minutes, 1d6 per 5 Minutes; -1). Total cost: 42 points.

Psi-Detector: Detect Psionic Powers, Increased Arc Of Perception (360 Degrees), Range, Sense (17 Active Points); OAF (-1), Limited Range (10"; -¼). Total cost: 7 points.

Psi-Shield Helmet: Mental Defense (20 points + base points from EGO) (20 Active Points); OIF Fragile (-¾), 1 Continuing Fuel Charge (easily replenished with a new power cell; 20 Minutes; -¼). Total cost: 10 points.

Telepathic Static Generator: Suppress Telepathy 5d6, Explosion (+½), Reduced Endurance (0 END; +½) (50 Active Points); OAF Fragile (-1 ¼). Total cost: 22 points.

SOCIAL ISSUES

Social issues are actually pretty simple in the Empire. Since the Empire itself is not at all democratic during much of its history, individual rights are low on the priority list. Psionics pose a potential danger to Imperial control, but are also tremendously useful, so they are controlled but not exterminated. Psionics in the Empire must register with the Imperial Psionic Foundation. The Foundation is in charge of identifying and training new talent. To keep the Foundation in line, the Imperial government quietly encourages anti-psionic attitudes among the general population (a task made easier by the existence of hostile psionic species like the Varanyi). The Foundation also conducts research on psionics and psi technology.

The Empire itself employs most psionics above Beta grade, in various agencies. The Imperial Security Police and the Imperial Secret Service both have a Psi Section; agents counter psionic threats and use their powers for espionage and covert operations. The military intelligence services have their own psi agents. The Foundation employs some high-rated psis, often veterans of Imperial service.

The sheer scale of the Empire means even the Psionic Foundation can't spot everyone with psi powers. Some grow up ignorant of their abilities, others hide deliberately. Rogue psionics who don't want to serve the Empire tend to wind up as rebels working with various dissident groups, or as criminals in the Empire's extensive underworld. Psionic crooks often gravitate toward the Olympian Syndicate, a psionic-dominated criminal organization with shadowy ties to psi-supremacist dissidents and the Psionic Foundation itself.

Legends also tell of a hidden organization of powerful psionics, an ancient sect tracing its roots to pre-starflight Earth. Whispered tales tell that the "Champions" are defenders of truth and justice, using their powers to protect Humans and oppose the Empire. Imperial propaganda alternately denies their existence or paints them as dangerous psionic rebels. Professional law-enforcement experts suspect the name has been used by several different groups over the years.

Player characters with psi powers in the Imperial era can fit into various campaign structures. Low-powered Betas exist in normal society, coping

with mild prejudice as they use their powers as an aid in mundane jobs. High-powered psionics are either Imperial agents, hunted rebels, scholarly Foundation researchers, or criminals.

EXAMPLE PSIONIC POWERS

Here are a few example psionic powers for *Star Hero* campaigns. They're not specifically related to the Terran Empire or any other setting. If necessary, the GM should alter or adapt them to fit a specific campaign's approach to psionic powers.

APPORT

The character can "summon" nearby objects by teleporting them into his hand. This ability only works on small objects, not on living beings.

Weak: *Teleport 10", Usable As Attack (+1), Ranged (+½) (50 Active Points); Concentration (0 DCV; -½), Only To Teleport Unliving Objects Of Up To 5 Kg And Within 10" To Character (-1). Total cost: 20 points.*

Average: *Teleport 15", Usable As Attack (+1), Ranged (+½), Reduced Endurance (½ END; +¼) (82 Active Points); Concentration (½ DCV; -¼), Only To Teleport Unliving Objects Of Up To 10 Kg And Within 15" To Character (-1). Total cost: 36 points.*

Strong: *Teleport 15", Usable As Attack (+1), Ranged (+½), Reduced Endurance (0 END; +½) (90 Active Points); Concentration (½ DCV; -¼), Only To Teleport Unliving Objects Of Up To 10 Kg And Within 15" To Character (-1). Total cost: 40 points.*

BRAIN HACKING

The character can telepathically infiltrate another being's brain to alter memories, feelings, and beliefs.

Weak: *Major Transform 2d6 (alter memories), Based On ECV (+1), Works Against EGO, Not BODY (+¼) (67 Active Points); Limited Target (beings with brains; -¼), Concentration (0 DCV throughout; -1), Extra Time (1 Turn; -1 ¼), Reduced By Range (-¼), Requires A Power: Psionics Roll (-½). Total cost: 16 points.*

Average: *Major Transform 2d6 (alter memories), Based On ECV (+1), Works Against EGO, Not BODY (+¼), Reduced Endurance (½ END; +¼) (75 Active Points); Limited Target (beings with brains; -¼), Concentration (0 DCV; -½), Extra Time (Full Phase; -½), Reduced By Range (-¼), Requires A Power: Psionics Roll (-½). Total cost: 25 points.*

Strong: *Major Transform 2d6 (alter memories), Based On ECV (+1), Works Against EGO, Not BODY (+¼), Continuous (+1), Reduced Endurance (0 END; +½) (112 Active Points); Limited Target (beings with brains; -¼), Concentration (½ DCV; -¼), Extra Time (Full Phase; -½), Reduced By Range (-¼), Requires A Power: Psionics Roll (-½). Total cost: 41 points.*



DEEP TELEPATHIC PROBE

The character has telepathy strong enough to get past most beings' mental shields and probe deep into their memories, and perhaps even their subconscious.

Weak: Telepathy 10d6 (50 Active Points); Concentration (0 DCV throughout; -1), Extra Time (1 Minute; -1 ½), Reduced By Range (-¼), Requires A Power: Psionics Roll (-½). Total cost: 12 points.

Average: Telepathy 10d6, Reduced Endurance (½ END; +¼) (62 Active Points); Concentration (0 DCV throughout; -1), Extra Time (1 Minute; -1 ½), Reduced By Range (-¼), Requires A Power: Psionics Roll (Active Point penalty -1 per 20 points; -¼). Total cost: 15 points.

Strong: Telepathy 10d6, Reduced Endurance (0 END; +½) (75 Active Points); Concentration (0 DCV throughout; -1), Extra Time (1 Minute; -1 ½), Reduced By Range (-¼), Requires A Power: Psionics Roll (Active Point penalty -1 per 20 points; -¼). Total cost: 19 points.

DREAM HACKING

The character can manipulate the dreams of sleeping people, allowing him to conduct a form of psychological warfare against them.

Weak: Mental Illusions 8d6 (40 Active Points); Concentration (0 DCV; -½), Gradual Effect (20 Minutes, 2d6 per 5 Minutes; -1), Increased Endurance Cost (x2 END; -½), Only Works Against Sleeping Targets (-1). Total cost: 10 points.

Average: Mental Illusions 8d6 (40 Active Points); Concentration (½ DCV; -¼), Gradual Effect (20 Minutes, 2d6 per 5 Minutes; -1), Only Works

Against Sleeping Targets (-1). Total cost: 12 points.

Strong: Mental Illusions 8d6, Reduced Endurance Cost (0 END; +½) (60 Active Points); Concentration (½ DCV; -¼), Gradual Effect (20 Minutes, 2d6 per 5 Minutes; -1), Only Works Against Sleeping Targets (-1). Total cost: 18 points.

EMPATHIC CONTROL

The character has the ability to manipulate the emotions of others. This is particularly useful for, among other things, triggering certain Enrageds.

Weak: Mind Control 8d6 (40 Active Points); Concentration (0 DCV; -½), Increased Endurance Cost (x2 END; -½), Reduced By Range (-¼), Set Effect (emotions only; -½). Total cost: 14 points.

Average: Mind Control 8d6 (40 Active Points); Concentration (½ DCV; -¼), Reduced By Range (-¼), Set Effect (emotions only; -½). Total cost: 20 points.

Strong: Mind Control 8d6, Reduced Endurance (½ END; +¼) (50 Active Points); Concentration (½ DCV; -¼), Reduced By Range (-¼), Set Effect (emotions only; -½). Total cost: 25 points.

EMPATHIC COMMUNICATION

The character can communicate with others empathically, both reading their emotions and projecting his own emotions into their minds.

Weak: Telepathy 6d6 (30 Active Points); Communication Only (-¼), Empathy (-½), Concentration (½ DCV; -¼), Increased Endurance Cost (x2 END; -½), Reduced By Range (-¼). Total cost: 11 points.

Average: *Telepathy 6d6 (30 Active Points); Communication Only (-¼), Empathy (-½), Reduced By Range (-¼). Total cost: 15 points.*

Strong: *Telepathy 6d6, Reduced Endurance Cost (0 END; +½) (45 Active Points); Communication Only (-¼), Empathy (-½), Reduced By Range (-¼). Total cost: 22 points.*

INTERSTELLAR BRAIN LINK

The character can establish a mental link with one other person, provided that person is no more than 50,000 light-years away (approximately the radius of the Milky Way Galaxy).

Mind Link, *one specific mind, No LOS Needed (works over interstellar distances, to a maximum range of about 50,000 light-years) (15 Active Points); Activation Roll 15- (-¼), Concentration (½ DCV throughout; -¼), Costs Endurance (-½). Total cost: 7 points.*

MIND SHIELD

The character knows how to shield his mind from psychic assaults and mental intruders.

Weak: *Mental Defense (10 points + base points from EGO) (10 Active Points); Costs Endurance (-½). Total cost: 7 points.*

Average: *Mental Defense (10 points + base points from EGO). Total cost: 10 points.*

Strong: *Mental Defense (20 points + base points from EGO). Total cost: 20 points.*

PREMONITIONS

The character receives strange flashes of insight — mysterious visions of events yet to occur. He cannot control this ability; the visions simply come upon him, bringing not only a glimpse of the future but intense headaches.

Weak: *Precognitive Clairsentience (Sight Group) (40 Active Points); Increased Endurance Cost (x2 END; -½), No Conscious Control (-2), Precognition Only (-1), Vague And Unclear (-½), Side Effect (take 4d6 STUN damage automatically; -½). Total cost: 7 points.*

Average: *Precognitive Clairsentience (Sight Group), Reduced Endurance (½ END; +¼) (50 Active Points); No Conscious Control (-2), Precognition Only (-1), Vague And Unclear (-½), Side Effect (take 3d6 STUN damage automatically; -½). Total cost: 10 points.*

Strong: *Precognitive Clairsentience (Sight Group), Reduced Endurance (0 END; +½) (60 Active Points); No Conscious Control (-2), Precognition Only (-1), Vague And Unclear (-½), Side Effect (take 2d6 STUN damage automatically; -½). Total cost: 12 points.*

PROBABILITY MANIPULATION

The character can consciously alter probability (though of course he cannot dictate exactly what occurs when he tilts the odds in his favor, he can only ensure the outcome will be good for him). The downside is that bad luck often follows.

Luck 8d6 (40 Active Points); Requires A Power: Psionics Roll (-½), Side Effect (automatically suffers 2d6 Unluck within 10 minutes; -½). Total cost: 20 points.

PSIONIC JAMMING

The character can project a field of psionic interference to protect one of his non-psionic friends from a mental attack. The character himself pays the END for the power, and controls when it works.

Weak: *Mental Defense (7 points, plus the base from character's EGO), Usable As Attack (+1), Range (+½) (17 Active Points); Concentration (0 DCV throughout; -1), Costs Endurance (-½), Requires A Power: Psionics Roll (roll is subject to Skill Versus Skill Contest with attacker's Psionics roll [or EGO Roll, if he lacks that Skill]; -¾). Total cost: 5 points.*

Average: *Mental Defense (10 points, plus the base from character's EGO), Usable As Attack (+1), Range (+½) (25 Active Points); Concentration (½ DCV throughout; -½), Costs Endurance (-½), Requires A Power: Psionics Roll (roll is subject to Skill Versus Skill Contest with attacker's Psionics roll [or EGO Roll, if he lacks that Skill]; -¾). Total cost: 9 points.*

Strong: *Mental Defense (15 points, plus the base from character's EGO), Usable As Attack (+1), Range (+½) (37 Active Points); Costs Endurance (-½), Requires A Power: Psionics Roll (roll is subject to Skill Versus Skill Contest with attacker's Psionics roll [or EGO Roll, if he lacks that Skill]; -¾). Total cost: 16 points.*

PSYCHIC INVISIBILITY

The character can manipulate others' minds to "erase" himself from their perceptions. Except at the highest level of power, he can only do this with a certain number of minds at once. He cannot affect cameras, robots, or other beings without minds.

Weak: *Invisibility to Sight, Hearing, and Smell/Taste Groups, No Fringe (40 Active Points); Only When Not Attacking (-½), Only Versus Beings With Minds (-½), Requires A Power: Psionics Roll (-½), Only Versus EGO/10 Persons At One Time (-1). Total cost: 11 points.*

Average: *Invisibility to Sight, Hearing, and Smell/Taste Groups, No Fringe, Reduced Endurance (½ END; +¼) (50 Active Points); Only When Not Attacking (-½), Only Versus Beings With Minds (-½), Requires A Power: Psionics Roll (Active Point penalty -1 per 20 points; -¼), Only Versus EGO/5 Persons At One Time (-½). Total cost: 18 points.*

Strong: *Invisibility to Sight, Hearing, and Smell/Taste Groups, No Fringe, Reduced Endurance (0 END; +½) (60 Active Points); Only When Not Attacking (-½), Only Versus Beings With Minds (-½), Requires A Power: Psionics Roll (Active Point penalty -1 per 20 points; -¼). Total cost: 27 points.*

PSYCHIC DIAGNOSIS

The character can send his mind into a person's body to discern whether he has an illness, and if so what kind.

Weak: *Detect Disease (INT Roll) (Mental Group), Discriminatory, Sense (17 Active Points); Activation Roll 14- (-½), Costs Endurance (-½), Extra Time (1 Turn; -1 ¼), Requires An SS: Medicine Roll (-¼). Total cost: 5 points.*

Average: *Detect Disease (INT Roll) (Mental Group), Discriminatory, Analyze, Sense (22 Active Points); Activation Roll 14- (-½), Costs Endurance (-½), Requires An SS: Medicine Roll (-¼). Total cost: 10 points.*

Strong: *Detect Disease (INT Roll +2) (Mental Group), Discriminatory, Analyze, Sense (24 Active Points); Requires An SS: Medicine Roll (-¼). Total cost: 19 points.*

REMOTE VIEWING

A character with this ability can see far-off scenes. This makes him an excellent asset for intelligence agencies, corporations willing to engage in industrial espionage, and military units.

Weak: *Clairsentience (Sight Group), Megascade (1" = 100 km; +¾) (35 Active Points); Attack Roll Required (-¼), Blackout (-½), Concentration (0 DCV throughout; -1), Extra Time (1 Minute to activate; -¾). Total cost: 10 points.*

Average: *Clairsentience (Sight Group), Megascade (1" = 100 km; +¾), Reduced Endurance (½ END; +¼) (40 Active Points); Attack Roll Required (-¼), Blackout (-½), Concentration (½ DCV throughout; -½), Extra Time (1 Minute to activate; -¾). Total cost: 13 points.*

Strong: *Clairsentience (Sight Group), Megascade (1" = 100 km, can scale down to 1" = 1 km; +1), Reduced Endurance (0 END; +½) (50 Active Points); Attack Roll Required (-¼), Blackout (-½), Extra Time (1 Minute to activate; -¾). Total cost: 20 points.*

TELEKINETIC HAND

The character has the ability to manifest a psychokinetic "hand" that no one can see, but which can move or manipulate objects weighing up to

100 kilograms.

Telekinesis (10 STR), Fine Manipulation, Invisible To Sight Group (+½), Reduced Endurance (½ END, +¼) (44 Active Points); Limited Range (20"; -¼). Total cost: 35 points.

TELEPATHIC SHRIEK

The character can telepathically project a "shout" into another person's mind, causing that person intense pain.

Weak: *Ego Attack 3d6 (30 Active Points); Concentration (0 DCV; -½), Limited Range (15"; -¼). Total cost: 17 points.*

Average: *Ego Attack 4d6 (40 Active Points); Concentration (½ DCV; -¼), Limited Range (20"; -¼). Total cost: 27 points.*

Strong: *Ego Attack 6d6 (60 Active Points); Limited Range (20"; -¼). Total cost: 48 points.*

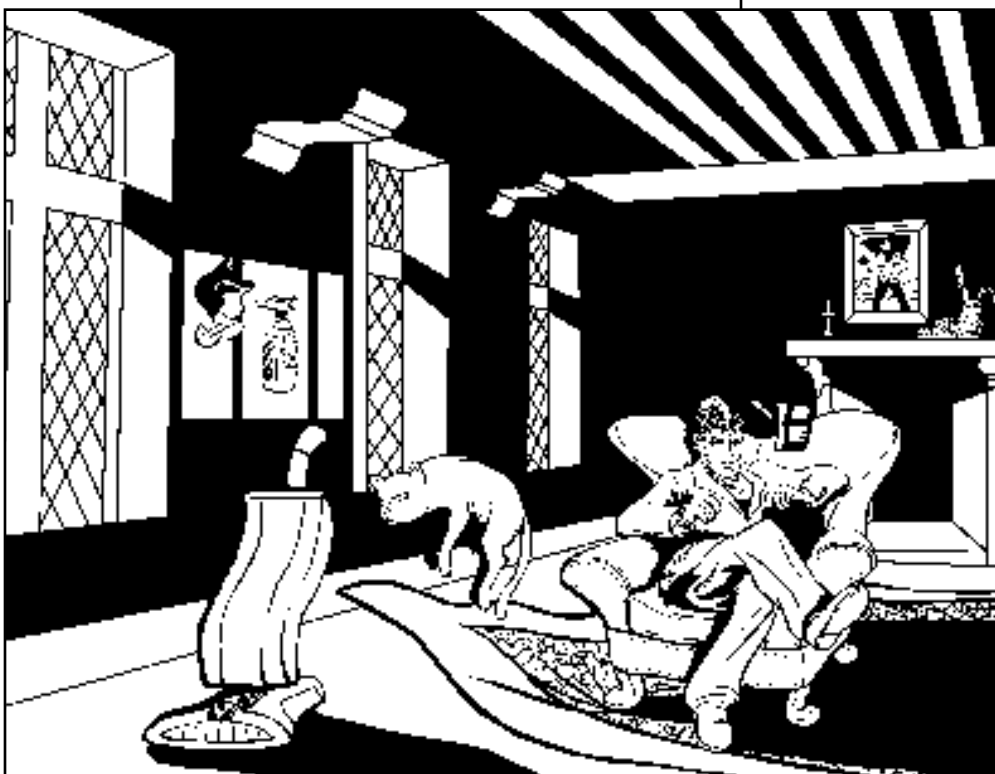
THOUGHT SPEECH

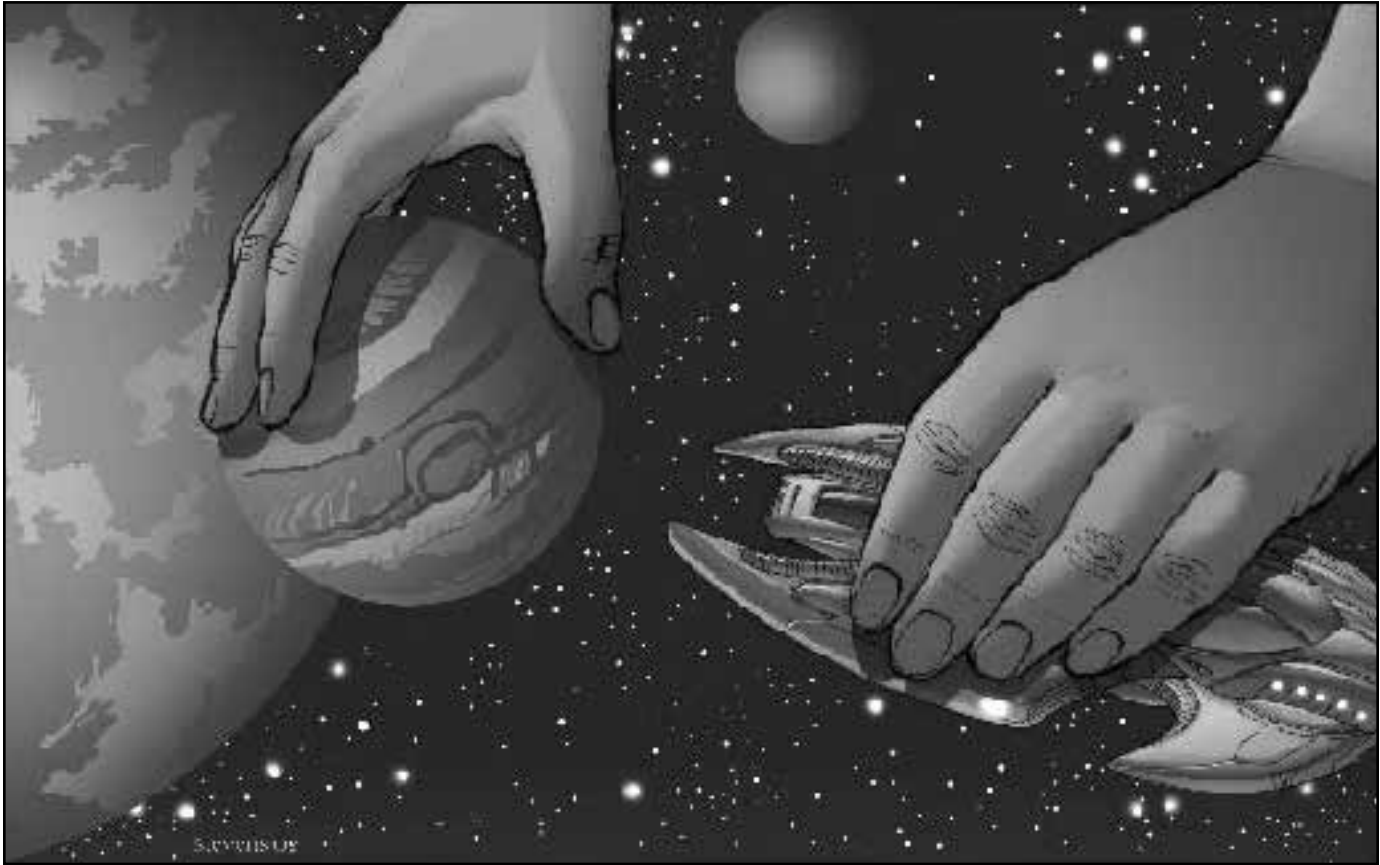
This power provides a character with basic telepathic communication powers.

Weak: *Telepathy 4d6 (20 Active Points); Communication Only (-¼), Concentration (½ DCV; -¼), Increased Endurance Cost (x2 END; -½). Total cost: 10 points.*

Average: *Telepathy 4d6, Reduced Endurance (½ END; +¼) (25 Active Points); Communication Only (-¼), Concentration (½ DCV; -¼). Total cost: 17 points.*

Strong: *Telepathy 4d6, Reduced Endurance (0 END; +½) (30 Active Points); Communication Only (-¼). Total cost: 24 points.*





The GM

A JOURNEY INTO THE UNKNOWN

Chapter One reviewed the major science fiction subgenres, discussing how to set up *Star Hero* campaigns to emulate them, and how to introduce the elements and features of the genre into your games. This chapter delves into more detail on the subject of GMing *Star Hero* — everything from how to set up and manage a campaign, to how to create enjoyable and memorable villains and NPCs, to the effects of environments often encountered in science fiction

stories.

Gamemasters interested in further advice about GMing in general can also consult the GMing chapter of the *HERO System 5th Edition, Revised*, the GMing section of *Champions* and other *HERO System* genre books, and plenty of generic references on the art and science of GMing roleplaying games. Even though those sources aren't specific to *Star Hero*, many of the suggestions and ideas they contain apply to any *HERO System* campaign.

CREATING A CAMPAIGN



Creating an RPG campaign is never easy — and in *Star Hero*, when the entire Galaxy may be the GM's backdrop, it can be particularly difficult! To keep the campaign on track, the GM needs to decide on things like the campaign's theme, the type of game he wants to run, and the game's primary setting.

CAMPAIGN THEME

The *theme* of a campaign is the underlying subject of all the adventures. It isn't strictly necessary to have one, but a campaign without a theme may seem disconnected and unfocused. In a campaign of interstellar exploration, the theme is "exploring the unknown." The heroes encounter new and unknown planets, beings, and civilizations. Some of them are hostile, some are friendly, some need help, some offer opportunities for profit, but the underlying theme is always the same. The GM may even twist the theme a bit on occasion to tell stories of the characters' *self*-exploration.

It's possible to have more than one theme in a campaign. Adventures can cycle among a couple of different underlying subjects — the adventures of a group of high-tech cyborg mercenary soldiers could alternate between a theme of the ethics of warfare and a theme of the boundaries of human and machine. Gamemasters shouldn't get carried away with multiple themes, though, since having too many isn't much better than having none at all.

Be careful not to confuse theme with message. "The effects of biotechnology on society" is a theme; "cloning is bad" is a message. You can return to a theme, look at it from various angles, and develop it in depth. But once you've stated a message, the only thing to do is state it again.

Some common themes in science fiction include:

BEING HUMAN

As technology allows people to create intelligent animals and robots, or replace Human bodies with machines and Human brains with computers, the question of what is Human becomes important. Is a cyborg a Human? What about an intelligent dog with some Human genes? What about an artificial intelligence program simulating a Human personality, or an artificially intelligent robot (like Data from *Star Trek: The Next Generation*)? Beyond the simple question of definition, the relations of Humans to near-Humans also leads to interesting questions. If a sentient robot is programmed to serve Humans, is that slavery?

EXPLORATION

Boldly going where nobody has gone before has one of the central themes of science fiction ever since Jules Verne wrote his "Voyages Extraordinaires." A campaign with an exploration theme constantly involves the heroes with new-found worlds and species. Its focus is on understanding aliens, solving science puzzles, and learning about the world... and about one's self.

POWER

Plato's dialogue *The Republic* can be considered a very early science fiction story, and concerns itself with an ideal state and how it might be governed. A campaign with the theme of power can ask all kinds of juicy questions. What are the proper uses of power? What should people do when power is used improperly? Does power corrupt? What forms of power are there? Beware: Plato asked these same questions and people have been finding answers to them for thousands of years.

TECHNOLOGY

Possibly the central theme of all science fiction is the question of technology, its proper role/place in society, and Man's relationship to it. Is it a positive force, freeing people from drudgery and hardship — or is it destructive and contrary to Nature? How can people enjoy the benefits while controlling the dangers?

This theme is particularly appropriate for *Star Hero* games, since, as noted on page 146, technology can cause problems in roleplaying campaigns as well. A clever GM might dovetail the exploration of the theme of technology with his solutions to the in-game problems it causes.

CAMPAIGN TYPES

After, or at the same time as, choosing a theme, GMs need to decide on the type of campaign they want to run. Often one decision leads to another; a Military SF game probably focuses on the power and/or technology themes, not on exploration or being Human.

Subgenre

Chapter One describes various science fiction subgenres and crossovers. The first consideration for a GM deciding on the type of *Star Hero* campaign he wants to run is which subgenre his campaign belongs to. Each decision has benefits and drawbacks; keeping these in mind as you create a

campaign should let you maximize the former, and minimise the latter.

APOCALYPSE/POST-APOCALYPSE

Most campaigns of this sort fall into the “post-apocalypse” category, since focusing on the civilization-ending (or -altering) disaster usually isn’t good for more than a few campaign sessions (at most), and is often depressing. The world after disaster has struck makes a much more interesting setting for most *Star Hero* gamers. Not only do they have to cope with the many problems disaster has wrought, but they get to embark on the noble and heroic effort to re-build civilization. In some games, the GM can couple this with the excitement of discovering there was once a better world, and what happened to it.

The benefit to choosing post-apocalypse as a campaign setting is that it’s a wide-open field in many ways. The GM can introduce all sorts of fun, weird stuff — mutants, leftover technology run amok, *Fantasy Hero*-like melee combats, dieselpunk car chases, perhaps even the return of magic to the world (as in the *Thundarr The Barbarian* cartoon) — but still keep many classic SF tropes reasonably intact (cyberware, superintelligent computers, and so on), even if only in isolated pockets or long-lost ruins. The drawback is that he also usually has to abandon many of the other tropes so beloved of gamers — things like starships, interstellar travel, and a plethora of alien species. In many ways, post-apocalyptic campaigns are as much *Fantasy Hero* as

Star Hero, and that’s not to every gamer’s taste.

CYBERPUNK

Although not as popular now as it was in the 1980s and early ’90s, the cyberpunk subgenre still retains a lot of appeal for many gamers. By reflecting, often darkly, a world based on our own — one where the computer, information, and technological revolutions of the past quarter-century have continued, sometimes unchecked by ethical considerations — it allows GMs and players to explore concepts and themes derived from modern-day concerns, but sufficiently removed from them so that no one becomes too uncomfortable.

The benefit to a *Cyber Hero* campaign is that very familiarity. To establish a good, plausible cyberpunk setting, the GM need only spend a few hours researching technology trends and futurological speculation, add a dash of the fantastic (if desired), and mix in some of the well-known features of the genre (cyberware, the Cybernet, super-powerful megacorporations, urban dystopia). The trick, in many cases, is to find a way to make the setting/campaign unique, rather than a warmed-over copy of what the GM read in a few novels.

The drawback to many cyberpunk games is getting the PCs to act like *heroes*. The subgenre lends itself to characters who are amoral and selfish, who care only about their own comforts and wallets. Many, if not most, of the characters depicted in cyberpunk stories are outright criminals at worst, violent urban survivalists at best. That works for a novel or movie, and it can even work for some roleplaying games. But generally, RPGs work best if the characters are heroes and act like it. Convincing them to stick to their principles as well as their guns may challenge even the most creative GM.

EARTHBOUND SCIENCE FICTION

Earthbound SF is an unusual choice for a *Star Hero* campaign, since most GMs and players prefer star-spanning adventure. But its benefits — including a setting well-known to everyone involved, yet containing the possibility of mystery, discovery, and excitement — do appeal to some gamers. If he sets the game in the Victorian or Pulp era, the GM can minimize the familiarity aspect by plunging the players into a time and a culture that isn’t the same as what they know from personal experience.

The drawback to this subgenre is, of course, that the PCs are stuck on Earth. That means there’s a whole Galaxy of adventure out there they can’t become involved in. The GM can, of course, bring aliens and other standard SF elements to Earth, but sooner or later that often begins to strain credibility. Make sure all the players are on board with the idea of an Earthbound campaign before you decide to run one.

HARD SCIENCE FICTION

True Hard SF is a difficult subgenre for *Star Hero* gaming, because its stories depend on rigorous scientific accuracy and extensive scientific knowledge. The GM and players all have to be con-



versant in the hard sciences, and able to use their scientific and technical knowledge as part of the campaign. Otherwise, the game breaks down into an unending series of Skill Rolls, which isn't much fun for anyone involved. It's sometimes possible to get around this difficulty by veering ever-so-slightly toward Space Opera. This works particularly well if the GM invents some hard pseudo-scientific principles the players can learn about and exploit (like "subspace" in *Star Trek*, which provides a convenient rubber science explanation for many types of technology, but generally behaves in scientifically predictable ways).

To make a Hard SF campaign work, the GM has to do a lot of work to justify the technology, alien species, psionic powers, and anything else he wants to use. He has to have a scientifically plausible explanation for why they exist and what they can do — and the players have to buy into his explanations. It's no fun for anyone if the game constantly breaks down into arguments over whether the Shreenar could "really" survive by photosynthesis alone.

LOW SCIENCE FICTION

Low SF suffers from many of the same drawbacks as Earthbound SF. It takes the most common and readily-identifiable element of science fiction — highly advanced technology — and tosses it away. To many gamers, if they can't have FTL starships, energy swords, blaster pistols, and bumbling robot servants, SF just isn't much fun. Something else about the campaign, be it the setting, the storyline, or the theme, has to interest them so the GM can draw them into the game and get them involved.

On the other hand, the low-tech nature of a Low SF game has some distinct benefits. The GM has to spend less time preparing extensive lists of equipment, and the players don't have to take as long to outfit their characters. The problems high technology causes in many *Star Hero* campaigns diminish in Low SF; the players don't have access to planet-busting weapons or teleporters, so they can't cause difficulties with them.

MILITARY SCIENCE FICTION

Military SF is a popular subgenre for *Star Hero* campaigns; the excitement and drama of war (from a literary perspective) mixes well with the excitement and drama of outer space, FTL travel, and weapons that *really* give the words "mass destruction" meaning. Players who enjoy tactical problem-solving have a field day as they try to exploit (or counteract) teleportation technology, FTL kinetic weapons, and combat mechs; they can spend hours of game time gleefully orchestrating planetary invasions or establishing a defense perimeter of automated weapons platforms.

The drawback to Military SF is its singular focus on matters military. A Space Opera or Hard SF campaign might concentrate on, say, exploration, but it could dip into trading, espionage, or even military adventure on occasion. A Military SF campaign, on the other hand, usually sticks to

invasions, raids, battles, and the like. The steady diet of gunfights and commando operations may soon lose its attraction if the GM doesn't find ways to mix in new elements. For example, after a while, maybe a Military SF campaign shifts from outright warfare to more of a Cold War/low-intensity conflict sort of situation, with the PCs acting more as spies and "special forces" operatives than ordinary soldiers.

PLANETARY ROMANCE

Planetary Romance campaigns offer many of the benefits of Earthbound SF without many of the drawbacks. They take place on a world other than Earth, which means the well-known elements of high technology and space travel (and all they imply) have to exist. It also means the PCs can meet aliens and explore weird alien landscapes; they're not limited to the familiar fields of Earth. As Larry Niven's *Ringworld* and its sequels illustrate, a Planetary Romance can easily involve dozens of alien species.

But some of the drawbacks remain. Even on a world as big as a ringworld or Dyson sphere, the PCs are still limited to just one world, and as a result they may feel trapped or artificially restricted. And because the campaign focuses on this one world, the GM has to develop it in detail. In an Earthbound campaign, he can rely on the players' common knowledge; he doesn't have to tell them what continents exist and where Europe is. But for a Planetary Romance, he has to create all the details (including the "deep mystery" backstory about who created the place, if appropriate), and communicate that information to the players. A GM who wants to run a Planetary Romance should develop a plan for dealing with this problem, lest he drown in details.

RETRO-SF

Retro-SF — or Pulp SF, to use its most common incarnation for gaming purposes — has a wonderful, lush feel that appeals to many GMs and players. It harks back to an earlier era of storytelling, where adventure and romance (in the classical sense) were the hallmarks of the day, and all but the lightest emphasis on scientific accuracy or plausible events was unnecessary. For many gamers, that lets them concentrate on roleplaying and having fun, without having to worry about the baggage SF sometimes brings with it.

But that asset is also the subgenre's biggest drawback. In today's modern, educated, scientifically literate, jaded world, many gamers find it difficult to put aside their knowledge and beliefs to embrace the Pulp SF aesthetic. These days, we *know* Mars doesn't have canals, and that Venus isn't a swampy jungle world. We *know* that some types of alien life, space travel, and technology are scientifically implausible. We *know*, at least from the perspective of cynicism, that the Pulp themes of "good always wins" and "noble intentions and a strong right hook solve everything," aren't true. Awareness of these "realities" may make it hard for the GM to pull off a Pulp SF campaign the way he wants to.

SPACE OPERA

Space Opera is by far the most popular subgenre for *Star Hero* gaming. After all, the best-known and most influential science fiction properties — *Star Trek*, *Star Wars*, *Babylon 5*, and others — all qualify as Space Opera to one degree or another. It's only natural for gamers to want to emulate what attracted them to the genre in the first place.

The advantage to Space Opera is that it offers the entire spectrum of science fiction adventure. A Space Opera GM can do pretty much *anything* the genre encompasses. The advanced technology and galactic scope of the setting provide unlimited possibilities for scenarios, characters, and excitement. The GM can even temporarily convert the campaign to another subgenre by, for example, stranding the characters in a low-tech situation or plunging the setting into an interstellar war.

On the other hand, the wide-open nature of Space Opera may lead to a lack of focus. The players need to have a firm idea of what the campaign's about, and that means the GM does, too. Similarly, the readily-available technology may cause all the "tech overshadowing character" problems discussed elsewhere in this book. To keep a Space Opera campaign exciting and flourishing, the GM definitely needs to have a theme, or at least a storyline, in mind when he begins, and to stick with it as the game progresses.

TIME TRAVEL

Time travel campaigns have a broad appeal for many gamers, particularly those interested in history. They offer a wonderful chance to play "what if?," combined with the tension and drama of having to preserve the "true" timeline and avoid being stranded in the wrong time-frame. However, they require a lot of work by the GM. To construct a plausible scenario set in, say, Elizabethan England, the GM has to research that period and gain a good "feel" for it. The game works even better if the players do the same; it's difficult to play the part of a time-cop sent back to make sure the colonists win the American Revolution if you don't know at least a *little* something about the Revolutionary period. But at the same time, the players and the GM have to avoid bogging the campaign down in arguments about what "really" would have happened if Hitler had gone into the Middle East instead of Russia, or if Genghis Khan had not been born. Research and realism aside, to some extent everyone involved in the game has to willingly suspend his disbelief in the interest of telling a fun story.

UTOPIA/DYSTOPIA

This subgenre is the least popular for *Star Hero* gaming; utopias are too perfect to offer many adventure opportunities and dystopias are too depressing (except perhaps as places to visit in an otherwise ordinary campaign). A few campaigns structure themselves around improving (or overthrowing) a dystopian society, but even that's fairly rare — rebellions against galactic tyrants seem to attract gamers more. A GM who wants to run a

successful utopia/dystopia campaign has to offer something more than just the (im)perfect nature of the setting. Given their stark qualities, utopias and dystopias often make excellent backdrops for campaigns with themes such as "what are the proper uses of power?" or "the role of moral absolutism in society."

Campaign Subject

A campaign can take place in any of the subgenres described above, but the campaign subject is also what the characters *do* — are they soldiers, thieves, policemen, traders, or explorers? Campaign subject and campaign theme have a lot of overlap — if the theme is exploration, the characters should probably be explorers (even if reluctant ones).

BOLDLY GOING

Campaigns centered on exploration and distant voyages are a natural choice. *Star Trek* and a host of imitators sent the crew off to encounter different problems and guest stars each week. Exploration doesn't even have to take place in outer space — *SeaQuest DSV* and its more obscure predecessor, *Voyage To The Bottom Of The Sea*, did the same thing in the oceans, and any number of post-apocalypse settings involve bands of heroic adventurers roaming through the devastated landscape to see what's in the next ruined city.

Exploration campaigns are good because episodes tend to be self-contained: the crew arrives at a new planet or city or seabottom trench, they explore it, confront whatever threats or mysteries lurk within, and leave. At the very most, each major "episode" constitutes a story arc in the overall campaign. This structure can become a disadvantage if the players want to feel more connected to the setting, and they may start to wonder if every new planet holds some deadly puzzle. Sometimes the GM needs to throw them a curve ball — such as a roleplaying-oriented episode on an idyllic pleasure-planet.

CLOAK AND DAGGER

Espionage and covert operations have a long history in science fiction, and at times the border between SF and spy stories gets blurry indeed. An espionage-oriented *Star Hero* campaign can focus on actual intelligence-gathering and paramilitary operations, or on James Bond-style superspy adventures. Robert Heinlein's *Friday* and Eric Frank Russell's *Wasp*, among others, provide excellent examples of the possibilities of SF espionage.

Spy characters as a team are best if each player chooses a specialty — the Tech Guy, the Con Man, the Martial Artist, the Master of Disguise, and so forth. Science fiction settings add the Hacker, the Psionic, and the Getaway Pilot. The introduction of alien species and ultra-technology can add even more dimensions to the party's composition.

The tone of an espionage campaign can vary greatly. If the emphasis is on spy-thriller chases and confrontations with master villains in their hidden headquarters, the tone is likely to be straightfor-

ward action-adventure. Grimmer stories emphasize the betrayal, paranoia, and moral compromises of the shadow war.

GALACTIC PATROL

The life of a military (or quasi-military) starship crew can draw from a variety of sources. If they're busy fighting pirates and waging war against rival empires, the GM can use all the tropes of sea adventure stories. If the crew are more like frontier marshals or cops on the beat, then the GM can lift ideas from Westerns or crime dramas. Combined with exploration, a Galactic Patrol campaign can be as much like *Star Trek* as the GMs and players desire.

Starship crews usually have to obey orders, which makes adventure hooks easy — “the Admiral says go check out the spacetime anomaly in Sector Twelve” — but may feel restrictive to players who want autonomy and resent being bossed around. Often, PCs who are part of a large military organization call in the cavalry early rather than dealing with threats themselves. You can prevent this by making them “the only ship in the quadrant” at the time, although they may start to wonder just where all those other ships are when danger appears. Another solution is to make the PCs a “special forces” outfit, one tasked with “impossible missions” and given a high degree of autonomy because of its members' skills and importance.

MAKING CRIME PAY

Science fiction crime stories usually center on the more clever and technically adept kinds of criminals — skilled thieves, quick-witted con men, and high-tech assassins. Cyberpunk stories add the elite computer hacker, who's really just another kind of thief.

Criminal characters can be fairly noble Robin Hood types, only stealing from Evil Corporations or conning people who really deserve it. Or they can be genuine rotters; it's up to the players to decide, though most *Star Hero* games work better with heroic-minded PCs. Often criminals in SF get recruited into espionage and covert operations. That neatly sidesteps the ethical issues and allows the characters to do their stuff in exotic and dangerous locales. In an all-crooks campaign, Hunteds are almost mandatory, so daring crimes can alternate with daring escapes.

A potential problem GMs need to watch out for is the question of the Big Score. If the criminal heroes successfully steal the most valuable gem in the Galaxy, why do they need to commit crimes anymore? Why not sell it and settle down on some resort world to live off the proceeds? You can avoid this by having fences take a ruinous percentage of the loot, and occasionally skipping ahead to when the money starts to run out after months of riotous living.



MANHUNTERS

Maybe the characters would like to be the hunters for a change. Bounty hunters and other free-lance law enforcers are quite popular in SF (Mike Resnick has made a career out of writing SF bounty hunter novels). Bounty hunter campaigns allow for plenty of action and gunplay, but the heroes probably won't go to jail for it. Characters can be idealistic, mercenary, or no better than the people they chase. This kind of campaign fits well with a theme of Law and Justice.

But the life of a manhunter isn't trouble-free. Problems faced by bounty hunters include getting the target back to the hands of the Law, outwitting rivals intent on the same prize, and coping with unfriendly police and Space Patrol officers who don't like freelancers.

Gamemasters need to worry about adventure hooks — what if the heroes don't want to chase the villain you spent two days creating? What if they stick with easier prey? If the heroes are the best in the business, their fees will be steep, which leads to questions of how to get them away from managing their investment portfolios long enough to have adventures.

THE PIRATE LIFE

Space piracy is largely unrealistic and pulpy, but it's also a lot of fun. It can be done with varying degrees of realism. The most realistic versions take into account the limitations of spaceships — you normally can't grapple and board across millions of kilometers, so the pirates have to rely on threatening merchant ships with superior firepower to get them to power down long enough to board and rob. This encourages a fairly “gentlemanly” style of piracy, since the merchants won't surrender if they know they'll be killed.

Or you can toss realism to the winds of space and have pirates wearing frilly shirts waving swords as they fly aboard with maneuvering packs or teleport onto the quarter-deck for some furious swash-buckling. This kind of piracy requires spaceships with very short-range weapons, and drives that let the corsairs to catch up to their prey and haul along-side.

Whichever style you use, key tropes of space piracy are hidden treasures, pirates who are secretly something else, privateering (working as a pirate for some interstellar government by attacking only its enemy's ships), rivalries with other bandits, and roistering times ashore in a lawless free port. In SF, pirates often wind up joining the rebels against tyranny (there's a historical precedent in Jean Lafitte), or serving as the ultimate deniable covert agents for a space intelligence agency.

REBELS

Long before *Star Wars*, heroic rebels in science fiction were overthrowing awful tyrannies and battling for freedom. Being part of a rebellion makes for a great campaign, because the organization can send heroes on missions when the GM needs an adventure hook, but a rag-tag rebel movement can't always provide backup when the heroes are in trouble. Also, the ultimate triumph of Good over Evil proves most satisfying.

The classic Rebellion campaign draws on the American Revolution and the exploits of resistance fighters in occupied Europe — the heroes are good, the villains are bad, and moral ambiguity is kept to a minimum. Gamemasters can darken the tone by making some of the Rebels fanatics or psychopaths (as shown on *Babylon 5*), and showing that the tyranny has sincere supporters with valid reasons to prefer order over upheaval.

Rebel characters all are Hunted unless they maintain a Secret Identity and/or Deep Cover. Missions are a mix of military operations and espionage. Rebellions can often cross over well with criminal campaigns, or a band of rebels might go undercover as space merchants.

SCIENCE!

A campaign covering the adventures of a group of scientists may not sound too exciting at first — analyzing data and filling out grant proposals? But this is science fiction after all, and sufficiently adventurous scientists do get out of the lab sometime.

Archaeology and paleontology have lots of adventure potential, especially when the characters are digging up remains of alien civilizations. Often there are powerful artifacts or lost technologies waiting to be found — and dangerous rivals or villains trying to get them. Most long-running *Star Hero* campaigns feature an archaeology-oriented scenario or two at some point.

Characters may need biologists (including, broadly speaking, doctors) to solve scientific puzzles on alien worlds, cope with devastating plagues, or go through harrowing adventures to locate a rare life form. In Fifties-style Retro-SF, biologists are often the first ones to discover alien invaders or

atom-spawned monsters. Physical scientists get to cope with spacetime anomalies, try to come up with countermeasures to alien superweapons, and test out new stardrives or power sources with unforeseen side effects.

Even historians and linguists may get into the act if time travel is available. Researchers studying the past might find themselves dealing with time crooks, undoing accidental changes to history, or simply caught in the middle of ancient battles and atrocities.

Scientific campaigns require both GMs and players interested in solving scientific puzzles, and usually involve a fair amount of background research to ensure accuracy. They mesh well with exploration campaigns. A big potential problem is that the pace can get glacially slow when the GM has to present a lot of information. Handouts or e-mails can move a lot of “infodumps” to out-of-game time.

STAR TRADERS

A classic standby in both written SF and science fiction roleplaying is the continuing exploits of a merchant starship crew as they try to earn a (mostly) honest living. Similar campaigns can describe space traders operating just within the Solar System, or even merchants in a post-apocalyptic landscape. Power levels tend to be low — the heroes are working stiffly trying to make a living, not save the Universe. The fact that they may wind up in a position to save the Universe anyway just makes it more entertaining.

Merchant campaigns make heavy use of the trade rules in Chapter Six (or a similar set of rules devised by the GM), and require GMs to do their homework and set up trade routes in a sector. Problems can arise when the players are more interested in “wargaming” the trade rules to get rich rather than having adventures, so the GM should feel free to introduce elements of economic unpredictability (depressions and recessions, the rising and passing of fads, and so forth) if necessary.

You don't have to limit a star traders campaign to commercial matters alone. Heroes in a mercantile campaign can often moonlight as rebels, spies, bounty hunters, or even pirates!

STARSHIP TROOPERS

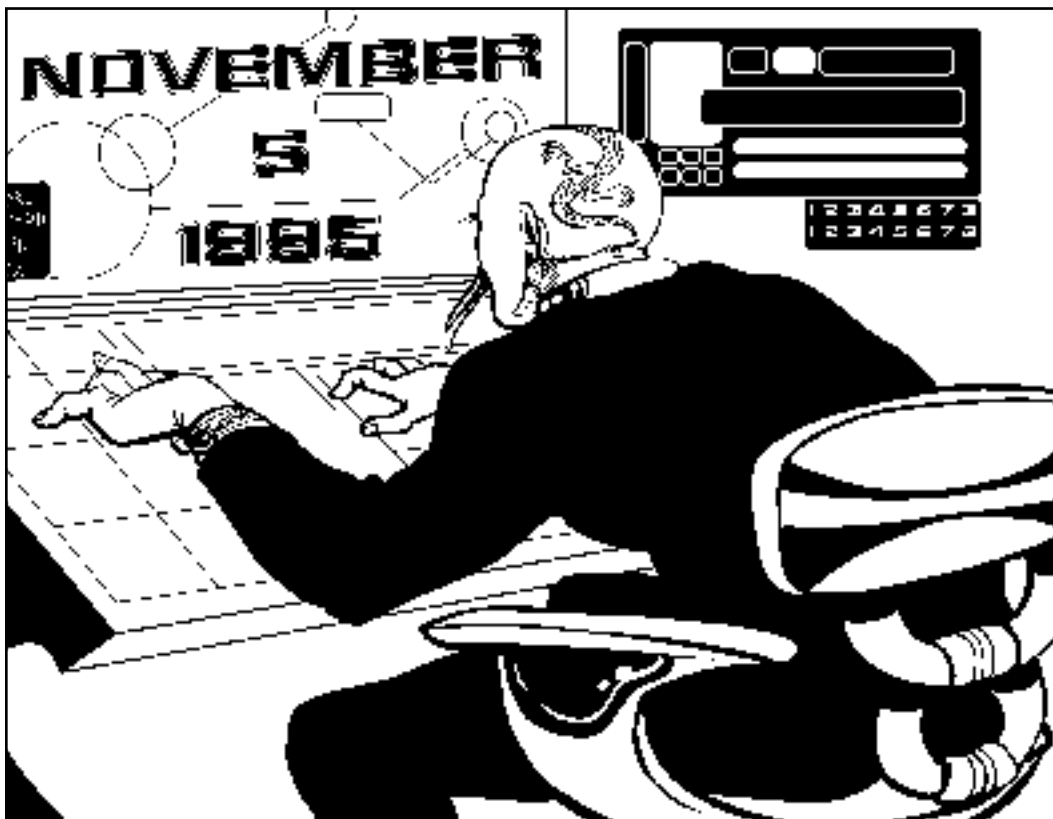
Military campaigns involve characters serving in the same unit — usually a squad or platoon. Adventures are naturally heavy on combat. A favorite subtrope is the mercenary campaign, which allows a lot more flexibility and action than most national armies face. Working as mercenaries also allows the heroes to face unexpectedly powerful opposition with no support because their patron was too cheap to hire any.

Since full-scale battles using even present-day weapons are incredibly destructive, military games often chronicle the exploits of specialized commando units. This may shade into espionage and covert operations if the troops fight secret battles, or into law enforcement if they oppose crime gangs or terrorists.

Military campaigns have several advantages — the heroes go where they're ordered and are certain of action when they get there. Players may start wishing for variety (which the GM can provide with "R&R" trips or temporary assignments). The emphasis on combat means players who like set-piece battles will have fun and those who don't will loathe this kind of campaign.

TIME POLICE

As outlined in Chapter Nine, a Time Police campaign combines the fun of time travel with the advantages of a space patrol or law enforcement campaign structure. The heroes still get to visit different times and cope with both historical perils and the meddling of other time travelers, but this way there's an agency back home to send them out on missions and control what gear they take along.



SETTINGS

The setting is a key ingredient in science fiction, which is why a major portion of this book talks about creating realistic and interesting settings. An intriguing setting has saved any number of mediocre novels, and can turn an otherwise average *Star Hero* campaign into one players will enjoy for years.

SCALE

Scale defines the size of the stage for the campaign. In a Cyberpunk setting, the characters may do all their adventuring in a single large city, while Space Opera heroes may make intergalactic voyages on a regular basis. Every level of campaign scale has its own advantages and disadvantages.

Small-scale settings offer the advantage of intimacy. You can develop a small locale (a city, a colony, a space station) in great detail. You may even have names and character notes, if not character sheets, for everyone who lives there (or at least every person of importance). The PCs are more likely to be "big fish" in a small-scale campaign, and their activities can have visible effects. On the other hand, the characters (or their players) may get bored with such limited surroundings. They may want to get away from the consequences of failure. They may seek more challenging foes.

Larger-scale settings — a planet, say — offer considerably more potential for adventure and travel. They may have exotic societies and multiple species. Gamemasters shouldn't underestimate the gaming potential of a single planet: consider that

except for a few astronauts, every single person in Human history has lived all of his life on Earth. Any alien world worth setting a campaign on is at least as varied and interesting as Earth is. Obviously, no GM can envision a whole planet in as much detail as a city or town, so if you want to create a planet as the focus for your game, concentrate on developing the things that affect the PCs: important states and organizations, major species, the environment, the actual places the heroes visit, and strange or unusual things that might form the basis for scenarios.

Multiplanet campaigns allow characters to adventure in radically different environments — airless worlds, low and high gravity, strange atmospheres, and all the other parameters discussed in the *Environment* section (page 278). They also allow for more exploration, greater interaction with alien beings, and a wider range of societies. The heroes are likely to be less important in the grand scheme of things (about as important as individuals in the modern world). Initially, you need only describe the components of the setting in general terms (physical parameters and the rough outlines of society for each world). As the heroes travel about, you can bring individual worlds and places into the spotlight and deck them out with more detail and depth. A multiworld campaign may be restricted to a single star system, or can cover several systems.

Finally, a truly star-spanning campaign lets the heroes visit just about any conceivable setting. There can be dozens or hundreds of alien species, variant Human races, and artificial life forms. Characters can play tourist in an infinite number of societies and cultures. The chief problem is that it's easy to get lost in the crowd when the universe has tril-

lions of inhabitants. Only exceedingly powerful characters can stand out and make a difference. (Of course, many characters may not want to stand out and make a difference, and are quite content to have adventures and gain profits in obscurity.)

Of course, all these scales may co-exist in the same campaign! Characters start out in a relatively small setting — a frontier colony, say — then explore their planet and become familiar with it, then venture to other worlds, and at last make their way across the stars. The expanding scale matches their increasing experience and power. Caveat: once the players get used to adventuring on a given scale, it's very hard to shrink things down again. If the characters have been visiting dozens of planets, an extended period stuck on one world may make the players bored and restless, even if once their characters were limited to a single town.

The technology level in the campaign significantly affects the scale. If space travel is as difficult as it is for Humans in 2002, visits to other worlds will be rare, and characters will tend to spend a long time at each place they visit. If it's as easy as making an airplane trip, the heroes can zip off to another planet at the drop of a space helmet. You can control this somewhat by deciding how accessible the technology is: if star travel is easy and quick, but the Imperial Interstellar Transport Authority controls all the ships, the characters may still have trouble getting around.

Decisions about the number of stars with planets and the frequency of habitable worlds also help define the scale. If there are only six planets in the Galaxy where Humans can live, then as far as the PCs are concerned, the scale is roughly the same as a single solar system setting. They may be able to cover immense distances at a bound, but there aren't that many places to go. Conversely, a campaign set in a "Dysonized" star system with thousands of space habitats as big as countries can have the feel of a wide-ranging interstellar campaign.

INTELLIGENT BEINGS

Once the scale of the stage is determined, the GM can start to people it with actors. In this case, the actors are the people the characters are likely to meet: the species and societies which exist in the campaign. The range of available actors depends on the scale. A wide-ranging campaign will probably have great diversity of species and cultures, while a narrowly-focused setting probably won't. This

isn't a hard and fast rule; Isaac Asimov's *Foundation* series featured a Galactic-scale setting with no aliens at all, while a space station like the ones on *Babylon 5* or *Star Trek: Deep Space Nine* can house all sorts of extraterrestrials in latex makeup.

As mentioned earlier in this book, each alien species should have a role in the campaign, although this is really true only for the ones that are important and developed in detail. The GM can always throw in some "spear carrier" aliens to add a little exotic color to crowd scenes without inventing a whole civilization for them.

MAJOR POWERS

These are the states or organizations which define the campaign's political and social landscape. Their size depends on the overall scale: major powers in a single-city Cyberpunk game are the city government, local crime gangs, the PCs' primary competitors and enemies, a few megacorporations, and maybe the national government. These probably wouldn't even register on the radar of a Space Opera game, in which the major powers are things like interstellar empires and entire species. For each major power, you should at least have an idea of what its goals are, how it interacts with other powers, and what role it can play in the campaign.

Example: *In a Space Opera game, the major powers are the Terran Alliance, the Rim League, the Machine Civilization, and the Psionic Guild. The Alliance wants peace and free trade because the Terrans have a booming economy. The Rim League is a union of minor starfaring races, worried about being swallowed up by the other big powers and fearful of raids by creatures from intergalactic space. The Machine Civilization, a very fast-growing species of intelligent robots, worries about "unpredictable biological units," but considers war irrational and risky. The Psionics want to unify all the organic races into a single mass mind, the "Galactic Mentality." Given those goals, one can see that the Terrans and the Rim League cooperate to limit the expansion of the Machine Civilization, but probably fight like weasels over things like trading rights. The Psionics shift allegiance between the two to gain leverage and influence. The Machines may do the same to prevent the Terrans and the Rim from becoming completely Psionic-dominated.*

RUNNING THE GAME



The GM's job doesn't end when he creates the campaign and develops the setting. Quite the reverse: now he has to actually run the games while his players enjoy what he has created... and help him flesh out the shared fictional universe.

ADVENTURE STRUCTURE

There are two main approaches to adventure design: plotted and unplotted. In a plotted adventure, the GM has a specific story in mind, which the PCs follow to the climax. In an unplotted adventure, there is no plot, merely a situation; what happens is entirely the result of the PCs' actions. There are advantages and disadvantages to both methods.

Plotted Adventures

Plotted adventures have the great advantage of a satisfying story structure. The action builds from the hook to the climax, encounters exist to provide tension or move the story along, and the heroes are at the center of events. You can use all the tricks developed by writers over the past three millennia: foreshadowing, suspense, conflict, and catharsis. You can borrow plots and plot ideas from a vast array of sources, from Shakespeare to Ed Wood. You can tailor the opposition to the characters' power level and personalities.

On the downside, plotted adventures are often too rigid in structure — the GM knows where he wants the story to go, and forces the heroes to go there. Players may feel they're being railroaded along, or that their actions don't really have an effect. If they suspect the GM will let them succeed anyway, all suspense is lost. Players often try to use "metagame thinking" to deduce the plot and figure out what their characters should do, rather than acting as their characters would behave in that situation.

To avoid the problem of "railroading," plan out several possible resolutions for the adventure (and for each major scene within the adventure) depending on what the characters do. If the story involves discovering an alien plot to sabotage a space station, the climax can be a battle with the saboteurs, an escape from the damaged station, or a last-ditch attempt to defuse the bomb. And, of course, no matter how many options you prepare, be ready to abandon all of them when the players think up something that hadn't occurred to you; the most profound truth in gaming is "the players never do what you expect."

Unplotted Adventures

Unplotted adventures, by contrast, have no set storyline. The GM merely establishes a situation and lets the players determine the action. The situation can be dynamic or passive. In a dynamic situation, things happen and it's up to the players to cope with them — the Xenovores are attacking, the Empire is about to collapse, or the like. A passive situation is one in which things are stable (at least until the PCs show up) — pirates are preying on the shipping in one star system, the Empire is oppressing the telepaths, or a drifting starship holds a lost treasure. If there are villains, they follow whatever motives you wish to give them, rather than filling the role of Antagonist in a story. The Universe is there, running along on its own, and the PCs must make their own decisions about what to do and how to do it.

Unplotted adventures have the advantage of feeling realistic — after all, the real world doesn't neatly follow classical dramatic structure, and every person is an NPC to other people. They give the players a great deal of influence over the course of the adventure, and let them choose to do what they enjoy. If you've prepared the setting well, unplotted adventures are a good way to show off the scope and depth of your campaign universe.

But unplotted adventures have their own set of disadvantages. Often the action becomes just a series of petty crimes or treasure grabs. In a dynamic situation, the players may find it frustrating that they are at the mercy of events. You may get overwhelmed by the need to either create new encounters on the fly or prepare a vast amount of background and NPCs which may never get used. Finally, the structure of unplotted adventures can be unsatisfying — the heroes overcome the main opposition early and spend the rest of their time mopping up underlings, or they fail to acquire crucial information or weapons and end up outclassed at the climax.

Plotted and unplotted adventures aren't completely incompatible. Characters may start out in a seemingly unplotted situation, but encounter various hooks for stories. Depending on which ones they decide to follow up, they can get involved in plotted stories. In the course of going through those story plots, they exist in an unplotted environment, so if they diverge from the story they don't wander off into "blank hexes."



Plotting

The most dependable basis for an adventure plot is the tried and true three-act structure, familiar from classic plays, comic books, films, and almost every other type of story. The first act is the adventure hook, in which the heroes become involved in the story and encounter initial obstacles. The second act presents more obstacles for the heroes to overcome (often with an intriguing twist or turn of events), and the third act is the climax and resolution of the story.

THE FIRST ACT: ADVENTURE HOOK

Adventure hooks come in various forms. The simplest is to have an NPC hire or order the heroes to do something. That's a standard hook for James Bond movies or *Star Trek* episodes. It's quick and gets the story moving. Alternately, someone can come to beg the heroes for help — if they're properly heroic, how can they resist? The actions of an enemy can draw the heroes into an adventure whether or not they want to. Many comic books begin this way — a supervillain shows up and starts blasting away at the heroes, and away the story goes. The risk of death concentrates one's attention very well.

Some adventure hooks are situational; almost any circumstance the PCs find themselves in can draw them into an adventure. Being out of money

means the heroes need to find a way to earn some cash, so they answer a mysterious ad. An asteroid hurtling toward their planet means someone needs to stop it. The heroes are caught in the crossfire when two rival gangs battle for control of the city. Ready, set, go!

Finally, objects often serve as adventure hooks. A cryptic clue or message can draw the heroes into danger; Alfred Hitchcock loved that method in his films. Another useful Hitchcock hook is "The MacGuffin." A MacGuffin is an object of value or importance to someone. If the heroes have the MacGuffin (or if someone thinks they have it), then all sorts of trouble results from other people trying to buy, steal, or destroy it. In the early part of the film *Star Wars*, R2-D2 and the message he carried functioned as a sort of MacGuffin.

Sometimes the adventure hook is not the same as the ultimate goal of the adventure itself. Many times the heroes get involved because they think they understand what's going on, and then learn better and must change their goals as a result of events in the story. As an example, suppose a wealthy patron hires a party of mercenaries to raid a remote outpost. The hook is their mercenary contract. But after a successful raid, their transport malfunctions, and the characters have to travel across thousands of miles of desert to reach safety. Suddenly, the goal is no longer accomplishing the contract, but simple survival. After they return to base, they discover their transport was actually sabotaged, so now their goal is to solve the mystery of who did it and why.

THE SECOND ACT: OBSTACLES

The second act of an adventure focuses on obstacles the heroes must overcome. Obstacles are many and various, but fall into three main categories.

Foes

The first are actual *foes* — people or things specifically trying to make the heroes fail, or do them harm. If the foe wants to kill the heroes or stop them from accomplishing their goal, then he's a villain. If he merely wants to beat them to the goal, or surpass their accomplishments, he's a rival. Finally, there are adversaries — people whose goals are opposed to the PCs' plans even if they aren't aware of them. (In this context, *HERO System* Hunteds can qualify as either adversaries or villains, but Rivals are usually rivals.) If the heroes are trying to get a vaccine across post-apocalyptic North America, villains would be those who don't want the vaccine to reach its destination, rivals would be those who want to beat the party across the continent and thereby win the reward, and adversaries would be the mutant gangs who don't know about any vaccine but do know they want to steal the party's fancy all-terrain vehicle.

At times friends can be foes, if they don't agree with the goal the heroes are pursuing, or have been duped into believing the heroes are a danger. A friend may even betray the PCs, like Dr. Yueh in *Dune*. Sometimes friends are correct, and it's the heroes who've been duped.

Features Of The Setting

The second type of obstacles the heroes must face are *features of the setting*, which would exist regardless of the heroes' actions. They include natural obstacles and mysteries.

Natural obstacles are things like hostile weather, sheer distance, dangerous terrain, hungry animals, deadly radiation, and the like. In addition to nature, there is society — laws, regulations, restrictions, social customs, prejudices, and the like. Obviously, natural obstacles are more important in uncivilized areas, while social barriers come into play in populated settings.

Puzzles and mysteries are sometimes features of the setting and sometimes the work of the party's opponents, but in either case make significant and intriguing obstacles. A mystery can either be something the heroes must solve to continue toward the goal, or it can be the key to the goal itself. In situations with changing goals, solving a mystery may be what finally points the heroes at their ultimate objective. The common feature of all mysteries is that they must be solved by thinking rather than force (although sometimes the solution involves a particular use of force). In science fiction, an especially important kind of mystery is the scientific puzzle, which turns on an interesting application of natural laws. Gamemasters creating scientific puzzles can base them on real science or rubber science peculiar to the campaign setting, but it's extremely important to make the puzzle fair and logical, since ultimately it's the players who are going to be solving it. An unfair puzzle just makes people angry.

Internal Obstacles

A final kind of obstacle lies within the heroes themselves — *internal obstacles*. Overcoming personal flaws, sacrificing something for the greater good, or learning a lesson are all obstacles, often more difficult to surmount than any horde of armed thugs or diabolical puzzle. In game terms, internal obstacles are often reflected by Disadvantages such as Dependence, DNPC, Enraged/Berserk, Psychological Limitation, and perhaps Rivalry. An honorable man who must break his word to achieve his goal faces an internal obstacle; so does a devious one who has to trust others to succeed. Tailoring the internal obstacles to the players is important: some players routinely sidestep their characters' Psychological Limitations if they can manage an EGO Roll, while others want to remain true to the characters they created.

THE THIRD ACT: CLIMAX AND CONCLUSION

Once the characters have surpassed or neutralized all the obstacles, it's time for the climax of the story, in which the heroes confront the main villain or surmount the ultimate barrier to reach their goal and win the reward. The goal may not be the one they originally signed up to accomplish, but it is the one which brings an end to this particular adventure.

Climaxes should be, well, climactic. This is the time for the GM to "blow the budget" and strive to make everything as tense and impressive as pos-

RANDOM PLOT GENERATOR

Sometimes GMs need a plot in a hurry, or maybe just some way to generate ideas to kickstart their imaginations. For those times, here's a *Star Hero* Random Plot Generator. Start by rolling a Hook, then determine the Goal and the Obstacles standing in the way. For more complex plots, roll for multiple Goals: the first is what the PCs think they are going to be doing, and then they discover what their real goal is later.

Hook (roll 1d6):

- 1 Client (NPC who asks or begs the party to do something)
- 2 Clue (message or information which inspires the party to act)
- 3 Enemy (NPC or other threat which menaces the party)
- 4 MacGuffin (PCs acquire an object of great importance to someone)
- 5 Patron (NPC who hires or orders the party to do something)
- 6 Situation (Some event happens which requires the party to react)

Goal (roll 2d6):

1st Die	2nd Die	Result
1-3	1	Acquire Something
1-3	2	Capture Someone
1-3	3	Defeat an Enemy
1-3	4	Destroy Something
1-3	5	Escape from a Place
1-3	6	Learn a Secret
4-6	1	Prevent a Disaster
4-6	2	Rescue a Captive
4-6	3	Solve a Mystery
4-6	4	Survive a Natural Environment
4-6	5	Travel to a Place
4-6	6	Win a Battle

Obstacles (roll 1d6 for the number of obstacles, then 1d6 to determine the nature of each):

- 1 Adversary (someone whose goals bring him into conflict with the PCs)
- 2 Friend (a DNPC or someone normally friendly, opposed to the party for some reason)
- 3 Nature (hostile features of the setting, creatures, and so forth)
- 4 Rival (an existing rival or someone who wants to achieve the same goal ahead of the party)
- 5 Society (the authorities, the culture, laws, infrastructure, and so forth)
- 6 Villain (someone who specifically opposes the PCs)

Example: *Steve, the GM, needs a plot idea for an epic Space Opera adventure. He starts by rolling the Hook, and gets a 2: a Clue. For the Goal he decides to roll twice, and gets 5, 2: Rescue a Captive, and 4, 1: Prevent a Disaster. He rolls for the number of Obstacles and gets 3; the specific ones are 6: Villain, 1: Adversary, and 5: Society.*

Now Steve has to put these pieces together. The two goals work best in order — when the heroes rescue the captive, they learn of the disaster which must be averted. What sort of disaster is it? Since one of our obstacles is "Society," that suggests a malfunction in some industrial plant or location under police protection. Steve decides it's an antimatter-storage facility with a hidden design flaw. If the magnetic containment fails, the antimatter stockpile will detonate in a continent-shattering blast. The captive must be someone who would know of this flaw: an engineer or technician.

That in turn makes the nature of the villain obvious: someone who wants to conceal the design flaw. Steve decides the contractor who built the facility cut corners and embezzled money, and has kidnapped the engineer to prevent him from blowing the whistle.

Steve now assembles the plot. First, the heroes get a cryptic message sent by the captive engineer. They travel to the remote lab where the villain is keeping him prisoner, battle the corrupt contractor and his goons, and liberate the captive. They have accomplished their original goal — but now the engineer warns them about the antimatter facility, giving them a new and more urgent goal.

On the way to the antimatter depot, they are delayed by adversaries: a gang of crooks try to ambush and rob them. As they near the facility, the heroes discover the villain sent a warning, portraying them as rebels intent on stealing antimatter to make bombs. The police, the depot's security forces, and the counterterrorist commandos are all on full alert to stop the party. Meanwhile the rescued engineer warns that the containment fields are breaking down faster than he had expected. The PCs must somehow evade the guards and enter the facility in time to eject the antimatter into space before the containment fields fail.

sible. If the heroes are trying to accomplish a task to foil the villain's plans, put a time limit on them and create all kinds of distractions. If they're battling the villain directly, set the battle in an exotic or impressive location — atop a skyscraper in a storm, on the hull of a starship while everyone wears spacesuits, or inside the whirring machinery of a giant robot. Since this is a roleplaying game, an exciting setting is no more expensive or difficult to arrange than a boring one.

Even if it isn't full of physical action, the climax can be tense and dramatic. If the heroes have to prevent a war or persuade someone, set the scene right on the edge of disaster — the Emperor's battle fleet is only minutes away from attacking the heroes' home planet, and they have to convince him right now that the assassin who killed his wife was an alien shapeshifter disguised as one of the PCs. If someone is on trial, the crucial evidence should arrive during the final summing-up, after the opposition has presented seemingly iron-clad arguments against the heroes.

DEALING WITH DISCONNECTS

Many ideas which work perfectly well in fiction are less successful in roleplaying games. A game is not a movie or a book, and different rules apply. Science fiction stories and settings come with a complete set of booby-traps and pitfalls waiting to snare unsuspecting GMs.

BUSINESS DIFFICULTIES

One favorite cliché of science fiction is the struggling merchant crew, flying its rustbucket starship from world to world, barely scraping by. In roleplaying games this kind of existence is hard to maintain: if the characters keep losing money or getting stiffed on deals, the players start to feel as though the GM is picking on them.

This problem often results from mismatched expectations regarding what a campaign featuring a bunch of interstellar traders is all about. To the GM this means "struggling merchant crew having adventures," while the players may think it means "getting obscenely rich." Making it clear the characters will just get by is one solution. Another possibility is to keep the bookkeeping "offstage," either with an NPC as the crusty old merchant captain, or else by simply telling the players "once again, you're having money troubles" and letting it go at that. (Of course, if the players and GM all enjoy the minutiae of interstellar trade, the system presented in Chapter Six lets them play out running a speculative trade operation, with risks and benefits.)

CYBERSPACE

A key trope of Cyberpunk science fiction is the experience of "cyberspace." Skilled hackers plug their consciousness directly into the computer network and go adventuring in a virtual environment. This is great fun for the GM and whoever's playing the hacker character, but the other players

may feel left out and bored. The same effect applies when a psionic explores some NPC's dreamscape, or any time one character does something the others cannot participate in.

In a sense, this is a form of splitting the party (see below); as in that situation the solution is to either find a way to involve the others or to link events in cyberspace to the outside world. A hacker or netrunner may have semi-sentient "utility programs" to help him — let the other players take those roles temporarily. Or try to set up the situation to allow cross-cutting, so the party in the "real world" are fighting off Information Police goons while the netrunner is frantically trying to recover a key file. The film *The Matrix* features this kind of cross-cutting at the climax. Or the GM can somehow provide a method for *all* the characters to enter cyberspace — though the hacker character will clearly be the most powerful party member in there.

If those methods don't work, then perhaps the GM should "cut to the chase" — resolve the cyberspace session with a few quick die rolls and give the results. That keeps things rolling, but can be unsatisfying for the player who has created a computer hacker and wants to go into cyberspace with gun and camera. As a final recourse, the GM can break out extended solo sequences to run while the other players are off getting pizza, or do them between sessions via blue-booking or e-mail.

INFODUMPS

A problem faced both by writers of science fiction stories and GMs in science fiction roleplaying adventures is how to explain the strange and complicated background without bringing things to a screeching halt. In stories, long expository passages are known as "infodumps," and working them into the narrative is a difficult task for writers.

One advantage a GM has over the author of fiction is that he can give the players handouts, but you shouldn't do this with gamers who aren't willing to spend the time to read them — many gamers don't really like having homework assignments. Another useful technique is to explain things as they come up, and not penalize players for being ignorant of the made-up game world — "You see an Imperial Security officer enter the bar, and you know Security frequently employs telepaths; what do you do?"

POSSESSION AND MIND CONTROL

Having characters fall victim to long-term mental domination (or be replaced by an identical duplicate, or succumb to a neuroparasite, or whatever) creates some practical problems for the GM and players. If the GM keeps it a secret from the player, then he must continually dictate the character's actions or demand die rolls to determine what the character can do. The players know something is up and react accordingly. ("Everyone in here for a planning session — except Bob's character!")

If the GM wants to bring the mind-controlled character's player into the secret, he is venturing into the tricky waters of group dynamics and individual personalities. Some players happily run their character as if under sinister mental control; others

find subtle (or not-so-subtle) ways to give clues to the other players. Even if the player does go along, playing his character straight, the other players may view him as a “traitor” for keeping the secret from them.

In most cases, the easiest way to eliminate this problem is to ask all the players, at the beginning of the campaign or well in advance of the actual event, if they wouldn't mind a storyline like the ones described above. Of course, that means tipping your hand a little, but if everyone agrees, and if you do it far enough before you run the actual game, that shouldn't cause a problem. If too many players object too strongly to this sort of story, don't run it.

REALITY QUAKES

Time travel, reality-altering psi powers, and intrusions from parallel dimensions can all transform the nature of reality as Humans know it. That much is cool. But how can one portray this in a game? Since everything the players know about the game world comes from the GM, any changes or inconsistencies are likely to be taken as mistakes or “retroactive continuity” on his part. Often it's necessary to hit the players over the head with the fact that a change has taken place: “You look out of the viewport at the familiar skyline of Imperial City, and suddenly realize it isn't familiar at all. The looming spire of the Terran Security Bureau tower is gone, and so is the huge dome of the Residence. Other buildings stand where they did, and with shock you realize reality itself has changed!”

Another potential problem with reality shifts is that the players may not automatically want to change things back — at least not right away. They may want to spend time “playing tourist” in the new conditions. They almost inevitably will want to try to profit from the shift, in terms of knowledge and equipment if not actual money.

To cope with this problem, you need to structure “reality quakes” carefully. Plan the event so you can alert the PCs about what's happened without an obvious infodump. Arrange the circumstances so ontological profiteering becomes difficult or impossible — maybe the shift back to “normal reality” eliminates the powerful new government jobs the PCs acquired, or all the cool new equipment they got their hands on becomes highly unstable due to the reality-shift. And make sure the “revised” reality is definitely an undesirable alternative to the setting the PCs know and love (or at least tolerate).

RELATIONSHIPS

Heroes in fiction fall in love when the author tells them to. If it's important for Captain Kirk to become infatuated with a blue-skinned woman on another planet, then the good captain falls for her like a ton of bricks. Player characters don't do that. Using die rolls to control a relationship doesn't work for anything more than a brief flirtation. This is a case where the personalities of individual players are important: some gamers happily dive into a doomed romance, while others view it all as mushy stuff that gets in the way of combat.

Genre conventions often include “typical” romance situations: Space Operas lend themselves to grand passions, love that endures beyond death, and a thoroughly romantic approach to romance. Planetary Romance stories follow an almost fairy-tale pattern: hero wins girl (occasionally heroine wins guy), and they live happily ever after until the villain abducts her in the sequel. Cyberpunk and Low SF have a much more cynical attitude, and abound in casual pickups, android prostitutes, kinky obsessions, and a very unromantic tone. Hard SF traditionally doesn't have much in the way of romance at all; after all, love's not very scientific. It's a good idea to respect the genre conventions — would the Jedi Knights of *Star Wars* seem as heroic if they had a James Bond attitude about women?

Much depends on the personalities and maturity levels of the players. A mature or broad-minded group may have no trouble with a fairly explicit situation. Immature gamers may develop a terminal case of snickering when anything of the sort comes up in play. The simplest rule of thumb is to play to the lowest comfort level — if even one member of the group doesn't handle “adult” situations well, draw the curtain and leave all that “off-screen.”



SPACE BATTLES

Space battles are always fun in movies and books, but often in roleplaying sessions they turn tedious. How come? Several reasons. In books or movies the combat doesn't have to follow game rules. Everything is maximized for dramatic effect, and the author knows how it's going to come out. In a game, the players usually like to have some control over the outcome, which means you have to resolve the battle as an extended combat, with lots of die rolling and table-checking.

Another problem is that in a game session, one player tends to wind up controlling the ship. The other players either just watch passively, or do nothing but roll dice when ordered to. They can't really contribute ideas — and if they do, the battle gets even slower because every action has to be argued to death first. A related problem is the fact that one or two players (not characters, players) may have more “tactical smarts” than the others, making their characters the stars of the scene whether the characters themselves should know anything about interstellar battles.

So, think carefully before including a space battle in your campaign. This is not to say that there shouldn't be space battles in your *Star Hero* adventures, but you should consider how to set them up and run them so they help the overall game instead of hindering it. Suit the style of battle to the preferences of the players. A bunch of gamers who love working out elaborate plans can come up with a “battle plan” which gets resolved as a contest of *Tactics* or *Combat Piloting Skills* against the enemy commander, with bonuses for a clever plan. Gamers who like combat up close and personal should face lots of boarding actions and

Space Marine raids. Groups interested in storytelling and character interaction can simply have the battle described to them, with plenty of bluffing and posturing via viewscreen with the enemy.

SPLITTING THE PARTY

A common situation in all roleplaying is when the PC group has two things to do and the players decide to split up. In films and fiction it's easy to cut back and forth between two groups of characters, because fictional characters don't get bored waiting for their turn to do something. In roleplaying, the characters have players who get fidgety when they are “off camera.” This is especially problematic when one group's actions are a secret from the rest of the party, so the GM and some players are off in another room or passing notes.

The best way to deal with a split party situation is not to let it happen. If that's not possible, keep the separation as brief as you can. If one group's activities don't involve any conflict or roleplaying, summarize it briefly and keep the focus on the more interesting events encountered by the others. You can put aside secret exchanges that only involve a few players for later — unless the events are going to have an immediate effect, you and the players involved can resolve it after the others go home, or by e-mail. If a prolonged separation is unavoidable, the GM can let the other players control NPCs or even villains when their characters are off stage.

TIME TRAVEL

As mentioned in Chapter Nine, time travel creates some major headaches for GMs. In fiction,



characters fated to do something obligingly do it, or else circumstances force them. Roleplaying characters are not under the author's control, and struggle against taking predestined actions. In fact, players often delight in resisting even the most trivial forms of predestination.

On the other hand, players also are quick to “work the system” and squeeze as much advantage out of time travel as they can. They try to have their future selves leave clues (or spare ammunition) in the past to help in the present. They often try to make big money by investing in the past or setting up bank accounts to accumulate millions in interest. They can't resist anachronistic technology — taking modern firepower into the past or stocking up at future gun shops.

You can short-circuit a lot of these potential problems by carefully defining how time travel and causality work, adjusting the mechanics of space and time to suit the tastes of your group. If players don't like predestination and hate to feel “railroaded” by a fixed timeline, set the rules for time travel to allow changing the future, or put them into an organization which prevents this kind of problem by fiat. If the Time Patrol won't let characters learn about their own future, the players can't feel bound by it.

An in-game organization is also a good way to prevent player abuse of time travel. Maybe the rules forbid carrying anachronistic technology, or else the Time Patrol issues a standard sidearm powerful enough to keep the players happy but not unbalance the game. Another method is to invoke some technobabble which forbids moving nonliving items back in time (as in the film *The Terminator*). Finally, the GM can just embrace it: let the players fool around getting wealthy in the past and loading up on future tech, then create adventures which focus on other matters. All the guns and money in the world won't help if the PCs have to arrange a romance between Abelard and Heloise, or track Jack the Ripper in the foggy streets of London.

TOO MUCH TECHNOLOGY

Unique to science fiction campaigns is the problem of technology — too much of it, or types that are too powerful. The *characters*, not their equipment, should be the most important thing in the campaign; they should solve problems themselves, rather than simply using a planet-breaker or neural control helmet to conveniently dispose of any difficulties they encounter. See the sidebar on page 146 for more on this subject.

DISADVANTAGES AND HOW TO USE THEM

Stories are about characters, and roleplaying game adventures are no exception. Characters, of course, have personalities — flaws and quirks and personal goals. In the *HERO System*, these are represented by the character's Disadvantages, particularly Psychological Limitations, Rivalries, and Hunteds. (Getting points for Disadvantages is partly a way to give players an incentive for creating interesting and complex characters.) You use the

Disadvantages of your PCs to enrich the game in a number of ways. They can serve as plot hooks, distractions, sources of conflict, and ways to link the party together. And of course, all the motivations below may apply to villains just as well as heroes.

ACCIDENTAL CHANGE

As a plot hook, Accidental Change can suddenly put the heroes on the run when it reveals their true nature to a society that doesn't tolerate them. If something in the environment keeps triggering a character's change, the party may have to find a way to cure or prevent it. As a distraction or complication, Accidental Change is wonderful — in the middle of a delicate situation one of the character suddenly feels “the change” coming on, and everyone must scramble to cover for him.

If the character's alternate form is a secret to the other characters, Accidental Change can provide a source of conflict. The character's efforts to keep his true nature hidden lead to suspicion or mistaken assumptions, and if the secret gets out the other characters may suddenly have to decide where their loyalties lie.

Finally, if all the characters are subject to the same form of Accidental Change, it gives them a reason to adventure together. Perhaps they're searching for a cure for the mutagenic plague, or for the secret homeworld of the shapeshifter species, or for a planet where super-soldiers aren't feared by the normal population.

AGE

Old age isn't a common feature of characters in most *Star Hero* campaigns, but it's more prevalent than in many Heroic campaigns. Thanks to age-retarding technology and advanced medical treatments, elderly characters in science fiction settings can remain active and vibrant much longer than twenty-first century Humans can. For example, on *Star Trek: The Next Generation*, Captain Picard is in his 60s and 70s, but goes right on getting involved in all sorts of strenuous adventures alongside his younger colleagues. But while progress in life-extension and medical technology may allow Humans to put off aging or avoid the worst effects, even the best-maintained mechanism still wears out.

As a plot hook, the *Age* Disadvantage fits in with one of the oldest story ideas in Human literature: the search for immortality. Characters who feel old age creeping up on them may well go off in pursuit of legends and rumors of rejuvenation treatments, immortality serums, or other futuristic versions of the Fountain of Youth. In an oppressive society which views the elderly as a waste of resources, older characters may have to struggle to simply survive.

Even if the campaign doesn't focus on the battle against old age, character age can be a distraction at key moments. A very young adventurer has to cope with the futuristic equivalent of truant officers, or child-welfare authorities concerned about a “dangerous environment.” Old adventurers must simply cope with the inevitable effects of age

ALTERING AGE OR NORMAL CHARACTERISTIC MAXIMA FOR ALIENS

Alien species may age more rapidly or more slowly than Humans do, with all sorts of story implications. For example, *Star Trek* has featured 200-year-old Vulcan ambassadors, and a species called the Ocompa who have nine-year lifespans. You can set aging thresholds as appropriate for the setting; some species may reach the “40+” Disadvantage threshold after only 20 years, while others still aren’t there yet at age 100. However, that may cause some characters to obtain an advantage they haven’t paid for; a better solution may be to give long-lived species some *Life Support: Longevity* through their Species Package Deals.

Similarly, a GM who’s interested in “realism” may want to consider altering the Normal Characteristic Maxima for various species in his *Star Hero* campaign. This is dangerous, though, because it ends up giving some species a benefit (the ability to buy certain Characteristics above 20 at normal price), and restricts others (by charging them double for some Characteristics before other characters have to pay the increased price). In most cases it’s best to leave the NCM totals the same for all characters, and simply rely on Package Deal alterations to Characteristics to reflect relative differences between species.

(it’s hard for a dashing secret agent to seduce an enemy spy if she thinks he looks like her grandfather, no matter what the movies say). Some societies may have restrictive laws about the very young or the very old — children might be property on one world, while another culture might mandate a dignified suicide for the elderly. Long-lived aliens who have formed friendships with Humans face the anguish of losing them to old age... or might exploit Humans’ short lifespans through policies designed to weaken Human governments over time while the aliens’ way of life remains unchanged.

Age can create conflict among the characters if a method of restoring youth does exist — but involves matters of questionable morality. Young heroes would see an operation raising clones for brain transplants as a particularly horrible form of slavery, but their older comrades might be tempted to sign up for the process. A party of older characters might be thrown together by the search for the Fountain of Youth, or by the need to struggle against an oppressive youth-dominated culture. Alternately, the Stellar Intelligence Service might have to call in a team of semi-retired experts when all the hot young agents have failed. Young characters could find themselves in a “Lord of the Flies” situation, in which they must survive in a hostile environment without adult help, or cope with the most dangerous setting of all: school.

DEPENDENCE

If a character in an alien environment depends on something for survival, that typically counts as a Dependence. This most commonly occurs with respect to breathing gases — aliens who breathe water or methane have to carry the proper environment around with them when they interact with air-breathers such as Humans. You should define the default environment for the campaign (almost certainly the oxygen/nitrogen mix Humans breathe), and then let characters who can’t survive in the default atmosphere without assistance take a Dependence (assuming they spend more than half of their in-game time in the default atmosphere).

The simplest way to use Dependence is as a plot hook is to confront the characters with a shortage of the vital substance. (In the immortal cartoon “Duck Dodgers in the 24 ½th Century,” Daffy Duck sets out in search of Planet X because the Earth’s supply of Illudium Phosdex — the shaving-cream atom — is alarmingly low.) There are few people more motivated than an astronaut who knows his oxygen supply is running out! More subtly, characters probably won’t like it if some enemy gains control of the supply, giving him the power to cut them off at will. Finally, NPCs with a Dependence naturally turn to their heroic PC buddies when a shortage develops in something they require.

As a distraction during other events, a Dependence works in much the same way. Do the heroes chase after the bad guy, or detour to refill their oxygen tanks? Perhaps the villains anticipate them, and set up an ambush outside the airlock.

Characters can come into conflict because of Dependences. An addict may have trouble persuad-

ing his un-addicted companions that getting his fix of Nova Drug really is more important than stopping the Galactic Tyrant’s latest scheme. Aliens may even have Dependences which the other characters find shocking or immoral. If your friend, an alien composed mainly of psionic energy, needs to engage in voyeuristic activities every day to maintain his composure, do you help him find victims?

As a way of connecting party members, a shared Dependence is an interesting and unusual possibility. The only oxygen-breathers on Venus will naturally work together to stop the terrorists who have taken over the only source of the gas, while in a gritty Cyberpunk setting the only dealer with a supply of Metacaine can ask some of his customers to do a little job for him.

DEPENDENT NPC

As a distraction from the main action, DNPCs are excellent. DNPCs are always reliable plot hooks, either because they have gotten into trouble or danger, or because someone has asked them for help in a difficult situation. Continuing villains with a grudge against the heroes naturally try to strike at vulnerable NPCs, or use them as the lure in a trap.

DNPCs work especially well as motivators in more realistic, low-powered campaigns. Saving the universe usually takes precedence over family matters, but an interstellar merchant or mercenary soldier may well decide to go on vacation with a loved one rather than undertake another mission this week. Troublesome DNPCs like animals or small children can wander off at inopportune times.

Within a group of heroes, conflicts over DNPCs can come up in several ways. The simplest is when the other party members don’t appreciate one character taking time off to indulge a loved one, or don’t want to risk their necks because some fool relative got into trouble. Things can get even more tense when two characters have DNPCs — if one hero wants to spend more time with his family, and another hero’s loved one is in trouble, which situation takes precedence?

Finally, DNPCs give the GM a way to get characters together, because they increase the number of possible social relationships. A tough mercenary soldier may not know any scientists, but his little brother at the Academy knows plenty of professors in the science department — one of whom may be the doting uncle of an interstellar explorer who needs a little muscle for his next mission.

DISTINCTIVE FEATURES

As a plot hook, Distinctive Features can come into play through mistaken identity — a character hunted for a crime committed by his clone-sibling. Strange cultures on distant worlds may have prophecies or superstitions about someone with particular features (a real-life example is the explorer Cortez, who fit the description of the mythic Aztec figure Quetzalcoatl, causing confusion and uncertainty among the Aztec leaders).

During an adventure, Distinctive Features function as a distraction to the extent they make it

hard for characters to disguise or hide themselves. Heroes who are particularly disturbing in appearance may have trouble when people react with fear or hostility. The heavily cyborged characters of many Cyberpunk settings face this problem: on the street their chrome limbs and glittering claws look intimidating enough, but at a fancy corporate party they stand out like a beacon.

A character's Distinctive Feature could become a source of conflict within the party. This can range from the comic to the deadly serious. If a character has the Distinctive Feature "intense body odor," his comrades are going to get pretty sick of his company on a long space voyage. And if one of the party is the target of bigotry and hostility because of his looks, do the others stand up for him every time, or let it slide because they've got a job to do?

As a way to get the party together, Distinctive Features is only rarely useful. Characters who are already part of an organization may adopt a common badge or uniform, but that's an effect rather than a cause. Gamemasters could set up a weird adventure in which the characters are clones who are unaware of their origin until they notice how much alike they are.

ENRAGED/BERSERK

Using Enraged/Berserk to represent mental conditioning (see page 63) makes for an interesting plot hook: the character may want to find out who programmed him, or the other heroes may have to race against time to stop their friend from carrying out his programming.

More typical Enrageds/Berserks may cause inter-party conflict, especially if the other characters don't share the Enraged character's prejudices, or even have conflicting opinions. If the guy who gets Enraged around Rigelians discovers his best pal has fallen in love with one, things will likely get interesting.

Using Enraged/Berserk to link party members is tricky, but possible. For example, characters with implanted programming may not be aware of it until they all are confronted with the same stimulus and find themselves turning into killing machines. When the dust clears, the characters could band together to learn the source of their mysterious compulsion.

HUNTED

The saga of a man (or woman, or alien, or android) on the run has a long history in fiction, and makes a natural plot hook. It also works in the other direction: the heroes can track a wily foe who continually evades them. The best *Star Hero* Hunter-Hunted situation is one allowing for frequent flight and escape, which requires proper design of both the PC and the Hunter. Star-traveling merchants can move to a different sector if the heat gets too close, but an office worker in a near-future city has much more trouble getting away. Similarly, a greedy bounty hunter can pursue a PC from planet to planet, whereas the Denebian Guard may not be able to leave its home system. If the campaign involves a lot of moving from world

to world, you should not let characters choose Hunters who are restricted to a particular world or sector unless they return there often.

Even when the Hunters are not close on the heroes' trail, the simple fact of having to keep moving and keep hidden is a continuing distraction and source of conflict. Party members who aren't Hunted may resent having to live the life of fugitives to help a friend, and may even have genuine conflicts of loyalty between the desire to obey the law and the desire to help a comrade unjustly accused. If some characters in a game are bounty hunters or lawmen and others are Hunted, the PCs may eventually find themselves Hunting each other!

As the old adage has it, "the enemy of my enemy is my friend," and being chased by the same people is a good way to link the characters in a campaign. They may not like each other, and they may disagree over everything... but they know they have to work together to stay ahead of their common foe.

PHYSICAL LIMITATION

Physical Limitations in a science fiction setting have to be pretty severe, or pretty distinctive, to overcome advanced medicines, medical nanobots, and other high-tech methods of keeping bodies functioning properly. Typical ones, like Blindness or Missing One Limb, aren't applicable in most *Star Hero* settings; players have to be more imaginative than that. At the very least, they have to explain why, for example, doctors can't cure a character's blindness through implants or neurotechnology, as with Geordi La Forge on *Star Trek: The Next Generation*.

The search for some way to cure a hero's physical handicap can drive the plot of an adventure, as can the quest for revenge on whoever (or whatever) caused it. Within an adventure, the Physical Limitations of the heroes can cause interesting problems to overcome. Although in fiction a character's Physical Limitations can be a fertile source of dramatic conflict, this isn't true in role-playing games. Since the player who designed the character wants him to have that Physical Limitation, there isn't as much resentment or anger over being handicapped (unless the player is very good at roleplaying).

Heroes who share a common affliction may come together to search for a cure, or perhaps some handicapped rejects from a society of "perfect" Humans could depend on each other for help. A band of wounded military veterans might reunite for a final mission. Finally, the heroes may be given their common Physical Limitation by whatever organization employs them: perhaps the Imperial Secret Police keep their undercover agents in line by implanting microscopic time bombs inside their brains. As long as the agents stay in the ISP's good graces, the timer is reset during debriefing. Characters who defect have only weeks before they go boom. A group of ex-agents who know this certainly have a strong motivation to work together!

PSYCHOLOGICAL LIMITATION

“Psychological Limitation” is effectively just another word for “motivation.” To turn a Psychological Limitation into a plot hook, simply put the character into a situation in which achieving his goal comes into conflict with his personality traits. This is, by the way, the quick and easy formula for most fiction of the past thousand years. Hamlet’s goal is revenge. His Psychological Limitation is *Needs To Be Sure He Is Doing The Right Thing*. The result is a pile of bodies on the stage at the end of the play.

Things become even more interesting when one character has two Psychological Limitations that conflict. For example, on *Star Trek: The Next Generation* and *Deep Space Nine*, Worf often experienced problems when his *Klingon Code Of Honor* conflicted with his *Devotion To Duty*. This forced him to evaluate his priorities, and sometimes to find clever ways out of dilemmas.

If the villain of the piece knows the heroes well enough, he can turn their Psychological Limitations against them. If they are greedy for money, he may simply bribe them to look the other way while his nefarious plot goes ahead. If one of the PCs fears rats, the Ministry of Love can torture him by locking him in a rat-infested cell. If the heroes won’t use deadly force, their adversary will dare them to shoot him, then escape while they look on in frustration.

Even if overcoming the heroes’ Psychological Limitations isn’t the main plot engine of the adventure, character traits can still distract PCs and create subplots. Again, simply create situations which set off the heroes’ Psychological Limitations and enjoy the fun. Will the lecherous good guy interrupt his mission to cruise the singles bars? Will the devoutly religious hero attempt to observe his dietary laws on an alien planet?

Heroes with conflicting Psychological Limitations can create lots of juicy roleplaying opportunities, although at times this may go over the line into “constant intra-party bickering.” A scenario that challenges the heroes to find a solution all of them can accept is entertaining; a scenario in which someone’s character has to violate his beliefs leaves at least one player unhappy.

Naturally, people with similar desires or beliefs work together well. Dedicated government agents may all share the *Patriotic* or *Loyal To The Agency* Psychological Limitations. A band of rebels would all have *Dedicated To Overthrowing The Empire*. If the heroes are all in love with the same person, they will naturally work together when that person is in jeopardy, but at the same time try desperately to undercut and outshine each other.

REPUTATION

Reputations are a natural source of distractions during other adventures. Just when the villains are getting away, the hero is deluged by a mob of angry parents who think he discriminates against alien children.

Reputation turns into a source of character

conflict when the individual’s Reputation doesn’t match his real personality. Do his comrades become disillusioned when he turns out to be not nearly as much of a “ruthless mercenary” as they’d heard? What if he has a Reputation as a “hotshot pilot” — even though he barely knows how to fly?

To link characters together, a Reputation is wonderful. It provides a pretext for completely unrelated individuals to get in touch with each other. (Not unlike the way people in the real world get together.) After all, if one of the heroes has a Reputation as a ruthless mercenary, anyone who needs a ruthless mercenary might contact him. On the other hand, a person known for cowardice, or for inadvertently causing immense collateral damage, won’t be high on the calling list when there’s a job to do; it may take some effort to convince the other PCs to let him join the group.

RIVALRY

Building an adventure on a Rivalry usually means coming up with a plan the Rival has to embarrass or harm the heroes, and then letting them either counter it or get themselves out of trouble. More subtly, a Rival’s plot could involve the heroes in something bigger, something the Rival didn’t know about, so that the two sides have to suspend their feud for a while until the greater menace is defeated.

Rivalries serve as a perennial source of distraction in an adventure. Bold fighter pilots may be battling the Galactic Tyrant’s space fleet, but sometimes that takes second place to outdoing one another in the squadron rankings. This kind of distraction becomes a plot element if the heroes are so busy sabotaging each other that the bad guy gets away.

Perhaps the best use of Rivalries is as a source of conflict and tension among the characters in a group. If the Rivals are both PCs, their dislike for each other will constantly be on display. It may be tempered by grudging respect, or it may be a genuine dislike limited only by the fact that they are on the same side. Characters who aren’t part of the Rivalry may be drawn into the conflict, or may stand apart, amused or disgusted.

Oddly, a Rivalry can be a way to get the characters together in the first place. Rivals will naturally keep tabs on each other, and if one is going off on a dangerous mission that offers the chance to win glory (or profit), the other has to tag along.

SOCIAL LIMITATION

Social Limitations can drive the plot, as a character from an oppressed background struggles for acceptance, or someone with a secret tries to keep it. The heroes don’t necessarily even have to be the ones with the Disadvantage: Human characters can fight for alien rights.

If the characters aren’t trying to change the world, but simply have to live with a Social Limitation, the GM can still use the Disadvantage as a story complication. How can alien characters convince the Human authorities that a Human is the one to blame for a series of crimes? Obviously they



need to get some ironclad evidence themselves, and that's where Our Heroes come in. Sometimes a Social Limitation can even help the PCs — getting downtrodden aliens to talk is much easier when a character is a downtrodden alien himself.

Within a party of heroes, Social Limitations can be a fertile source of interaction and conflict. An alien character may need to win the respect of his Human comrades, and later convince them that the injustices his people suffer are real and need correcting. A robot character may in fact be the property of another PC.

Social Limitation, like Reputation or Hunted, is a natural way to draw the heroes together. Characters subject to the same persecution come together for mutual protection. A duty to the same organization means superior officers can simply assign the characters to work together.

SUSCEPTIBILITY

The simplest way to use a Susceptibility as a plot hook is to put a character into an environment flooded with whatever he's Susceptible to, then create obstacles to make it hard for him to escape. Will he get away before he succumbs? The character in question can be one of the PCs, or an NPC they must rescue before time runs out. In the course of a larger adventure, encounters involving a character's Susceptibility make good scenes or distraction.

UNLUCK

Unluck as a plot hook is hard to pull off. Perhaps an NPC wants to find a way to "cure" his chronic bad fortune, and hires the party to accompany him on his quest (this can work even if there really is no cure for Unluck in the campaign). Unluck works better as a distraction — the super-competent PCs are plagued by accidents and misfortune despite their skills.

An Unlucky character in the party may well be a source of conflict (see the Biblical story of Jonah for an example). This can also be true of the players as well as the characters — gamers may well start to resent it when all their cool plans fail because of one character's disadvantage.

VULNERABILITY

Vulnerabilities don't make very good plot hooks, since they don't lend themselves well to the kind of "burning fuse" situation mentioned under Susceptibility. Unless someone is trying to find a cure for an artificial Vulnerability, they work better as an obstacle to overcome in play.

If a character's Vulnerability isn't well known, his reluctance when facing certain attacks may be interpreted as cowardice or treachery by his comrades. On the other hand, there is great potential for real heroism in the same situation — a Chiroptan braving a barrage of sonics to save his comrades, for instance.

THE STAR HERO ENVIRONMENT



ALBEDO TABLE

Albedo	PER Roll Modifier
0.81 to 1.0	+4
0.51 to 0.80	+2
0.31 to 0.50	-0
0.21 to 0.30	-2
0.11 to 0.20	-4
0.01 to 0.10	-6

Science fiction lets characters travel to a wide variety of new environments, some of which pose unusual hazards. This section tells how to cope with unusual conditions peculiar to SF.

Albedo

Albedo refers to the percentage of light (or other electromagnetic radiation) the surface of an object (such as a moon, asteroid, or starship) reflects. The higher an object's albedo, the easier it is to see, since that makes it "brighter." On the other hand, in the dead black of space, an object with a low albedo may be so difficult to see that characters only detect it by colliding with it. An albedo of 1 indicates an object with perfect reflectivity (one that reflects all light falling upon it); an albedo of 0 indicates an object that absorbs all light falling upon it and reflects none. Earth's Moon, for example, has an overall albedo of about 0.12; Mars has an overall albedo of about 0.25. Gamemasters can use the accompanying sidebar to determine the PER Roll modifiers for detecting objects based on their albedos.

In some science fiction stories, such as Orson Scott Card's *Ender's Game*, space militaries deliberately keep the albedo of space stations and starships low, to minimize the enemy's ability to detect them. To simulate this, starships, space stations, and other such objects can buy Images to impose the appropriate penalties on the Sight and Radio Groups, with the Limitations *Self Only* (-½) and *Set Effect* (-1). Alternately, GMs could have the object buy a Stealth roll and engage in Skill Versus Skill Contests with characters who try to perceive it.

Gravity

When physicists talk about an invisible energy field which permeates the universe and binds it together, they're talking about gravity. One of the weakest of the fundamental forces on a small scale, gravity becomes important when you have masses the size of planets and stars around.

GENERAL RULES

As discussed on page 203, the G force from gravity/acceleration is rated as 5 STR for 1 G, +5 STR for each +1 G thereafter. That rule provides a quick and easy way to evaluate the force of gravity/acceleration in most circumstances, and thus to set a guideline by which to determine how much

extra STR a heavyworlder should have, the effects of increasing the artificial gravity on a space station, and so forth. If appropriate, a character should have to make STR Versus STR Rolls simply to move against the force of gravity. If he loses the contest, he can't move (or, at the GM's option, can only move 1" per Phase). That way, security forces can trap characters in "high gravity fields" and so forth.

Heavyworlders have +5 STR above what's needed for the gravity they normally live in to make these rolls easy for them (and to represent their relative STR versus characters accustomed to 1 G). In general, neither they nor other characters should have to roll to move in normal circumstances, or in any situation where the character's STR equals or exceeds the STR of gravity/acceleration.

ENCUMBRANCE

In heavy gravity, a character is not only encumbered by the things he carries, but by his own body. To determine encumbrance in high G, multiply the weight of equipment by the local gravity, then add an amount equal to the character's body weight times (local G - 1). So a 100-kilogram man with STR 10, carrying 10 kilograms of gear in a 1.5 G environment, would calculate his encumbrance as follows: 10 kg of gear times 1.5 G equals 15 kg of encumbrance from equipment. Increased body weight equals 100 kg times (1.5 - 1 = 0.5), or 50 kg. His total encumbrance is 65 kilograms, which means he takes a penalty of -3 to his DCV and DEX rolls, a -2" movement penalty, and burns 2 END per Turn just moving around. (See page 379 of the *HERO System 5th Edition, Revised*.) Characters can counteract the penalty for high gravity by buying extra STR, possibly with the *Only To Counteract High Gravity Encumbrance Penalties* (-1) Limitation — 5 STR per +1 G suffices to reduce the character's Encumbrance penalty to what he'd experience in 1 G.

In light gravity, the reverse is true: the character can not only multiply the weight of what he's carrying by the local gravity, thus making it lighter, he can also subtract the difference between his own normal weight and his current weight in low gravity. Our 100-kilogram man in an 0.75-G environment could not only carry 13 kg of stuff without encumbrance, he could add to that the 25 kg of body weight he doesn't have to carry. So in low G he can move easily with a load of 38 kilograms.

FALLING

High gravity makes things fall harder and faster; low gravity makes them fall slower and land gently. In an environment with different G, multiply falling velocity and damage by the local gravity. In

a normal atmosphere, falling objects move at 5" per Segment, and rapidly reach terminal velocity — 30" under standard gravity. Multiply these values by local gravity to determine falling speed and terminal velocity on other worlds. Local air density may reduce this; for atmospheres exerting a pressure of 1.1 atmospheres or greater, divide terminal velocity by the local atmospheres. If there is no air at all, objects continue to accelerate indefinitely, adding (5" x local gravity) to their velocity each Segment. This means very long falls on a low-gravity but airless body like the Moon can be more dangerous than comparable falls on Earth.

SOLAR SYSTEM GRAVITIES

Here are the gravities of major objects in Earth's solar system, where Earth's gravity = 1 G.

Object	Gravity
Asteroids	Negligible
Earth	1.00
Moon	0.16
Jupiter	2.60*
Europa	0.13
Ganymede	0.14
Mars	0.38
Deimos	Negligible
Phobos	Negligible
Mercury	0.37
Neptune	1.20*
Triton	0.76
Pluto	0.06
Charon	0.015
Saturn	1.20*
Titan	0.14
Uranus	0.80*
Miranda	0.008
Venus	0.88

*: Indicates gravity as of the cloud-tops; all others are surface gravity.

FIGHTING

Gravity affects both HTH and Ranged Combat.

Hand-To-Hand Combat

Hand-To-Hand Combat in high or low gravity is more difficult for fighters who aren't used to the environment.

In low gravity, there is an OCV/DCV penalty of -1 in a gravity field of 0.5 to 0.9, -2 in a field between 0.1 and 0.5, and -3 in less than 0.1 G.

Heavy gravity imposes a straight -1 penalty to CV, but that is in addition to the increased encumbrance penalty (see above).

A character can negate the CV penalty for high or low gravity by taking the appropriate Environmental Movement (page 51). However, this does not eliminate the encumbrance penalty.

Ranged Combat

Gravity affects the maximum range of projectile weapons. Simply divide range by local gravity to get the new maximum range. Thus, a weapon with a maximum range of 150" in 1 G has a maximum range of only 100" in 1.5 G ($150"/1.5$), but a maximum range of 200" in .75 G ($200"/.75$). The Range

Modifier to accuracy does not change; it has more to do with perception than with the actual distance the projectile can travel.

Characters using ballistic weapons in a new and unfamiliar gravity should suffer at least a -1 OCV penalty, as shots tend to fall short. One hour worth of practice (or one actual combat lasting at least 1 Turn) in the new conditions can correct this penalty.

MOVING

High and low gravity affect Flight, Gliding, Leaping, Running, Swimming, and Swinging. As a general rule, don't forget that moving opposite gravity (*i.e.*, straight up, when on a planet) halves a character's gravity-based movement rate; moving in a direction consistent with gravity doubles it. (See page 364 of the *HERO System 5th Edition, Revised.*)

Flight

Gravity makes flying more difficult. In high gravity, winged flyers have to go faster to keep aloft, helicopters or thrust-based flying machines have to work harder, and antigravity and other "rubber science" methods of levitation require more power.

In gravities greater than 1 G, divide Flight movement by local gravity, since flyers are burning more power just staying off the ground. Winged craft with Stall Velocity should multiply Stall Velocity by the square root of local gravity (lift is proportional to velocity squared). Maneuvers become more strenuous: climbing (Flying opposite the pull of gravity) requires 2" times local gravity to gain 1". Thus, a jetpack with 12" of Flight in a 2 G field would only be capable of 6" Flight, and would burn 4" of movement to gain 1" of altitude. This means a jetpack with less than 6" of Flight can't take off in a 2 G environment. Alternately, GMs may rule that any Flight device simply can't operate at gravity levels more than 50% greater than the environment it was designed for (unless they buy extra inches of Flight with a -1 Limitation, *Only To Counteract Gravity Flight Penalty*; these inches allow the device to take off, but do not counteract or add to the modifier for flying with/against the pull of gravity).

In gravities lower than 1 G, Flight gets more complicated. Maximum speed remains unchanged, but it gets easier to maneuver. Climbing uses 2" times local gravity to gain altitude — though the value can never be less than +1" per 1" used to gain altitude. The rules for diving (moving with the pull of gravity) are unaffected; characters still add +1" per 1" moved.

Forms of Flight requiring lift (wings, rotor blades, and the like) depends a lot on atmosphere density, which can affect carrying ability and the ability to stay aloft; see the section on Atmospheres, below.

Gliding

Gliding requires a local gravity field to work. Beings and gadgets with Gliding can't use it to move in zero gravity, although GMs may let them try to "swim" clumsily through the air at 1-2" or so.

Gliding works fine in heavy gravity — if the local air density is high enough (see below). How-

GRAVITY AND FLIGHT/SWIMMING

Here's a quick reference table for the effects of gravity on Flight and Swimming. The table rounds off the results for a more even curve of effect.

Normal Movement: divide inches by local gravity

Gravity	5" Movement Equals...
.25	5"
.50	5"
.75	5"
1.0	5"
1.5	3"
2.0	2½"
2.5	2"
3.0	1½"

Climbing: multiply 2" by local gravity (minimum 1"/1")

Gravity	Climbing 1" Requires...
.25	1"
.50	1"
.75	1½"
1.0	2"
1.5	3"
2.0	4"
2.5	5"
3.0	6"

ever, multiply the 1" the character must descend per Phase by local gravity; Gliding characters drop more quickly in high G.

The same rule applies for low gravity — multiply the 1" by local gravity — but in this case the effect is to allow characters to Glide longer/further without losing altitude. For example, on a world with .5 G, a Gliding character only has to drop ½" per Phase (or 1" per two Phases).

Leaping

Gravity affects a character's vertical Leaping and horizontal Leaping distance. Divide the character's inches of Leaping by the local gravity level.

Example: *The New Patagonian Pampas-Leaper can normally jump 10" in a 1 G environment. In the Martian Interstellar Zoo, where the gravity is 0.4, the Pampas-Leaper can jump 25", but on the planet Adamant (local gravity 2 G) it can only cover 5".*

GRAVITY AND LEAPING

Here's a quick reference table for the effects of gravity on Leaping. The table rounds off the results for a more even curve of effect.

Divide inches of Leaping by local gravity

Gravity	5" Leaping Equals...
.25	20"
.50	10"
.75	7"
1.0	5"
1.5	3"
2.0	2½"
2.5	2"
3.0	1½"

Swimming

Swimming is affected by gravity much like Flight. In high-G environments, divide Swimming movement by local gravity, and multiply the inches needed to gain 1" when Swimming against gravity by local gravity. In low-G environments, maximum speed and diving speed remains unchanged, but climbing speed improves (multiple the normal 2" per inch climbed by the local gravity).

Swinging

Swinging, like Gliding, requires gravity to work; in a zero-G situation, characters cannot Swing. In high or low gravity situations, Swinging suffers no net affect; the affect on the downward arc of the swing balances out the affect on the upward arc.

LIFTING

The Lift amount listed on the Strength Table assumes a standard 1 G environment. In high gravity, multiply an object's mass by the local gravity to determine its apparent weight. Thus, a 100 kg barrel on a 1.6 G planet weighs as much as 160 kilograms do on Earth, and so requires STR 14 to get off the ground.

In low gravity, lifting gets easier. Multiply weight by local gravity as above to determine its local weight. This means characters can pick up extremely heavy items in low gravity — a STR 0 person can pick up 250 kilograms in a 0.1 G field! Below 0.1 G, use the guidelines for Zero Gravity, below.

THROWING

Throwing distance in different gravities is simply a matter of multiplying the mass of the thrown item by the local gravity and consulting the Strength Table to determine the thrower's available extra STR based on the increased weight. Then consult the Throwing Table, as usual.

Zero Gravity

The complete absence of gravity imposes its own set of difficulties on characters (some of which are noted above in reference to lighter-than-normal gravity). Since there is no force holding them down, there is also little or no friction on surfaces. It becomes very hard indeed to exert any force unless the character is properly braced.

The standard Skill Roll and OCV penalty for all activity in zero gravity (*a.k.a.* free fall) is -3; the standard DCV penalty is ½ DCV. Characters can overcome this penalty in two ways. First, they can buy the *PS: Zero-G Operations Skill* (page 45). This method is the most "realistic," and is best suited for characters used to normal gravity but trained for zero-G work. Second, they can buy the *Zero-G Training* form of Environmental Movement (*HERO System 5th Edition, Revised*, page 90). This costs 4 Character Points and automatically cancels all Skill Roll and CV penalties caused by zero-G. This method is most appropriate for characters born to a zero-G environment, or who spend virtually all of their time in one (such as Spacers, page 32).

FIGHTING

The effects of zero-G on Hand-To-Hand Combat fall into four categories: OCV Penalties, DCV Penalties, Damage Penalties, and Action/Reaction (Knockback). These penalties all apply when the character is in free fall in zero-G. If he's braced against a surface (for instance, if he wears magnetic shoes and stands on a steel surface), they do not apply.

OCV Penalties

A character suffers a -3 OCV penalty for all attacks requiring him to have his feet on the ground (such as kicks in Martial Arts packages) performed in zero-G. In some situations the GM may rule that characters cannot use these maneuvers at all. He also suffers a -3 OCV penalty for other HTH attacks, reflecting the general difficulty he has moving and contorting his body in zero-G.

DCV Penalties

Characters are at ½ DCV when in zero-G.

Damage Penalties

All HTH Combat attacks suffer a minimum of a -1 DC damage penalty when performed in free fall, as they normally benefit from the character's secure contact with a surface or momentum arising from a leap from a surface. These penalties are usually higher (-3 DC), but the GM can adjust the penalty as he sees fit.

Action/Reaction (Knockback)

Combat in free fall should always use the Knockback rules, even if the campaign normally only uses Knockdown rules.

Knockback becomes a very serious problem in zero-G combat. When a character takes Knockback, he continues to move that many inches per Segment until he hits something. If the character has a safety line or tether, he moves until he reaches the limit of the rope and stops. Without a tether, there's a real danger of floating off helplessly into deep space. Characters in that situation can make a DEX Roll once per Phase to attempt to grab objects in adjacent hexes and thereby keep from flying away. Victims wearing any sort of zero-G flight pack can bring themselves to a stop using their thrusters.

For characters in free fall, roll 1d6 less than normal to determine Knockback, as if they were flying — which, in essence, they are. Moreover, instead of applying Knockback just to the target, divide it between attacker and target. If an attack does 4" Knockback, then the target doesn't sail back 4" — both attacker and target sail away from one another 2".

Grappling

Grabbing someone negates OCV penalties for strikes and the Action/Reaction effect (when a character has Grabbed someone and hit him, doing Knockback, neither of them goes anywhere).

LIFTING AND THROWING

Lifting and throwing objects in zero gravity are both easier and harder. A character can theoretically move any mass, and once something is

moving it keeps on moving until it hits something. When shoving an object in zero-G, consult the Throwing Table (*HERO System 5th Edition, Revised*, page 35) to determine the character's Extra STR as if making a Standing Throw. The accompanying Zero-G Strength Table gives the velocity per Segment imparted by a braced shove. (If a shove is not braced, divide the inches of velocity between the character and the shoved object, as with unbraced Knockback.) The object continues to move until it hits something.

Stopping something in zero gravity is as hard as starting it. A person trying to halt a moving object in free fall compares the Extra STR (from the Throwing Table, as if making a Standing Throw) to the object's velocity on the table below. Subtract the inches a character could throw the object from its velocity. If the character slows the object to 0" or less, it stops moving. If the character doesn't have the STR to slow the object to 0" of movement, he takes damage from a Move Through attack at whatever the remaining velocity is (the object has STR 0 for Move Through purposes).

Example: *Big John the astronaut has STR 18 and wants to move a 100 kg fuel tank. The Throwing Table indicates he has an Extra STR of 8, which means he can impart a velocity of 15" per Segment to the tank. It goes hurtling across the Space Shuttle's cargo bay to where Little Willie the mission specialist tries to catch it. Willie has STR 8. According to the Throwing Table, Willie has -2 Extra Strength, which means he can slow the tank by 4" per Segment (Willie gets to round in his favor). Subtracting 4" from 15" shows the tank retains a velocity of 11". That means poor Willie gets hit by a Move Through from the tank moving at its remaining 11". Crunch! Poor Willie takes 3d6 damage.*

ZERO-G STRENGTH TABLE

Extra STR	Velocity
-25	⅛"
-23	⅙"
-20	¼"
-18	⅓"
-15	½"
-13	¾"
-10	1¼"
-8	1½"
-5	2½"
-3	3"
0	5"
3	7½"
5	10"
8	15"
10	20"
13	30"
15	40"
18	60"
20	80"

Vacuum

Most of the Universe consists of nothing at all. When characters venture out into that nothingness, they'd better have protection. There are four things to worry about in space: lack of air to breathe; lack of pressure; extremes of temperature; and radiation.

Scientist and doctors have debated, and continue to debate, the precise effects of vacuum on an exposed Human body; for obvious reasons, it's difficult to test what happens thoroughly. The information and rules below are based on the best information available as of 2002. Gamemasters who prefer some other interpretation — such as bodies instantly freezing, or instantly exploding into crimson mush due to internal pressure — are free to adopt those interpretations for their games.

BREATHING VACUUM

Characters stuck in space without life support are in trouble. They have no oxygen to breathe. The standard rules for drowning (*HERO System 5th Edition, Revised*, page 424) apply. However, as noted below, attempting to hold one's breath in space can have severe negative consequences.



LACK OF PRESSURE

The Human body is adapted to an environment with external pressure. The Earth's atmosphere presses against every square centimeter of our skin with a force of about 10 Newtons. Take away that pressure, and the body tries to expand to fill the void. However, the Human body turns out to be a pretty good spacesuit, at least for short periods. Skin is strong enough to resist rupturing, so nobody's going to explode in vacuum (though the body swells up to as much as twice its size). The chief danger is blood vessels rupturing, especially in the lungs, where there is a vast network of them separated from the air by only a thin membrane. Additionally, eardrums might rupture.

In game terms, characters in a vacuum without Life Support: Safe Environment (Low Pressure/Vacuum) suffer ½d6 Normal Damage, NND Does BODY, per Segment of exposure to vacuum. Increase the damage to 1d6 per Segment if he holds his breath; the increase represents rupturing of the lungs and the like. Swelling and related problems result in a DEX Drain ½d6 NND per Segment (to a maximum of -10 points of DEX); the character cannot recover any of the lost DEX until he's recompressed, after which it returns at the usual rate. Roll 3d6; on an 8-, the character suffers eardrum damage (leading to a Physical Limitation of -2 [or greater] Hearing PER Roll penalties, or total Deafness if exposure lasts more

than three Turns). The result is that most characters should enjoy a period of "useful consciousness" of about 9-12 seconds, and can survive as much as about 90 seconds of exposure.

Because decompression damage is internal, Paramedics is of limited use (impose a Skill Roll penalty of -3). Characters need advanced medical procedures and technology to treat it.

TEMPERATURE

Science fiction writers frequently refer to "the icy blackness of space" and the like, but in fact vacuum itself has no temperature — it's a near-perfect insulator. What coldness there is in space exists because the trace atoms floating in the vacuum radiate energy into it, causing a chill. Compared to suffocation and loss of pressure, any threat posed by the low temperature is minimal; characters exposed to vacuum die long before they get cold.

A Human exposed to vacuum can only cool off by radiating heat or sweating. This causes a rise in body temperature of 1 Temperature Level per minute of activity (see page 441 of the *HERO System 5th Edition, Revised*), or per five minutes of rest. Of course, a person just resting in vacuum has other problems....

A related effect is that unprotected exposure to the ultraviolet rays of a star causes characters to suffer very bad sunburns. See page 439 of the *HERO System 5th Edition, Revised* for more information on sunburn.

RADIATION

Solar and cosmic radiation can be a serious problem in space, even to space travelers in shielded spacecraft. For someone floating in vacuum with just a suit, the danger is very real.

Gamemasters can also use these rules for other types of radiation encountered on planetary surfaces and the like.

General Principles

Radioactivity harms living things as energetic particles destroy cell nuclei or damage the complex molecules which carry on biological processes in the cells. Very intense radiation kills cells en masse, producing effects like burns. More insidious is long-term exposure to lower levels of radiation, which kills off body cells and induces mutations leading to cancer and leukemia.

RADIATION LEVEL TABLE

Source	Rads
Occupational Safety Limit	5 per year
Medical X-Ray	0.01 to 0.05 per shot
X-Ray Laser	1 per die of Killing Damage
Cosmic Rays (in space)	30 per year
(Lunar surface)	15 per year
(Earth surface)	0.03 per year
Jovian Radiation Belt	1,000 per hour
Solar Flare (Earth orbit)	100-1,000 per event
Nuclear Fallout (within plume)	240 per year
Plutonium (1 gram)	1 per second
Reactor Core (unshielded)	7,000 per second

RADIATION EFFECTS

Exposure (Rads) is...	Effect
Greater than 5 x CON	Radiation Sickness: Individual loses 1d6 CON (heals normally)
Greater than 10 x CON	Serious Sickness: Lose 2d6 CON (heals normally)
Greater than 20 x CON	Internal Damage: Lose 2d6 CON and 1d6 BODY (heals normally)
Greater than 30 x CON	Lethal Threshold: Lose 3d6 CON and 2d6 BODY (heals at half normal rate)
Greater than 50 x CON	Fatal Dose: Lose 4d6 CON and 3d6 BODY (does not heal)
Armor and other defenses do not reduce BODY damage from radiation; consider it as NND Does BODY damage, with the defense being Life Support: Safe Environment (High Radiation).	

Radiation exposure is measured in Rads, short for “Radiation Absorbed Dose.” One rad is defined as 100 ergs of energy per gram of material. The radiation level of various sources of radioactivity is given in the Radiation Level Table. The effects of exposure are given in the Radiation Effects Table. Radiation, like all forms of energy, is subject to the inverse square rule — so divide the rad level given on the table by the square of the distance to the source to determine a character’s exposure.

Fallout And Half Life

Fallout is radioactive material released by nuclear weapons explosions. Typically, a bomb going off scatters bits of radioactive material high into the atmosphere, creating a long plume, extending hundreds of miles, where the radiation levels are temporarily higher than normal. The problem with fallout is that it affects an area — the radiation level rises over the whole region covered by the plume.

Some sources of radiation, like ongoing nuclear reactions, emit radiation at a constant level.

RADIATION SHIELDING

Substance	Radiation Multiplier
Trace Atmosphere (per meter)	.98
Thin Atmosphere (per meter)	.9
Standard Atmosphere (per meter)	.75
Dense Atmosphere (per meter)	.9
Water (per cm)	.9
Brick, Soil, or Rock (per cm)	.75
Wood or Plastic (per cm)	.95
Steel (per mm)	.9
Lead (per mm)	.8
Spacesuit	.9
Radiation Suit	.7
Vehicle Hull (per point of DEF)	.9

Radiation protection is exponential. Steel plating reduces rad levels by .9 per millimeter, so a layer of steel 5 millimeters thick would reduce it by a factor of (.9 x .9 x .9 x .9 x .9), or about .59 overall.

Others, like radioactive isotopes or fallout, have a half life. The half life is the amount of time it takes for half of the radioactive material to decay to a stable form. Because of the way radioactive decay works, this time is constant, so the rad level drops by half for each half life increment. The process of decay is gradual — the radiation level doesn’t suddenly drop when the half-life period is up.

Radiation Shielding

Radiation shielding absorbs high-energy particles. In practice, different materials stop different kinds of radiation better than others, but for the sake of simplicity you can lump them all together as “radiation shielding” and leave it at that. The Radiation Shielding Table gives the amount of protection for different materials. Radiation shielding is exponential: each additional layer of protection halves the radiation which penetrates.

Atmospheres

Earth is the only known planet with air Humans can breathe. Characters venturing to other worlds will encounter a variety of atmospheres, many of them with harmful effects. (See pages 86-88 for more on atmospheres.)

DENSE ATMOSPHERES

Atmospheres denser than Earth’s may cause two problems for Humans and other living creatures: pressure and toxicity.

Pressure

As indicated on page 87, to determine atmospheric pressure on the surface of a planet, determine the density of the atmosphere relative to that of Earth, then multiply by the surface gravity. For example, on a world with a Standard atmosphere 120% as dense as Earth’s, and a surface gravity of 1.3 G, the atmospheric pressure is 156% that of Earth’s, or roughly half again as strong.

Earth’s average atmospheric pressure at sea level (one atmosphere, or approximately 1000 millibars) is the default for game purposes. At 1 atmosphere or below, a character’s normal PD is enough to resist the effects of pressure.

Heavier pressure, such as from descending into a dense atmosphere like Jupiter’s or diving deep into the sea, can cause injury and death. As of 2002, the free-diving record for Humans is to 137 meters, where the pressure is about 14 atmospheres (see sidebar) — but without special protection, they can only remain at such pressures for short periods. For game purposes, 10 atmospheres of pressure is the most an unprotected Human can withstand for extended periods. For each +1 atmosphere (or fraction thereof) thereafter, a character suffers 1d6 Normal Damage, NND Does BODY, per Turn (the damage accrues on Segment 1). For example, at 15.5 atmospheres, a character suffers 6d6 damage per Turn. The defense to the damage is Life Support (Safe Environment: High Pressure).

In Hard SF or “realistic” settings, Safe Environment (High Pressure) only constitutes a total defense to pressure damage up to 30 atmospheres.

ATMOSPHERIC PRESSURES

As a guideline, on Earth, 10 meters (5”) of depth in the ocean equals 1 atmosphere, and every +10 meters (+5”) (or fraction thereof) equals +1 atmosphere. Thus, a character swimming 43 meters below the surface experiences 5 atmospheres of pressure.

For Dense atmospheres (181% or greater than Earth’s atmosphere), the GM must establish what the surface pressure is (see page 87), then determine how quickly pressure decreases as one rises in the atmosphere (page 87-88). That way he can determine at what point characters and ships start to suffer damage, based on the rules in this section.

Above that, Safe Environment (High Pressure) alone is not enough. At that point, for each +1 atmosphere (or fraction thereof) above 30, a person suffers the damage indicated above (beginning at 1d6, not 21d6) unless he has the proper defense: Safe Environment (High Pressure) *and* a minimum of 1 Resistant PD for every 3 atmospheres of pressure. (Normally the defense to an NND shouldn't vary this way, but in this case it's a realistic and valid way to represent the increasing effects of pressure.) This defense can come from armor, personal force fields, or any other source. Thus, at 31 atmospheres, a character with Safe Environment (High Pressure) and 10 rPD is fine; at 32 atmospheres, he starts taking damage, because his rPD is no longer enough to protect him.

The Bends

Even when the pressure isn't high enough to cause harm, being in a high-pressure environment has other dangers. Nitrogen and other gases dissolve in the bloodstream under pressure. When the pressure is reduced quickly, the dissolved gases form bubbles and expand. For a graphic demonstration of this, shake up a bottle of carbonated soda and open the top — then imagine that happening in your veins. The effects of the bends are highly variable; some deep-sea divers have survived dozens of dives with no permanent effects, but others died or were left paralyzed.

The bends are only a problem in rapid decreases in pressure. For any decrease in pressure of greater than 1 atmosphere per minute, make a CON Roll, with a penalty of -1 for each additional atmosphere of pressure. Success means no bends this time; failure means RKA 1d6 NND Does BODY damage (the defense is Life Support [Safe Environment: High Pressure]).

Toxicity

Where the air pressure is greater than 10 atmospheres, the concentrations of gases become toxic. A character without Life Support (Safe Environment: High Pressure) effectively drowns (use the standard drowning rules).

THIN ATMOSPHERES

In air pressure below 25% Earth normal (.25 atmospheres), characters can't get enough oxygen to stay alive. The drowning rules apply unless they have artificial protection. (In situations with no pressure at all, use the *Lack Of Pressure* rules under *Vacuum*, above.)

Thin air also affects how flying creatures and vehicles stay aloft. Any type of Flight requiring lift from wings, propellers, rotors, or gas bags has its lift reduced in proportion to the lower pressure. In game terms, this means the weight a flying character or vehicle can carry is reduced by the atmospheric pressure — in 25% pressure, reduce its STR to one-fourth of normal for purposes of carrying objects while flying. (See the Encumbrance Table on page 379 of the *HERO System 5th Edition, Revised* for rules regarding the effects of encumbrance on movement.) In atmospheres 10% of Earth's, or thinner (including no atmosphere), any type of Flight requiring lift

cannot function at all; there's not enough atmosphere to "push" against.

Gliding works poorly in thin atmospheres, since there's less air to "support" a Gliding character. Multiply the glider's inches of movement by the percentage of air pressure relative to Earth; at 20% or less pressure, Gliding is not possible.

ATMOSPHERIC COMPOSITION

There are dozens of likely atmospheric gases — hydrogen, helium, methane, carbon dioxide, oxygen, nitrogen, ammonia, argon, chlorine, fluorine, and various combinations of them (see page 88). Most of them are poisonous to Humans (even oxygen and nitrogen, if the concentration or pressure are too high). Rather than detailing the effects of each, you can simply divide them into Breathable, Unbreathable, and Poisonous atmospheres. A *Breathable* atmosphere is of course one a character can breathe normally.

Unbreathable atmospheres are any mix of gases not containing free oxygen but also not poisonous. Noble gases like helium and argon are unbreathable, as are carbon dioxide, methane, and pure nitrogen. Characters in an unbreathable atmosphere without appropriate Life Support suffer the same effects as drowning in water. Otherwise, Unbreathable atmospheres are not harmful. A character with oxygen tanks can operate in an Unbreathable atmosphere without other protection (unless the pressure or temperature demand it).

Poisonous atmospheres, also referred to as *Corrosive*, contain primarily gases that react with Human tissues, killing cells and causing pain. Poisons include pure hydrogen, ammonia, chlorine, fluorine, hydrogen sulfide, nitrogen oxides, and most combinations of those chemicals. Characters in a poisonous atmosphere without protection suffer the effects of suffocation, plus 1d6 Normal Damage, NND Does BODY, per Turn (damage accumulates on Segment 1) as the toxic gases burn skin and exposed mucous membranes (and corrode equipment). If the character breathes in the poison air, he takes an additional 1d6 Killing Damage, NND Does BODY, per Phase as the poison sears his lungs and nasal passages. The defense against poisonous atmospheres is Life Support (Self-Contained Breathing) plus some sealed, airtight Resistant Defense such as a suit of Armor or a Force Field. If the character doesn't have the Life Support, he'll suffocate, but at least the corrosive effects of the atmosphere won't get him.

ATMOSPHERES AND STARSHIPS

Starships may run into several problems in atmospheres.

Entering An Atmosphere

Vehicles entering an atmosphere from space experience heat as the result of friction generated by moving into/through air. Entering an atmosphere causes a ship to suffer 5 BODY damage per Phase; therefore, 5 DEF (or other defenses providing equivalent Resistant Defense) protects the ship from that effect.

Many ships have the Physical Limitation *Cannot Enter Atmospheres* (page 204), because their designers

intend them solely for use in space and see no reason to spend the time and money to reinforce them to handle atmospheric pressures. These ships may be able to make it into an atmosphere, but they'll soon crack under the strain regardless of their defenses.

Atmospheric Pressure

Even ships designed to enter atmospheres may encounter problems when descending deep into one, however. On planets with large or dense atmospheres, the atmospheric pressure increases the further into the atmosphere the ship goes, eventually crushing it if it's not sturdy enough (in much the same way that a submarine going too deep into the ocean gets crushed).

Ships designed to enter atmospheres need two things: a minimum of 5 DEF (see above) and Life Support (Safe Environment: High Pressure). A ship without the Safe Environment (High Pressure) can stay in up to 5 atmospheres of pressure without difficulty, but suffers 1d6 Normal Damage, NND Does BODY, per Turn (the damage accrues on Segment 1) for each +1 atmosphere above 5 (or fraction thereof).

In a Space Opera or cinematic setting, Safe Environment (High Pressure) lets a ship withstand any level of pressure without difficulty (though the ship may creak and groan alarmingly, as its hull adjusts to the stress). In "realistic" or Hard SF settings, things aren't quite so simple. As with Humans, the Safe Environment only offers complete protection up to a point — 50 atmospheres. At that point, for each +1 atmosphere (or fraction thereof) above 50, a spacecraft suffers the damage indicated above (beginning at 1d6, not 46d6) unless it has the proper defense: Safe Environment (High Pressure) *and* a minimum

of 1 Resistant PD for every 3 atmospheres of pressure. This defense can come from its hull, defense screens, or any other source. Eventually, though, sufficient atmospheric pressure will crush even the strongest ship.

Corrosive Atmospheres

Sufficiently corrosive atmospheres may affect ships. In this case, the GM determines the amount of damage and how quickly it accrues. Typically a ship suffers 1d6 Killing Damage, NND Does BODY (defense is Force Field or Force Wall), per Turn, with the damage accruing on Segment 1. More corrosive atmospheres do more dice of damage.

Atmospheric Interference

In some situations, the composition of a planet's atmosphere, or the effects of weather, may interfere with a ship's ability to use sensors or communications through/into that atmosphere. A Systems Operation penalty of -1 to -3 may apply.

Explosive Decompression

Although sometimes used to describe what happens to the lungs of a person who's exposed to vacuum and holds his breath, in general *explosive decompression* refers to the sudden loss of air and air pressure when a sealed environment (such as a starship's hull) is opened to the vacuum of space. Typically this occurs due to a puncturing of the environment (from, say, a meteor impact, or an enemy ship's laser blast), or when a heroic character deliberately opens an airlock to put out a fire or suck some



EXPLOSIVE DECOMPRESSION TABLE

Size Of Hole	Rate Of Air Loss	STR Of Decompression
Insectile (.031" or smaller)	.031 cubic hex/Segment, or less	-15
Minute (.032")	.032 cubic hex/Segment	-10
Minuscule (.064")	.064 cubic hex/Segment	-5
Tiny (.125")	.125 cubic hex/Segment	0
Diminutive (.25")	.25 cubic hex/Segment	5
Small (.5")	.5 cubic hex/Segment	10
Human (1")	1 cubic hex/Segment	15
Large (2")	2 cubic hexes/Segment	20
Enormous (4")	4 cubic hexes/Segment	25
Huge (8")	8 cubic hexes/Segment	30
Gigantic (16")	16 cubic hexes/Segment	35
Gargantuan (32")	32 cubic hexes/Segment	40
Colossal (64" or larger)	64 cubic hexes/Segment, or more	45+

OBJECT DEFENSE AND BODY IN STAR HERO

The Object Table (*HERO System 5th Edition*, page 303) lists many objects that might appear in *Star Hero* games. Some (such as large spaceships) are almost exclusively the province of science fiction settings; others could occur in many different types of games.

Generally speaking, objects manufactured in science fiction settings are sturdier — better made, and of more durable materials — than objects from earlier time periods. They also often weigh less. When determining an object's DEF and BODY using the Object Table, consider increasing the ratings of all multi-period objects by 1-2 in each category (sometimes more). When determining the weight of large objects, consider reducing the rulebook's listed weight by as much as one-fifth (20%).

bug-eyed alien monster out into space.

When explosive decompression occurs, two issues are important: how long before all the air leaks out; and is the outward flow of air strong enough to pull objects or characters out of the ship? While formulae do exist to calculate the loss of a volume of substance through a hole of given size, that's more complex than necessary for all but the hardest of Hard SF *Star Hero* games. Instead, use the accompanying Explosive Decompression Table to determine the effects.

Decompression STR

The STR of the decompression depends on two things: the size of the rupture in the environment, and the pressure in the environment. First use the accompanying table to determine the STR based on rupture size — the larger the hole, the more air can rush out quickly, resulting in a stronger pull. Then, for each +1 atmospheric pressure (or fraction thereof) in the environment above 1 (1 being Earth-normal average atmospheric pressure, used in Human starships), add +5 STR. Thus, if the interior of a ship is pressurized to 3 atmospheres and develops an Enormous (4") rupture, the pull of the decompression is equal to 35 STR (base of 25, +10 for the two atmospheres above 1).

The GM determines the size of a hole in a sealed environment's walls/hull. The standard rules for breaking walls (*HERO System 5th Edition, Revised*, page 449) indicate a Human-sized (*i.e.*, about 1" square) hole for 1 BODY damage, with the size doubling per +1 BODY thereafter. That rule works fine on the average, but it may not make much sense in the case of a micrometeor or a pinpoint laser blast, so the GM should use his judgment when deciding how big a rupture is.

The Pull

The pull of decompression affects everything in the environment — people, objects both loose and attached, dust, and so forth. Even a tiny pull can be dangerous; after all, stray computer chips and pieces of paper don't weigh much, and may contain invaluable data. But what characters are most concerned about is whether they'll be yanked into the deadly depths of space. To save themselves, they must have something to hang onto or brace themselves against (if not, out they go, though the GM may allow a DEX Roll for a character to snag something to hold onto as he flies toward the rupture). Then he engages in a STR Versus STR Roll against the pull every Phase. As long as he keeps winning the contest, he stays put; otherwise, out he goes. If a character is particularly well braced, strapped in, or the like, the GM may give him a bonus to his STR Roll for the contest. The GM should also assign STRs to fixed objects (like desks bolted to the floor) to determine if they come detached; typically an object should have 5 STR for every 1 DEF it has.

The decompression STR pulls characters and objects at the rate it could make a Running Throw with them (so characters may have more than one chance to grab something and hold on for dear life). It has SPD 6 for these purposes.

The Outcome

If a character gets pulled all the way to the rupture, what happens next depends on the relative size of the rupture and the character. (The same applies to objects, of course.) If the rupture is larger than the character, he goes flying out into space (where he continues traveling at the same direction and velocity every Segment thereafter until something stops him).

If the rupture is smaller than the character, but larger than one-third the character's size, he gets forced violently through the rupture. Convert the decompression STR's damage into an equivalent number of DCs of Killing Damage and apply it to him. (Some gamers refer to this as the "sausage grinder effect.") After he takes the damage once, he's out in space, as described above.

If the rupture is one-third the character's size, or smaller, he takes the decompression's STR damage and then plugs the rupture with his body. Thereafter he takes half the decompression's STR damage per Phase (again, based on SPD 6) until someone saves him, he pries himself away, or the like.

VILLAINS AND NPCs



Perhaps the most important single aspect of any scenario is the villain(s) — the adversaries and enemies the characters encounter or pursue during the course of the game. Closely related to the villain are the NPCs: other characters the PCs encounter who may be helpful, hostile, or annoying. A good villain or NPC can make a lackluster scenario enjoyable, and a poor one can diminish the impact of an otherwise wonderful adventure.

VILLAINS

Quick: think of half a dozen memorable characters from science fiction films and stories. Chances are, your list includes people like Darth Vader, Harry Mudd, Khan Noonien Singh, and the Mule. Villains.

A good villain makes a good story. The reader may not care much about the heroes, but everybody loves to root against a good villain. This isn't limited to science fiction: Lucifer in Milton's *Paradise Lost* is by far the most striking character in the whole epic poem.

In a *Star HERO* game, the PCs' adversary often drives the plot, and consequently should be more than just some game stats on a sheet. What makes a good villain? What makes a good science fiction villain?

Villain Qualities

In science fiction (and other genres, for that matter), good villains have certain qualities that set them apart.

COMPETENCE

The best villains in fiction are competent, often extraordinary in their abilities. They are powerful, clever, and subtle; overcoming them is a worthwhile challenge for the good guys. Think of Darth Vader in *Star Wars*: he can out-plot Princess Leia, out-fly Han Solo, out-fight Luke Skywalker, and has the whole might of the Empire at his beck and call.

A villain who isn't competent isn't very interesting. It hardly seems fair for the heroes to take on somebody weaker than themselves. Note, however, that "power" here doesn't necessarily mean sheer muscle or available firepower. A weak but clever opponent who can maneuver the heroes into a situation where their superior abilities are useless is just as powerful as one who can bat them aside with casual ease.

Exactly how powerful the villain is depends

on the campaign's scale and tone, the abilities of the PCs, and the role the GM intends for the villain. Role is perhaps most important. What part will the villain play in the campaign? Is he the Big Bad Guy behind all the heroes' problems? In that case he must be powerful indeed, with underlings and henchmen who can each serve as the main villain of adventures themselves. If he's one of those henchmen, then the villain should be only slightly more powerful than the heroes. If he's only a one-shot opponent in a casual encounter, he can be the same level or even weaker than the PCs.

MENACE

Just being powerful doesn't make a good villain. Blue whales are immensely powerful animals, but nobody's afraid of them because they're shy and don't harm Humans. A villain requires a credible menace: the heroes must believe the villain is not only able, but willing, to cause harm.

The best way to create this sense of menace is to give the villain the chance to demonstrate his power without directly harming the PCs. When the Imperial forces destroy Alderaan at the beginning of *Star Wars*, everyone learns they mean business. Similarly, you could have a villain in your game harm a character's DNPC, kill a favorite NPC, destroy a large chunk of a major city, or reveal information to the characters that makes it plain he could attack them at any time.

SYMPATHY

The best villains have a streak of humanity or at least some admirable traits. They may be people the heroes might have been friends with in other circumstances, or at least enemies they can maintain a grudging respect for. Otherwise, they're just two-dimensional cutouts; it's not hard to hate, or oppose, someone who's unlikeable and villainous in all aspects.

Examples of "admirable" villains abound in fiction. Long John Silver is a vicious pirate, but he's brave, resourceful, and doesn't let young Jim Hawkins come to harm. Darth Vader is a callous, brutal tyrant, but there's a spark of humanity within him that Luke Skywalker, his son, can perceive and use to redeem him. Khan Noonien Singh is a ruthless dictator, but he can be polite and charming if necessary.

MOTIVATION

Hardly anyone gets up in the morning and says "How can I be evil today?" Even the worst villains can justify their own actions to themselves. The motives of villains are the same as those of most

people: they want things (desire); they fear things (fear); and they believe things (conviction).

Wanting something is easy to understand. Everyone wants something. Villains may be motivated by a desire for wealth, lust for the opposite sex, a simple urge to survive, or even love for another person or being. Sometimes a villain's desires aren't quite normal — twisted sexual urges, mad plans to conquer the galaxy, or the obsessive pursuit of some object. But other villains can have quite prosaic desires, such as revenge.

Fear is another powerful motive. Most living things fear death, most Humans fear poverty and hardship, a ruler might fear losing power, an official in a tyrannical regime might fear the consequences of failure. Even the most incredibly powerful villain can still have fears: the Galactic Tyrant fears rebels and threats to his throne, and the Cosmic Overmind fears the heat death of the universe. Often people (not just villains) take great risks to avoid or overcome the things they fear; as long as the consequences are not as bad (in their opinion) as the thing they fear, it's a rational choice.

Finally, most Humans have beliefs about right and wrong. Even villains do, although their beliefs may not match everyone else's. People often endure great danger and make tremendous sacrifices in the name of what they believe in; villains may do the same.

These three motives can feed on and strengthen one another. A villain who's greedy for wealth may also fear losing his property and sources of income, and may believe he's doing the right thing by stimulating economic growth and providing employment.

The motives for villains are not necessarily different from those of heroes. Han Solo was greedy for money, and Captain Kirk certainly had an eye for the ladies. What separates heroes from villains is how they go about achieving their goals. Bringing unity and peace to the Galaxy is a noble goal. Exterminating all other species is not a heroic way to accomplish it.

In some campaigns, the distinction between the heroes' motives and those of the villains is all but invisible. Interstellar mercenaries or spies can resort to pretty sleazy methods to accomplish their missions, and some cyberpunk heroes are villains by the standards of their society.

STAR HERO PLOT HOOKS

Here are a few *Star Hero* plot hooks, organized by villain motivation.

Desire

An antiquities collector hires mercenaries to steal a priceless religious relic from an alien temple.

An AI expanding its processing power is taking over the planet's datanet — and the brains of everyone linked into cyberspace!

A con man has just "sold" the party's starship to four

different customers and skipped out with the loot.

A dictator plans to invade a neighboring planet rich in resources.

A military commander fakes reports of alien raids along a peaceful border so he can gain glory leading the counterattack.

An obsessive fan illegally clones a famous dead actress, but the clone escapes.

A parasitic alien implants its eggs in several people, including one of the heroes' DNPCs; when the eggs hatch, the larvae will consume the host... but ordinary surgery can't remove them.

A starship captain is determined to open an ancient alien artifact to learn its secrets.

Fear

An alien species must flee its homeworld because its star is going nova, so it's invading nearby systems.

An astronaut believes many of the people around him are aliens in disguise.

An energy creature living in Jupiter's radiation belts mistakes a spaceship's radar beams for an attack.

A growing political movement pressures the government to sterilize all psionics to prevent them from taking over.

A megacorp covers up evidence that its new implant computer causes psychotic episodes in many users.

The government sends a military force to destroy an alien artifact because it may pose a danger.

A native tribe on an alien world captures some explorers, whom they believe to be demons.

A powerful alien civilization destroys all warlike, dangerous species it encounters — and it's just found Earth.

Conviction

A deep-cover spy works for an enemy species because he respects their stable civilization and sophisticated culture.

The Cosmic Overmind wants everyone to join it and share the wisdom of the Galaxy; refusal is a sign of illogical thinking.

A group of space rebels wages a guerrilla war against the Empire.

A new planetary government orders all citizens to work for the common good... or else.

A powerful alien empire wants to bring peace to a planet's warring nations by taking over at gunpoint.

A religious fanatic believes all who link into cyberspace lose their souls.

A robot leads a campaign to liberate machines from the tyranny of organic life.

A time traveller believes that by changing history he can make a better future.

Villain Archetypes

Over the years, science fiction stories and films have developed a set of standard villainous archetypes that turn up again and again. Gamemasters looking for inspiration can employ them as is, or use them as the basis to create variations or combinations.

ENEMY SPECIES

In any setting with a large ongoing conflict, one side can be the designated “bad guys.” Fictional examples include the Klingons from the original *Star Trek* series, House Harkonnen and its minions in *Dune*, the Kzin in Larry Niven’s works, and the minions of Boskone from E. E. Smith’s “Lensman” novels; a historical version might be the Nazis. When these guys show up, the heroes know who to fight.

Useful Features: Enemy species or civilizations have lots of resources and minions to throw at the heroes, making them versatile, powerful opponents. Once you introduce them, you can use them again and again, saving you the trouble of creating new enemies. Even if the heroes kill off or capture one leader, you’ve got an endless supply of replacements to put on the black hat. Moral issues get very simple when the players know who the bad guys are.

Potential Problems: Mowing down an endless series of Space Mongols becomes boring after a while, and the sheer scale and resilience of the bad guys may make the heroes wonder if they’re really accomplishing anything. The idea of an “evil species” may have racist overtones, which could either offend players or bring out their less admirable qualities.

Variations: In a “cold war” situation, the heroes may know who their enemies are, but blazing away at

them with ray guns could plunge the galaxy into war. Instead, the PCs have to approach the problem subtly; a series of chess-game adventures of plots and counterplots may be entertaining. Giving the villains understandable motives goes a long way toward negating the problem of racism.

GALACTIC TYRANTS

For tyrants, there’s a depressingly long list of historical examples to draw on. Notable fictional ones include Emperor Palpatine (from *Star Wars*) and Ming of Mongo (from *Flash Gordon*). Tyrants command vast fleets and armies, and tend to remain in their heavily fortified headquarters until the final battle with the heroes. The main difference between an Enemy Species and the forces of a Galactic Tyrant is that the Tyrant holds his empire together by force of will and personality. Without the top man, the Tyrant’s legions are easily mopped up, and may convert to the right side with a little talking-to.

Useful Features: Giving evil a face and a name solves the problem of how to defeat an entire empire — cut off the head and the body will die. A colorful tyrant can be whimsical or motivated by love or revenge. If the heroes learn something about the tyrant’s personality and blind spots, they may be able to fool or outmaneuver him.

Potential Problems: A tyrant who’s too villainous risks becoming implausible. If the Galactic Emperor casually shoots underlings who fail him, why haven’t his underlings conspired to overthrow him? If he annihilates planets which are home to rebel activity, eventually he won’t be Emperor of anything but a bunch of gravel.

Variations: An hereditary empire might have a whole family of Galactic Tyrants, all busily scheming against each other for the throne — offer-

ing plenty of opportunities for wily heroes to divide and conquer. A more sympathetic Galactic Tyrant may become an Honorable Enemy. Sometimes the Tyrant turns out to be nothing but a Puppet of some even bigger and badder opponent. For a more scaled-down tyrant, GMs may want to use the “Napoleon on Elba” option of a former overlord scheming to regain power.



HERO GONE BAD

Maybe the Galactic Tyrant is controlling his mind, maybe he's miffed because he got passed over for promotion, or maybe he just looks better in black. Being a hero is hard work, and even the best may give up and decide that if you can't beat the hordes of Evil, you may as well join 'em. Sometimes even PCs turn to the wrong side.

Useful Features: The great strength of a Hero Gone Bad is that he knows what the good guys are likely to try, and can anticipate and frustrate them. If they have some sort of unique technology or powers, he can counter them. A Hero Gone Bad may well have a personal connection to the PCs, making for good roleplaying opportunities.

Potential Problems: An ex-PC turned villain could simply be too effective as an enemy — he knows the heroes, knows their weaknesses and secrets, and if played properly could do serious damage. This may turn the campaign into a vendetta.

Variations: Ex-heroes are often Honorable Enemies, or may have simply turned Mercenary. Whipping off the Galactic Tyrant's mask to reveal a familiar face can be a stunning climax to the campaign. Maybe the Hero Gone Bad didn't go bad at all — either he's operating under deep cover, ready to switch sides again at the critical moment; or maybe he was bad to the bone all along and only pretended to support the heroes' cause in the first place.

HONORABLE ENEMY

Just because he's on the other side doesn't mean a villain can't be a gentleman. Honorable enemies respect the heroes as worthy opponents even as they try to foil or kill them. Historical examples are common: even amid the carnage of World War I, pilots sometimes dropped flowers over enemy airfields when an ace was killed.

Useful Features: An Honorable Enemy may well grant mercy to defeated opponents, letting them run away to fight another day. When confronted with some genuine evil, an Honorable Enemy could join forces temporarily with his adversaries in the name of common decency. An Honorable Enemy who meets his foes on neutral territory could form friendships or even romantic connections — catnip for dedicated roleplayers.

Potential Problems: It's difficult to make a villain ruthless enough to pose a genuine threat and still keep him likeable. Players sometimes hold grudges against anyone who thwarts them, no matter how honorable. They can also be very Machiavellian, using the Honorable Enemy's own code of honor against him.

Variations: A villain may only pretend to be honorable, abandoning his facade when things get desperate (or when he thinks he's won). A really successful Honorable Enemy can reach Galactic Tyrant rank. Heroes who violate the code of conduct an Honorable Enemy follows may discover he now views them as unworthy opponents — vermin to be destroyed.

MAD SCIENTIST

A cliché of early pulp fiction which nowadays is less common, the mad scientist's lineage goes back through the original Dr. Frankenstein to Faust. The size and expense of major research programs has made the lone genius creating wonders in his basement less plausible, but the possibilities of genetic engineering and nanotechnology could revive the Mad Scientist in fiction. A more realistic version is the researcher who cuts ethical corners to complete his experiments.

Useful Features: Mad Scientists can have seemingly magical technology which is otherwise unavailable in the game world. Their demented experiments can create monsters. It's traditional for every Mad Scientist to have a beautiful daughter suitable for romantic attachments.

Potential Problems: Unless handled very deftly, the Mad Scientist is such a creaky old cliché that players may start rolling their eyes. The question of "why doesn't he just license these inventions and get rich?" must be answered for the cynical modern gamer.

Variations: Galactic Tyrants sometimes dabble in Mad Science as a hobby, or else keep some Mad Scientists on the staff. In a Cyberpunk setting, the Mad Scientist gets major corporate backing and a squad of loyal security goons. Desperate Rebels may turn to Mad Science in search of a secret weapon.

MERCENARY

The flip side of an Honorable Enemy is the Mercenary. He serves the opposition simply because they pay him, and if Good offers a better price than Evil, he'll happily change sides. Han Solo, in his first appearance in *Star Wars*, was close to being a Mercenary, and his adversaries Greedo and Boba Fett certainly fit that description. *Star Trek's* Ferengi are a whole Mercenary civilization.

Useful Features: It may reassure slightly shady heroes to find a foe with motives similar to their own. A Mercenary with highly marketable skills could wind up serving different master villains, turning up against the heroes when they least expect him. Mercenaries can be bribed in a pinch, and could be motivated to join forces against some menace which threatens the free enjoyment of their wealth. Mercenary villains usually cut and run when the situation looks hopeless.

Potential Problems: The major difficulty with a Mercenary villain is that sufficiently wealthy heroes may be able to simply buy them off; GMs who don't like credit-card diplomacy should beware (or institute a "Code of the Mercenary" system whereby honorable Mercenaries don't abandon a contract until its terms have been met). Unless the Mercenary is powerful, or protected by a heavy helping of Combat Luck or GM's fiat, keeping him alive to bedevil the PCs again and again may prove difficult.

Variations: To make a Mercenary more sympathetic, perhaps his greed has a noble purpose — supporting a loved one, acting as a Robin Hood for the poor folk of the Galaxy, or paying off some helpless person's debts to the Interstellar Mafia. To make him less

attractive, give him depraved appetites or a sadistic streak. Since players may expect a Mercenary to redeem himself, the GM can throw them a curve by having him decide to put aside his materialistic goals and support the Galactic Tyrant!

OMNIPOTENT ALIEN

Most alien species aren't far different from Humans in terms of personal power. They may have slightly different physical capabilities, mental powers, or the like, but by and large they're interchangeable with Humans. But sometimes science fiction heroes encounter aliens who blow that paradigm out of the water. Like the Q of *Star Trek: The Next Generation*, the Slavers of Larry Niven's "Known Space" stories, or the mysterious aliens watching Earth in Arthur C. Clarke's *Childhood's End*, they possess so much power — either innately, or due to their ultra-advanced technology — that they're effectively omnipotent.

Useful Features: Because he outclasses the PCs so, the Omnipotent Alien can put them in whatever situation he (*i.e.*, the GM) wants. Hurl the characters' starship across the Galaxy, transform all the PCs into members of a different species (or gender), create new foes for the PCs to fight — whatever you as GM want, the Omnipotent Alien can provide it, and often in such a way as to raise intriguing moral or ethical issues.

Potential Problems: Because he outclasses the PCs so, the Omnipotent Alien may be regarded as unbeatable. Frustrated and depressed, the PCs don't act as heroes should, but instead give in to the Alien's demands or become silly. And the old Omnipotent Alien chestnut of "grant a Human absolute power and see what he does with it" is as likely to backfire as work in a roleplaying game.

Variations: Make the Omnipotent Alien a member of the characters' own species who's been "elevated" somehow, thus possibly giving them psychological "hooks" with which to oppose him. Or perhaps the Omnipotent Alien is genuinely helpful, not the aloof, condescending "superior being" or wise-cracking gadfly he's usually depicted as. Take the Omnipotent Alien's power away for a while and see how he and the PCs interact.

PUPPET

A Puppet is a villain controlled by another. The fact that he is controlled may be common knowledge, or a deep secret revealed only at the climax. Mundane puppets are people like a weak ruler dominated by his shrewd minister, or a politician who owes favors to a crime syndicate. Science fiction allows for puppets who really *are* puppets — psionically brain-washed, controlled by brain implants (like Chekov in *Star Trek II: The Wrath of Khan*), or replaced by alien shapeshifters (like several characters in *Star Trek: Deep Space Nine*).

Useful Features: If nobody knows the Puppet is controlled by another, the heroes may struggle to defeat their ultimate enemy, only to discover he's a hapless victim. If the Puppeteer is a weak-willed incompetent, the heroes have to cope with the problem that removing the evil councillor leaves the Puppet in

charge by himself. And of course, a sufficiently powerful Puppeteer may decide the heroes themselves make good Puppets.

Potential Problems: Trigger-happy heroes may not let their opponent survive long enough to reveal that he was a Puppet. Mundane Puppets tend to be weak personalities, making them kind of boring as enemies.

Variations: A really shrewd villain may only pretend to be a Puppet, so that when things go bad he can blame his Puppeteer. In a really Machiavellian campaign, there could be several layers of Puppeteers, each pulling the strings of those below him. A Hero Gone Bad may turn out to be a Puppet.

REBELS

Rebels are sometimes heroes, when the government they oppose is evil or tyrannical. But a legitimate state can still have enemies. A look at the evening news may give an idea of the evil people are capable of when they are fighting what they consider oppression.

Useful Features: Rebels often are few in number and poorly equipped, making them good opponents for PCs. They may put millions at risk through acts of terrorism, so that in even a small-scale campaign the heroes can have a major effect on the world. Fanatical terrorists are gaining on the Nazis as the enemy everyone loves to hate.

Potential Problems: The very topicality of adventures involving terrorism and guerrilla warfare can make some players uncomfortable. Practical-minded heroes may simply call the Galactic Patrol and let them handle the rebels (unless the heroes are the Patrol, of course). And as the old saying goes, one man's terrorist is another's freedom fighter — players may find the rebel cause more attractive than the established order the GM expects them to defend.

Variations: Sometimes a rebel turns out to be the Puppet of some rival state, trying to sow chaos and weaken its enemies. If the rebels' motives really are noble, a rebel villain makes a good Honorable Enemy. Historically, rebels often contract with Mercenaries who have useful skills.

ROGUE PSI

The psionic villain, using his insidious mental powers to dominate normals, dates back to the discovery of hypnotism, at the very least. One of the best psionic villains is the creepy Mr. Bester of *Babylon 5's* Psi Corps, but plenty of others populate the pages of science fiction. While telepathy is the most common Rogue Psi power, the anime film *Akira* includes powerful telekinetics run amok. Of course, the term "Rogue Psi" assumes people with psionic powers normally have to follow a set of rules and that mechanisms exist to control them — otherwise "Psi" itself may qualify as a villain category.

Useful Features: Rogue Psi villains make excellent puppet masters, especially if their powers are a secret. Player characters with secret abilities of their own may have to oppose a Rogue Psi without exposing their own powers. If society oppresses psionic individuals, the PCs may sympathize with

them, creating a blind spot the Rogue Psi can exploit.

Potential Problems: A powerful psi pitted against non-psionic characters may be too strong to overcome. Conversely, if the psi's powers aren't effective in a confrontation, the PCs can simply shoot him or beat him up.

Variations: If an Enemy Species has psi powers, it may be a nearly unstoppable (and very sinister) foe. A Rogue Psi may well be a Rebel against whatever oppressive measures are used to control mental powers. Psionic tyrants (like Asimov's Mule) can literally rule the Galaxy by force of will, turning captured enemies into loyal servants.

ROGUSH CON MAN

Somewhere in the grey area between heroes and villains stands the Roguish Con Man. His motives are unworthy, his methods are unethical, but you can't help but like the guy. *Star Trek's* Harry Mudd is one well-done example, the early Han Solo is another; historical figures like Casanova serve as a model. Con Man characters are typically motivated by greed and selfishness.

Useful Features: Con Man opponents are good foils for heroes who are similarly devious and manipulative. They allow the GM to play the villain as intelligently as possible. Since their plots revolve around scams and crooked deals, they make for a less violent campaign.

Potential Problems: Coming up with a good con game to ensnare the PCs is hard work for the GM. Finding the right mix of charm and callous greed is tricky.

Above all, it's important to actually make the Con Man likeable, and that can be difficult to pull off.

Variations: A Roguish Con Man doesn't have to be just in it for the money; a silver-tongued enemy spy can work the same way for ideological motives. They make good puppetmasters for Puppet villains. A Roguish Con Woman with devastatingly attractive looks becomes a Femme Fatale.

NON-PLAYER CHARACTERS

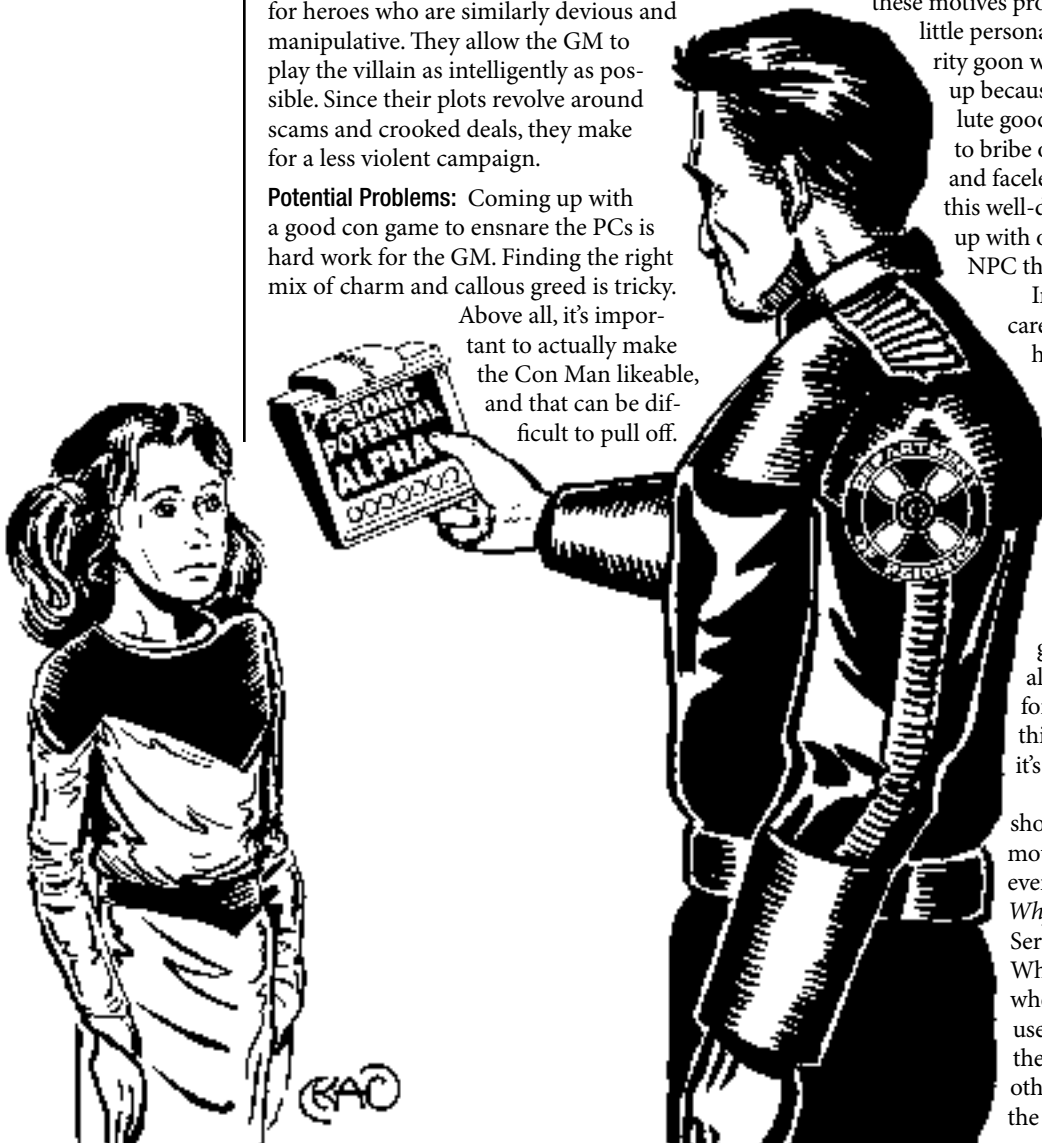
The world isn't divided evenly into heroes and villains. Most people in a campaign setting are simply non-player characters — NPCs.

In most cases what you need for a good, enjoyable NPC is a realistic, well-developed character. But that isn't always true. Realistic, well-developed NPCs tend to take over the story, leaving the heroes as spectators. It's actually more effective to keep many of your NPCs one-dimensional, but make them into memorable one-dimensional characters. Give them a distinctive habit or a manner of speaking for the heroes to remember. Players often forget NPC names, but they recall "the stuttering guy" or "the man with the onion."

Nonplayer characters have the same motivations as villains — desires, fears, and beliefs — and these motives provide a good way to give them a little personality. The PCs can bribe a security goon who's greedy, but one who joined up because he believes order is an absolute good reacts poorly (to say the least) to bribe offers. Obviously, spear-carriers and faceless hordes don't all need to be this well-developed, but it's worth coming up with one or two motivations for any NPC the heroes directly interact with.

Important NPCs need as much care and feeding as villains — a hero's DNPC, Rival, or Hunter should have some independent goals and a recognizable identity. Dependent NPCs usually are nice people (though one can have a good deal of fun with a hero who feels protective of a cranky or irritating NPC). Rivals should have a mix of good and bad traits, and above all should be competent enough for the Rivalry to mean something — if the hero always wins, it's scarcely a Rivalry.

If a hero is Hunted, the GM should give some thought to the motives of the Hunters. This is true even if it's a large organization. *Why* is the Imperial Intelligence Service tracking the character? What do they want him for? Even when the Hunter is a group, it's useful to give that group a face in the form of a "case officer" or some other member of the group who is the one the heroes have the most



dealings with. So when free-lance explorer Jamaica Jones is hunted by the Imperial Intelligence Service, the IIS officer in charge of the operation is Captain Zorm. Other IIS operatives may track Jones's movements or intercept her communications, but it's Zorm who questions her about the missing alien artifacts, Zorm who kidnaps Jamaica's clone sister to lure her into a trap, and Zorm who tracks her through the dark tunnels of the lost alien city.

NPC Archetypes

These are some standard character types who turn up again and again in SF stories and film. Gamemasters can use them as-is, or play against the stereotype by creating NPCs very different from these.

ALIEN SPECIES

As noted in Chapter Six, entire alien species sometimes play NPC-like roles in the campaign. See page 122 for more details.

CRUSTY OLD ADMIRAL

A dependable standby in all Space Opera games, the Crusty Old Admiral is the authority figure who sends the heroes out on missions, must be warned about the intergalactic menace, and sometimes needs rescuing from insidious perils. The Admiral is short-tempered, grey-haired, and usually conceals a twinkle in his steely eyes. In classic science fiction the Crusty Old Admiral was always a man, but more recent books and films have featured women just as gruff and overbearing as their male predecessors. The Crusty Old Admiral and other authority figures are a godsend to GMs, since they can order the heroes into an adventure point-blank.

Variations: In dark settings the Crusty Old Admiral may turn out to be a traitor, or plotting to make himself Emperor, or both. Even if his motives are good, the Crusty Old Admiral may be too suspicious of old enemies, too willing to use force instead of diplomacy, or too dismissive of things like civil rights and due process. Take away his Admiral's uniform and he becomes the Crusty Old Colony Governor or Sector Administrator. In Cyberpunk games he gets a greying ponytail and a vocabulary studded with Marxist jargon as the Crusty Old Activist.

DOCTOR

When you've been shot by the Mind Police, or need a new face to evade the Interstellar Mafia, or want to get some alien goop analyzed without tipping off the authorities, it's time to visit your friendly Doctor. On Galactic Patrol ships, the Doctor sometimes serves as the informal advisor for everyone on board, including the captain. In Cyberpunk settings, the street doc wears dreadlocks and lost his license because he wouldn't knuckle under to the corps. Post-apocalyptic Doctors have a carefully-hoarded supply of antibiotics and strong opinions about sanitation. Many Doctors take a dim view of technology, even as they make use of advanced medical gadgets.

In *Star Hero* campaigns, the Doctor is often just a faceless "repair station" for heroes after they shoot it out with the villains. Gamemasters can make Doctors more vivid by giving them strong opinions and personality quirks the players can remember. Using the Doctor as a plot hook is one way to make him (or her) come alive. Medical professionals know a lot of confidential information about people — sometimes more than is healthy....

Variations: Doctors sometimes dabble in Mad Science, both for good and evil. Historically, frauds often promised miracle cures and claimed medical degrees; a fake doctor on a frontier planet may be the only medical care available.

SECURITY OFFICER

When someone calls the cops, this is who shows up. Security officers may wear red shirts, white armor, or blue uniforms, but their job is always the same — they keep the peace and enforce the law. In lawless settings the Security boys are there to serve whoever has power — corporations in Cyberpunk worlds, warlords in post-apocalyptic campaigns, or the Galactic Tyrant in Space Operas. They tend to be large, humorless, and bad shots... and distressingly short-lived, even when they're working for the good guys.

While it's traditional for Security goons to be faceless and say little besides "Halt!" and "Unnh!", a clever GM can personalize them and add a little depth to encounters. If the heroes have gotten to know Ensign Kowalski over a few game sessions, they'll be genuinely upset and vengeful when the Superego Monster eats his cerebellum.

Variations: The best Security officers enforce the law and obey it themselves, respecting the rights of the accused even as they pursue lawbreakers tirelessly. Less admirable cops serving tyrants or villainous corporations may be little better than thugs. A few walk the fine line in between — doing their best to preserve order but a little weak on things like Miranda rights. Psionic Security officers become the scary Mind Police. Security robots are even more humorless and worse shots than their Human analogues. In a Planetary Romance setting, Security officers become Guards, whose job description is mostly seizing people.

STREETWISE KID

Ever since Tom Sawyer and Huck Finn, meddling kids have been uncovering villainous plots, acting as the eyes and ears of grown-up heroes, and generally having a ball getting into trouble. If Streetwise Kids have families at all, they're massively dysfunctional, so that no bothersome parents object to their child staying out all night or going on pick-up commando raids with live ammo. Streetwise Kids have high DEX and remarkable skill at acting, lying, and conning grown-ups. They often have well-developed abilities at picking pockets, shoplifting, and climbing walls. Combat Luck is very common. Cyberpunk Kids have fantastically high skills at computer hacking and programming, while Space Opera Kids exhibit precocious scientific or starship piloting abilities.

Gamemasters can use Streetwise Kids as an occasionally reliable source of information, victims to be rescued, or even as the innocent-looking stooges of the villains. Most people are protective of the young, which makes it that much more wrenching when a Streetwise Kid falls into the clutches of a serial killer or alien parasite.

Variations: Planetary Romance Kids are known as Urchins, and may be the only ones who believe the heroes are really from another planet. Kids with psionic powers may be a lot more formidable than they appear, and can turn into Rogue Psis if the heroes aren't careful; wild talents are surprisingly common among psionic outcast children. To give the players a nasty surprise, borrow from contemporary headlines and make the Streetwise Kid a deadly and conscienceless killer.

SUPPLIER

Whatever you want to buy, he's got it. Legality is no obstacle as long as the price is right. In a Space Opera setting he runs a trading post on the frontier; in Cyberpunk games he has a shop down in the city's lowest levels, his address known only to the top hackers and samurai. Frontier traders are often generalists, but starbase or big-city Suppliers usually specialize in a single type of commodity — guns, drugs, software, or rumors.

Suppliers tend to be shifty-eyed, cynical, and furtive. They follow two rules: get payment in advance; and don't get involved. But when the situation is desperate and defeat seems inevitable, the Supplier disappears into his back room to bring out the heavy-duty special merchandise he's been saving for emergencies.

Suppliers are handy NPCs for GMs, as they can

release just enough information to steer the players in the right direction, without giving them the whole story ("Sorry, you didn't pay me for that.") As a plot hook, the Supplier is ideal for putting the heroes together with someone who wants to hire them (perhaps in exchange for a cut of their fee...).

Variations: Sometimes the shady Supplier with his finger on the pulse of black-market trade turns out to be an agent for either the Rebels or the Galactic Patrol. Sometimes he's working for both. A Supplier whose trade is genuinely immoral — dangerous drugs, slaves, stolen organs — can be a questionable ally for heroic characters.

TECHNICIAN

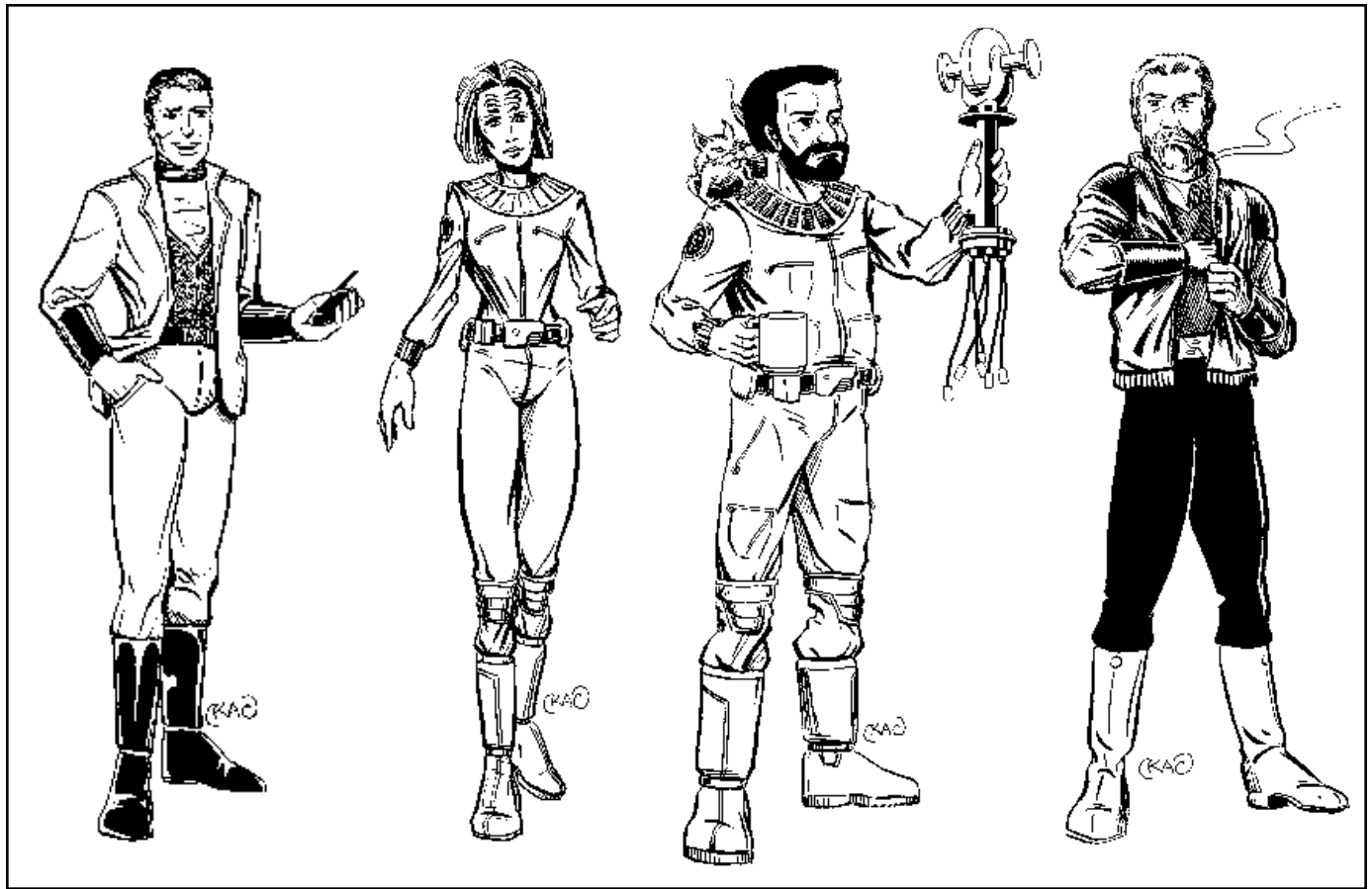
Science fiction settings usually have lots of machines, and someone has to operate and repair those machines. Technicians can be civilian engineers, military techs, highly-trained mission specialists, brilliant programmers, or grimy street techs. In Post-apocalyptic settings, they may be the only ones left who understand ancient machinery. Whatever the setting, technicians are usually portrayed as more comfortable around machines than people, sometimes with eccentricities a mad scientist would envy. Occasionally one is a beautiful woman (and potential romantic interest for the PCs) once you clean the grease and grime off her face and change her out of a spaceman's jumpsuit into more presentable clothing. Regardless, when the chips are down and the clock is ticking, the Technician can work miracles, re-engineering starships or computer networks on the fly to save the day.

Technician NPCs can be a good GM's mouthpiece when the PCs need to learn some details of the setting's technology. The GM can also use an

NPC technician to keep vital systems running when the plot demands it.

Variations: In many science-fiction settings, Technicians may be specialized repair robots. This usually doesn't improve their social skills any, but it does provide them with all kinds of nifty built-in tools and gadgets. Give a Technician some combat training and a utility belt full of high-tech toys and he becomes the Specialist, an essential part of any special-ops military unit or espionage team. Combine a Technician and a Supplier and you get a Street Tech, who'll fix your cyber-arm and sell you the latest in illegal Finnish hacking software — cash only.





Characters

ARGOS EXPLORATION

To help you get your *Star Hero* campaign started, here are five sample player characters — the members of Argos Exploration — and five adversaries they might encounter. All of them are from Hero's "Terran Empire" setting for *Star Hero*, but you can easily adapt them to your own universe. You can find out more about the Terran Empire in the appro-

priately-named *Terran Empire* source-book.

Because GMs may need to adapt these characters to a wide variety of settings and situations, their lists of "Equipment Carried" are fairly short and simple. In addition to listed items, they could certainly have just about any commonly-available piece of technology the GM needs them to have.

ARGOS EXPLORATION



Membership: Robert Avilla, Jennifer DeGraff, Jason Grigori, Segaro Krez'shul, and Kiritha Tal

Background/History: Argos Exploration looks on paper, and tries to pass itself off in person, as a “freelance exploration and mercantile firm” — a small company of bold explorers and traders who “prospect” among the stars of the Galaxy for inhabitable planets, new trade routes and markets, and other such things of value. But while it is that, in truth it's also a refuge for a number of kind-hearted scoundrels who've found themselves on, one might say, less than the best of terms with the Imperial authorities.

Argos was founded by Robert Avilla, a free trader and gambler with a reputation for taking on dangerous trade runs, and even engaging in a bit of smuggling and other shady dealings. Then he ran afoul of a notorious Hzeel arms merchant named Zee'gansh, from whom he won a prodigious sum of money in a card game Zee'gansh himself had rigged. Zee'gansh exposed some of Avilla's less-than-legal activities to the Imperial Security Police, and had him framed for other crimes he wasn't responsible for. Unwilling to spend the rest of his life on an Imperial prison-world, Avilla realized he needed to disappear.

Using his skills, and a few contacts he'd developed over the years, Avilla created a new identity (Kaithon Argosina, a Human merchant and explorer), used Zee'gansh's money to buy a ship (the aptly-named *Jackpot*), and set up Argos Exploration as a way of making money and preserving his freedom to move about the Galaxy. But he realized he needed to make Argos look legitimate; a one-man company wouldn't provide much cover for very long.

His first “employee” came along in the form of Segaro Krez'shul, a Mon'dabi con artist and thief whose life Avilla had saved. Feeling bound by the obligations of honor, Krez'shul appointed himself Avilla's “bodyguard,” and the two became fast friends. Argos now had an “executive assistant.”

Since Argos had a ship, it needed a crew. For a pilot, Avilla could think of no one better than his ex-wife, Jennifer DeGraff. While the two of them had learned long ago they couldn't live together, they never seemed to remain away from one another for very long — and she was an ace pilot, no question about that. Seeking to escape some legal entanglements of her own, DeGraff was glad to go to work for Argos Exploration.

For the position of ship's engineer, Avilla tapped his old friend Jason Grigori, whom he'd known since the time the two of them formed an

impromptu team during a barfight and ended up as the only two people left standing when the dust settled. A hard-drinking, hard-working, hard-fighting, wise-cracking genius of a mechanic, Grigori loved to travel and see new sights, so the Argos job suited him perfectly.

It then occurred to Avilla that his exploration company probably needed an *explorer* — a scientist versed in planetology and the skills of surveying worlds. After scouring a number of Imperial universities, he found Kiritha Tal, a young Perseid woman with an unconventional outlook on life and a thirst for adventure. Eager for a job that wouldn't bore her, Tal accepted Avilla's offer to join the *Jackpot*'s crew.

Argos Exploration has maintained its payroll of five for a couple of years now as the team journeys into uncharted regions of space, engages in free trading, and occasionally gets mixed up in some rather unusual adventures. Often just one step ahead of the law, the Argosians have somehow managed to come out ahead in all of their escapades. They're having a fine time and making good money, so they plan to keep on doing exactly what they're doing. They're always on the lookout for “bold new opportunities,” as Avilla likes to say.

Group Relations: Kindred souls brought together by circumstance and a mutual love of free travel and adventure, the members of Argos Exploration get along quite well. Although Avilla is the *Jackpot*'s captain, and nominally “first among equals,” the group actually runs more like a democracy. Profits are split evenly five ways, and everyone has a say in major decisions.

Other than the unwelcome attentions of the Imperial authorities and other enemies they've made, only two things trouble the Argosians. The first is the relationship between Avilla and DeGraff. Still attracted to one another, but with personalities that frequently clash, they often end up quarrelling. Even though these fights are rarely serious, they sometimes cause stress and strain within the crew. Second is the fact that they have to keep some of the truths about Argos from Kiritha Tal. The young, and in some ways still naive, Perseid isn't so blind as to think Argos Exploration doesn't engage in some questionable activities, but she's not aware of “Kaithon Argosina”'s true identity or all of his background. Sooner or later, she's bound to find out, and Avilla worries about how she'll react. He's also concerned she may unknowingly alert the Imperial Security Police to his presence without meaning to. So far, none of the things he fears have come to pass, but you never know what may lurk just over

the galactic horizon....

Tactics: The members of Argos prefer *not* to fight if possible; they'd rather avoid anyone who intends them harm, or at worst find a way to talk themselves out of any predicament they've gotten into. But when push comes to shove and blasters are drawn, they're skilled and dangerous combatants. Krez'shul and Grigori usually prefer hand-to-hand fighting (though they're good shots as well). While they mix it up with the enemy, the others usually try to get behind cover and support them with blaster fire. DeGraff can sometimes call upon her psionic powers to help in combat situations, but because they're so difficult for her to use Avilla rarely counts on them.

Campaign Use: Argos Exploration makes a good ally or rival for a group of similarly-minded PCs. Its members, though not exactly squeaky clean, are good-hearted people who don't use their criminal skills to steal from innocent people, wreck lives, or cause serious harm to anyone who doesn't deserve it. The authorities may assign a group of PCs associated with the Imperial government to capture them, while a group one with little or no respect for the Empire's officials may team up with the

Argosians for an adventure or two. A friendly — or not-so-friendly — rivalry, or romantic relationships, may develop between the members of the two groups.



ROBERT AVILLA

Val	Char	Cost	Roll	Notes
10	STR	0	11-	Lift 100 kg; 2d6 [1]
18	DEX	24	13-	OCV: 6/DCV: 6
15	CON	10	12-	
12	BODY	4	11-	
18	INT	8	13-	PER Roll 13-
11	EGO	2	11-	ECV: 4
20	PRE	10	13-	PRE Attack: 4d6
14	COM	2	12-	
5	PD	3		Total: 8 PD (3 rPD)
5	ED	2		Total: 8 ED (3 rED)
4	SPD	12		Phases: 3, 6, 9, 12
5	REC	0		
30	END	0		
30	STUN	5		Total Characteristics Cost: 82

Movement: Running: 7"/14"

Cost Powers **END**
2 *Fast On His Feet:* Running +1" (7" total) 1

Perks
2 Deep Cover (Kaithon Argosina)

Talent
6 Combat Luck (3 PD/3 ED)

Skills
3 Bureaucratics 13-
3 Combat Piloting 13-
3 Disguise 13-
1 Electronics 8-
2 Gambling (Card Games) 13-
3 High Society 13-
2 AK: Centauri Trade Routes 11-
2 KS: Imperial Scout Service 11-
1 Mechanics 8-
2 Navigation (Space) 13-
3 Persuasion 13-
1 SS: Planetology 8-
3 Sleight Of Hand 13-
3 Stealth 13-
3 Streetwise 13-
4 Systems Operation (Communications Systems, Radar, FTL Sensors) 13-
5 Trading 14-
8 TF: Commercial Spacecraft & Space Yachts, Industrial & Exploratory Vehicles, Military Spacecraft, Personal-Use Spacecraft
6 WF: Beam Weapons, Energy Weapons, Small Arms

Total Powers & Skills Cost: 68
Total Cost: 150

75+ Disadvantages
20 Hunted: Imperial Security Police 8- (Mo Pow, NCI, Capture)
15 Hunted: Zee'gansh 8- (As Pow, NCI, Kill)
10 Psychological Limitation: Wanderlust (Common, Moderate)
5 Reputation: wanted criminal 11- (throughout the Empire; about 20 billion people are

THE JACKPOT

For Avilla's ship, the *Jackpot*, you can use the Merchant Ship on page 222. Just install a few unlisted (and possibly illegal) "upgrades" — a little more speed, an extra weapon or two, or the like — to make it distinctive.

- aware of Reputation)
- 10 Rivalry: Professional, with Bertrand Devereaux (Seeks To Harm Avilla)
 - 15 Social Limitation: Secret Identity (maintains the cover of "Kaithon Argosina") (Frequently, Major)

Total Disadvantage Points: 150

EQUIPMENT CARRIED

Blaster pistol
 Pocket blaster
 Body armor applicable to situation
 Hand computer
 Nightsight monocular
 Quick disguise kit
 Deck of cards
 100-1,000 credits' worth of the local currency (if applicable)

Background/History: As a restless young man growing up on Sigma Draconis III, Robert Avilla yearned to see the wider Galaxy, so when he turned 18 he joined the Imperial military. Based on his aptitude tests and performance evaluations, he was assigned to the Imperial Scout Service — just what he wanted. He spent a year learning how to fly starships and astronavigate, and then for the rest of his hitch surveyed various regions of space for the Terran Empire.

When his hitch was up, he decided he'd had enough of military discipline, so he mustered out and joined a group of free traders. His time with them was educational, but ultimately no more satisfying than being a scout; he still had to follow orders and curb his desire to do what *he* wanted. He took out his frustrations through gambling, drinking, and general misbehavior, which didn't help his reputation among his fellow traders.

After several years, Avilla's conduct became too much for his bosses to tolerate, and he was fired. He drifted into the underworld, and got involved in smuggling and other unsavory activities. This wasn't exactly what he wanted to do, either, but he had a lot more personal freedom than he did as a normal free trader. He almost got caught by the Imperial Security Police a few times, but somehow he always came out free and clear, with nothing but a few suspicious notes in his growing Imperial file.

During one of his smuggling runs, he had the misfortune to encounter some pirates. He tried to run, but in the end they caught him, beat him, and took his cargo. After that, no one would trust him; somehow the word got out that he'd been working with the pirates to cheat his employer.

That's when Lady Luck stepped up and kissed him smack on the lips. Figuring he had nothing to lose, he took all of his remaining money to a casino on Shalagar VII and got into a high-stakes card game. Then he started winning... and winning... and winning. He knew he should cash out and thank his lucky stars, but he just couldn't do it — the smug Hzeel across the table kept taking too many pots

from him, and he was determined to win once and for all.

Eventually, it came down to him and the Hzeel, an arms dealer named Zee'gansh. Raise followed raise, until literally billions of credits were in play and the entire casino had gathered around to watch. Avilla called, and the Hzeel triumphantly laid down his cards: a golden rhombus! The crowd looked sorrowfully at Avilla as Zee'gansh reached for the money — only to gasp in astonishment as Avilla showed that he held a diamond rhombus!

Avilla knew opportunity when he saw it. Rather than waste the money on foolish luxuries, he decided it was time to turn himself around and get on with living the life he'd always envisioned. With some help from his friend Segaro Krez'shul, he created a new identity — Kaithon Argosina, merchant and explorer — and used his winnings to buy a small ship which he christened the *Jackpot*. Then he set up Argos Exploration, and ever since he's been enjoying a life of adventure, excitement, and profit.

Personality/Motivation: Avilla is a classic "rogue with a heart of gold." Although he often finds himself slightly on the wrong side of the law, his intentions are usually good, and he doesn't commit crimes that hurt people who don't deserve it. Really, all he wants is to live his life free of unnecessary entanglements or Imperial interference. He wants to go where he pleases, when he pleases. He loves to see and experience new things, making him an enthusiastic (if not formally trained) explorer and free trader. Getting him to sit still in one place for much longer than a month is difficult.

Quote: "Okay, what have you gotten us into *now*?"

Powers/Tactics: Avilla's been in his share of barfights and blaster battles, but he's not a fighter — he'd rather avoid, outrun, or talk himself out of trouble. If forced to fight, he'll often fight sneaky, using concealed weapons or underhanded tactics; he cares about winning, not nobility or honor.

In most combats, Avilla gets behind cover as soon as possible, and then begins shooting at the most obvious targets. He favors unorthodox tactics, such as tricking an opponent into thinking he's facing twice as many people as he really is, and has something of a flair for thinking them up.

Appearance: Robert Avilla is a handsome Human male in his early 30s, standing 6'2" tall with a broad, muscular build. He has dark hair, which he keeps short and well-styled, and is clean-shaven. When he expects to encounter important people or conduct business, he wears appropriate attire that's stylish but not overly expensive. When he's lounging around the *Jackpot* or on an exploration mission, he dresses more comfortably — typically in dark pants, matching shirt, and well-polished boots, and sometimes with a jacket or vest if appropriate or necessary.

JENNIFER DEGRAFF

Val	Char	Cost	Roll	Notes
10	STR	0	11-	Lift 100 kg; 2d6 [1]
20	DEX	30	13-	OCV: 7/DCV: 7
15	CON	10	12-	
10	BODY	0	11-	
15	INT	5	12-	PER Roll 12-
18	EGO	16	13-	ECV: 6
15	PRE	5	12-	PRE Attack: 3d6
16	COM	3	12-	
4	PD	2		Total: 7 PD (3 rPD)
4	ED	1		Total: 7 ED (3 rED)
3	SPD	0		Phases: 4, 8, 12
5	REC	0		
30	END	0		
30	STUN	7		Total Characteristics Cost: 79

Movement: Running: 6"/12"

Cost Powers **END**

- 10 *Telepathic Probe:* Telepathy 8d6; Activation Roll 14- (-½), Concentration (0 DCV throughout Extra Time and probing the subject's mind; -1), Extra Time (1 Turn; -1¼), Limited Range (15"; -¼) 4
- 7 *Mental Attack:* Ego Attack 1d6, Continuous (+1); Activation Roll 14- (-½), Concentration (½ DCV throughout; -½), Extra Time (Full Phase; -½), Limited Range (15"; -¼) 2

Talent

- 6 Combat Luck (3 PD/3 ED)

Skills

- 7 Combat Piloting 15-
1 Cryptography 8-
1 Electronics 8-
1 Gambling (Card Games) 8-
2 AK: Centauri Trade Routes 11-
1 KS: Alphadyne Mercantile Combine 8-
4 Navigation (Space) 14-
3 Persuasion 13-
1 SS: Planetology 8-
3 Stealth 13-
9 Systems Operation (Communications Systems, FTL Sensors, Radar, Sensor Jamming Equipment) 14-
3 Trading 12-
6 TF: Commercial Spacecraft & Space Yachts, Industrial & Exploratory Vehicles, Personal-Use Spacecraft
6 WF: Beam Weapons, Energy Weapons, Small Arms

Total Powers & Skills Cost: 71

Total Cost: 150

75+ Disadvantages

- 5 Distinctive Features: Margravite psionic's tattoos (Easily Concealed, Noticed And Recognizable)
25 Hunted: Alphadyne Mercantile Combine 11- (Mo Pow, NCI, Capture/Kill)

- 15 Psychological Limitation: Thrillseeker (Common, Strong)
10 Psychological Limitation: Still Attracted To Robert Avilla Even Though She Knows He's Bad For Her (Common, Moderate)
5 Reputation: risk-taking pilot 11- (throughout the Empire; about 20 billion people are aware of Reputation)
5 Social Limitation: Psionic (Occasionally, Minor)
10 Susceptibility: to strong mental emanations within 4", takes 1d6 per Turn (Uncommon)

Total Disadvantage Points: 150

EQUIPMENT CARRIED

Blaster pistol (or pocket blaster, depending on situation)

Body armor applicable to situation

Hand computer

Personal HoloChamber™ goggles

Background/History: Born and raised on Epsilon Indi III, better known as Margrave's World after its discoverer, Jennifer DeGraff tested as psionic-positive while still in school. Following Margravite tradition, her inner wrists were tattooed with a purple square moline cross, so everyone would know she possessed mental powers.

Eager to leave her homeworld, which she considered sort of a boring backwater, Jennifer attended piloting school. While still a student, she met Robert Avilla, a cadet at the Imperial Scout Service Academy. The two fell in love, and after a whirlwind courtship, were married. That soon proved to be a mistake. Although they *were* in love, they just couldn't live together for long periods of time, or really get along well. They soon obtained a divorce, though they remained in contact and periodically saw each other after that.

Based on her high scores at piloting school, Jennifer got a pilot's job with the Alphadyne Mercantile Combine, a large corporation. She soon developed a reputation as a skilled, even slightly daredevil, starship jockey — though her risk-taking cost her more than a few jobs, too. She enjoyed the work, though it got monotonous at times.

Things took a turn for the worse when Alphadyne discovered she was psionic — a fact she'd carefully failed to mention on her employment application. She was soon transferred to the company's psionics division, where she sat in on important business meetings to monitor whether the parties with whom Alphadyne was negotiating were telling the truth. She loathed the job; it was distasteful and boring.

One day, while monitoring a high-level meeting concerning the acquisition of an Altairan manufacturing corporation, Jennifer picked up thoughts from one of the Alphadyne executives that revealed some highly illegal conduct by the company in regard to this deal, and other deals. Shocked, Jennifer reported the executive... only to find out his superiors, and for that matter the direc-

tors of the corporation, were aware of it! They'd *sanctioned* the criminal conduct, not only for those deals but on many other occasions. And now that Jennifer knew about it, they'd have to see that she didn't talk... ever.

Jennifer ran, but without having a good place to hide, she found the Alphadyne "bounty hunter" teams always just a few steps behind her. Then she heard from Robert again. He was starting up a new exploration business, and needed a pilot. Would she be interested in the job?

Personality/Motivation: Jennifer, like many pilots, has a well-deserved reputation as a thrillseeker. She dislikes anything that's routine, boring, or ordinary;

she wants excitement and danger (though not too much of the latter). She's got a strong streak of "No problem, I can do it!" confidence that causes her shipmates to become concerned whenever there's an asteroid field blocking their flight path. Her favorite phrase, "Nothing to worry about!", is guaranteed to make them worry.

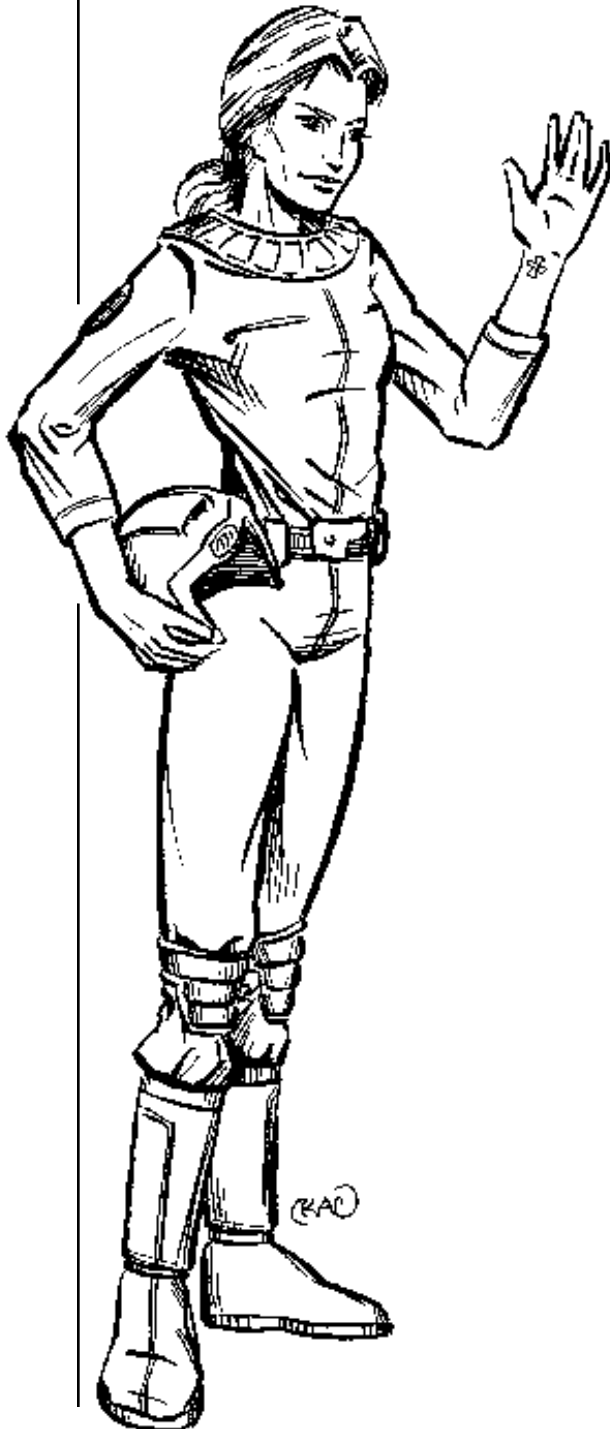
One of the reasons Jennifer accepted Avilla's job offer is that she's still attracted to him (as he is to her, just not quite as strongly). Although she knows getting involved with him would be stupid, and that he's really not good for her, she can't help how she feels. In any dangerous situation, she's likely to rescue or help him first, even if some other Argosian needs her help more.

Quote: "Sit tight! We'll be through this in a minute. Nothing to worry about!"

Powers/Tactics: Jennifer DeGraff is a skilled, experienced pilot with a natural gift for astrogration and spaceflight. But she's got something other, equally-skilled pilots don't: psionic powers. She has two low-level abilities, telepathy and the ability to induce mental pain ("You're a headache in more ways than one," as Avilla sometimes tells her). She may develop additional powers in time, or improve the ones she has. Unfortunately, her psionic defenses aren't well-developed (*i.e.*, she has not bought Mental Defense). This makes it difficult for her to block out strong mental emanations near her, which cause her intense pain. ("Strong mental emanations" include the use of any Mental Power, the use of most other powers with a "psionics" special effect, and sometimes even the presence of *extremely* strong minds.)

Because her psionic powers take time to work and aren't really powerful, DeGraff rarely uses them in combat. Instead, she prefers to rely upon her fast reflexes and good aim. She has no hand-to-hand combat skills to speak of.

Appearance: Jennifer DeGraff is an attractive 28-year-old Human female, short (5'4") and of slight build. Her blonde hair is a little longer than shoulder length; she keeps it tied back in a ponytail so it doesn't get in her way during zero-g situations. Both of her inner wrists sport a small purple tattoo of a square moline cross, marking her as a psionic to those who are aware of Margravite customs. Jennifer typically wears a dark blue pilot's jumpsuit, with sleeves that end halfway down her lower arm so they never interfere with working a starship's controls.



JASON GRIGORI

Val	Char	Cost	Roll	Notes
15	STR	5	12-	Lift 200 kg; 3d6 [1]
15	DEX	15	12-	OCV: 5/DCV: 5
18	CON	16	13-	
15	BODY	10	12-	
18	INT	8	13-	PER Roll 13-
10	EGO	0	11-	ECV: 3
15	PRE	5	12-	PRE Attack: 3d6
10	COM	0	1x-	
8	PD	5		Total: 8 PD (0 rPD)
6	ED	2		Total: 6 ED (0 rED)
4	SPD	15		Phases: 3, 6, 9, 12
7	REC	0		
36	END	0		
37	STUN	5		Total Characteristics Cost: 86

Movement: Running: 6"/12"

Cost	Powers	END
7	<i>Brawling:</i> HA +2d6; Hand-To-Hand Attack (-½)	1

Talent

3	<i>I Can Drunk Just As Good Fight!:</i> Environmental Movement (no penalties when drunk)

Skills

5	+1 Hand-To-Hand
5	Computer Programming 14-
3	Demolitions 13-
5	Electronics 14-
1	AK: Centauri Trade Routes 8-
2	KS: Obscure Tech Specs & Trivia 11-
1	KS: Classical Music 8-
3	Inventor 13-
1	Lockpicking 8-
5	Mechanics 14-
3	Security Systems 13-
3	Stealth 12-
9	Systems Operation (Communications Systems, Environmental Systems, Medical Systems, FTL Sensors, Radar, Sensor Jamming Equipment) 13-
2	TF: Personal-Use Spacecraft
6	WF: Beam Weapons, Energy Weapons, Small Arms

Total Powers & Skills Cost: 64

Total Cost: 150

75+ Disadvantages

15	DNPC: Napoleon (his pet <i>sokar</i>) 8- (Incompetent)
15	Hunted: Yorgen Vlar's pirate band 8- (Mo Pow, Kill)
10	Hunted: Dargen 8- (As Pow, Hurt/Kill)
15	Psychological Limitation: Loves A Good Fight (Common, Strong)
10	Psychological Limitation: Perpetually Grumpy (Common, Moderate)
5	Reputation: temperamental engineer 11-

(throughout the Empire; about 20 billion people are aware of Reputation)
5 Rivalry: Professional, with other engineers

Total Disadvantage Points: 150

EQUIPMENT CARRIED

Blaster rifle (or blaster pistol when he needs to be "subtle")

Body armor applicable to situation

Hand computer

Portable toolkit

Some spare parts

Background/History: A gifted engineer with a knack for making any system, no matter how jury-rigged or bizarre, work properly, Jason Grigori had no difficulty finding a job working on starships after he graduated from technical school. *Keeping* a job was another matter. He just didn't seem to fit in anywhere. During the day he was constantly grumpy, and at night he mostly seemed to spend a lot of time drinking, frequently getting into barfights in the process. With behavior like that, it wasn't easy to hold on to a job, so he drifted from ship to ship and world to world, getting by on the strength of his skills instead of his personality.

One night, in a bar on a space station orbiting a mining world on what was at the time the Imperial frontier, he picked a barfight bigger than even he could handle. Over a dozen Humans and aliens were about to start pounding him into the ground when another Human, a rakish looking free trader, said, "This doesn't look like even odds. I think I'll join him." By the time he and the other man — Robert Avilla — were done, the other fighters were all unconscious, and the two of them had become fast friends. Though their careers took them to different parts of the Galaxy, they kept in touch and periodically ran into each other.

A few years later, Grigori heard from Avilla again. It seems Avilla had gotten himself a ship somehow, and needed an engineer. The first person he thought of was his old friend Jason. Preferring to have a boss he was simpatico with, instead of the ones who constantly nagged and berated him, Grigori walked out on his job at the time (for an unsavory group of pirates, who've sworn revenge for the trouble he caused them) and became a part of Argos Exploration.

Personality/Motivation: Most of the time, Grigori is a quiet loner who gets grumpy, even surly, if people try to talk to him or otherwise distract him from his work — he's only truly pleasant with people he genuinely likes, such as Avilla or Segaro Krez'shul. Though he's not rude, he doesn't have as much tact as he should, and is quick to make his dislike of a situation or person evident through facial expressions and clipped comments. When working, he prefers to be left alone, with only the ship's computer playing classical music far too loudly to keep him company.

The only time Grigori “comes alive” is when he’s drinking. He has a prodigious capacity for alcohol, which rarely seems to impair him (in fact, he says he does some things, such as fighting, better when he’s been drinking). After he’s had a few, he’s prone to mischief, and often picks fights. He loves a good scrap, be it with fists or lasers, and it’s often hard to drag him away from a battle even when he knows it would be smarter to leave.

Quote: “Yeah yeah, fix the food processing unit, I got it. Go away.”

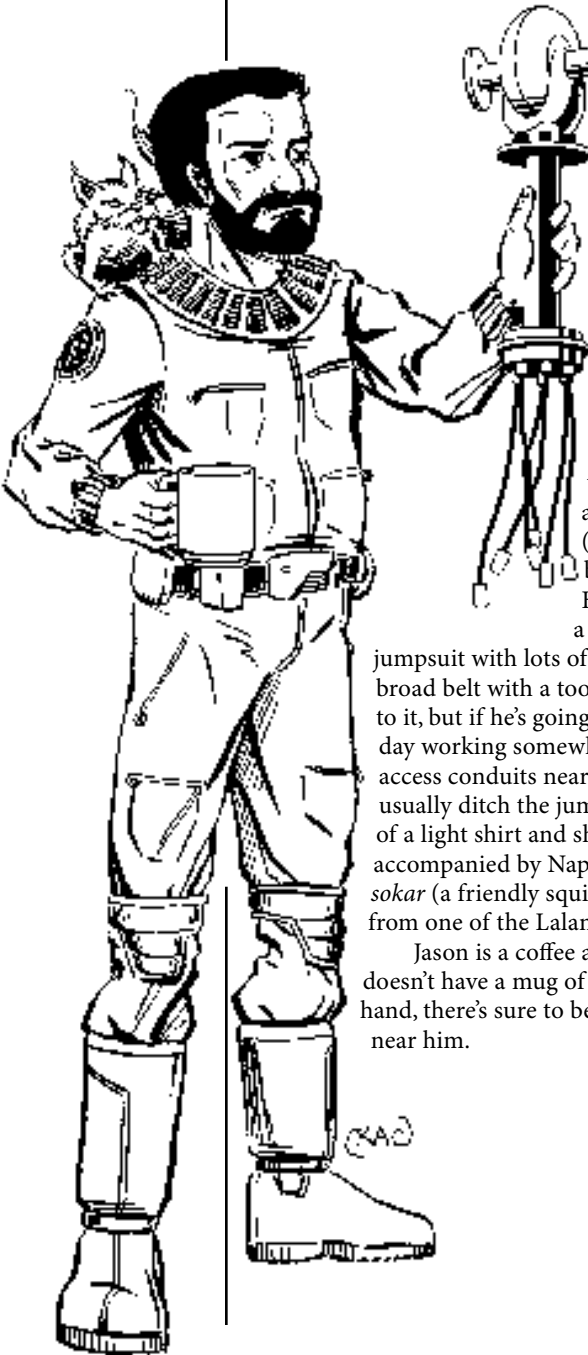
Powers/Tactics: In combat, Grigori is a straight-forward and aggressive fighter. He’ll pick the biggest guy he can find and light into him with fists (if possible), or look for the best shot and then start shooting (if not). If Avilla can get him to stop *acting* and start *thinking*, he often finds clever

ways to use his engineering skills in battle that would ordinarily get drowned out by his love of fighting.

Appearance: Jason Grigori is a male Human, age 31, with short black hair and a short black beard. He’s 5’9” tall and weighs about 200 pounds (he’s a little pudgy, but not overly so). He usually wears a typical spacer’s

jumpsuit with lots of pockets, plus a broad belt with a toolpack attached to it, but if he’s going to spend the day working somewhere hot (like the access conduits near the engine) he’ll usually ditch the jumpsuit in favor of a light shirt and shorts. He’s often accompanied by Napoleon, his pet *sokar* (a friendly squirrel-like mammal from one of the Lalande worlds).

Jason is a coffee addict. If he doesn’t have a mug of coffee in his hand, there’s sure to be one on a table near him.



SEGARO KREZ'SHUL

Val	Char	Cost	Roll	Notes
20	STR	10	13-	Lift 400 kg; 4d6 [2]
16	DEX	18	12-	OCV: 5/DCV: 5
20	CON	20	13-	
18	BODY	16	13-	
13	INT	3	12-	PER Roll 12-
10	EGO	0	11-	ECV: 3
18	PRE	8	13-	PRE Attack: 3 ½d6
10	COM	0	11-	
8	PD	4		Total: 8 PD (1 rPD)
6	ED	2		Total: 6 ED (1 rED)
3	SPD	4		Phases: 4, 8, 12
8	REC	0		
40	END	0		
45	STUN	7		Total Characteristics Cost: 92

Movement: Running: 6"/12"

Cost	Powers	END
3	<i>Mon'dabi Teeth:</i> HKA 1 point; No STR Bonus (-½)	1
7	<i>Brawling:</i> HA +2d6; Hand-To-Hand Attack (-½)	1
1	<i>Mon'dabi Skin:</i> Damage Resistance (1 PD/1 ED)	0
3	<i>Mon'dabi Senses:</i> +1 PER with all Sense Groups	0
5	<i>Tail:</i> Extra Limb (tail), Inherent (+¼; Limited Manipulation (-¼))	0

Skills	
3	Bribery 13-
3	Computer Programming 12-
3	Conversation 13-
2	Forgery (Documents) 12-
1	Gambling (Card Games) 8-
1	AK: Centauri Trade Routes 8-
2	KS: Mon'dabi Underworld 11-
1	Lockpicking 8-
3	Persuasion 13-
3	Shadowing 12-
3	Sleight Of Hand 12-
3	Stealth 12-
3	Trading 13-
2	TF: Personal-Use Spacecraft
6	WF: Beam Weapons, Energy Weapons, Small Arms

Total Powers & Skills Cost: 58

Total Cost: 150

75+ Disadvantages

5	Distinctive Features: scars on neck, left leg, tail (Easily Concealed, Noticed And Recognizable)
15	Enraged: if tricked or fooled (Uncommon), go 11-, recover 11-
15	Hunted: Mon'dabi organized crime group 8- (Mo Pow, NCI, Limited Geographical Area, Kill)
10	Hunted: one of his scam victims 8- (As Pow, Capture)
15	Psychological Limitation: Protective Of

- Robert Avilla (Common, Strong)
- 10 Psychological Limitation: Prefers Brains Over Brawn (Common, Moderate)
- 5 Reputation: wanted criminal 11- (throughout Mon'dabi space, parts of the Empire, and elsewhere; about 20 billion people are aware of Reputation)

Total Disadvantage Points: 150

EQUIPMENT CARRIED

Pocket blaster (sometimes a blaster pistol instead)

Body armor applicable to situation

Hand computer

Precision writing implements (for Forgery)

Lockpicking equipment

Two or three different decks of cards

Background/History: Born into a poor family in a poor neighborhood of the capital on Mon'da, Segaro Krez'shul got involved in petty crime as a teenager. Although big and strong, and therefore good at "muscle" work and protection rackets, he preferred to use his mind and agile hands rather than his fists whenever possible. Slowly but surely, he drifted away from street crime and into confidence games and fraud.

He was on his way to what might have been a brilliant career as a grifter when he made the mistake of pulling a scam on a Mon'dabi associated with a large organized crime group on his home-world. The "mark" brought a few "friends" over to teach Segaro a lesson... a *permanent* lesson. Segaro fled, hopping from world to world as he tried to keep ahead of his bloodthirsty pursuers.

But he couldn't run forever. They finally caught up to him in an alley on Vardel IV and were about to kill him when Robert Avilla, who saw what he thought was an innocent Mon'dabi being attacked by thieves, came to his rescue. Together they defeated the thugs and got away from Vardel IV without any serious repercussions.

Touched by Avilla's rescue, and believing he owed the Human his life, Segaro chose to become the free trader's constant companion, assistant, and "bodyguard." They worked together well, with Segaro's con-man skills complementing Avilla's abilities as a smuggler. When Avilla decided to go into business as Argos Exploration, Segaro came right along with him.

Personality/Motivation: Segaro Krez'shul is a clever, cagey individual who prefers to rely on his wits and guile rather than his muscles. He's perfectly capable of projecting an air of physical menace, or even fighting, if necessary — he'd just rather not if he can find a more "sophisticated" way to avoid his problems. He still uses his grifting skills whenever he gets the chance; as a result, more than a few people are pursuing him to get back their money or take revenge. (In game terms, the GM should roll the "scam victim" Hunted, and if the roll succeeds, one of these people has caught up to Segaro and causes trouble for him somehow during the

adventure.)

Segaro hates to be fooled or outwitted. His self-image makes him think he's smarter than other people, and being proved wrong infuriates him. He may attack then and there, or may bide his time and take revenge later.

Although he's not normally that honorable a person, for some reason Segaro feels honor-bound to Robert Avilla because Avilla saved his life. He's protective of his "boss," and tries not to let him go into any threatening situation without coming along to help keep Avilla safe. He'd gladly risk his life for Avilla's if necessary... though he prefers to arrange things so it's *not* necessary.

Quote: "Why didn't you *tell* me we had a proton inductor? If I'd known that, I could've thought of something to keep us out of this mess!"

Powers/Tactics: Segaro is big and strong, able to use his size and muscles to hit fast and hard if he has to. He's also a good shot with a blaster. However, he'd rather use his smarts than his fists if he can. He may spend more time maneuvering for a clever shot, or trying to concoct a plan to trick the enemy, than he ought to, leaving himself and his friends exposed when more direct action would eliminate the problem.

Segaro finds that many non-tailed humanoids forget about his tail. It's not very manipulable, but in a battle it can hit just as hard as a fist. In some cases he may get a Surprise Move bonus the first time he hits someone with it.

Appearance: Segaro Krez'shul is a light-scaled Mon'dabi male. He's 29 years old, stands 6'4" tall, and weighs nearly 250 pounds. He usually dresses in typical Mon'dabi fashion — sandals, blousy pants, and a blousy cross-breasted tunic that comes down to the mid-thigh.



KIRITHA TAL

Val	Char	Cost	Roll	Notes
10	STR	0	11-	Lift 100 kg; 2d6 [1]
18	DEX	24	13-	OCV: 6/DCV: 6
16	CON	12	12-	
10	BODY	0	11-	
13	INT	3	12-	PER Roll 12-
12	EGO	4	11-	ECV: 4
15	PRE	5	12-	PRE Attack: 3d6
14	COM	2	12-	
4	PD	2		Total: 7 PD (3 rPD)
10	ED	9		Total: 13 ED (5 rED)
4	SPD	12		Phases: 3, 6, 9, 12
5	REC	0		
32	END	0		
25	STUN	2		Total Characteristics Cost: 75

Movement: Running: 7"/14"
Swimming: 3"/6"

Cost	Powers	END
1	<i>Perseid Physiology:</i> Damage Resistance (0 PD/2 ED)	0
5	<i>Perseid Eyes:</i> Sight Group Flash Defense (5 points)	0
2	<i>Fast On Her Feet:</i> Running +1" (7" total)	1
1	<i>Strong Swimmer:</i> Swimming +1" (3" total)	1

Talents

6	Combat Luck (3 PD/3 ED)
3	Lightning Calculator

Skills

3	Climbing 13-
3	Computer Programming 12-
5	Cramming
3	Deduction 12-
3	Electronics 12-
1	AK: Centauri Trade Routes 8-
2	KS: Perseid Politics 11-
2	KS: Sendravian Scientific University 11-
3	Paramedics 12-
3	Stealth 13-
4	Systems Operation (Communications Systems, FTL Sensors, Radar) 12-
1	Trading 8-
2	TF: Personal-Use Spacecraft
6	WF: Beam Weapons, Energy Weapons, Small Arms
3	Scientist
4	1) SS: Planetology 14-
1	2) SS: Anthropology 11-
1	3) SS: Archaeology 11-
1	4) SS: Astronomy 11-
1	5) SS: Biology 11-
1	6) SS: Botany 11-
1	7) SS: Chemistry 11-
1	8) SS: Geology 11-
1	9) SS: Physics 11-
1	10) SS: Zoology 11-

Total Powers & Skills Cost: 75

Total Cost: 150

75+ Disadvantages

15	DNPC: Nalee (her young daughter) 8- (Incompetent)
15	Hunted: Vaxandrosian Intelligence Bureau 8- (Mo Pow, NCI, Limited Geographical Area, Capture)
10	Hunted: Imperial Planetological Society 8- (Mo Pow, NCI, Watching)
15	Psychological Limitation: Scientific Curiosity (Common, Strong)
10	Psychological Limitation: Reckless (Common, Moderate)
10	Rivalry: Professional, with Bertrand Devereaux (Seeks To Harm Tal)

Total Disadvantage Points: 150

EQUIPMENT CARRIED

Blaster pistol
Body armor applicable to situation
Hand computer
Field science kit (including hand-held scanner)
Field medical kit

Background/History: Ever since she was a little girl, climbing cliffs and exploring forests on her native Dorvala, Kiritha Tal wanted to be a scientist — a planetologist, someone who looks for, explores, and studies new worlds. When she was older, she was smart enough and fortunate enough to win a scholarship to the prestigious Sendravian Scientific University to study a wide variety of scientific subjects, with an emphasis on planetology and related matters. While there she met and married her husband Jennor, and they had a daughter.

Tal nearly gave up her studies when Jennor was killed in a rockslide during a student field expedition, but eventually worked through her grief and returned to the University. When she completed her degree and was ready to start working, she found that most of the job opportunities available were boring assignments for the Imperial government. Then Kaithon Argosina came along, looking for an adventurous soul to join his small exploring and trading company, Argos Exploration. Intrigued not just by the nature of the job, but by him, she interviewed and was hired.

Since then, Tal's been an important part of the Argos staff, since she's got more formal scientific training than all the rest of them combined. She usually leads the company's exploratory missions. Sometimes, when her parents aren't able to take care of her daughter Nalee, she brings her along on Argos trips.

As a result of her activities as a member of the *Jackpot's* crew, Tal has made herself a few enemies. One is her boss's nemesis, Bertrand Devereaux, a Human who envies her skills as a planetologist (and resents her usefulness to Avilla), and seeks to thwart her. Another is the Intelligence Bureau of Vaxandros Prime, which is convinced, because of the way one of Segaro's scams backfired, that she's some sort of spy. Lastly, the Imperial Planetological Society has raised some questions about her cre-

dentials as a professional planetologist, and keeps hounding her to file more accurate reports and answer the Society's questions about her qualifications and activities.

Personality/Motivation: Unlike the other Argos employees, most of whom are motivated by money (to at least some degree) and a desire for adventure, Tal is driven by her scientific curiosity. She loves exploring, not because she's restless or on the run, but because discovering a new world and unraveling its mysteries fascinates her. She sometimes sidetracks the company's missions to look into some phenomenon that's strange or interesting, but of no monetary value.

Tal also displays a certain degree of recklessness that even the daredevil DeGraff worries about sometimes. She's prone to acting on the spur of the moment, and leaping before looking — a trait that's almost gotten her seriously hurt a time or two. Usually a reminder of her daughter is enough to curb any unjustified "enthusiasm."

Quote: "Everybody fan out! There's a deposit of sarnenite around here somewhere. If we can find it, we can stake a claim."

Powers/Tactics: Tal may be reckless, but she has no desire to fight. The other Argosians have taught her how to fire blasters and similar weapons, and she'll back them up in a pinch if she has to, but her preferred reaction to that sort of danger is to cower behind cover.

By virtue of her training in field medicine, Tal has become Argos's *de facto* "doctor," even though her medical knowledge is scant. She finds she enjoys the subject, and has entertained thoughts of someday returning to school to study medicine.

Appearance: Kiritha Tal is, at age 24, the youngest member of Argos Exploration. She's 5'6" tall, with the blue-black skin of a Perseid from the equatorial regions of Dorvala. She keeps her straight hair cut short, but well-styled. She usually wears field clothes when planetside (unless circumstances call for more formal garb), and a jumpsuit on the ship.



VILLAINS

ALLYSSA BARTH

PLOT SEEDS

To her surprise, Major Barth finds herself romantically attracted to one of the PCs. How will she reconcile her devotion to duty with her feelings? What repercussions will her decision have for the PCs?

Major Barth uncovers a major corruption scandal within the Interstellar Organized Crime Task Force. Unsure of how high up the corruption may reach, and unable to investigate the situation herself without tipping off her superiors, she turns to the PCs (whom she's previously encountered and knows to be honorable) for help.

High-ranking Imperial government officials who are enemies of the PCs manipulate Major Barth into going after them. How can the PCs convince such a scrupulously honest cop that they're not the biggest threat in this situation?

Here are a few of the adversaries and antagonists the members of Argos Exploration have encountered during their travels and adventures. Most of them have access to resources such as groups of Imperial Security Police officers, gangs of thugs, or squads of hired goons, so any one of them should be able to challenge the entire group of PCs if necessary.

MAJOR ALLYSSA BARTH

Val	Char	Cost	Roll	Notes
15	STR	5	12-	Lift 200 kg; 3d6 [1]
16	DEX	18	12-	OCV: 5/DCV: 5
15	CON	10	12-	
10	BODY	0	11-	
14	INT	4	12-	PER Roll 12-
11	EGO	2	11-	ECV: 4
15	PRE	5	12-	PRE Attack: 3d6
12	COM	1	11-	
6	PD	3		Total: 9 PD (3 rPD)
4	ED	1		Total: 7 ED (3 rED)
4	SPD	14		Phases: 3, 6, 9, 12
6	REC	0		
30	END	0		
30	STUN	4		Total Characteristics Cost: 67

Movement: Running: 7"/14"

Cost	Powers	END		
2	Fast On Her Feet: Running +1" (7" total) 1			
	Martial Arts: Karate			
	Maneuver	OCV	DCV	Notes
4	Atemi Strike	-1	+1	2d6 NND(1)
4	Block	+2	+2	Block, Abort
4	Dodge	+0	+5	Dodge all attacks, Abort
4	Knifehand			
	Strike	-2	+0	1d6 HKA
4	Punch/			
	Snap Kick	+0	+2	5d6 Strike

Perks
10 Contacts (GM's choice)
8 Fringe Benefit: Interstellar Police Powers
6 Fringe Benefit: Membership (Major in Imperial Security Police)
4 Fringe Benefit: Security Clearance

Talent
6 Combat Luck (3 PD/3 ED)

Skills
6 +2 with Imperial Security Police Weapons
3 Bureaucratics 12-
3 Computer Programming 12-
3 Criminology 12-
1 Forensic Medicine 8-
3 Interrogation 12-
2 AK: Karilath IV 11-
2 KS: Criminal Law 11-
2 KS: Interstellar Organized Crime 11-
2 PS: Law Enforcement Agent 11-
3 Stealth 12-
3 Streetwise 12-
2 TF: Personal-Use Spacecraft
6 WF: Beam Weapons, Energy Weapons, Small Arms

Total Powers & Skills Cost: 97
Total Cost: 164

75+ Disadvantages
5 Distinctive Features: Imperial Security Police Uniform (Easily Concealed, Noticed And Recognizable)
15 Hunted: Gha'krl Mob 11- (As Pow, NCI, Limited Geographical Area, Kill)
10 Hunted: Imperial Security Police 8- (Mo Pow, NCI, Watching)
25 Psychological Limitation: Scrupulously Honest (Very Common, Total)
20 Social Limitation: Subject To Orders (Very Frequently, Major)
14 Experience Points

Total Disadvantage Points: 164

EQUIPMENT CARRIED

Blaster pistol
Other weaponry applicable to situation (e.g., stun-rods, knockout grenades)
Body armor applicable to situation
Hand computer
Uniform and badge/identification

Background/History: Smart, self-confident, and aggressive, Allyssa Barth attended the Imperial Security Police Academy after finishing her secondary education, and graduated at the top of her class. After several boring and dangerous assignments on Karilath IV (where she earned the enmity of the Gha'krl organized crime "family" because of her unflagging efforts to topple it), her success record led to a posting back on Earth as

part of the I.P.'s Interstellar Organized Crime Task Force.

While working with the TF, Barth got involved in a case against one Robert Avilla because of his smuggling activities. After he “disappeared,” Barth (now a Major) lost track of him for several years. She’s now received reports that make her think one “Kaithon Argosina” of Argos Exploration is, in fact, Avilla. She has spent a lot of time and money tracking Argosina, trying to trip him up and prove he’s Avilla. So far she hasn’t succeeded, but she *knows* she’s right; it’s just a matter of proving it....

Personality/Motivation: Major Barth is a tough, hard-nosed cop known for her scrupulous honesty. She wouldn’t even think of ignoring regulations, doing something other than in the “by the book” way, or taking a bribe. Her incorruptibility makes her perfect for operations against organized crime (or groups of PCs!). Unfortunately, her frank nature also tends to make her blunt and tactless, which has kept her from advancing further in the I.P. or forming many lasting personal relationships.

Quote: “No, that’s all wrong. They’ll see through that in a minute. We should do it *this* way....”

Powers/Tactics: Major Barth has received the standard Imperial Security Police training with energy weapons and hand-to-hand combat, which she’s supplemented by studying karate. She prefers to avoid violence (primarily by approaching arrestees only when backed up by overwhelming force), but if forced to fight is aggressive and imaginative on the battlefield.

Although she’s a formidable combatant, what makes Major Barth really dan-

gerous are her devotion to duty and her ability to call on the resources of the Imperial Security Police if she needs them. In essence she represents the strength of the Imperial government, not just a single adversary for the PCs to overcome. If necessary she can call up squads of heavily-armed special operations officers, or the like, to help her catch criminals.

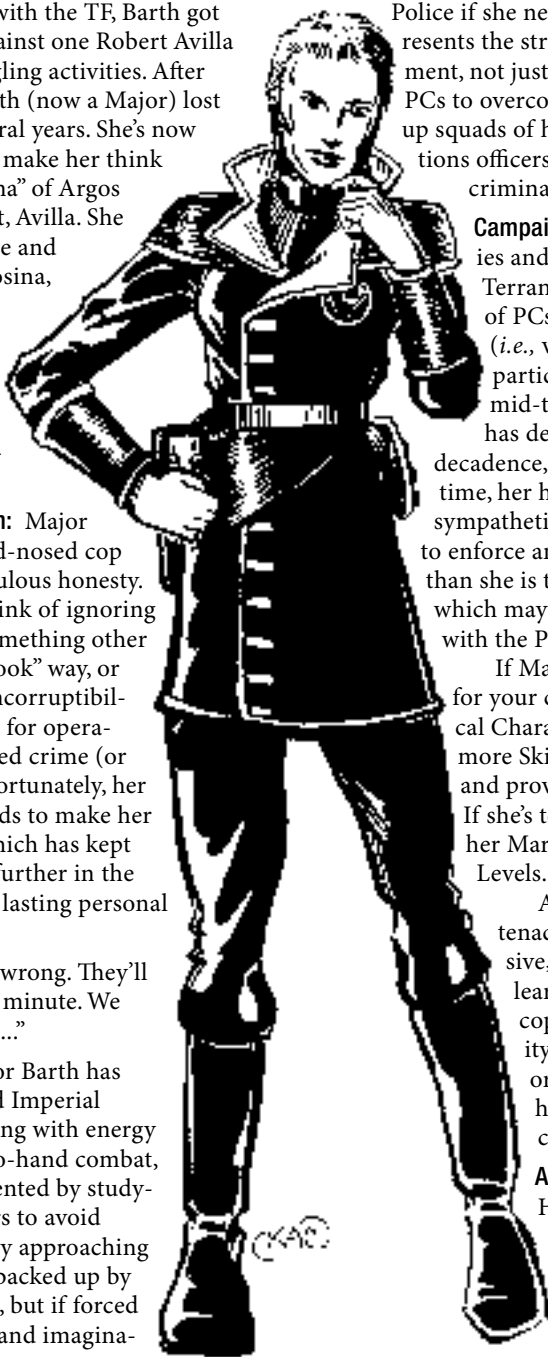
Campaign Use: Major Barth embodies and personifies the threat the Terran Empire poses to any group of PCs that isn’t strictly law-abiding (*i.e.*, virtually any group of PCs), particularly for campaigns set in the mid-to-late 2600s (when the Empire has descended into corruption, decadence, and oppression). At the same time, her honesty makes her a somewhat sympathetic figure; she’s no more likely to enforce an illegal order against the PCs than she is to take a bribe from them, which may eventually lead her to work with the PCs to topple the Empire.

If Major Barth’s not tough enough for your campaign, boost her physical Characteristics a bit, give her a few more Skills (and perhaps Skill Levels), and provide her with better equipment. If she’s too tough already, get rid of her Martial Arts and her Combat Skill Levels.

As a Hunter, Major Barth is tenacious, versatile, and aggressive, as Robert Avilla has already learned. But unlike many I.P. cops, she won’t abuse her authority, plant evidence on suspects, or engage in any other underhanded police tricks — she’s a completely by-the-book officer.

Appearance: Allyssa Barth is a Human female, mid-30s, 5’10”, in excellent shape due to frequent workouts and martial arts training. She’s attractive, in a severe sort of way, with brown hair cut short. When

on duty, she wears her uniform; off-duty she favors casual clothes.



**BERTRAND
DEVEREAUX
PLOT SEEDS**

One of Devereaux's clients wants a priceless, unique artifact that's kept under tight security as a display at the Beldana V Museum of Fine Art. Devereaux can't steal it himself... but maybe he can trick the PCs into doing the job for him.

Judith Craswell, a well-known maven of Imperial society, is found murdered in her luxurious space-mansion. The death is a complete mystery; the Imperial Security Police have no suspects. The PCs get involved somehow and have to solve the mystery. Devereaux killed her because she found out about him and was going to reveal his "job" to her friends, but he's cleverly concealed the evidence.

In search of a valuable archaeological treasure, the PCs end up with half the information they need to find it. Devereaux, it turns out, has the rest of the data. If they team up, can they trust him?

BERTRAND DEVEREAUX

Val	Char	Cost	Roll	Notes
10	STR	0	11-	Lift 100 kg; 2d6 [1]
14	DEX	12	12-	OCV: 5/DCV: 5
14	CON	8	12-	
12	BODY	4	11-	
20	INT	10	13-	PER Roll 13-
18	EGO	16	13-	ECV: 6
20	PRE	10	13-	PRE Attack: 4d6
12	COM	1	11-	
4	PD	2		Total: 4 PD (0 rPD)
4	ED	1		Total: 4 ED (0 rED)
3	SPD	6		Phases: 4, 8, 12
5	REC	0		
28	END	0		
30	STUN	6		Total Characteristics Cost: 76

Movement: Running: 6"/12"

Cost Perks

- 6 Contacts: defined by GM
- 5 Money: Well Off

Skills

- 3 Bribery 13-
- 3 Concealment 13-
- 3 Conversation 13-
- 2 Cryptography 13-; Translation Only (-½)
- 1 Electronics 8-
- 4 Forgery (Art Objects, Documents) 13-
- 2 Gambling (Card Games) 13-
- 3 High Society 13-
- 2 KS: Art History 11-
- 2 KS: History 11-
- 2 KS: Literature 11-
- 3 Persuasion 13-
- 2 PS: Appraising 11-
- 3 Stealth 12-
- 3 Streetwise 13-
- 4 Survival (Mountains, Temperate/Subtropical, Tropical) 13-
- 2 TF: Personal-Use Spacecraft
- 6 WF: Beam Weapons, Energy Weapons, Small Arms
- 3 Scientist
- 2 1) SS: Anthropology 13-
- 2 2) SS: Archaeology 13-
- 1 3) SS: Astronomy 11-
- 1 4) SS: Biology 11-
- 1 5) SS: Chemistry 11-
- 2 6) SS: Planetology 13-
- 1 7) SS: Physics 11-

Total Powers & Skills Cost: 74

Total Cost: 150

75+ Disadvantages

- 15 Hunted: Jenak iv Gerasha 8- (Mo Pow, Kill)
- 10 Hunted: Imperial Security Police 8- (Mo Pow, NCI, Watching)
- 15 Psychological Limitation: Greedy; Determined To Rebuild Family Fortune (Common, Strong)
- 10 Psychological Limitation: Collector's Mania

(Common, Moderate)

- 5 Reputation: man who can obtain illegal antiquities 11- (throughout parts of the Empire, and elsewhere; about 20 billion people are aware of Reputation)
- 5 Rivalry: Professional, with Argos Exploration
- 5 Social Limitation: Harmful Secret (career as illegal antiquities dealer) (Occasionally, Minor)
- 10 Experience Points

Total Disadvantage Points: 150

EQUIPMENT CARRIED

- Pocket blaster
- Hand computer
- Field science kit
- Lucky *threedel's* foot

Background/History: Descended from a long line of wealthy industrialists, Bernard Devereaux had the misfortune to be born at a time when the family's coffers were nearly empty due to centuries of mismanagement and foolish spending. Even worse, he had no head for business or numbers; his interests ran to history, art, and literature. Despite this, his father made it clear the responsibility for rebuilding the family's wealth lay on his shoulders.

After studying archaeology and art at university, Devereaux decided there was more than one way to skin a cat. Industry and finance weren't the only ways to get rich; he'd read dozens of stories about explorers and scientists who made themselves fabulously wealthy by discovering a rich new world, or an ancient civilization whose art comes into vogue among collectors. Determined to re-create their success, he embarked on a career as a freelance explorer/archaeologist.

He spent much of his family's remaining money trying to make his "business" a success, to no avail. He finally cast professional ethics away and began trafficking in illegal antiquities, forged art, and other such illicit goods. That he's proven quite skilled at. Though a few of his deals have gone sour (one ex-client, Jenak iv Gerasha, wants to kill him because Devereaux tried to swindle him), most have come off without a hitch. He's on his way back to wealth and power, and he doesn't intend to stop until he gets there.

During his career, Devereaux has encountered many other "freelance explorers" like himself, some honest, others not. Robert Avilla is an old adversary; the two have competed for the same prize many a time, with Devereaux usually losing out to the dashing "merchant." He's determined to defeat Argos Exploration once and for all... some day.

Personality/Motivation: Devereaux has a genuine appreciation for art and antiquities, and enjoys collecting them. Unfortunately, his desire to rebuild the family fortune (resulting not only from personal greed, but family pressure) wars

with his collector's mania most of the time. Should he keep a unique and intriguing relic... or sell it for hundreds of thousands of credits? Usually avarice wins, but not always.

Devereaux is terrified his peers in high society will discover what he does to make money. (Some already know, because they're his clients, and they certainly won't reveal their own complicity in interstellar crime.) If word got out that he was, in essence, a smuggler and forger, he'd be banned from polite society, and that's something he couldn't tolerate. If necessary, he'll kill to keep his secret.

Quote: "Ah, yes, you have an excellent eye. That drinking-cup is of early Toractan manufacture; it was used by priests in religious ceremonies. Very rare... very valuable."

Powers/Tactics: Devereaux has no combat skills to speak of (though he does know how to fire a gun, and has a steadier aim than most people). He'll run from a fight if he can, or try to talk his way out of it. He'll surrender rather than risk harm to his person.

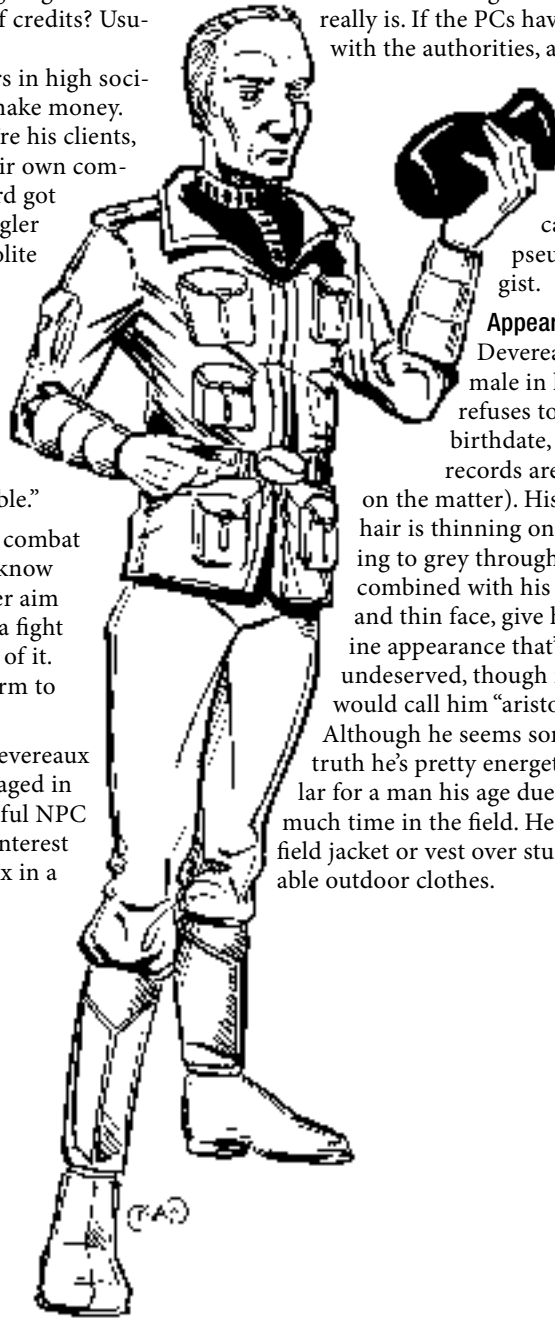
Campaign Use: The GM can use Devereaux as a competitor for PC groups engaged in similar occupations, and as a colorful NPC if not. If one of the heroes has an interest in art, he may encounter Devereaux in a

museum, perhaps striking up a friendship with him before learning who and what he really is. If the PCs have a connection with the authorities, a friend in the

Imperial Security Police may ask for their help in exposing and catching the wily pseudo-archaeologist.

Appearance: Bertrand Devereaux is a Human male in his early 40s (he refuses to reveal his exact birthdate, and Imperial

records are strangely silent on the matter). His sandy blonde hair is thinning on top and starting to grey throughout, and that, combined with his rather long nose and thin face, give him a vulture-like appearance that's not entirely undeserved, though most people would call him "aristocratic-looking." Although he seems somewhat frail, in truth he's pretty energetic and muscular for a man his age due to spending so much time in the field. He usually wears a field jacket or vest over sturdy but comfortable outdoor clothes.



DARGEN
PLOT SEEDS

A high-ranking Nakeerash gangster wants to eliminate the PCs, and gets Dargen to take on the job. But what if *Dargen* is really the one he wants to eliminate, and he starts tipping off the PCs so that they'll all end up dead?

With the Imperial Security Police about to expose one of his criminal operations, Dargen decides to frame the PCs so they'll take the fall while he skips the planet. Can the PCs avoid the cops, find out what's going on, and catch Dargen before the I.P. arrests and imprisons them?

After a battle between the PCs and Dargen leaves both of them with stranded starships that are running out of air, the heroes and the crooks have to work together to save all their lives. Can they trust each other long enough to get to safety?

DARGEN				
Val	Char	Cost	Roll	Notes
20	STR	10	13-	Lift 400 kg; 4d6 [2]
18	DEX	24	13-	OCV: 6/DCV: 6
18	CON	16	13-	
15	BODY	10	12-	
13	INT	3	12-	PER Roll 12-
10	EGO	0	11-	ECV: 3
18	PRE	8	13-	PRE Attack: 3 ½d6
8	COM	-1	11-	
8	PD	4		Total: 8 PD (0 rPD)
7	ED	3		Total: 7 ED (0 rED)
4	SPD	12		Phases: 3, 6, 9, 12
8	REC	0		
36	END	0		
40	STUN	6		Total Characteristics Cost: 95
Movement: Running: 6"/12"				
Cost	Powers		END	
7	Brawling: HA +2d6; Hand-To-Hand Attack (-½)		1	
Perks				
4	Fringe Benefit: Membership (in Nakeerash organized crime family)			
Skills				
5	+1 Hand-To-Hand			
5	+1 with Ranged Combat			
3	Combat Piloting 13-			
1	Demolitions 8-			
1	Electronics 8-			
4	Gambling (Card Games, Sports Betting) 13-			
3	Interrogation 13-			
2	KS: Nakeerash Organized Crime Family			
3	Lockpicking 13-			
3	Security Systems 13-			
3	Stealth 13-			
3	Streetwise 13-			
2	TF: Personal-Use Spacecraft			
6	WF: Beam Weapons, Energy Weapons, Small Arms			
Total Powers & Skills Cost: 55				
Total Cost: 150				
75+ Disadvantages				
20	Hunted: Imperial Security Police 8- (Mo Pow, NCI, Capture)			
20	Psychological Limitation: Amoral (Very Common, Strong)			
10	Reputation: hard-core, violent criminal 11- (throughout parts of the Empire, and elsewhere; about 20 billion people are aware of Reputation) (Extreme)			
5	Rivalry: Professional, with another gangster			
20	Experience Points			
Total Disadvantage Points: 150				

EQUIPMENT CARRIED

- Blaster pistol
- Brass knuckles, or the like
- Body armor applicable to situation
- Hand computer
- 100-500 credits' worth of local currency

Background/History: Dargen doesn't talk much about his background — in fact, he doesn't even tell most people his family name. Supposedly his family's been associated with the Nakeerash mob for several generations, and there wasn't any question he'd "join the family business" when he got old enough.

Fortunately, Dargen grew up not only big and strong, but smart. He quickly moved from strong-arm work to leading gangs, a task he excelled at. He was doing well, earning a lot of credits for his bosses, succeeding at every mission — until he ran into Argos Exploration. Thanks to Robert Avilla and friends, a sweet little scam Dargen had going on Vinarcus fell apart, costing the family a lot of money, and Dargen a lot of prestige. When he tried to express his "displeasure" to the Argosians, a fight resulted in which Jason Grigori got lucky and beat Dargen bloody... for which Dargen has sworn an equally bloody revenge.

Personality/Motivation: Dargen is an amoral, brutal thug — smart and cunning, to be sure, but a thug nevertheless. He has no scruples whatsoever; theft, violence, and even murder are all casual acts to him. Though it's often slow to wake, he has a fearsome temper, and holds grudges a long, long time.

But Dargen's brutality doesn't make him stupid or predictable. He wouldn't have gotten as far as he did in the Nakeerash family if he wasn't smart enough to know his way around some sophisticated con games and other criminal schemes. Player characters who think they can deal with him by returning violence for violence may soon be unpleasantly surprised at his deviousness.

Quote: "This was a *simple job*, but you had to go and butt yer noses into it. Now I've gotta kill you. What a mess."

Powers/Tactics: Dargen prefers to use his fists and strength in combat; he hits hard and fast, enjoying the crunch of bone when he connects with a good roundhouse. But he's good with a blaster, too, and is pretty quick to draw his if he thinks his opponent is armed. Hit first and hit hard, that's his motto — that way the other guy won't get to hit back at all. Dirty tricks, underhanded blows, and unfair advantages are all part of his stock in trade.

Because he's a gang leader in the Nakeerash family, Dargen usually has a gang of up to two dozen criminals at his beck and call. You can include just about any sort of gangster in that group to make Dargen a better opponent for the PCs.

Campaign Use: Dargen is a pretty simple, combat-oriented opponent for the PCs. Though he's tougher than the average street thug because of his intelligence and organized crime connections, he's still

best used as a straightforward enemy for the PCs to encounter and enjoy defeating.

If Dargen's not a powerful enough enemy for your PCs, bulk up his Characteristics some, and give him Contacts and Followers to call upon. If he's already too much of a challenge, reduce his STR, CON, and DEX a few points each.

As mentioned above, Dargen holds grudges, so it wouldn't be out of character for him to start Hunting a hero that crosses his path — even on an 11- or 14-, if he's been badly enough humiliated or defeated. His early attacks will be brutal assaults and the like, gradually transforming into clever scams and distractions as he realizes force alone won't get the job done.

Appearance: Dargen is a Human male 32 years old. Although big and beefy — he stands 6'2" tall and weighs about 225 pounds, most of it muscle — he's quick and graceful when he moves; he knows how to use his size to his advantage. He has dirty blonde hair and a matching beard. He frequently smokes Centauran cigarettes, and wears expensive but comfortable clothing.



GHENAK VAA'RESH

Val	Char	Cost	Roll	Notes
25	STR	20	14-	Lift 800 kg; 5d6 [2]
20	DEX	30	13-	OCV: 7/DCV: 7
20	CON	20	13-	
18	BODY	16	13-	
13	INT	3	12-	PER Roll 12-
12	EGO	4	11-	ECV: 4
20	PRE	10	13-	PRE Attack: 4d6
10	COM	0	11-	
10	PD	7		Total: 10 PD (1 rPD)
7	ED	3		Total: 7 ED (1 rED)
4	SPD	10		Phases: 3, 6, 9, 12
9	REC	0		
40	END	0		
41	STUN	0		Total Characteristics Cost: 123

Movement: Running: 8"/16"

Cost	Powers	END
3	<i>Mon'dabi Teeth:</i> HKA 1 point; No STR Bonus (-½)	1
1	<i>Mon'dabi Skin:</i> Damage Resistance (1 PD/1 ED)	0
4	<i>Fast On His Feet:</i> Running +2" (8" total)	1
3	<i>Mon'dabi Senses:</i> +1 PER with all Sense Groups	0
5	<i>Tail:</i> Extra Limb (tail), Inherent (+¼); Limited Manipulation (-¼)	0

Perks

10	Contacts (GM's choice)
5	Money: Well Off

Talent

3	Lightsleep

Skills

8	+1 with All Combat
5	+1 with Ranged Combat
3	Combat Piloting 13-
3	Computer Programming 12-
3	Electronics 12-
3	Fast Draw (Small Arms) 13-
2	Gambling (Card Games) 12-
3	KS: Bounties 12-
3	Lockpicking 13-
1	Mechanics 8-
2	Navigation (Space) 12-
2	PS: Bounty Hunter 11-
3	Security Systems 12-
3	Shadowing 12-
3	Stealth 13-
3	Streetwise 13-
5	Systems Operation (Communications Systems, FTL Sensors, Radar, Sensor Jamming Equipment) 12-
4	TF: Military Spacecraft, Personal-Use Spacecraft
8	WF: Beam Weapons, Common Melee Weapons, Energy Weapons, Small Arms

Total Powers & Skills Cost: 101

GHENAK VAA'RESH PLOT SEEDS

Trapped in an abandoned (and oxygen-poor) orbital mining facility by a group of Xenovore pirates, the PCs and Ghenak Vaa'resh must team up to defeat a mutual enemy. Will Vaa'resh try to betray his erstwhile allies to steal from them, or capture them for any money they might have on their heads?

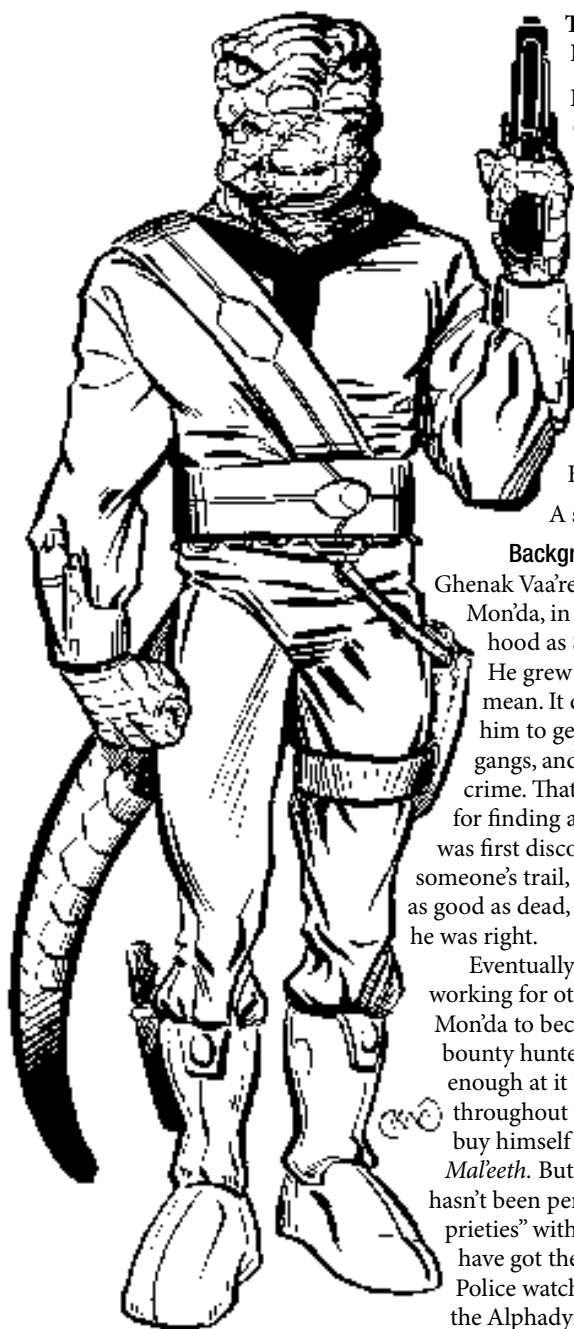
A cleverly-planned ambush by Vaa'resh cripples the PCs' ship. Now they have to fight off both him and his gang of hired cut-throats as he infiltrates their vessel to capture them.

The PCs compete with Vaa'resh to locate and capture an infamous mass murderer with a 10 million credit bounty outstanding. What will Vaa'resh do to sabotage the PCs' chances of beating him?

Total Cost: 224

75+ Disadvantages

- 15 Hunted: Alphadyne Mercantile Combine 11- (Mo Pow, NCI, Watching)
- 10 Hunted: Imperial Security Police 8- (Mo Pow, NCI, Watching)
- 15 Psychological Limitation: Code Of The Mercenary (Common, Strong)
- 10 Psychological Limitation: Vengeful (Common, Strong)
- 5 Reputation: violent, dangerous bounty hunter 11- (throughout parts of the Empire, and elsewhere; about 20 billion people are aware of Reputation)
- 5 Rivalry: Professional, with another bounty hunter (GM's choice)
- 89 Experience Points



Total Disadvantage Points: 223

EQUIPMENT CARRIED

- Blaster rifle
- Blaster pistol
- Another blaster pistol
- Some grenades
- A knife
- Body armor applicable to situation
- Hand computer
- A surly attitude

Background/History:

Ghenak Vaa'resh was born on Mon'da, in the same neighborhood as Segaro Krez'shul. He grew up big, tough, and mean. It didn't take long for him to get involved with local gangs, and then organized crime. That's where his talent for finding and killing people was first discovered. Put him on someone's trail, and that person was as good as dead, his boss said... and he was right.

Eventually Vaa'resh got tired of working for other people and left Mon'da to become an interstellar bounty hunter. He's done well enough at it to earn a reputation throughout the Empire, and to buy himself a small ship, the *Mal'eeth*. But his track record hasn't been perfect. A few "improprieties" with some of his jobs have got the Imperial Security Police watching him closely, and the Alphadyne Mercantile Combine is convinced a "botched"

job that resulted in the death of Vaa'resh's quarry is actually part of a scheme to steal valuable trade secrets. As soon as it has "proof," it will send other bounty hunters after Vaa'resh... equipped with "dead or alive" orders!

Personality/Motivation: Ghenak Vaa'resh is cold-hearted, hard, and brutal — qualities his job demands and rewards. He's suspicious and cautious, and that, combined with his hair-trigger reactions, sometimes makes it difficult to deal with him.

As a professional bounty hunter, Vaa'resh abides by a professional code that mandates he do his best to complete a job, obey all of his employer's instructions, and reveal his employer's identity only with permission or to a duly-authorized law enforcement officer. He does a good job living up to this code, most of the time. He only has difficulties when his vengeful streak gets in the way — sometimes he's so eager to hurt someone who's hurt him that he forgets what his employer wanted.

Quote: "See this warrant? It says I can bring you in "dead or alive," reward's the same. Decisions, decisions...."

Powers/Tactics: Vaa'resh is quick, strong, and clever, a dangerous opponent in just about any battle. He prefers to use his blaster, but he's got big, strong fists and knows how to use them if he has to. If possible, he'll try to "talk his way out" of a battle, but only until he can get a decent shot without fear of being shot at in return. He has no honor; he cares only about winning.

Vaa'resh owns a small, agile ship, the *Mal'eeth*. Although it's not heavily armed, it has enough weapons mounted to let him fight off larger ships. It also comes equipped with the best stealth technology he can afford.

Campaign Use: Vaa'resh is a pretty tough opponent for most individual PCs, though you may have to give him some "backup" if he's got to face an entire PC group on his own (or arrange the situation to his advantage somehow). He might also make a useful underworld contact for the PCs.

If you need Vaa'resh to be tougher, give him some Martial Arts and increase some of his Figured Characteristics a little. If he's already too strong, shave some points off his Primary Characteristics and get rid of his *Brawling* ability.

Vaa'resh's vengefulness makes him a good candidate to Hunt a PC who defeats him. He'll usually pursue the matter vigorously (*i.e.*, on at least an 11-), and call on all his contacts and friends throughout the Empire to help him get the job done.

Appearance: Ghenak Vaa'resh is a 6'8" Mon'dabi with a scarred face and a bad attitude. Instead of typical Mon'dabi garb, he wears a dark green jumpsuit with a broad leather belt and matching bandolier. He usually wears at least one weapon, if not more; even in situations where he can't openly carry a blaster or knife, he probably has one or two small weapons concealed on his person.

ZEE'GANSH

Val	Char	Cost	Roll	Notes
8	STR	-2	11-	Lift 75 kg; 2 ½d6 [2]
12	DEX	6	11-	OCV: 4/DCV: 4
13	CON	6	12-	
10	BODY	0	11-	
20	INT	10	13-	PER Roll 13-
14	EGO	8	12-	ECV: 5
15	PRE	5	12-	PRE Attack: 3d6
8	COM	-1	11-	
3	PD	1		Total: 6 PD (3 rPD)
3	ED	0		Total: 6 ED (3 rED)
2	SPD	0		Phases: 6, 12
5	REC	0		
26	END	0		
25	STUN	4		Total Characteristics Cost: 37

Movement: Running: 6"/12"

Cost	Powers	END
4	<i>Hzeel Eyes:</i> +2 PER with Sight Group	0
15	<i>Lucky Bastard:</i> Luck 3d6	

Perks

30	Contacts (GM's choice)
15	Money: Filthy Rich All the Followers, Bases, and Vehicles he needs

Talent

6	Combat Luck (3 PD/3 ED)

Skills

3	Computer Programming 13-
3	Conversation 13-
8	Gambling (Card Games, Board Games, Sports Betting) 14-
5	KS: Interstellar Arms Market 15-
1	KS: Fine Art 8-
3	Security Systems 13-
3	Streetwise 13-
7	Trading 14-
4	TF: Military Spacecraft, Personal-Use Spacecraft
6	WF: Beam Weapons, Energy Weapons, Small Arms

Total Powers & Skills Cost: 113

Total Cost: 150

75+ Disadvantages

15	Hunted: Draconis Defenseworks, Inc. 8- (As Pow, NCI, Kill)
10	Hunted: Imperial Security Police 8- (Mo Pow, NCI, Watching)
15	Psychological Limitation: Vengeful (Common, Total)
10	Psychological Limitation: Compulsive Gambler (Common, Strong)
25	Experience Points

Total Disadvantage Points: 150

EQUIPMENT CARRIED

Hand computer

Expensive Hzeel clothes

Background/History: Zee'gansh got involved in gambling early — as a child, he ran errands for the pit bosses that operated an illegal casino near his home on Shendara III. He was pretty good at the games himself, often winning tidy sums of money when he was allowed to play.

He might have gone on to become a professional gambler, if not for a stroke of good luck. He got into a game with a drunken trader and won his entire cargo — stolen weapons — from him. After getting some help from friends who'd been in the military, Zee'gansh sold all the guns for an enormous profit. He used that money to buy other weapons for other customers, and so on, and so on....

Today, several decades later, Zee'gansh has established a vast interstellar arms empire and is fabulously wealthy. Although most of his business is entirely aboveboard, he's got nothing against selling on the black market, which has aroused the suspicion of the Imperial Security Police (though they can't prove anything yet). As long as a customer has money and doesn't cause trouble, Zee'gansh is happy to deal with him. But his no-holds-barred business practices have earned him more than a few enemies, including Draconis Defenseworks, a large military contractor determined to get rid of him.

Unfortunately, the gambling tables haven't always been as kind to Zee'gansh as they were back in his childhood. He still gambles frequently; he has a hard time passing up any sort of game or bet. One night a few years back, he got into a card game with a Human named Avilla. Though the game was rigged — Zee'gansh was *supposed* to win easily — Avilla somehow turned the tables on him, winning billions of credits. Convinced Avilla somehow cheated, Zee'gansh has sworn to get revenge... and get back his money.

Personality/Motivation: Zee'gansh is a bitter, lonely, grasping Hzeel who cares about no one and nothing but himself and his profits — except perhaps for the turn of the cards, for he dearly loves to gamble. On a few occasions his adversaries have gotten out of his clutches by challenging him to a game and beating him, but he still can't resist the lure of the casino.

Zee'gansh *hates* to suffer any sort of defeat or insult. He's used to getting his way in just about everything, and anyone who denies him (as Avilla did) gets put on "the list." The list is long, and he enjoys concocting schemes to remove people from it permanently. His vengeance, though it may be long in coming, always arrives, and is never pleasant.

Quote: "Don't play me for a fool. I can get twice that price in the Selvi system. Pay up, or I'm taking the goods elsewhere."

ZEE'GANSH
PLOT SEEDS

Zee'gansh captures the PCs and puts them in a gigantic "arena zone" on a desolate planet. If they can win their way to freedom past wild beasts and armed patrols, he'll give them a ship and let them go wherever they want (not really, but that's what he tells them). Meanwhile, he and his friends bet on the outcome.

After losing in a high-stakes card game to an abrasive Zurite, Zee'gansh hires the PCs to investigate or eliminate him (what-ever seems appropriate, given the nature of the PCs). When the arms merchant betrays and refuses to pay them, what will the PCs do?

One side in a planetary war is losing because Zee'gansh sells only to the other side. The losing nation hires the PCs to disrupt the trade between Zee'gansh and its enemies, or to find it an equivalent source of weaponry.

Powers/Tactics: Zee'gansh doesn't fight; he hires other people to fight for him. He knows how to use most types of blasters — he enjoys testing out his own products from time to time — but he has no intention of risking his own neck in battle.

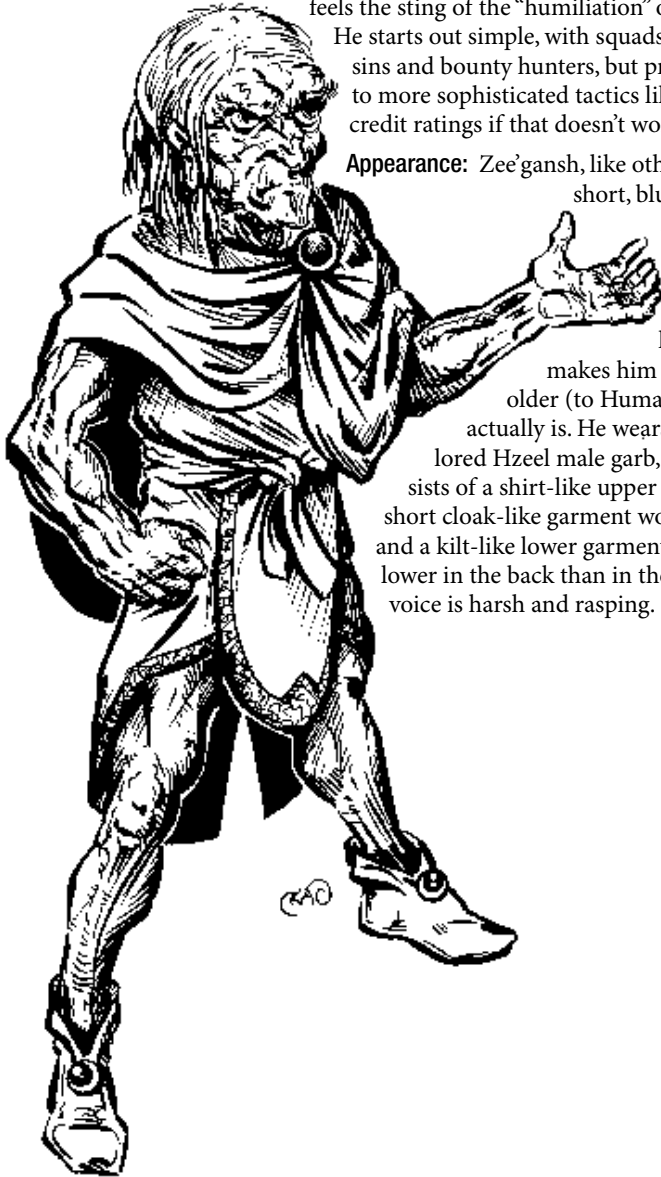
Campaign Use: Zee'gansh is a sort of “master villain” for use in *Star Hero* campaigns. Not as overpowering or deadly as the Terran Empire or other governments, he nevertheless presents a significant threat to most groups of PCs due to his vast wealth and resources. All they have to do is defeat him once, and he'll never leave them alone.

Zee'gansh isn't intended to overpower or outfight the PCs. If you need to make him more “powerful,” do so in social or political ways: give him more Contacts and resources to draw upon, rather than personal combat skills. If he's already too powerful, cut down on his wealth and resource base a little.

Zee'gansh's vengeful nature makes it quite likely he'll start Hunting one or more PCs after they thwart him. He usually Hunts on at least an 11-, but not always; it depends on how badly he feels the sting of the “humiliation” of losing.

He starts out simple, with squads of assassins and bounty hunters, but progresses to more sophisticated tactics like ruining credit ratings if that doesn't work.

Appearance: Zee'gansh, like other Hzeel, is short, blue-skinned, large-eyed, and has a sort of gnarled look that makes him appear older (to Humans) than he actually is. He wears finely-tailored Hzeel male garb, which consists of a shirt-like upper garment, a short cloak-like garment worn over it, and a kilt-like lower garment that's cut lower in the back than in the front. His voice is harsh and rasping.



GENERIC NPCs

The following character sheets are for “generic” NPCs you can quickly adapt for use in a game instead of taking the time to create your own. They reflect the way these types of characters are portrayed in science fiction, and so may not be appropriate for other types of campaigns.

DOCTOR

Val	Char	Cost	Roll	Notes
8	STR	-2	11-	Lift 75 kg; 1 ½d6 [1]
10	DEX	0	11-	OCV: 3/DCV: 3
8	CON	-4	11-	
10	BODY	0	11-	
13	INT	3	12-	PER Roll 12-
10	EGO	0	11-	ECV: 3
13	PRE	3	12-	PRE Attack: 2 ½d6
8	COM	-1	11-	
2	PD	0		Total: 2 PD (0 rPD)
2	ED	0		Total: 2 ED (0 rED)
2	SPD	0		Phases: 6, 12
4	REC	0		
16	END	0		
20	STUN	2		Total Characteristics Cost: 1

Movement: Running: 4”/8”

Cost Powers END
-4 *A Little Slow:* Running -2”

Perks
20 *Contacts:* in the galactic medical community

Skills
9 *Devoted To His Craft:* +3 on all rolls to resist attempts to deprive people of medical care, take patients away from him, or make him compromise his medical ethics.

3 Computer Programming 12-
1 Electronics 8-
5 AKs/CKs of GM's choice
2 KS: Hobby 11-
7 Paramedics 14-
3 PS: Doctor 12-
3 Scientist
4 1) SS: Biology 14-
2 2) SS: Chemistry 12-
4 3) SS: Medicine 14-
4 4) SS: Surgery 14-
2 5) SS: Virology 12-
2 6) SS: Xenobiology 12-

Total Powers & Skills Cost: 67
Total Cost: 68

25+ Disadvantages
20 *Psychological Limitation:* Hippocratic Oath (Common, Total)
23 *Additional Disadvantages* (typically Age, Physical Limitation, Psychological Limitation, or Social Limitation) and/or Experience Points

Total Disadvantage Points: 68**Typical Equipment**

Field medical kit

Field medical scanner

FREE TRADER/MERCHANT

Val	Char	Cost	Roll	Notes
10	STR	0	11-	Lift 100 kg; 2d6 [1]
10	DEX	0	11-	OCV: 3/DCV: 3
10	CON	0	11-	
10	BODY	0	11-	
13	INT	3	12-	PER Roll 12-
12	EGO	4	11-	ECV: 4
15	PRE	5	12-	PRE Attack: 3d6
12	COM	1	11-	
2	PD	0		Total: 2 PD (0 rPD)
2	ED	0		Total: 2 ED (0 rED)
2	SPD	0		Phases: 6, 12
4	REC	0		
20	END	0		
20	STUN	0		Total Characteristics Cost: 13

Movement: Running: 6"/12"**Cost Perks**

- 10 Contacts: people he knows along the trade routes
- 20 Vehicle/Base: a small trader's ship, or a shop

Skills

- 3 Bribery 12-
- 3 Bureaucratics 12-
- 3 Computer Programming 12-
- 3 Conversation 12-
- 1 Electronics 8-
- 10 AKs/CKs of GM's choice
- 2 KS: Hobby 11-
- 3 KS: The Market 12-
- 4 Languages: 4 points' worth
- 1 Mechanics 8-
- 2 Navigation (Space) 12-
- 3 Persuasion 12-
- 3 PS: Trader 12-
- 3 Seduction 12-
- 2 SS: Astronomy 11-
- 2 WF: of player's choice
- 7 Trading 14-
- 2 TF: Commercial Spacecraft & Space Yachts

Total Powers & Skills Cost: 87**Total Cost: 100****25+ Disadvantages**

- 20 Psychological Limitation: Always Looking For Major Deals And Other Good Sources Of Income (Very Common, Strong)
- 55 Additional Disadvantages (typically Age, Physical Limitation, Psychological Limitation, or Social Limitation) and/or Experience Points

Total Disadvantage Points: 100**Typical Equipment**

Hand computer

Blaster (in rough territories)

Trade goods

SCIENTIST/TECHNICIAN

Val	Char	Cost	Roll	Notes
10	STR	0	11-	Lift 100 kg; 2d6 [1]
10	DEX	0	11-	OCV: 3/DCV: 3
10	CON	0	11-	
10	BODY	0	11-	
13	INT	3	12-	PER Roll 12-
10	EGO	0	11-	ECV: 3
10	PRE	0	11-	PRE Attack: 2d6
10	COM	0	11-	
3	PD	1		Total: 3 PD (0 rPD)
3	ED	1		Total: 3 ED (0 rED)
2	SPD	0		Phases: 6, 12
4	REC	0		
20	END	0		
20	STUN	0		Total Characteristics Cost: 5

Movement: Running: 6"/12"**Cost Skills**

- 10 *Scientific/Technical Genius*: +2 with all science- and technology-oriented Skills
- 3 Computer Programming 12-
- 3 Electronics 12-
- 3 Inventor 12-
- 4 AKs/CKs of GM's choice
- 4 KSs related to job/profession
- 2 KS: Hobby 11-
- 3 Mechanics 12-
- 7 Paramedics 14-
- 3 PS: Scientist or Technician 12-
- 3 Security Systems 12-
- 8 Systems Operation (Communications Systems, Environmental Systems, Medical Systems, FTL Sensors, Radar) 12-
- 3 Scientist
- 15 SSs of GM's choice

Total Powers & Skills Cost: 71**Total Cost: 76****25+ Disadvantages**

- 15 Psychological Limitation: one appropriate to the profession, such as *Scientific Curiosity* or *Prefers Technology To The Company Of People*
- 36 Additional Disadvantages (typically Age, Physical Limitation, Psychological Limitation, or Social Limitation) and/or Experience Points

Total Disadvantage Points: 76**Typical Equipment**

Hand computer

Field kit appropriate to mission or profession



SECURITY OFFICER

Val	Char	Cost	Roll	Notes
13	STR	3	12-	Lift 150 kg; 2 ½d6 [1]
14	DEX	12	12-	OCV: 5/DCV: 5
13	CON	6	12-	
10	BODY	0	11-	
13	INT	3	12-	PER Roll 12-
10	EGO	0	11-	ECV: 3
15	PRE	5	12-	PRE Attack: 3d6
8	COM	-1	11-	
4	PD	1		Total: 4 PD (0 rPD)
4	ED	1		Total: 4 ED (0 rED)
3	SPD	6		Phases: 4, 8, 12
6	REC	0		
26	END	0		
24	STUN	0		
				Total Characteristics Cost: 36

Movement: Running: 6"/12"

Cost Perks

- 2 Fringe Benefit: Membership (member of law enforcement agency)
- 5 Fringe Benefit: Planetary Police Powers

Skills

- 3 Criminology 12-
- 1 Forensic Medicine 8-
- 3 AK: character's "beat" 12-
- 2 KS: Criminal Law 11-
- 2 KS: Hobby 11-
- 2 KS: The Law Enforcement World 11-
- 3 PS: Security Officer 12-

- 3 Stealth 12-
- 3 Streetwise 12-
- 4 TF: GM's choice
- 6 WF: Beam Weapons, Energy Weapons, Small Arms
- 6 Choose two Skills from this list: Bureaucratics, Combat Piloting, Computer Programming, Concealment, Conversation, Deduction, Persuasion, Security System, Shadowing

Total Powers & Skills Cost: 45
Total Cost: 81

25+ Disadvantages

- 5 Distinctive Features: Uniform (Easily Concealed; Noticed And Recognizable)
- 10 Hunted: police agency he works for 8- (Mo Pow, NCI, Watching)
- 20 Social Limitation: Subject To Orders (Very Frequently, Major)
- 21 Additional Disadvantages (typically Hunted, Physical Limitation, Psychological Limitation, or Social Limitation) and/or Experience Points

Total Disadvantage Points: 81

Typical Equipment

- Blaster pistol
- Body armor (12 PD/12 ED, Activation Roll 14-)
- Hand computer
- Badge/identification)

BIBLIOGRAPHY & FILMOGRAPHY



The literature of science and science fiction is vast. The selections below are either the author's favorites, books the author thinks would be useful for *Star Hero* gamers, or sources used in writing this book (plus a few added by the Line Developer, a notorious meddler) — this is not a comprehensive attempt to review the genre as a whole. Readers interested in a more thorough discussion of the genre should consult *The Encyclopedia Of Science Fiction* or similar reference works.

I. NONFICTION REFERENCES

- Asimov, Isaac. *The Universe*
 Berry, Adrian. *The Next Ten Thousand Years*
 Bova, Ben, series ed. *The Science Fiction Writer's Series* books
 Bretnor, Reginald, ed. *The Craft Of Science Fiction*
 Clarke, Sir Arthur C. *The Exploration Of Space*
 Clute, John and Peter Nicholls, eds. *The Encyclopedia of Science Fiction*
 Couper, Heather and Nigel Hembest. *The Dorling-Kindersley Space Encyclopedia*
 Diamond, Jared. *Guns, Germs, And Steel*
 Dozois, Gardner, et al., eds. *Writing Science Fiction And Fantasy*
 Goldsmith, Donald and Tobias Owen. *The Search For Life In The Universe*
 Heppenheimer, T.A. *Colonies In Space*
 Langford, David. *War In 2100*
 Menzel, Donald. *A Field Guide To The Stars And Planets*
 National Audobon Society Pocket Guide. *Planets And Their Moons*
 Niven, Larry. Essays including "Bigger Than Worlds," "Theory and Practice of Teleportation," and "Theory and Practice of Time Travel"
 O'Byrne, John. *Space*
 Oberg, James. *New Earths*
 Regis, Ed. *Great Mambo Chicken And The Transhuman Condition*
 Sagan, Carl and I.S. Shklovskii. *Intelligent Life In The Universe*
 Vogel, Steven. *Life's Devices*
 Yenne, Bill. *The Atlas Of The Solar System*
 Zubrin, Robert. *The Case For Mars*
 Zuckerman, Ben and Michael Hart. *Extraterrestrials: Where Are They?*

II. APOCALYPSES

- Anderson, Poul. *Orion Shall Rise*
 Anthony, Piers. *BattleCircle*
 Brin, David. *The Postman*
 Hoban, Russell. *Riddley Walker*
 King, Stephen. *The Stand*
 Miller, George, dir. *The Road Warrior* (film)
 Miller, Watler. *A Canticle For Leibowitz*
 Niven, Larry and Jerry Pournelle. *Lucifer's Hammer*
 Williams, Paul. The "Pelbar Cycle" novels
 Zelazny, Roger. *Damnation Alley*

III. COMEDY

- Adams, Douglas. *The Hitchiker's Guide To The Galaxy* and sequels
 Foglio, Phil. The "Buck Godot" series (comics)
 Ford, John M. *How Much For Just The Planet?*

IV. CYBERPUNK

- Delany, Samuel R. "Time Considered as a Helix of Semi-Precious Stones"
 Gibson, William. *Neuromancer*, *Count Zero*, and *Burning Chrome*
 Harris, Anne. *The Nature Of Smoke*
 Katsuhara Otomo. *Akira* (film and comic)
Max Headroom (television series)
 Scott, Ridley, dir. *Blade Runner* (film)
 Stephenson, Neal. *Snow Crash*
 Sterling, Bruce. *Schismatrix Plus*
 Swanwick, Michael. *Vacuum Flowers*
 Vance, Jack. "The Augmented Agent"
 Varley, John. *The Ophiuchi Hotline*
 Williams, Walter Jon. *Hardwired*

V. HARD SCIENCE FICTION

- Clarke, Sir Arthur C. *2001: A Space Odyssey*, *The Fountains Of Paradise*, *Rendezvous With Rama*, and other novels and short stories
 Forward, Robert. *Dragon's Egg*
 Heinlein, Robert A. *The Moon Is A Harsh Mistress* and *Rocket Ship Galileo*
 Landis, Geoffrey. *Mars Crossing*
 Niven, Larry. Much of the "Known Space" series of novels and stories
 Robinson, Kim Stanley *Red Mars*, *Green Mars*, and *Blue Mars*
 Steele, Allen. *Orbital Decay*

Verne, Jules. *20,000 Leagues Under The Sea* and *From Earth To The Moon*

VI. LOW SCIENCE FICTION

Heinlein, Robert A. *Friday*

Herbert, Frank. *Dune* and its sequels

VII. MILITARY SCIENCE FICTION

Bujold, Lois McMaster. *Shards Of Honor*

Cameron, James, dir. *Aliens* (film)

Card, Orson Scott. *Ender's Game*

Dickson, Gordon R. *Dorsai!* and its sequels

Drake, David. *Hammer's Slammers* and its sequels

Haldeman, Joe. *The Forever War*

Heinlein, Robert A. *Starship Troopers*

Laumer, Keith. *Bolo*

Pournelle, Jerry. *King David's Spaceship*

Saberhagen, Fred. *The Berserker* series

Wells, H.G. *The War Of The Worlds*

VIII. MYSTERIES

Asimov, Isaac. *The Caves of Steel* and sequels

Bester, Alfred. *The Demolished Man*

Niven, Larry. *The Long ARM Of Gil Hamilton*

Niven, Larry and Stephen Barnes. *Dream Park*

Vance, Jack. *The Araminta Station* trilogy

—*The Many Worlds Of Magnus Ridolph*

IX. PLANETARY ROMANCE/BIG DUMB OBJECTS

Brackett, Leigh. *The Book Of Skaith*

Burroughs, Edgar Rice. *The Mars* series

De Camp, L. Sprague. *The Viagens Interplanetarias* series

Niven, Larry. *Ringworld* and its sequels

Silverberg, Robert. *Lord Valentine's Castle*

Swanwick, Michael. *Stations Of The Tide*

Vance, Jack. *Big Planet* and *Planet Of Adventure*

Varley, John. *Titan*, *Wizard*, and *Demon*

Wofle, Gene. *The Book Of The New Sun*

X. SPACE OPERA

Asimov, Isaac. *The Foundation* trilogy

Babylon 5 (television series)

Banks, Iain M. *The Culture* series

Banks, Iain. M. *Against A Dark Background*

Brin, David. *Startide Rising* and its sequels

Bujold, Lois McMaster. *The Vorkosigan* series

Lucas, George, dir. *Star Wars* and its sequels/prequels (films)

Niven, Larry and Jerry Pournelle. *The Mote In God's Eye*

Resnick, Mike. *Santiago*

Reynolds, Alastair. *Revelation Space* and its sequels

Simmons, Dan. *Hyperion* and its sequels

Smith, E.E. "Doc." *The Lensman* series

Star Trek (television and film series)

Vance, Jack. "The Moon Moth" and numerous other short stories and novels

Williamson, Jack. *The Legion Of Space* series

XI. STEAMPUNK

Chadwick, Frank. *Space: 1889* (roleplaying game)

Foglio, Kaja, Phil Foglio, and Mark McNabb. *Girl Genius* (comic)

Gibson, William and Bruce Sterling. *The Difference Engine*

Jeter, K.W. *Infernal Devices*

Moore, Alan, et al. *The League Of Extraordinary Gentlemen* (comic)

Pondsmith, Mike. *Castle Falkenstein* (roleplaying game)

Rowland, Marcus. *Forgotten Futures* (roleplaying game)

Stoddard, William H. *GURPS Steampunk* (roleplaying game)

The Wild, Wild West (television series)

XII. TIME TRAVEL/ALTERNATE HISTORY

Anderson, Poul. *The Time Patrol* series

Baker, Kage. *The Company* series

De Camp, L. Sprague. *Lest Darkness Fall*

Doctor Who (television series)

Leiber, Fritz. *The Big Time*

Piper, H. Beam. *Lord Kalvan Of Otherwhen* and its sequels

Twain, Mark. *A Connecticut Yankee In King Arthur's Court*

Wells, H.G. *The Time Machine* and *Men Like Gods*

Zemeckis, Robert, dir. *Back To The Future* and its sequels (films)

XIII. UTOPIAN/DYSTOPIAN

Atwood, Margaret. *The Handmaid's Tale*

Bass, T.J. *The Godwhale*

Fleischer, Richard, dir. *Soylent Green* (film)

Heinlein, Robert A. *Revolt In 2100*

Huxley, Aldous. *Brave New World*

LeGuin, Ursula K. *The Dispossessed*

Menzies, William Cameron. *Things To Come* (film)

Orwell, George. *1984*

XIV. MISCELLANEOUS

Cambias, James. *GURPS Mars* (roleplaying game)

Jackson, Steve, et al. *GURPS Space* (roleplaying game)

Miller, Marc, et al. *Traveler* (various incarnations) (roleplaying game)

The *Star Trek* roleplaying games from Last Unicorn Games and Decipher, Inc.

STAR HERO INDEX

- 360 View System (example technology) 207
- 61 Cygni 74, 78, 108
- Abbreviations 5
- Ablative And Reflective Armors 155-56
- Ablative Foam (example technology) ... 156
- Ablative Vest (example technology) 156
- Absolute Time Sense 50
- Absorption 52-54
- Acceleration in space 185-87
- Accelerator Pack (example technology) 153
- Accidental Change 61, 273
- Achernar 74, 78
- Ackálian Sickle (example technology) .. 148
- Acting 40
- Actions in Starship Combat 212-13
- Adreno-Booster Drug (example power) 53
- Advanced Firearms 148-50
- Advanced Personal Force Screen (example technology) 157-58
- Advanced Tech (Perk) 48
- Advanced technology 143-44
- Age 61-62, 273-74
- Aid 53
- Airlocks 200
- Albedo 88-89, 278
- Aldebaran 74, 78
- Algol 74, 78
- Alien blade weapons 148
- Alien civilizations 109-40
- Alien cuisine 117
- Alien life, effect on atmospheric composition 87
- Alien Pheromones (example power) 57
- Alien Physiology (Physical Limitation) .. 64
- Alien species
Generally 14
- As NPCs 122-24
- Creating 115-23
- SF without aliens 110-11
- Alien technology 144
- Alpha Centauri 74, 78, 107-08
- Altair 74, 78, 108
- Alternate histories 240-41
- Always On 61
- Ammunition, buying 178
- Amphibian aliens 116-17
- Analyze 40
- Ancients alien civilizations 122-23
- Android Package Deal 23
- Androids 15-16, 165-68
- Andromeda Galaxy 69
- Animal Handler 40
- Anomalies, astronomical 77
- Anomalies in planetary systems 81
- Anomalies of moons 85
- Anonymity 48
- Antares 74, 78, 108
- Antimatter Bullets (example technology) 150
- Antimatter Power 171-72
- Antimatter rockets 189
- Apocalypse SF 8
- Apport (example power) 254
- Archetypes, aliens 115
- Architecture, alien 139
- Arcturus 74, 78, 108
- Argos Exploration (sample PC group) 295-305
- Armor, for space vehicles 198
- Armored Spacesuit (example technology) 175
- Armored Vest (example technology) 155
- Art, alien 139
- Artificial gravity for space vehicles .. 203-04
- Artificial Gravity (example technology) 203-04
- Asteroids
Generally 95-96
- Flying among or attacking 96
- In Earth's Solar System 103-04
- Astronomical units (AUs) 73
- Atmosphere
Planetary, generally 86-88
- Components 88
- Effects of on characters and space vehicles 283-85
- Atmospheric Composition Table 87
- Atmospheric Density Table 87
- Attacking a planet 197
- Attacking in space combat 216-20
- AUs 73
- Autocannon (example technology) 206
- Autodoctor (example technology) 175
- Avilla, Robert (example PC) 297-98
- Axial tilt, planetary 86
- Background Skill 39
- Barnard's Star 74, 78, 108
- Barter 128
- Barth, Major Alyssa (example villain) 306-07
- Base (Perk) 50
- Bases in space 98, 208-11
- Basic Mecha Sensors (example technology) 207
- Battle Armor (example technology) 156
- BD +5° 1668 74, 78
- Beam Weapons, for space vehicles ... 195-97
- Beamed Power 171
- Bellatrix 74, 78
- Bends, the 284
- Betelgeuse 74, 78, 108
- Bibliography & Filmography 317-18
- Big Dumb Objects 14
- Bigger Tailfins civilizations 110-11
- Binary stars 73-74
- Bioplastic Armor (example technology) 157
- Biotechnology 168-69
- Black holes 75-76
- Blasters 14, 54-55, 152-53
- Blazing Energy Sword (example technology) 206
- Blob aliens 117
- Bode's Law 80-81
- Bodiless Being aliens 117
- Body control (psionic power) 244
- BODY and DEF of objects in
Star Hero 286
- Botanoid Package Deal 23-24
- Brain Hacking (example power) 254
- Breakfall 40
- Breaking objects in *Star Hero* 286
- Bright giant stars 74
- Bright Quasar 3C 273 108
- Brown dwarfs 76
- Bugging 40
- Bullets 149-50
- Bussard ramjets 190
- Buying equipment 177-78
- Campaign creation 259-66
- Caninoid Package Deal 24
- Canopus 74, 78
- Capella 74, 78, 108
- Captured planets 81
- Carbon-ammonia life 90
- Carbon-hydrogen life 90
- Carbon-methane life 90
- Cargo Loader/Heavy Labor Robot (example technology) 166
- Cargo Price Table 130
- Catastrophes, cozy 8
- Causality 233
- Cerebral Enhancement (example power) 168
- Chaff Generator (example technology) 199
- Champions 20
- Character Creation, generally 20-65
- Characteristics 39
- Characteristics (Power) 53
- Characters in space combat 219-20
- Charon 107
- Chemical rockets 188
- Chronometer Implant (example power) 52
- Civilizations, alien and future 109-40
- Clairentence 53
- Clarke's Law 160
- Classes of minds 250
- Classification systems for planets 92
- Climate 88-90
- Climate Types Table 89
- Clinging 53
- Cloaking Device (example technology) 199
- Clones 14, 54
- Cloning 168
- Cold Fusion 172
- Cold Fusion Generator (example technology) 172
- Colonies 91, 126-27
- Colonist Package Deal 33
- Colony Creature aliens 117
- Colony planets 126-27
- Combat Maneuvers in space combat 216-17
- Combat Modifiers in space combat 216
- Combat Suit (example technology) 155
- Comedy 17
- Comeliness 39
- Comets 71, 96
- Comm Button (example technology) ... 175
- Command Officer Package Deal 37
- Communications And Sensor Devices 175-76
- Communications Implant (example power) 29, 52
- Communications Implant (example power) 52
- Communications Systems, for space vehicles 200-02
- Complexity of life 91
- Composition, planetary 83
- Computer Programming 40-41
- Computers 14, 160-65
- Computers as characters 160-62
- Concentration 61
- Constitution 39
- Contemplative Culture Package Deal 27
- Corrosive atmospheres 284-85
- Counterworlds 81
- Cozy catastrophes 8
- Creating Package Deals 120-22
- Creating PC species 119-22
- Crew casualties in space combat 220-21
- Crew Skills, in space combat 221
- Criminal Culture Package Deal 27
- Criminology 41
- Cryptography 41
- Cube Roots Table 84
- Cuisine, alien 117, 140
- Cultural Fusion civilizations 111-12
- Cultural Package Deals 27-28
- Cultural Stereotypes civilizations 111
- Culture, alien 139-40
- Cumulative (as applied to Flight) 187
- Currency 127-28
- Cybernetic Arm (example power) 29
- Cybernetic Eye (example power) 29-30
- Cybernetic LF (example power) 30
- Cyberpunk SF 8-9
- Cyberspace 162-65
- Cyborgs 28-30
- Damage in space combat 217-19
- Damage Reduction 53
- Danger Sense 51
- Dargen (example villain) 310-11
- Dark Champions 20
- Darkness 54
- Deep Telepathic Probe (example power) 255
- DEF and BODY of objects in
Star Hero 286
- Defending in space combat 216-20
- Defense Powers 52
- Defense technology 155-57
- Defenses, for space vehicles 197-99
- Deflector Field (example technology) .. 199
- DeGraff, Jennifer (example PC) 299-300
- Deimos 103
- Delayed Effect 59
- Delta-V 188
- Demolitions 41
- Deneb 74, 78, 108
- Dense atmospheres 87
- Density, planetary 83
- Dependence 62, 274
- Dependent NPC 62, 274
- Devereaux, Bertrand (example villain) 308-09
- Dexterity 39
- Diameter, planetary 83
- Digger aliens 117
- Dimensional Missile (example technology) 158
- Dimensions 70
- Diplomat Package Deal 33
- Disadvantages
Generally 61-65
- Space vehicle Disadvantages 204
- Using in a campaign 273-77
- Disassembler Grenade (example technology) 170
- Disasters, planetary 127
- Disconnects, dealing with 270-73
- Disguise 41-42
- Disintegrators 154
- Disintegrated (example technology) .. 155
- Dispel 54
- Distant Stars Table 78
- Distinctive Features 62-63, 274-75
- Diversity among alien populations .. 138-39
- Docking and docking systems 200-01
- Doctor Package Deal 34
- Does BODY 59
- Double Heart (example power) 31
- Drain 54
- Drake Equation 68
- Dream Hacking (example power) 255
- Duplication 54
- Duration 59
- Dwarf stars 74
- Dyson spheres 98
- Dystopia SF 13-14
- Dystopias 112
- Early Gauss Cannon (example technology) 150
- Early Ion Gun (example technology) 152
- Early Plasma Gun (example technology) 153
- Early Rocket Gun (example technology) 155
- Early Starship Fusion Plant (example technology) 172
- Earth, attacking and destroying 197
- Earthbound SF 9
- Eccentricity, orbital 82
- Economics 127-31
- Education, alien 139-40
- Eidetic Memory 51
- Elder Civilization aliens 122-23
- Electric guns 55
- Electric Whip (example technology) 149
- Electron Beams 152
- Electron Rifle/Pistol (example technology) 152

Electronic Binoculars (example technology) 175
 Electronic Counter-Countermeasures (example technology) 202
 Electronic warfare 201-02
 Electronics 41
 Elements and features of SF 14-16
 Empathic Communication (example power) 255-56
 Empathic Control (example power) 255
 Emplaced Plasma Cannon (example technology) 158
 Encumbrance, affect of altered gravity on 278
 Endurance for space vehicle movement 185
 Endurance Reserve 54, 170-73
 Enemy species 289
 Energy Being Package Deal 24
 Energy beings 24, 91, 115
 Energy Blade Fencing (Martial Arts style) 44
 Energy blades 148
 Energy Blast 54-55
 Energy Form (example power) 118
 Energy Grenades (example technology) 155
 Energy Sword (example technology) 148
 Energy Technology 170-73
 Engineering Officer Package Deal 37
 Enhanced Flight Control (example technology) 202
 Enhanced Senses 55
 Enhanced Sensor/Communications System (example technology) 202
 Enraged/Berserk 63, 275
 Entertainment, alien 140
 Environment Package Deals 28-32
 Environmental Movement 51
 Environments in *Star Hero* 278-86
 Epsilon Eridani 74, 78, 108
 Epsilon Indi 74, 78
 Equipment, acquiring 177-78
 Escape velocity 187
 ESP 244
 Espionage 135-36
 Europa 104
 Everyman Powers 52
 Everyman Skills 40-42
 Exotic life 90-91
 Exotic objects 75-77
 Expanded Base Size Table 210
 Expanded Time Chart 234
 Expanded Vehicle Size Table 183
 Experimental Antimatter Reactor (example technology) 172
 Experimental Laser Rifle (example technology) 151
 Explorer Package Deal 34
 Explosion 59-60
 Explosive decompression 285-86
 Extra-Dimensional Movement 55, 233
 Falling, affect of altered gravity on 278-79
 Fangs (example power) 31
 Fantasy Hero 20-21
 Fast Being aliens 117-18
 Faster-Than-Light propulsion 190-94
 Features and elements of SF 14-16
 Felinoid Package Deal 24
 Fifties SF 12
 Fighter (example space vehicle) 223-24
 Fighting, affect of altered gravity on 279, 281
 Filmography 317-18
 Fire Extinguishing System (example technology) 210
 Firearms, Advanced 148-50
 Fission power 171
 Flare stars 77
 Flight (Power) 56
 Flight, affect of altered gravity on 279-80
 Flight Mode (example technology) 206
 Fluorine-silicon life 91
 Fluorocarbon-sulfure life 91

Flyer aliens 118
 Focus, space vehicle design and 184-85
 Fomalhaut 74, 78, 108
 Force Blade (example technology) 148
 Force Dome (example technology) 158
 Force Field 56
 Force Field Technology 157-58
 Force Shield Projector (example technology) 158
 Force Shields, for space vehicles 198
 Force Wall 56
 Forcebeam Tool (example technology) 176
 Forensic Medicine 41
 Forgery 41-42
 Forms and functions of government 131-38
 Four Arms (example power) 31
 Four Eyes (example power) 31
 Free Robot (Fringe Benefit) 50
 Fringe Benefits 49
 FTL 5
 FTL missiles (example technology) 195
 FTL Pilot (Talent) 51
 FTL propulsion 190-94
 FTL Travel (Power) 56
 Fuel Cell Generator (example technology) 171
 Fuel Cells 171
 Full Body Armor (example technology) 155
 Funny-looking Humans aliens 115
 Fusion Beam (example technology) 196
 Fusion power 172
 Fusion rockets 189
 Future civilizations 109-40
 G forces 186
 Galactic Computernet 161
 Galactic Computernet Access Card (Fringe Benefit) 49
 Galactic empires 14
 Galactic energy barriers 68
 Galactic habitable zone 67
 Galactic tyrants 14, 133-34, 289
 Galaxies and galaxy creation 66-69
 Gamemastering *Star Hero* 258-94
 Ganymede 104
 Gas giants 83
 Gaseous Form (example power) 118
 Gauss Pistol (example technology) 150
 Gauss Rifle (example technology) 150
 Gauss Weapons 150-51
 Generation ships 14-15, 190
 Generic NPCs 314-16
 Genetic engineering 168
 Genres, mixing *Star Hero* with others 20-21
 Giant aliens 118
 Giant Brain (example power) 31
 Giant stars 74
 Gland Override (example power) 52
 Gliding, affect of altered gravity on 279-80
 Globular clusters 69
 Government 131-38
 Gradual Effect 61
 Gravity Adaptation (Physical Limitation) 64
 Gravity
 General rules for 83-84, 278-81
 Artificial, for space vehicles 203-04
 Penalty to Skills 39
 Planetary 83-84
 Gravity Lifter (example technology) 176
 Greenhouse effect 89
 Grenades 154-55
 Grey Goo Grenade (example technology) 170
 Grigori, Jason (example PC) 301-02
 Groombridge 34 74, 78
 Ground vehicles 205-07
 Guardian Robot (example technology) 167-68
 Guns, for space vehicles 196-97
 Habitats in space 96-98

Hand Computer (example technology) 161
 Handless Being aliens 118
 Hangars 201-02
 Hard Science Fiction 9-10
 Head Of State (Fringe Benefit) 49
 Healing 56
 Heat beams 55
 Heavy Gauss Gun (example technology) 150-51
 Heavy Weapons 158
 Heavyworlder Package Deal 28-29
 Herdfolk Package Deal 25
 Hero Universe 20
 Hibernation aboard STL spacecraft 190
 Hideous Being aliens 118
 High gravity, rules for 278-80
 High Gravity Training (Environmental Movement) 51
 High Society 42
 History of space travel 180-81
 Hit Locations in space combat 218
 Hive creatures 115
 Hive minds 15
 Holographic entertainment 204
 Holoprojector (example technology) 175-76
 Homing Bullets (example technology) 150
 Horror 17-18
 Hotshot Pilot (Talent) 51
 Hovercraft 205
 HTH Combat, affect of altered gravity on 279, 281
 Huge Eyes (example power) 31
 Humanity, origin of 15
 Hunted 63, 275
 Hydrosphere 92
 Hyperdrive 192
 Hyperspace 15
 Hyperspace Drive 55
 Hyperspace Engine (example technology) 192-93
 Ichthyoid Package Deal 25
 Images 56-57
 Immaterial Aliens 118
 Immobile Being aliens 118
 Imperial Ship Classification 182
 Imperial Station Classes 208
 Improving technology 145-46
 Incantations 61
 Inclination, planetary 82
 Incredible Digestive System (example power) 31
 Incredible Immune System (example power) 31
 Inertial Gloves (example technology) 149
 Inertialess Drive 194
 Insectoid Package Deal 25
 Intelligent life 91
 Intense Interferiation Field (example technology) 202
 Interaction Skills 39-40
 Interference, with sensors and communications 201-02
 Interferiation Field (example technology) 202
 Intergalactic space
 Perils in 68
 Traveling through 69
 Internal Security Monitor (example technology) 211
 Interrogation 42
 Interspecies societies 116
 Interstellar Brain Link (example power) 256
 Interstellar governments 133-34
 Interstellar life 71-72
 Interstellar phenomena and dangers 71
 Intrinsic Language (example power) 52
 Introduction 5
 Inventor 42-43
 Invisibility 57
 Ion Beams 152

HERO SYSTEM 5TH EDITION

Ion Cannon (example technology) 196
 Ion Pistol (example technology) 152
 Ion Rifle (example technology) 152
 Ion rockets 188-89
 Jackpot (Argos Exploration's ship) 298
 Jetpack (example power) 56
 Jump Drive 193
 Jumpjets (example technology) 206
 Jupiter 104
 Kapteyn's Star 74, 78
 Kardashev classifications 124
 Knowledge Skills 43
 Krezshul, Segaro (example PC) 302-03
 Kruger 60 74, 78
 Kuiper Belt 107
 Lacaille 8760 74, 78
 Lacaille 9352 74, 78
 Lalande 211385 74, 78
 Language 138
 Languages 42-44
 Laser Assault Cannon (example technology) 206
 Laser Flashing 152
 Laser Pistol (example technology) 151
 Laser Rifle (example technology) 151
 Lasers
 Personal 151-52
 For space vehicles 195-96
 Latent Psionic (Talent) 51-52
 Law and justice 136-38
 Law Enforcement Agent Package Deal 34-35
 Laws Of Robotics 165
 Leaping, affect of altered gravity on 280
 Legal Strictness Table 136
 Legal System Table 136
 Legal systems 136-38
 Licensed Psionic (Fringe Benefit) 50
 Life 90-91
 Life of stars 74-75
 Life support systems, for space vehicles 202-03
 Life Support (Power) 57
 Lifting, affect of altered gravity on 280-81
 Lift distances 186
 Light-year 73
 Lightworlder Package Deal 28-29
 Limited Maneuverability 186
 Limited Power 61
 Limiting PC's technology 146-47
 Liquid helium life 91
 Liquid-Propellant Sniper Rifle (example technology) 149
 Literature, alien 140
 Lockpicking 44
 Longevity Treatment (example power) 52
 Low gravity, rules for 278-80
 Low Gravity Training (Environmental Movement) 51
 Low Science Fiction 10
 Low-Tech SF 144-45
 Luyten 725-32 74, 78
 Luyten 726-8 74, 78
 Luyten 789-6 74, 78
 Macro-Life 127-28
 Mag-Boots (example power) 53
 Magellanic Clouds 69
 Makarides High Port (example space station) 227-29
 Maneuvering and movement in starship combat 214-16
 Mars 102-03
 Martial Arts 44-45
 Mass media, alien 140
 Mass, planetary 82-84
 Matter Fax Booth (example technology) 173
 Mech Limbs (example technology) 206
 Mecha 205-07
 Mechanics 45
 Medical Devices 175
 Medical duty, in space combat 220
 Medical facilities, on space vehicles 204
 Medical Nanobots (example

- technology) 170
 Medkit (example technology) 175
 Mega-Bases 98
 MegaScale
 Generally 60
 For Senses 55
 Megastructures 97-98
 Melee weapons 148-49
 Mental Defense 57
 Mental Powers (see also *Psionics*)
 Classes of minds 250
 Computers and 160
 Mercantile Culture Package Deal 27
 Merchant Ship (example space vehicle) 222
 Mercury 100-01
 Merfolk Package Deal 29
 Metagenres 17-20
 Microverse travel 55
 Militaries, planetary and space 134-35
 Military Communicator (example technology) 158
 Military Rocket Pistol (example technology) 155
 Military Rocket Rifle (example technology) 155
 Military SF 10
 Military Technology 158-59
 Military UV Rifle (example technology) 151
 Milky Way Galaxy 67
 Mimicry 45
 Mind Control 57
 Mind Control Drug (example power) 57
 Mind Shield (example power) 256
 Mind Transfer, form of time travel 237
 Mindscapes 55
 Miranda 106
 Missile Deflection & Reflection 57
 Missile Pod (example technology) 206
 Missiles, for space vehicles 195
 Mondabi *Chashur* (example technology) 148
 Money (Perk) 50
 Moon, Earth's 101-02
 Moons 84-85
 Movement and maneuvering in
 starship combat 214-16
 Movement in space 185-87
 Movement Powers 52
 Moving, affect of altered gravity on 279-80
 Multi-Purpose Energy Weapon (example technology) 154
 Multiform 57-58
 Multiple Limbs aliens 118
 Multiple species on a single planet 91
 Multisyringe (example technology) 175
 Multitool (example technology) 176
 Music, alien 139
 Mutant abilities 31
 Mutant Package Deal 29
 Mystery 18
 Naming planets 83
 Naming stars 73
 Nanobot Immune Enhancers (example power) 52
 Nanotechnology 169-70
 Navigation 45
 Navigation Computer (example technology) 202
 Near Stars Table 78
 Near-Future Body Armor 155
 Nebulae 71
 Neptune 106
 Neural Probe (example power) 57
 Neutron stars 77
 Nightstight Glasses (example technology) 176
 No Normal Defense 60
 Non-player Characters, creating and using 292-94
 Nuclear Bomb, Self-Propelled (example technology) 158
 Nuclear Fission 171
 Nuclear Reactor (example technology) 171-72
 Nuclear Space Missile (example technology) 195
 Object DEF and BODY in *Star Hero* 286
 Obsolete technology 143-44
 Omnipotent aliens 291
 Oort Cloud 107
 Operations Officer Package Deal 37-38
 Operations Systems, for space vehicles 199-202
 Optional Starship Hit Location Table 218
 Orbital distance 80
 Orbital eccentricity 82
 Orbital effects 82
 Orbital Military Base (example space station) 229-31
 Orbital separation 73-74
 Orbitals (type of space habitat) 97
 Origin of humankind 15
 Package Deals
 Creating 120-22
 Cultural 27-28
 Environment 28-32
 Racial 23-32
 Species 23-27
 Paradox 233, 236
 Parasite and Symbiote aliens 118-19
 Parsec 73
 Particle Accelerator (example technology) 196
 Particle Beams, for space vehicles 196
 Particle Blaster (example technology) 153
 Particle Guns 153
 Penetrating 60
 Perks 48-50
 Personal Force Field Generator (example power) 56
 Personal Force Screen (example technology) 157
 Personal Force Shield (example power) 56
 Personal Sensor Unit (example technology) 176
 Personal Teleporter (example technology) 158
 Personal Tractor Beam (example power) 58
 Personnel Systems, for space vehicles 202-04
 Philosophy, alien 140
 Phobos 103
 Physical Limitation 63-64, 275-76
 Pilot Package Deal 34-35
 Piloting Systems for space vehicles 202
 Planet classification 92
 Planetary economics 128-29
 Planetary Kinetic Bombarder (example technology) 197
 Planetary Romance SF 10-11
 Planetary Surface Area Table 124
 Planetary systems 80-81
 Planetary vehicles 205-07
 Planets
 Generally 79-98
 As Bases 209
 Attacking a planet 197
 Wandering planets 71
 Plasma Battle Rifle (example technology) 153
 Plasma Cannon, Emplaced (example technology) 158
 Plasma Guns 153
 Plasma Pistol (example technology) 153
 Plasma Rifle (example technology) 153
 Plasma rockets 188-89
 Pleasure planets 15
 Plot Generator, Random 269
 Plot hooks for *Star Hero* 288
 Plotting an adventure 268-70
 Pluto 106-07
 Pocket Ion Pistol (example technology) 152
 Point Defense Lasers (example technology) 199
 Point Defenses, for space vehicles 198
 Poisonous atmospheres 284
 Polaris 74, 78
 Police Powers (Fringe Benefit) 49
 Pollux 74, 78
 Population, alien 124-27
 Population I and II stars 68
 Post-Apocalypse civilizations 112-14
 Post-Apocalyptic SF 8
 Posteconomic civilizations 129
 Power 45
 Power Advantages 59-60
 Powered Battlesuit (example technology) 156-57
 Powered Exoskeleton (example technology) 176
 Power for space vehicles 184-85
 Power Frameworks for psionics 249-50
 Power Limitations 61
 Power Mace (example technology) 206
 Power Technology 170-73
 Powers 52-59
 Premonitions (example power) 256
 Pressure, atmospheric 87-88
 Pressure, atmospheric 283-84
 Pressure Table 88
 Pricing Guide 177-78
 Probability Drive 194
 Probes 201
 Procyon 74, 78
 Professional Package Deals 33-38
 Professional Skill: Zero-G Operations 45-46
 Programs, for cyberspace (example technology) 163-65
 Propulsion Systems for space vehicles 185-94
 Protective Nanoswarm (example technology) 170
 Proton Rifle (example technology) 153
 Protostars 76-77
 Proxima Centauri 74, 78
 Psi-Agent Package Deal 35
 Psionic Jamming (example power) 256
 Psionic Package Deal 29-30
 Psionics
 Generally 15, 242-57
 Campaigns 251-54
 Classes of minds for in SF 250
 How they work 243
 Power level of 243-44, 249
 Power Frameworks and 249-50
 Powers common in SF 244-46
 Rarity of 246
 Rules considerations for 249-50
 Social issues relevant to 246-49
 Psychic Diagnosis (example power) 257
 Psychic Invisibility (example power) 256-57
 Psychological Limitation 64, 276
 Psychological Limitation, in Professional Package Deals 33
 Psychotronic Translator (example power) 52-53
 Pulp Hero 21
 Pulp SF 11-12
 Pulsars 77
 Pure Psionic Energy Form (example power) 118
 Quantum Displacement Transporter (example technology) 174
 Quaoar 107
 Quarantines of technology 145
 Quick Planet Creation Checklist 92-93
 Quick planetary system creation 82
 Racial Package Deals 23-32
 Radar Jammer (example technology) 199
 Radar Spoofing (example technology) 199
 Radiation, effects of 282-83
 Radiothermal Generators 171
 Railgun (example technology) 197
 Ramjets, Bussard 190
 Random Plot Generator 269
 Ranged Combat, affect of altered gravity on 279
 Ranged Weapons 148-55
 Ray guns 13
 Reactionless drives 189
 Realism 5
 Recreation, alien 140
 Red giant stars 74-75
 Reflective Coverall (example technology) 156
 Reflective Undervest (example technology) 156
 Regulus 74, 78
 Religion, alien 140
 Remote Viewing (example power) 257
 Repairs in space combat 220-21
 Reptiloid Package Deal 25
 Reputation (Disadvantage) 64, 276
 Reputation (Perk) 50
 Resources, planetary 93-94
 Retro-SF 11-12
 Riding 46
 Rigel 74, 78, 108
 Ringworlds 97-98
 Rivalry 64, 276
 Robots
 Generally 15-16, 165-68
 Robot characters 165-66
 Rocket propulsion for space vehicles 188-89
 Rockets (weapons) 154-55
 Rogue Package Deal 35-36
 Rogues 16
 Romance 18
 Rosettes 81
 Ross 128 74, 78
 Ross 154 74, 78
 Ross 248 74, 78
 Rotation, planetary 85-86
 Rubber science 16, 146-47
 Rubber suit aliens 115
 Ruchbah 74, 78
 Running a campaign 267-77
 Sample Tactical Computer 213-14
 Satire 18-19
 Saturn 105
 Scale of a campaign 265-66
 Science fiction elements and features 14-16
 Science fiction without aliens 110-11
 Science Officer Package Deal 37
 Science Skill 46
 Science! 5
 Scientist Package Deal 36
 Scientists 16
 Seëcra Wrist Blade (example technology) 149
 Secondary Life Support System (example technology) 211
 Sector Creation Checklist 71
 Secure Laser Communication System (example technology) 207
 Security Systems 46
 Seduction 46-47
 Self-Propelled Nuclear Bomb (example technology) 158
 Sense-Affecting Powers 52
 Sensor Drone (example power) 53
 Sensor Ghosts (example technology) 202
 Sensor Locks in space combat 216
 Sensor Systems, for space vehicles 200-02
 Sensory Enhancements (example power) 169
 Setting for a campaign 265-66
 SF 5
 Shape Shift 58
 Shaped-Charge Bullets (example technology) 150
 Shapeshifter Package Deal 26
 Ship Facilities Table 131
 Sickbays, on space vehicles 204
 Side Effects 61
 Sigma 2398 74, 78
 Sigma Draconis 74, 78
 Silicon Life-Form Package Deal 26

Simulate Death	52
Single-Shot Plasma Gun (example technology)	153
Singularity Power	173
Sirius	74, 78, 108
Size, of Bases	208-10
Size of stars	74
Size/Weight (Physical Limitation)	63-64
Size/Weight Package Deal	30-32
Skillchip Interface System (example power)	58
Skills	39-48
Skills	58
Skills as tools	48
Slingshotting	212-13
Slow Being aliens	119
Slower-Than-Light propulsion	188
Small Aliens	119
Small Radiothermal Generator (example technology)	171
Social commentary	18-19
Social Limitation	65, 276-77
Sol	100
Solar flares	100
Solar Panel (example technology)	171
Solar power	171
Solar System Gravities Table	279
Solar System of Earth	99-108
Solar systems	80-81
Soldier Package Deal	36
Sonic Multitool (example power)	58
Sonic Multitool (example technology)	176
Sonic weapons	55
Space combat	212-21
Space Combat Laser (example technology)	195-96
Space elevators	187-88
Space habitats	96-98
Space militaries	134-35
Space Opera SF	12
Space sails	189-90
Space stations	16, 208-11
Space storms	72
Space trade	129-30
Space travel, history of	180
Space vehicles	
Generally	179-204
Atmospheres and	284-85
Equipment	183-84
Obtaining	182-83
Power for	184-85
Propulsion	185-94
Size and Characteristics	183-84
Spaceports	130-31
Spacer Package Deal	32
Spacesuit (example technology)	174-75
Spatial Analysis (example power)	169
Special weapons for starships	197
Species Package Deals	23-27
Species within a species	119
Spectrum of stars	74
Speed	39
Spica	74, 78
Spinning Gravity (example technology)	203
Spy Package Deal	36-37
Standard atmospheres	87
Standard Energy Grenade (example technology)	155

Standard Immaterial Form (example power)	118
Star Gates	193-94
<i>Star Hero</i> Pricing Guide	177-78
Star sectors	70-72
Star System Data Table	77
Star Types Table	76
Starbases	208-11
Stars	
Generally	73-78
Life of	74-75
Naming	73
Size	74
Spectrum	74
System types	73-74
Types	74
Starship Antimatter Reactor (example technology)	172-73
Starship Creation	180-204
Starship Force Shield, Type II (example technology)	199
Starship Force Shield, Type I (example technology)	199
Starship License (Fringe Benefit)	50
Starship Maneuvers	215-16
Starship Officer Package Deals	37-38
Starships	
Generally	16, 179-204
Obtaining	182-83
Stealth Field (example technology)	158
Stealth Hull (example technology)	199
Stealth systems, for space vehicles	199
Steampunk SF	11
Stellar cartography	70
Stellar engineering	69
Sticky	60
STL	5
Storms, space	72
Strategic Officer Package Deal	38
Strength	39
Structuring adventures	267-70
Stun Rod (example technology)	149
Subdwarf stars	74
Subgenres	8-14
Subgiant stars	74
Subject of a campaign	262-65
Sun, Earth's	100
Super Intellect aliens	116
Superconducting surfaces for armor	156
Superefficient Sleep (example power)	52
Supergiant stars	74
Superheavy Laser (example technology)	196
Superheroes and SF	20
Supernova	75
Supernova remnant	77
Supertanks	11
Surface, planetary	92-94
Surrealistic SF	10
Survival	47
Survival Devices	174-75
Susceptibility	65, 277
Sustained-Beam Laser Rifle (example technology)	151
Swimming, affect of altered gravity on	280
Swords and starships	12
Systems Operation	47
Tactical Computer, Sample	213-14
Tactical Officer Package Deal	38

Tal, Kiritha (example PC)	304-05
Talents	50-52
Talking Beast aliens	115-16
Target: Earth!	197
Targeting Computers (example technology)	150
Targeting Sensor (example technology)	207
Tau Ceti	74, 78, 108
Tech Package Deal	38
Technology	
Generally	141-78
Acquiring	177-78
Civilizations and	124
Compatibility of different species's tech	144
Improving	145-46
Problems it can cause in the game	146-57
Technology Classifications Table	125
Technology levels	142-44
Technology quarantines	145
Telekinesis	58
Telekinesis, as psionic power	244
Telekinetic Hand (example power)	257
Telepathic Shriek (example power)	257
Telepathy	58
Telepathy, as psionic power	244-45
Teleportal Network (example technology)	174
Teleportation (Power)	58
Teleportation (technology)	173-74
Teleportation, as psionic power	245-46
Terraforming	16, 87, 89-90, 102
Terrain, dominant	92
Theme of a campaign	259
Thermal rockets	188
Thickened Skin (example power)	31
Thin atmospheres	87
Thought Speech (example power)	257
Three-dimensional mapping	68
Three-dimensional movement	215
Throwing, affect of altered gravity on	280-81
Thrusters (example technology)	202
Tidal heating of moons	84-85, 89
Time Belt (example technology)	234
Time Chart (Expanded)	234
Time dilation at FTL speeds	194
Time loops	233-34
Time Machine License (Fringe Benefit)	50
Time travel	16, 232-41
Time travel campaigns	237-41
Time Travel SF	12-13
Titan	105
Supertanks	176
Tools, Skills as	48
Topopolis	97
Towel (example technology)	176
Trace atmospheres	87
Tractor beams	202
Trade, planetary and space	129-30
Trader Package Deal	38
Tragedy	19
Transdimensional	60
Transform	58-59
Translator Chip (example power)	53
Transmit Sense Modifier, range of	55
Transport Familiarity	47-48

Travel	16
Trinary stars	73-74
Triton	106
Type of campaign	259-62
Types of space vehicles	181-82
Types of stars	74, 78
Underwater Impeller Pack (example power)	58
Universal Translation Matrix (example power)	52
Universal Translator	52
Universal Vaccine (example power)	52
Unluck	277
Uranus	105-06
Ursoid Package Deal	26
Usable Land Table	125
Utopia SF	13-14
Utopias	110
UV Laser Pistol (example technology)	151
Vaa'resh, Ghenak (example villain)	311-12
Vacuum, effects of	281-83
Van Maanen's Star	74, 78, 108
Variable Advantage	60
VARIABLE Special Effect	60
VASIMR rocket	189
Vega	74, 78, 108
Vehicle (Perk)	50
Vehicles, obtaining	182-83
Venus	101
Victorian SF	21
Villains, creating and using	287-92
Visiting the Sun	100-01
Vulnerability	65, 277
Wandering planets	71
Warp Drive	192
Warrior aliens	116
Warrior Culture Package Deal	28
Warship (example space vehicle)	225-27
Weapon Familiarity	48
Weapons	148-55
Weapons, for space vehicles	194-97
Weaponsmith	48
Weird diets	117
Well-known stars	74
Wells Device (example technology)	234-35
Western Hero	21
White dwarf stars	74-75
Winged Humanoid Package Deal	26-27
Wolf 359	74, 78
Wormhole Gate, Fixed Dates (example technology)	235
Wormhole Gate, Standard (example technology)	235
Wormholes, as method of FTL travel	193-94
X-780 Combat Mech (example vehicle)	227
X-Ray Laser Rifle (example technology)	152
Year length	82
Zee'gansh (example villain)	313-14
Zero gravity, rules for	280-81
Zero Point Power	173
Zero-G Strength Table	281
Zones in solar systems	80