For Twilight: 2000—
Shell Game
by Adam Geibel

For Traveller—
The Warehouse
by Joe Fugate

For 2300—
The IEX
by Deb Zeigler

Plus—
Building the Perfect 'Mech
by Kevin Stein

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Incorporating the Journal of the Traveller's Aid Society

CHALLENGE
GDW's Magazine of Adventure Gaming

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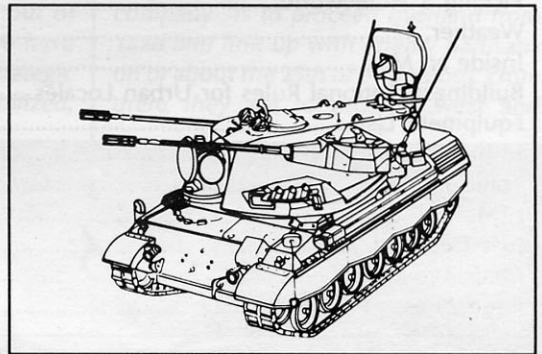
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From the Management

As you may have noticed, this issue of *Challenge* has a little more meat to it. We've expanded to sixty-four pages, allowing us to put in sixteen more pages of articles. When we conducted our Workshop Newsletter survey, larger page count topped the responses. Another matter which received a favorable response was expansion of game coverage, especially other companies' games. Since its origins as the *Journal*, *Challenge* has been devoted solely to GDW products, but enough of our readers play other games to make coverage in *Challenge* worthwhile. This issue features our first article on a game which is not our own. *Challenge* will remain a magazine devoted to futuristic games, of both a board and and role-playing nature, whatever their origin.

With expanded page count and expanded coverage, we hope that each issue of *Challenge* will be more useful to the reader. This also affords us an opportunity to take on more submissions from our readers. If you some ideas that you are interested in and you feel would be of interest to your fellow gamers, you might consider making a submission to *Challenge*. Write in for our guidelines, and go dust off your typewriter!

—*Timothy B. Brown*

JUST DETECTED

CONVENTIONS

DRAGON CON'87

October 2-4, 1987, Atlanta, Georgia. The Southeast Fantasy and Gaming Convention will be held in the Pierremont Plaza Hotel and Conference Center. Guests include: Michael Moorcock, Gary Gygax, Richard "Lord British" Garriott, Robert Asprin, Lynn Abbey, Brian Herbert, and Steve Jackson. Pre-registration is $20 Fan and $25 Game through 4/15/87, $25 Fan and $30 Game through 9/15/87 (Game registration includes four tournament entries). Strategic, FRP, and computer gaming in over 75 featured tournaments, panels, dealers' room, masquerade, video room, auction, and more! Send self-addressed stamped envelope to Dragon Con '87, Box 148, Clarkeston, GA, 30021, or Use your Visa or MC to charge your advance memberships by calling toll-free 1-800-554-1162 (in Georgia, call 404-441-3045).

SUNCOAST SKIRMISHERS

October 2-4, 1987, Tampa, Florida. *Skirmishes* presents the seventh annual production of this gaming extravaganza, at the Howard Johnson Plaza Hotel in Tampa, Florida. Events will include: Historical miniatures, RPGs, boardgaming, live action tournaments, dealers, seminars, awards, and more! For more information and registration packets, contact: Skirmishes, 1803 3rd Ct., SE #A, Winter Haven, FL 33880 or call (813) 294-9166.

TOLEDO GAMING CONVENTION

October 3-4, 1987, Toledo, Ohio. THis convention, held on the Scottpark Campus of Toledo University, will feature miniatures, D[D, boardgaming, a painting contest, computer clubs, movies, an auction, and a dealer showroom. For more information, send SASE to Mind Games, 3001 N. Reynolds Rd, Toledo, OH 43615.

FALL-CON '87

October 16-18, Cincinnati, Ohio. Sponsored by the Cincinnati Adventure Gamers, this convention will be held on the

Shell Game

I was hell on the road to complete and total obliteration, courtesy of "Rosie's" rotgut. Seems like every place we go gives birth to a new "Rosie's." Name doesn't even change.

Lopez on his beat-up old Fender guitar and some kid from the 82 on a purloined piano were playing old Al Stewart tunes when a loser from Intelligence came in looking for me. I was cordially ordered to report to GHQ in four hours...a mission of utmost importance...least I wouldn't spend Christmas sitting here feeling depressed...

INTRODUCTION

Shell Game is a mini-module for use with GDW's WWIII role-playing game, **Twilight: 2000**. The scenario begins with a hastily assembled team of allied commandos racing to prevent the Soviets from obtaining a dangerous advantage, with only a 10-day margin before disaster strikes.

Details are given for the Shiraz Defense District and the country to the north and west, as well as information on the 3rd AD, IPA. Outlines for resolving airdrops are provided, as well as some special equipment.

Shell Game is presented as an operation in the "old" sense—aircraft, paradrops, and technical gizmos to make the job easier. The logical conclusion, however, can only be the same as all warfare past, present, and future—violent and lethal.

REFEREE'S NOTE

This mini-module is designed to be used by the referee. Narrative scenes describing certain events from the point of view of the characters are provided to add additional color and detail to the referee's narrative description of the situation to the players. The narrative section, set apart in italics for easy recognition, should be read to the players. All other sections are reserved for the referee only (unless otherwise stated).

I knew this was going to be a weird mission heading full tilt to bad when I saw the brass in the GHQ briefing bunker. Israeli, Brit, Air Force. Us pigeons had the privilege of the first three rows, and I had worked with at least half these guys before, which was some comfort. Then Tweedle Dum and Tweedle Dumber from Intelligence strolled in with a couple of armfuls of maps and papers. This was going to be fun...

0800 21/12/00 BEK—S-2 PRESENTING

Gentlemen, sorry to drag you out of bed on such short notice, but we have a problem. You're aware of the strategic situation, that both sides have stabilized, but one good push either way would carry the whole shooting match. We have discovered a Soviet plan that, if successful, could wipe out the Iran Nowin and the IPA.

During the early morning hours of 18 December, a single dispatch vehicle travelling from 1st Army HQ via Qom to Tehran was ambushed on a deserted stretch of highway by pro-NATO Kurds. Documents were recovered, but the unit had to flee upon the impending arrival of elements of the 91st KGB MRR.

The Kurds escaped unnoticed with the plans to Operation Footfall, leaving an innocuous wreck overturned on an icy road. The KGB patrol discovered the wreck and the papers left by the guerrillas. They duly reported the accident to higher headquarters, who instructed them to burn the vehicle, and say nothing about the papers...

The Kurds managed to filter the information back to BEK in only two days, but not before a Shir Iran spy got a look at them...and so the word spread to the various intelligence groups.

From what we've been able to piece together, a Soviet unit codenamed Arrowhead—a long-range recon company—is to proceed overland from Yazd and link up with enemy partisans on or about the 25th of this month. From there they are to proceed west and
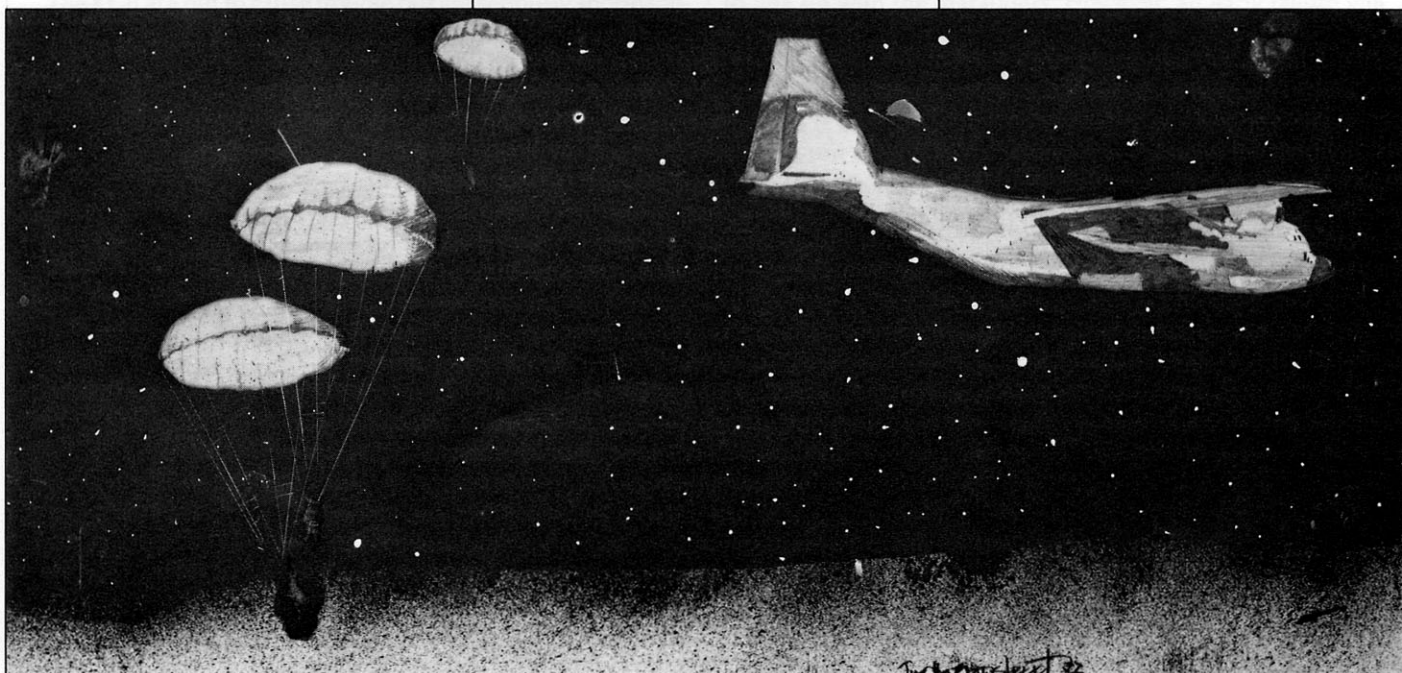
CO, Team Oscar

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CG SOCCENT
BUSHEHR (vic QHNJ5129) IRAN
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OPORD SHELL GAME

References: DMAAC 4-96, JNC-9N, Edition 11, 1:2,000,000
Time Zone Used Throughout The Order: ZULU
Task Organization:
TEAM OSCAR
Per Annex C, OPORD SHELL GAME

1. SITUATION

a. Weather—22 thru 25 Dec—clear
26 Dec—clouding
27 thru 31 Dec—60 percent precipitation
Temp.—Highs 5 degrees C
Lows—4 degrees C
+ or −2 degrees C
Full moon throughout operation

b. Enemy Forces. 315th LRRC, 8th MRD; Marauder Band Nhaziern (MBN). Enemy intend to infiltrate Shiraz, emplace and detonate two portable nuclear devices. Consult Annex A, OPORD SHELLGAME for current G2 threat estimate.
1. Location—315th moving west; MBN Kor River Valley area.
2. Activity—Units rendezvousing, headed to Shiraz
3. Strength—315th 20 to 30; MBN 25 to 35

c. Friendly Forces
1. Mission of next higher unit BEKHQ Command and support.
2. Attachments and Detachments. None.

2. MISSION

Team Oscar to intercept and capture or destroy enemy TacNuk.

3. Execution

Concept of Operation—Infiltrate undetected and intercetp enemy unit(s). Exact details left to mission commander's discretion.

Coordinating Instructions
Time of Departure: 22.12.00, 21.00
Time of Mission Termination: (Theoretical) 01.01.01, 12.00

Command and Signal
Signal: BEKGHQ (SECURE) 35:10 (24 hour moniter)
Air Assets 40:05
U.S. Embassy, Shiraz 35:40 (24 hour monitor)
Code in Effect—Blue 3
Team Code OSCAR
Cmmd Code ERNIE
ArAsst Cd DEWY
Command: Mission leader supersedes aircraft commander
Service Support
Rations 10 days MRE per
Arms As per requisition
Ammunition As per requisition
Wounded As per Mission Leader's discretion
Prisoners/Captured Equipment: As per M.L.'s discretion
Airdrop Eqp.: S-4, 82nd Abn

KIRBY CG

Annexes
A-Enemy Dispositions
B-Friendly Dispositions
C-TOE, Team OSCAR
D-Aerial Movement

south, infiltrate Shiraz, and emplace and detonate two portable nuclear devices. We feel that the most likely place for a rendezvous is the Kor River Valley or the Gar/Dashtak mountain range. They plan to resolve this operation by 1 January.

The IPA and the Iran Nowin have not been informed as there is a leak in their higher communications. Until that leak has been neutralized, this mission will remain a secret from them. This means that under no circumstances should Shiraz be contacted as it would embarrass the Allied command.

If, for whatever reason, Shiraz learns of the mission, the Tudeh network will have passed this on clandestinely to Yazd within half an hour. Use this margin for calculating a Soviet airmobile counter response.

Intelligence has gleaned this from the incomplete papers: the 315th will carry out this mission with vicious determination with or without marauder help.

Your team's mission is to intercept the Soviet forces and capture or destroy the nuclear devices. Exert all effort to capture these weapons intact.

The essence of this mission is secrecy. It is imperative that no one find out your true identity or link you to the Allied command. Your best chance would be to impersonate a marauder group. You have all received your oporder packets? Good...this mission gets off the ground in 25 hours. Good luck, gentlemen...

In addition to the 315th and Nhaziern's marauders, the KGB and the Iranian Royalists will be after the nukes. The French have been called in for assistance by the Shir Iran as their assets in the Shiraz area are negligible. The Royalists would use these as weapons of extortion, the French as bribes to some corrupt Iraqi generals, and the KGB would use the missions failure as an excuse to purge General Suryakin.

The French have little use for the Shir Iran other than as pawns now or as a possible future cat's paw. If Franco/Royalists came into possession of the nukes, the Iranians would unfortunately die to a man, a tragic result of enemy contact. If the mission is successful for them, they will rendezvous with a Djibouti-based aircraft and then head east on another mission...

The KGB are out to cause trouble but are seriously shorthanded and are quite willing to hire a marauder group to bolster their numbers. As with any KGB deals, the hirelings would be wiped out by the forces that came to collect their agents and, hopefully, the weapon. Since the marauders in this area have had little or no experience with the KGB, they would not be aware of this.

The Allied group should be composed of 15 to 20 very strong characters, as they must make up in skill what they will lack in numbers. Members must be at least Ranger qualified and preferably Special Forces of American, British or Israeli origin. Ideally, the group should include ISA and AJITF agents and possibly a pair of Kurdish guides waiting at the drop scene. If the referee wanted to make things really interesting, one of the Kurds could be a Tudeh spy.

Like the French, the Allies will be dropped out in the middle of nowhere on foot. It would therefore be logical to procure some local transportation (read steal some horses). There should be at least one designated radio specialist and one medic. Strong language skills in Russian and Farsi are essential, as well as NWH and some equestrian experience.

Equipment and gear should be of mixed origin, including night vision devices, weaponry of interchangeable calibers (i.e. only weapons in 9mm, 5.54B or 7.62N), and clothing. Jump equipment should be buried as soon as possible after landing.

There is a potential for an incredible amount of confusion that the players could take advantage of or be overwhelmed by. Remember, the players and their adversaries are commandos, a breed that thrives in an environment of chaos and fog. All of the groups will appear, in dress and range of equipment, to be marauders. At a distance of greater than 100 meters, exact identification will be impossible (unless they're doing something to give themselves away, like shooting a downed airman); at closer ranges it will be a DIF:RCN task.

Probably the best strategy for the commandos is to catch the LRRP's east of the mountain range, before they get a chance to link up with the marauders. However, an early failure will blow the element of surprise and make the Soviets very paranoid. Initially, they have no idea that their mission has been compromised.

There is also a timetable for NPC group actions should the players not encounter any of them in the first few days. The Soviet recon team travelled west, unwittingly avoiding the French, and linked up with Nhaziern's marauders by the 27th. Nhaziern would allow his men to act only as guides, showing the Soviets the smugglers' routes in and out of the Shiraz area. His refusal to commit his group, unless in their own self-defense, angered Major Buchavitch. The Soviet commander will leave at sundown on the 28th (with guides) from the west face of Mt. Gar and try to make the cover of Banesh by sunup.

The French and Royalists, who followed Buchavitch's trail 30 hours behind, struck during the afternoon of the 28th and seized the nuke. Both sides suffered half a dozen casualties during the firefight. Men and animals of the victorious raiders were exhausted after their earlier chase, unable to outrun the Soviets and marauders. The Soviets recovered the nuke and were headed to Banesh by the early morning of the 29th.

The KGB unit never made it further than a few kilometers

into the Mt. Gar/Dashtak range, where they were ambushed and annihilated on the 30th by smugglers offended earlier. The referee may use this as a guide to the bomb location as time progresses if players have not yet influenced events. The following lists events should characters not interfere with the groups. Approximate times accompany dates, when appropriate.

ENCOUNTER SCHEDULE

22.12.00 The 315th passes south of Mt. Sefid's southern foothills, spends the day of the 23rd in camp.

23.12.00 The 315th travels north along the east base of the Mt. Chub Bidi range, ignorant that they are following the trail of the Shir Iran group. Trail lost and camp made by daybreak.

24.12.00 The 315th travels around the north end of the Mt. Chub Bidi range, then due south into the Dashtak range. Shir Iran links up with G11, then heads west.

25.12.00 G11 travels through the Mt. Chub Bidi pass and reaches the base of the Mt. Gar/Dashtak range. The 315th passes through the Gar/Dashtak and attempts to approach Shiraz from the northeast (near Mt. 9285). Backtracks north to avoid IPA air and horse patrols.

26.12.00 The 315th works back up the Gar/Dashtak, searching for Nhaziern. G11 picks up trail after questioning shepherd boy.

27.12.00 (03.30) The 315th rests, joins Nhaziern's marauders.

28.12.00 (14.00) G11 and Shir Iran attack 315th camp north of Mt. 9275 on Mt. Dashtak ridge, then west to Kor River Valley.

28.12.00 (20.15) The 315th, with marauder guides, attacks G11, inflicts heavy casualties, and recovers the bomb.

29.12.00 (01.45) The 315th, with marauder guides, breaks camp and eads for Banesh. Nhaziern attacks G11/Shir Iran remnants, nearly eliminating them. A few survivors flee north.

29.12.00 (05.10) The 315th makes Banesh and hides until sunset.

30.12.00 (04.30) The 315th makes Qalat Mt. (pt. 9837). KGB group eliminated south of Mt. Bakan.

31.12.00 (08.00) The 315th ambushes small merchant convoy and assumes their role to slip into Shiraz. Bomb emplaced and set to detonate in 11 hours at 13.00.

31.12.00 (14.20) The 315th is caught at a checkpoint while leaving city. Ensuing firefight scatters survivors.

01.01.01 (00.01) Nuclear device explodes in the town's center.

WEATHER TABLE

Weather could play a major part in the chase for the nuke. Though unlikely, a snow squall at a critical time could obscure a harried group from its pursuers. Following is a D100 table. For this campaign only, add 5% per day cumulative until the 27th, then subtract 5% per day (noncumulative). Initially, the weather is clear, cold (-1°C) and only slightly breezy.

Basic Weather

Die	Weather
1-15	Clear
16-22	Clear, scattered clouds
23-28	40% Cloud Cover
29-44	60% Cloud Cover
45-54	80% Cloud Cover
55-65	Overcast
66-69	Overcast, with fog
70-74	Snow Flurries/Sprinkling
75-78	Sleet/Drizzle
79-92	Light Snow/Light Rain
93-98	Heavy Snow/Heavy Rain
99-00	Blizzard/Thunderstorm

TEMPERATURE

Roll 1D10 and subtract the result from 7°C. Subtract 3°C when in mountains and at night.

Wind Direction (1D10)

Die	Quadrant
1	N/NW (330°)
2	N/NW (315°)
3	W/NW (300°)
4	W/NW (285°)
5	W (270°)
6	W/SW (255°)
7	W/SW (240°)
8	SW (225°)
9	S/SW (210°)
10	S/SW (195°)

This table gives the direction from which the wind is blowing.

Wind Speed (1D10)

Die	Wind Speed
1	1-3 kph
2	4-7 kph
3	8-10 kph
4	11-14 kph
5	15-19 kph
6	20-24 kph
7	25-28 kph
8	29-32 kph
9	33-35 kph
10	36-40 kph

REFEREE'S NOTE

Parachute drops are a new facet of **Twilight: 2000** and are really not too complicated, though these operations go beyond a simple die roll for parachute skill. Referees should refer to *Challenge* issue 26.

The two principal concerns of a paradrop are whether the chute works and the nature of the landing. Equipment is checked meticulously before a drop, but accidents happen. Only a catastrophic failure roll will indicate a main chute failure. If a jumper is above 150 meters and wearing a reserve chute, he has a second chance.

Daylight drops are ESY:PAR as long as the drop zone is basically level, clear ground. For night drops and drops when the wind speed is greater than 16.5 kph, subtract 15%. The task becomes average if the ground is wooded or slightly hilly, and difficult if mountainous. As noted previously, a catastrophic failure indicates a malfunctioning chute, a failure a fall from seven meters, and a minor failure being dragged by a runaway chute for 10 meters.

The mission commander must specify the drop zone, airspeed, and altitude of the aircraft, as well as whether a reserve will be carried. The length of the drop zone, in meters, is one-half the number of jumpers times the aircraft speed (in kph). Drift is measured with the equation 1.6 times altitude (in 100s of meters) times velocity (ground winds in kph). Wind velocity is excluded for equipment drops from less than 80 meters.

The order provided should be copied and given to the mission leader.

PERSONALITIES

Major Pieter Buchavitch

A promising young officer who has received two battlefield promotions in the last 18 months, Peter Buchavitch has been with his unit, in combat, for the last three years. Though a devout communist, he is tired of the war and feels betrayed by the "diseased old men in the Kremlin." He expresses this in his meticulous mission planning and execution and his off-duty excesses involving women and alcohol. As long as his men survive and the mission is accomplished, anything is permissible on or off the battlefield.

Buchavitch is extremely loyal to Suryakin and would gladly support the general's bid for an independent Transcaucasus, were he to know of it and survive this mission. He is somewhat of a bigot, preferring not to work with "locals" as they have been less than reliable in the past. The Major is tall, thin, has sandy blonde hair and half a dozen visible, old scars. Major Buchavitch is a Veteran NPC.

The Major speaks Russian (100%), English (99%), German (60%), and Farsi (70%).

NPC Motivation: *Heart 9:* Loyalty to his men and General

Suryakin. *Club 3:* Violence; in this case, he is unintimidated by threats and will not hesitate to react violently if the situation warrants it.

Nhaziern Khazi

A silent, bearded man with deeply suntanned skin, coal black eyes and graying hair, he is small, only 160 cm, and painfully skinny. Unlike other successful men of small stature, Nhaziern is unnervingly quiet and unassuming. He is an expert with knife and pistol, as well as being very devious.

Originally, Nhaziern ran hashish from Afghanistan to the Persian Gulf, where it was loaded on ships headed west. When the ships stopped coming, he took his two cousins and some herdsmen and joined a Pasdaran militia unit. He betrayed them to a Tudeh group and left with a small following in the ensuing confused massacre.

In late 1999, he chose the Kor River Valley as a permanent home. The band absorbed, eliminated or chased away most of the other marauder bands in the area. Nhaziern realized that the way to survive under the Iran Nowin's nose was to be invisible—other naughty boys could ruin his paradise.

The area's residents don't mind Nhaziern's presence, as he keeps potentially worse bands away and isn't too greedy. With Shiraz eliminated, Nhaziern could become ruler of the entire neighborhood around the Kor. Nhaziern is a Veteran NPC.

Nhaziern speaks Farsi (100%) and English (20%).

NPC Motivation: *Spade Queen:* Ruthless and will do anything or act in any manner to achieve his goals. *Club 7:* Views violence as an acceptable solution to almost any problem.

Ordubadi

Ordubadi is a squirrelly, thin, old herdsman who moonlights as a bandit. After ambushing several groups of stragglers back in '97, Ordubadi and his confederates realized that this was an easy way to increase their standard of living.

During the winter, Ordubadi becomes a "bandit," as he finds that he has to be outdoors less than when shepherding, and it's more fun than watching sheep and goats.

Ordubadi speaks only Farsi. He is a Veteran NPC.

NPC Motivation: *Diamond Jack:* Scared of a real fight, so he attacks only the weak and unprepared. *Diamond 9:* Greedy,

sometimes to the point of foolishness.

Major Gorges Amiet

Having just turned 40 last month, Amiet was considered by many of this mission's planners to be too old for this job. Amiet had worked his way up through the ranks and twice served under Lt. General Cervelan.

Before the war, Gorges had only officially seen action in Chad and Lebanon. However, his file notes sabbaticals, which happened to occur at the same time as several rumored DGSE operations in Indochina. He also spent some time in Kuwait as an advisor.

He is a career soldier and dedicated to his men, though viewed with distaste by fellow officers for his off-duty antics. In spite of his coarse activities, Amiet has been kind to small children and animals when he thought no one was looking. Major Amiet is an Experienced NPC.

The major speaks French (100%), English (75%), Vietnamese (70%), Arabic (65%), and Farsi (40%).

NPC Motivation: *Heart 7:* Loyal to his men. *Club 4:* Not easily intimidated and ready to do whatever necessary to accomplish the mission—within the bounds of decency.

Dr. G. H. Rezai

A handsome man, Dr. G. H. Rezai (whose education in England was financed by the Royalist underground) is third cousin to the current Shah-in-exile. He practiced medicine in the United States until 1994, at which time he clandestinely reentered Iran and worked with the Shir Iran organization as a surgeon and occasional field agent.

Rezai is somewhat of a romantic who believes that the future for Iran lies with the Royal family. Though a competent doctor and a reasonably wise man, he lacks military training and is not above deferring to those with more knowledge. However, he may not act on advice, preferring to remain cautious and alive. Rezai is an Experienced NPC.

The Doctor speaks Farsi (100%) and English (90%).

NPC Motivation: *Heart 10:* A strong belief in his cause and people. *Diamond Ace:* Generosity, in that he willingly sees to the medical needs of people when he can.

ORGANIZATIONS

Nhaziern's Band

Nhaziern's marauder band of prewar smugglers is composed of local tribesmen and army deserters. It was first identified as a group May 1997. They have operated with Soviet and Tudeh forces in the past but are not ideologically sympathetic, being motivated by personal gain or preservation.

Referee's Note: This band is competent and dangerous in combat and is well disciplined for irregulars. Their vigilance has slipped a bit in the last few months, as they have been leading a life of ease in the Kor River Valley. They possess limited mobility with 30 mules, 15 horses, and 20 burros.

Leaders: Nhaziern is the unquestioned leader, being the most experienced and deadliest. He is backed by his two cousins, Nafici Khazi and Omar Moghadh, who assisted him in prewar criminal exploits.

Meeting the Band: If encountered or tracked down, one out of every six men will be on guard. This is effective 24 hours a day, but lately some of the men have taken to catnapping,

though careful not to be caught. If encountered on the road, a smaller group will eventually return to the main camp.

Numbers: Including the leaders, 50 men. This includes 20 Veterans, 22 Experienced and five Novices.

Where Found: As per the encounter tables. Anywhere outside the Mt. Gar/Dashtek range the group will be a small party foraging for supplies. They will number 2D10 and be mounted. There is a 50%-chance they are headed away from the main camp, 50% returning. In the range it will be the main group, less 2D10 men, at one of their many lairs/caches.

Weapons: *For Veterans:* 4 AKRs, 5 AK-074s, 2 RPK-74s, 3 G-3s, 4 FNs, 1 MG-3, 1 M-16, 2 RPG-16s and 8 Rockets, 2 BG-15s, and 40 Grenades

For Experienced: 2 AK-74s, 1 RPK-74, 5 M16s, 1 M249, 7 FNs, 5 G-3s, 1 HK 21, 1 60mm Mortar, 10 HE Shells, 1 BG 15 and 15 Grenades

For Novices: 2 AK-74s, 3 M16s

Everyone carries 100 rds of rifle ammo and a pair of fragmentation grenades, or two belts of machinegun ammo. There are five cave/camps, each with a cache of six crates each of 5.56N, 5.54B and 7.62N, as well as two crates of frag grenades.

The Majestic Bandits of the Mountain

The Majestic Bandits are sheepherders who have become bandits. The date of their formation is unknown, as they avoid contact with organized military units. This group is rumored to have operated in the past in conjunction with Nhaziern. Though excellent mountaineers and marksmen, they are undisciplined and prone to avoid conflict unless their numbers are overwhelming.

Referee's Note: This group is a bunch of peasants supplementing their income by occasionally raiding merchant caravans. The majority live in their own hovels and care for small flocks, gathering with the leaders only for raids. Captured members of this group will be easy to interrogate and add a second die roll to the rumor chart.

Leader: Ordubadi

Meeting the Band: As per the encounter table. The main group will only consist of 2D + 4 bandits, including Ordubadi, 75% of the time. Individual members could be encountered as sheepherders 40% of the time while in the Mt. Sefid area, 10%

elsewhere.

Numbers: At full strength this band has 43 members: 5 of them Veterans, 18 Experienced, and 17 Novices.

Where Found: As per encounter table, in the Mt. Sefid area.

Weapons and Equipment: *For Veterans:* 2 AKRs, 5 MP5s, 2 M16s

For Experienced: 2 RPK-74s, 1 PK, 2 HK-21s, 3 M16s, 4 AK-74s, 2 MP5s, 3AKMs, 1 FN

For Novices: 5 M-16s, 7 G-3s, 2 AKMs, 3 FNs

315th Long-Range Recon Co., 8th MRD Recon Batt. (Yazd)

The 315th is a decimated Spetsnatz unit that merged with a recon company in December of 1999, which absorbed the company's remaining personnel.

Referee's Note: A tired group of dedicated communists and career soldiers now resigned to staying alive, the 315th is fiercely loyal to General Suryakin and realizes the gravity of this mission for his command. This type of unit is often referred to as a Long-Range Recon Patrol, hence the abbreviation LRRPS. Skill levels for Spetsnatz are as special forces, Recon as rangers, Kurds as mountain troops.

Leaders: Major Pieter Buchavitch, Lt.

Meeting the LRRPS: They travel by night and sleep by day with 50% security. Dress and equipment are varied so as to appear as marauders. In open terrain, three security teams will be riding a half kilometer in front and to each flank.

Numbers: In addition to the two officers and three NCO's, there are seven Spetsnatz troopers (Vet), 15 Recon (Vet), three Kurdish guides (Exp) and two Tudeh representatives (Exp, Nov).

Where Found: Helilift from Yazd to Persepolis, mule to op area. Route south of Mt. Sefid, rendezvous with marauders in Mt. Gar area. Travelling 30 km/night.

Weapons and Equipment: *For Spetsnatz:* 1 MP5, 1 M16, 1 SVD, 1 AKR, 2 G-3s, 1 UZI

For Recon: 1 FN, 1 M249, 3 M16s, 2 AK-74s, 2 UZIs 1 MP5S, 3 G3s, 1 PSG-1, 1 RPK-74, 2 BG-15+s, 30 grenades

For Kurds: 1 AK-74, 1 M16, 1 G3

For Tudeh: 1 MP5, 1 UZI, 1 tactical nuclear device, 2 detonators for above, 2 50 km secure BKPK/VEH radios, 1 500 km antenna, 1 foot-operated generator, 3 cases plastic explosives, 1 case detonating devices, 2 RPG-16s and 8 rockets, 1 stinger and 4 missiles, 2 doctor's med kits, 3 IR goggles, 3 4× binoculars, 25× image intensifier, starlight scope

Group Onze, Marine Parachute Regiment, Gole

A new group whose members were carefully chosen, Group Onze has a radio specialist, a medic, a nuclear explosives technician, three snipers, and two professional trackers.

Referee's Note: Like the Allied group, this team is being air-dropped near Mt. Sefid and will be mobility handicapped unless it can procure horses or vehicles. This group landed in the early hours of 21.12.00, and this mission will be its first, although the members have had considerable experience.

Leaders: Major Gorges Amiet, Lt. Paul Hulet, and SGM F. Silberstein

Numbers: 15, all Veterans.

Where Found: On the west face of Mt. Sefid until the 22nd, the as per the Encounter table.

Weapons and Equipment: 3 MP5S, Parker Hale sniper rifle, 2 PSG1, 25 km secure radio, 500 km antenna, solar generator, M249, 2 M16A2, M203, 2 galil sar, 3 G3, RPG-16 and 4 rockets,

4 claymores, 25× image intensifier, starlight scope, hand-cranked generator, doctor's medical kit, 3 IR goggles

Referee's Note: All members of the group carry 200 RDS and four grenades.

Shir Iran (Lions of Persia)

The Shir Iran is a Royalist operations group staffed by ex-officers and officer cadets and composed of students and professionals that had emigrated to the west.

Referee's Note: Though determined and well meaning, this group is not as professional as the others. They lack physical endurance, survival skills, and the sophisticated training usually taught to commando groups.

The group has a dozen horses and half a dozen donkeys loaded with their equipment. They are posing as a merchant caravan (which explains why they're carrying all that ammo).

Leader: Dr. G. H. Rezai, M.D.

Meeting the Shir Iran: The Shir Iran will appear as a small merchant caravan. They are hoping to have the French find them, in spite of the prearranged gathering point and passwords. They may become overeager and mistakenly approach the players if encountered before the 24th.

Numbers: Three Experienced and seven Novices, two of whom are women.

Where Found: They will be headed north to rendezvous with G11. They will not link up until the 24th. Otherwise, as per the Encounter table.

Weapons and Equipment: 2 UZIs, 3 G3s, 2 AK-74s, 1 RPK-74, 2 MP5s, 3 cases 9mms, 3 cases 7.62Ns, 3 cases 5.56Ns, 6 RPG rockets, 3 doctor's med kits, 1 25km-secure radio, 1 4× binoculars, 2 spare radio batteries, 1 solar generator, 1 case frag grenades

Each member carries 100 rounds for his weapon and two grenades.

Iranian People's Army

Unit	Strength	Equipment and Notes
Shiraz (Proper)		
GHQ, IPA	47	5A, 2B, 3E, 3G
3rd A.D. HQ	45	5A, 2B, 4G
12th Commo Batt	65	5A, 2B, 4E, 3G, 4N
161st Srv/Sup Batt	87	2A, 2C, 3D, H
77th MP Company	31	5A, 3E, 10G
1st Reg, 3rd AD (Gr A)	100	18A, 4B, 2Q
Shiraz Militia Batt A	500	Armed only with small
Batt B	490	arms, machineguns
Batt C	495	and 60mm mortar
Shiraz International		
AFHQ, IPA	71	3A, 4B, 3E, 5G
AF 202nd Commo Batt	37	2A, 2B, 3E
AF Secur. Detachment	52	7A, 5E
227th Ftr Sqdn	200	4 F-20, 6B
Army AVE BDE	400	2 AH-1Ts, 6 UH-60s,
		organized in six lifts
		of 45 men each
Forts 1 and 2		
2nd Reg, 3rd AD (Gr C)	400	15A, 10B, 3C, 15F, 6I,
		5J, 3M, 2R, 2K

Unit	Strength	Equipment and Notes
Bardej Forts (3, 4 and 5)		
2nd Reg HQ, 3rd AD	47	7A, 2B, N
2nd Reg, 3rd AD (A)	350	5A, 18B, 5H, 10S
2nd Reg, 3rd AD (B)	350	5A, 25B, 10G, 6S, 5L
Fort 6		
1st Reg, Grp B	100	18A, 4P, 8O, 6U
Fort 7		
1st Reg, Grp D	300	15A, 10B, 2D, 3E 5F, H, 5J, 5L, 4Q, 10O, 3U
Fort 8		
1st Reg, Grp C	150	10B, 2M, 5H, 3Q, 3P, 3O
Shiraz North Fort		
1st Reg, Grp E	350	20A, 16B, 4C, 4K, 6P
1st Reg, HQ	50	6A, 3B, 2N, 3P, 4U
Shiraz Militia Batt	100	V, 2W, 8O, 6P
Shiraz Militia HQ	65	4G, 3O
Fort 10		
3rd Reg, Grp A	500	5A, 10B, D, 5F, G, 4K, 6L, 2Q
Forts 11-13		
3rd Reg, Grp C	175	16A, 4B, 5D, 2Q
3rd Reg, HQ	55	5A, 3B, 2S

Vehicle and Equipment Index

A	Landrover	M	Challenger
B	2 ½-ton Truck	N	M577
C	5-ton Truck	O	81mm Mortar
D	8-ton Truck	P	120mm Mortar
E	3/4-ton Truck	Q	ZSU 23-2
F	UAZ 469	R	40mm Bofors Autocannon
G	Motorcycle	S	EE-11
H	M113 or variant	T	Horses
I	BMP	U	30mm Autocannon
J	Btr 70	V	130MM Howitzer
K	105mm Howitzer	W	155mm Howitzer
L	Chieftain MK V		

Referee's Note: The IPA provides local security and reconnaissance for the SDD, through the 3rd AD. Ground patrols extend roughly 20 km from the perimeter; air patrols 300 km. All IPA units have 80% Experienced personnel, 15% Veterans and 5% Novices. The Shiraz Militia HQ and Battery are staffed with older draftees with previous military experience, so they have 10% Experienced, 60% Veterans and 30% Novices. These two units serve full time while the line battalions rotate every three days. The three infantry battalions have 50% Experienced, 25% Veterans, and 70% Novices.

The defense lines are a series of independent hedgehog type fortifications, complete with bunkers, covered trenches, telephone communications, barbed wire, antitank ditches, and minefields. These "forts" are often within sight of each other and each is under the indirect fire umbrella of the two adjacent forts.

The 3rd AD is equipped with German small arms (G3, MP-5, HK21, etc.), as well as 60mm mortars and RPG-16s for close support. Other IPA units in the SDD are equipped with a variety of western pattern small arms, primarily in 7.62N caliber. The Shiraz militia carries a hodgepodge collection of virtual antiques that gives its supply officer nightmares.

Since oil is in good supply around Shiraz, military vehicles remain unconverted to alcohol. IPA vehicles are kept in good shape, often having a wear value of only 2 or 3.

The forts are shown on the map as numbered, clear squares. These are the general areas for each detachment's H.Q. Subunit emplacements may be within a 5km radius of each point.

ADDITIONS TO THE EQUIPMENT LIST

Tactical Nuclear Device, Portable: A tactical nuclear weapon suitable for use by special forces, packaged in a standard issue nylon backpack. U.S. and Soviet weapons are virtually identical. This weapon requires a separate chemical detonator, five minutes, and an NWH skill of 40 to arm/disarm and set. The timer can be adjusted to detonate anywhere from 10 seconds to 12 hours. The radiation dissipates quickly to 375 rads in 24 hours and a mere 23.43 within 48 hours. *Wt:* 22 kg (detonator three kg) *Price:* $2,500,000 (R/R) *Crater Diameter:* .100 *Fireball Diameter:* .500 *Total Destruction Radius:* .470 *Radiation Cloud Diameter:* 1.5 *Heavy Destruction Radius:* .680 *Medium Destruction Radius:* 1.042 *Int. Radiation:* 6000 rads *Light Destruction Radius:* 1.303 *Radiation Half-life:* 6 hours

BG-15: A Soviet 40mm grenade launcher attachable to any standard AK rifle. Identical to the U.S. M203 in range and effect; ammunition is not interchangeable. The BG-15 operates like a mortar, loaded from the muzzle. It has a rude pistol grip, allowing it to be fired when dismounted from a rifle. Subtract 15% from the die roll when firing dismounted. *Wt:* 1 kg *Cost:* $200 (R/S)

Generator, Compact: A compact generator used by mountain troops and special forces. It is only 10 × 10 × 15cm and extremely efficient. *Wt:* 5 kg *Cost:* $300 (C/S) *Fuel Consump:* 1/4 l per period (G, Avg, A) *Output:* 400 watts

Generator, Solar, M85: A backpack-style solar panel set. Its folded size (22 × 12.5 × 5cm) expands (100 × 22 × .04cm) and can be set up on its own frame or hung from a tree, vehicle or man's back. It can charge one 12- or 24-volt battery per period, provided there is strong sunlight. *Wt:* 2.2 kg *Cost:* $600 (C/S) *Output:* 21 watts

Generator, Hand-cranked, M91: A small, folding generator designed primarily to give radios short periods of extended range (usually triple the radio's normal range). Operating this counts as hard labor for a period, though one person can operate it for two half-hour segments once per period. It could be worked in shifts, but broadcast times are kept short to avoid eavesdropping, jamming, and detection. *Wt:* 2 kg *Cost:* $200 (C/C) *Output:* 1 kw (Max)

Antenna, 500km: A role of wire used to rig field expedient and half a dozen resistors and insulators. Rigged from trees or other support and grounded, the antenna alone will triple the radio's range. When used in conjunction with a generator, the full range may be reached. Weather and terrain will affect the range of the radio when using these antennas. *Wt:* 1.5 kg *Price:* $10 (C/C)

PLACES OF INTEREST

Shiraz

The city of Shiraz is the seat of power for the Iran Nowin National Emergency Council, as well as the Iranian People's Army Headquarters and the headquarters of the 3rd Armored Division. It is a prosperous, teeming city—for 21st century Iran, a metropolis.

It's population has been infused with refugees from the north and the surrounding countryside. The population of the city proper is some 30,000—mostly miners, merchants, and workers and their families. Surprisingly, there is little unemployment and few have starved this year. Another 15,000 live in a well-built shantytown of adobe huts to the northwest—these include the families of the members of the 3rd Armor Division and the attached units. An additional 5,000 population, herdsmen mostly, live and work in the region of the Dalu mountain range to the west.

Though the city has been damaged by the war, there is running water for three hours every afternoon and electricity for public buildings. Hospitals, schools, and roads are in reasonable repair, food is in good supply, and trade is flourishing. Oil wells in the immediate area provide more than enough diesel fuel for military needs. The state munitions factory produces explosives, detonators, 105mm projectiles, and mortar shells of all sizes. Three independent factories provide small arms ammunition for the government and civilian markets.

Shiraz also hosts embassies from the United States, France, and the United Kingdom, as well as AJITF liaison offices. Due to the large amount of traffic, Shiraz is a hotbed of black market and spy activity. Every major faction has representatives here. Even the Shiraz militia has been infiltrated by Tudeh and Shir Iran sympathizers, to the extent that it is only reliable for defensive operations.

Shiraz is the key city in what the IPA calls the Shiraz Defense District (hereafter referred to as the SDD). The SDD includes the towns of Zardej, Zargan, and Marv Dahst. Zargan and Marv Dahst were flattened and evacuated during the 1997 seiges. The SDD fortifications were constructed in early April 1997. The defenses held through the April 30 to July 16 seige. However, they were overrun within 24 hours during the August 21 attack when elements of the IPA and Shiraz militia panicked and ran after receiving two howitzer-delivered nuclear ground bursts.

Currently the NEC, the Shiraz city government, and intelligence elements of the IPA are negotiating with the leaders of the town of Banesh for entry into the SDD.

Bardej

A small town swollen with refugees, Bardej shares Shiraz's prosperity as well as having a small forest and numerous orchards to the north. The town has a population of approximately 5000 farmers, herdsmen, and dependents.

Zargan

A hillside town on the highway northwest of Shiraz, Zargan was obliterated during the '97 seige and subsequently picked clean by salvage hunters. There are two small artillery nuke craters 1 km west of the town. SDD lines and fortifications run throughout the ruins.

Marv Dahst

A large town destroyed by urban fighting during both '97 seiges, Marv Dahst is outside of SDD lines and contains nothing of value. Only the main highway through town has been cleared of rubble.

Ahmbad

Ahmbad is a village of herdsmen, farmers, and their families living in stone or adobe brick hovels. The outer ones are unoccupied and in ruins or used as sheepfolds. Only some thirty dwellings are occupied, clustered around the village well and surrounded by a three-meter-high rubble wall.

The men are armed with a variety of military and hunting weapons. They have a good supply of Shiraz manufactured ammunition and simply want to be left alone with their sheep, goats, and crops. They will take no side in any outsider's conflict and be amicable only with merchants.

Rumor Table: Subtract 10 from die roll with result no less than 1.

Kor River Valley

The Kor River Valley is an 80km oasis of orchards, small forests, lush fields, and large herds of goats and sheep. Wild game is also abundant at the valley's edges. Two thousand five hundred people live in single-family dwellings sprinkled throughout the valley.

Rumor Table: Roll twice, subtract 5 from each roll. Results no less than 1 and no duplicate rolls.

Banesh

Banesh is a walled town of 700 people, just over the Zana Mountains, south of the Kor River Valley. Most of the people are herdsmen or merchants. The village chief is neutral but greedy, waiting for a lucrative offer to join the SDD. He has a personal bodyguard of 20 Experienced mercenaries and a town militia of 300 Novices. None possess a weapon heavier than a light machinegun.

Rumor Table: Subtract 4, result no less than 1.

Sedeh

Sedeh is a large town badly damaged by air attacks and ground fighting earlier in the war. The outskirts have been abandoned and the rubble used to build a wall protecting the inner city. A 100-meter zone outside the wall has been cleared for defensive fire and as an open-air market during daylight hours. All trade is conducted outside the city walls—no strangers are permitted entry without the town council's permission.

The town has a population of 1500 and a standing militia of 125. In an emergency another 250 would turn out to defend the town. All are armed with military or civilian rifles and a few machineguns.

Rumor Table: Roll twice and subtract 6 from each roll. No duplicate results or less than 1.

RUMORS

Rumors may be gathered in towns or from interrogated travellers. Individual bands and INT skill will affect the roll.

Rumors Table

1-3: No one has seen any strangers since the last merchant caravan a week ago. If the group is not hostile, the locals will offer to trade. If the group goes out of its way to be friendly (e.g. medic treats sick villagers), there is a 50-percent chance they will offer a guide. This does not apply to villages and towns noted otherwise above.

4-5: The surrounding area is swarming with bandits and marauders. They are uniting for a raid on one of the larger villages.

6: Some wolves have been terrorizing local shepherds. One was killed five days ago and nearly 100 sheep have been eaten.

7-11: The whole Kor Valley is going to be swallowed up by Shiraz, and we'll all be paying taxes to the Iran Nowin. They already have commandos up near Sedeh.

12-14: Several groups of heavily armed strangers have been seen heading up into Gar/Dashtak range. No one knows why, and we don't want to find out.

15: Some strangers have been looking for hired guns up in Sedeh. They're willing to pay a lot.

16: Some Russians passed by here yesterday heading east. There were a dozen carrying a lot of hardware.

17-20: A group of heavily armed men with pack animals passed heading (Referee's choice dependent on nearest commando group) about three hours ago.

ENCOUNTERS

The following table cross-references probable encounters and locations by date, December 22, 24, 26, 28 and 30, and January 1. The abbreviated notations are obvious, save for MBoM (Majestic Bandits of the Mountains), ShpHrd (Sheepherder), Wreck (a military vehicle picked clean of everything of value), AbdBld (Abandoned Building), and Caravan (a merchant convoy of 1D merchants and 3D camels, horses, and donkeys loaded with trade goods).

ENCOUNTER TABLE

Unit	22	24	26	28	30	01
Mt. Sefid						
G11	1-20	1-15	1-10	—	—	—
315th	21-40	16-25	11-20	—	—	—
Shlr	41-50	26-35	11-20	01-05	—	—
MBoM	51-60	36-50	21-35	06-30	01-30	01-30
Wreck	61-65	51-55	36-40	31-35	31-35	31-35
ShpHrd	66-85	56-85	41-80	36-80	36-80	36-80
AbnBld	86-90	86-90	81-85	81-85	81-85	81-85
Caravan	91-00	91-00	86-00	86-00	86-00	86-00
Mt. Chubb Bidi						
MBom	01-10	01-10	01-10	01-10	01-10	01-10
315th	—	11-20	11-30	11-15	—	—
G11	—	21-25	31-40	16-35	11-15	—
Shlr	—	26-35	41-45	36-50	16-25	11-15
Wreck	11-20	36-45	46-55	51-60	26-35	16-25
ShpHrd	21-80	46-80	56-80	60-80	36-80	26-80
AbnBld	81-90	81-90	81-90	81-90	81-90	81-90
Caravan	91-00	91-00	91-00	91-00	91-00	91-00
Kor River Valley						
Nhaziern	01-15	01-15	01-15	01-15	01-15	01-15
315th	—	—	—	—	—	—
G11	—	—	16-25	16-25	16-20	—
Shlr	—	—	31-35	36-40	26-30	—
KGB	11-20	16-25	36-45	41-50	31-40	16-25
Wreck	21-30	26-35	46-55	51-60	41-50	26-35
ShpHrd	31-80	36-80	56-80	61-80	51-80	36-80
AbnBld	81-90	18-90	81-90	81-90	81-90	81-90
Caravan	91-00	91-00	91-00	91-00	91-00	91-00
Mt. Gar/Mt. Dashtak Range						
Nhaziern	01-10	01-10	01-10	01-10	01-10	01-05
315th	—	11-15	11-15	11-20	11-15	—
G11	—	—	21-30	21-30	21-30	—
Shlr	—	—	31-40	31-40	—	—
KGB	—	—	—	41-50	16-25	—
ShpHrd	11-80	16-80	41-80	51-80	26-80	06-80
AbdBld	81-85	81-85	81-85	81-85	81-85	81-85
Wreck	86-90	86-90	86-90	86-90	86-90	86-90
Caravan	91-00	91-00	91-00	91-00	91-00	91-00
Sedeh Bowl						
KGB	01-10	01-10	01-10	01-10	—	—
Nhaziern	11-20	11-20	11-20	11-20	01-10	01-10
ShpHrd	21-60	21-60	21-60	21-60	11-50	11-50
Wreck	61-70	61-70	61-70	61-70	51-60	51-60
AbdBld	71-80	71-80	71-80	71-80	61-70	61-70
Caravan	81-00	81-00	81-00	81-00	71-00	71-00

—Adam Geibel

Canada: 2000

This article is a three-part description of Canada during the Third World War. The first part is a chronological description of the events which took place in Canada from 1995 to 2000. The second is a province-by-province listing of all major target points of nuclear weapons that hit Canada in December, 1997, and a map of those locations. The third part is a listing of all Canadian and foreign troops present in Canada as of November 2000.

This article can be used by referees to set the scene for *Twilight: 2000* campaigns in Canada for characters that never left North America and for those returning from Europe.

1995

On the 6th of December the Canadian Federal Government formally pledged its support to the People's Republic of China, then involved in the war against the Soviet Union in Asia. Within a week,

Canadian Merchant Marine vessels had begun to transport small arms, ammunition, and badly needed food and communications equipment to the port cities along the Chinese southeastern coast.

1996

Supplies were shipped to China throughout the spring, summer, and fall. On the 10th of November, however, as West Germany's situation became desperate in the war in Europe, supplies to China were discontinued, and on the 12th of November the Canadian Forces were put on alert.

On the 9th of December, Canadian troops in Europe, in company with the American and British forces, crossed the inter-German border in support of the East and West German Armies. This action was taken upon the request of the military junta which had taken over control of East Germany late in the month of November.

1997

Rationing in the civilian sector began on the 15th of March, and Canadians adjusted very quickly and easily to the luxury and food shortages created by war in Europe.

Conscription began nationwide on the 18th of May. Initially, there were some "card burning" rallies held by people opposing Canadian involvement in the war in Europe and by those resisting conscription, but most accepted conscription, and by late June, the resistance had faded away.

The Canadian Army began to organize a battle group, to be ready for departure to Korea by the 20th of July, in order to assist the American, Australian, and South Korean (ROK) troops already fighting against North Korean troops in Korea. The Soviet invasion of Alaska in early July forced the commanders of the Canadian Army to cancel the departure

Canadian Nuclear Targets

0 km   200   400   600   800
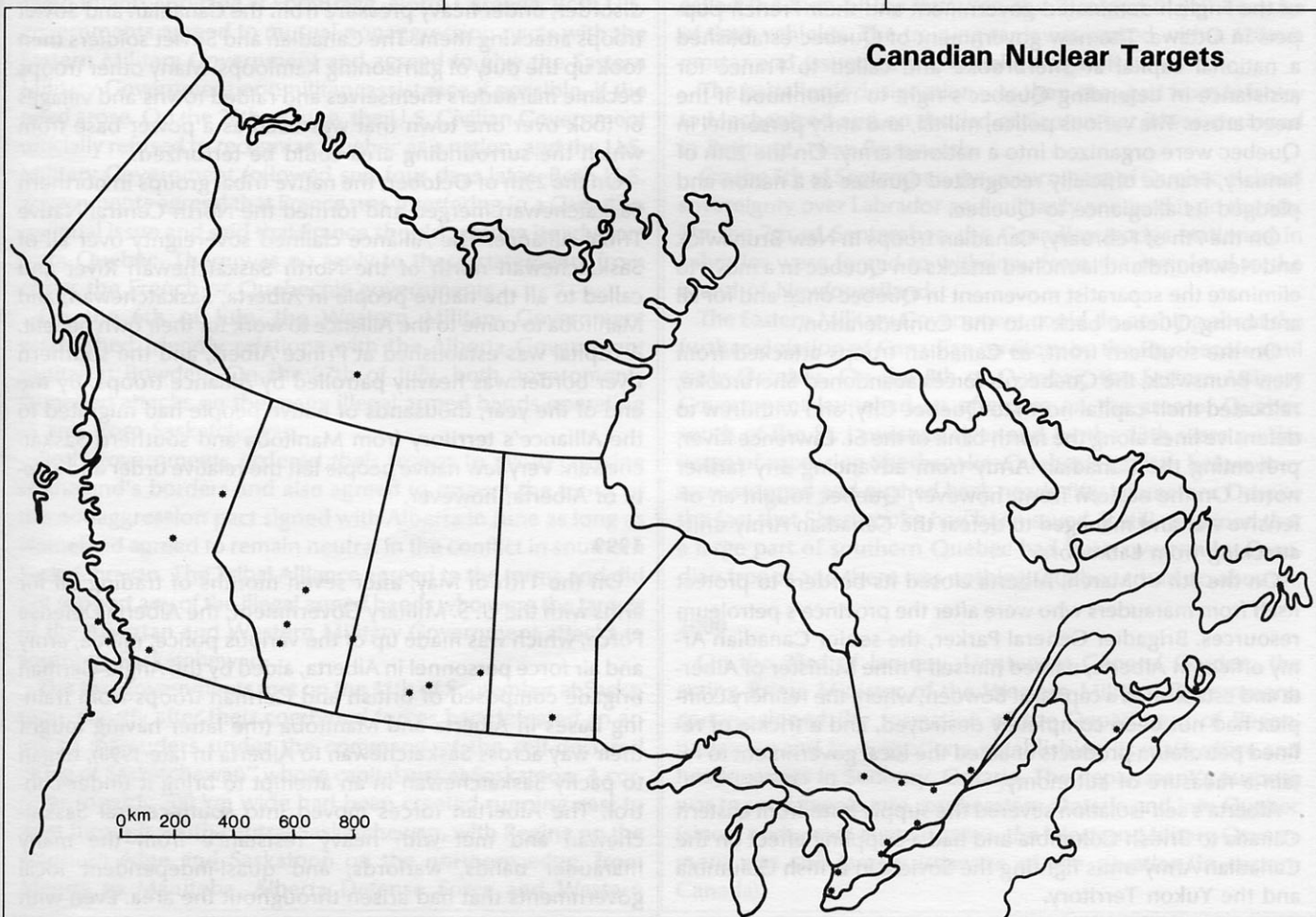
plans of the new Korean Command. Instead the Korean Command, newly appointed the Northern Command, was moved north into the Yukon Territory. Canadian troops moving east for transportation to Europe were redirected and sent west to be held as a strategic reserve in Alberta. Canadian troops in the Yukon Territory and British Columbia prepared defense lines throughout both provinces.

Starting with Toronto on the 12th of December, Canada was hit in the nuclear exchange. As Soviet troops launched a major offensive southeast from Alaska, British Columbia was hit heavily by both tactical and strategic nuclear weapons and conventional air attacks in an effort by the Soviets to support their offensive.

Due to the destruction and widespread anarchy which immediately followed the attack, conscription ceased because the national postal system had been all but obliterated, and the conscription notices could not be delivered to the would-be conscripts.

1998

On the 5th of January, Soviet troops crossed the border from Alaska into the Yukon Territory and continued to press their attack throughout the spring. By mid-year the Soviets were approaching British Columbia's southern border with Washington.

On the 18th of January, Quebec declared its independence from the Confederation of Canada and closed its borders. The Quebecois said that the destruction of Quebec was the fault of the English-dominated government and their French puppets in Ottawa. The new government of Quebec established a national capital at Sherbrooke and called to France for assistance in defending Quebec's right to nationhood if the need arose. The various police, militia, and army personnel in Quebec were organized into a national army. On the 20th of January, France officially recognized Quebec as a nation and pledged its allegiance to Quebec.

On the 7th of February, Canadian troops in New Brunswick and Newfoundland launched attacks on Quebec in a move to eliminate the separatist movement in Quebec once and for all and bring Quebec back into the Confederation.

On the southern front, as Canadian troops attacked from New Brunswick, the Quebecois forces abandoned Sherbrooke, relocated their capital north to Quebec City, and withdrew to defensive lines along the north bank of the St. Lawrence River, preventing the Canadian Army from advancing any farther north. On the eastern front, however, Quebec fought an offensive war and managed to defeat the Canadian Army units attacking from Labrador.

On the 8th of March, Alberta closed its borders to protect itself from marauders who were after the province's petroleum resources. Brigadier General Parker, the senior Canadian Army officer in Alberta, named himself Prime Minister of Alberta and established a capital at Bowden, where the refinery complex had not been completely destroyed, and a trickle of refined petroleum products enabled the local government to retain a measure of autonomy.

Alberta's self-isolation severed the supply lines from eastern Canada to British Columbia and had a crippling effect on the Canadian Army units fighting the Soviets in British Columbia and the Yukon Territory.

On the 23rd of August, the Alberta government, from their capital at Bowden, established contact with the U.S. military government's capital at Colorado Springs, Colorado. The reason for the communication was that the Alberta Government wished to trade their oil for American weapons, ammunition, and vehicle parts. The U.S. military government agreed to the offer and, with the transfer of the 104th Infantry Division (Light) to Montana and Idaho in late August, the Americans were able to begin trade with Alberta by mid-September. Although fairly frequent, the trading was unscheduled and sporadic due to the American's poor logistical situation.

In September, the withdrawal of American troops south, out of British Columbia, coupled with Alberta's self-isolation in March, forced Canadian Army units in British Columbia and the Yukon Territory to break up into small groups dependent upon living off the land. Combat throughout the theater wound down as the Soviets were forced to do the same thing. In April the American counteroffensive severed the Soviet's main supply route across the Bering Strait. The Soviet units were forced to live off the land and had to break up to survive. It became common practice for Soviet and Canadian troops to cooperate with each other in agricultural or industrial endeavors, or the elimination of marauder bands, as was the case on the 13th of November at Kamloops, British Columbia. The remnants of the first battalion, Rocky Mountain Rangers, and those of a Soviet motor rifle regiment merged and attacked a large marauder band that was terrorizing the city. The battle ended quite quickly as the marauders retreated north in disorder, under heavy pressure from the Canadian and Soviet troops attacking them. The Canadian and Soviet soldiers then took up the duty of garrisoning Kamloops. Many other troops became marauders themselves and raided towns and villages or took over one town that was used as a power base from which the surrounding area could be terrorized.

On the 29th of October, the native tribal groups in northern Saskatchewan merged and formed the North Central Native Tribal Alliance. The Alliance claimed sovereignty over all of Saskatchewan north of the North Saskatchewan River and called to all the native people in Alberta, Saskatchewan, and Manitoba to come to the Alliance to work for their own benefit. A capital was established at Prince Albert, and the southern river border was heavily patrolled by Alliance troops. By the end of the year, thousands of native people had migrated to the Alliance's territory from Manitoba and southern Saskatchewan. Very few native people left the relative order and safety of Alberta, however.

1999

On the 11th of May, after seven months of trading oil for arms with the U. S. Military Government, the Alberta Defense Force, which was made up of the various police, militia, army and air force personnel in Alberta, aided by the Anglo-German Brigade composed of British and German troops from training bases in Alberta and Manitoba (the latter having fought their way across Saskatchewan to Alberta in late 1998), began to pacify Saskatchewan in an attempt to bring it under control. The Albertan forces moved into south-central Saskatchewan and met with heavy resistance from the many marauder bands, warlords, and quasi-independent local governments that had arisen throughout the area. Even with

air strikes, made possible by oil from Bowden and CF-18s from Canadian Forces Base (CFB) Cold Lake, the Alberta Defense Force was only able to advance about 200 km into central Saskatchewan by late June.

On the 20th of May, as Albertan troops attempted a wide northern sweep in an effort to encircle Saskatoon, elements of the Alberta Defense Force encountered combat units of the North Central Native Tribal Alliance while crossing the Alliance's declared border. The Alliance troops were quick to open fire in defense of their border, and for the next two weeks, a confused battle, with no solid front line, was fought in the area of North Battleford. On the 3rd of June, however, the Alberta government signed a mutual nonaggression pact with the North Central Native Tribal Alliance and withdrew all Albertan troops from the Alliance's territory.

On the 16th of June, the North Central Native Tribal Alliance named the land under their control Homeland and the Alliance itself changed its name to the Tribal Alliance.

On the 15th of May, the Western Military Government of Canada, from its new capital at Thunder Bay, Ontario, made contact with the U.S. Military Government's capital at Colorado Springs, Colorado. The two governments agreed to a mutual nonaggression pact and also agreed to help each other in nonmilitary matters if possible.

On the 17th of June, the Eastern Military Government of Canada, from its capital at Fredericton, New Brunswick, made contact simultaneously with the U.S. Military Government's enclave at Norfolk, Virginia, and the U.S. Civilian Government's 184th Infantry Brigade at Fort Bragg, North Carolina. Both U.S. governments agreed to mutual nonaggression pacts with the Eastern Military Government and agreed to give the Eastern Military Government nonmilitary assistance if possible, if the need arose. On the 26th of June, the U.S. Civilian Government officially refused to recognize Quebec as a nation, and the U.S. Military Government followed suit four days later. Both U.S. governments agreed that France was interfering in a Canadian regional issue and said that France should remove its advisors from Quebec. There was no reply to these statements from either the French or Quebecois governments.

On the 6th of July, the Western Military Government established friendly relations with the Alberta Government capital at Bowden. On the 27th of July, both governments launched attacks on the many illegal armed bands operating in and from Saskatchewan.

Both governments ordered their troops to avoid crossing Homeland's borders and also agreed to respect the terms of the nonaggression pact signed with Alberta in June as long as Homeland agreed to remain neutral in the conflict in southern Saskatchewan. The Tribal Alliance agreed to the terms and did not support any of the illegal armed bands who were the targets of the Albertan and Western Military Government attacks in southern Saskatchewan.

The two governments met on the 11th of September at Saskatoon, shortly after their combined forces had defeated an army of marauders under the command of the self-declared "King of Saskatchewan" whose capital was at Saskatoon. A corridor roughly 200 km wide had been created running east to west through south-central Saskatchewan, with Regina on the southern edge and Saskatoon on the northern edge, from Alberta to Manitoba. Alberta Defense Force and Western

Military Government troops maintained vigorous patrols of the "Central Corridor." Despite the patrols, many marauders continued to raid the territory inside the corridor and in most cases ruled the land outside the corridor.

On the 1st of August, the Western Military Government of Canada, from its capital at Thunder Bay, Ontario, made first contact with the U.S. Civilian Government capital at Omaha, Nebraska. The two governments then agreed to a mutual nonaggression pact on the 3rd of August.

On the 1st of August, the Eastern Military Government began recruiting men and gathering material throughout its sphere of control for the creation of the 1st battalion of the Princess of Wales' own regiment. Shortly after their decision to activate the battalion, the government discovered that there were no armored vehicles to be had anywhere in eastern Canada for the new battalion other than one training tank, with no turret, from CFB Gagetown in New Brunswick.

On the 3rd of August, shortly after their realization that there was no immediate need for all of the banks in the Maritime Provinces or the armored cars that carried their money from place to place, the Eastern Military Government ordered that enough armored cars be commandeered from the civilian sector to equip the battalion. The armored cars were then modified by the army engineers and turned into armored personnel carriers. The modifications were completed by late August, and, on the 29th of August, the vehicles were turned over to the battalion. The weird APCs were dubbed "Brinksmobiles" by the men of the battalion, and the other troops in the Maritimes called the men of the battalion the "Golden Boys" because of their vehicles. The training tank was armed with a 120mm mortar and issued to the battalion as well.

The battalion's designation was then changed from Infantry to Mechanized and on the 3rd of September it was stationed in Bathurst, New Brunswick.

On the 5th of September, the government of Quebec claimed sovereignty over Labrador and militarily annexed it on the 6th. On the 7th of September, the Canadian troops stationed in Labrador were forced to withdraw from the mainland to the island of Newfoundland.

The Eastern Military Government could do nothing about the further violation of Canadian territory by the Quebecois until early October. On the 8th of October, the Eastern Military Government launched an offensive on the area of Quebec south of the St. Lawrence river and by the 13th were on the verge of capturing Sherbrooke, Quebec's capital, before they were stopped and pushed back nearly fifty kilometers. Despite the fact that Sherbrooke had been saved, it still remained that a large part of southern Quebec had been overrun by Canadian troops and there was nothing Quebec could do about it.

2000

On the 23rd of January, Lieutenant General Gordon, the acting Prime Minister of the Western Military Government, commissioned the formation of the Department of Reconnaissance and Investigations, establishing its main office and headquarters in Sudbury, Ontario. The department's purpose was to send agents into southeastern Ontario and into Quebec (since, aside from some rumors, the Western Military Government was still largely unaware of the situation in eastern Canada).

The agents were to move to their objective, do a thorough investigation, and then report back to headquarters on their findings regarding reconstruction possibilities for industrial areas, illegal armed bands present, and any other major changes in Canada's situation since 1997. Agents sent into southern Ontario discovered that there were many city-states, with economies based on agriculture and light industry, coming to power in the area. All the city-states were fighting each other, but none of them was strong enough to decisively defeat any of the others. Many of the city-states along the Ontario-Quebec border, it was discovered, were supported by and allied with Quebec.

The agents sent to Quebec were more often than not turned back by gunfire. Those few agents who did get into Quebec and back out again confirmed the rumors that Quebec had separated from Canada and that there were French combat troops and supplies entering Quebec.

On the 17th of February, the two military governments of Canada made first contact with each other and agreed to the subordination of the Eastern Government to the Western Government and also agreed to mutual assistance and defense.

On the 2nd of March, the two Canadian Military Governments merged and formed the Federal Government of Canada. The two men in charge of the individual military governments changed their titles from acting prime ministers to acting premiers and nominated one military man of lesser rank than themselves to be the administrator for each province. The two acting premiers retained their control over the territory controlled by them when they commanded their separate military governments. Thunder Bay, Ontario, became the Federal Government's capital, but Fredericton, New Brunswick, was retained as the regional capital of the Maritime Provinces.

On the 20th of March, the Federal Government of Canada demanded the withdrawal of the French military personnel from Quebec, which they claimed was still legally part of Canada. The French refused, stating that Quebec was no longer part of Canada and that they were in Quebec at the express request of the Quebecois Government. They also said that Labrador would remain part of Quebec as a trade-off for Quebec's lost territory south of the St. Lawrence River.

In late March, the government of Alberta received a large number of complaints from farmers in the province that they had an overabundance of produce, but no market for it. The farmers asked for government assistance in establishing routes and markets through the Saskatchewan "Central Corridor," into Manitoba, northern and eastern Ontario, and south into Montana. Due to the farmers' requests, in April the Alberta Government organized the Alberta Farmers' Cooperative. The Cooperative's purpose was to establish and maintain trade routes to markets for the food produced by the farmers in Alberta. By the end of the year, convoys carrying food from Alberta had reached as far east as Thunder Bay, Ontario, and as far south as Dillon, Montana.

On the 19th of May, Canadian troops in Ontario and southern Quebec attacked Quebec and her allies. Most of the Quebec-backed city-states in Ontario were either eliminated or besieged, preventing them from aiding Quebec. The Canadian troops attacking out of southern Quebec overran all of Quebec south of the St. Lawrence River.

Canadian troops laid siege to Sherbrooke, Quebec, and after a week, the city fell. Nothing important was lost by Quebec at Sherbrooke since they had moved their capital back to Quebec City again as Canadian Army units were approaching Sherbrooke.

For the first time since Quebec's separation, troops from eastern and western Canada fought alongside one another.

Then, on the 15th of June, with Canadian troops prepared to cross the St. Lawrence River to continue the invasion of Quebec, France warned the Canadian Federal Government that it would use military force in defense of Quebec's right to independence.

The Canadian Federal Government, uncertain of whether or not the French could carry out their threat, ordered their troops to halt their advances at the boundaries claimed by France in the general warning.

On the 16th of July, the Alberta Government capital at Bowden was contacted by the U.S. Civilian Government from its capital at Omaha, Nebraska. The two governments could not make any agreements, however, because of Alberta's refusal to accept the U.S. Civilian Government as a legal governing body. Prime Minister Parker did, however, assure the American president that Alberta would in no way interfere in the United States' affairs aside from free trade with anyone with something worth trading.

In August, the Anglo-German Brigade left Alberta and moved east. Upon arrival in southeastern Ontario, the brigade took up residence in Sudbury, Sault Ste. Marie, and Kitchener as an area police force.

On the 28th of September, the Canadian Federal Government ordered the withdrawal of all Canadian troops and civilians from Europe, in cooperation with the American Operation Omega. All non-Canadians who had been serving in Canadian units and who requested it, were granted Canadian citizenship and evacuated from Europe. A few ships in the American evacuation fleet were reserved for Canadians only, and the fleet departed from Bremerhaven, Germany, on the 15th of November.

On the 25th of November, the evacuation fleet from Europe arrived in Charlottetown harbor on Prince Edward Island and began immediate disembarkation of the people brought back from Europe.

Some of the newly arrived troops were incorporated into an eastern branch of the Department of Reconnaissance and Investigations under the command of Major General Tierney, the acting Premier of the Maritime Provinces. The main office and headquarters of the new eastern branch was set up at Fredericton, New Brunswick. The eastern branch of the Department was charged with the responsibility of infiltrating southern Quebec and Labrador and reporting back on their findings there.

NUCLEAR TARGET LIST

Each location on the list is followed by notes on why it was a target. The strength of each attack is given by the Kiloton (Kt) or Megaton (Mt) rating shown after the notes for each location. Although the Kiloton and Megaton ratings are given as single numbers, many of the attacks were carried out with multiple weapons. All detonations were air bursts unless otherwise specified on the list.

Primary targets were oil refining and storage facilities, military

and civilian command and control centers, and the heavy industrial center at Hamilton, Ontario.

Secondary and tertiary targets included electrical power plants (nuclear, hydroelectric, and conventional) and lesser industrial facilities.

Major population centers were not targets themselves, but many were damaged because of their location near targeted facilities.

In addition to the Soviet strategic weapon strikes in British Columbia some tactical nuclear weapons were used by the Soviets in support of their drive southeast from Alaska.

Geographic locations of target points on the list are given in terms of the nearest city or place most commonly associated with each target point. Ground zero could have been quite some distance from the center of the location listed. The islands of the Northwest Territories have been omitted from the map since no weapons were targeted on them. Target points in the United States are not on the list or shown on the map. The sizes of the dots used on the map do not coincide with the Kiloton or Megaton ratings of the weapons which were used against each location. The list itself is appended to the end of this article.

THE AFTERMATH

Canada's population was subjected to 13.1 million fatalities (or 45 percent of Canada's population in 1997) by the nuclear attack. This total includes both initial fatalities and those caused by injuries received in the attack, as a result of various disease epidemics which started shortly after the attack, and those incurred in the widespread anarchy in Canada up to November 2000.

Many, if not most, towns and cities in Canada were directly or indirectly damaged as a result of the attack, and the absence of a city's name from the list does not indicate that the city is intact.

Anarchy, conventional warfare, and many other factors have caused severe damage to areas not immediately damaged in the attack. For example, most of Sherbrooke, Quebec, was destroyed in the fierce fighting between Canadian and Quebecois in May 2000.

A major part of Canada's petroleum refining capability was destroyed in the attack, and this, in addition to attack-related damage and anarchy, effectively destroyed electrical power generation, the electrical distribution net, and industrial and food production and distribution. Food shortages, disease, and the anarchy created by the attack destroyed Canadian society and tore the country apart. Martial law is in effect nationwide, although it is far from being in force. Various warlords and self-appointed "governments" reign in most areas.

THE LIST

Provincial abbreviations are standard; Mt = megaton; Kt = kiloton.

Bowden, Alta: Oil refining and storage facilities (500 Kt).
Calgary, Alta: Oil refining and storage facilities (1 Mt).
Edmonton, Alta: Oil refining and storage facilities (1 Mt).
CFB Chilliwack, BC: Staging area for Canadian and American troops (750 Kt).
CFB Comox, BC: Staging area for Canadian and American aircraft (750 Kt).

Fort St. John, BC: Oil refining and storage facilities (750 Kt).
Nanaimo, BC: Parliamentary Emergency Facility (500 Kt, ground burst).
Prince George, BC: Oil refining and storage facilities (500 Kt).
Vancouver, BC: Oil refining and storage facilities (1 Mt).
Victoria, BC: Provincial Capital/Maritime Forces Pacific Headquarters (1.5 Mt).
Winnepeg, Man: Training Command Headquarters (750 Kt).
Saint John, NB: Oil refining and storage facilities (1 Mt).
Come By Chance, NFLD: Oil refining and storage facilities (750 Kt).
Halifax, NS: Oil refining and storage facilities/Maritime Command Headquarters (1.5 Mt).
Point Tupper, NS: Oil refining and storage facilities (750 Kt).
Chalk River, Ont: Nuclear electrical power plant (500 Kt).
Hamilton, Ont: Industrial facilities (1 Mt).
North Bay, Ont: Air Defense Command Headquarters (750 Kt).
Ottawa, Ont: Canadian Forces Headquarters/Communications Command Headquarters (1.5 Mt).
Toronto, Ont: Oil refining and storage facilities (2 Mt).
Trenton, Ont: Air Transport Command Headquarters (750 Kt).
Sarnia, Ont: Oil refining and storage facilities (1.75 Mt).
Windsor, Ont: Industrial facilities (1 Mt).
Montreal, PQ: Oil refining and storage facilities/Mobile Command Headquarters (2 Mt).
Quebec, PQ: Oil refining and storage facilities (1 Mt).
Kamsack, Sask: Oil refining and storage facilities (750 Kt).
Lloydminster, Sask: Oil refining and storage facilities (750 Kt).
Moose Jaw, Sask: Oil refining and storage facilities (1 Mt).
Regina, Sask: Oil refining and storage facilities (1 Mt).
Yellowknife, YT: Northern Region headquarters (500 Kt).

ORDER OF BATTLE

Following are the Orders of Battle (OBs) of Canadian and foreign troops in Canada as of November 2000. Each unit name is followed by that unit's manpower and AFV strength (if any), and location as of November 2000. The unit's type of formation will be given after the location. Because of the many political organizations in Canada, military units are listed after the government that controls them or with which they are allied.

Abbreviations: (A): Armored; (E): Unit newly returned from Europe; (F): French-Canadian unit loyal to Canadian Federal Government; (M): Mechanized Infantry; (P): Parachute.

CANADIAN FEDERAL GOVERNMENT
Northern Command
(Yukon Territory)

1/Canadian Scottish Regiment: 350 men (now broken up into numerous small bands and no longer accepting orders).

2/Canadian Scottish Regiment: 250 men (now broken up into numerous small bands and no longer accepting orders).

Pacific Command
(British Columbia)

3/Canadian Scottish Regiment: 350 men (now broken up into numerous small bands and no longer accepting orders).

1/Regina Rifle Regiment: 400 men (now broken up into numerous small bands and no longer accepting orders).

1/Rocky Mountain Rangers: 300 men (Kamloops).

Prairie Command (Saskatchewan and Manitoba)

1/Royal Westminster Regiment: 200 men (Saskatoon, Sask)

1/Royal Canadian Regiment (M): 350 men (Regina, Sask).

2/Rocky Mountain Rangers: 250 cavalry (Yorkton, Sask).

2/Regina Rifle Regiment: 400 men (Brandon, Man).

2/Royal Westminster Regiment: 350 men (Portage la Prairie, Man).

2/British Columbia Regiment (A): 350 men, 7 AFVs (CFB Shilo, Man).

Eastern Command

(Ontario)

3/Regina Rifle Regiment: 300 men (London, ON).

1/Toronto Regiment: 350 men (Peterborough ON).

3/Royal Canadian Regiment: 300 men (Thunder Bay, ON).

2/Toronto Regiment: 400 men (Thunder Bay, ON).

3/Toronto Regiment: 300 cavalry (Kingston, ON).

Maritime Command

(New Brunswick, Nova Scotia, Prince Edward Island, Newfoundland, southern Quebec)

2/Queen's Own Rifles of Canada: 350 men (Fredericton, NB).

1/Princess of Wales' Own Regiment (M): 300 men (Bathurst, NB).

1/Princess Patricia's Canadian Light Infantry (M, E): 300 men (Moncton, NB).

2/Princess Patricia's Canadian Light Infantry (M, E): 350 men (Edmunston, NB).

1/Royal New Brunswick Regiment: 400 men (Sydney, NS).

1/Royal 22e Regiment (M, E, F): 250 men (New Glasgow, NS).

1/Queen's Own Rifles of Canada: 300 men (Charlottetown, PEI).

1/Newfoundland Regiment of Foot: 350 men (Gander, NFLD).

1/Royal Newfoundland Regiment: 350 men (Cornerbrook, NFLD).

2/Royal 22e Regiment (M, E, F): 350 men (Saint John's, NFLD).

1/Lake Superior Scottish Regiment: 400 men (Sherbrooke, Quebec).

2/Royal Canadian Regiment: 300 cavalry (Sherbrooke, Quebec).

1/British Columbia Regiment (A, E): 250 men, 3 AFVs (Gaspe, Quebec).

1/Canadian Airborne Regiment (E, P): 300 men (Gaspe, Quebec).

3/Princess Patricia's Canadian Light Infantry (M, E): 400 men (Rimouski, Quebec).

ALBERTA FEDERAL GOVERNMENT

Alberta Defense Force (Alberta and Saskatchewan)

1/King's Own Calgary Regiment: 250 cavalry (Banff, Alta).

1/Loyal Edmonton Regiment: 400 cavalry (Grande Prairie, Alta).

1/Lord Strathcona's Horse (A): 350 men, 9 Afvs (Bowden, Alta).

2/Lord Strathcona's Horse (A): 250 men, 4 AFVs (CFB Cold Lake, Alta).

2/Ontario Regiment: 350 cavalry (Bowden, Alta).

1/Windsor Regiment: 350 men (Wainwright, Alta).

2/Windsor Regiment: 300 men (Bowden, Alta).

1/Calgary Highlander: 350 men (Rosetown, Sask).

1/Royal Winnipeg Rifles: 300 cavalry (Canora, Sask).

1/Toronto Scottish Regiment: 300 cavalry (Swift Current, Sask).

Anglo-German Brigade (Ontario)

1/The Royal Hampshire Regiment: 250 cavalry (Kitchener).

1/The Cheshire Regiment: 350 men (Sault Ste. Marie).

53rd Panzer Battalion: 250 men, 9 AFVs (Sudbury).

81st Panzer Grenadier Battalion (M): 300 men, 6 AFVs (Waterloo).

TRIBAL ALLIANCE

Homeland Defense Force (northern Saskatchewan)

Eastern Defense Group: 150 cavalry (Creighton).

Southwestern Defense Group: 200 cavalry (North Battleford).

Central Defense Group: 250 cavalry, 1 AFV (Prince Albert).

Northwestern Defense Group: 150 cavalry (Meadow Lake).

LOYAL SOVIET TROOPS

62nd Motorized Rifle Division: 2500 men, (coastal British Columbia around Queen Charlotte Sound).

SOVIET MARAUDERS

76th Tank Division: 3000 men, 6 AFVs (Queen Charlotte Island, BC).

114th Motorized Rifle Division: 1000 men, 8 AFV (Whitehorse, YT).

120th Motorized Rifle Division: 2000 men, 6 tanks (Queen Charlotte Island, BC).

QUEBEC FEDERAL GOVERNMENT

Quebec National Army (Quebec and Labrador)

1/Regiment de Hull: 350 men (Hull, Quebec).

1/Regiment du Saguenay: 450 men (Troise-Rivieres, Quebec).

1/Regiment de la Chaudiere: 350 men (Matagami, Quebec).

3/22e Regiment (M): 300 men, 6 AFVs (Quebec, Quebec).

1/Fusiliers du St Laurent: 350 men (Noranda, Quebec).

1/Voltigeurs de Quebec: 350 men (Havre-St. Pierre, Quebec).

1/Front de Liberation du Quebec: 400 men (Quebec, Quebec).

2/Front de Liberation du Quebec: 350 men (Val d'Or, Quebec).

1/Regiment de Maisonneuve: 250 men (Goose Bay, Labrador).

1/Fusiliers Mont-Royal: 300 men (Churchill Falls, Labrador).

Equipment List
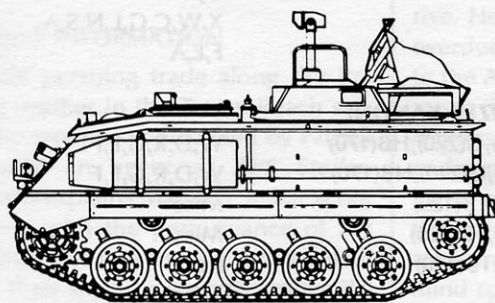
FV 432 Spartan: A British built tracked APC. There is a driver's hatch on the left front deck, a commander's hatch and a gunners' cupola on the top deck. The gunners cupola (G) is equivalent to an NHT, and usually mounts a light machinegun (MAG or equivalent). The FV 432 also has ATGM, mortar, radar and RCLR variants. **Price:** $70,000 (S/R), **Tr Move:** 170/150, **Com Move:** 60/50, **Fuel Cap:** 390 liters, **Fuel Cons:** 156 liters, **Load:** 600 kg, **Fuel Type:** G, AvG, A, **Vehicle Wt:** 7 tons, **Mnt:** 12, **Crew:** 3+4.
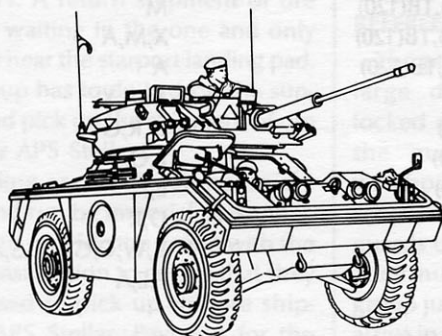
Fox Armored Car: A British built four-wheeled amphibious armored car. There is a driver's hatch on the front deck, hatches on the turret deck for the commander and gunner, and another hatch on the left side of the vehicle. **Price:** $50,000 (S/R), **RF:** +30, **Armament:** 35mm autocannon, **Ammo:** 132 × 35mm, **Tr Mov:** 200/60, **Com Mov:** 70/25, **Fuel Cap:** 390 liters, **Fuel Cons:** 180 liters, **Load:** 400 kg, **Fuel Type:** G, AvG, A, **Vehicle Wt:** 6.1 tons, **Mnt:** 6, **Crew:** 3.
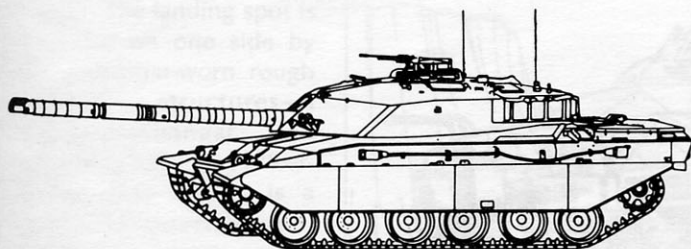
Challenger MkIIA: A British built tracked main battle tank. There's a driver's hatch on the center front deck, and a commander's hatch and loader's hatch on the turret deck. The tank's gunner uses the loader's hatch. A weapon mount (C) is located by the commander's hatch. **Price:** $850,000 (R/R), **RF:** +40, **Armament:** 120mm L11A5 gun, MAG MG, M2HB (C), **Ammo:** 60 × 120mm, **Tr Mov:** 110/45, **Com Mov:** 35/20, **Fuel Cap:** 1250 liters, **Fuel Con:** 500 liters, **Load:** 500 kg, **Fuel Type:** D,G,AvG, A, **Veh Wt:** 58 tons, **Mnt:** 18, **Crew:** 4.
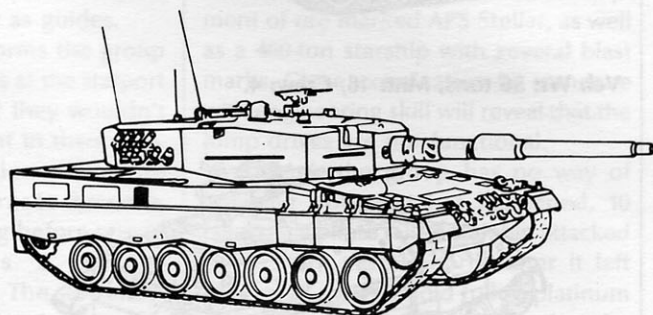
Leopard II: An earlier version of the Leopard series, no longer in frontline service in the Bundeswehr by 1995, but occasionally found in the arsenals of other nations. It is armed with the same 120mm gun as that on the Leopard III, and is similar in general layout to the M60A4 as described in *The U.S. Army Vehicle Guide.* **Price:** $650,000 (R/R), **RF:** +40, **Armament:** 120mm gun, MG-3 MG, MG-3 MG (C), **Ammo:** 40 × 120mm, **Tr Mov:** 115/50, **Com Mov:** 40/30, **Fuel Cap:** 2000 liters, **Fuel Con:** 500 liters, **Load:** 500 kg, **Fuel Type:** D,G,AvG, A, **Veh Wt:** 56 tons, **Mnt:** 18, **Crew:** 4.
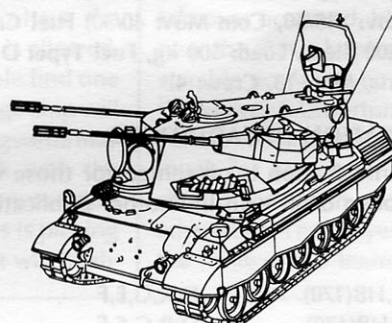
Gepard SPAA: A German built self-propelled antiaircraft gun. The layout is identical to that of the leaopard except for the turret. The two 35mm AA guns are mounted on the turret sides, and the gunner's hatch is on the front of the turret deck. A large radar dish is mounted on the extreme rear of the turret deck, making the vehicle superficially similar to the Soviet ZSU-57-2. **Price:** $850,000 (R/R), **RF:** +40, **Armament:** 2 × 35mm autocannon, **Ammo:** 240 × 35mm, **Tr Mov:** 115/50, **Com Mov:** 40/30, **Fuel Cap:** 2000 liters, **Fuel Con:** 500 liters, **Load:** 500 kg, **Fuel Type:** D,G,AvG, A, **Veh Wt:** 56 tons, **Mnt:** 18, **Crew:** 4.

Jagdpanzer Kanone: A German built turretless antitank vehicle on a Leopard chassis. The 90mm gun is located in the forward casemate, the crew exit through two hatches on the upper deck. Typically of vehicles with this configuration, the Kanone has a low silhouette and a limited field of fire. **Price:** $850,000 (R/R), **RF:** +40, **Armament:** 90mm gun, **Ammo:** 36 × 90mm, MAG MG, **Tr Mov:** 115/50, **Com Mov:** 40/30, **Fuel Cap:** 2000 liters, **Fuel Con:** 500 liters, **Load:** 500 kg, **Fuel Type:** D,G,AvG, A,
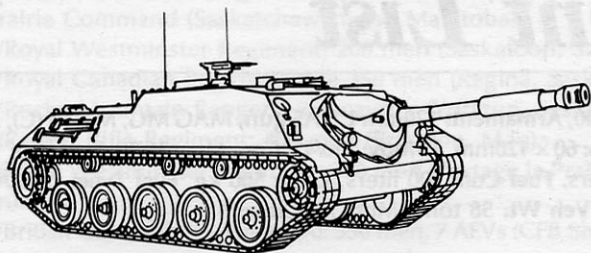
Veh Wt: 56 tons, **Mnt:** 18, **Crew:** 4.
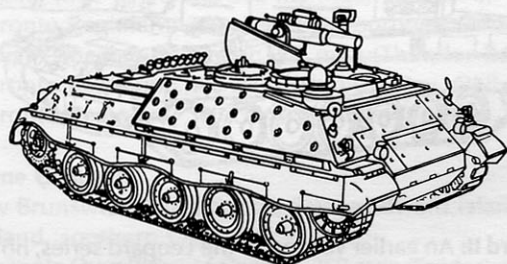
Jaguar: A German built tank destroyer, armed with either the TOW II or Milan ATGM systems. The hull is similar in layout to that of the Leopard series, but the turret is replaced by the ATGM launch tube and sighting gear. The Jaguar has an extremely low silhouette, but the elevated firing pintle enables it to take up hull-down positions with a 360° field of fire. **Price:** $850,000 (R/R), **RF:** +40, **Armament:** TOW II or Milan **Ammo:** 12 × ATGM, **Tr Mov:** 115/50, **Com Mov:** 40/30, **Fuel Cap:** 2000 liters, **Fuel Con:** 500 liters, **Load:** 500 kg, **Fuel Type:** D,G,AvG, A, **Veh Wt:** 56 tons, **Mnt:** 18, **Crew:** 4.

VEHICLE HIT LOCATION LIST ADDITIONS

The following information is presented for those vehicles which have not been dealt with in another publication.

LEOPARD II

R: LH(220),G(220),HB(170)	D,R,G,E,F
L: LH(220),G(220),HB(170)	D,R,G,E,F
R: TF(240),TB(120)	G,C,A
C: TF(240),TB(120)	X,W,N,A
L: TF(240),TB(120)	L,A
TS(120)	L,C,G,W,A,X
F: HS(180)	D,R
C: HS(180)	L,G,S
B: HS(180)	E,F
FD(25)	D,R
TD(25)	X,W,C,G,L,N,S,A
BD(25)	F,E,A

GEPARD

R: LH(220),G(220),HB(170)	D,R,G,E,F
L: LH(220),G(220),HB(170)	D,R,G,E,F
R: TF(80),TB(60)	N,G,A
C: TF(80),TB(60)	W,A,N,A,W
L: TF(80),TB(60)	N,A,C
TS(120)	W,A,C,A,W

F: HS(180)	D,R
C: HS(180)	L,G,S
B: HS(180)	E,F
FD(25)	D,R
TD(25)	X,W,C,G,L,N,S,A
BD(25)	F,E,A

JAGDPANZER KANONE

R: LH(220),G(220),HB(170)	W,D,R,G,E,F
L: LH(220),G(220),HB(170)	W,D,R,G,E,F
R: TF(240),TB(120)	Miss
C: TF(240),TB(120)	Miss
L: TF(240),TB(120)	Miss
TS(120)	Miss
F: HS(180)	D,R
C: HS(180)	L,G,C,S
B: HS(180)	E,F
FD(25)	D,R
TD(25)	W,X,C,G,L,N,S,A
BD(25)	F,E,A

JAGUAR

R: LH(220),G(220),HB(170)	D,R,G,E,F
L: LH(220),G(220),HB(170)	D,R,G,E,F
R: TF(240),TB(120)	M
C: TF(240),TB(120)	X,M,A
L: TF(240),TB(120)	A
TS(120)	M,A,X
F: HS(180)	D,R,G
C: HS(180)	L,G,S
B: HS(180)	E,F
FD(25)	D,R
TD(25)	X,W,C,G,L,N,S,A
BD(25)	F,E,A

The Warehouse

PLAYER'S INFORMATION

While pursuing trade along the Imperial frontier in the Trojan Reach sector, the group is approached by Patrick Gaanash, an agent of *APS Stellar*. Gaanash explains that APS Stellar is not satisfied with the performance of the merchant line they usually contract with to do their small cargo runs (under 200 tons); thus, they have decided to contract some of the runs to free traders. Gaanash says that he has heard of the group and would like to hire them for a cargo run.

APS Stellar would like the group to run supplies to their miners on the world Peroi (Trojan Reach 1219, E360256-4), where mining of various heavy metals is being done by several companies with the help of some local scientist-prospectors. A return shipment of ore should be waiting in the one and only warehouse near the starport landing pad. All the group has to do is drop the supplies off and pick up the shipment of ore marked for APS Stellar.

The landing area and warehouse are guarded and run by Imperial personnel. Gaanash can provide the group with the proper identification to certify that they are supposed to pick up the ore shipment for APS Stellar. Payment for the shipment of supplies to Peroi is the standard Cr1000 per ton, while the return shipment of ore will be paid at a premium rate of Cr1500 per ton.

The trip to Peroi is uneventful, as usual. The "starport" on the desert world is little more than a bare spot of rock on top of a mesa. The landing spot is bordered on one side by three weather-worn rough stone structures—a warehouse/hangar, an operations office and a "barracks." Also nearby is a crude wind-powered water-tower. The group arrives right at twilight, just as Peroi's binary suns are setting.

Upon checking with the operations office, the manager says the APS Stellar ore shipment has yet to arrive. He adds that the prospectors are overdue and it would be good for to go to the APS Stellar claim in the morning to see if everything's okay. He graciously offers to lend the group his new air raft and some of his people as guides.

The manager also informs the group that the accommodations at the starport are minimal and asks if they wouldn't mind spending the night in their ship.

After their discussion with the manager, the group returns to their ship for the night. It isn't long before one of the group discovers a strange "stowaway" in his cabin. The stowaway, a man apparently suffering from severe exposure and dehydration, is barely able to speak. He manages to utter only two hoarse words before he passes out:

"The...warehouse..."

REFEREE'S INFORMATION

The players will have noticed that the large double-doored warehouse is locked and guarded. If the players ask the guards to let them into the warehouse, the referee should fake a secret reaction roll and then have the guards declare that no entry is allowed. They must protect the valuable find one group just made. Another large ship will arrive in a few days for it. The guards may also comment (in small talk with the players, if they engage in conversation with the guards) that business is picking up so much that the starport will likely soon be upgraded to a class D. The players must devise some type of break-in if they are to gain access to the inside of the warehouse. Once inside, they will find that the warehouse contains a shipment of ore marked APS Stellar, as well as a 400-ton starship with several blast marks. Close examination by someone with engineering skill will reveal that the jump drives are not functional.

Although the group has no way of knowing just what has happened, 10 days ago a pirate raider starship attacked a merchant vessel shortly after it left Peroi with a cargo hold full of platinum ore. Much to the pirate's surprise, the merchant ship was armed (a miscalculation on the pirate's part). The ensuing battle saw the pirates destroying the merchant ship while sustaining heavy damage to their own jump drives.

Desperate, they landed on Peroi and staged a takeover of the starport. Twenty personnel were taken by air raft into the desert and left to die in the harsh climate of Peroi. One of the starport personnel evaded the pirates when the takeover occurred, hiding in the desert near the mesa, hoping to warn the next starship to land—he was the group's "stowaway." Unfortunately, exposure to Peroi's environment was almost too much for him. After his utterance, he should remain in a coma through the adventure. The players will have to do the footwork to learn what's going on.

TR787
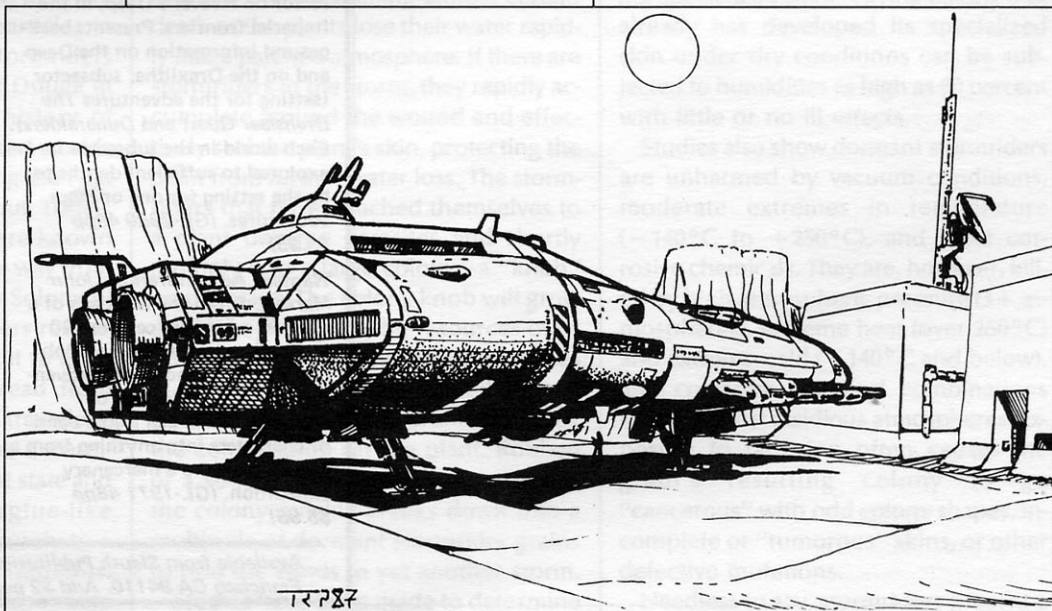
If the group is foolish enough to take the "manager" up on his offer, one day out they will be stranded by the "guides" who will take all supplies and the air raft. If matters aren't bad enough, that evening a storm will start with the threat of storm-riders likely if the group cannot find shelter. If the group refuses to go out with the "guides" looking for the APS Stellar prospectors, their ship will be taken at gunpoint by the pirates, and the group will be forced onto the air raft, taken out into the desert, and stranded as above.

In either case, after a few hours in the desert (and a few encounter rolls, just to heighten the tension), the referee should enforce the following encounter: the players will happen upon a group of scientist-prospectors riding six-legged camel-like creatures who (after a fake reaction roll) will help them get back to the starport. They will arrive just in time to see the pirates loading the last of the APS Stellar cargo onto the players' starship and about to lift off. Subsequent events are up to the referee. In all cases, the referee should balance the number and armament of the pirates with that of the players and their prospector friends so that the players have a fighting chance of getting their starship back. A satisfying victory over the pirates would make this adventure one that the group would not soon forget and it should open a lot of doors for them with APS Stellar as well!

—Joe Fugate and Gary L. Thomas

Stormrider

Many of the so-called desert worlds in the Imperium are not totally void of water; they just have little free-standing water, and hence a zero hydrographic percentage. In fact, if a desert world has a population digit of 6 or more and an atmosphere type 2-9, it is likely that water can be found somewhere; either deep underground, frozen in ice caps, high up in the atmosphere, or locked in strong chemical bonds with elements in the world's crust.

Several of these water-poor worlds also harbor a near-microscopic lifeform often called a "stormrider." Stormriders get their name from their common dormancy habitat—riding like sand particles in a windstorm. It is believed stormriders are native to the desert world Duuga in the Zarushagar sector. The history of their appearance on other desert worlds in the Zarushagar sector during the First Imperium seems to bear this out. Today, in the Third Imperium, they are known to exist on desert worlds all the way from the Spinward Marches to the Solomani Rim. Since dormant stormriders resemble grains of sand, it is difficult to keep them from being slowly spread from world to world by interstellar travellers.

In the presence of moisture, a stormrider "grain" leaves its dormant state and secretes a sticky, superglue-like substance that attaches it securely to a possible source of water and nutrients. If the source contains reasonable nutrients, the grain multiplies wildly and in several hours can spawn a large, tough, pitchlike colony more than 10,000 times the size of the original parent grain. When the moisture source is removed, the colony looses its "stickiness" in a matter of hours and quickly breaks down into a multitude of sandlike grains. Each dormant grain then awaits the time when moisture will trigger the cycle again.

Any plant life on water-poor worlds often develops very tough, nonporous skin to prevent loss of water. Severe windstorms can puncture or tear the skin of these plants, spelling almost certain death as the plants lose their water rapidly into a parched atmosphere. If there are stormriders in the storm, they rapidly accumulate around the wound and effectively seal the plant's skin, protecting the plant from further water loss. The stormriders that have attached themselves to a plant become parasites and shortly multiply into a large colony—a "knob" on the plant. The colony knob will grow until it begins to tax the resources of its host, at which point no longer increases in size, having reached an "equilibrium." Another windstorm will eventually break the colony knob off the plant. Robbed of a source of moisture and nutrients, the colony quickly breaks down into a multitude of dormant stormrider grains to ride the winds in yet another storm.

Studies have been made to determine why stormriders seem only to survive on desert worlds and not also in the desert environments on worlds with more water. Results indicate that the tough, leather-like skin of a living stormrider colony is specialized to release the metabolic wastes of the colony into the air. In atmospheres with anything over about 1 percent water vapor, the specialized waste-releasing skin does not form, and a new colony quickly dies, basting in its own wastes. Likewise, when a dormant grain is submerged in water, the result is death because it is unable to eliminate its wastes without the missing specialized skin. A living colony that already has developed its specialized skin under dry conditions can be subjected to humidities as high as 80 percent with little or no ill effects.

Studies also show dormant stormriders are unharmed by vacuum conditions, moderate extremes in temperature ($-140°C$ to $+250°C$), and most corrosive chemicals. They are, however, killed by high atmospheric pressure (3+ atmospheres), extreme heat (over $250°C$) and extreme cold ($-140°C$ and below), and corrosive chemical combinations found in most insidious atmospheres. Exposure to radiation often causes the grain's resulting colony to go "cancerous" with odd colony shapes, incomplete or "tumorous" skins, or other defective mutations.

Needless to say, stormriders present a

considerable hazard to adventurers, especially those caught in a storm containing them. The stormriders will accumulate in a character's eyes, mouth, nostrils and even their ears.

Generally, roll 6+ for stormriders to be present in a violent windstorm on a desert world that could harbor stormriders. For each 10 minutes that a character is not in shelter, roll 8+ for stormrider accumulation to cause 1D damage to dexterity or endurance. If the character's endurance reaches zero, he or she will die in the next 10 minutes from suffocation unless emergency aid is rendered (under shelter) by an individual with at least medical-1 skill. If the character's dexterity reaches 0, he is debilitated and is blind unless an individual with at least medical-1 skill can render aid (again under shelter). If the character does go blind and aid is not rendered at major medical facilities in the next 1D weeks, the blindness is permanent. A permanently blind character's dexterity can only return to one-third its original level, and then at only 1 point every 30 days as the character learns to cope with his new handicap.

If a character is simply walking through sand containing stormriders, a problem will only arise if anything is done that gets the sand into the eyes, mouth, nostrils or ears.

Energy weapons will kill dormant stormriders, but to do this en masse is obviously impractical. Slug throwers are worthless. The most effective weapon against stormriders turns out to be: stay away from them!

Ironically, carrying dormant stormrider grains from their dry desert habitat into a starship with its over 1 percent atmospheric humidity also effectively kills them. They will start to grow into a colony, only to die because of the failure to develop their specialized skin! Under these conditions, a dormant grain will enlarge into a runny patch of "syrup" in about 30 minutes and then slowly dry up. Stormrider grains in areas of a starship in a vacuum (cargo hold, external hull, etc.) will survive unharmed.

The hits and armor figures below apply only to a growing, healthy, stormrider colony. The remaining figures are for dormant stormrider grains when encountered and introduced into the eyes, nose, mouth or ears.

Animal	Weight	Hits	Armor	W&W	Reactions
Stormriders	.01 g	1/0	cloth	1D as stinger	A0 F0 S0

—*Joe Fugate and Gary L. Thomas*

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TRAVELLER
NEWS SERVICE

CAPITAL/CORE (0508-A586A98-F)   **Date:** 200-1116

¶ Unrest among the population continues following the assassination of Strephon and the questionable rise to power of Emperor Lucan. Fanned by opponents such as Duke Simalr of Ushra, the flames of unrest have sparked rioting in major population centers and intense quarreling among the members of the Moot.

¶ Police and Imperial guard troops have kept these isolated outbreaks under control, but their frequency and intensity are on the rise.

CAPITAL/CORE (0508-A586A98-F)   **Date:** 217-1116

¶ In the shadow of the Imperial Palace, a particularly violent clash between police and rioters has rocked the capital. For nearly three hours the skirmishes continued, as demonstrating citizens forced their way toward the palace against strict orders of the authorities.

¶ Nonlethal means were finally used to disperse the crowd, but not until over forty citizens and at least three riot policemen were killed.

¶ A spokesman for Emperor Lucan has stated that the Emperor, though aware of the problem, was not concerned and did not at any time leave the palace for his own safety.

DLAN/ILELISH (1021-A8D1ADE-G)   **Date:** 245-1116

¶ The Archduke's official state visit to Capital ended abruptly today with his surprise return to Dlan and his immediate call for a full-media press conference on the steps of his palace for later in the day.

¶ After appearing wearing an elaborately fashioned crown, the Duke began his statement with a list of wrongs and abuses perpetrated by Emperor Strephon. He concluded with the startling statement: "The Emperor is dead! I have dedicated my life to the people of the Imperium. I claim the Iridium Throne by right of assassination and shall rule this Imperium as Emperor Dulinor."

¶ The stunned public then listened as the Emperor called for a complete mobilization to seize all of the Imperium for his sacred cause. He made a public and official request to Admiral Hutara, his brother, for the Ilelish Fleet to side with him in his sacred struggle to gain his rightfully secured place on the throne.

¶ The Emperor Dulinor retired to his chambers without answering questions. A subsequent statement detailed the new Emperor's trip to Capital and the assassination of Strephon on the Iridium Throne itself. The statement concluded with an account of Dulinor's ascension of the Throne to the well wishing cheers of millions of Capital's citizenry followed by a selection of patriotic video vignettes.

¶ Celebrations have been organized on Dlan and throughout the sector as the populace is encouraged to honor the beginning of a new age for the Imperium and Ilelish sector.

DLAN/ILELISH (1021-A8D1ADE-G)   **Date:** 248-1116

¶ Sector Admiral Hutara and his Fleet Officers made an official announcement that the Ilelish Fleet has declared for Dulinor. In a brief but ancient ceremony, Hutara offered his dagger to Dulinor, who solemnly accepted, and then briefly embraced his brother.

AMDANI/DAIBEI (2034-A727A88-E)   **Date:** 265-1116

¶ Heightened high level conferences and military activity in the area have done nothing to quell rumors that Core sector is in civil unrest. Statements from the nobility have been universally, "No comment."

¶ As of this date, all naval personnel have been put on special alert, all shore leaves have been cancelled, and a complete media blackout of naval exercises has been imposed. The Admiralty has no comment.

AMDANI/DAIBEI (2034-A727A88-E)   **Date:** 309-1116

¶ Official announcement of Emperor Strephon's assassination has reached the sector. The nobility has also issued a statement encouraging the populace to have faith in the systematic and peaceful shift of power to Strephon's heir, Duke Varian.

¶ Subsequent messages from Core sector have indicated that Varian was killed in combat in and around the palace area. Prince Lucan is apparently the new Emperor of the Imperium.

CAPITAL/CORE (0508-A586A98-F)   **Date:** 310-1116

¶ Lucan has announced that unrest in Core sector has been successfully dealt with. All citizens are encouraged to have faith in the new Emperor, despite unsubstantiated rival claims to the throne.

¶ Emperor Lucan also announced today that the Core Fleet is on the move toward Dlan to hunt down the criminal Dulinor. His actions warrant death, and he will certainly be brought to justice.

### TERRA/SOL (0207-A867A69-F)									Date: 313-1116

¶ In an unexpected move, much of the Imperial Rim Fleet has been concentrated and many reservists have been placed on alert. No substantial explanation has been forthcoming.

¶ General Yoshtiru of the Terran Home Guard has called for a high level conference of the commanders of all troops stationed on Terra.

### TERRA/SOL (0207-A867A69-F)									Date: 322-1116

¶ Military installations in Asia, Africa, and North America have been closed to civilians. All active duty personnel worldwide have been recalled from leave or furlough.

¶ An unofficial source has stated that large shipments of materials have been arriving at these closed installations. The exact nature of these shipments is unknown, and no official Home Guard spokesman will comment on the issue.

### REGINA/REGINA (0310-A788899-A)									Date: 330-1116

¶ The ducal household today announced that Duke Norris of Regina will travel to Rhylanor to meet with representatives from several key worlds in the Spinward Marches and Deneb sectors. The conference is scheduled to cover "economic matters," a general term used when an agenda has not been made public. The exact nature of the meeting has not been disclosed.

¶ In related matters, a rumor that the Duke has recently received a private communication from Emperor Strephon has not been confirmed by official sources.

### REGINA/REGINA (0310-A788899-A)									Date: 340-1116

¶ The ducal household announced today that Duke Norris was elevated to rank of Archduke of the Domain of Deneb by the hand of Emperor Strephon 091-1116 in recognition of his activities in the late Fifth Frontier War.

¶ The Duke plans a trip to Capital to personally accept the Emperor's blessing.

### TERRA/SOL (0207-A867A69-F)									Date: 036-1117

¶ Emperor Strephon has been assassinated in the Imperial Palace by Archduke Dulinor of Ilelish 132-1116. In a prepared statement, a spokesman for the Terran Government has appealed for calm and for all citizens to mourn the loss of the Emperor.

### TERRA/SOL (0207-A867A69-F)									Date: 037-1117

¶ In an almost immediate response to the announcement of Strephon's assassination, rioting and rebellion have broken out in key population centers around the world. Thought to be Solomani sponsored, this tremendous unrest has affected almost the entire population and has tied up all transportation and industry on Terra.

¶ Clashes between the occupation army and rebels has been particularly fierce in India, where riot police have been unable to stop rioters from looting Vilani-owned homes and businesses. In India alone there have been over a hundred people killed.

¶ Curfews and restrictions on activity have been announced by the military governor for many population centers. Violators will have to deal with strict penalties, as the rights of the citizenry have been temporarily suspended in the face of this current crisis.

### REGINA/REGINA (0310-A788899-A)									Date: 067-1117

¶ The Emperor Strephon was assassinated on 132-1116. His assassin, the Archduke Dulinor of Ilelish, fled the scene.

¶ The fighting during and after the assassination plot also took the lives of Empress Isolde, Grand Princess Iphegenia, and Prince Varian. Prince Lucan has ascended the Iridium Throne as the new Emperor.

¶ Duke Norris of Regina is en route to the upcoming Rhylanor Conference and was unavailable for comment. The ducal household expressed its deepest sympathy and has dispatched a special ceremonial convoy to Capital to pay last respects to Strephon and homage to Lucan.

### HOME/ALDEBARAN									Date: 117-1117

¶ The Committee for Information has announced the assassination of Emperor Strephon. His assassin, Archduke Dulinor of Ilelish, has fled, probably to his base of support in his home sector.

### HOME/ALDEBARAN									Date: 120-1117

¶ Subsequent reports from the Imperium, reporting considerable unrest and multiple claims to the throne, have met with considerable favor among officials here today. Quotes vary, but most sources consulted uniformly agree that what's bad for the Imperium is almost certainly good for the Solomani movement.

¶ Administrator Howard has stated that "Our brothers who are still under the yokes of Imperial rule are calling out to us now. It is our obligation, indeed our moral imperitive, to contact them and lend them our support in this moment of opportunity, and bring us one step closer to the ultimate victory of the Solomani destiny."

¶ Rumors that large portions of the fleet have been placed on alert and are on the move have not been officially confirmed.

Fall of the Imperium

THREE YEARS OF REBELLION

Editors Note: The dispatches from Core Sector presented in Challenge #29 were all dated from the year 1116. Note that the Traveller News Service entries in this issue are from the year 1119. Three years have passed since the Emperor's assassination and the breakdown of Imperial rule. Challenge will begin presenting information about the ongoing rebellion from this point, the year 1119, forward.

This essay will let you catch up on the happenings within the Imperium over those three years. For a complete history of the civil war and the great economic and political upheavals of that period, consult **MegaTraveller**, appearing this fall.

The Imperium is crumbling. Its thousand-year reign created an illusion of strength and lasting power, but continued expansion and internal pressures have strained its ability to govern to the limit. The only thing that held the vast interstellar empire together was the person of the emperor: the one individual to whom all imperial citizens ultimately owed their loyalty.

Now the emperor is dead. He has no immediate heirs. His assassin claims the throne by an obscure and obsolete right. His nephew claims that he is the Emperor's rightful successor. The Moot demands a say in naming a new emperor. The Solomani demand independence. The Vargr have invaded several frontier provinces. Aslan *Ihatei* are nibbling at a few distant subsectors.

The Imperium is crumbling.

The Imperium was held together, before the Emperor's death, by a web of personal oaths and loyalties. Hereditary nobles held their offices directly from the emperor; new appointees hold their offices as rewards for contributions or good work. Potentially disloyal citizens were often granted nobility and co-opted into support of the empire. All nobles had a vested interest in supporting the Imperium. But which side do they choose when no faction is clearly right, or clearly winning? Their choices were dictated by their other loyalties, most often dividing the nobles at the expense of the Imperium.

At the same time, signs of weakness within the Imperium enticed outsiders to attack, conquer, and pillage. The famous Corridor Fleet was transferred to the Core, and Vargr raiders moved into the void it left; the entire Spinward Marches territory was cut off from the central Imperium. Imperial task forces were withdrawn from the Trojan Reach to fight the invading Vargr, and Aslan *Ihatei* conquered undefended worlds on the Marches' frontier. Imperial fleets along the Solomani border moved back to a more defensible line, and the Solomani gobbled up whole sectors at the first opportunity. Unrest and Vargr incursions in Vland sector forced three megacorporations there to reestablish the Vilani Empire, with its merchant socialism, if only to protect their markets. The League of Antares found their portion of the Imperium unprotected against raiding Vargr, and seceded to become a client-state of a more protective border empire.

Within the Imperium the population was not faced with clear choices. Loyalists supported a new emperor, but its various factions could not agree on which of several heirs had priority. The Pretenders supported Emperor Strephon's killer, accepting that ascending the throne by right of assassination was a legitimate, if seldom used, precedent. Federalists supported a change to the federation form of government. And many citizens preferred to keep quiet, wishing that the old days were back.

POINTS OF INTEREST

Advance Knowledge: Though current technology in the Imperium allows jump-6 travel, the standard means of ferrying information, the xboats, only travel at jump-4. Publicly, the Imperium writes this discrepancy off, sighting the high cost of building new ships and fact that many frontier routes simply do not need jump-6 service. The cost of jump-6 is high enough to make a universal jump-6 xboat network inefficient. But the Imperial government also knows the power of information, and maintains a variety of naval couriers which can make jump-6. Knowing vital facts before they become general knowledge is essential to a well run bureaucracy.

When Strephon was assassinated on 132-1116, the word went out immediately by both naval courier and the standard news services. The following table shows the increasing discrepency between the advance word and the official news:

Assassination		132-1116
World	Advance Word (J-6)	Official News (J-4)
Vland	202-1116	237-1116
Dlan	244-1116	300-1116
Daibei	250-1116	309-1116
Terra	311-1116	036-1117
Regina	328-1116	067-111
Home	001-1117	117-1117

Note that Dulinor announced the news
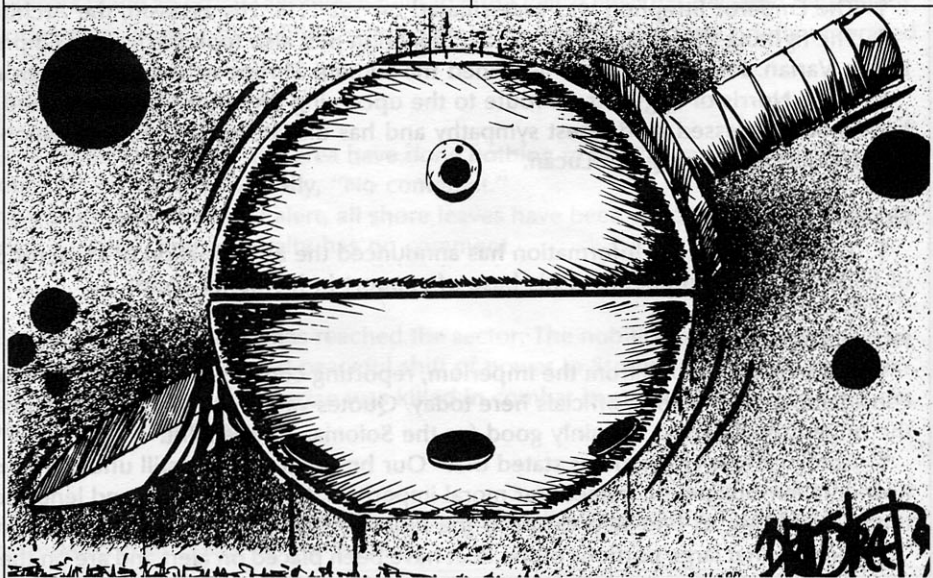
The Rebellion Begins

Circa 1116 to 1121

Factions emerge as the Imperium Falls

Vargr forces move into the power vacuum in Lishun

Antares secedes from the Imperium (1117) and joins itself to the Julian Protectorate

The Marches are cut off from the Imperial Core

Vargr raiders invade and occupy Corridor after Corridor Fleet is redeployed to Core

Vland declares the Restored Vilani Empire

Aslan ihatei expand into March border subsectors

Ilelish sector becomes focus for Archduke Dulinor's claim to the throne

Major campaigns are fought between Core and the Solomani for control of Diaspora and links to Vega

Old Expanses voluntarily joins the Solomani Confederation

Daibei sector, left without an Imperial fleet, declares independence to resist Solomani Expansion

Vegan and Human territories unite against Solomani advances

Solomani occupy Imperial border regions

Mendan | *Amdukan*

Julian Protectorate

Empty Quarter

•Antares

•Regina

Spinward Marches

Deneb
Deneb•

Corridor

•Vland
Vland

Lishun

Reft

Gushemege

Dagudashaag

•Capitol
Core

Fornast

Ley

•Reference

Riftspan Reaches

Verge

•Dlan
Ilelish

Zarushagar

•Kaggushus

Massila

Delphi

•Liasdi

Hlakhoi

Ealiyasiyw

Reaver's Deep

•Marlheim

•Libert

Daibei

Diaspora

Old Expanses

The Aslan Hierate

Staihaia'yo | *Iwahfuah* | *Dark Nebula* | *Magyar*

•Dingir
•Terra

Alpha Crucis

Spica

The Hive Federation

Aktifao | *Uistilao* | *Ustral Quadrant* | *Canopus* | *Aldebaran* | *Neworld* | *Langere*

•Home

standard multi-sector grid

The Imperial Family — 1116

Legend:
- ☐ Male
- ○ Female
- ▦ Deceased

Family tree:

- Gavin ▦ — ○
  - Paulo III ▦ — ○
    - (Dresden ▦ — ○ Lydia)
      - Lucan ☐
      - Varian ▦
  - ▦ — Strephon ▦ — ○ Iolanthe
    - Iphegenia ○
  - ▦ — ▦
    - ▦ — ○
      - Margaret ○

locally in Dlan 245-1116.

The further from the event, the greater the discrepency between the advance word and the official news reports. As an example, at Regina there was over one hundred days between the time the government and nobles knew about the Emperor's assassination and the time the official news reports were broadcast to the public. This gave the nobles one hundred days to prepare themselves, possibly to sway public opinion, and to lessen the shock when the news became available to the masses.

The Moot: The Moot rises to a prominence it has never had before with the assassination of Strephon; it is the legislative body of the Imperium. It has few powers, and even more rarely exercises them. The Moot is theoretically composed of all nobles (baron and above) of the Imperium. It has evolved over the years into a sort of elective assembly, as those attending hold proxies for absent nobles, and vote them on matters of importance. Sitting members cast weighted votes based on the proxies they hold.

The Moot is technically supreme in the Imperium, but its power is extremely limited. Its acts are primarily advisory to the Emperor. In practice, the Moot has one power: to dissolve the Imperium—the power to commit suicide. When this power is brought to bear, it compels compromise between opposing parties.

In the absence of an Emperor, the Moot becomes important as the validating body for the new Emperor. It has the power to examine the qualifications and credentials of the heir apparent, and in unusual situations, reject him.

Right of Assassination: The curious fact is that the assumption of the Imperial throne by a successful assassin traces its roots back more than 800 years. Assassination grew to be accepted as a viable way of removing an unfit, insane, or ineffective Emperor. Certain conditions apply to such assassinations; no commoner can simply walk in, shoot the Emperor, and take over his job. The assassin must be a high-ranking noble, be prepared to defend his or her actions to the Moot, and have sufficient support in the Moot to make the claim stick. As such, assassination is a risky undertaking, since death at the hands of Imperial bodyguards or the Imperial justice system is a very real possibility.

When Martin II died in 244, he had no immediate heirs to take his place; the Moot examined the credentials of several claimants and supported Cleon Zhunastu, great-great-great grandson of Cleon II. Cleon resolved disagreements within his cabinet by shooting vocal opponents. Surviving members of the government decided it was essential to the health of the Imperium that Cleon be deposed. Porfiria drew the short straw, and shot Cleon as he entered the council chamber. Partially in recognition of her efforts, she was proclaimed Empress in 245.

During a 147-year period in the chaotic fifth and sixth centuries, 11 assassinations propelled new emperors to the throne. In most cases, the new emperor personally assassinated the

old one. Only with the assumption of Arbellatra in 629 did the method fall into disuse.

The Factions: Remember, every Imperial noble has a vested interest in maintaining the power and strength of the Imperium, which is, after all, the source of their power. Why should any tear down the most powerful government in the universe? But every noble in the power structure faces a unique problem in the current situation: in supporting the Imperium, who exactly does one support? There is no clear choice at present.

The choices each face include: the Usurper Dulcinor who raises genuine criticisms of the current government, and claims the throne by time-honored right of assassination; the Pretender Lucan, already crowned Emperor, but also accused of killing his own brother on the way to the throne; the Other Pretender Margaret, seen as an easy and legitimate alternative to Lucan; the "Real" Strephon, who appeared in Usdiki/Gushemege in 1117 claiming his double was the one killed in the Palace; or even the Archduke of Deneb (the Duke of Regina), conquering hero of the Fifth Frontier War, and a loyal commander of a major group of fleets. Less powerful Imperial leaders, each ruling a significant force of starships and territories, include: Litininin of Daibei, who declared independence for his sector when the Imperium started draining it of naval strength; the Shadow Emperor of the Restored Vilani Empire; and the Regent of Antares, now aligned with the Julian Protectorate in order to resist the advances of Vargr worlds to coreward—various Vargr marauders and even entire nations have been on the move since the civil war began.

Every noble has made his choice; every Imperial citizen will have to live with the consequences.

THE IMPERIAL FAMILY

Four generations of the Imperial family are depicted here. Starting with Gavin, we see that Lucan is Strephon's nephew, and that Margaret is somewhat further removed from his line.

THE MAP

The map shown here depicts the approximate positions of power and resistance at this chaotic point in the struggle for dominance. Of course, friction is widespread—virtually no part of the Imperium is free from commerce raiding or outright warfare.

The attached notes give explanations of certain important events and their locations. Detailed information is for the most part unavailable, and the average Imperial citizen is left pretty much in the dark about the wars waging around him. Actual coverage of events is often far removed and reshaped by propoganda, and the rumor mills are working full tilt. However, information on this map should be considered reliable.

—*Marc Miller*

There When You Need Them

BASIC CHARACTER GENERATION

Tables are provided for generating Police characters using the basic system of Book 1. These tables are used in the same fashion as the tables of Book 1 and Supplement 4; all skill definitions on this table are as in Supplement 4 except as noted below:

Bribery: Note that in police work, bribery skill reflects experience in offering benefits such as police toleration of petty crimes or lighter punishment after a conviction in exchange for cooperation such as information or physical evidence.

Gun Combat: In addition to the guns listed in Supplement 4, Police characters may also select skill in Snub Pistol. Due to the option of using tranq rounds, this is a common weapon of police forces at tech level 8 + .

Interrogation: Naturally, police interrogation techniques will vary with the society. Police operating under low law levels will be restricted to moderate psychological pressure (the "third degree"); in more repressive societies, full-fledged physical and psychological attack may be used (especially by Security Police) in some cases.

Legal: This skill represents knowledge of local laws and law enforcement procedure.

Referee: Legal skill is directed to the situations faced by police in the field (e.g. Is it legal to use deadly force in this situation?); it does not encompass the skills required to function as a lawyer. This skill will help characters gauge the probable legal consequences of a given action should they be caught at it.

ADVANCED CHARACTER GENERATION

Initial Preparation: Roll the six characteristics Strength, Dexterity, Endurance, Intelligence, Education, and Social Standing in the usual manner.

Enlistment and Branch Selection: Characters may choose to attempt enlistment in one of the following branches of Police service:

Patrol police routinely guard the community and deal with routine crimes.

Detective police investigate crimes in order to identify and gather evidence against criminal suspects.

Customs police guard starports and associated free trade areas and deal with crimes concerning extraplanetary trade (such as smuggling).

Riot police control civil disturbances which are beyond the capability of patrol police, but do not require military intervention.

Security police investigate crimes against the state. The scope of this mandate depends considerably on the government. Societies with high law levels will treat even minor political dissent or illegal economic activity as crimes against the state; those with lower law levels will use security police only against clear dangers to the social order (espionage, sabotage directed at the national defense, major economic crimes such as counterfeiting, etc.).

Basic Training: Basic training occupies the first year after enlistment. This training provides two skills rolled on the appropriate Branch Skill Table.

Assignment Determination: Each year roll two dice on the appropriate Assignment Table to determine the character's assignment for the year.

Special assignments are determined by rolling on the appropriate Special Assignment Table. The skills received in a given special assignment are described just below these tables.

Assignment Resolution: The rolls for sur-

vival, citations, promotions, and skills are made as indicated. A character may take a negative DM up to − 2 for survival and receive an equal positive DM for citation (police organizations discourage excessive risktaking); citations come in only one type.

Reenlistment: At the end of each term of service, the character must make the reenlistment throw from basic Police character to be allowed to reenlist. A throw of 12 exactly requires reenlistment.

Transfers: A character who has completed cross-training in a branch may choose to transfer to that branch upon reenlistment.

Mustering Out: Characters who have completed service muster out. (See basic Police character generation.)

Skill Eligibility: Skills are received as basic/advanced training, special assignments, or from the skill roll. Skill table usage is restricted to the following:

Police Life: Any Police character.

NCO Skills: Must hold rank ES-E8.

Officer Skills: Character holds commissioned rank (01-08).

Field Skills: Character is in a Field, Investigation, Civil Disturbance, or Covert Operation assignment.

Staff Skills: Character is in a Training or Staff assignment.

Branch Skill Tables: The character is in

the appropriate service branch.

Skills: As per the basic Police generation system except:

Gun Combat: Police characters can select from Pistol, Rifle, Submachinegun, Laser Weapons, and, for characters with Zero-G Combat skill, Zero-G Weapons.

The snub pistol is included in Pistol and Zero-G Weapons skill. The higher skill is used under normal gravity; only Zero-G Weapons skill may be used under very low or zero gravity ("very low" refers to the gravity of a size 0 world).

Heavy Weapons: Police characters may select Auto Weapons, Auto Cannon, Fluid Cannon (water or gas in crowd control), and Grenade Launcher (usually gas).

Vehicle: Police characters may select from Wheeled, Tracked, Gravitic, and Helicopter.

BASIC POLICE GENERATION TABLES

Prior Service (Police)

Enlistment	7+	Promotion	8+
DM +1	Intel 7+	DM +1	Intel 9+
Position	8+	Survival	6+
DM +1	Educ 8+	DM +2	Dext 8+
DM +2	Endur 8+		
		Reenlist	5+

Combined Rank/Benefits Table

Rank	Title	Cash Benefits	Material Benefits
1	Lieutenant	5,000	Low Psg
2	Captain	5,000	+2 Intel
3	Major	10,000	+1 Educ
4	Lt. Colonel	10,000	Gun
5	Colonel	20,000	High Psg
6	Commandant	20,000	+1 Social
7	—	40,000	Travellers'

Characters with gambling skill or who have retired may take a DM +1 on cash benefits.

Those with rank 5+ may take a DM +1 on material benefits.

Skill Table

	Pers Dev	Serv Skills	Educ	Adv Educ (Educ 8+)
1	+1 Stren	Vehicle	Vehicle	Medical
2	+1 Dext	Admin	Legal	Electronic
3	+1 Endur	Streetwise	Streetwise	Computer
4	Gambling	Brawling	Bribery	Tactics
5	Carousing	Blade Cbt	Interrog	Interrog
6	Brawling	Gun Cbt	Gun Cbt	Leader

Automatic Skills

Police Enlistee: Pistol-1 (See below.)
Police Lieutenant: Leader-1 (See below.)

The initial Pistol skill is taken in the standard handgun of the character's local police force, which is chosen by the referee. Usually, this will be a snub pistol if tech level 8+ is available because of the value of tranq or gas rounds in police work. At lower tech levels, the revolver is the most common choice.

ADVANCED POLICE GENERATION TABLES

Enlistment

Branch	Enlist
Patrol	6+
DM +1	Intel 7+
DM +2	Endur 8+
Detective	(cross training only)
Customs	8+
DM +1	Endur 6+
DM +2	Intel 8+
Riot	10+
DM +1	Endur 7+
DM +2	Stren 9+
Security	9+
DM +1	Social 9+
DM +2	Educ 7+

Table of Ranks

	Enlisted	Officer
1	Patrolman	2nd Lieutenant
2	Patrolman 1st Class	1st Lieutenant
3	Lance Corporal	Captain
4	Corporal	Major
5	Sergeant	Lt. Colonel
6	Leading Sgt.	Colonel
7	First Sgt.	Vice Commandant
8	Master Sgt.	Commandant

Assignments

	Patrol	Detective	Customs	Riot	Security
2	Civ Dist	Covert Op	Covert Op	Invest	Field
3	Special	Special	Special	Special	Special
4	Staff	Staff	Covert Op	Field	Staff
5	Staff	Staff	Staff	Staff	Invest
6	Field	Field	Field	Field	Invest
7	Field	Invest	Field	Civil Dist	Covert Op
8	Field	Invest	Invest	Civil Dist	Covert Op
9	Invest	Invest	Invest	Covert Op	Staff
10	Training	Training	Training	Training	Training
11	Special	Special	Special	Special	Special
12	Invest	Covert Op	Covert Op	Special	Invest

Assignment Resolution

Patrol, Detective, and Customs

	Train	Admin	Field	Invest	Civ Dist	Covert Op
Survival:	auto	auto	4+	5+	6+	6+
Citation:	none	none	11+	10+	8+	9+
Promotion:	(6+)	(8+)	9+	7+	7+	7+
Skill:	8+	8+	7+	6+	6+	5+

Riot

	Train	Admin	Field	Invest	Civ Dist	Covert Op
Survival:	auto	auto	3+	5+	6+	6+
Citation:	none	none	12+	10+	7+	9+
Promotion:	(7+)	(9+)	9+	7+	6+	7+
Skill:	8+	8+	8+	6+	4+	5+

Security

	Train	Admin	Field	Invest	Civ Dist	Covert Op
Survival:	auto	auto	4+	5+	6+	5+
Citation:	none	none	10+	10+	8+	8+
Promotion:	(6+)	(7+)	9+	6+	8+	6+
Skill:	7+	7+	8+	5+	6+	4+

Special Assignment

	Patrol	Detective	Customs	Riot	Security
1	OCS	OCS	OCS	OCS	OCS
2	Combat	Combat	Space Env	Combat	Combat
3	Admin	Admin	Space Env	Admin	Space Env
4	Tech	Tech	Tech	Tech	Tech
5	Medical	Medical	Medical	Medical	Medical
6	Crs Trn	Intel	Intel	Military	Intel

DM +1 if commissioned officer.
DM −1 allowed if Educ 8+.

Cross Training: Roll two skills on the Branch Skill table of another branch. The character may then transfer to this branch at the beginning of any subsequent term of service.

Medical: Receive Admin-1, Medic-1; if one of these skills is already level 3 or more, substitute Instruction-1 (if both are level 3 or more, only Instruction-1 is received).

OCS: Roll one skill each from the character's Branch Skills table.

For all other situations, roll twice and consult the indicated table:

Special Assignment Skills

	Combat	Milit	Tech	Admin	Space Env	Intel
1	Veh*	Veh*	Mech	Admin	Zero-G Cbt	Bribery
2	Recon	Recon	Electron	Recruit	Zero-G Cbt	Forgery
3	Vacc Suit	Surv	Comput	Comput	Vacc Suit	Comput
4	Hvy Wpn	Demo	Commo	Legal	Vacc Suit	Electron
5	Hvy Wpn	Cbt Eng	Gravitics	Instruct	Gunnery	Interrog
6	Battle Dr	Battle Dr	Demo	Liaison	Ship's Boat	Interrog

*For indicated Vehicle skills, characters may also choose to select a category from Air Craft or Water Craft. These two categories have been further explained and defined in Supplement 4.

Skill Table

	Police Life	NCO Skills	Officer Skills	Field Skills	Staff Skills
1	Brawl	Brawl	+1 Educ	Brawl	Admin
2	Streetwise	Streetwise	Admin	Blade Cbt	Comput
3	Carousing	Gun Cbt	Instruct	Gun Cbt	Admin
4	+1 Stren	Admin	Admin	Vehicle	Medical
5	+1 Endur	Leader	Bribery	Streetwise	Recruiting
6	+1 Dext	Tactics	Leader	Gambling	Legal
7	+1 Educ	Legal	Legal	Legal	Legal
8	+1 Social	Admin	+1 Social	Liaison	Legal

Die modifiers for the above skills table are as indicated in the following list: DM +1 NCO, DM +2 ES+, DM +2 O4+, DM +2 Off.

Branch Skill Table

	Patrol	Detective	Customs	Riot	Security
1	Gun Cbt	Gun Cbt	Zero-G	Gun Cbt	Gun Cbt
2	Vehicle	Vehicle	Vacc Suit	Vehicle	Electronic
3	+1 Endur	Bribery	Medical	Recon	Forgery
4	Interrog	Interrog	Interrog	Interrog	Interrog
5	Streetwise	Interrog	Forgery	Gun Cbt	Interrog
6	Streetwise	Streetwise	Ship's Boat	Hvy Wpn	Bribery

—Stephen Brinich and James Schwar

campus of Cincinnati Technical College. All types of RPGs, boardgames, card games and miniatures will be played, as well as a painting contest, a costume contest, and a *Titan* tournament. For more information, write to Fall-Con '87, PO Box 462, Cincinnati, OH 45201-0462.

NOTJUSTANOTHER³CON

October 23-25, 1987, Amherst Massachussets. Guests include Joan Vinge, Jim Frenkel, A.C. Farley, Ben Bova, Hal Clement, Jane Yolen, and others. There will be movies, talks, art show, auction, hucksters, costume party, formal dance and other interesting and entertaining events. For preregistration information, write NJA³C, RSO 104, Campus Center UMASS, Amherst, MA 01003 (413) 545-1924.

EARTHCON VII

November 13-15, 1987, Cleveland Ohio. Guests include R. M. Meluch, Jay Sullivan, Alan Tiskes, Sheldon Jaffrey, and Jim Young. There will be other guests, videos, dealers, a masquerade, filksinging, an art show/auction, gaming and more. For preregistration information, contact NEOSFA, PO Box 5641, Cleveland, OH 44101.

SUPPLEMENTS

ESCAPE

This folio adventure by J. Andrew Keith continues where his earlier folio adventure *Trading Team* (published by Marischal Adventures) left off. The players are a trading team on Htalrea, and have been captured by invading Alsan. Check out the title for what they have to do next. *Escape* is the first in a series of J. Andrew Keith folio adventures which Seeker plans to release.

Escape is a 12-page, 8 × 11'' booklet, priced at $3.
Designer: J. Andrew Keith.
Publisher: Seeker, PO Box 337, Finley, ND 58230.

GAZELLE CLASS CLOSE ESCORT

A booklet and plans for (guess what!) the Gazelle class of close escorts in Imperial service. The booklet contains the plans themselves (in either 15mm or 25mm scale) for the ship and its 20 ton gig, a brief history of the ship, and (for the 15mm version only) 56 die cut counters representing the ship's crew and sundry boarders, visitors, and interlopers.

The 15mm set is $6, the 25mm $8, both come with ziplock plastic storage bags.

Publisher: Seeker, PO Box 337, Finley, ND 58230.

Stutterwarp Technology in 2300

Or **"One small step for an electron; one giant leap for Mankind."**

INTRODUCTION

The single item of technology which has made human colonization of the stars possible is the stutterwarp drive. It is, to date, the only known means of travelling between the stars in acceptable periods of time. Other races encountered thus far by mankind have also discovered and applied stutterwarp technology, and for all of them the same rules apply.

Current research into spaceflight and drives rests mainly in the areas of streamlining and perfecting existing technology. While some theories are being looked into which promise other methods of space travel, the perfection of the stutterwarp is receiving the bulk of the attention of the modern scientific community.

The utilization of the stutterwarp is an area of human experience which is, for some, difficult to understand. Travelling faster than light while really not moving faster than light becomes confusing, and the uninitiated begin to question their grasp of the physical universe. Understanding the anomalies, dangers, and wonders of stutterwarp use is something which even most planet-bound citizens are aware of, at least to some degree—if not from experience, then via media presentations of exploration and life on the distant stellar frontier.

For those few members of mankind's interstellar community who lack an understanding, presented here are the basics of stutterwarp utilization. Advanced studies might reveal the particulars of navigation and communications, but this overview will initiate you sufficiently to deal with that which is the pulse-beat of the 2300 universe, the stutterwarp starship.

HISTORY AND OPERATION

With the dawning of the 21st century, mankind left behind the most brutal war it had yet known, killing over 50 percent of the world's population (in some estimates—many records of the Third World War were destroyed in that strug-gle) in the all-encompassing conflict. The psychological scars left on humanity by the conflict have yet to thoroughly heal even today. Though it had been in the minds and dreams of a few during the decades preceding the war, our race as a whole was compelled to look starward for its destiny. The reality of global thermonuclear devastation demonstrated the fragility and limitations of Earth's environment. Though the population was significantly thinned, it would not be long before nations once again felt the need to expand their boundaries or influence in reluctant reaction to the pressures of limited land and resources. If the stars could be put within man's grasp before that time, then perchance an even greater war which could utterly destroy the planet and the human race could be avoided. Humanity had no desire to make its cradle its coffin as well.

It was with this incentive that researchers in all nations labored to find a viable method of interstellar travel during the Age of Recovery (2001-2100). The traditional approach toward achieving an interstellar drive lay in probing the speed of light (c) boundary: testing, measuring, and pushing to see if the predictions of Einstein were indeed true—that the speed of light was an insurmountable barrier. The distances between stars are vast beyond human imagination, and if one could not traverse the distances with speeds somewhere near that of c, then interstellar travel would not be feasible. Unfortunately, it appeared to those early researchers that Einstein was correct, but the scientific community would not admit defeat. In their view there simply had to be a way to "have your cake and eat it too"—a way of travelling at acceptable speeds while staying within the restrictions of the relativistic universe. Undaunted by the seeming contradiction of their goal, the researchers continued.

Finally, diligence paid off. In 2080 a glimmer of hope surfaced in the form of an experiment undertaken by Dr. E. J. Jerome. At the newly constructed synchrocyclotron on the grounds of France's CERN facility, a hydrogen atom was induced to perform an electron tunneling jump. This experiment lay down the foundation for the stutterwarp in-terstellar drive. The many problems involved in scaling up this original effect to useful proportions involved most of France's research and development facilities (the technology was not originally disseminated beyond France) for over 40 years. However, by 2126 the first interstellar probe ship, the *Prometheus*, was launched by the ESA.

The Politics of Technology: While French researchers set to work on the fundamentals of creating a stutterwarp-capable exploratory craft, most of the rest of the world was nowhere even near understanding the physics involved. The French research and development facilities were then the best to be found in the world, and much of French-discovered technology was for offered sale on the world market. However, stutterwarp technology had applications which the French government recognized as being tremendously powerful for the future, and that technology was very carefully guarded. Only the ESA-member nations (Bavaria, England, and Azania because of its tantalum reserves) were given the technology, but only as they approached it on their own. The French recognized the potential wealth of the stars accessible from Earth early on and tried their best to get the first foothold there for themselves.

The stutterwarp drive skirted the problem of the c-barrier by actually not moving the ship at all. The stutterwarp unit creates a field which encompasses the entire starship. It is then capable of "tunneling" all the mass within the field instantaneously a few hundred meters away (actual distance depends on the technology and efficiency of the drive—a hundred meters is about average). This effect is cycled at hundreds of thousands of times per second. The ship is in essence getting from point to point faster than light would make the same distance, *but the ship is not physically moving in excess of c.* A stutterwarp ship has a pseudo-velocity which is greater than that of light, hereinafter referred to as "velocity." Individuals crewing stutterwarp craft feel no loss of temporal continuity as they exist for mere nanoseconds along a vector determined by their stutterwarp's alignment. In a

sense, it's like viewing a film, only with hundreds of thousands of frames per second—it all seems quite natural and continuous. In fact, as far as the effects of time are concerned, the stutterwarp does not suffer the effects of time dilation that would be experienced in craft travelling at relativistic speeds. Another problem avoided by cheating the c-barrier with stutterwarp is that of red and blue shifting—the compression or expansion of wave motion radiation as an object approaches or recedes at relativistic speeds—since the ship is not actually in motion.

Of course, to say that ships travelling using stutterwarp are completely motionless is a fallacy. Stutterwarp-equipped craft are usually also fitted with a reaction drive for maneuvering about planets and other large celestial objects, as the efficiency of stutterwarp's "tunnel distance" is decreased by a factor of approximately 10,000 when used in a gravity field of any more than 0.001g. The fact that objects resist inducement into stutterwarp as the gravitational field increases was the chief stumbling block to the technology's discovery and application on Earth.

When a vessel activates its stutterwarp, any inertial velocity the craft had before the drive's activation is conserved through the stutterwarp transition. Therefore, if a ship is cruising at 1000kps using a chemical reaction drive when the stutterwarp is activated, the ship would retain this speed relative to the star system of origin when the stutterwarp is deactivated. The "velocity" of a stutterwarp is determined by controlling the "tunnel distance" rather than the cycle rate (which is only tunable within certain parameters). The true limits of "velocity" are determined by the G-field present.

The field effect which the drives generate is termed "stupid"—it will carry along anything which is in the field as if it were part of the ship. It was for this reason that the AR-I's *Bayern* overloaded its drive at the start of its mission to the Pleiades. Due to the failure in the ship's systems to recognize that an umbilical had not been released from an orbiting depot, *Bayern's* stutterwarp computers read the depot's mass as part of the ship that had to be propelled. This resulted in a drive overload and explosion. Safeguards are now installed in all drives to avoid this kind of accident—computers are designed to recognize foreign objects and will refuse to begin field generation until circumstances are normal. Ships often drag along particles of interstellar dust within their fields, but this is not considered a problem since the quantities are usually negligible.

Stutterwarp drives act upon a linear directional field effect. In order to steer a stutterwarp propelled ship, the ship itself must be turned in physical space. This is accomplished by using the ship's reaction thrusters to change the heading, a maneuver which can be executed while the stutterwarp is engaged (and often is). Though it may take only a few seconds to change heading by 30°, the distance travelled to accomplish this feat has been hundreds of thousands of kilometers. An alternative for "tighter" maneuvering is to disengage the stutterwarp (known as "all stop"), change heading, then reactivate the drive. Such considerations can play an important role in starship military activities.

DANGERS AND PROBLEMS

The nature of stutterwarp travel—existing discontinuously

FIGURE 2. C+ SHIP PASSING AN OBSERVER

TIME = 0 SECONDS

Ship's velocity vector (1.5c).

Scale
Distance travelled by light in one second.

• Observer (stationary)

TIME = 1 SECOND

Point of closest approach.

Ship's new position at time = 1 second.

T = 0

EM radiation from ship at time = 0 seconds.

45°

The ship is now at the point where it will first be observed.

TIME = 2 SECONDS

T = 2   T = 1   T = 0

TIME = 3 SECONDS

T = 3   T = 2   T = 1   T = 0

TIME = 4 SECONDS

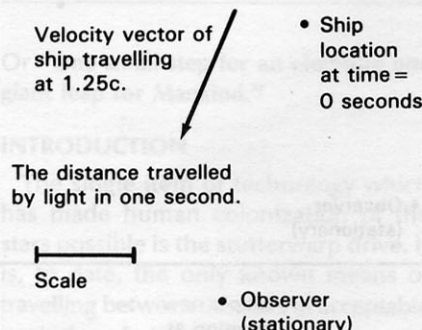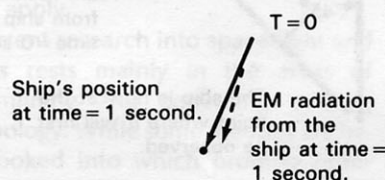T = 4   T = 3   T = 2   T = 1   T = 0

The image from T = 1 (the position of the ship at 45° from closest approach) reaches observer. Images from T = 0 and T = 2 will be received at about the same time (a fraction of a second more). The two images will travel away from T = 1 location.

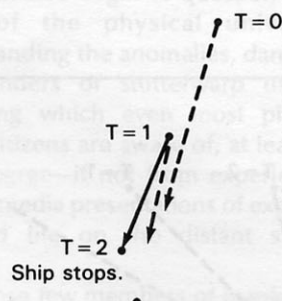## FIGURE 1. C+ OBJECT APPROACHING AN OBSERVER

TIME = 0 SECONDS

Velocity vector of ship travelling at 1.25c.

• Ship location at time = 0 seconds

The distance travelled by light in one second.

|—————| Scale

• Observer (stationary)

TIME = 1 SECOND

T = 0

Ship's position at time = 1 second.

EM radiation from the ship at time = 1 second.

•

TIME = 2 SECONDS

T = 0

T = 1

T = 2

Ship stops.

TIME = 3.5 SECONDS

The image from the ship at T = 2 + has reached the observer. T = 1's image will be next, followed by T = 0's, making the apparent motion of the object exactly opposite to its true motion, though the T = 2 + image will remain fixed.

T = 0

T = 1

T = 2
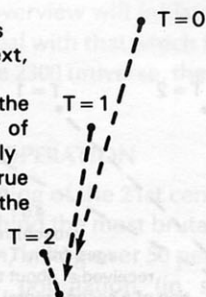
along a vector—presents a number of problems, most having to do with the utilization of electromagnetic radiations. Of primary concern is the inability of a ship to navigate with active radar at c+ "velocities." Radar becomes quite useless simply because the ship outruns its radar pulse, arriving at a hazard before the radar pulse has had a chance to warn against it. Before a radio beam can get to a stray asteroid and bounce off, the ship would have already collided with it. It is for this reason that ships usually pull their "velocity" below c when entering or passing through a system's cometary halo, asteroid belt, or other area of high debris concentration. The ship is still using its stutterwarp drive, but will bring its tunneling distance down below c for safety. For this reason, however, space hazards must be reported upon contact to authorities. In explored space, zones of higher than normal densities are marked with radio beacons to warn spacers to skirt the area or lower their drive rates. Unexplored space, however, has no such beacons emplaced and collisions with undetectable objects are a constant threat to the explorer.

By the same token, laser and particle weapons are extremely limited at c+ "velocities" since one could "tunnel" into one's own beam. Even if one were to fire a weapon laterally at "velocities" below c, the weapon's beam would be sliced up very badly by the cycling drive. The resultant beam would pulse and might cause damage, but would have great trouble maintaining a continuous burn on the target.

Micrometeorites cannot be attended to by simply erecting a shield on the front of a ship. A craft could tunnel to a spot where a meteorite was already beyond the shield; it would not necessarily have to pass through the shield. It is possible for micrometeorites to temporarily exist within the confines of the ship, or crew for that matter. However, the precautions taken by starship pilots in avoiding "high" density zones makes significantly damaging occurrences of such events astronomically small.

COMMUNICATION

The aspect of stutterwarp which has proven the most annoying is the inherent problem of radio communication. While a drive is activated, any incoming or outgoing radio signal would be chopped to ribbons and distorted beyond the capacity of the ship's crew or computer to decipher it. Two solutions to this problem have been adopted.

The easiest of the two solutions to the communications problem is to simply deactivate the drive system for transmission or reception of messages. This method is foolproof and cheap. However, not all vessels are able to simply stop dead in space for various reasons.

Thus, the second method is a quite complex system which is used commonly on many military vessels. When such a vessel wishes to transmit a message to an object which is relatively stationary, it sends the message along with a pulsed signal which gives the ship's exact cycle rate and velocity vector relative to a standard inertial reference point. The receiver then runs the transmission through a computer which decodes the ship's vector information signal (called a DDB for Dynamic Data Burst) and corrects for any distortions. Now, if the stationary receiver wishes to transmit a signal back, it sends out its response in a chopped form fashioned for the ship to read with no computer assistance; that is, unless they have changed their heading, speed, or cycle rate since their initial transmission. The same mechanics apply to two ships using stutterwarp, except the initial message is just the DDB. The receiver ship reads the DDB and alters its cycle rate slightly to mesh with the transmitting ship's. It then sends a confirmation signal that it is ready to receive and meaningful communication can occur.

The inertial reference point chosen in human space is the brilliant A-class star Sirius. Its brightness makes it an unmistakable beacon from all corners of man's domain.

Another method of communication which is sometimes employed is the stutterwarp message torpedo: a stutterwarp driven drone with a radio transmitter. Though this method is quicker than using strictly radio communication, the cost and availability of tantalum make it a seldom afforded convenience.

VISUAL EFFECTS

The nature of the stutterwarp itself, that of defying the laws of physics effectively and travelling at multi-light speeds, creates many spectacular visual effects.

These effects have distinct characteristics and have necessitated a unique terminology for the common spacefarer.

The View from the Ship: As discussed earlier, there is no red or blue shift effect observable by the occupants of a stutterwarp driven spaceship. Remember that the ship is not moving near or faster than light in real space. Therefore, instead of "seeing" all the light waves between the two endpoints of a cycle, the observers only see the waves at the first point and at the second point. Those waves in-between never touch the spacecraft and never can be viewed by the occupants.

An observer looking in the direction of motion on a stutterwarp powered starship will see light from all the stars and objects in the foreground, as if he were moving at multi-light speeds toward these objects, only without any kind of relativistic doppler shift. For instance, if the ship is moving fast enough past a star, that star might actually appear to be moving with respect to the ship, which, in fact, it is.

Similarly, an observer looking in the opposite direction, that is, where the ship has been, will see the stars and objects in that direction in the same manner, as if the ship were moving at tremendous speeds. However, should the ship suddenly come out of stutter warp, the aft observer will get a real treat known as a "termination image" or "chaser."

Since the ship has been moving effectively faster than light, all the light from previous positions of the ship will "catch up" to the stopped ship. First, the light of the ship from the last cycle point will catch up, then the light from the point before that. What results is an image of the ship moving away, along the vector the ship originally took, but in the opposite direction. Commonly, a termination image is lost rather quickly, but with telescopic enhancement the image might be maintained for upwards of a few seconds. This effect also comes on gradually as a ship slowly drops below c+ velocities—this is the effect referred to as a "chaser." A chaser image recedes at a slower rate.

The View from the Ground: Actually, for purposes of this discussion, ground refers to any stationary position. A stationary observer is also treated to some fascinating views of a spacecraft moving with the aid of a stutterwarp.

If a ship moving at c+ velocities comes directly at an observer and stops, the observer will detect the ship, then its receding termination image. As this occurs, both radar and visual observations would detect a ship travelling *away* at c+ velocities (see Figure 1).

When an observer views a ship passing close by, he will see the ship appear at its point of closest approach, then see the termination image take off in one direction (the one from where the ship came) while an image of the starship, continuing along its vector, speeds the other way! So, there will be two images of the ship visible from one location; each apparently moving in an opposite direction and neither being an accurate representation of the ship's true location at the time it is observed.

As one observes cases of starship passes at greater distances, it is seen that the divergent images don't start at the same point of closest approach, but at 45° (in the direction of which the ship came, relative to the observer) from the ship's position at closest approach (see Figure 2). Both ship images are valid observations; either could be used, by observations in the electromagnetic spectrum, to identify or track the vessel.

DISCHARGE OF STUTTERWARP DRIVES

The true limitation on stutterwarp drives is the necessity to discharge the gravimetric charge the drive picks up while in use. A true understanding of the charge has yet to be established. Thus far, the only method known to discharge the drive is to immerse it in a significant gravity well, such as are found only around star systems. The result is that ships must pull into a star system where they must slow down or stop completely as they travel between distant stars.

A typical discharge will take place in the outer reaches of a star system. The length of time required for the discharge is less than two standard days, so there is insufficient time to travel to the inner system before the drives are again ready to run through deep space. Therefore, it is rare that a ship will make planetary calls when it is just passing through to other worlds, unless it is in need of fuel or supplies.

There have been nearly two hundred years of refinements and modifications to space travel in order to accommodate the unique characteristics of man's only means to traverse stellar distances. Only a terrific breakthrough in the theoretical sciences will lead to new methodology. In the meantime, spacefarers will continue to perfect their craft, and the assets and drawbacks of the stutterwarp drive will continue to rule space travel.

—Rob Caswell and Timothy B. Brown

Flight of the Bayern

Serving as an embodiment of the Astronomischen Rechen-Institut's (AR-I) achievements in the field of astronomical research and starship engineering, *Bayern* is designed solely for the mission of travelling to and exploring the Pleiades star cluster, a group of approximately 350 young stars still shrouded in the veils of gas which spawned them, lying some 400 light years from the Sol system. The scale of this mission easily makes it the most ambitious and far-reaching of all man's deep penetration space efforts to date. It is not surprising that it was considered and undertaken by the AR-I, a foundation noted for its devotion to pure research for research's sake and its extravagant projects attacking the limits of mankind's understanding of the cosmos.

Spanning over four years in duration, the mission profile of *Bayern* is one of great potential and diversity. As with most AR-I projects, *Bayern*'s crew is drawn from the best-suited individuals that human space can offer. Among its personnel are names known throughout the scientific community—such as Jacqueline Borhanian, sapientologist with the IEX (Institut des Etudes Xenologique)

who is known for her work with the AR-I's visiting Ebers in Heidelburg, and Deiter "Hole Hunter" Bohl, chief astrophysicist at the foundation's Augereau Station who was responsible for engineering the first capture of a naturally occurring quantum black hole in 2291. Of its 110 crew members, 80 will remain in cryogenic suspension for about 50 percent of the mission, although individuals may be awakened if the services of their specialities are required en route. It is no great surprise that a number of cameramen and reporters are also present in the ship's contingent to record the voyage for the adventure-hungry masses back on Earth.

Even though it mounts the most advanced hardware that man can offer, *Bayern*'s voyage will take it on a slightly circuitous route to the Pleiades. The 315-day trek to Alcyone, a young blue star located near the center of the cluster, will take the ship through a large number of previously unexplored star systems as it stops to discharge its stutterwarp drive. The standard procedure of each stop is to do a detailed scan of the system in order to determine a rough profile on any planetary system present.

This is accomplished by utilizing the ship's vast array of sensory equipment and by deploying its swarm of ten stutterwarp probes. The standing orders for the mission are to pursue more detailed investigations on any human-habitable worlds, stellar anomalies, or signs of extraterrestrial life. *Bayern* mounts five small, chemical drives, remote planetary probes which may be dropped from orbit to soft land on a planet's surface to gather more data on the surface and atmospheric characteristics of the world. The probe with its load of surface samples is then guided back to the ship. Provisions for landing parties have been afforded, but this action is only carried out when it is deemed necessary by a board composed of the ship's captain and representatives of the on-board scientific community. The cases for this would usually involve either a contact scenario or an enigma, which only had the potential to be solved by firsthand investigations.

Once *Bayern* enters the outer extents of the Pleiades cluster, it will deploy its ten interstellar probes—each powered by its own MHD turbine and outfitted for frontier refueling—which will in-

dependently work their way around the mass of stars gathering data from areas *Bayern* will not have the chance to visit. From that point, *Bayern* will proceed along its course to Alcyone.
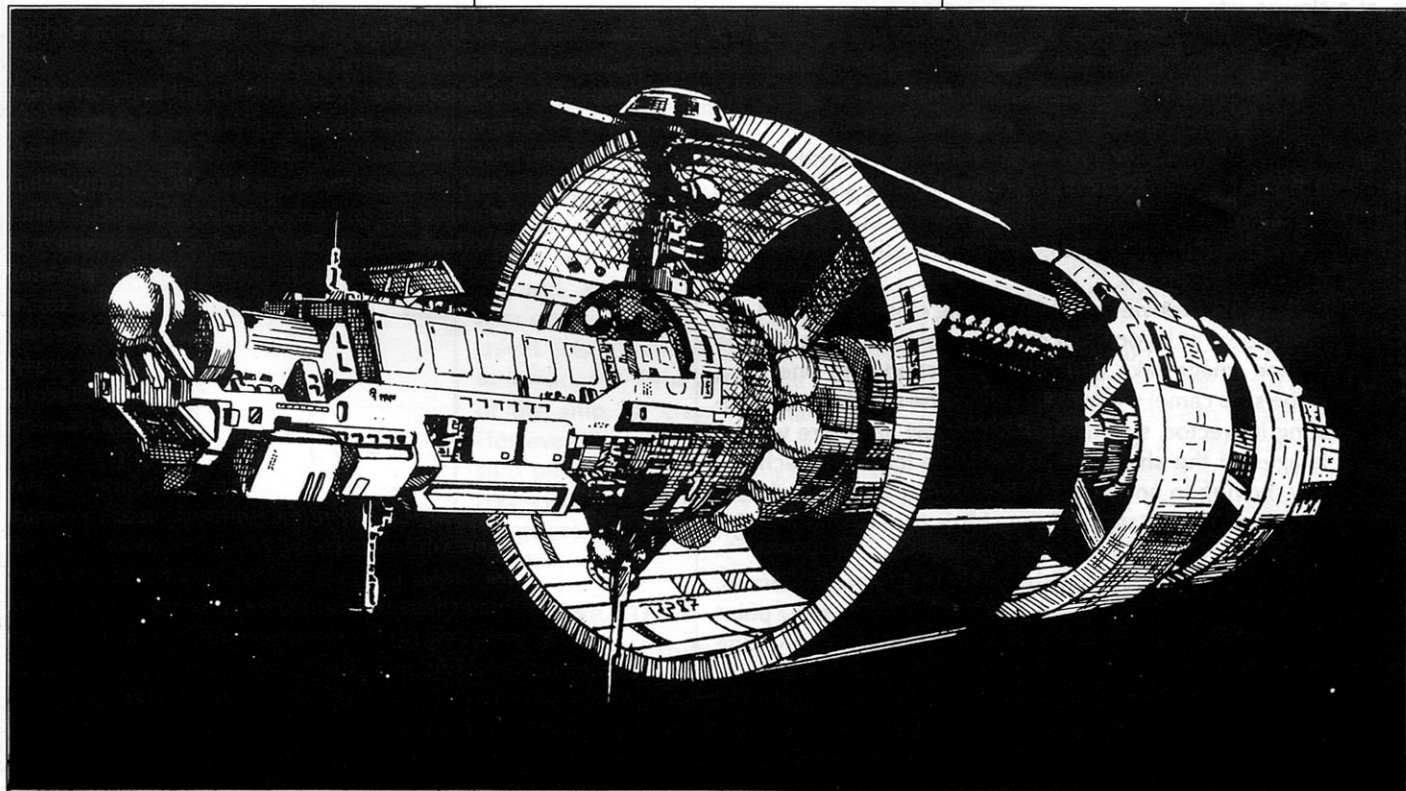
Navigating its way through the stellar herd, it will be performing a wide battery of experiments and observations. Among these activities are the collection and analysis of the ISM (Interstellar Medium) present in the cluster, the compilation of maps scrutinizing the stars in every range of the electromagnetic spectrum, and dynamical studies. Due to the cluster's extremely young age (in stellar terms) of 60-80 million years, the mission should yield a wealth of data on young stars, stellar birth, and the evolution of planetary systems. Assimilating all the data will be a chore that will doubtlessly take Earthbound astronomers years to complete.

During the outbound portion of the trip, stutterwarp message drones carrying media footage and a complete data dump of the mission to date are launched back to Earth at six-month intervals to safeguard against a mishap in the mission resulting in all the data being lost. *Bayern* will spend 840 days plying the dusty voids between the Pleiades' members before collecting its drones and commencing its return trip. Its travel along this 400-day leg of the journey will bring it along a different route from its approach—a course carrying it through the Hyades star cluster, a group of stars ten times older than the Pleiades which lies some 150 light years from Earth.

Ships engineered on the scale of *Bayern* are not common in human space. As most ships are designed with the flexibility of multiple functions in mind, *Bayern*'s design fulfills the requirements of its mission and nothing more. It is a one-shot ship for a unique and demanding assignment. Unlike ships which cruise the lanes in explored space, it must spend almost four years travelling through uncharted space, away from any manner of repair and maintenance facilities, providing its crew with life support (of varying means) for the duration. To this end, it utilizes many of the aspects which have characterized long-duration survey missions of the past. In particular, *Bayern*'s design features are an extension of those of *Baade*'s, the AR-I's historic vessel which made the first visit to a pulsar, CP 0950 + 08, in 2286.

Redundancy plays an obvious role in *Bayern*'s construction. Three multi-level spin habitats, one of which has solar panel arrays for supplementary internal power, are roughly evenly spaced along the length of the spacefaring behemoth. The habitats provide space for the primary living areas, most of the lab facilities, and the vast hydroponic gardens serving to nourish the crew. It is also here, in the ship's sickbay, where the vessel's 100 cryobunks reside, holding most of the crew in a state of suspension with their body temperature held a fraction above freezing. In this fashion, the ship's resources are conserved till such a time when the additional crew are required. The ship's engineering and support systems reside in the lumpy, elongated core. Riding at the bow, the launch facilities hold two space planes, two landers, ten independently guided stutterwarp probes, five remote-piloted planetary probes, and five EVA "Bugs." *Bayern*'s command center also resides in this section, with an auxiliary control room located centrally. Behind this station, three sensor and avionics booms stretch out from the hull. Almost every conceivable sensor for stellar and planetary studies is emplaced on these spires, in-
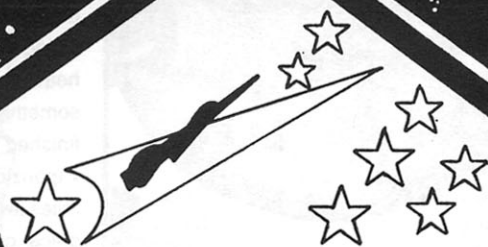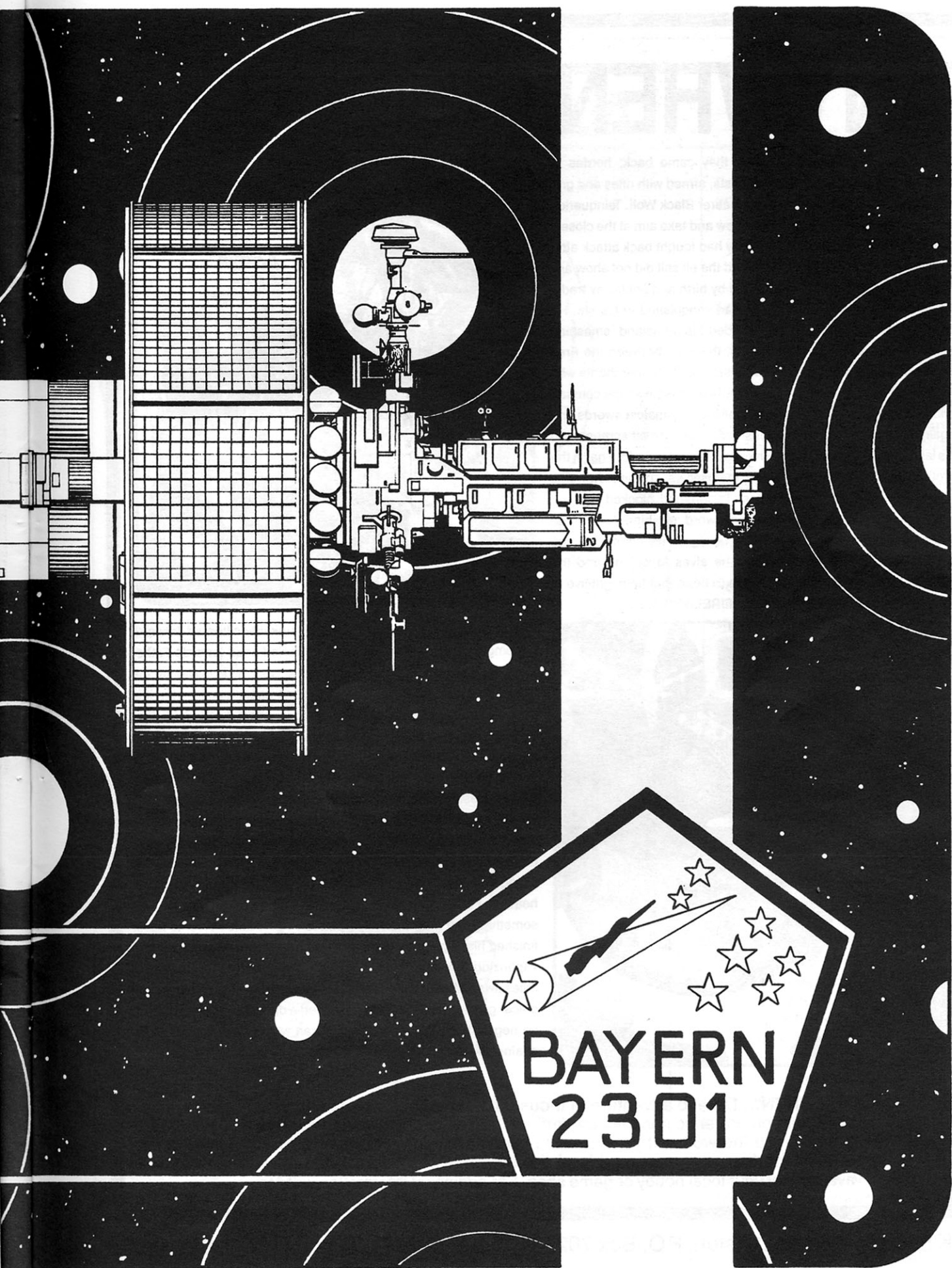
cluding AR-I's latest developments in G-wave sensors and neutrinopulse radar. Extending from this point to the stern are the four jettisonable stutterwarp units, sheathed in a maze of support machinery and tankage. The reason for the utilization of four drives is two-fold. First, as with most of the systems, the redundant drives serve as insurance in the event the primary drive has a failure. The other two drives are present in the event a jump larger than the ship's maximum efficiency must be performed. This would be accomplished by using one drive till it reached its saturation point, then ejecting it into interstellar space and proceeding on another of the drives which is eventually discharged in a gravity well. Using this approach, *Bayern* is capable of making one interstellar jaunt of up to 15.4 light years on the inbound and outbound trips if it is deemed necessary. This method, an offspring of that which was used on the first voyage to the Alpha Centauri system, is far too expensive to be used in any manner of commercial vessel. Trailing behind the stutterwarps are the fusion power plant, with its sweeping, coal black cooling vanes jutting into the void, and the NERVA reaction drive system. Due to the constant bombardment of cosmic rays that will be experienced during the prolonged voyage, the hull is much thicker than most starships to protect the crew from the radiation element.

Though not particularly spacious, the crew accommodations are designed with comfort and convenience as a primary criterion. With the exception of the captain and department chiefs, double occupancy is the rule in the crew staterooms. Each room is provided with a voice-reactive computer terminal tied into *Bayern*'s research computer. A simulated 1G environment is maintained in the spin habitats and day/night cycle lighting brightens and dims with a twelve hour period for each phase. Bright colored paint adorns many of the ship's passages and genetically altered air ferns are generously placed throughout the vessel. Pneumatic express tubes facilitate travel between the spin habitats and the core, with service crawlways existing as emergency routes.

Bayern launched in 2297, but the mission was aborted due to technical problems. While outbound and taking on supplies at (ironically) Neubayern Station, an explosion occurred in one of the stutterwarp drives when, due to a faulty umbilical which failed to disconnect, the stutterwarp engaged and read the station as part of the mass it was to propel. This resulted in a critical overload for the drive. The resulting explosion totalled the straining drive and deactivated another. After minor repairs, *Bayern* limped back to Clarke Habitat at Earth's L-5 position where it has since undergone repair, reassessment, and some modification. It's current launch window has been rescheduled for late in 2301.
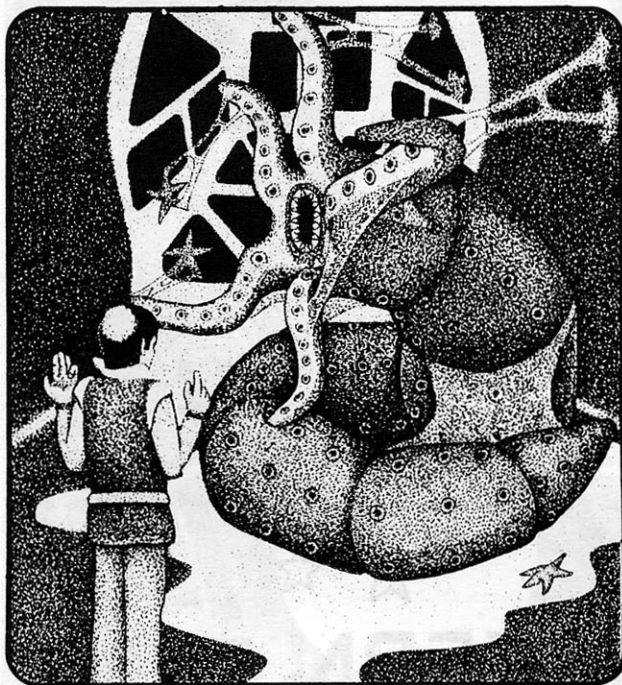
—*Rob Caswell*

BAYERN
2301

Coach

danforth 87.

Gorkin Flangulanti
Spaceracer
UPP: 5C5C68 Age 43 6 terms Cr 6,000
Pilot-5, Ship Maint-3, Navigation-2, Ship Tactics-1, Brawling-1, Instruction-2

Gorkin Flangulanti was a Belter in the Castor system of the Gemini Sector of the Solomani Rim for one term before finding a place with a spaceracing team on Aristotle (Gemini 0110) at age 22. After only two years he became an active member of a racing team, specializing in Navigation.

Six years later, when the team's pilot was killed in an accident, he took on the task as team leader and soon proved his mettle as a pilot. At age 33, he led his team across the finish line winning the Procyon 500, one of the most grueling races in the Solomani Rim. After this single spectacular win, Gorkin was unable to remain in the racing spotlight, and, after three years of relative obscurity, retired to coach new racers from his home on Aristotle.

One young racer who was a protege of Gorkin was Terrance Schnelling, who went on to win the famed Lightcourse Run (the Jump-1 route from Hamilcar to Twylo) in 1108.

Coach, growing restless remaining within the confines of a single star system, soon fell in with a band of pirates operating from a temporary base set up on the asteroids of Pollux (Gemini 0606). He moved there with them, flying their high-performance ships with ease. Within a year, however, he was missed, having misjudged the significance of his disappearance from racing circles. He retired, at the suggestion of his pirate comrades, after only one year of illegal activities. He now roams the Solomani Rim taking on odd jobs as they come.

Coach is a friendly, open man who takes his limited fame in stride. He usually travels in style, but not opulently. As a member of the *Travellers' Aid Society*, he maintains social contact with old friends on many worlds. He will smile and comply when asked for an autograph, and will openly engage in conversations on starship, piloting, etc. Although not an eloquent speaker, he is

nevertheless sharp of wit and has a knack for discussing complex mechanical topics in layman's terms, which occasionally gets him part-time jobs teaching evening classes in Ship Maintenance at local schools.

As usual, he will not admit ever having been with the pirates, and will explain his one-year absence from society as private tutoring of a "special racing student," which has lead to considerable speculation in racing periodicals about the "special student's" identity.

Coach owns his own ship, which is stored in a racing club's warehouse on Aristotle. A refurbished *Lucifer*-class Destroyer Escort, the weapons were stripped and the entire aft end of the ship was refitted with reduced armor to accommodate increased engine tonnage, providing Jump-6 and 6G-acceleration with a corresponding agility of 6. Coach's high performance engines are very fragile, however, and require enormous amounts of fuel and almost constant maintenance. For these reasons and because its basic configuration (Destroyer Escort) raises the eyebrows of Navy patrols and system defense forces wherever it goes, the ship spends most of its time in storage.

Despite Coach's fame and open friendliness, he can be a dangerous adversary. His few friends in the pirates owe many of their most recent successes to his superb piloting and are therefore willing to assist him in any way possible, even though he no longer actively participates in their capers.

Coach is basically a law-abiding individual, but, like so many others, will not pass up a chance to make a fast buck if it does not involve too much risk. His primary love is to operate a starship—he does so simply for the joy of sitting in the pilot's couch. His motives are apolitical; he never crossed into Imperial space because visas are hard to come by, and "running to border" is too risky (unless he's driving someone else's ship).

Any money he earns is immediately spent on his ship, which he calls "Black Wing."

Traveller characters, especially Scouts, will have a reasonable chance to have heard of Coach, and maybe even have seen him racing. If they engage him in conversation, chances are he will be between odd jobs, since he only makes planetfall because ships' captains tell him to. If hired on to a ship, he will immediately be found tinkering with the ship's systems on his off-time (anything that is remotely out-of-order will catch his eye), and may be suspected of attempted sabotage, depending on the crew's paranoia. At the least, he will be considered odd by most of the crew. His love of starships (and of operating them) can truly be understood only by engineers, who also love huge pieces of complex machinery.

("Coach" is accreditable in part to Aaron Porter, who helped develop the character. *Lucifer*-class Destroyer Escort *FASA*, 1981.)
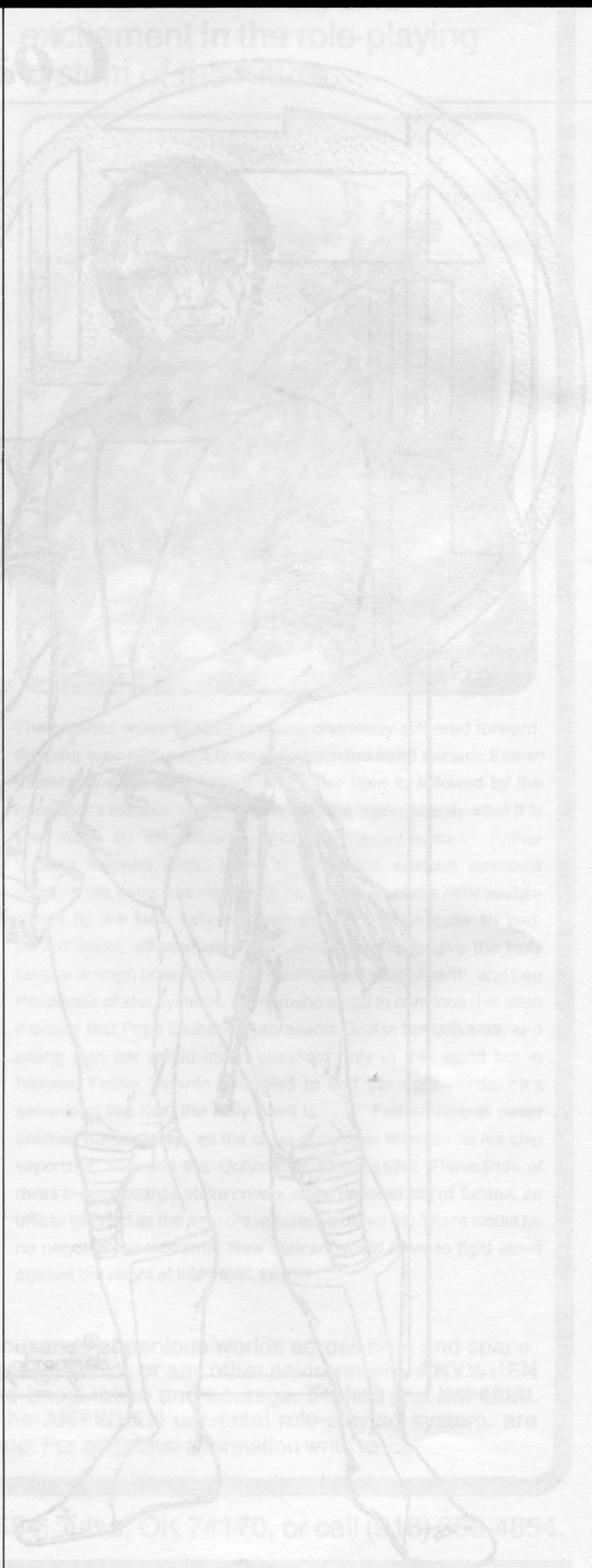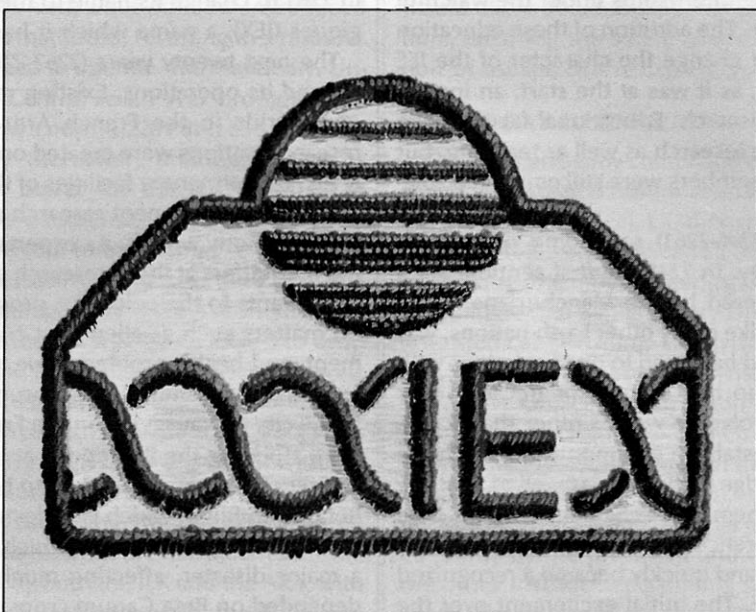
L'Institut des Etudes Xenologiques

Humans share their worlds with a vast variety of lifeforms, both great and small. From enormous creatures larger than anything which has ever existed on Earth to tiny organisms visible only with microscopes, the universe appears to teem with life. The Institut des Etudes Xenologiques (IEX), an academic institution funded by the French government, is the foremost organization on Earth dedicated to studying the diversity of alien lifeforms. Frequently requested by the govern-

agencies were eliminated or changed. These fears proved groundless, as the Bureau survived relatively unscathed (its budget was trimmed, but not drastically) in the wake of the collapse. Growth of the Bureau, however, was significantly slowed for the next few years as a consequence.

In 2168, the Bureau was renamed the Institut des Etudes Exobiologiques. It was at this time that the Bureau (now the Institut) inaugurated an exobiological training program for extraterrestrial

ments of the French Empire to conduct biological surveys of potential colony worlds, the IEX has, at any one time, a number of study expeditions out among the worlds in and just outside of the French Arm of explored space. Most of the data gathered by these expeditions must be brought back to IEX facilities on Earth where it is catalogued, stored, and analyzed extensively. Because the IEX maintains the largest and most complete collection of xenological data in the world, the main IEX facilities (located on a large campus in the French countryside) attract many of the world's leading xenobiologists and sapientologists.

HISTORY

The IEX went through several incarnations in its past before becoming the organization it is today. It was first established in 2140 (one year before the first extraterrestrial outpost was founded) as the Bureau d'Affaires Exobiologiques, an agency of the French government charged with collating and analyzing biological data obtained by survey missions studying newly-discovered, potential colony worlds. The original Bureau staff was comprised of five people, all of whom were affiliated with the Universite de Paris' biological sciences department before the establishment of the Bureau. Having run into departmental politics problems within the Universite's biology department, these five (three professors, a post-doctoral student, and a pre-doctoral student of one of the three professors) were readily recruited by the French government for their new agency and eagerly set to work studying the latest exobiological survey data brought back by French survey teams. Soon, it became apparent that five people were too few a number to handle efficiently all the data coming in. Within a couple months after the Bureau's start, eleven more staff members were hired. Ten years after its founding, the Bureau boasted a work force of 52 people. At this time, however, with the end of the French Peace and the collapse of the French government, the Bureau feared for its future as many government

survey personnel. Designed to prepare survey personnel for the rigors of doing biological studies in a an alien environment, this program provided training in decontamination procedures, contamination-prevention procedures, sample collection and preservation methods, taxonomic classification (both terrestrial and known extraterrestrial), and operation of data collection/analysis field equipment (including mobile lab operation procedures). Personnel were also given a crash course in animal behavior (how to make an intelligent guess as to whether the beast you're observing is going to tear you to shreds or flee in terror), and in known extraterrestrial biology. Upon completion of the program, a 12-18 month intensive session, a person would receive certification from the Institut and would then be qualified to participate in biological survey missions sponsored by the French government. The inauguration of this training program was prompted by an incident in 2164 involving an expedition on the outpost world, Serurier, in which cross-contamination by insufficiently-trained survey staff resulted in the catastrophic extinction of several alien species of that world and the deaths of most of the expedition personnel.

The years 2170-2245 were a golden age for the IEE. Since France established most of its colonies and outposts during these eighty years, the IEE was kept very busy with the amount of work involved with these worlds. In correspondence with the growth in workload, funding and the number of people employed by the IEE were both increased significantly (especially since France had gotten back on its feet and was once again a major world power). Off-Earth quarantine facilities devoted to the analysis of alien biological samples were established at the ESA L-5 station and on Luna. The educational programs offered by the IEE also grew; graduate degree programs, in affiliation with the Universite de Paris, were created. Granting both master's and doctoral degrees, the IEE programs enabled qualified students a chance to participate in limited field work on a variety of established colony worlds—an opportunity

offered by no other academic institution at the time. Senior-level undergraduate students from the Universite de Paris were also allowed to do some studies at the IEE, generally in the form of semester- or summer-long internships under the watchful eye of an IEE faculty member. The addition of these education programs, however, did not change the character of the IEE drastically, and it remained, as it was at the start, an institution devoted primarily to research. Educational faculty were expected to engage in some research as well as teaching, but a large number of IEE staff members were still employed solely as research personnel.

The next fifteen years (2246-2261) saw some remarkable events relating to exobiology. In 2248 the first sentient alien race, the Sung, was discovered by the Manchurians in the DM + 4 123 system. France, like many other Earth nations, was very excited by this news and hastened to open relations with the Sung. IEE scientists, who had argued for decades over whether sentience could evolve on worlds other than Earth, were especially anxious to establish communication with the Sung and exchange knowledge with them, as well as to study the biology of the Sung themselves. Sapientology, a field previously limited to theoretical speculation, sprang into legitimacy almost overnight and quickly became a recognized field of study within the IEE. The initial excitement over the contact with the Sung was marred by the discovery of a second sentient race in the DM + 4 123 system, the Xiang. Considerably less advanced than the Sung, the Xiang were, at least to all appearances, being used as slaves by the Sung. While the IEE cautioned against jumping to conclusion about the Sung-Xiang situation (since communication with these newly-discovered alien species was still very difficult at best, and the Sung-Xiang interaction was not well understood at that point), the North American Research League (NARL), reacting to what it perceived as a major social injustice, began a world-wide publicity campaign designed to mobilize world leaders into acting to free the Xiang "slaves." NARL's campaign was extremely successful, and the result was the Slaver War (2252-2255), which the IEE protested vigorously, arguing that more information was needed about the situation before engaging in war with an alien race that we had barely contacted and hardly understood. Fortunately, the war was over quickly with little loss of life on both sides (casualties were highest for the Sung, though), and relatively peaceful relations were soon re-established. When Canada was granted permission to establish an enclave on Stark, the Sung homeworld, IEE sapientologists were able to forge an agreement with the Canadians enabling the scientists to live and work at the enclave while being able to study the Sung on a regular basis.

Two more sentient races were also encountered during this time period. One race, the Pentapods, was contacted by the French in 2251, just before the Slaver War. The other, the Ebers, was discovered by the UAR just at the conclusion of the Slaver War. The tremendous demand for knowledge about all these aliens overwhelmed the few sapientologists on the IEE staff at the time. Quickly, the IEE established a separate Department of Sapientology within its organization and began recruiting among the best universities of France and Europe for staff to fill the newly-created positions. Drawing from a variety of academic disciplines (such as cultural and physical anthropology, psychology, and linguistics), the IEE was able to assemble a top-notch group of people for its department, which soon gained a reputation for excellence. With the addition of sapientological studies to its organization, the IEE opted in 2261 to change its name to the Institut des Etudes Xenologiques (IEX), a name which it has retained to this day.

The next twenty years (2262-2282) saw the IEX continue to expand its operations. Existing research installations on colony worlds in the French Arm were expanded, and new research stations were created on colonies that had previously had no permanent facilities of that type. By 2280 the IEX had at least one permanent research station on each of the seven French colony worlds. As experts on extraterrestrial biology, the IEX staffers at these research stations frequently served as consultants to the colonists, providing advice and assistance on matters such as alien pest control, hybrid crop development, and health problems due to alien micro-organisms. In 2268 on Beta Canum Venaticorum-4, IEX researchers located in the city of Nauseville on the French Continent (where they were studying the Pentapods at the enclave) were contacted by French farmers and asked to help with the problem of the Beta Grain Blight which was destroying their crops. Agreeing to help with the problem (which threatened to escalate into a major disaster, affecting much of the French Arm which depended on Beta Canum crops), IEX researchers had barely begun investigating the problem when they were told by the French Colonial Government that the Pentapods had been contracted to solve the problem and that the IEX should leave the blight alone and go back to working on its previous projects. Puzzled by this directive, the IEX staffers decided to continue work on the blight (albeit surreptitiously) while appearing to outside observers to be working only on their previous projects. Just as the IEX pinpointed the blight as being due to a nearly microscopic worm, the Pentapods announced that they had found the blight's cause (the same worm found by the IEX) and were hard at work on a solution. According to the Pentapods, the worm was a native of Beta Canum that had just recently developed a liking for Terran crops. Originally, the IEX scientists also believed this theory, but, after careful study of the worm's biology, they weren't so sure. Basically, the worm's biology fit well enough into the known biology of Beta Canum, but there were a few anomalies in its chemistry that were totally unlike any other known Beta Canum organism. Although these variations could have been naturally-occurring, they lent credence to the theory that the Pentapods may have had some role in starting the blight (Pentapods being the only ones with sophisticated enough bioengineering techniques to accomplish such a subtle manipulation of an organism's biochemistry) either as a job for the French government that somehow got out of control or as a project of their own for reasons known only to them. As there was no real solid evidence except the biochemical anomalies in the worm itself, though, the IEX could hardly make any accusations against either the French Colonial Government or the Pentapods. Once the Pentapods came up with a solution for the blight (namely Terraban), the rumors of foul play were slowly forgotten, and the IEX was forced to keep its suspicions to itself. (For further information on the Beta Grain Blight, see the adventure module, *Beanstalk*.)

The advent of France's involvement in the Central Asian War heralded a period of rougher times for the IEX. To support the

military actions in the Central Asian War, the French government was forced to trim the budgets of many of its agencies, including the IEX. Several biological survey expeditions in the planning stages had to be canceled, while others were reduced in scope. A hiring freeze was instituted, resulting in a number of research groups being forced to operate shorthandedly. Unfortunately, the end of the Central Asian War brought even tougher times. With the army coup in 2289 and the runaway inflation that came shortly thereafter, financial problems became worse rather than better for the IEX. Even more stringent budget controls were established, with more operations having to be cut or shelved. In an attempt to keep alive major sapientological studies being done with the Ebers, the IEX enlisted the aid of sapientologists from the Astronomischen Rechen-Institut (AR-I). Since the IEX was being forced to drop the Eber projects for the time being due to financial reasons (the Ebers were not an important factor in French colonization efforts), the staff members involved with these projects were effectively out of their jobs. Through an arrangement with the AR-I, the IEX sapientologists working on the Ebers were "hired" on a temporary basis by the AR-I, while technically being on an extended, indefinite sabbatical from the IEX. Salaries for the scientists involved were paid by both the IEX and the AR-I, with the IEX providing twenty-five percent and the AR-I giving seventy-five percent. Knowledge from these endeavors was shared equally between both organizations. Before the army coup, the IEX and AR-I had been working together to some extent on studying the Ebers, and each group held a fair amount of respect and appreciation for the other's work. It was natural, then, that the AR-I should offer, in the name of the advance of scientific knowledge, to help out the IEX scientists in their time of need. This cooperation held even through the War of German Reunification (2292-2293), as the scientists involved decided that political differences should not impede the advance of science. The existence of this arrangement, however, was kept quiet throughout the war in order to avoid trouble with the French and German governments. This situation with the Ebers, though, was a rare exception in the history of the relations between French and German scientific personnel, which has been friendly rivalry at best, and antagonistic and secretive at worst.

With the War of German Reunification and the Flemish War of Independence in 2293, France's troubles got worsened, forcing the IEX to postpone even further a number of operations and surveys. Finally, in 2294, with the free elections in which Nicolas Ruffin and his followers stepped into power, things began looking up for the IEX. As the French economy was brought back on track, funding for IEX operations was gradually increased. IEX activities received an unexpected boost when, in 2295, the Kafers were first contacted. After the Kafers destroyed the French astrophysical research outpost at Arcturus in 2297 and attacked Aurore in the Eta Bootis system in 2298, the IEX was ordered by the French government to make the study of Kafers a number-one priority. Additional funding, specifically earmarked for Kafer studies, was allocated to the IEX. Unfortunately, due to the dangers inherent in capturing a live Kafer and the rapid decomposition of dead Kafers, the IEX has been able to make only limited progress in obtaining useful knowledge about Kafer biochemistry, psychology and culture. For the most part, the information gained on the Kafers

by the IEX to date has been restricted to general anatomy and physiology. Plans to capture a live Kafer have been considered by the IEX, but, as of yet, no plan has been developed which would allow detailed study of a live Kafer while, at the same time, ensuring the safety of the researchers and the prevention of escape of the captive Kafer.

PRESENT-DAY ORGANIZATION

The IEX is presently comprised of a number of smaller departments: Le Bureau d'Administration, L'Office Extraterrestre (the Extraterrestrial Office), L'Office d'Expertise et des Donees (the Survey and Records Office), La Division de l'Art de l'Ingenieur Biologique (the Bioengineering Division), La Division de la Sapientologie (the Sapientology Division), La Division Medicale (the Medical Division), La Division de l'Exobiologie (the Exobiological Division), and La Division de l'Education (the Educational Division). Le Bureau d'Administration is, as its name suggests, the administrative branch of the IEX. This branch consists of the President d'Institut (this position is currently held by Dr. Philea-Marie Thibaut), the Board of Trustees, and bureaucratic office staff. Official policy for the Institut is decided jointly by the president and the Board, with the heads of the other Institut departments serving as consultants to the Board. The Bureau d'Administration serves as the link between the French government and the Institut—receiving governmental directives, keeping the government informed of the Institut's various operations, and handling the monies received from the French government to fund IEX activities, facilities, and staff. The Bureau also handles, through its office staff, in coordination with department heads and the Board of Trustees, the selection of candidates both for employment by the IEX and for admission to the educational programs of the IEX.

Closely linked to the Bureau d'Administration is the Extraterrestrial Office, an administrative branch coordinating the various off-Earth facilities of the IEX. The quarantine and experimental lab stations at L-5 and Luna, and the various IEX research installations scattered throughout explored space, all report directly to, and are administrated by, the ET Office. The IEX Zoological Park on Tirane (Alpha Centauri) is also under the jurisdiction of the ET Office.

Surveys of new territories and worlds, however, are coordinated by the Survey and Records Office. The Survey and Records Office is in charge of planning any biological surveys (both on colonized and on previously unexplored worlds) and is in charge of maintaining, cataloguing, and disseminating any and all data from those surveys.

A sub-branch of the Survey and Records Office, Les Services des Machines a Calculer (Computer Services) operates the vast computer system used by the IEX to store all the exobiological data presently known to mankind. Databases within the system are frequently updated as new information becomes known or old information is found to be obsolete. Virtually every IEX staff member on Earth has ready access to these databases, either through hardwired terminals located throughout the main IEX campus in France or through remote access via public computer networks linked into the IEX mainframe computers. Non-IEX personnel can obtain access to the databases, but only after applying for a user account through Computer Services. Non-IEX staff user accounts are usually granted only if a valid research reason is given for needing access to the databases.

Off-Earth IEX research stations maintain their own computer systems and databases, with regular data dumps being sent back to the Survey and Records Office via stutterwarp courier to be added to the main IEX databases on Earth. Personnel working at these off-Earth stations can subscribe to an update service in which new data relating to their field of study or work in progress is listed in a subject catalog that is released several times a year. Data files listed in the catalog can be requested by these personnel, and computer-readable forms can be sent via stutterwarp courier. The IEX databases also include copies of all the biological, chemical, medical, exobiological, and sapientological scientific journals published, all of which are as accessible as the data files themselves.

The duties of the Bio-engineering Division of the IEX encompass several areas and can be grouped into three categories: Pentapod product evaluation, genetic engineering, and hybrid development. With the contact of the Pentapods and their willingness to sell bio-engineered products to humans came the problem of making sure that those products were safe for human use and safe within the environments where humans would be using them. The Bioengineering Division has been asked by the French government to test Pentapod products thoroughly before they are allowed to be used by French citizens and colonists. Although the Bio-engineering Division's evaluations and recommendations concerning Pentapod products are not the final word in determining the acceptability of such products, they are still relied on heavily in the decision-making process by French government officials.

Genetic engineering done by the IEX generally involves tailoring known organisms to fit a new environment or new purpose. Most of this work is done on terrestrial organisms—microbes, plants, and animals—and usually is limited to helping the organism survive better in an alien environment. Symbiotic bacteria, however, have been engineered from existing bacterial strains to help unengineered plants and animals fit into extraterrestrial ecosystems. Rather than altering the plant or animal strain itself, genetic engineers will alter a bacterium to live within the organism so the organism can survive off-Earth. Since initial contact with the Pentapods, though, genetic engineering done by IEX scientists has dropped off to some extent. With Pentapod genetic engineering being more advanced than that of humans, the French government has often found it quicker and cheaper to hire the Pentapods to accomplish a certain genetic engineering task than to have the IEX work on it. IEX genetic engineers are dying to learn more about Pentapod techniques, but the Pentapods refuse to say too much about them—probably being afraid that if they divulge too much, they'll end up losing a significant amount of business. The IEX scientists, then, often try to learn Pentapod genetic engineering techniques by scrutinizing Pentapod products presently available, a line of study often frustrating at best.

The Bioengineering Division's hybrid development programs have generally met with limited success. Designed to produce hardier organisms through crossbreeding, the hybrid development programs have usually progressed slowly. With virtually the same goal as the genetic engineering programs, hybrid development can be broken down into two areas: crossbreeding of only terrestrial organisms and crossbreeding of terrestrial and alien organisms. The former area has had much more success than the latter, which has had only a few successes, all of which have been sterile, nonreproductive organisms. Numerous cross-breeds of Earth-native organisms (mostly plants) have been developed which have seen great success among the colonies of the French Arm. A few crossbreeds of totally extraterrestrial organisms have been accomplished which have proven useful to French colonists.

The newest of the IEX's departments, the Sapientology Division, is also one of the largest, encompassing such fields of study as sapient neurology, psychology, anatomy and physiology, alien physical and cultural anthropology, and linguistics. The study of alien intelligent life is the domain of the Sapientology Division, and, while it is an exceedingly interesting field of study to pursue, it can also be one of the most challenging. While communication with the known alien races has progressed significantly since first contacts, it is still often difficult to communicate clearly with a sentient alien race without misunderstandings occurring on either or both sides. Societal taboos have also served to limit the exchange of information between sentient species, with the result that large gaps exist in our knowledge of these aliens. The Sapientology Division has some of the leading experts on alien culture and biology working under its jurisdiction. Through their efforts, the Sapientology Division has amassed the largest body of information in human space concerning the known sentient species.

The Medical Division of the IEX has been kept busy with maintaining the health of French colonists, their livestock, and plants. New environments have brought with them new infectious agents to plague humanity. The main purpose of the Medical Division is to work on ways to help French colonists remain healthy in their new environments. Much work has been done on developing vaccines, antibiotics, and antiviral agents to aid the human immune system in fighting off extraterrestrial pathogens. Similar work has also been done by the IEX in developing agents to help the colonists' plants and animals to stay healthy and disease-free in their extraterrestrial environs. Presently, the most important problem the Medical Division is working on is the fungal blight on Aurore, which is a life-threatening problem for the colonists there. Although little progress has been made in finding an agent to kill the fungal parasites, the Medical Division has a number of leads which it is following that should, given time, result in a solution to this problem.

Devoted more to pure research than to applied science, the Exobiological Division of the IEX is engaged in studying the diversity of nonsentient, extraterrestrial life. Staff within the Exobiological Division can generally be grouped within one of three categories: microbiology, macrobiology, and biochemistry. The microbiologists tend to work with those alien organisms invisible to the naked eye, while the macrobiologists are involved in studying those creatures visible to humans, from tiny plant-like lifeforms barely as big as an eyelash to enormous beasts like the giant lizards of Wolf 424B-1. The study of alien body chemistries is the province of the biochemists, who work to unravel the intricacies of how alien body systems function on the most basic levels. Currently, some members of the Exobiological Division are working on L'Encyclopedie des Organismes des Colonies, an extensive compilation of all the data presently known on all the organisms discovered to

date in explored space. An exhaustive work, L'Encyclopedie will be regularly updated as new data is acquired or old data is found to be obsolete. Members of the Exobiology Division often find themselves working on a consulting basis with members of the other IEX departments (especially the Medical and Bioengineering Divisions) as their expertise is needed in solving problems related to their fields of specialization.

The academic programs of the IEX fall under the jurisdiction of the Educational Division. Essentially, the Educational Division is a graduate school, offering master's and doctoral degrees in exobiology, sapientology, applied bioengineering, and extraterrestrial medicine. Faculty of the Educational Division are expected to teach graduate-level courses in their specialties while, at the same time, doing research benefiting their department (faculty hold joint memberships in the Educational Division and in one of the four research-oriented departments of the IEX). Field work done by students (under faculty supervision) on colony worlds is coordinated by both the Educational Division and the Extraterrestrial Office. The training program for new IEX biological survey personnel is also run by the Educational Division, in consultation with the Survey and Records Office.

PRESENT ACTIVITIES

While the IEX has numerous research activities operating throughout the French Arm of explored space, it is, by no means, restricted to French space and has several on-going research projects located in areas not under French jurisdiction. The IEX has research installations on each of the seven French colony worlds, with several colonies having more than one IEX station on their world. Several of the nine French outposts also have IEX staff in residence, although the number of IEX staff members at these facilities is significantly lower than that of a colony world station. Over half of the people employed by the IEX, however, are currently working within Earth's solar system, either at the main IEX complex in France or at one of the two quarantine stations located off-Earth.

The IEX Complex

Located in the French countryside near the village of St. Denis de la Campagne, the main IEX complex is an impressive facility. Each of the eight IEX departments has its own building, housing offices, laboratory space, classrooms, and lounge/reading rooms. Several of these buildings have had annexes added to them as demands for space have grown over the years since they were first constructed. Most of these buildings are connected to one another by either skywalks or tunnels, allowing easy sharing of resources and equipment among them all. Located roughly equidistant from the department buildings is a large cafeteria, open from six in the morning until ten at night, providing a convenient place for IEX staffers to eat.

Computer Services, with a facility all to itself, is situated in between the cafeteria and the main Survey and Records Office building. The IEX computer mainframes are located at Computer Services, as are the extensive database libraries. Although all of the department buildings are networked directly into the mainframes, additional terminals (mainly for visitor use) are available at Computer Services. Ultra-fast batch printers, for producing hardcopy of large computer files, are also located at Computer Services and are available for use any time during the day that the building is open.

There are five large dormitory complexes located on campus, each with its own dining facilities. Three of these are used exclusively for IEX students while the other two are reserved for visiting scientists, usually either off-world IEX researchers or non-IEX scientists engaged in special work using IEX resources. Additional classrooms and lecture halls are located in these dormitory complexes, as are lounges and reading rooms.

As impressive as most of the IEX campus is, the aspect that seems to amaze visitors the most is the large number of greenhouse-like buildings. Situated immediately north of most of the campus, these structures house a multitude of alien lifeforms. Collected from all over explored space, these organisms live in specially controlled environmental chambers. Each chamber, controlled separately from the others, duplicates as closely as possible the natural environment of the organism(s) living within. Factors such as light, moisture, temperature, atmospheric gases and pressure, and environmental radiation are monitored carefully and adjusted to make the inhabitants feel as much at home as can be done on Earth. Gravity, however, cannot be adjusted here on Earth, so researchers are somewhat limited in the species that they can keep alive and well in such a habitat chamber. Care is exercised in the selection of species for these habitats; organisms that are extremely dangerous to terrestrial creatures are not allowed on Earth, but are instead restricted to the off-Earth quarantine facilities. Escape of such organisms, even under the most careful of precautions, is always a possibility. Such an escape could prove to be catastrophic in results; thus, only relatively safe extraterrestrial organisms are allowed to be kept at the IEX facility in France.

Transportation to the main IEX complex is not a difficult task. An air-film train station is located on the outskirts of St. Denis de la Campagne, providing regular service between the IEX and major French metropolitan areas. Well maintained roads for ground cars heading to the IEX are also available for use, although parking at the IEX is limited (most people use the air-film train and take a regularly running shuttle to travel between the train station and the IEX complex). Additionally, there is a sizable heliport/VTOL landing pad on the IEX grounds for air transport (the IEX has four VTOL craft of its own that are used for official trips only).

Off-Earth Facilities in the Solar System

The two IEX quarantine facilities are located in the Earth-Luna system. One is in Earth orbit at the L-5 point (next to the ESA station); the other is based on the Moon itself. Each of these is devoted to the study of extraterrestrial organisms too hazardous to bring to Earth itself. Strict decontamination procedures are followed by all personnel entering or leaving these facilities. In the event of an accidental escape of alien organisms, the lab complexes can be sealed off and the contaminated areas sterilized through various methods, including opening the areas to the vacuum of space.

Shaped like a large, fat cylinder with docking ports at each end, the L-5 installation was designed in such a way as to be able to support organisms needing surface gravities different from that of Earth. With an internal structure of concentric

cylinders, the IEX L-5 station provides levels of different simulated gravities as it rotates on its axis, with the one-G level being roughly halfway between the axis and the station's outer surface. Personnel working at the station commute via a "space taxi" system from the ESA station where they live.

The IEX lunar base is a fairly independent facility, with living quarters for the staff located in a building connected to the lab complex by a tube system capable of being sealed off and sterilized in the event of an accident in the labs. Specimens kept at the lunar base are generally those that are gravity inspecific, or those whose natural environment is very low gravity. Landing facilities adjacent to the base allow easy transport to and from the base.

Projects Outside of the Solar System

Outside of the Solar System, the IEX has a number of ongoing studies of particular interest.

Aurore: IEX activity on Aurore, in the Eta Bootis system, has been given high priority by the French government due to the problems with the Kafers there. With a research station located in the town of Equator Flats, IEX scientists are trying to learn as much about Kafer biology and psychology as possible while, at the same time, trying desperately to find some means of combating Kafer Rot, a fungal blight. Introduced into the Auroran ecosystem by the Kafers, this fungal parasite affects both humans and Terran plants. In humans, Kafer Rot is a generally fatal manifestation of the fungal blight. Without the development of an agent to kill or arrest the fungal blight, the survival of the colonies on Aurore is threatened. (For more information on Kafers, Kafer Rot, and Aurore, see the adventure module *Kafer Dawn* and the upcoming supplement, *Aurore Sourcebook*.)

Beta Canum Venaticorum-4: On the major colony world of Beta Canum, scientists of the IEX are engaged in studies of the Pentapods and their bioengineering techniques. With an installation in the city of Nauseville (relatively close to the Pentapod enclave), the IEX has been examining both the Pentapods and their bioengineered constructs. Anxious to learn the advanced methods the Pentapods employ in their bioengineering, the IEX has been pressing the Pentapods to share some of their techniques. This has met with very little success, since the Pentapods are reluctant to reveal their "trade secrets." Frustrated by the Pentapods' attitude, IEX researchers are examining Pentapod products carefully in the hopes that, by studying the genetic modifications made, some insight into the techniques used can be found.

Tirane: In the Alpha Centauri system, the major activity of the IEX has centered around the establishment and maintenance of Le Parc Zoologique Extraterrestre, the zoo devoted to extraterrestrial species. On Tirane, in the colony of Provence Nouveau, the zoo has become a major tourist attraction, drawing visitors from all over Tirane as well as from Earth and also many of the colony worlds. Although its exhibits are limited to those relatively safe animals that can survive in an environment fairly similar to that of Tirane, the zoo boasts an unparalleled variety of diverse species collected in one place. For those who have never been to Earth, the zoo also has representatives of some of the more interesting terrestrial species (among some of the colonists these exhibits have proven more popular than many of the extraterrestrial ones). IEX

staff associated with the zoo are involved not only in maintenance and care of the exhibits, but also in procuring new species for inclusion in the zoo. IEX expeditions are sent out on a fairly regular basis to capture new animals for exhibit. In the case of a few species which have become extinct in the wild since mankind moved into their territory, the IEX zoo is the only place where such creatures still survive and flourish.

Stark: Working out of the Canadian enclave on Stark (DM + 4 123-4), the IEX is currently engaged in extensive studies of the Sung, the indigenous sentient race. Sapientologists are particularly interested in studying the interactions between the Sung and their ecosystem, hoping to learn more about the degree to which sentient beings manipulate, control, or disrupt their natural environment. Much work is also being done to learn more about the Sung, their language and culture, and their relationship with the Xiang. (Much is still not clearly understood of the motivations concerning the Sung "enslavement" of the Xiang.) Frequent expeditions from Stark are made to the Xiang homeworld, where sapientologists have been having a challenging time studying the enigmatic Xiang. A truly "alien" species, the Xiang have proven difficult to understand in terrestrial terms of behavior. Much work needs to be done before IEX scientists will have a good understanding of Xiang culture and behavior.

Kormoran: IEX scientists on Kormoran (83 Eridani-4), the Eber homeworld, are engaged in two projects: study of the Ebers and evaluation of the Pentapod-designed "tree-houses" being used by some of the UAR colonists. The Eber studies are the more extensive and long-ranging of the two projects, with much work still needing to be done in piecing together the Eber language, culture, and history (especially the reasons behind the destruction of the other Eber colonies on Beta Hydri and Rho Eridani). The "tree-houses" are a Pentapod product currently being used on a trial basis by some of the the UAR colonists on Kormoran. The French government, intrigued by the tree-houses which provide housing and subsistence-level nourishment for people living within the natural cavities in the trees, is considering using them on some of the newer French colony worlds. IEX scientists have been commissioned to do a detailed evaluation of these tree-houses to determine their safety, successfulness in accomplishing their intended purpose, and suitability for colonial use.

Beta Hydri: With the ruined Eber colony in the Beta Hydri system, IEX sapientologists/archeologists have been kept busy. Although a fair amount has already been excavated, large areas of the ruins are still relatively unexplored and unexplained. The AR-I also has several teams of scientists working at the Eber ruins and has "imported" a group of Ebers from Kormoran to serve as consultants and guides in the excavations. Due to the ruins being about 4,000 years old, however, these Eber guides have not proven as useful as the AR-I had hoped. Although the IEX and the AR-I had cooperated in the past on Eber studies, the current relationship between the two groups is one of friendly rivalry, with each group trying to learn more about the Ebers in a shorter period of time than the other.

King: A colony world in the American Arm, King has in its solar system a Jovian planet which has been discovered to support life in its atmosphere. Invited by the Americans to participate in a joint venture to study these organisms, the IEX has only just begun to collect data on these unusual creatures,

which have managed to evolve and survive in the atmosphere of a gas giant. Observations of these fascinating lifeforms have been difficult to obtain, so information-gathering by IEX scientists has proceeded at a slow pace.

DM + 17 2611-II: The Klaxun, a sentient alien race living on a world in the DM + 17 2611 system, will probably find themselves the subjects of study by the IEX after the events detailed in the adventure module, *Energy Curve*. As AR-I sapientologists will also undoubtedly be interested in studying the Klaxun, IEX scientists may end up competing with AR-I researchers in a race to learn the most about the Klaxun in the least amount of time (both groups wanting to be the first to make vital discoveries about this new species).

ADVENTURING WITH THE IEX

The IEX can easily by incorporated into adventures for **Traveller: 2300** in a number of ways. With the IEX engaged in numerous biological surveys, player characters could easily by used as staff on such expeditions, either as highly skilled scientists (who might have received their training at the IEX main complex) or as relatively low-skilled support personnel such as pilots, drivers, lab technicians, bodyguards (in hostile environs), or sample collection workers. IEX training, either at the graduate level or the less extensive survey personnel training program, can be used as part of the background of a player character. Other adventure possibilities for the IEX could be to have player characters sent out on a mission to search for an IEX team with which all contact has been lost, to send them on an IEX-sponsored mission to capture new creatures for the zoo on Tirane or to have them get involved somehow with an IEX operation: either one of the current operations mentioned above or one based on a French colony world.

CHRONOLOGY OF EVENTS RELATING TO THE IEX

2140: IEX founded as Bureau d'Affaires Exobiologiques.

2141: First extraterrestrial outpost established (Azania's Nyotekundu in the Wolf 359 system).

2145: Bessieres, first French outpost, founded.

2150: Bureau (IEX) has grown to 52 people; end of French Peace.

2152: Augereau, French outpost, founded.

2159: Serurier, French outpost, founded.

2164: Contamination disaster at Serurier.

2167: Provence Nouveau, French colony on Tirane (Alpha Centauri), founded.

2168: Bureau (IEX) renamed Institut des Etudes Exobiologiques; survey training program initiated.

2170-2245: Educational programs at IEE expanded; "golden age" for IEE.

2175: French outpost at DM − 26 12026 founded.

2184: French outposts at Davout and Nyotekundu established.

2185: D'Artagnon, French outpost, founded.

2205: French colony at Beta Canum Venaticorum-4 founded.

2211: French outpost at DM + 36 2219 established.

2220: French colony at Beta Comae founded.

2231: French colony at Kimanjano founded.

2244: French colony at Vogelheim established.

2246: Aurore, French colony at Eta Bootis, founded.

2248: Sung discovered by Manchurians at DM + 4 123-3 (Stark).

2250: Xiang discovered in DM + 4 123 system.

2251: Pentapods discovered by French at DM + 27 28217.

2252: Start of the Slaver War (despite IEE protests).

2255: End of the Slaver War.

2256: Ebers discovered by UAR at 82 Eridani-4.

2261: IEE is renamed Institut des Etudes Xenologiques.

2268: Start of Beta Grain Blight on Beta Canum Venaticorum-4.

2271: End of Beta Grain Blight (with the help of Pentapods' Terraban).

2274: French outpost established at DM + 27 28217.

2282: Start of Central Asian War.

2287: End of Central Asian War.

2289: Army coup in France; start of financial troubles for IEX.

2290: Establishment of unofficial IEX/AR-I cooperation in studying Ebers.

2292-2293: War of German Reunification.

2293: Flemish War of Independence.

2294: Nicolas Ruffin elected as leader of France.

2295: Kafers contacted at Arcturus by French astrophysical outpost.

2297: Arcturan outpost destroyed by Kafers.

2298: Kafers attack Aurore; Third French Empire inaugurated; IEX financial troubles over.

2300-on: The present.

—Deb Zeigler

Building the Perfect 'Mech

INTRODUCTION

One of the most interesting aspects about FASA's game, *Battletech*, are the rules for players to design their own Battlemechs (or 'Mech for short). Players can build 'Mechs to their own specifications, including size, what types of weapons to carry, and how much heat is lost in a turn. However, since there are such a large number of variations to choose from in 'Mech design, many players become confused or totally lost about how to design their 'Mechs. This article explains how to build a better 'Mech, including sections on the advantages and disadvantages of size, discussion of weapon statistics, and overall 'Mech design.

Note: Much of the information cited here comes from the *Battletech Technical Readout: 3025*.

"MY 'MECH IS BIGGER THAN YOURS"

In the *Battletech* 'Mech design rules, a player's first decision is what size to make his 'Mech. The size of the 'Mech determines all critical statistics about the rest of the design process, including internal structure, number of weapons and how much armor it may carry, and, indirectly, how fast it can move. This section will explain the importance of choosing the right 'Mech weight for the function the 'Mech is supposed to perform.

In *Battletech*, as in any game in which the player is given the option of designing combat units, the most important decision a player makes in the design process is what his unit is supposed to do: is it a long-range fighter or a close-range fighter? fast-moving or slow-moving? Is it heavily armored, or does it rely on speed and maneuverability to evade enemies? This decision determines everything about a 'Mech.

Because of factors inherent in the game system, there are three basic types of 'Mech design: small and fast-moving, with little armor and few weapons; large and slow-moving, with lots of armor and weapons; and the medium-sized 'Mechs that are built for a specific function or have reasonable movement and fighting capabilities. Each of these sizes of 'Mechs are broken down into four classifica-

tions: light, medium, heavy, and assault.

"I Have A Need For Speed"

Light 'Mechs are, by a rule, very fast and almost all jump. The average speed of light 'Mechs is about six, while a few move as much as eight (there is only one light 'Mech that moves less than three). This is because the average fusion power plant required to move a light 'Mech only takes up about twenty to twenty-four percent of the total 'Mech tonnage. This means that the small 'Mechs can afford to move very quickly, unlike the larger 'Mechs (especially the assault 'Mechs) that usually use about fifty percent of their tonnage for a fusion plant. Likewise, most light 'Mechs jump because the weight for jump jets for small 'Mechs is negligible. At a half-ton each, most 'Mechs can afford to have their full jump allotment.

The main limitation of small 'Mechs is, of course, their weight. Although they may only use one-fifth of their tonnage for movement, their actual size does not allow them to carry very powerful or a large number of weapons; therefore, most light 'Mechs will only carry whatever weapons will afford them protection against other 'Mechs of similar size. For instance, the most popular light 'Mech weapons are the medium laser and the short range missile pack, because each can, almost on its own, remove the armor of another light 'Mech with one shot. There is no probable way in a head-on firepower fight that a light 'Mech can defeat a much larger 'Mech.

'Mech designers should remember this important fact: light 'Mechs are not frontline combat units; their purpose is to act as a scout and stir up trouble against heavier opponents.

No matter what the function of a light 'Mech may be, it is still a combat unit and must therefore carry weapons and armor. The question is, How many weapons and how much armor can a light 'Mech carry before it becomes ineffectual, because it carries too many weapons and not enough armor (making it simple to destroy), or too much armor and not enough weapons (making it a useless combat machine)? The average light 'Mech should carry 25 to 35 percent of its total weight in weapons, and about the same amount in armor, with personal preference balancing the two; this takes

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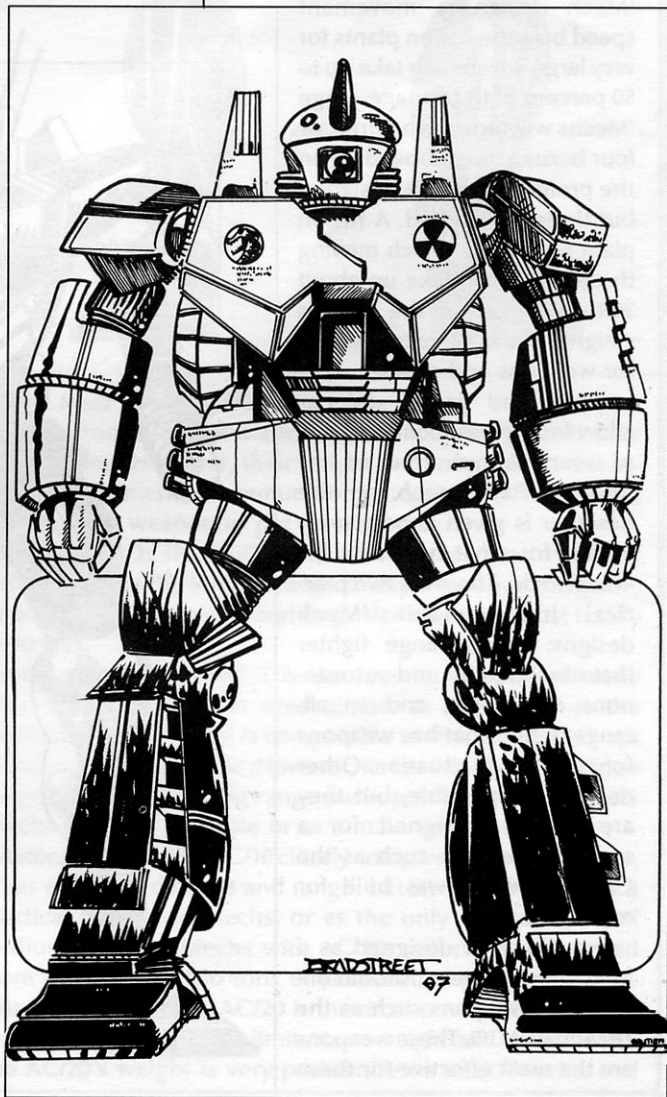
about 50 percent of the 'Mech's total tonnage. This mix will give the 'Mech enough firepower to adequately fight similar units and still give it enough armor to stand up to more than one turn of fire.

The rest of the remaining tonnage of the 'Mech is taken up by a combination of the gyros, cockpit, jump jets (if any), and any ammunition or extra heat sinks the 'Mech's weapons may require. It is usually completely safe not to add any extra heat sinks because the limited number of weapons light 'Mechs can carry do not usually generate more than ten points of heat, which the 'Mechs original heat sinks can easily handle. However, if your light 'Mech carries a weapon that does generate a lot of heat (such as a PPC), you may want to add one or two additional heat sinks to allow your 'Mech a few more rounds of combat before taking penalties from excess heat generation.

"The Bigger They Are..."

Unlike light 'Mechs, the heavy and assault 'Mechs move quite slowly because they do not rely on speed for fighting; instead, they effectively manage to use their staggering firepower and thick, heavy armor as their protections against any threat of attack.

One of the least important elements of heavy and assault 'Mech design is movement speed because fusion plants for very large 'Mechs can take up to 50 percent of its tonnage. Large 'Mechs will move two, three, or four hexes a turn, depending on the preference of the designer; but three is standard. A fusion plant for a large 'Mech moving three hexes will take up about 20 to 30 percent of the 'Mech's weight, allowing extra weight for weapons and armor.

Heavy and assault 'Mechs allow for the best combinations of weapons and armor of any unit in *Battlemech* so the designer is given almost every option for what he wants his 'Mech to do. There are two practical heavy/assault 'Mech designs: a long-range fighter that uses missiles and autocannons exclusively, and an all-range fighter that has weapons for every range situation. Other designs are possible, but they are usually designed for a specific situation, such as the Charger, which was built for melee attacks.

If a 'Mech is designed as a long-range fighter, it should only mount weapons such as the LRM-20 or AC/5. These weapons are the most effective for these types of attack because they generate the least amount of heat, which results in allowing the 'Mech to engage in firing at long range for several consecutive turns before an enemy 'Mech can manage to effectively move into closer ranges. PPCs and large lasers generate too much heat to be at all effective in this role.

However, PPCs and large lasers happen to be ideal weapons for all-range 'Mechs because they result in causing a large amount of damage to one specific area, unlike LRMs, which affect several areas, or ACs, which can have a long-range effect but do not do a great amount of damage. PPCs and large lasers also have the advantage of having comparable range to the LRMs and ACs. Unfortunately, these weapons generate a large amount of heat, and thirty to fifty percent of the total weapons tonnage must be allocated to heat sinks so the 'Mech may fight effectively. Other weapons, such as SRMs and medium lasers, are usually used for close defense and backup firepower, while machineguns and small lasers are used for purely defensive purposes, such as when small, fast-moving 'Mechs get too close. However, some 'Mechs use medium lasers and SRMs as their main weapon, with heavier weapons added as "bonus" firepower. These 'Mechs usually have a number of smaller weapons that equal the tonnage of their one larger weapon.

A large 'Mech will have 20 to 30 percent of its weight allocated to weapons and ammunition, 10 to 15 percent to heat sinks, and 20 to 30 percent to armor, bringing the total for weapons and armor to 63 percent. This allows for the cockpit, gyros (three tons), and internal structure.

A Happy Medium

Medium 'Mechs don't have the limited weight of a small 'Mech, or the practically unlimited combat capacity of heavy and assault 'Mechs, so a designer can build a medium 'Mech with the advantages of light and heavy 'Mechs.

Medium 'Mechs have fusion plants that only take up 14 to 44 percent of the mass. Unlike heavy 'Mechs, larger power plants give medium 'Mechs movement comparable to light 'Mechs, up to seven hexes a turn. Most medium 'Mechs can afford to have jump jets as well.

Medium 'Mechs have the advantage of being able to carry a formidable arsenal of weapons; in fact, many
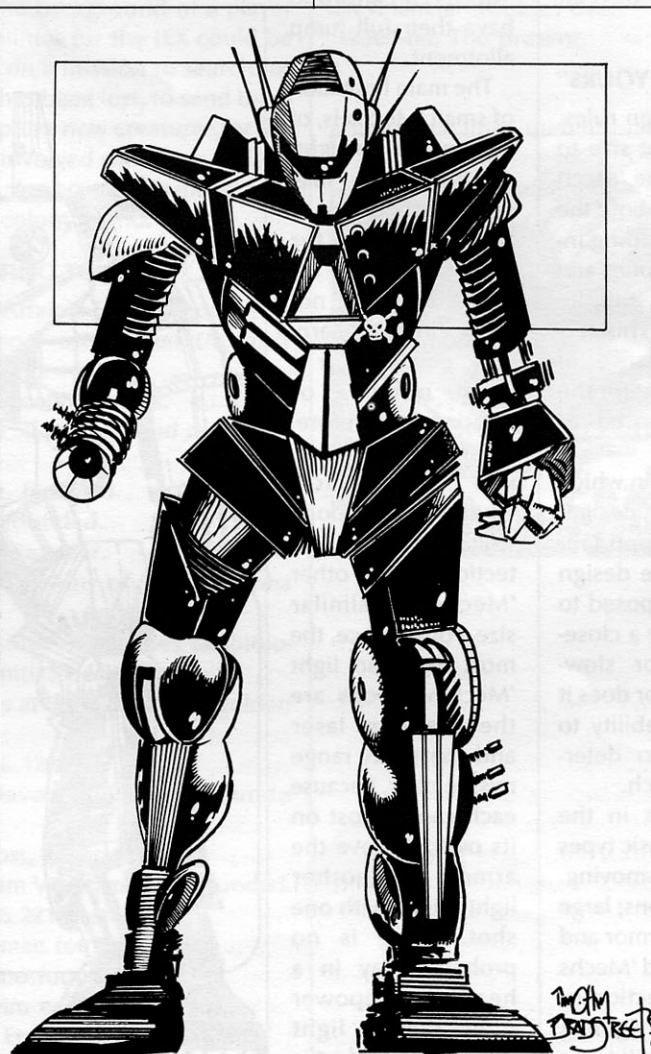
medium 'Mechs are more than capable of disabling or destroying heavy 'Mechs. The average medium 'Mech will have 27 to 37 percent of its weight in weapons and 10 to 20 percent in armor. This small gun-and-armor-to-weight ratio is the reason that the medium 'Mechs can afford to move so quickly. The rest of the weight usually goes into heat sinks, which results in giving the medium 'Mechs an excellent sustained-firefight capability.

Unlike heavy 'Mechs, medium 'Mechs can be designed to perform any function; that is, they can be designed as long-range fighters, all-range fighters, scouts, and just about anything else the designer can imagine. However, an important point to remember is that although they are very flexible, medium 'Mechs will only carry one, possibly two, heavy weapons, and maybe a few light weapons for backup; medium 'Mechs can carry heavy firepower, but there is a definite limit to the total firepower of the 'Mech.

"IT'S NOT THE SIZE OF THE GUN THAT COUNTS"

In *Battletech* there are three basic weapon types: lasers/PPCs, autocannons, and missiles. Flamers and machineguns can count as either lasers or autocannons. Each of the three types of weapons has certain advantages and disadvantages.

"Zap! You're Dead!"

The advantage of lasers and PPCs is that there is no worry about ammunition restrictions, allowing them to fire an unlimited number of times in a game. However, they do have the disadvantage of massive heat build-up, which can put a stop to a fighting 'Mech before the enemy does.

Small Laser: The small laser is a purely defensive weapon, of little use in actual combat. Although its light weight makes it very appealing to small 'Mechs, the laser's limited range makes it practically worthless.

Medium Laser: The medium laser is easily the best weapon in the game. It combines the best damage-to-heat ratio of all the laser weapons in the game. Its range is used as the standard for all other weapons in the game. It is used on almost every 'Mech because it also has the best damage-to-weight ratio.

Large Laser: The large laser is a popular weapon on many heavy 'Mechs, but is also a popular weapon on some lighter 'Mechs. Its range is long enough to give medium laser-armed 'Mechs difficulty, but it still has problems against many autocannons and LRMs. The large laser is the first beam weapon to do enough damage to a single area to cripple a light 'Mech.

PPC: The particle projection cannon is one of the most powerful weapons in the game, combining very long range with massive damage. Its main problem is the amount of heat it generates, and not its minimum range. It is usually not worth replacing a large laser with a PPC because of the difference in tonnage and number of heat sinks required to dissipate the PPC's heat in comparison with the large laser. Any 'Mech with PPCs should have plenty of heat sinks, or the 'Mech may never recover from the buildup.

Flamer: The flamer is a special-purpose unit and should not be considered a combat weapon. Its only purpose is the obvious one: Flamers can be used to set fires, and that's all they're good for.
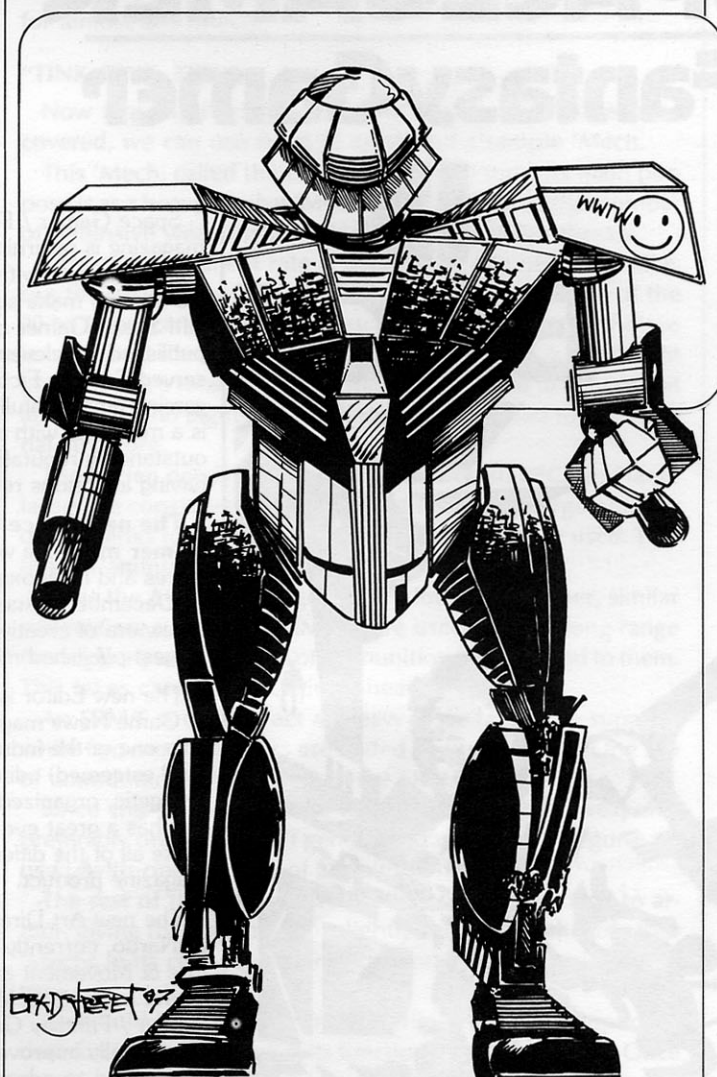
"...The Most Powerful Handgun in the World"

Autocannons have the advantage of long range with little heat buildup. However, their weight and ammunition restrictions (not to mention ammunition explosions) make them a questionable weapon to put in a 'Mech.

Autocannon/2: The AC/2 is the worst autocannon available. Although it has the longest range of any weapon in the game, its poor damage capacity and large size make it almost totally worthless.

Autocannon/5: The AC/5 is the favorite weapon of many 'Mech designers and is used almost as commonly as the medium laser. Its range is comparable to that of the PPC, but its damage is much lower. However, its low heat buildup makes it a good choice for long-range backup firepower, and many 'Mechs use it in that role or as a main weapon.

Autocannon/10: The AC/10 closely compares to the large laser. It has excellent damage and range, but its size only makes it practical for heavy 'Mechs, or as the only main weapon of medium 'Mechs. 'Mechs with AC/10s will not usually need more than one or two tons of ammunition per gun.

Autocannon/20: The AC/20 is the most powerful weapon in the game. It has only two limitations: weight and ammunition. The AC/20's weight is very prohibitive to most 'Mechs, and

there is not a 'Mech in the game that carries more than one. In addition, 'Mechs with AC/20s need at least two tons of ammunition to sustain themselves in any firefight. Otherwise, the AC/20 is definitely worth mounting, especially if the enemy is comprised of medium and light 'Mechs, which the AC/20 can easily destroy.

Machinegun: The machinegun, like the small laser, is used only as a defensive weapon. It has the advantage over the small laser in that it doesn't generate any heat; however, the machinegun must have ammunition, so the weight between the two is practically the same. The main problem with the machinegun is that if the ammunition explodes, the resulting damage will probably completely destroy even the heaviest of 'Mechs.

"Incoming!"

Long-range missiles have the advantage of (that's right) long range. However, the damage they do is spread out over an area, so there is little chance of damaging the same location on an enemy. In addition, the ammunition supplies on LRMs is usually low, and the six-hex minimum range makes them useless in close combat. No 'Mech should be without defensive weaponry when mounting LRM weapons. Short-range missiles have the advantage of doing a large amount of total damage, but, like LRMs, they spread their damage over an area.

Long-range Missile/5: The LRM/5 is a weapon used on many light and medium 'Mechs because it gives the longest range fire with the smallest amount of weight and heat. Although the LRM/5 never does massive damage, it is still a good support or backup weapon.

Long-range Missile/10: LRM/10s are also used on medium 'Mechs, but very few light 'Mechs use them because of the weight; it is usually more advantageous for a faster 'Mech to have more short-range weapons than one LRM/10. The ammunition supply per ton is still reasonable: only one ton per LRM/10 is usually needed.

Long-range Missile/15: The LRM/15 is the least practical of the long-range missile systems. Its main problem is that it is usually worth the three extra tons to mount an LRM/20, or mount three LRM/5s in its place (the odds for hitting and the total damage between the two different systems are practically identical).

Long-range Missile/20: The LRM/20 is the most powerful long-range weapon in the game. Only heavy and assault 'Mechs are large enough to carry both it and a large enough amount of ammunition to sustain it in a fight. It is definitely worth mounting if a 'Mech is designed for support.

Short-range Missile/2: The SRM/2 is the favorite weapon of light 'Mechs, although they are also found on many medium 'Mechs. Their low heat and tonnage, combined with a large ammunition supply, make them a good weapon. However, they don't do enough damage to be used as a main weapon on larger 'Mechs. They are most often used with medium lasers.

Short-range Missile 4-Pack: SRM/4s are also found on light 'Mechs, but are more often found on medium 'Mechs as backup firepower. Like the SRM-2, the SRM-4 combines low heat and tonnage with the total amount of damage.

Short-range Missile 6-Pack: The SRM/6 is usually found as one of two main weapon systems on medium 'Mechs, and as a secondary weapon on heavy and assault 'Mechs. Like its lighter cousins, the SRM/6's heat and weight make it a good choice for almost any 'Mech.

"TINK. TINK. TINK"

Now that the basic principles of construction have been covered, we can use them to construct a sample 'Mech.

This 'Mech, called the Lucien, weighs 85 tons. Its main purpose is as a heavy combat 'Mech, but it also has a large number of defensive weapons for taking care of smaller threats.

First, the movement rate is decided. A rate of four is nice, but the fusion plant weighs 27 tons, the higher range of the 20 to 30 percent average as described above. A rate of three is used, and the fusion plant weighs 13 tons, only 15 percent of the 'Mech's total weight. Six tons are allocated to the cockpit and gyros, and eight-and-a-half tons are allocated to the internal structure.

The Lucien needs some heavy firepower, so PPCs and large lasers are considered. However, both require a large number of heat sinks to remain effective, so two AC/10s are used. Two tons of ammunition are allocated to each.

Since the AC/10s don't generate a lot of heat, other, similar systems are used. Two LRM/20s are used as extra long-range fire support, and two tons of ammunition are allocated to them. This takes care of the Lucien's heavy firepower.

An SRM/6 is used to act as heavy close-range fire support, while two medium lasers are added as support to it. One ton of ammunition is allocated to the SRM/6.

Since the Lucien needs a lot of close support weapons, preferably ones that don't generate heat, six machineguns are used, with one-half ton of ammunition.

The rest of the Lucien's weight (10 tons) is allocated to armor, giving the Lucien armor slightly lighter than that of other 'Mechs in its class. This brings the total weight to eighty-five tons.

As should be obvious from this article, the most important decision in 'Mech design is its function on the battlefield. Once this is decided, the rest of the design falls into place.

—Kevin Stein

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Larry Bond, the designer of *Harpoon*, served in the U.S. Navy in a variety of warfare billets. He is currently a naval analyst in Washington, D.C. He is co-author (with Tom Clancy) of *Red Storm Rising*, a novel of the Third World War. *Harpoon* is $20.00.

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