Science Fiction Roleplaying Game

TRAVELLER®
The New Era

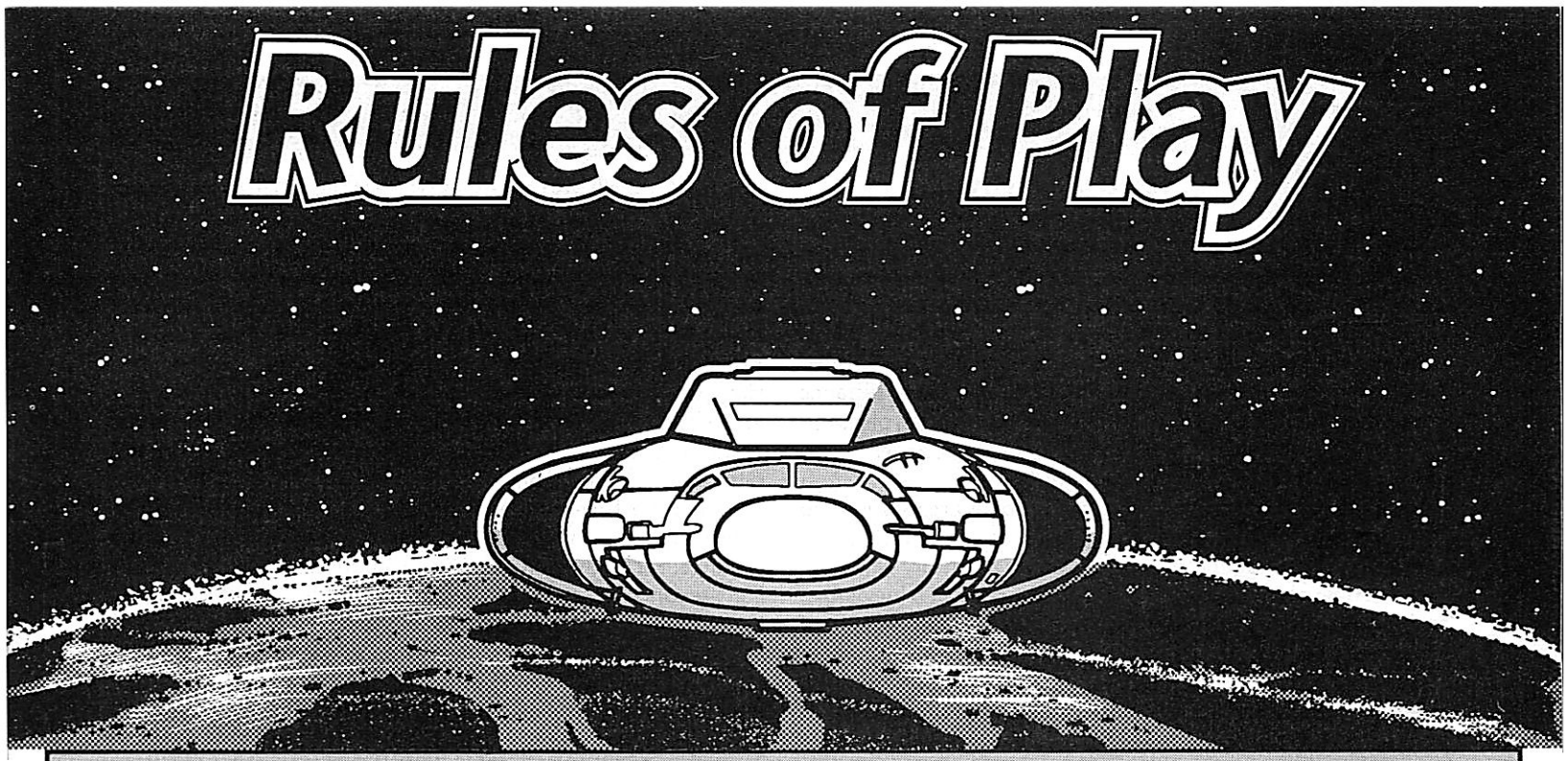
0303

BRILLIANT LANCES™

Traveller Starship Combat

GDW

Rules of Play



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BRILLIANT LANCES

INTRODUCTION

The universe of **Traveller** is known space several thousand years in the future. Humankind has explored and settled over 11,000 worlds, and inhabits a volume of space hundreds of parsecs across. On its journey to the stars, it met dozens of alien races. It befriended some, warred on others, and maintained an uneasy distance from others still. It turned the worlds it owned into safe, pleasant, technological wonderlands. Then, in less than a dozen years, greed and stupidity destroyed everything.

Now, 70 years later, small groups of humans are returning to the stars. The worlds they find, however, are much more dangerous places than they were less than a century earlier. In the uncertain environment of the New Era, conflict is inevitable, and the first place that conflict is joined is in the cold vacuum of space.

However, space is vast, and the distances which must be defended are so large that the passage of light itself is measured in seconds. At these distances, opposing ships are invisible to each other; an entire planet appears only the size of a thumbnail. In order to strike each other at these distances, warships are fitted with sensors and fire control which are accurate to tens of meters, a mere one-30 millionth of the range. Weapons that can take advantage of these precise measurements must travel as fast as physics allows: the speed of light. Many of these bolts will not strike home, so each one that does must hit hard. Like ancient jousting knights, the warships of the 57th century seek to score the crucial first hit that will put the enemy at a decisive disadvantage. To do this, they send powerful bolts of pure energy—relativistic particles and bundles of coherent photons—sizzling into the vast darkness. These bolts, silent but blindingly bright, strike the enemy hulls with mathematically perfect violence, piercing and rending them like brilliant lances.

COMPONENTS

Brilliant Lances contains two rules booklets, three 22"x31" maps, two sheets of die-cut cardboard game markers, two two-sided reference cards, a pad of forms to be used in the game, two six-sided dice, and a 20-sided die. Not included in **Brilliant Lances**, but necessary for play, are several pencils. Players may also find that a calculator is helpful.

Brilliant Lances is one of many games and supplementary products intended for use with the **Traveller: The New Era** science-fiction roleplaying game. However, it is also intended as a stand-alone space combat game, and can be played and enjoyed on its own by players who never intend to play any other **Traveller** product. At many points in the rules below, references are made to concepts detailed elsewhere in the **Traveller** line of materials. While familiarity with these other products may enhance the players' enjoyment of **Brilliant Lances**, none of these are necessary to understand or play this game. When referring to the **Traveller: The New Era** roleplaying game rulebook, the rules below will sometimes use the abbreviation "TNE."

Rules Booklets: These booklets include the 32-page *Rules of Play* booklet that you are reading at this moment, and a 48-page *Technical Booklet*. The *Rules of Play* booklet presents the rules necessary to play **Brilliant Lances**, as well as the scenarios with which the game is played.

The *Technical Booklet* contains rules that players can use to design their own starships. These are the same rules that were used to create the starship designs that are included with **Brilliant Lances**, and in other **Traveller: The New Era** products. Players of **Brilliant Lances** need not use or master these design rules. However, they will need the ship data profiles that are included in the back of the *Technical Booklet*. These data profiles present all of the ships used in **Brilliant Lances** with all of the statistics and ratings needed for play.

Maps: The three maps are all identical, and portray the vastness of open space within a hexagonal grid which is used to measure distance. Each hexagon measures 30,000 kilometers, or 1/10 of a light-second (the distance that light travels in 1/10 of a second). Note the way that the hexagonal pattern runs off of the map edges. These maps may be butted up to each other along their short or long edges to form a continuous hexagonal grid. Players may also order additional maps from GDW to create as large a playing area as desired.

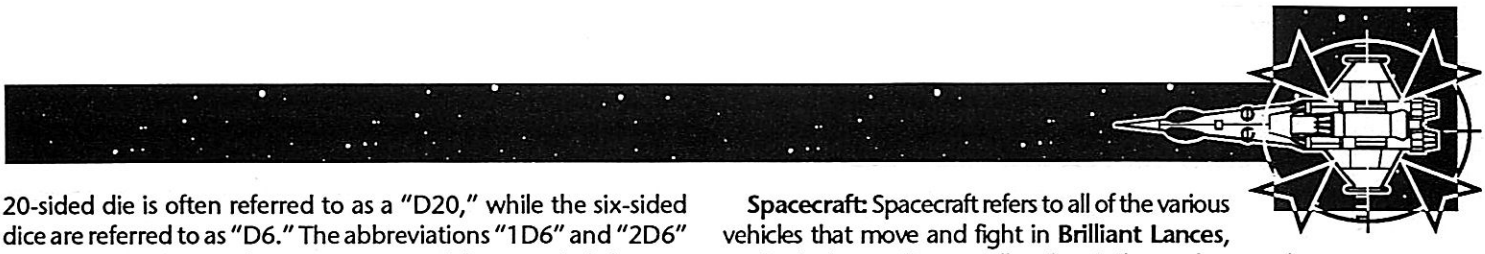
Counters: The two die-cut counter sheets provide a total of 183 cardboard pieces. Thirty of these are large, measuring 1 1/2 inches square, 21 measure 1 inch square, and the remaining 132 pieces measure 1/2 inch square. These pieces are used in two ways, as "counters" and "markers." A piece which represents a spacecraft, sensor drone, missile, planet, or other object in the game is called a "counter." A marker is a piece which is used to represent the status of certain systems (such as Velocity or Heading markers) or conditions on the map (such as Bogey, Active, and Target Lock markers).

Players who are familiar with wargames will notice that the spacecraft counters do not have any statistics or game values printed on them, only an ID number to help players in telling the counters apart. No values are printed on them because **Brilliant Lances** is intended to allow use with starship miniatures. RAFM is producing a line of official **Traveller: The New Era** starships which are intended for use with this game, but players are free to use any miniatures they like, or to simply use the counters provided if they do not wish to purchase miniatures. Either way, the statistics and combat values for each craft are recorded on separate data profiles and control panels. Players must simply note which playing piece in the board is assigned to which data sheets.

Control Panel Pad: The pad contains a number of copies of Spacecraft Control Panels and Spacecraft Log Sheets for use in the game, one on each side of each sheet. The Control Panels are used to each keep track of the operations and circumstances of an individual spacecraft. The Log Sheets are used to keep track of unmanned spacecraft such as missiles and sensor drones. Be sure to save at least one clean sheet in order to make additional copies. GDW grants permission for players to make photocopies of these sheets as needed to provide control panels and log sheets for playing **Brilliant Lances**.

Charts: Two cardstock charts are included, each printed on both sides. These are player aids cards printed with frequently used charts for quick reference. Some of these charts appear in the *Rules of Play* booklet, but keep these cards handy as you read the rules so you can refer to charts that appear only on the cards.

Dice: The three dice included in the game are used to resolve the success of various sensor and combat tasks in the game. The



20-sided die is often referred to as a "D20," while the six-sided dice are referred to as "D6." The abbreviations "1D6" and "2D6" are used to indicate when one or two of the six-sided dice are rolled to determine a result. When 2D6 are rolled, the results of the two dice are added together to yield a result from 2-12. In some cases the rules will refer to "1D10," which requires the use of the 20-sided die. When rolling the D20 for a D10 result, disregard the first (tens place) digit of the result for a result of 1-10. Thus 1 and 11 equal 1, 2 and 12 equal 2, up to 10 and 20 both yielding a result of 10.

GENERAL COURSE OF PLAY

Brilliant Lances is played in scenarios, each of which represents a hostile encounter between two or more spacecraft. A hostile encounter involves detecting the hostile vessel and maneuvering to intercept or avoid it. Combat involves pinpointing targets with fire control sensors, and performing successive attacks (such as missile fire, laser shots, or spinal meson fire) on the located targets.

Die rolls are made at each point in order to obtain sensor locks and hits; the likelihood of the die roll is established and modified by such considerations as range between the attacker and the target, the type of weapon used, the defensive abilities of the target spacecraft, and other factors. If a hit is obtained, the weapon must penetrate the target's screens and active defenses (such as laser fire destroying incoming missiles). The damage inflicted depends on the type of weapon.

The game continues until one side is vanquished, flees, surrenders, or is destroyed.

Definitions

The following terms are used repeatedly in the rules.

Game Turn: The game is played in turns. Each turn represents 30 minutes of elapsed time. Thus, two game turns equal one hour.

Within a single turn, each individual spacecraft is allowed opportunities to maneuver, detect, and attack. Each spacecraft may likewise be detected and attacked by one or more enemy spacecraft as they conduct their turns.

Hex: A hexagonal grid is superimposed over the map to regularize movement and placement of spacecraft. Distance between vessels (used to calculate sensor and weapon range) is measured in hexes, each of which represents an area of space 30,000 kilometers (one-tenth of a light-second) from hexside to hexside.

Velocity: The speed of a vessel or missile expressed in hexes per game turn. For reference purposes, a velocity of 1 hex per turn is equal to a speed of 60,000 kilometers per hour.

G-Turn: An acceleration of 1 G for one game turn (30 minutes). G-turns are cumulative; for example, 6 G-turns yields the same final velocity regardless whether it was generated by accelerating at 1G for six turns, or 6Gs for one turn. Two G-turns equal one G-hour.

Tasks: All combat activities use tasks. Each task involves rolling a die and comparing the result to a target number. If the roll is equal to or less than the target number, the task succeeds; if it is greater than the target number, the task fails. However, regardless of the target number, a roll of 1 always succeeds and a roll of 20 always fails. See the Task Resolution section below for more details.

Spacecraft: Spacecraft refers to all of the various vehicles that move and fight in **Brilliant Lances**, and includes starships, small craft, missiles, and sensor drones.

Starships: Starships are the most commonly used type of spacecraft. These are space vessels with interstellar jump drives that allow them to travel from star system to star system, much faster than light can travel the same distance.

Small Craft: Small craft are vessels that displace less than 100 tons, and have no jump drive, so cannot travel from star to star. They are limited to movement within a single star system unless they are carried by a starship. Many of the small craft in **Brilliant Lances** are carried and launched by starships.

Manned Craft: This term means a spacecraft that has a living crew (as opposed to missiles and unmanned drones) and refers to both starships and small craft.

Missiles: These are weapons fired from spacecraft that maneuver on the map like other spacecraft, but destroy themselves when attacking their targets.

Drones: These are vehicles that are controlled by an operator from another point, usually a starship. Unlike missiles, drones are not built to be used up with each mission, but are intended to be re-used. However, since they have no crew, they can be abandoned or placed at great risk if necessary.

TASK RESOLUTION

Every action attempted in **Brilliant Lances**, whether an evasive maneuver, attempting sensor lock, or firing a weapon, is a *task*. A task is an attempt by the crewmember operating a particular piece of equipment (maneuver controls, sensors, weapons, etc.) to use his or her skills and training to successfully accomplish the action. The success of these tasks is based upon the expertise of the crewmember who is making the attempt, where expertise is a combination of in-born aptitude coupled with accumulated experience and training. This expertise is called the crewmember's *asset* in that particular area.

Success: In order to succeed at a task, the player must make a 1D20 roll that is less than or equal to the crewmember's adjusted asset. The asset is adjusted for factors that increase or decrease the difficulty of the task, called *Difficulty Modifiers* (which will sometimes be abbreviated in charts and tables as "Diff Mods"). Each increase in difficulty level halves the asset, each decrease in difficulty doubles it. There are five levels of difficulty as shown in the Difficulty Levels and Asset Modifiers table, page 4.

Thus, if a crewmember with an asset of 12 is attempting a task, the player must roll a 48 or less if the task is Easy, 24 or less if Average, 12 or less if Difficult, 6 or less if Formidable, and 3 or less if Impossible. Note that Impossible is the name of a difficulty level, and does not mean that a task cannot be attempted.

Tasks can never be reduced to less than Easy. If a task is increased in difficulty above Impossible, it may not be attempted.

Automatic Failure and Success: Regardless of the difficulty level and asset of a task, a roll of 1 always succeeds, and a roll of 20 always fails.

Outstanding Success and Catastrophic Failure: Whenever the roll is 10 or more points lower than the number needed for success (for example, a 3 or less on a roll where 13 or less was needed), the attempt is considered an Outstanding Success. The effects of Outstanding Success are listed in the rules with each type of action. Not all actions have an

additional bonus for Outstanding Success; for these, a normal success is the best result that can be obtained, no matter what the die roll.

If a roll is 10 or more points greater than the number needed for success (for example, a roll of 18 or greater on a roll requiring an 8), there is a chance of Catastrophic Failure. To see if Catastrophic Failure has occurred, roll for the task a second time, at the same difficulty level. If this roll succeeds, there is no Catastrophic Failure, and the attempt is treated as a normal failure. But if this roll also fails (by even the normal amount, not just by 10 points or greater), the attempt has met with Catastrophic Failure.

As with Outstanding Success, these effects are listed with types of action, and not all actions have an additional penalty for Catastrophic Failure.

Assessing Difficulty: The rules below give specific details on the calculations of difficulty in each specific area. In most cases, however, the range at which a task is attempted yields a base difficulty level to which additional Difficulty Modifiers are applied, based on specific circumstances. Each sensor, communicator, and weapon in the game has its performance listed in hexes as short, medium, long, and extreme. Medium range is twice short, long is twice medium (i.e., four times short), and extreme is twice long (i.e., eight times short). Whenever there is only a single range figure listed with a weapon, that range is always its short range. Some tables may go so far as to list the separate short, medium, long, and extreme ranges of equipment—but even if this is not the case, these numbers are easy to compute.

The range at which a piece of equipment is being used modifies the chances of success of the equipment so that the longer the range, the more difficult the task. Difficulties at these ranges is given in the accompanying list.

Difficulty Level by Range

Range		*Difficulty*
Short		Average
Medium	(2×Short)	Difficult
Long	(4×Short)	Formidable
Extreme	(8×Short)	Impossible

Asset Areas and Crew Quality: In the **TNE** roleplaying game, each person (called a character) has many different assets in many different areas of expertise, and not every person will have expertise in a particular area. However, for the purposes of this starship combat game, crewmembers are all assumed to have the proper skills for their assigned roles (gunner, sensor officer, etc.).

Furthermore, rather than each crewmember having a different level of expertise in his or her assigned area, all crewmembers of a ship are treated as having the same expertise in their assigned role. This common level of expertise is called crew quality, and comes in one of four levels: Green, Trained, Line, and Crack. The accompanying table shows the asset that is used for all tasks attempted by the ship, and the success rolls required according to difficulty level. A parenthetical number followed by a "–" sign to the left of the target number indicates the number or less required for Outstanding Success. A parenthetical number followed by a "+" sign to the right of the target number indicates the number or greater that may result in a Catastrophic Failure. Note that the Automatic Failure concept is also incorporated into this table.

Difficulty Levels and Asset Modifiers

Easy	4×asset
Average	2×asset
Difficult	1×asset
Formidable	1/2×asset
Impossible	1/4×asset

Using the chart above, players simply look up the target numbers according to crew quality and difficulty level and roll the die. They never need to know the asset number of a crew, nor calculate the target number required for a certain difficulty level. Asset numbers are listed for completeness, and for integration with the **Traveller** roleplaying game.

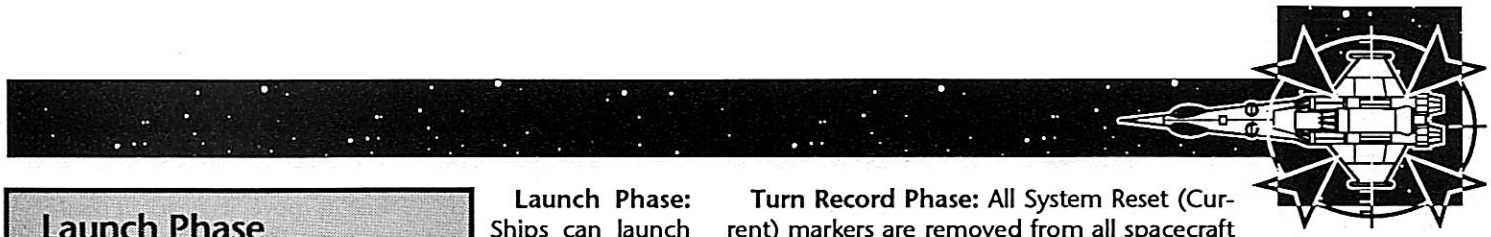
Integration with TNE: The Crew Quality rule does not require specification of particular assets, as crewmembers are presumed to have assets appropriate to their jobs. However, specific assets are sometimes listed parenthetically for use with PC crewmembers who do use their own assets. **Traveller** players will also note that the asset numbers of the four crew quality levels are the same as those of the four NPC experience levels (Novice, Experienced, Veteran, Elite) given in **TNE**, page 59, but the names are different. This is because NPC experience levels in **TNE** are defined as their prowess in ground combat, including their Initiative and damage given by unarmed combat attacks. Crew quality in **Brilliant Lances** does not equal prowess in ground combat; many members of a crack crew may in fact have low Initiative and skills in terms of ground combat. It is only their abilities in the technical areas of space combat that are rated by the crew quality classes below.

SEQUENCE OF PLAY

Each turn of play in **Brilliant Lances** is broken down into several sub-turns, called phases, to organize the number of activities that must be conducted each turn. Phases are always conducted in the same order. If, in a later phase, a player remembers something that he meant to do in an earlier phase, it is too late, as the decisions made in each phase affect the decisions in the phases that come later.

Crew Quality and Task Resolution Rolls

		Rolls				
Crew Quality	*Asset*	*Easy*	*Average*	*Difficult*	*Formidable*	*Impossible*
Green	9	(9–) 19	(8–) 18	9 (19+)	4 (14+)	2 (12+)
Trained	11	(9–) 19	(9–) 19	(1–) 11	5 (15+)	2 (12+)
Line	13	(9–) 19	(9–) 19	(3–) 13	6 (16+)	3 (13+)
Crack	15	(9–) 19	(9–) 19	(5–) 15	7 (17+)	3 (13+)



Launch Phase
Plotting Phase
Movement Phase
Sensor Phase
Fire Phase
Damage Control Phase
Turn Record Phase

Launch Phase: Ships can launch small craft that they are carrying, which includes missiles and sensor drones. Place a new marker in the hex they are launched in for each craft which has been launched.

The number of craft that can be launched in a Launch Phase depends on the launch facility type.

Normal Launch Facilities: Small craft which use normal launch facilities may be launched at the rate of one per launch phase per launch facility (unless specified otherwise on the ship data profile, each ship has one normal launch facility).

Launch Tubes: Small craft which are served by a launch tube are launched at the rate of 10 craft per Launch Phase per launch tube.

External Grapples: Small craft (including missiles) carried in external grapples may all be launched in one Launch Phase.

Missile Launchers: All missile launchers, including turrets, barbettes, and bays, may launch up to 10 missiles per Launch Phase.

All newly launched craft have the same vector as the vessel they were launched from.

Plotting Phase: All ships and craft, including those launched in the preceding Launch Phase, plot their maneuvers for the turn. As **Brilliant Lances** uses a realistic vector-based system, this consists of making maneuver "burns" to change the vector heading and velocity, which determines where each craft will move in the Movement Phase. This plotting is done in secret.

Movement Phase: All ships carry out the movement resulting from the vectors created in the Plotting Phase.

Sensor Phase: All players secretly determine the status of their active sensors for the phase, and make their announcements simultaneously. All craft which went active with their sensors have an Active marker placed in their hex. The players then make sensor lock attempts on as many units as there are on the map, including bogeys and already-revealed units. As sensor locks are obtained, Lock markers are placed in the locked craft's hex, indicating that it may be fired on by the craft which holds the lock.

Fire Phase: Missile detonation White Out markers from the previous turn are removed. Vessels may fire on enemy units for which they have a sensor lock. Target vessels may also use various defensive systems to avoid or lessen the effects of successful hits. As hits are obtained, damage is resolved against the target ship. Fire may be resolved in any order desired, as all fire and damage is considered to be simultaneous.

Damage Control Phase: Each craft which has damage control parties may attempt to limit or repair the damage resulting from the current or previous turns. Repairs which are successful are effective at the end of the phase.

For ships which do not have enough power to supply all of their systems (as a result of damage to the power plant), players use this phase to decide which systems will be powered down for the coming turn. Place a Powered Down marker on each such system. Ships which already have powered-down systems from the previous turn may re-allocate their power in this phase, changing the systems which are and are not receiving power.

Turn Record Phase: All System Reset (Current) markers are removed from all spacecraft control panels. Then all System Reset (Next) markers are flipped to their System Reset (Current) side to show that they will be removed in the Turn Record Phase of the coming turn.

Players who wish to keep track of the number of turns played should keep track of them on a piece of scratch paper during this phase. **Brilliant Lances** does not include a turn record track, as it is usually not important to know the number of elapsed turns.

PLOTTING AND MOVEMENT

Brilliant Lances uses a realistic system of vector movement, unlike many games, television programs, and movies, which use fanciful (and unrealistic) analogs of aerodynamic motion. Spacecraft move through space due to thrust and inertia. Once a spacecraft has expended thrust to move it in a certain direction, it will continue to coast in that direction forever, unless another force acts upon it, usually meaning until it expends thrust to change its course or speed. A spacecraft's course and speed are called its vector. On Earth, we rarely see pure examples of vectors, because moving objects are acted on by so many other forces such as friction with the ground or air, aerodynamic lift, and gravity. Our intuitive experience tells us that moving objects tend to slow down and stop, and that it's difficult to keep things moving. However, that is only true in the limited area of our planetary frame of reference. In fact, all objects are in motion and remain that way, coasting along at quite high speeds through empty space. Although it might initially seem strange to players who have not played vector games before, it is that reality which **Brilliant Lances** portrays.

Setting Up: Each manned craft has a control panel sheet and a set of control panel markers which are used to control and keep track of its movement. A set of control panel markers consists of six markers: a Velocity 0 marker, a Velocity 00 marker, a Heading Marker, a Facing marker, a Next Hex marker, and a Heading Change Accumulated G-Turns marker. **Brilliant Lances** contains eight such sets. Each set has its own number in the upper right corner to make it easier to sort out complete sets.

Vectors: A vector is a representation of directional movement. In the game, each ship's vector is represented by its velocity and its heading. Velocity is measured in hexes moved per turn, while heading is the vector's direction of movement with respect to the hex grid. Vessels may have any one of 12 headings, corresponding to the six hexsides and six hex vertices of the hex they currently occupy. Each map sheet has a compass rose printed in the corner which shows the 12 different headings, numbered 1-12. When assembling the maps, make sure they are butted together so that all of the compass roses are oriented in the same direction.

Each spacecraft's current vector is recorded with markers on the craft's control panel. The scenario instructions will tell the players how to determine starting velocities and headings for each spacecraft in the scenario (craft which are launched from larger vessels assume the same vector as the launching vessel). Place one or more Velocity markers in the correct box(es) of the velocity scale and a Heading marker in the correct box of the heading display. For example, if the scenario instructions state that a starship has a heading of 2 and a velocity of 14, the player would place the Heading marker in the 2 box of the heading display, the Velocity 00 marker in the 1 box of the Velocity/Accumulated Gs Track, and

the Velocity 0 marker in the 4 box of the Velocity/ Accumulated Gs Track.

Because players will be sitting around a table with their control panels oriented in different directions, they must remain aware that the heading display on every control panel (labeled 1-12) is oriented according to the compass rose on the maps, not according to the direction that the control panel is laid out.

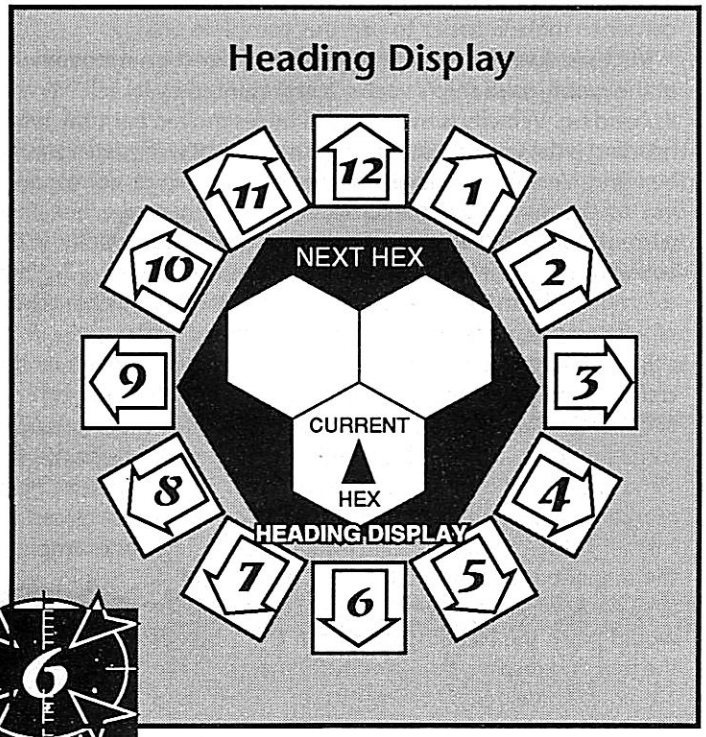
Heading vs. Facing: A craft's *heading* is the direction of its current vector, i.e., the direction it is moving. A craft's *facing* is the direction that the craft's nose is currently pointed. Because a ship can coast through space with its nose pointed in a direction completely different from its direction of motion, or *heading*, its heading and facing need not always be the same direction. However, under certain conditions, such as when thrusting, a craft's facing and heading will be closely related to each other. See the Facing rules on page 16 for more information.

Movement: In each game turn, each spacecraft will move hexes equal to its current velocity in the direction of its current heading. In reality, there are an infinite number of vectors which, for simplicity, **Brilliant Lances** has abstracted into 12.

If the heading direction is a hexside, the craft moves directly down the hexrow.

If the heading is a hex vertex, the ship will move alternately from side to side down the line of the hex vertex. If a ship retains a hex vertex heading from one turn to the next, it can be easy to forget which side of the vertex (left or right) is the next hex to move into. At the center of the heading display is the next hex reminder diagram, showing three adjacent hexes, one of which shows a starship aimed at the common hexside shared by the other two hexes. Use the Next Hex marker to show which hex the ship will enter on its next move. As soon as it finishes its move, alternating along either side of the hexside, place the Next Hex marker in the correct hex to show which will be its first hex when it resumes moving the next turn (assuming that it does not change the direction of its vector, of course).

In the example on the facing page, the starship has a heading of 5 and a velocity of 3. Before its move, its heading display and next hex reminder are as seen on the left. After orienting the starship's heading of 5 with the compass rose as shown on the map fragment, the next hex reminder shows that the ship moves first to the right. The ship then moves its three hexes, alternating left and right across its hex vertex facing. At the end of its move the player notes that, following the alternating pattern, the next hex to be entered is to the left, and so moves the Next Hex marker as seen on the heading display on the right.



Note that in this example, the starship's counter was oriented so that its facing was the same as its heading. This did not need to be the case; so long as the starship is coasting (not expending thrust burns), it can be facing in any direction the player desires.

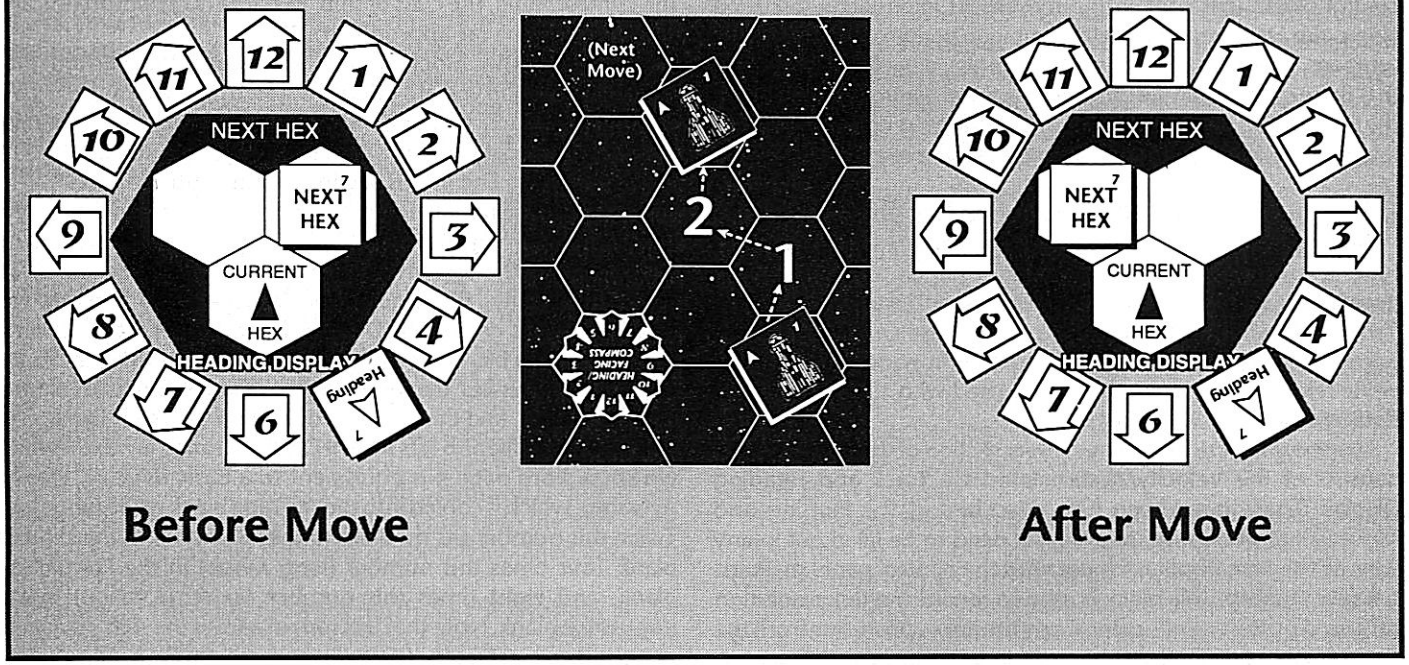
Maneuver: As described above, movement consists of carrying out the vector that is recorded on the heading display. In maneuvering, players use their ships' maneuver drives to change the velocity or direction of the current vector. The new vector is then carried out in the Movement Phase. Any ship that does not use its maneuver drive to change its vector during the Plotting Phase simply continues to execute the same already existing vector each and every Movement Phase until it is acted on by an outside force (such as the gravity of a large body), or until time as we know it comes to an end.

During the Plotting Phase of each turn, all players make decisions concerning the movement of their vessels for the coming Movement Phase. Each vessel maneuvers by firing its maneuver drive thrusters to change its velocity or heading. The power of a craft's thrusters is expressed in G-turns of thrust (each of which represents the force of 1 G acting for a period of 30 minutes, or 1 game turn). Each vessel may spend G-turns up to its G rating on maneuver (to change its vector), evasion (to thwart potential incoming fire), or a combination of the two. The total number of G-turns spent on maneuver and evasion cannot exceed the vessel's G rating. (Note also that a craft spending G-turns for evasion may not have an extended folding sensor array—see "Sensor Lock Procedure," page 12.) Each craft's G rating is listed on its data profile under the heading "Maneuver Gs."

The effects of evasion are explained in the Sensor Lock and Fire Combat rules below. The roll for evasion success is made during the Plotting Phase and is in effect for the rest of the turn. G-turns spent on maneuver may be used to change the craft's vector, by either changing its velocity or its heading. Each G-turn of thrust must be allocated to either velocity or heading change, and cannot be used for both. However, a vessel with a maneuver rating of more than 1 may spend some of its G-turns of thrust on a velocity change and the remainder on a heading change.

Velocity Change: Each G-turn of thrust spent by a ship changes its current velocity by 1. The velocity may be either increased or decreased. As G-turns of thrust are spent, the players must declare whether they are going to increase (accelerate) or decrease (decelerate) the velocity. A small craft with a current velocity of 6 and a G rating of 4 could spend its G-turns to increase its velocity to 10 or decrease it to 2.

Heading Change: The thrust required to change heading is a function of the velocity of the craft. 1/2 G-turn of thrust is required per hex of spacecraft velocity to make a heading change of one position to the port (left) or starboard (right). For example, a ship with a velocity of 6 would require 3 G-turns of thrust per heading change made. If its current heading were 12 and it wanted to change to a heading of 1, it would have to expend 3 G-turns of Starboard thrust.



G-turns may not be spent fractionally. In other words, a ship with a velocity of 3 that was changing its heading by 1 would only require 1 1/2 G-turns to do so. However, the ship would have to spend 2 G-turns to acheive those 1 1/2 G-turns. The left-over 1/2 G-turn could not be counted on the Accumulated G-Turns Track (see below), nor could it be used for evasion. It is simply lost. Note that this same ship, if its G rating were high enough, could spend 3 G-turns to change its heading by 2 all in one turn, and this way would not lose any excess thrust.

Accumulated Thrust: Thrust may be spread over several turns. In other words, a ship may spend 1 G-turn of thrust one turn and another G-turn the next turn. G-turns spent which are not sufficient to achieve an immediate heading change are recorded by placing the Heading Change Accumulated G-Turns marker on the Velocity/Accumulated G-Turns track of the control panel. This marker has a Port arrow on one side to show G-turns spent to change heading to port (counterclockwise—e.g., from 12 to 11 or 4 to 3) and a starboard arrow on the other to show accumulated G-Turns to change the heading to starboard (clockwise—e.g., from 12 to 1 or 7 to 8). As soon as sufficient additional G-turns are added to bring about a heading change, the Heading marker is moved one position in the appropriate direction and accumulated G-turns are reduced to 0. Additional heading change G-turns spent beyond this point are accumulated on the track normally until they reach the point at which they are converted to a heading change, and so on.

For example, a ship with a velocity of 5 and a heading of 8 burns 6 G-turns for a starboard heading change. The first 5 G-turns are sufficient for two heading changes (2 1/2 Gs per heading change at a speed of 5), and the sixth is insufficient for a full heading change. So the ships control panel is adjusted to show a new heading of 10, with one starboard accumulated G-turn on the Velocity/Accumulated G-Turns Track.

A ship which already has an Accumulated G-Turns marker on its Accumulated G-Turns Track must first reduce that marker to 0 before accumulating acceleration for a heading change in the opposite direction. This would mean spending G-turns in the opposite direction to cancel out those already accumulated. For example, if there were already 4 starboard G-turns on a craft's Accumulated G-Turns Track, and the craft now wanted to change its heading to port, it would first have to spend 4 G-turns accelerating to port to counteract the accumulated starboard G-turns before any accumulated G-turns to port would be shown on the Accumulated G-Turns Track.

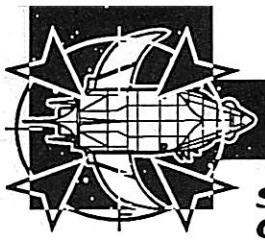
As mentioned above, 1/2 G-turns may never be accumulated on the Accumulated G-Turns track.

Vector Adjustment: Although the thrust decided on in the Plotting Phase is actually applied throughout the entire turn, for simplicity, **Brilliant Lances** treats these changes as taking place immediately. All G-turns spent on velocity change are applied immediately, as are any G-turns sufficient to cause a heading change. Thus these changes are reflected in the movement of the immediately following Movement Phase.

G-turns spent on heading changes that are not sufficient to change the heading this turn are simply recorded on the Accumulated G-Turns Track and do not affect the current turn's movement.

Fuel Use: The control panel lists the amount of fuel used per G-turn (see page 9). Each time G-turns are spent for any purpose, record the fuel use on the "Fuel Use" blank.

Secrecy: The vector adjustments of the Plotting Phase are made in secret so that players cannot adjust their movement to take advantage of another player's plans.



SPACECRAFT CONTROL PANELS AND MOVEMENT LOGS

Most of the remainder of the rules deal with the many issues related to combat: fire control solutions, weapons firing, hit locations, damage description, damage control, etc. The same control panels that contain the movement information discussed above also have areas that detail the range performance of sensors, weapons, defensive systems, and electronics, as well as the damage that these systems can sustain. Because these control panels contain the information that will be used in the following combat rules, it is important to look at the control panels before proceeding further.

Filling out the Spacecraft Control Panels

Each manned craft used in a **Brilliant Lances** scenario should have a control panel filled out. These panels are filled out in accordance with the ship data profiles presented at the end of the *Technical Booklet* and the following rules. There is a sample control panel for a *Gazelle*-class starship printed on page 10 to consult while reading these rules. It is to be used with the *Gazelle*-class data profile in the *Technical Booklet*.

Maneuver Section: The maneuver section of the control panel consists of the Velocity/Accumulated Gs Track and Heading Display. These have been fully described in the Plotting and Movement rules above, and do not need to be filled out in any way, as they are displays for use with the control panel markers.

Crew Quality: This block is used to record the task resolution rolls used by the vessel's crew. Copy the appropriate line from the Crew Quality and Task Resolution Rolls table on page 4. The crew quality of each craft is listed in the scenario instructions, or is decided by the referee or players in home-made scenarios. The control panel contains no column for the asset number, and abbreviates the names of the difficulty levels. Note also that the control panel also lists the ranges at which these difficulty levels apply, in accordance with the Difficulty Level by Range table on page 4.

Constant Difficulty Modifiers vs. Detection and Fire: As will be discussed in more detail under the Sensor Locks rule (page 11), the chance of detecting and hitting a ship varies with its signature, which is based on size and other details. This chart, unique to each ship, is broken down into five categories: signature versus radar (an active sensor), versus active electromagnetic sensors (active EMS, a more advanced radar-type system; this signature is also used versus ladar), versus high-resolution thermal sensors (HRT, a passive sensor), versus passive EMS (a more advanced HRT-type system), and versus enemy fire. For a more detailed discussion of the four sensors, see the Sensor Locks rule.

This chart records two permanent components of this signature, the craft's size, and the effectiveness of its electromagnetic masking (EMM) system, if it has one. To fill this section out, first find the craft's target size on its data profile and consult the Difficulty Modifiers by Target Size chart at right.

Write this number in all five blanks on the "Target Size" line. Note that the Diff Mods are identical versus both sensors and fire, except in the case of Sub-Micro targets.

For ships noted as being equipped with EMM, the four blanks of the EMM line are filled out +2, +1, +2, and +1 from left to right. Note that the column for signature versus fire is already filled out "N/A" for the EMM line. If the craft has no listed EMM system, put a dash, "–", in the blank.

Once the Target Size and EMM blanks are filled in, add the target size and EMM Difficulty Modifiers to get the total modifier which is recorded on the bottom line. For example, a –1 target size modifier and a +1 EMM modifier make a total modifier of 0.

Identification Block: This block is used to record the ID number of the counter or starship miniature that corresponds to the control panel, the class of ship, its name (as appropriate), and its player's name (as appropriate).

Weapons: This block is used to record the performance parameters of the vessel's offensive systems, as well as their state of damage. Each weapon listed in the Offensive Armament section of the data profile and each master fire director (MFD) receives its own line in this section of the control panel.

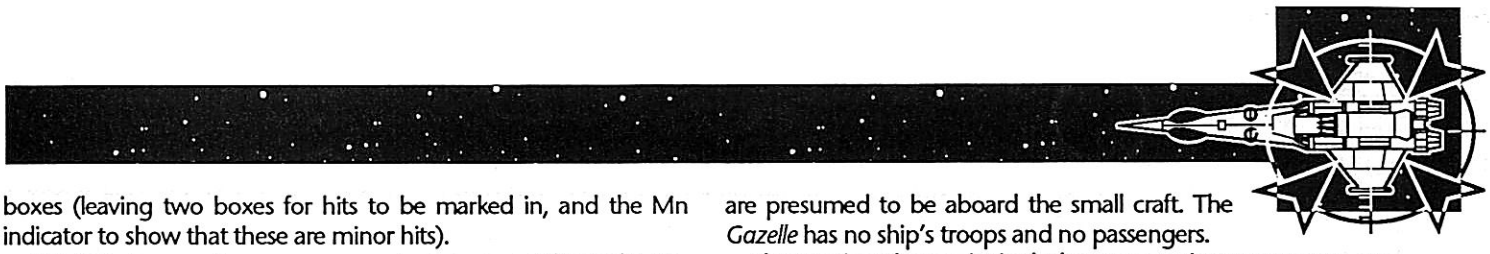
Each MFD line has blanks for the number of Diff Mods ignored, the number of megawatts (MW) of power needed by the system, the ranges of the system (broken down by task difficulty), its missile capability, the amount of damage it ats antenna can sustain, and its crew. The Diff Mod and power information is copied into the blanks from the data profile. If the MFD is capable of controlling missiles, the short range in hexes of its missile communicators is listed, and this range is copied into the "Msl" blank.

The data profile also lists the MFD's short range in hexes (which we know from page 4 is equivalent to a basic difficulty level of Average), which is copied into the Average blank of the range line. Twice this number (its medium range) is written in the Difficult blank, four times this number (long range) in the Formidable blank, and eight times this number (extreme range) in the Impossible blank. Note that this format allows the ship's player to get the basic difficulty level direct from the range in hexes, without having to translate range to difficulty level.

The damage portion consists of a number of hit boxes that can be crossed out to indicate advancing damage, plus the alternative indicators MJ (major) and Mn (minor) to show the type of hits that are being marked. In order to fill out this section, consult the Damage Tables portion of the data profile sheet, on the far right, under "Systems." Here each system is listed with the number of major or minor damage results that it can sustain. Major damage results are listed in the format "NH" where N is the number of major hits that are required to destroy the system, or "(Nh)" where N is the number of minor damage results required to destroy the system. Any system installed in a ship that is not listed separately on the table comes under the "All Others" heading and thus absorbs 1 minor hit. Cross off the MJ or Mn notation so that the appropriate hit type remains, and line out any additional hit boxes beyond those that the system can contain. Thus, a system that was listed as "3H" would be marked by crossing off the Mn notation and two of the hit boxes (leaving three boxes and the MJ notation), and a system that was listed as "(2h)" would be marked by crossing off the MJ indicator and three of the

Difficulty Modifiers by Target Size

Target Size	*Displacement Tons*	*Diff Mods vs. Sensors*	*Diff Mods vs. Fire*
SM (Sub-Micro)	less than 1	+2	+1
MC (Micro)	1-9	+1	+1
VS (Very Small)	10-99	—	—
S (Small)	100-999	–1	–1
M (Medium)	1000-9999	–2	–2
L (Large)	10,000-99,999	–3	–3
VL (Very Large)	100,000-999,999	–4	–4
G (Gigantic)	1,000,000+	–5	–5



boxes (leaving two boxes for hits to be marked in, and the Mn indicator to show that these are minor hits).

All MFDs have only one crewmember, so no additional notations need be made.

Thus, on the sample control panel, we have recorded an MFD that ignores 5 Diff Mods, consumes 1.62 MW, has a short range of 10 hexes, absorbs 4 minor hits before being destroyed, has an antenna that can take 1 minor hit, and has one crew. It is not missile-capable.

Offensive Weapons are filled out in basically the same manner with the following exceptions. Each weapon line has a blank which is used to write in a description of the weapon, and two blanks beneath, one for the hit location which the weapon occupies (see the Facing rules, page 16), and one for the weapon's arc of fire (also see Facing, except that missile launchers have no arcs of fire; fill in this blank with the number of ready missiles). Both of these are listed with each weapon, along with its power consumption and crew size, which may be a number other than 1 (including 0). The weapon's range is given for all four range bands (for each band, the range in hexes is the number to the left of the colon), which are simply copied into the Average, Difficult, Formidable, and Impossible blanks. Some weapons are given additional power to increase their hit chances. These are shown on the data profile by following the power MW with a slash and a –1 or –2 (e.g., "21/–1" or "42/–2"). Copy this notation as is onto the MW blank.

Unused lines may be left blank or completely lined out, at the player's preference.

Defenses: These are filled out much like the weapons section, with certain exceptions. Each defensive system receives one line, and has space for a description of the system, its hit location, arc of fire, power consumption, damage, and crew, as described under Weapons above. In addition, each defensive system must have its tech level (TL) copied from the data profile sheet into the blank provided. If the system is a sandcaster, it must have its Reduction per Hit (Reduc/Hit) copied into the blank provided, as well as the number of sand cannisters carried (Cann). The "Cann Used" blank is not filled out right away, but is used to record the number of sandcaster cannisters used in combat.

If the system is a nuclear damper, it must have its "CV÷" number copied from the data profile into the appropriate blank. Meson screens have their PV value written in the PV blank. Black globes use the PV blank to record their maximum flicker value. Only sandcasters need to fill out the Arc of Fire blank. Other defenses do not use arcs of fire. Meson screens, nuclear dampers, and black globes do not fill out the Reduc/Hit or Cann blanks.

Unused lines may be left blank or completely lined out, at the player's preference.

Crew: Each box in the crew section indicates one crewmember. These numbers are obtained from the crew line under Accommodations on the data profile. Line out all boxes above the correct number of crew for each line. Bridge crew includes all of the Electronics, Maneuver, and Command crew. Engineering crew is one half (round fractions up) of the listed Engineering crew, and Damage Control Parties are the remaining engineering personnel plus all Maintenance personnel. Ship's Troops are listed if present, as are other types of crew (such as stewards) and passengers if applicable.

On our sample control panel, the *Gazelle* has seven bridge crew (1 Electronics + 2 Maneuver + 3 Command—note that the 1 MFD crew is tracked with the MFD, although he/she may be hit on Bridge Crew hits), four engineering crew (7÷2=3.5 rounded up to 4), and four damage control crew (the rest of the 7 engineers plus the one maintenance crew). The three small craft crew are not listed as they are presumed to be aboard the small craft. The *Gazelle* has no ship's troops and no passengers.

Electronics: Electronics includes communicators, sensors, computers, and ECM gear. These are filled out as discussed under Weapons, above, with the following differences.

Communicators and sensors each have two components—the internal control system for the system, and the external sensor. Each of these has its damage listed separately. In most cases, both of these will sustain only 1 minor hit. In a few cases, a communicator will have its short range listed as "∞", which means that its range is infinity for purposes of the **Brilliant Lances** scale. Write "∞" in each of the four difficulty blanks, which means that the basic task difficulty is Easy at these ranges (subject to a "Degraded Performance" damage result, see the Damage rules, below, and environmental Diff Mods, see the Communicator rules).

Some sensors are noted on the data profile sheet as being folding arrays. For each such sensor, place a check mark or "x" in the box marked "folding."

Computers only take 1 minor hit each, so only need to have their type written into the blank provided.

Ships with electromagnetic masking systems mark the hits for the EMM radiators, marked EMMR on the damage tables, as well as the EMM controls.

Target Locks Box: This is not filled out, but is used during play.

Quarters: As indicated on the craft's damage table, each large stateroom takes 1H, and each small stateroom takes (2h). The lines for large and small staterooms are already permanently marked to show major and minor hits for that reason. Line out all excess boxes. The power listing is per individual stateroom or low berth, not the total.

Ships with a specialized sick bay have this noted in the Accommodations section.

Emergency Life Support does not have a power requirement. The Grav Compensator includes a blank to show the maximum Gs compensated.

Hold: These are filled out according to the above guidelines.

Cargo space may not always be filled. The parenthetical blank is used to indicated total cargo space, while the blank "Tons of Cargo" is used to show the amount currently carried. This will vary from scenario to scenario. In most cases, simplicity dictates that cargo will absorb damage at the rate of 1 *damage point* (not hit, see Damage, below) per cubic meter.

Likewise, ships may start with partially empty fuel tanks, with the beginning fuel indicated in the "Starting Fuel, "m^3" blank. Fuel Losses and use are recorded during play. The fuel use per G-turn expended is listed on the G-Hours line of the data profile.

Engineering: In addition to the guidelines already discussed, engineering systems must be rated in two other areas. For the Power Plant, enter its total output in MW in the left-hand blank, then divide this number by the number of hits it can sustain, rounding fractions up. The result is the number of MW of power output lost per hit, which is written into the right-hand blank.

For the Maneuver Drive, copy the MW of power required per G of rated performance from the Maneuver Gs line of the data profile. Then multiply this number by each allowed G rating of performance to show the amount of power needed for each level.

"Other" systems include such things as auxiliary power plants, spare jump drives, etc.

Internal Armor: If a system is noted on the data profile as having internal armor, draw a box around that system on the control panel and note its armor value next to it.

Velocity/ Accumulated Gs Track: | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

Crew Quality and Target Numbers

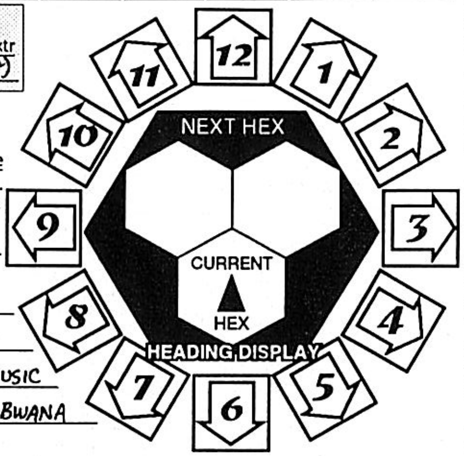
Quality	Easy	Ave/Short	Diff/Med	Form/Long	Imp/Extr
LINE	(9-) 19	(9-) 19	(3-) 13	6(16+)	3(13+)

Constant Diff Mods vs. Detection and Fire

	Vs. Active Radar	Vs. Active Act. EMS	Vs. Passive HRT	Vs. Passive Pass. EMS	Fire
Target Size	-1	-1	-1	-1	-1
EMM	+2	+1	+2	+1	N/A
Total	+1	0	+1	0	-1

BRILLIANT LANCES™
Traveller® Starship Combat
Spacecraft Control Panel

Identification # 001
Class: GAZELLE
Name: U.S.S. ROXY MUSIC
Player: COMMODORE BWANA



Weapons

□ Master Fire Director — Ranges: Ave (10) Diff (20) Form (40) Imp (80)
Ignore 5 Diff Mods Msl — 1.62 MW [redacted]/Mn □□□□[redacted] Crew □ Ant: [redacted]/Mn □[redacted]

□ Master Fire Director — Ranges: Ave (__) Diff (__) Form (__) Imp (__)
Ignore ___ Diff Mods Msl ___ ___ MW MJ/Mn □□□□□ Crew □ Ant: MJ/Mn □□□□□

□ Master Fire Director — Ranges: Ave (__) Diff (__) Form (__) Imp (__)
Ignore ___ Diff Mods Msl ___ ___ MW MJ/Mn □□□□□ Crew □ Ant: MJ/Mn □□□□□

□ Master Fire Director — Ranges: Ave (__) Diff (__) Form (__) Imp (__)
Ignore ___ Diff Mods Msl ___ ___ MW MJ/Mn □□□□□ Crew □ Ant: MJ/Mn □□□□□

□ (300 MJ Laser Barb) — Ranges: Ave (10) Diff (20) Form (40) Imp (80)
Loc: 10 Arc/[redacted]: 1,2,3 8.3 MW MJ/[redacted] □□[redacted] Crew □[redacted]

□ (300 MJ Laser Barb) — Ranges: Ave (10) Diff (20) Form (40) Imp (80)
Loc: 11 Arc/[redacted]: 1,2,3 8.3 MW MJ/[redacted] □□[redacted] Crew □[redacted]

□ (150 MJ Laser Turr) — Ranges: Ave (2) Diff (4) Form (8) Imp (16)
Loc: 16 Arc/[redacted]: All 4.2 MW MJ/[redacted] □[redacted] Crew □[redacted]

□ (150 MJ Laser Turr) — Ranges: Ave (2) Diff (4) Form (8) Imp (16)
Loc: 17 Arc/[redacted]: All 4.2 MW MJ/[redacted] □[redacted] Crew □[redacted]

□ (__________) — Ranges: Ave (__) Diff (__) Form (__) Imp (__)
Loc: ___ Arc/Msls: ___ ___ MW MJ/Mn □□□□□ Crew □□□□□ □□□□□

□ (__________) — Ranges: Ave (__) Diff (__) Form (__) Imp (__)
Loc: ___ Arc/Msls: ___ ___ MW MJ/Mn □□□□□ Crew □□□□□ □□□□□

□ (__________) — Ranges: Ave (__) Diff (__) Form (__) Imp (__)
Loc: ___ Arc/Msls: ___ ___ MW MJ/Mn □□□□□ Crew □□□□□ □□□□□

□ (__________) — Ranges: Ave (__) Diff (__) Form (__) Imp (__)
Loc: ___ Arc/Msls: ___ ___ MW MJ/Mn □□□□□ Crew □□□□□ □□□□□

□ (__________) — Ranges: Ave (__) Diff (__) Form (__) Imp (__)
Loc: ___ Arc/Msls: ___ ___ MW MJ/Mn □□□□□ Crew □□□□□ □□□□□

□ (__________) — Ranges: Ave (__) Diff (__) Form (__) Imp (__)
Loc: ___ Arc/Msls: ___ ___ MW MJ/Mn □□□□□ Crew □□□□□ □□□□□

Defenses

□ (__________) TL ___ Reduc/Hit ___ CV+ ___ PV ___ Cann ___
Loc: ___ Arc: ___ ___ MW MJ/Mn □□□□□ Crew □ Cann used ___

□ (__________) TL ___ Reduc/Hit ___ CV+ ___ PV ___ Cann ___
Loc: ___ Arc: ___ ___ MW MJ/Mn □□□□□ Crew □ Cann used ___

□ (__________) TL ___ Reduc/Hit ___ CV+ ___ PV ___ Cann ___
Loc: ___ Arc: ___ ___ MW MJ/Mn □□□□□ Crew □ Cann used ___

□ (__________) TL ___ Reduc/Hit ___ CV+ ___ PV ___ Cann ___
Loc: ___ Arc: ___ ___ MW MJ/Mn □□□□□ Crew □ Cann used ___

Target Locks

Crew

Bridge Crew □□□□□ □[redacted]
Engineering Crew □□□[redacted]
Damage Control Parties □□□□[redacted]
Ship's Troops □□□□□ □□□□□ □□□□□ □□□□□ □□□□□ □□□□□
Other Crew (Boat Crew) □□□[redacted]
Passengers □□□□□ □□□□□ □□□□□ □□□□□ □□□□□ □□□□□

Electronics

□ Commo (300K Radio) 10 MW — Ranges: Ave (10) Diff (20) Form (40) Imp (80)
Ant: [redacted]/Mn □[redacted] Cntrl: [redacted]/Mn □[redacted]

□ Commo (1000AU Maser) 0.6 MW — Ranges: Ave (∞) Diff (∞) Form (∞) Imp (∞)
Ant: [redacted]/Mn □[redacted] Cntrl: [redacted]/Mn □[redacted]

□ Commo (__________) ___ MW — Ranges: Ave (__) Diff (__) Form (__) Imp (__)
Ant: MJ/Mn □□□□□ Cntrl: MJ/Mn □□□□□

□ Commo (__________) ___ MW — Ranges: Ave (__) Diff (__) Form (__) Imp (__)
Ant: MJ/Mn □□□□□ Cntrl: MJ/Mn □□□□□

□ Commo (__________) ___ MW — Ranges: Ave (__) Diff (__) Form (__) Imp (__)
Ant: MJ/Mn □□□□□ Cntrl: MJ/Mn □□□□□

□ Sensor (150K PEMS) Folding ☒ 0.15 MW — Ranges: Ave (5) Diff (10) Form (20) Imp (40)
Ant: [redacted]/Mn □[redacted] Cntrl: [redacted]/Mn □[redacted]

□ Sensor (300K AEMS) Folding □ 15 MW — Ranges: Ave (10) Diff (20) Form (40) Imp (80)
Ant: [redacted]/Mn □[redacted] Cntrl: [redacted]/Mn □[redacted]

□ Sensor (__________) Folding □ ___ MW — Ranges: Ave (__) Diff (__) Form (__) Imp (__)
Ant: MJ/Mn □□□□□ Cntrl: MJ/Mn □□□□□

□ Sensor (__________) Folding □ ___ MW — Ranges: Ave (__) Diff (__) Form (__) Imp (__)
Ant: MJ/Mn □□□□□ Cntrl: MJ/Mn □□□□□

□ Sensor (__________) Folding □ ___ MW — Ranges: Ave (__) Diff (__) Form (__) Imp (__)
Ant: MJ/Mn □□□□□ Cntrl: MJ/Mn □□□□□

□ Sensor (__________) Folding □ ___ MW — Ranges: Ave (__) Diff (__) Form (__) Imp (__)
Ant: MJ/Mn □□□□□ Cntrl: MJ/Mn □□□□□

Computer (TL-14 Fb) 1 MW Mn □ — Computer (__________) ___ MW Mn □
Computer (TL-14 Fb) 1 MW Mn □ — Computer (__________) ___ MW Mn □
Computer (TL-14 Fb) 1 MW Mn □ — Computer (__________) ___ MW Mn □

□ ECM (EMS Jammer) 30 MW — Ranges: Ave (10) Diff (20) Form (40) Imp (80)
Ant: [redacted]/Mn □[redacted] Cntrl: [redacted]/Mn □[redacted]

□ ECM (__________) ___ MW — Ranges: Ave (__) Diff (__) Form (__) Imp (__)
Ant: MJ/Mn □□□□□ Cntrl: MJ/Mn □□□□□

Electromagnetic Masking 5.6 MW Rad: [redacted]/Mn □□□□□ Cntrl: MJ/[redacted] □[redacted]

Quarters

Large Staterooms .008 MW MJ □□□□□ □□□[redacted]
Small Staterooms .001 MW Mn □□□[redacted]
Low Berths ___ MW Mn □□□□□ □□□□□ □□□□□ □□□□□ □□□□□ □□□□□ □□□□□ □□□□□

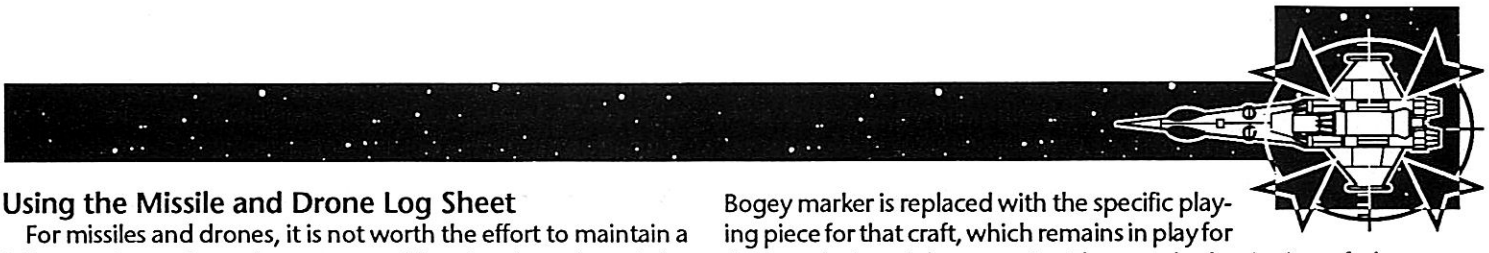
Hold

Lab ___ MW MJ/Mn □□□□□
Hangar (Ext Grapple) MJ/[redacted] □[redacted]
Machine Shop ___ MW MJ/Mn □□□□□
Electronics Shop ___ MW MJ/Mn □□□□□
Cargo (10.8 m³) Tons of Cargo 10.8 Dam. pts. per ton 1 Damage ___
Fuel Tankage (2800 m³) Starting Fuel, m³ 2800 Fuel Losses ___
Fuel per G-Turn 18.75m³ Fuel Use ___

Sick Bay ___ MW MJ/Mn □□□□□
□ Life Support 0.784 MW MJ/[redacted] □□□□□
□ Emergency Life Support ___ MW MJ/[redacted] □□[redacted]
□ Grav Compensator 5 G 19.6 MW MJ/[redacted] □[redacted]

Engineering

□ Jump Drive MJ/[redacted] □□□□□ □□[redacted]
□ Power Plant (891 MW 99 MW ea) MJ/[redacted] □□□□□ □□□□[redacted]
□ Maneuver Drive (200 MW/G) MJ/[redacted] □[redacted] 6G — 5G — 4G — 3G 600 2G 400 1G 200
□ Contra-Gravity 40 MW MJ/[redacted] □[redacted]
□ Fuel Purification Plant 7.6 MW MJ/[redacted] □□□□□ □□□[redacted]
□ Other (__________) ___ MW MJ/Mn □□□□□ □□□□□ □□□□□ □□□□□ □□□□□ □□□□□
□ Other (__________) ___ MW MJ/Mn □□□□□ □□□□□ □□□□□ □□□□□ □□□□□ □□□□□



Using the Missile and Drone Log Sheet

For missiles and drones, it is not worth the effort to maintain a full control panel, so they use an abbreviated version of the normal movement rules. Rather than having a control panel and heading display, these unmanned craft simply have their new vector information for the turn noted on the Missile and Drone Log sheet during the Plotting Phase.

Plotting and Movement: Each missile or drone that is brought into play (either at the beginning of the scenario or by launch during play) is assigned a line on the log sheet, where its description and identification number are written in the ID block. Its five signature Difficulty Modifiers are copied into the signatures box provided from the data given on the Missiles Characteristics table (in the *Technical Booklet*). Each subsequent turn it has its movement plotted according to the Plotting and Movement rules. However, rather than having this plotting recorded by markers on a heading display, its vector is recorded in shorthand form in the box for the appropriate turn, using the abbreviations listed at the bottom of the log sheet. For example, a missile which on Turn 2 had a heading of 12, a velocity of 6, and 2 accumulated G-turns to starboard would have "H12, V6, AGS2" written in the Turn 2 box. When each line of turn boxes is used up, use the "Cont" box to note the line number on which the craft has its plotting continued.

Ship Notes: When handling more than one ship at a time, players may wish to use the log sheets to jot down notes about the activities of their ships to assist them in computing Difficulty Modifiers vs. sensor locks or enemy fire, or to remind them of G-turns expended in order to compute fuel expenditures.

Tournament Play: To prevent chances for confusion or concern about cheating, all players participating in **Brilliant Lances** tournament play must use log sheets to note G-turns used for evasion and maneuver, folding and unfolding of passive arrays, and the like. These sheets will also aid in the reconstruction of such battles for later demonstration and analysis.

SENSOR LOCK

Obtaining a sensor lock on an unidentified or known enemy target is the single most crucial step in space combat. Until this sensor lock is obtained, the exact nature of the target is not known. The crew of a starship may be well aware that "something is out there" based on ghost images, thermal hot spots or flashes of returns on active sensors, but a sensor lock is required to identify the target, and more importantly, to do anything about it. At the incredible ranges of interstellar combat, fire control solutions require good, hard data on their targets. The speed of the target, its direction of motion, even its facing, roll, pitch, and yaw, are essential for the fire control to be able to tell where the target will be when the outgoing fire arrives. The most powerful, precise weapons known to violent minds are just so much inert matter without a sensor lock.

Bogeys: Before the first target lock is gained on an unidentified target, that target is an unknown. At the start of play, all spacecraft are unknowns, whether they are large starships, small craft, missiles, or sensor drones. For this reason, no counter (or ship miniature) is placed onto the map until an opponent gains the first sensor lock on that craft. Instead, the position of each craft on the map is indicated by a Bogey marker. The Bogey marker is moved normally using the movement and maneuver rules. This represents the tell-tale indications of something out there that can attract a sensor lock attempt. Once this lock is obtained, the Bogey marker is replaced with the specific playing piece for that craft, which remains in play for the remainder of the scenario. Thus, at the beginning of play, even if they know the overall composition of an enemy force, players do not know what where individual ships are, and which bogeys are only drones or missiles already in flight.

Types of Sensors: There are six main types of sensors used in **Brilliant Lances**, divided into two broad types—active sensors and passive sensors. Active sensors detect targets by sending out pulses of energy, such as radio waves or lasers, which then bounce off their targets and back to the sensor. The time that it takes the pulse to return, the shift in frequency of the pulse, etc., can be used to determine the distance and direction of the target, its motion relative to the sensor, etc. The two major drawbacks of the active sensor are that it broadcasts its own presence by filling space with pulses of energy, and that it requires a lot of power to generate pulses powerful enough to bounce back from very distant targets.

Passive sensors do not betray themselves by emitting energy; rather, they detect targets by sensing the energy given off by those targets. This energy is primarily in the form of heat, but advanced passive sensors also include radar and radio direction finders. Passive sensors are typically less effective than active sensors in terms of absolute range, but are more tactically useful for ships that wish to remain unnoticed.

Radar: This is an active sensor which detects its targets by emitting radio energy across wide angles, and detecting the radio energy which bounces back from distant targets. When a spacecraft is using radar, it suffers the penalties of going active, "lighting up."

Ladar: This is similar to radar, except that it uses laser rather than radio energy, and emits its energy in tight, focused beams, not across wide angles. Ladar may not be used to make an initial sensor lock, as it cannot scan broad areas. However, another sensor which has already locked on the target may hand off its lock to the ladar, which can then maintain the lock. Ladar does not carry the same penalties for going active as do radars, active EMS, and radio broadcasts. However, if its target is using sandcasters, it is one level of difficulty higher to maintain the sensor lock with a ladar set.

Active EMS: Active EMS (electromagnetic spectrum) sensors are advanced versions of radar (appearing at tech level 10), which incorporate the use of wavelengths other than radio, and add in sophisticated computerized image enhancement. Active EMS is an active sensor, and when used, carries the same penalties.

HRT (High Resolution Thermal): This is a passive sensor that detects targets by their infrared radiation. The more heat the target is giving off, the easier it is for the HRT to detect it.

Direction Finders: These specialized passive sensors detect targets by sensing their radar and radio emissions. At tech level 9 and below these are separate stand-alone systems, but by tech level 10 these are incorporated into the passive EMS sensors (immediately below). Note that these sensors are not directly used to roll for sensor locks. Rather, the presence of direction finders assists in the use of other sensors carried by a spacecraft.

Passive EMS: This is an advanced passive sensor (appearing at tech level 10) that combines the capabilities of the HRT with EMS direction finders and computerized image enhancement.

Other: There are several other types of sensors

installed aboard spacecraft, such as densitometers, neutrino sensors, and neural activity sensors, but these do not come into play in normal space combat (see, however, Integration with Traveller: The New Era, below).

Sensor Lock Procedure

Most ships have a number of sensors, each with different ranges of effectiveness. Once the scenario begins, players may begin to attempt sensor locks using any of the sensors available to them. Obtaining a sensor lock on a target is a task using crew quality (or Sensors skill), with the basic difficulty determined by the range of the target from the sensor, using the ranges noted on the craft's control panel. For example, a sensor with listed ranges of Ave 5, Diff 10, Form 20, Imp 40 would have a basic level of Average at 0-5 hexes, Difficult at 6-10 hexes, Formidable at 11-20 hexes, and Impossible at 21-40 hexes. A sensor lock could not be attempted beyond 40 hexes. This basic difficulty level can then be modified up or down by other factors as explained below.

All sensor locks are rolled for during the Sensor Phase. Each ship may use any or all of its sensors, and may attempt as many sensor locks as desired, with the limitation that each sensor may not attempt to gain a lock on the same target more than once in the same Sensor Phase.

Once a lock on a target is successfully rolled, a Target Lock marker is placed in the target's hex. Each Target Lock marker is numbered, and the number of that marker is recorded in the Target Lock box of the control panel belonging to the ship that made the lock. This allows players to keep track of who has seen whom at any given moment. In addition, any Bogey marker is replaced by its counter or starship miniature when it has been "locked up."

Decision Step: Before any sensor lock tasks are rolled, all players must simultaneously decide which sensors they intend to use.

Active/Passive: Players decide for each ship whether it will use active or passive sensors, or both. Each ship has an Active/Passive chit, marked Active on one side, and Passive on the other. If the player decides that the craft will use any active sensors (even in conjunction with passive sensors), the chit is placed, hidden, with its Active side up. Once all players have made their decisions, these chits are simultaneously revealed so that no player may react to any other player's decision. Chits with their Passive side showing are set aside for use on later turns, while chits with their Active sides showing are placed on the map in the hex occupied by the craft using the sensor. Vessels which have gone active are easier to detect by vessels equipped with direction finders or passive EMS sensors.

Folding Sensors: Some vessels are equipped with passive sensors that are noted on the data profiles and control panels as being folding arrays. These sensors have large, synthetic aperture collection areas that must be extended on the ends of pylons and struts in order to be used. The passive sensor must be extended if it is to attempt a lock, as it cannot function when retracted. However, the greater target area presented by a vessel with an extended passive array makes it a better target for enemy *active* sensors. Each ship with a folding array must also make an extend/retract decision during each Decision Step. A chit is also provided for this purpose. On the Extended side, the chit shows a front view schematic of a ship with its array deployed, and the notation "–1 vs. Active." On the Retracted side is the notation that no locks are possible with that sensor. Although this decision is also made during the Decision Step, the chit is not revealed, so as not to disclose information that opposing players would not automatically know. The chit is kept on the player's control panel.

Because of the fragility of the folding struts, no vessel may have an extended folding array in a turn that is burning G-turns for an evasion attempt. If the player chose to burn Gs for evasion in the preceding Plotting Phase, all folding sensors are automatically already retracted in this step.

Integrity: Because of the secret steps included in **Brilliant Lances**, there are many opportunities to change one's mind about a sensor decision after the fact, and reverse that decision after seeing the tactical benefits that might result. Resist the temptation if it ever occurs. That small act of integrity will not only make you a better person, but it will, in a small but very real way, make the world a better place for you and everyone else to live in.

Additional Difficulty Modifiers

The following conditions and circumstances modify the basic difficulty level based on range.

Retaining Sensor Locks: Sensors roll each Sensor Phase for all potential targets on the board, even those which the sensor had a lock on during the previous turn. Thus, an existing sensor lock can potentially be lost on any given turn. However, when rolling to maintain locks from previous turns, apply a –1 Difficulty Modifier to the task (i.e., the task becomes one difficulty level easier).

Handing Off Sensor Locks: Sensor locks may also be "handed off" to other sensors on the same ship or to other friendly ships. When rolling for a handed-off sensor lock, apply a –1 Difficulty Modifier to the task (i.e., the task becomes one difficulty level easier).

Handing a sensor lock off to another sensor on the same ship allows a lock obtained with an active sensor to be transferred to a passive sensor so that the active sensor can be powered down for more stealthy operations. A lock cannot be handed off on the first turn that it is made, but only on a turn following a successful lock. The sensor that first obtained the lock does not need to re-roll the lock for the turn that the lock is handed off. In effect, this task is rolled as if the sensor that is receiving the handoff is rolling to retain a lock from the previous turn.

To hand a sensor lock off to another ship, both ships must make successful communications rolls to make contact with each other (see the Communicators rule, page 15). Again, this handoff can only take place for a target that was successfully locked on the previous turn, and the handing off ship does not need to roll to re-lock it for the current turn.

Going Active: A ship which has gone active for the turn by using either active sensors or radio (see Communicators, below) becomes easier to detect for ships equipped with direction finders or passive EMS sensors. Any ship equipped with functioning direction finders or passive EMS (in the case of a folding passive EMS sensor, the array must be extended) applies a –1 Difficulty Modifier to sensor lock attempts with any of its sensors when rolling to lock onto an active target.

There are two restrictions to this: 1) the direction finder-equipped vessel must be within twice the extreme range (16 times the short range) of the active sensor, and 2) the tech level of the direction finder or passive EMS must be equal to or equivalent to the tech level of the active sensor. If either of these conditions is not met, there is no –1 Difficulty Modifier.

See the procedure section on page 14, for further details.

Target Size: The size of the target is a universally applicable modifier which applies in all sensor and fire tasks. Targets smaller than VS (Very Small) are harder to spot and hit, while larger targets are easier. See the table on page 8. This modifier is included in the Constant Diff Mods table on each spacecraft control panel.

Target Maneuver: The basic sensor lock difficulty levels assume that the target is expending some energy (and hot reaction mass) to maneuver. Thus, a target which has spent any G-turns at all in the turn adds no Difficulty Modifier to the task attempt (except in the case of stern on—see next paragraph). If the target has expended no G-turns for any purpose in the current turn, sensor lock is one difficulty level harder (+1 Diff Mod). If the target is in "cold mode," with its systems off-line and its power plant reduced to only a trickle of power, the sensor task is raised by two difficulty levels (+2 Diff Mod).

On the other hand, if the target is expending G-turns of thrust and is presenting its stern (and therefore its hot exhaust) toward the sensor, the sensor task roll is reduced by three difficulty levels (–3 Diff Mod). "Presenting its stern" is defined as facing so that the sensor is in the stern quarter arc (arc 4) of the target vessel. See the facing rules under the Hit Procedure rules, below.

Target Evasion: Vessels may also expend G-turns on erratic, evasive maneuvers in an attempt to throw off enemy sensor and fire tasks. An evasion attempt is an Impossible task (Ship's Tactics), but the task is reduced one level of difficulty (–1 Diff Mod) for each G-turn that is spent for evasion. For example, a ship with a G-rating of 5 that spent 3 G-turns on maneuver and 2 on evasion would require a Difficult roll against the captain's Ship's Tactics asset in order to successfully evade. The evasion roll is made one time only for the entire turn, in the Maneuver Phase. That result applies to all sensor and hit tasks for the remainder of the turn.

Success on the evasion roll means that the enemy's sensor lock task is one level more difficult (+1 Diff Mod). Outstanding Success on the roll means that the enemy's task is increased by one level for every two G-turns spent on evasion, rounding fractions down, with a minimum of one. Thus, an Outstanding Success would yield a +1 Diff Mod for 1, 2, or 3 G-turns spent on evasion, +2 Diff Mod for 4 or 5 G-turns, and +3 for 6.

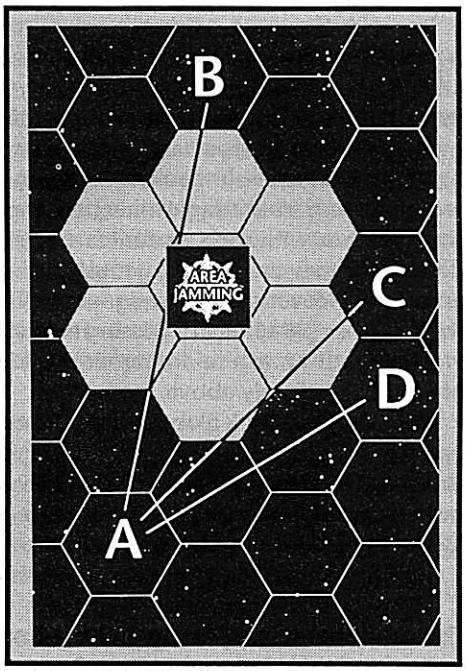
Failure on the roll indicates that there is no increase in difficulty for the enemy's sensor lock attempt. Catastrophic Failure means in addition that the craft's unpredictable and violent gyrations throw off the ship's own sensors and weapons: all of its sensor and firing tasks for the turn are increased by one level in difficulty (+1 Diff Mod).

Electromagnetic Masking (EMM): Ships which are equipped with electromagnetic masking (EMM) packages reduce the effectiveness of active and passive sensors which are used against them. EMM not only disguises a vessel's passive (heat) signature, it also includes the use of stealthy materials to reduce the echo of active sensor energy. A working EMM package increases the difficulty level of sensor locks by radar and HRT sensors by two levels (+2 Diff Mod), and the difficulty of an EMS (active or passive) or ladar sensor lock by one level (+1 Diff Mod). Remember that these Diff Mods are incorporated into each vessel's signature in the Constant Diff Mods vs. Detection on its control panel.

Laser Sensors: Any ship which is equipped with a sandcaster has a laser sensor included as part of the sandcaster installation. A ship equipped with a laser sensor can detect when a ladar set has a sensor lock on it, allowing it to fire sandcasters to increase the sensor task attempt by one difficulty level (+1 Diff Mod) on the current turn. This requires the expenditure of a single sand cannister (see Sandcasters under "Defensive Weapons" below). If the vessel already has sand "in the air," this +1 Diff Mod is already in effect without the need to expend another cannister.

Jamming: Vessels may be equipped with radar or EMS jammers which allow them to attempt to jam enemy *active* sensors. These jammers are deceptive jammers, and are different from the area jammers discussed immediately below. Deceptive jammers do not attempt to blot out enemy sensor energy, but deceive enemy sensors by sending back false echoes that fool the enemy sensor about its target's true location/heading, etc. Jamming tasks, like other tasks, are based on the range in hexes from the jammer to the target of the jamming attempt, as indicated on the control panel. Additional modifiers to this basic difficulty level are based on tech level (TL) differences between the sensor and the jammer. For each TL that the sensor exceeds the jammer, the jamming task is increased one level in difficulty (+ Diff Mod). For each TL by which the jammer exceeds the sensor, the jamming task is decreased one level in difficulty (– Diff Mod). This task is rolled separately for each enemy active sensor that the player wishes to jam. Success in the jamming task indicates that the opposing sensor is jammed, and rolls its sensor task at one difficulty level higher (+1 Diff Mod). Outstanding Success means that it must roll at *two* difficulty levels higher (+2 Diff Mod).

Area Jamming: Some ships may be equipped with jamming drones. These drones are fitted with energy-intensive broadband noise jammers. Area jammers are not finesse devices like the above deceptive jammers. Area jammers attempt to defeat enemy sensors merely by drowning out their signals with more powerful electronic noise. The area of affect of an area jammer is the hex it is in plus the six hexes surrounding it. Any sensor "line of sight" (i.e., the straight line traced from the center of the sensor's hex to the center of the target hex) that passes through this area of effect has its difficulty increased by one level (+1 Diff Mod). In the example at right, a sensor in hex A is attempting locks on targets in hexes B, C, and D. Because the lines of sight A-B and A-C pass through the area jammer's area of effect, those sensor tasks are increased by one difficulty level. The sensor task A-D is unaffected by the area jammer.



If the line of sight passes through the overlapping areas of effect of more than one area jammer, the difficulty is increased by one level per area jammer.

Because area jammers are typically mounted on drones, the areas of effect will move from turn to turn. Area jammers may be turned on and off by the owning player at will. The decision is made during the Decision Step of the Sensor Phase, and remains in effect until the Decision Step of the following turn's Sensor Phase.

Any craft that is carrying an operating area jammer makes itself an easy target for sensor locks. Use the rule above for Going Active, except that there is no tech level requirement, the sensor must be within 80 hexes, and the Difficulty Modifier is *two* levels easier (–2 Diff Mod).

Missile Detonation White Out: When a missile detonates (see the Combat rules below for a fuller description) in a hex, its nuclear explosion creates a temporary white out effect that makes the use of passive sensors more difficult. Any passive sensor lock into that hex (this does not include lock attempts whose "line of sight" merely pass through the hex) is one difficulty level higher (+1 Diff Mod) for each missile detonation in the hex. This is easily represented by flipping over each detonated missile counter to its White Out side, and adding up the difficulty modifers marked on each White Out marker in the hex. These markers are placed at the instant the missile detonates, and are removed at the beginning of the Combat Phase of the turn following their detonation.

"Terrain" Effects: Certain objects in space can also affect the success of a sensor lock. There are two types of interstellar terrain in **Brilliant Lances**: planets and asteroids, which are represented by counters placed on the map. For a complete discussion of the use of planets and asteroids in **Brilliant Lances**, see the Miscellaneous Objects and Issues rule.

Planet: Any craft that is in the same hex as a planet counter is given the benefit of the doubt that it is maneuvering to take advantage of the planet's bulk and passive signature to obscure its own. All sensor tasks rolled against the target are one level more difficult vs. passive and active sensors (+1 Diff Mod).

Asteroid: An asteroid counter represents one or more asteroids travelling in the same direction and speed. Again, ships sharing a hex with such a counter are given the benefit of the doubt that they are advantageously using the presence of the asteroids to cover their own signature. The effects of being in the same hex (whether just passing through or having matched vectors) with an asteroid counter are identical to those of a planet, immediately above.

Black Globes: Black globes are a very sophisticated, very rare, and very expensive defensive device that create a sphere around the defended vessel. Because these screens are so rare, they are not discussed here, but are dealt with in the Miscellaneous Objects and Issues rules.

Multiple Effects: The effects described above are all cumulative.

Procedure for Resolving Sensor Lock Attempts

The procedure for resolving sensor lock attempts divides the task between the sensing player and the target player, where each is responsible for calculating certain Difficulty Modifiers. This not only eases the workload and keeps both players interacting, but also is intended to ensure that information about bogeys is not revealed to an opponent during the course of resolving an unsuccessful sensor task.

As all sensor lock attempts are considered to be simultaneous, they may be resolved in any order desired.

Sensing Player: The player attempting the sensor lock indicates the target of the attempt and announces to the target player the type of sensor being used: radar, active EMS, ladar, HRT, or passive EMS. If using an active sensor, the sensing player must indicate where the scan is coming from, the tech level of the sensor, and point out which opposing units on the map are within twice the extreme range of the sensor (i.e., within direction finding range for purposes of the Going Active Difficulty Modifier). The player does not have to announce the 2xextreme range figure, only which units on the map are within it. Thus, by going active and filling space with pulses of detectable and classifiable energy, a player does offer information about his equipment.

If using a passive sensor, the sensing player does not have to tell the target player where the sensor is located.

When announcing these scans, the sensing player is responsible for calculating the following items which need not be told to the target player.

- Basic difficulty level of the sensor lock attempt based on range (the sensing player must also be careful to not use folding arrays which are in retracted status, or those which cannot function due to damage)
- Difficulty Modifiers based on retained sensor locks (–1 Diff Mod)
- Difficulty Modifiers based on handed off sensor locks (–1 Diff Mod)
- Difficulty Modifiers based on own vessel's Catastrophic Failure at evasion task (+1 Diff Mod)
- Difficulty Modifiers based on sensor line of sight passing through an area jamming area of effect (+1 Diff Mod per area)
- Difficulty Modifiers based on Planet or Asteroid counter in the target hex (+1 Diff Mod)
- Difficulty Modifiers based on White Out markers in the target hex (+1 Diff Mod per marker)
- Difficulty Modifiers based on target having gone active (–1 Diff Mod if sensing ship meets equipment, tech, and range criteria)
- Difficulty Modifiers based on target being a source of area jamming (–2 Diff Mod if sensor meets equipment and range criteria)

The player aids card presents these items in a flowchart style to assist the player in keeping track of them. These items yield one cumulative, net Difficulty Modifier.

Target Player: Once told that his or her ship is the target of a sensor lock attempt, the target player is responsible for reporting to the sensing player the net Difficulty Modifier based on the following criteria.

First, if the sensor attempt is using a radar or active EMS sensor, the target player must decide whether to try to jam the sensor. If so, the target player must announce to the sensing player that the target is jamming. The jamming task roll is made, but the sensing player need not be told if it was successful or not—the target player must merely remember to include the correct jamming Difficulty Modifier in the net Diff Mod reported to the sensing player.

The target player is responsible for the following items:

•Diff Mods from the Constant Diff Mods table on each spacecraft control panel. This table includes modifiers for target size and EMM packages, so the player should not add these items again. The player must also make sure to use the correct column of the table based on the enemy sensor being used, and to delete the EMM modifiers if the EMM has been rendered useless by combat. Use the Active EMS column for ladar.

•Difficulty Modifiers based on a successful jamming attempt vs. the sensor (+1 or +2 Diff Mods)

•Difficulty Modifiers based on the target's maneuver that turn (0, +1, +2, or –3 Diff Mods)

•Difficulty modifiers based on a successful evasion roll that turn (+1 or Evasion Gs ÷2 Diff Mods)

•Difficulty Modifiers based on sandcasters (+1 Diff Mod if equipped with sandcasters or if sand is already "in the air;" this modifier is optional, target player may elect not to use up a sand cannister)

•Difficulty Modifiers based on black globe generators (Diff Mod varies with use)

The player aids card presents these items in a flowchart style to assist the player in keeping track of them.

Resolution: The target player announces the target net Diff Mod to the sensing player, who then combines it with the sensing net Diff Mod to get the final net Diff Mod. The sensing player then applies this modifier to the basic difficulty level based on range. If the difficulty is shifted above Impossible, the attempt may not be made (although the sensing player may roll the dice anyway just to bother the target player and keep him confused about the sensor's real capabilities). If the difficulty is shifted below Easy, it is still rolled as an Easy task.

If the roll is a success, the sensing player places a Lock marker by the target, and records the number printed on the Lock marker in the Target Locks box of the vessel that "owns the lock." This makes it easy for players to keep track of who has seen who.

Outstanding Success and Catastrophic Failure results have no additional effect when rolled as part of a sensor task.

Effects of Sensor Lock: A sensor lock on a target is necessary in order to fire on it. It also allows the player to know the type and class of ship (for example, *Gazelle*-class Close Escort) and therefore any and all information written on the vessel's data profile sheet, such as the craft's G-rating, damage tables, etc. It does not allow the player to know detailed information about the current status of damage the ship has sustained.

In addition, players that currently hold sensor locks on a target may ask for the exact heading, velocity, and accumulated G-turn data of the target in order to help them plan their movement. In the case of multiple players on a side, some of whom might not have a sensor lock on the given target, this information must be passed in secret. There is, however, always the option for players to roll a communications task to share this information with their fellow players (this is not the same as a sensor lock handoff for purposes of the sensor rules, although a communications link opened for this purpose in the Plotting Phase will remain open to be used for a handoff in the Sensor Phase). For purposes of this rule, a sensor lock is held from the Sensor Phase that it is rolled until the Plotting Phase of the following turn (in other words, the lock only gives information on the vector from the turn the lock was rolled, not the new vector the locked target may be plotting).

COMMUNICATORS

Communicators allow craft to pass information back and forth. In game terms, this includes the ability of vessels to hand off sensor locks to each other, the ability of vessels to control drones and missiles, and the ability of players in different ships to discuss tactics with each other.

A communications task is rolled in the same manner as sensor and weapons tasks, with a basic difficulty level based on range modified by other conditions. There are four types of communicators carried by vessels, each of which are subject to different Difficulty Modifiers. These Difficulty Modifiers are all listed and discussed under the Sensor Lock rules. Like any system, communicators are all subject to degraded performance damage results (they are also affected by black globes, as detailed under the special Black Globe rule included in the Miscellaneous Objects and Issues section).

Communications tasks are attempted in the Plotting Phase to control missiles and to allow multiple players to discuss tactics and decisions for the coming turn and in the Sensor Phase to allow ship-to-ship target handoffs.

Radio: Radio communication tasks are affected by "terrain" (planets and asteroids), missile detonation white out, and area jamming. Radio does, however, have the ability to make broad band transmissions that can potentially be picked up by any-receiver in its range, which is useful for purposes of distress calls, warnings, etc. Laser, maser, and meson communicators cannot make such broad-band transmissions; they must all have a specific intended recipient or may not transmit.

Note, however, that any ship that is using its radio communicator during a given turn is treated as having gone active (see the Sensor rules above) for that turn, and is marked with an Active marker.

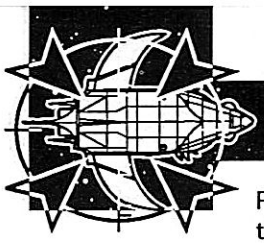
Laser Communicators: Laser communicators are affected by planets and asteroids, missile detonation white out, and sand present around the target (but not around the craft sending the message, as it can create a hole to send the transmission through).

Maser Communicators: Masers are affected by planets, asteroids, and missile detonation white out only.

Meson Communicators: These transmissions are not affected by terrain, white out, or area jamming. They cannot be used to communicate with any vessel with an operating meson screen. Optionally, players can announce that a ship has lowered its meson screen to allow meson communications for a particular turn. However, that meson screen may not be used for any defensive purpose for the entire turn.

Type	*Subject to Conditions*
Radio	Degraded performance, terrain, area jamming, white out
Laser	Degraded performance, sand at target, planet and asteroid hexes
Maser	Degraded performance, planet and asteroid hexes
Meson	Degraded performance, meson screen

Radio Jamming: Vessels equipped with radio or EMS jammers may attempt to jam enemy radio transmissions. This task is based on the range in hexes from the jammer to the target of the jamming attempt, as indicated on the control panel. Additional modifiers to this base difficulty level are based on tech level (TL) differences between the target radio and the jammer.



For each TL that the radio exceeds the jammer, the jamming task is increased one level in difficulty (+ Diff Mod). For each TL by which the jammer exceeds the radio, the jamming task is decreased one level in difficulty (– Diff Mod). This task is rolled separately for each enemy radio that the player wishes to jam. Success in the jamming task indicates that the opposing radio is jammed, and rolls its communications task at one difficulty level higher (+1 Diff Mod). Outstanding Success means that it must roll at *two* difficulty levels higher (+2 Diff Mod).

This use of the EMS jammer requires it to expend energy to blot out the enemy's transmission, so that the craft so doing is treated as having gone active for the turn. The intent to attempt radio jamming is announced during the Plotting Phase, and is in effect for the remainder of the turn. However, the jamming roll and the effect for having gone active does not take place until the target attempts its radio task. Thus, if the target does not attempt a radio communication during the turn until after the Sensor Phase is over, the prospective jammer is not penalized for having gone active, because it had not yet done so. For this reason, a player who intends to attempt a radio transmission during the turn should make sure to announce it by the Sensor Phase so that the jammer is penalized during the Sensor Phase for having gone active.

FACING

The facing of a spacecraft plays an important rule in **Brilliant Lances**. Facing affects sensor tasks, and also controls which weapons can be be brought to bear on the enemy and what portions of any enemy ship can be hit. In general terms, spacecraft must face in the direction that they are *accelerating*. Note, however, that if a spacecraft is not accelerating (i.e., firing its maneuver engines to speed up, slow down, or change direction), its facing has nothing to do with its vector (i.e., the direction and speed at which it is coasting through space). Like a leaf floating down a stream, it may freely spin or point in any direction desired, regardless of its vector.

The facing of a spacecraft is noted in the same way as its heading, by designating one of the 12 directions on the heading display, using the Facing marker provided with each set of control panel markers.

Each spacecraft has five firing arcs as shown in the Arcs of Fire Diagrams on the player aids card. The arcs are defined differently depending upon whether the craft's facing is a hexside (even-numbered facings) or a hex vertex (odd-numbered facings).

The arcs are numbered 1-5 as shown on the diagrams to make them easier to note on the control panels. It is important to understand that there are no port and starboard arcs. All vessels in **Brilliant Lances** are assumed to be constantly rolling about their longitudinal axes in order to bring all of their weapons to bear to all sides. Although split into two pieces, both Broadside arcs (3) are considered to be one arc. The same is true of the Bow Quarter (2) and After Quarter (4) arcs.

These arcs control the way a ship can fire, as well as the way it can be hit. In general, a target located in a particular arc of fire can only be hit by weapons that bear into that arc. Likewise, an enemy ship in a particular arc can only hit parts of the ship that are visible from that direction (a fuller discussion of this topic is presented under "Facing Effects on Combat," page 17).

Players decide the facing of each of their ships during the Sensor Phase, within limits dictated by the type and amount of G-turns used in the previous Plotting and Movement Phases. Within those limits, players may select the most advantageous facing for the current circumstances (this is the players' judgment, based on location of enemy vessels, arcs of fire of their weapons, hit locations that they wish to expose or protect, etc.).

Facing Limits Based on G-Turns Expended

When deciding on a craft's facing, the player must first determine the craft's base facing for the turn, and then determine the amount of allowed deviation from that base facing.

Base Facing: The base facing is controlled by the number of G-turns used that turn, and by how those G-turns were used.

- If G-turns were used to accelerate (increase velocity), the base facing is the same as the craft's *heading*.
- If G-turns were used to decelerate (decrease velocity), the base facing is the craft's heading number +6 (see sidebar).
- If G-turns were used to change heading to starboard, the base facing is the facing number at the beginning of the turn (before the heading change) +3 (see sidebar).
- If G-turns were used to change heading to port, the base facing is the facing number at the beginning of the turn (before the heading change) –3 (see sidebar).
- If G-turns were used for evasion only, there is no base facing, see next step.
- If no G-turns were used for any purpose, there is no base facing, see next step.

If G-turns were used for more than one type of maneuver (e.g. acceleration and heading change), use the base facing resulting from the purpose for which the most G-turns were spent. In case of a tie, the player chooses the base facing from the tied purposes.

If G-turns were used for maneuver and evasion, use the base facing for the maneuver, and proceed to the next step.

Deviation: Once the base facing is established, determine the amount of leeway to either side of that facing that the player has when choosing the craft's facing for the turn.

Deviation is determined by the number of G-turns used for maneuver (not evasion) as a proportion of the craft's *current* G-rating. (Current G-rating includes damage that may have reduced performance from the undamaged G-rating.)

- If G-turns equal to the current G-rating were used, final facing *must* be the base facing.
- If G-turns equal to more than half of the current G-rating but less than the full G-rating were used, final facing must be within base facing ±2 (see sidebar).
- If G-turns greater than zero but less than half of the current G-rating were used, final facing must be within base facing ±4 (see sidebar).

Adding and Subtracting Facings

Look at the control panel heading display and think of it as the face of a clock. Adding a number to a facing direction means to proceed that many positions around the display in a clockwise direction. Subtracting a number from a facing means to proceed that many positions counterclockwise. Thus a facing of 10 plus 5 equals 3, a facing of 3 minus 3 equals 12, and a facing of 6 plus 3 equals 9.

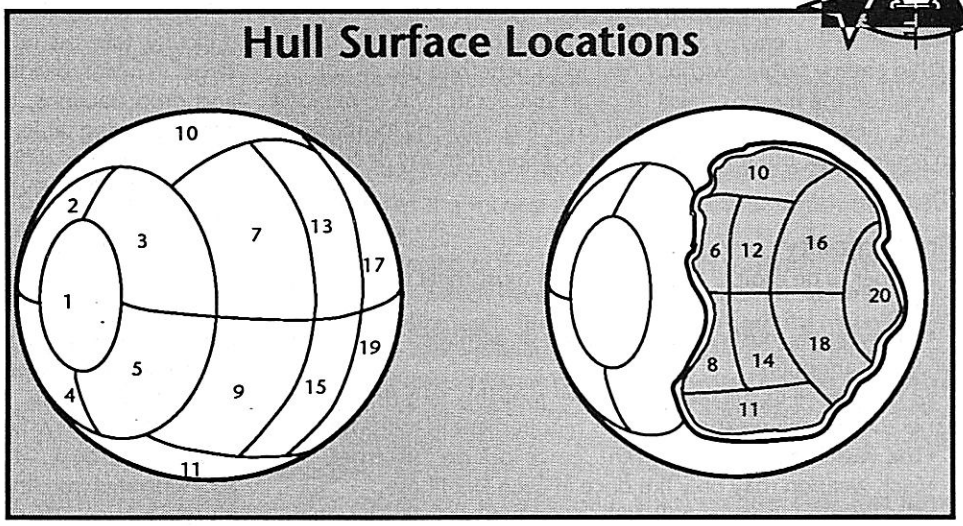
When calculating deviation, the symbol "±" means "plus or minus." The final facing is allowed to be anywhere within this band. Thus a heading of 5 ±2 would allow a final facing of 3, 4, 5, 6, or 7.

No G-Turns Spent: In cases where there is no base facing because no G-turns were spent, the player is not subject to deviation limits and may select any facing for the final facing.

Evasion: In cases where G-turns were spent for evasion (whether the evasion roll was successful or not), the final facing is determined randomly. If all the spent G-turns were used for evasion only, there is no base facing and the final facing is determined by die roll: roll D20 and reroll results of 13-20. The result is the direction of facing.

In cases where maneuver was combined with evasion, the final facing is also rolled randomly, but is rolled randomly from the base facing and deviation limits established by its maneuver actions.

The only exception to random facing determination for evading spacecraft is in the case of Outstanding Success at the evasion task. In this case, the vessel's commander has succeeded in maintaining facing control even while successfully complicating enemy sensor and fire tasks: the player may select any facing for the final facing.



Facing Effects on Combat

The facing of a ship controls which of its weapons can be fired against enemy targets and which portions of the ship can be hit by enemy fire.

Offensive Effects: All weapons except missile launchers have their arcs of fire indicated on the spacecraft control panel (using the numeric abbreviations illustrated on the Arcs of Fire Diagrams). Based on the craft's final facing, determine the fire arc that is occupied by the prospective target. All weapons that have that arc listed on the control panel are eligible to fire into that arc. Weapons that are not listed as able to bear into a particular arc cannot fire in that direction.

Missiles are an exception to this rule, as missiles are not direct fire weapons, as are lasers, particle accelerators, and meson guns. Missiles are small vehicles that are launched in the Launch Phase and maneuver to arrive near their targets. Therefore arcs of fire do not apply to them.

Defensive Effects: Enemy laser and particle accelerator fire coming at a spacecraft from a certain arc can only hit the portions of the craft that are visible from that angle. For example, an enemy firing on a ship from within its Bow On arc (1) should not be able to score a hit on the ship's stern.

Each manned craft has its hull surface and hull interior divided into 20 hit locations. The diagram above shows a spherical craft and its hit locations.

In the case of this spherical example, only hull locations 1-11 can be hit from the Bow On arc (1), 1-15 from the Bow Quarter arc (2), 2-19 from the Broadside arc (3), 6-20 from the After Quarter (4) arc, and 10-20 from the Stern On arc (5). This should make it clear that shrewd use of facing during combat can mask valuable hit locations from enemy fire.

The exact hit locations that can be hit from each arc varies with the hull form of the target, and these are shown on the player aids card.

Although meson guns are direct fire weapons, they are immune to this rule because mesons pass through matter to explode in the interior of their targets. Thus meson guns roll 1-20 for hit location no matter what arc they fire at their targets from.

Facing for Missiles and Drones

In most cases, players should ignore facing for missiles and drones. It is a waste of perfectly good time and energy because missiles and drones have no arc of fire limitations and no hit locations. Determining their facing is justified under special circumstances, such as when a missile or drone might be firing its thrusters directly at a sensor that is attempting to gain a lock on it (and thereby qualifying the sensor for a –3 Diff Mod).

FIRE AND COMBAT

Fire of all weapons takes place during the Fire Phase. All fire and damage resulting from fire is considered to be simultaneous, so that a ship that has just been destroyed by enemy fire is still allowed to conduct its fire for the turn before it is removed from play.

Hits may be negated or reduced in effect by shipboard defenses which include active defenses like lasers, and relatively passive defensive screens.

Weapons Types

There are three main types of weapons used in space combat, each with different hit and damage performance.

Lasers use focused beams of coherent light to impart energy to enemy targets over a very small area. Relative to other long-range beam weapons, lasers have good penetration performance, but generate less explosive force and damage. The main type of missile used in **Brilliant Lances** is a specialized high-performance laser carrier, which powers these lasers by detonating a nuclear explosion, thereby destroying itself. Lasers are direct fire weapons and are limited to hitting enemy hit locations visible from the arc they are firing from.

Particle accelerators accelerate subatomic particles—almost exclusively neutral atoms such as hydrogen—to very high speeds at enemy targets. These have less penetrative ability than do lasers, but generate a much greater explosive force. Like lasers, particle accelerators are limited to only hitting visible hit locations when firing at enemy vessels.

Meson guns also accelerate subatomic particles at enemy targets. But in this case the particle is a meson, which does not interact with matter, and therefore passes through all objects without resistance. However, the meson has only a short life, after which it decays into other more destructive particles. By accelerating the meson to relativistic speeds, its subjective passage of time slows, and its decay is delayed. By timing the decay

to occur as a group of mesons pass through an enemy ship, powerful explosions can be created within enemy targets without having to penetrate the armor.

Because the mesons travel through spacecraft hulls to explode inside, meson guns are not limited to hitting visible hit locations on an enemy ship, but roll 1D20 for hit location from any direction of fire.

Fire Eligibility

In order to be eligible to fire, weapons must meet the following criteria:

- The weapon must not be destroyed or damaged to the point where it cannot fire.
- It must have its full required power available to it (the control panel shows each weapon's power requirement in megawatts).
- The vessel must have a current sensor lock on the target.
- Each weapon may only fire once in each Fire Phase.
- The weapon must be able to bear on the prospective target.

Hit Procedure

As with sensor lock and communications tasks, obtaining a hit on a target is a task whose basic difficulty level is based on the range to the target. Basic difficulty levels by range are listed with each weapon on the control panel. Additional Difficulty Modifiers are applied to this basic level. These are much fewer in number than those that are used in sensor lock attempts, and are based on target size, target evasion, Catastrophic Failure of own evasion attempt, absolute range, and the use of advanced fire control systems called master fire directors (MFDs).

Target Size: The target's size provides a Difficulty Modifier that is used when resolving all fire tasks. This Difficulty Modifier is noted on the control panel in the Fire column of the Constant Diff Mods vs. Detection and Fire table.

Target Evasion: Target evasion works in the hit procedure exactly as it does in the sensor lock procedure, detailed above. Remember that the evasion roll is made in the Maneuver Phase once for the entire turn, with that result applying to all sensor and hit tasks in the turn. (If the firing ship made an evasion attempt and rolled a Catastrophic Failure, all firing tasks for the turn are resolved at +1 Diff Mod.)

Absolute Range: The basic difficulty level listed with each weapon is based on that weapon's own permanent fire control system, called its on-mount fire control system (OMFCS), or beam pointer. This difficulty reflects the beam pointer's ability to accurately direct the weapon's fire at a given point in space over a certain range. However, the range to the target has another affect on hit probability.

When a weapon fires at a target at range R, it is using tracking data that has come from the target (infrared radiation, reflected radar or ladar beams, etc.) over that range R at the speed of light. Assuming the weapon is a laser, it arrives at the target at the speed of light, again passing over the distance R. The time elapsed from when the tracking information left the target and the arrival of the laser fire back at that target is the amount of time that it takes light to travel the distance 2R. If R is a large number, say 300,000 kilometers or one light-second (10 hexes in **Brilliant Lances** scale), the elapsed time would be two seconds. The target can have moved a long way in two seconds, and a tiny degree of error magnified over 300,000 kilometers makes it very easy to miss that target.

To account for this additional difficulty, take the range to the target in hexes, divide by three, and drop fractions, or see the accompanying table. The result is the number of difficulty level increases (+ Diff Mods) applied to the to hit task.

Diff Mods from Absolute Range

Range in hexes	*Diff Mod*
0-2	—
3-5	+1
6-8	+2
9-11	+3
12-14	+4
15-17	+5
18-20	+6
21-23	+7
24-26	+8
27-29	+9
30-32	+10
33-35	+11
36-38	+12
39-41	+13
42-44	+14

Overpowered Weapons: Some weapons can be designed to draw five, 10, or more times their normal power requirements to improve their hit probabilities via high rate of fire. These are indicated in the MW blank of the control panel by a "–1" or "–2," etc., separated from the MW rating by a slash. These are the number of + Diff Mods that can be counteracted. These overpower Diff Mods may eliminate + Diff Mods, and cannot be used to reduce the base difficulty level.

Master Fire Directors: Some ships are equipped with one or more master fire directors (MFDs). An MFD allows one gunner to fire a number of separate weapons at a single target, and with an improved chance to hit. All of the weapons under the control of a single MFD are referred to as a battery, and must be equipped with the same type of beam pointer (tech level and range—this can be determined by looking at the ship data profile and seeing if the lasers have the same range bands in hexes, regardless of the damage and penetration at those ranges), and the weapons must all be of the same type (laser, particle accelerator, or meson gun), although they may be of different power. When the MFD and the controlled weapon(s) have different range bands, the lower of the two is used for calculating difficulty levels: the MFD's range performance is thus an upper limit on the range performance of its controlled weapons.

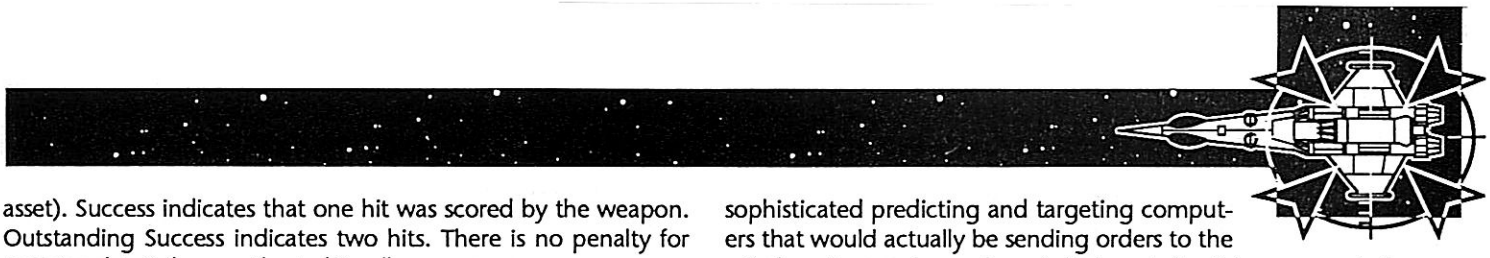
Each MFD may only control one set of weapons per turn, but the weapons assigned to the control of an MFD may be freely changed from turn to turn within the above limits.

For example, using the sample *Gazelle* control panel on page 10, the *Gazelle*'s MFD could be used to control the two laser barbettes or the two laser turrets on a given turn, but not both. When firing the laser turrets, the basic difficulty would be calculated based on the turrets' 2-4-8-16 range bands, so the MFD's superior range would clearly be "wasted." The MFDs installed in *Gazelle*s were obviously designed to match up with the barbettes (both have 10-20-40-80 range bands).

The difficulty level of an MFD-directed fire task is calculated the same as it would be for the individual weapons of its battery. However, when calculating increased difficulty levels due to target range and evasion, the MFD allows the gunner to ignore a certain number of increases in difficulty level as noted on the ship data profile and control panel. The MFD may only *counteract* +Diff Mods that apply; it may not *reduce* a difficulty level.

Although the weapons controlled by the MFD are referred to as a battery, the to-hit rolls are made separately for each weapon controlled by the MFD, so that each has a separate chance to hit or miss.

Resolution: Once the final difficulty level is derived, the task is rolled against the Crew Quality table (Gunnery [Energy Weapons]



asset). Success indicates that one hit was scored by the weapon. Outstanding Success indicates two hits. There is no penalty for Catastrophic Failure on the to-hit roll.

Missiles

Missiles use the rules above, but with slight modifications. All missiles in **Brilliant Lances** are armed with nuclear-pumped X-ray laser warheads. Missiles maneuver to arrive in or near the hex occupied by the target. Once it is close enough to the enemy, the missile makes final targeting adjustments, then deploys a number of laser-generating rods, and detonates its nuclear warhead. The energy of the nuclear explosion creates high-energy (X-ray) photons within the rods, which are focused along the rods' lengths into X-ray beams which travel to the target, and do damage as normal lasers. Mere milliseconds after firing, the rods are themselves consumed by the nuclear explosion.

All missiles are listed in the *Technical Booklet* with their maneuver characteristics in total G-turns, the maximum number of G-turns that can be used per turn, the number and damage values of their lasers, the short range of their communicators (laser or maser), and the characteristics of on-board sensors (if any). Most missiles are controlled by operators aboard the firing ship, but fully independent missiles also exist, and are discussed later.

Each missile launcher may launch up to 10 missiles per Launch Phase, so long as a supply of missiles remains.

Controlling Missiles: Once a missile is launched, it behaves just like any other spacecraft, expending G-turns to maneuver toward its target. Missiles spend their G-turns at any rate desired, within the per-turn limit.

If the missile does not carry its own sensors, the firing vessel must maintain a sensor lock on the missile's target in order for the missile to fire. The controlling ship may lose the lock while the missile is travelling, but the missile requires the firing ship to have a final sensor lock on the turn it detonates to generate a fire control solution. If the missile has its own sensors, it may generate its own lock (using the Sensor asset of the controlling gunner), and have the sensor lock handed off to it from the firing vessel according to normal hand-off rules.

The missile needs telemetry from its controller in order for it to maneuver and fire. So long as the missile remains within its listed communicator short range from its launching vessel, there is no need to roll communications tasks (for simplicity of play they are considered automatic at this range). Beyond this range, a communications task must be rolled during the Plotting Phase for the missile to be controlled (i.e., able to maneuver and/or fire during the turn).

If the missile launching system (turret, barbette, bay, etc.) is manned, that gunner may control one missile at a time. Control of missiles may also be given to master fire directors, which can control more than one missile at a time. The number of missiles that may be simultaneously controlled by an MFD is equal to the number of Difficulty Modifiers it may ignore. Note that a ship can have more missiles in flight at one time than it can control. For example, a ship could launch a large number of missiles a few at a time, and maneuver them to a form a picket line in front of the ship. As it launched more missiles, the missiles that were already in position in the picket line would be allowed to go uncontrolled, and would coast along ahead of the ship, forming a screen until they were needed.

Plotting and Maneuvering Missiles: As stated earlier in the rules, missiles are plotted and maneuvered exactly as any other spacecraft. However, a player does not have access to the sort of sophisticated predicting and targeting computers that would actually be sending orders to the missile as it moved ever closer to its target. For this reason, missiles can be plotted out of the normal sequence of play order to simulate these fire control effects. All manned craft must be plotted normally in the Plotting Phase, but players may leave their missiles unplotted until they see the moves of enemy vessels for which they have sensor locks.

At the beginning of the Movement Phase, players indicate to each other the ships which have target locks on them which are held by missile-controlling craft. Then the players carry out the movement of those vessels one at a time. As each vessel is moved to its destination hex, unplotted missiles which are controlled by vessels holding locks on the moved target have their maneuvers plotted. After all such sensor-locked vessels have been moved, all missiles must have been plotted. Then all other craft and missiles execute their moves.

After movement is carried out, it will become clear that some missiles and locked target vessels will have crossed paths during their movement. Because missiles are commanded to detonate and fire at their point of closest approach, some moves may need to be re-executed to establish that point of closest approach. Starting hexes can be easily established by working in reverse from the heading display or log sheet, and when players know that such backtracking may be required they can easily mark the starting hexes with spare markers or counters.

Movement is then re-executed on a hex-by-hex basis using the Proportional Movement Guide on the player aids card. Each craft or missile that is involved finds its velocity line which shows when it moves during the procedure. Proportional movement steps are counted off from 1 to 10, and each craft or missile moves one or more hexes in each step that an "M" appears on its velocity line—see the guide for details. Players owning missiles may declare that their missiles are detonating at any time during this procedure (but only against vessels for which their controlling ship has a sensor lock). If during any step the range between a missile and a prospective target increases, the player can declare that the detonation took place just before that move, when the range was lower. Immediately upon declaring detonation, the player flips the missile counter over to its White Out side, and makes a note of the range to the target at the moment the missile detonated. The player controlling the missile's target also makes a note of the target's facing at the moment of detonation. This facing does not need to be the same facing that will be chosen for the final facing during the Sensor Phase, but both of these facings must be within the limits allowed by the Facing rule (if the missile detonated in the same hex as the target, do not select a facing, as the missile rolls a straight D20 for hit location).

Firing Missiles: Most missiles have an *absolute range* of 0 and therefore need to detonate in the same hex as their target, but this is not the case for all missiles. However, even missiles with an absolute range of 1 or 2 will find it advantageous to detonate in the same hex, as this will increase their to-hit chances.

Missile fire is resolved in the Fire Phase, but missile detonations and fire can be designated during either the Maneuver or Fire Phases. Designation during the Maneuver Phase was discussed immediately above. Designation during the Fire Phase can take place if the missile ends its turn within firing range of a previously unlocked enemy vessel which is then locked by by the missile's controlling ship during the Sensor Phase.

The missile tables show the fire performance of

each missile's detonation laser. Missiles resolve their laser fire using a modified version of the normal fire procedures. Most missile lasers do not have short, medium, long, and extreme ranges, but rather have an *absolute range* of 0 meaning that they may only fire at targets in the same hex. Rare missiles will have ranges of greater than 0, listed as short/medium/long, for example, 0/1 or 0/1/2. Only listed ranges are available (in the example, the 0/1 laser has short and medium ranges only, no long or extreme). Note that missile lasers with ranges greater than 0 will also have different damage values at these ranges, also noted with the table.

When the missile detonates and fires, its difficulty level is calculated using the normal procedure with the following basic difficulty levels. Basic difficulty level for *all* missiles at 0 hexes is Average, at 1 hex is Difficult (if this range is available), and at 2 hexes is Formidable (if this range is available). It is modified by target size and target evasion as normal. However, unless otherwise indicated, missiles carry no sensors of their own, and rely on sensor updates from the controlling ship. For this reason, the absolute range Diff Mods are calculated based on the range from the controlling ship to the missile's target. (Note that if the missile is firing at a range of greater than 0, the absolute range Diff Mod is calculated on the range from the missile to its target plus the range from the missile to its controlling spacecraft.) If the missile is being controlled by an MFD, the MFD may allow some of these Diff Mods to be ignored according to the normal rules, so long as the range is less than the MFD's listed extreme range band (shown on the control panel as Imp).

If a hit is rolled, roll 1D6 for the total number of hits (each using the listed damage) acheived. The missile is done, consumed by its warhead.

Semi- and Fully Independent Missiles: Missiles which carry their own sensors but which are still controlled by their firing gunner (as discussed above) are referred to as semi-independent missiles (SIMs). SIMs roll every turn for sensor locks like any other craft, except that only one lock may be maintained at a time. If a SIM has a sensor lock on its target when it fires, the absolute range Diff Mod is based only on the range from the SIM to the target. However, a SIM may be commanded to fire by its controller at a target that it does not have a sensor lock on. In this case, absolute range Diff Mods are calculated from the controller to the target just like normal missiles.

Some missiles carry their own targeting and tracking systems and are completely independent of outside input once they are fired. These are called fully independent missiles (FIMs), and are listed with their own Crew Quality/Gunnery asset equivalent which is used when rolling for hits. Once fired, these missiles need no further attention from their gunners, and do not count against the total number of missiles that can be controlled at one time by that gunner. However, these missiles must have a sensor lock on an enemy target in order to maneuver. A FIM which does not have a sensor lock merely coasts on its current vector until it gains a lock. FIMs may also be controlled by their launching ship under such circumstances, but in this case they do count against the total number of missiles that can be controlled.

Fire at Missiles: A missile may be fired upon by enemy vessels at any point in its movement. Most missiles are Micro or Sub-Micro size targets, although larger missiles can be built. Any hit on a Micro or Sub-Micro size missile which can penetrate its armor and has any damage value remaining is sufficient to prevent it from accomplishing its mission, and it is removed from play. (All solid-fueled TL-3+ missiles, i.e., all those listed on page 10 of the *Technical Booklet*, have an Armor Value of 3.)

DEFENSES

Defenses on the target vessel may be used to attack specific "hits" which have been scored. Each defense must be directed against a specific "hit." Although more than one weapon may be directed against a specific hit, if one defensive weapon stops the hit, the others may not then be re-targeted against a different one.

Beam Weapons: Beam weapons can be used in a *de facto* defensive role to destroy missiles before they get close enough to fire. In the Fire Phase, all anti-missile fire is resolved before missile fire. This preemptive defensive fire is an exception to the rule that all fire is simultaneous, and takes place in the short period of time that the missile is deploying its laser rods and making adjustments for its final fire control solution. This fire is resolved as any other beam weapon fire. Naturally, any weapons which were used for anti-missile fire have done their fire for the turn and are not eligible to fire at any other targets.

Sandcasters: Sandcasters fire cannisters of ablative crystals, commonly known as "sand." Each sandcaster contains a generator which creates a field which manipulates the location and shape of the cloud of crystals. At early tech levels, these fields are electromagnetic in nature, and require the use of magnetic sand. More advanced systems are able to supplement and then supplant the magnetic manipulation with gravitic manipulation, which allows the use of more effective non-magnetic crystals.

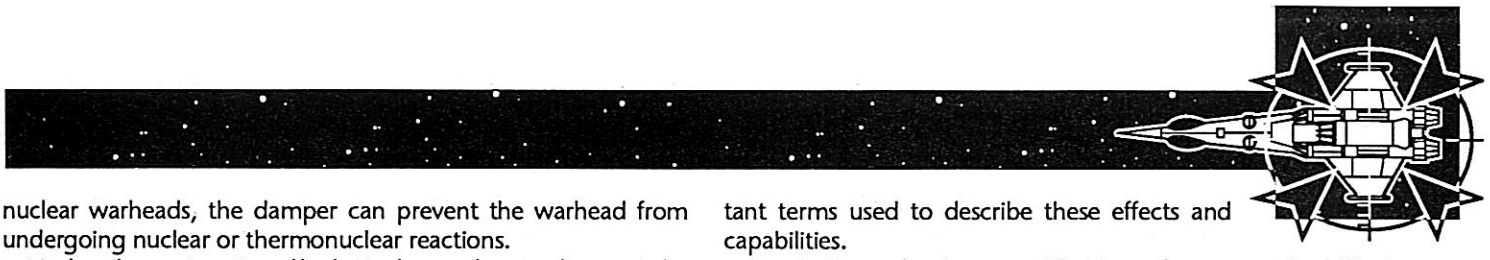
These clouds are placed in the path of incoming beam weapons, and cause the beam weapon to expend its energy burning through the cloud. The sandcaster operator uses laser warning sensors installed in the sandcaster to detect fire control locks and anticipate incoming beam fire. The roll to intercept a beam weapon with a sandcaster is a Difficult test of the Screens (Sandcaster) asset of the operator, and is modified one level up (+1 Diff Mod) for each two tech levels by which the firing beam weapon exceeds the sandcaster, or downward one (–1 Diff Mod) for each two tech levels by which the sandcaster exceeds the beam weapon's tech level. Sandcasters may only fire against weapons coming in through their arc of fire.

A successful sandcaster "hit" on a beam reduces its damage value (for particle accelerators, damage value = penetration value). The amount of this reduction is listed on the ship data profile and control panel. Each such successful sandcaster hit requires that a cannister be used to replace the sand that was burned up by the beam weapon, and this is recorded on the control panel in the "Cann used" blank. On Outstanding Success, double the amount of the beam reduction, but still only one cannister is required to replenish the sand cloud.

In order to function against incoming fire, sand must be out in advance of that fire, which means that each sandcaster which is to function in combat must fire one cannister of sand before combat begins. It is this sand which is then replenished following successful hits. Although sand cannot be recovered, it is not lost except by being burned up by incoming fire. Because it is held in an energy field, sand is held in place around the spacecraft regardless of maneuver or evasion (but it is lost when a ship enters jumpspace, as the jump field does not extend around the sand cloud).

Like offensive weapons, each sandcaster turret can only be used against one hit per turn. However, when a weapon scores two hits by rolling an Outstanding Success, a sandcaster can be used against both these hits, rolling separately for each one, and perhaps using up more than one cannister.

Nuclear Dampers: Nuclear dampers are based on the manipulation of the so-called strong nuclear force which holds atomic nuclei together. By properly projecting this force onto incoming



nuclear warheads, the damper can prevent the warhead from undergoing nuclear or thermonuclear reactions.

Nuclear damper turrets and barbettes have only enough range to be used within the same hex, and are used against the missile during the same moment before it fires at the preemptive beam fire, above.

Larger internal nuclear dampers may have a greater range, which is listed with the damper. This range is an absolute range of effect, and not a short range as with most weapons. These are not limited by arcs of fire when firing out of their own hex.

It is crucial that the damper remain focused on the warhead for long enough to disable it. It is a Difficult task of the operator's Screens (Nuclear Damper) skill to disable a missile's nuclear warhead with a nuclear damper. Modifiers are based on the closing velocity of the missile. This figure varies with the tech level of the damper, and is listed on the ship data profile and control panel as the "CV÷" number, which means that the missile's closing velocity (the velocity of the missile's vector for that turn) is divided by that number and the result (dropping fractions) is the number of + Diff Mods applied to the task. Success indicates that the missile's warhead becomes inert, and cannot detonate and fire.

Nuclear damper turrets, although relatively compact and inexpensive, are limited to firing on only one missile per turn. Larger damper installations may conduct defensive fire against all missiles that fire on the ship during the turn.

Meson Screens: Meson screens project an energy field which interacts with incoming mesons, causing them to decay harmlessly outside of the vessel's hull.

Meson screens come with a listed Protection Value, "PV," on the ship data profile and control panel. The basic difficulty to stop a meson gun hit with a meson screen is Difficult, but this varies with the relative power of the meson gun to the meson screen. Compare the damage value of the firing meson gun by the PV of the meson screen, drop fractions, and consult the table to find the Difficulty Modifier applied.

If the gun's damage value is 4 or more times the PV, difficulty is increased two levels (+2 Diff Mod).

If the gun's damage value is 2 or more times the PV (but less than 4 times), difficulty is increased by one level (+1 Diff Mod).

If the PV of the screen is 2 or more times the gun's damage value (but less than 4 times), difficulty is decreased by one level (–1 Diff Mod).

If the PV of the screen is 4 or more times the gun's damage value, difficulty is decreased by two levels (–2 Diff Mod).

Success indicates that the meson gun "hit" does no damage to the vessel.

Black Globes: These rare defensive devices are not normally encountered, so are discussed in the Miscellaneous Objects and Issues section, page 28.

DAMAGE

Once hits are obtained, and they have successfully made it through the target's defenses, determine what systems were damaged and how much actual damage was sustained.

Weapon Damage Performance

Weapons are listed with penetration and damage figures that are used to calculate the amount of damage they do when they hit a target. These figures vary with range; make sure to use the correct numbers for the range at which the hit was scored.

Terms and Concepts: There are basically two ways for a hit to affect its target: by penetrating (punching holes through) armor, and by explosively damaging equipment. There are several important terms used to describe these effects and capabilities.

Penetration value is a quantification of a weapon's ability to penetrate through heavy structural objects such as starships and their armor and machinery.

Damage value is a quantification of the amount of damage a weapon can inflict on a variety of objects, including heavy machinery.

Penetration rating is a conversion factor used to describe the relationship between a weapon's penetration value and its damage value. The penetration rating is the number of damage value points lost per point of armor value penetrated. For example, a laser with a penetration rating of 1/6 and a damage value of 19 would spend 2 points of damage value to penetrate an armor level of 12, and still have 17 damage points remaining to do interior damage. The penetration rating allows a weapon's performance in terms of damage value to be translated to penetration value (damage value ÷ penetration rating = penetration value), or from penetration value back to damage value (penetration value × penetration rating = damage value—see "Penetration Ratings Conversion" on the player aids card).

Not all weapons have a penetration rating. For some types of weapons, such as particle accelerators (or modern tank-fired kinetic energy rounds), the ability to punch holes in armor and the ability to cause explosive damage to heavy equipment are effectively the same. These weapons do not need a penetration rating, because their penetration value is an accurate assessment of their performance in both cases. On the other hand, some weapons, such as lasers, by their very nature have very different penetration and explosive damage effects. The energy contained in a laser is more efficient at punching holes than it is at causing explosions in machinery. For this reason, lasers use a penetration value for punching holes and a damage value for blowing up equipment, and are also given a penetration rating in order to convert the two values back and forth.

Damage points are the units that are used to describe the amount of damage caused by a hit. Damage points are inflicted on a starship in different ways by different weapons:

- Particle accelerators penetrate armor and inflict damage points with their *penetration value.* They also do additional radiation and EMP damage—see that section under "Damage Effects," below.
- Lasers penetrate armor with their *penetration value,* but inflict damage points with their *damage value.*
- Meson guns do not worry about penetrating armor, and inflict damage points with their *damage value.*

Lasers and particle accelerators hit the surface of a ship first and do explosive damage to any surface fixture they encounter. If they have remaining energy after damaging the surface fixture, or if they hit bare hull surface instead of a fixture, they hit the hull itself and expend energy for penetration. If they penetrate all the way through the hull armor, they cause internal explosions with their remaining energy.

Meson guns do not follow this pattern. Meson gun beams pass through the hull without interacting with or damaging it and simply cause interior explosions. Because they do not penetrate armored hulls *per se,* they do not have a penetration value or penetration rating.

Final Damage Point Value: A weapon's damage and penetration characteristics vary with the range at which the hit was made. Look at the weapons

data on the ship data profile to find the values for the correct range.

Because of intangibles in relative target motion, angle of the hit, "lucky shots," etc., there is some variation in the final force of each hit. To simulate this, roll 2D6 for each hit prior to finding the hit location. For particle accelerators, add the result to its penetration value. For lasers, calculate the penetration value (damage value + penetration rating) and add the result to it. Do not make this roll for meson guns.

Hit Location

When a weapon hits a spacecraft, roll for the hit location. To determine hit location, first determine the arc of fire from which the craft was hit, based on the craft's final facing and the location of the firing weapon. Then consult the Arcs of Fire and Hit Locations by Hull Form table on the player aids card. Find the line for the target's hull form, and intersect that line with the column for the arc of fire that the hit came through. This gives the hit locations that can be hit from that arc. Roll randomly to get the hit location from among those available. Depending upon the number of available locations, this will require a 1D6 or 1D20 roll, with unavailable results rerolled.

Example: If locations 1-5 are available, roll 1D6, rerolling results of 6. If 2-19 are available, roll 1D20, rerolling results of 1 and 20.

Some weapons do not have their hit locations limited based on arcs of fire. A meson gun hit rolls 1D20 for hit location regardless of the target's facing. Likewise, any laser or particle accelerator fire that was fired from a range of 0 (within the same hex as its target—this is typically the case with detonation missiles) also does not concern itself with target facing, and rolls hit location on 1D20.

Once the hit location is determined, find the line for that hit location on the craft's damage table. Each craft has its own unique damage tables, printed on each ship data profile page in the *Technical Booklet*, with the entries determined by the actual placement of systems within the ship and on its surface. During the discussion below, examples will be given using the damage tables of the *Gazelle*-class Close Escort found in the *Technical Booklet*.

Surface Hits: For lasers and particle accelerators, first resolve surface damage. Meson guns skip this step and proceed directly to the internal hits step.

Look in the Surface Hits column of the damage table for the correct hit location. If there is no notation there, the entire surface area of that hit location is considered to be bare hull. Proceed directly to hull penetration.

If there is a notation, this indicates the surface fixture(s) on the surface of that location. In most cases, these notations are abbreviations. A glossary of these abbreviations is printed at the beginning of the data profile section of the *Technical Booklet*. If there is a number before the notation, for example, "1-6: Ant" on the Gazelle's hit location 2, that is the roll on 1D20 to hit the listed fixture. If the fixture is not hit (in the example, on a 7-20), the shot hits bare hull elsewhere on the surface. Proceed directly to hull penetration.

Sometimes there is no number before the notation (the Small Craft at locations 18 and 19). This means that all hits here hit the listed fixture.

In some cases, the notation is not a specific fixture, but a broad category that requires a further roll, as in the case of "Ant," for Antenna. Look at the Damage Type chart on the player aid card. Roll 1D10 (with DMs as indicated beneath the chart if necessary) on the chart to find the specific piece of equipment within the category that was hit. If more than one system fits this criteria, roll randomly among the systems of that type (the roll will vary depending upon number of systems) to see which system was hit. Note that systems that have already been destroyed by previous hits can be hit again by this random roll. However, they absorb no additional damage points when hit again, and the shot passes through them on to the next step. For example, the *Gazelle* took an antenna hit, and a roll of 8 on the Damage Type chart shows that a sensor antenna was hit. As the *Gazelle* has two sensor antennae, one active EMS and one passive EMS, 1D6 is rolled to determine which was hit.

Surface Damage: Once it has been determined which system has been hit, look at the control panel to see how much damage the system can take. Then use the Spacecraft Damage table to find the amount of damage the hit can do based on its number of damage points (for particle accelerators this is its penetration value; for lasers, this is expressed in terms of its damage value).

Spacecraft Damage

Damage Points	*Result*
0 or less	No effect
1 to 10	1 minor
11 to 20	2 minor
21 to 40	1 major
41 to 60	2 major
61 to 80	3 major
81 to 100	4 major
101 to 120	5 major

No more than five major damage hits can be done in a single location. Remaining damage points beyond 120 are rolled as excess damage in another location.

If the damage is equal to or less than the amount the system can take, apply the damage to it, and the hit is resolved. If the damage is more than the system can take—for example, more hits than the system can take, or major hits when the system takes damage in only minor hits—reduce the number of damage points by the maximum amount required to destroy the system (e.g., 20 damage points would be absorbed by a system that could take 2 minor hits, 40 points by a system which could take 1 major). Note that while a minor hit could be caused by only 1 damage point when the damage was less than or equal to the maximum sustainable damage, that same minor hit would absorb 10 damage points when absorbing energy from a damage quantity greater than it could completely absorb.

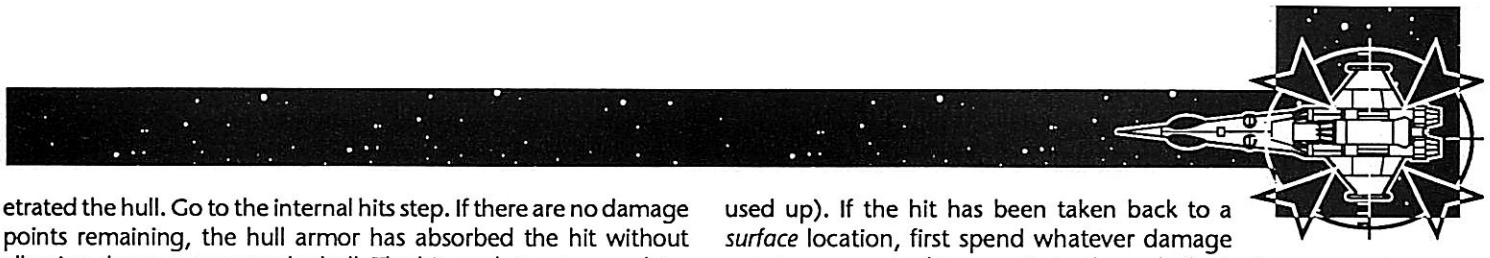
Any leftover damage points are then taken to the hull penetration step.

Hull Penetration: This is only conducted if damage points remain from particle accelerator or laser hits after the surface damage step. Meson guns skip this step.

Find the armor value of the craft's hull on its data profile sheet. (Some craft have different armor values at different hit locations, which is clearly indicated in the "Notes" section. If this is the case, use the armor value for the correct hit location.)

If the hit is by a particle accelerator, whose damage points and penetration value are the same, subtract the hull's armor value from the hit's penetration value to see if the hull was penetrated. For lasers, whose damage points represent their damage value, multiply the armor value by the penetration rating for that range to see how many damage points are used up (round all fractions *up*) in penetration.

If there are damage points remaining, the weapon has pen-



etrated the hull. Go to the internal hits step. If there are no damage points remaining, the hull armor has absorbed the hit without allowing damage to enter the hull. The hit resolution is complete.

Internal Hits: Look in the Internal Explosion column of the hit location to find the system hit there. As with surface hits, there may be a D20 roll to decide which of several types of systems is hit—for example, the *Gazelle*'s hit location 1 where 1-10 means an Electronics hit and 11-20 is a Quarters hit.

Sometimes the result is a specific system, such as Laser Barbette (*Gazelle* locations 10 and 11), and sometimes the result is rolled with 1D10 on the Damage Type chart as described under Surface Hits.

Internal Armor: Some starships have, in addition to the armor of their hull, additional internal armor surrounding one or more systems. These systems and their armor value are indicated on the ship data profiles and control panels. If one of these armored areas is hit, the weapon must first penetrate the additional armor on that area before proceeding to the internal damage step.

Internal Damage: This is conducted in the same basic manner as surface damage.

However, there are additional limits on the amount of damage that can be absorbed by internal systems. There is a maximum amount of damage that can be deposited in one system by one hit. This maximum is 5 major damage results or 120 damage points, even if the system has hit boxes remaining.

There is also a maximum amount of damage that can be absorbed by a crew hit result; this is 1 major hit (40 damage points) for a crew section with more than one crewmember, or 1 minor hit (10 damage points) for a crew section with only one crewmember (such as an MFD or turret).

Excess Damage: After a system has absorbed the maximum possible damage (because it has been destroyed or it has absorbed the maximum levels just described), any remaining damage points are rolled again as excess damage, meaning that the energy goes to damage another system in the same or adjacent hit location.

Roll 1D6 on the Excess Damage Location table to see where the excess damage goes. Use the following notes to interpret the results:

Excess Damage Location

1D6	*Area*
1	–1 internal area
2-3	Same internal area
4	+1 internal area
5	–1 surface area
6	+1 surface area

–1 or +1 internal means that an adjacent internal area has been hit, either 1 place lower or higher on the hit location chart (i.e., hit location 15 becomes 16 on +1, 14 on –1). If this would move the hit location off the chart (by reducing it to 0 or increasing it to 21), the hit instead becomes additional surface damage in the same hit location.

The notation "same internal area" indicates that an additional component in the same area absorbs the excess damage.

The notation –1 or +1 surface area indicates that the additional damage is applied to a surface area adjacent to that original hit, either one higher or one lower on the chart. If this would move the location off of the chart, reverse the sign.

Once the new hit location is determined, determine damage normally using the damage tables. If the excess damage has moved to another internal location and there is still excess damage remaining after the new hit is resolved, roll for excess damage again (and again and again until all damage points are used up). If the hit has been taken back to a *surface* location, first spend whatever damage points are required to penetrate through the hull armor again. Then apply damage to surface fixtures there according to the normal procedure. However, if the hit result at the location is bare hull, all remaining damage points are vented to space with no further damage. If a surface fixture was hit and excess damage remained after destroying it, that remaining excess damage is also vented to space.

Example: Our friend the *Gazelle* is hit by a 300 Mj Laser Barbette at a range of eight hexes (short range—see the barbette listed on the *Gazelle*'s own data profile) through its bow quarter arc (hit locations 1-19 for a wedge hull form). At this range the damage value is 45 and the penetration rating is 1/14. A hit location of 1 is rolled, and a 6 is rolled on 1D20 for the surface hit column, showing that an antenna was hit. A roll of 3 on the Antenna column of the Damage Type chart shows that the antenna hit was for a communicator. The *Gazelle* has two communicators, a radio and a maser. A roll of 2 on 1D6 indicates that the radio antenna was hit.

The radio antenna can take 1 minor hit, so absorbs 10 damage points of the 45 and is destroyed.

35 damage points remain to penetrate the hull, which has an armor value of 62. Multiplying 62 by the penetration rating gives ($62 \times 1/14 = 4.43$ rounded up to) 5 damage points used up in penetration, leaving 30 for internal hits.

Location 1's internal column requires another 1D20 roll to decide between an Electronics and a Quarters hit. The roll is 9, so it is Electronics. Going back to the Damage Type chart, this time using the Electronics column, we roll a 2, again getting a Communicator result. As this is an internal hit, this would be a hit on the communicator's internal controller, rather than its external antenna. Rolling a D6, we get a 3, indicating a hit on the radio controls. The player is lucky; this was essentially a free hit, as the radio was already useless without its antenna. The radio controller takes 1 minor hit, so absorbs 10 damage points and is destroyed, leaving 20 excess damage points.

Rolling on the Excess Damage Table, a roll of 4 indicates that the damage goes to +1 internal area: hit location 2. All internal damage in location 2 is rolled on the Electronics column of the Damage Types chart. A D10 roll of 9 indicates a Bridge Crew hit. The remaining 20 damage points are enough for 2 minor hits against the crew, which indicates that two casualties are taken.

Damage Effects

Damage is taken and recorded in two basic ways: by systems which are divided into the number of minor and major hits they can sustain ("hit box systems"), and systems (such as crew, fuel, and cargo) which are recorded in other terms ("non-hit box systems").

Hit Box Systems: As damage is taken by ship's systems, mark off the proper number of damage boxes on the control panel. It is suggested that this be done in pencil, as successful damage control tasks (page 25) can remove hits. Once all of the boxes are marked off, the system is destroyed and cannot function or be repaired. As long as some damage boxes remain unmarked, the system may still function, although at reduced levels. Note that systems which are defined in terms of minor hits may only take minor hit damage, while systems that are defined in major hits may take either. However, only major hits cause hit boxes to be marked off; minor hits on these systems have

different effects (see "Degraded Performance and System Resets," below).

The specific effects of a system losing hit boxes and being destroyed or out of service due to system resets are as follows:

Weapons, MFDs, Defensive Weapons or Screens, Communicators, Sensors, and ECM: The destroyed system may not be used nor provide its benefits (e.g., EMM), and for weapons and defenses, any listed crewmembers are casualties when the system is destroyed. Non-destroying hits cause system resets and degraded performance (below). Systems which have an antenna are useless if the antenna is destroyed. Degraded performance or system resets on the antenna confer these effects on the entire system.

Missile Launchers: Damage to missile launchers (turrets and barbettes) also destroys their missiles. Each non-destroying hit destroys missiles: one per minor hit and 1D6 per major hit.

Computers: If there is more than one computer, each time a computer is destroyed, the next computer takes over its functions. Once all computers on a ship are destroyed, all tasks become one difficulty level harder (+1 Diff Mod), and the ship may not use its jump drive.

Staterooms and Low Berths: These are "free hits" from a combat standpoint, although passengers or crew with no battle stations occupying the rooms or berths may be killed by such hits, as ruled by the referee in refereed games. Roll randomly to determine specific stateroom.

Life Support and Emergency Life Support: Once both these systems are destroyed, all crew must be in vacuum suits and all tasks become one level more difficult (+1 Diff Mod). See also Critical Hits, below.

Gravitic Compensators: If this system is not functioning, each turn in which the ship expends more than 1 G-turn maneuvering, all tasks are conducted at +1 Diff Mod for each additional G-turn of maneuver. Crewmembers strapped into a workstation ignore 1 additional G-turn of maneuver before Diff Mods set in. Any G-turns spent on evasion increase difficulty by +1 per G-turn, crewmembers in workstations ignore the first +1 Diff Mod. Crewmembers not in workstations (i.e., damage control parties) may not function at all at 2 G-turns or more of evasion.

Sickbay, Labs, Machine, and Electronic Shops: These have no immediate combat effects, but have obvious roleplaying and campaign consequences.

Jump Drive: If destroyed, the ship may not enter jump space. If not destroyed, find the percentage of hit boxes that have been marked off. Multiply the ship's standard jump performance by this number, and round fractions down. This is the current jump performance number. A jump of this or lesser range may be attempted, but with a +1 Diff Mod, in addition to any degraded performance Diff Mod. If the jump performance has rounded down to 0, the ship may attempt a jump 1, but with an *additional* +1 Diff Mod, thus the highest possible Diff Mod is +3.

Power Plant: Each hit on the power plant eliminates the listed portion of the ship's power generation capability. System Reset (below) results only affect one hit box worth of power as well, with only one system reset allowed at a time.

Contra-Gravity: Landings on and take-offs from planetary surfaces are impossible.

Non-Hit Box Systems: These systems have specific instructions regarding the effects of damage, as follows:

Crew: A minor Crew hit causes one casualty, and a major hit causes 1D6. (Note that an MFD operator may become a casualty on either bridge crew hit or an MFD hit where the subsequent D10 roll indicated "crew.")

Fuel: Starship fuel tanks have self-sealing features. A minor hit causes the loss of 1D6 displacement tons of fuel before tanks reseal. A major hit causes the loss of 1D20 displacement tons of fuel before tanks reseal.

Objects: Objects include cargo, vessels carried in the hangar, and other items not actually a part of the ship. If these objects are not being used in the battle, the major damage should be recorded and determined later. However, scenarios will indicate their damage capacity for purposes of destroying the cargo and for absorbing damage which would otherwise be distributed to other areas of the ship. Because ship's cargoes are normally generated by displacement tons rather then metric tonnes, use the following rule of thumb: When not otherwise indicated or able to be determined, assume that each metric tonne of a typical cargo will absorb 1 damage point (being destroyed in the process). Thus, each displacement ton of typical cargo will absorb 14 damage points. For unusually dense or light cargoes (ingots of gold on the one hand, or light bulbs packed in Styrofoam on the other) adjust these figures down or up accordingly.

System Resets and Degraded Performance: Whenever a system suffers damage (major or minor) which does not destroy the system (this includes systems which are defined in terms of major hits and suffer minor or major hits), roll a die and consult the minor damage table. The two results are System Reset and Degraded Performance.

System reset means that the system is off-line for the next combat turn and may not be used, but that it comes back on-line the following turn and may be used normally. If the ship's computer suffers a reset result, and there are no backup computers available, all ship's systems reset. When this result is received, place a System Reset marker by the system with the arrow clearly pointed at the system, and with the Next Turn side up. During the Turn Record Phase of each turn, System Reset markers on their Next Side are switched to their Current side, and all markers on their Current side are removed to indicate that the system will be back up on-line the following turn. Note that a System Reset on a power plant does *not* affect the entire power plant, but only one hit box worth of the plant, as discussed under Hit Box Systems above.

Degraded Performance means that all tasks conducted with that system are conducted with a +1 Diff Mod. This applies principally to sensors, weapons, jammers, jump drives, etc., which have clearly defined tasks associated with their use. However, the following systems experience special effects from DP results:

Computer: All ship tasks are conducted with a +1 Diff Mod. However, if another undamaged computer is available, this computer takes over with no penalty.

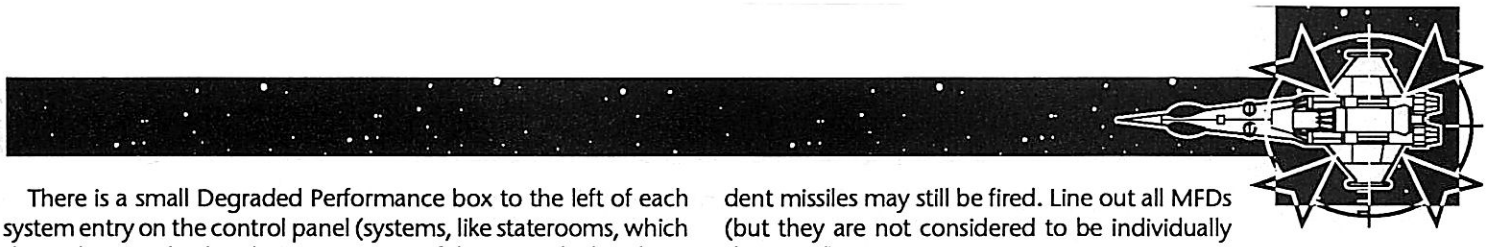
Life Support and Emergency Life Support: Degraded Performance has no game effects; the boxes are included to allow roleplaying effects.

Gravitic Compensators: All damage control tasks are one difficulty level harder (+1 Diff Mod).

Power Plant: All damage control tasks to repair the power plant are performed with a +1 Diff Mod.

Contra-Gravity: Any attempt to land on or take off from a planet becomes a Difficult task (Pilot [Interface/Grav]) instead of automatic. Failure indicates an abort back to the planetary surface or orbit; Catastrophic Failure indicates a crash, and the vessel is destroyed.

Maneuver Drive: The ship may no longer divide its acceleration between maneuver and evasion; it must do one or the other in any given turn.



There is a small Degraded Performance box to the left of each system entry on the control panel (systems, like staterooms, which do not have such a box have no meaningful way in which to have their performance degraded for combat purposes). Mark this box with a check or "x," but use pencil as damage control can remove this result. So long as the Degraded Performance box is already checked, all subsequent minor damage results result in a System Reset.

System Redundancy: Most ships carry more than one computer, and so whenever the computer suffers damage, one of the backup systems will automatically take over without interrupting the function of the other ship systems. For simplicity, all computer hits are assumed to be on the computer currently on-line. This means that if two different weapons scored computer hits in the same turn, and the first hit took the primary computer off-line, then the first backup computer would come on-line and be damaged by the second hit.

Carried Vehicles and Vessels: If damage is taken on a carried vehicle or vessel, it should be treated as a hit on the vehicle or vessel just as if it were in combat (except that, if unmanned, it cannot suffer personnel hits, and these are rerolled).

Radiation and EMP Damage: Any hit by a particle accelerator on any part of a ship will automatically cause all computers, except those with fiber-optic circuits, to suffer a System Reset result (fiber-optic computers suffer no additional ill effects). Also, any particle accelerator damage that rolls a Crew hit does twice the normal number of casualties (2 on a minor, and 2D6 on a major hit).

Critical Hits: Under certain circumstances, a weapon may cause one or more critical hits. This is a function of the damage value of the weapon compared to the size of the target ship. The Critical Damage Level table indicates whether a critical hit is achieved by a weapon and, if so, how many.

If one or more critical hits are achieved, there is a chance that the ship will be vaporized by massive internal explosions. Roll 1D20. If the roll is less than the number of critical hits achieved, the ship is vaporized. If it is equal to or greater than the number of hits achieved, the ship suffers only the actual number of critical hits shown. Roll the appropriate number of critical hits on the Critical Hits table and apply the result immediately.

There are 11 distinct critical hits possible. As critical hits are scored and applied differently than normal hits, keep track of them separately.

Bridge Destroyed: The ship's bridge explodes, destroying all controls located there (including maneuvering, astrogation, sensors, MFDs, and communication equipment) and killing or incapacitating the entire bridge crew. The ship is no longer capable of maneuvering, entering jump, acquiring new sensor fixes, detecting new targets, communicating, or operating screens. Weapons with local fire control stations may continue to engage targets which have already been acquired by the ship's sensors, but do so at one difficulty level higher (+1 Diff Mod). Ships equipped with more than one bridge (main operating, auxiliary operating, fire control, flag, etc.) roll to see which is destroyed. Ships with another crewed operating bridge may shift control functions there beginning the following turn. Mark off all appropriate crew as casualties, and MFDs if they were located on the destroyed bridge.

Fire Control: Destroyed circuitry and power spikes disable the ship's fire control interface between weapons, sensors, and targeting processors. The ship may not fire any energy weapons, nor may it operate missiles (all non-fully independent missiles currently in flight are considered lost). Ship's defenses (sandcasters, nuclear dampers, meson screens) continue to operate, and fully independent missiles may still be fired. Line out all MFDs (but they are not considered to be individually destroyed).

Power Plant: The power plant is seriously damaged and goes off-line. It may not be repaired or restarted for the duration of the scenario. The ship goes on auxiliary power/batteries. The ship may not maneuver, fire energy weapons, nor operate any active sensors or screens. The ship may fire missiles and operate sensors in passive mode at +1 Diff Mod. Line out the power plant.

Sensors: Destroyed circuitry and power spikes disable all sensors. The ship may no longer acquire new sensor locks. All weapons may continue to engage targets which have previously been acquired by the ship's sensors, but do so at +1 Diff Mod. Line out all sensors.

Life Support: The ship's life support has failed and the hull's integrity has been breached, and the crew must rely on their vacuum suits for survival. All tasks are conducted on +1 Diff Mod. This has no additional effect on crews which were at battle stations in their vacuum suits, as these suits have sufficient air and power to keep the crew alive for the remainder of the scenario. However, this result does have potentially dire consequences for the long term. Crews which were for some reason not suited up must spend the entire next turn suiting up and may not conduct any other action. Line out the Life Support and Emergency Life Support systems.

Fuel Explosion: Liquid hydrogen and oxygen escape from shattered storage tanks, combine in the internal spaces of the ship, and explode. Roll for one damage result on the internal explosion table, with the damage value of the explosion determined by the ship size. See the Fuel Explosion Damage Value table.

Artificial Gravity: The ship's artificial gravity and G compensators fail. See the Gravitic Compensators destruction effects above. Line out the Artificial Gravity and G Compensator systems.

Jump Drive: The ship's jump drive is seriously damaged and the ship may not enter jump space until it is repaired. Line out the Jump Drive.

Maneuver Drive: The ship's maneuver drive is seriously damaged and it may not maneuver or evade until it is repaired. Line out the Maneuver Drive.

Spine: The ship suffers serious structural damage that throws the vessel out of alignment. Any spinal mount weapons are rendered inoperative. In addition, the maneuver drive thrust line is no longer centered on the ship's axis of mass, and so any acceleration must be accompanied by constant attitude correction. Each time the ship accelerates, a Difficult task (Pilot [Interface/Grav]) is required to avoid inducing a tumble. For each G less than the full rating of the power plant used, reduce the task difficulty level by 1. Failure results in the ship beginning to tumble, and Catastrophic Failure indicates a severe tumble. In the case of a tumble, the ship may not maneuver or evade in the next combat turn, as it corrects the tumble, and all tasks are conducted at +1 Diff Mod. The same is true of a severe tumble, except that tasks are at +2 Diff Mod.

Computer: Destroyed circuitry and power spikes disable the ship's data bus and information processing systems. The ship may not launch small craft or enter jump. All other tasks are conducted at one higher difficulty level (+1 Diff Mod). Line out all computers.

DAMAGE CONTROL

Players may attempt to repair damage suffered during the current or preceding combat phases during the Damage Control Phase of each turn. These repairs may be attempted using *damage control crew* as listed on the spacecraft control panel.

Damage control crewmembers may be used

singly or in groups to repair one of three kinds of damage: major hits, minor hits, or system resets. Major and minor hits may only be repaired if there are unmarked hit boxes left in the system, because any system with all its boxes marked off is completely destroyed. Critical hits may also not be repaired during the course of a **Brilliant Lances** scenario.

Control panels show the number of crew available for damage control under Damage Control parties. These crewmembers may be assigned individually or in groups to repair damage. The more crew assigned, the lower the task's difficulty. Each crewmember can only be assigned to one damage control task per Damage Control Phase, and a maximum of three crew can be assigned to each task—see the table below.

Damage Control

# Crewmembers	*System Reset*	*Minor Hit*	*Major Hit*
1	Difficult	Formidable	Impossible
2	Average	Difficult	Formidable
3	Easy	Average	Difficult

These crew may only be assigned to repair damage to internal, not hull surface, systems, but these systems may be anywhere in the ship. Engineering crew may also be used to make damage control rolls, but only to systems listed in the engineering section of the control panel. Engineering crew may be combined with damage control crew on such tasks. (Asset used is Ship's Engineering for all systems except those listed in the Electronics block, for which the Electronics asset is used.)

Success indicates that the repair is effective immediately, so a system reset that would have lasted for the entire following turn will not take place at all. Outstanding Success also indicates that a degraded performance result on the system is also removed. Note that without an Outstanding Success, a system can be repaired back to its full level (i.e., all hit boxes unmarked) and still function at its degraded performance level. Catastrophic Failure indicates a system reset in addition to already-existing damage (if the equipment will already be under a system reset the following turn, there is no additional effect).

Energy Allocation and Powering Down Systems: Brilliant Lances does not require players to make decisions each turn on how to assign power. **Traveller** starships are usually designed with sufficient power for all installed systems to function at once. However, as combat damage reduces the power produced by the ship's power plant, players may be required to power down certain systems in order to bring energy consumption into line with production.

During the Damage Control Phase, after the turn's damage control tasks have been attempted, players must cut power to systems so that the total power consumed in megawatts is less than or equal to the amount produced by the power plant. Each system has its MW requirement listed with it, and the maneuver drive has a listing of the amount of power needed for each G of its G rating. To show that a system has been powered down, place a Powered Down marker by the system so that the red arrow in the upper right hand corner of the marker is pointed at the shut down system. On the reverse of these counters are Powered Down markers with the notation 2, 3, 4, 5, and 6. These are used to show how far the maneuver drive has had its power reduced. For example, a maneuver drive with a G rating of 4 would have a Powered Down 2 marker placed on it to show that it was reduced to enough power for only 2 G-turns.

Even systems which are damaged require their full MW input to function at their damaged levels. The one exception is weapons which have been overpowered to increase their hit probabilities. A weapon boosted to –2 Diff Mods could have its power cut in half and would function at –1 Diff Mod (use a Powered Down marker), or have its power divided by 10 and function without its overpower Diff Mod (use a Powered Down 2 marker). A weapon functioning at –1 Diff Mod could have its power divided by 5 to function without its overpower Diff Mod.

BOARDING ACTIONS

Disabled enemy ships may be boarded. Disabled ships have no functioning maneuver drive and no weapons which can fire at the boarding vessels. Unfortunately, there is no way to tell whether an enemy vessel is disabled or playing possum. In **Brilliant Lances**, players will have a general idea of each other's damage because they jointly roll damage results. However, there is no need for either side to tell the other the exact damage status of their ships.

In order to board, the boarding vessel must match vectors with the disabled ship. On the turn following matched vectors, boarding may begin in the Launch Phase, when the boarding player decides how many and what variety of personnel to send over. Reinforcements may be sent each subsequent Launch Phase.

Procedure: Assuming that a vessel is disabled, divide the displacement tonnage of the ship being boarded by 500, and round to the nearest whole number (except that numbers less than 1 always round up to 1). The result is the number of hull sections.

Each game turn, during the Launch Phase, the boarding and boarded player each roll 1D6 and add the following die modifiers (DMs): +1 per Marine (combat armor-equipped combat troop trained in Environment Suit and Zero-G skills), +1 per 2 (non-Marine) troops, and +1 per 10 (non-Marine, non-Troop) crewmembers, and +2 if defending. The player with the higher adjusted die roll captures one hull section, except that a side which took the +2 defending DM does not take any additional hull sections. If both sides choose the defending die roll, no hull sections will change hands. The boarding player must always be attacking (i.e., forego the defending die modifier). Regardless of the winner, each side takes casualties equal to the adjusted die roll of the other side.

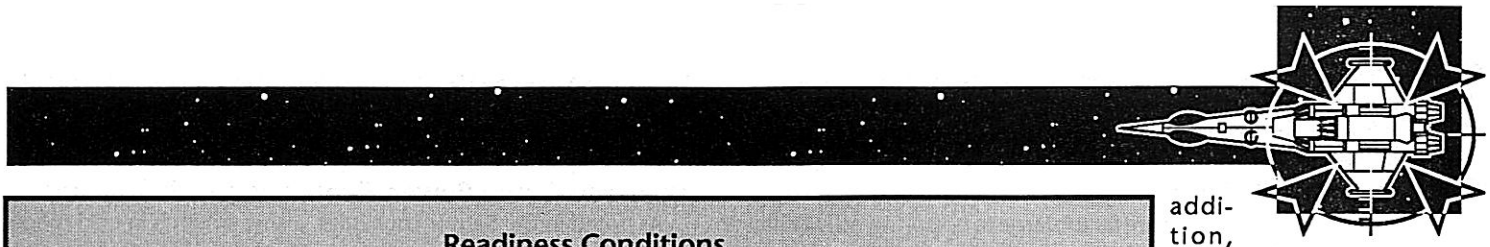
Combat continues until all hull sections belong to one side. If the boarding side loses, the survivors may return to their own vessel. If the boarding side loses, surviving members are captured.

SURPRISE

Surprise is determined only once per scenario. Surprise is possible for either side, and the element of surprise gives an advantage both in attacking and in avoiding the enemy. In some cases surprise is indicated in the scenario instructions, but it can also be determined by the players.

Surprise is a Formidable task (Fleet Tactics). It is rolled by the side which first makes a sensor lock on an enemy (referee's decision, based on the relative sensor and crew qualities of the ships).

Benefits of Surprise: The vessel(s) which was surprised may not maneuver or fire on the first turn it was surprised, unless it is able to man battle stations. Manning battle stations is a Formidable task (Leadership). Battle stations are always manned on the first full turn following surprise.



Readiness Conditions

Name	Description	Effects on Readiness	Max Periods	Side Effects
Condition 0	Normal cruising	Normal	—	None
Condition 1	Alert status	–1 Diff Mod	6	+1 Diff Mod per two periods
Condition 2	Battle stations	Automatic	3	+1 Diff Mod per period

Readiness: Under certain circumstances, players or scenario instructions may stipulate that their vessels are operating at alert status, with some battle stations already manned, or at battle stations. If operating under alert status, the roll to man battle stations is one difficulty level easier (–1 Diff Mod). However, these levels may not be maintained indefinitely. There is a maximum number of consecutive four-hour periods for which these conditions can be maintained, shown on the Readiness Conditions table above. Each additional consecutive four-hour period beyond these limits imposes a +1 Diff Mod on every task attempted by every crewmember. Thus, if Captain Queegulii kept his crew at battle stations for 20 hours, beginning at 12 hours and one minute, all tasks would be one difficulty level higher. Beginning at 16 hours and one minute, all tasks would be two levels higher. These penalties remain in effect until at least three consecutive periods (12 hours) are spent at condition 0. So, in the example, if Queegulii let his crew stand down after 20 hours, but called them back to battle stations after only four hours, they would still perform their tasks at two difficulty levels higher.

In addition, once the crew has returned to normal cruising status, the roll to man battle stations is increased in difficulty if the crew had been standing at alert status or battle stations for a long period of time. For each consecutive period at battle stations or two consecutive periods at alert status, the roll to man battle stations is increased in difficulty by one level (+1 Diff Mod). This penalty is decreased by one level for each subsequent period spent at normal cruising. Thus, a crew which had been at alert status for four consecutive periods (16 hours) would be at +2 difficulty levels to man battle stations during the first period after they stood down, +1 level the period after that, and back to normal after two full periods of normal cruising.

Furthermore, no maintenance or repairs (this applies only to the **Traveller: The New Era** roleplaying rules) can be conducted under either condition 1 or 2, although damage control may be.

MISCELLANEOUS OBJECTS AND ISSUES

Recording Fuel Use: Each ship data profile and control panel lists the amount of fuel (in m^3) use for each G-turn expended by a craft. The Plotting and Movement rules indicate that the amount used is to be recorded each Plotting Phase. In addition, the damage rules show how volumes of fuel may be lost to major and minor hits. These figures are not always relevant, and in many scenarios players can ignore keeping careful track. However, some scenarios portray situations in which ships need to have fuel left over for activities after the end of the scenario. In these cases, players should be careful to track the fuel used through maneuver as well as lost to combat, as fuel use figures in the victory conditions.

Sensor Drones

Drones are basically larger missiles which carry sensors and do not blow up, but return to their owning ship to be used again. In addition, some very large fully independent missiles also use these rules.

A variety of sensors are listed in the *Technical Booklet* along with their characteristics, such as sensors, G rating, armor, size, etc. When firing on a drone, do not use firing arcs or hit locations. If a hit is scored, merely use the Drones column on the Damage Type chart. Each one of the listed systems can absorb 1 minor hit, unless otherwise listed on its characteristics list. If excess damage points remain after inflicting a minor hit, roll again on the table until the damage is used up. Results of Sensor and Communications must be rolled to see if they are antenna (1-3) or internal controller (4-6).

Sensor drones and missiles are also highly susceptible to critical hits—use the separate critical hits table for unmanned craft. Control system indicates that the craft loses all control and goes stupid. Although it will coast through space forever, it is removed from play. Payload indicates that its primary reason for being has been destroyed, whether it was a missile warhead, all of a drone's sensors, or an area jammer. Fuel indicates that the target is destroyed in a massive explosion of its fuel.

Some drones are controlled by an operator aboard the launching ship, and like missiles, are automatically in contact if they remain within the short range of their installed communicator. If communication contact is lost, the drone simply coasts. Other drones are fully independent craft which are controlled by the player but do not need to be controlled by any crewmembers aboard the launching vessel. These drones are given a crew quality rating that is used when it attempts sensor locks and communications tasks with friendly ships to pass sensor lock hand-offs to them, etc.

Gravity

Gravity has very little effect in **Brilliant Lances**. This is because Gs are measured in whole numbers, and no worlds which fit onto **Brilliant Lances** counters extend their 1 G field out of their own hex. Larger bodies such as stars and large gas giants would certainly do so, and sample figures are given below. However, **Brilliant Lances** does not contain templates for such large bodies, but players should feel free to make their own.

Effects: Any craft that is within the 1 G threshold of an astronomical body has 1 G-turn added to its vector each turn in a direction directly at the center of the body. A craft within the 2G threshold as 2 G-turns added to its vector each turn, and so on. These G-turns must be counteracted by the craft's own drives, or else its vector will be bent toward the gravity source.

G thresholds are calculated by using the formula

$$\frac{\sqrt{GM+g}}{3\times10^{7}} = \text{range in hexes}$$

$G = 6.67\times10^{-11}$
M = body's mass in kg
g = 9.8 × G threshold desired

Remember to subtract the body's radius to get the range above its surface to the threshold.

Stars

Stars are far too large to be portrayed in **Brilliant Lances.** In the **Brilliant Lances** scale, our sun would have a diameter of 46.5 hexes. Its 1 G threshold would extend out another 99.5 hexes from its surface (2G threshold at 63.5 hexes, 3Gs at 47.6, 4Gs at 38 hexes, etc.), and there would be tremendous + Diff Mods against sensor tasks within this area and beyond.

Planets

At the scale and distances from the system's primary star represented in **Brilliant Lances,** the orbital paths of planets show no curvature and are treated as perfectly straight lines. Planets may be given a heading and velocity in the scenario instructions, and these will not change during play for any reason.

The planets represented by counters in **Brilliant Lances** are Terra-size worlds, as even small gas giants take up multiple hexes.

Take-Off and Landing: Any ship that wishes to land on a planet must first match vectors with it in the same hex. This means that craft must spend one turn in which their movement from hex to hex is identical to that of the planet. On the first turn following, the craft can announce that it is landing, which takes the entire turn. Craft which are landed on a world have a +2 Diff Mod applied to sensor tasks against them if the world has an atmosphere of Very Thin or less, +3 if the atmosphere is Thin or greater, and +4 if the atmosphere is Exotic, Corrosive, or Insidious. In addition, any craft landed on a planet with a Hydrographic rating of 1 or more may declare that it is underwater, in which case an additional +1 Diff Mod is applied.

Taking off from a Terra-sized planet also takes a full turn. At the end of this turn, the craft has a vector identical to that of the planet.

Sample Planets: To assist players in designing their own scenarios, the following planetary statistics from our own Solar System are presented in **Brilliant Lances** terms as examples. 1 G threshold is given in hexes beyond the planet's surface. Velocity is orbital velocity, and has nothing to do with the rate that our entire Solar System is scorching around the core of the Milky Way (12 hexes per turn, in **BL** scale, is our "local standard of rest" for you trivia freaks).

Planet	*Diameter in hexes*	*1 G Threshold*	*Velocity in hexes per turn*
Mercury	0.16	Below surface	2.87
Venus	0.40	Below surface	2.1
Earth	0.43	Surface	1.787
Mars	0.23	Below surface	1.45
Jupiter	4.76	1.4 hexes	0.78
Saturn	4.00	0.07 hexes	0.58
Uranus	1.86	Below surface	0.41
Neptune	1.62	0.07 hexes	0.33

There are two equally valid ways to handle planetary (and asteroid belt) motion in **Brilliant Lances.** One is to have the maps represent a motionless chunk of space and have the astronomical bodies move across them at their appointed rates. Another is to pick the planet or asteroid belt as the frame of reference so that they remain motionless and drag the visual window represented by the map along with them. Both are perfectly correct, but the latter is usually much easier.

Powered Down Power Plants and Crash Startups

As noted in the Sensor Lock rules, a ship which is in cold mode, with its power plant powered down to minimal levels (assume 1% of maximum power plant output), presents a very difficult target to passive sensors. However, this tactic can backfire if the ship has to start up quickly. To bring the power plant up to full power normally requires a full 30 minutes, leaving the vessel vulnerable for an entire turn. Rather than waiting, the player may attempt a crash startup. This is a Formidable task (of Ship's Engineering). Success indicates that the power plant is brought up to full levels almost immediately, allowing the craft to exercise its full functions in the current turn, including maneuver. Failure indicates that the vessel will not be powered up until the following turn, while Catastrophic Failure means that the power plant has just suffered 1 major damage result, and startup is delayed one additional turn.

Black Globes

Black globes are highly sophisticated and exotic defensive screens. Even at the height of the Third Imperium's technology, only the most basic black globe screens could be reproduced. The best black globes in use were recovered relics from an ancient civilization that pre-dated humanity's starfaring days. Thus black globes are only rarely encountered.

Although these weapons are very advanced from an engineering and scientific standpoint, their use is very simple. Black globe generators create a spherical field around themselves which absorbs all energy that crosses it. This energy is shunted into capacitors within the hull of the protected vessel where it is stored. This screen can be also set to flicker at a set percentage rate in multiples of 10%.

Combat: When set all the way up, the black globe absorbs the energy of all weapons which successfully rolled to hit the target. For example, each hit from a 150 Mj laser would place 150 Mj into the capacitors of the protected ship.

When the weapon is set to flicker, all weapons which successfully rolled "hits" then roll to see if they were absorbed by the globe or passed through to hit the target normally. For each hit, roll 1D10 to get over the flicker rate divided by 10 (i.e., roll 2+ to get through 10% flicker, 3+ to get through 20% flicker, and so on). Hits which do not make this roll are completely absorbed.

Outgoing fire is not affected, as it is synchronized to match the flicker.

Capacitors installed aboard the ship will have a listed capacity in megajoules. If this limit is ever exceeded, the capacitors spontaneously discharge, inflicting 1D20 critical hits on the vessel, two of which must be a power plant and jump drive critical hit. Incoming sensor and communicator energy absorbed by the black globe is considered to be negligible.

Maneuver: When its globe is all the way up, a vessel cannot maneuver to change its vector or attempt to evade. When it is set to flicker, any Gs that are spent for a purpose are reduced in effectiveness by the amount of flicker (e.g., 4 G-turns to accelerate are reduced to 2 G-turns spent on acceleration by a globe set on 50% flicker). The lost amount of G-turns was absorbed by the globe: Use the megawatts per G-turn figure listed on the control panel to find how much power was sent to the capacitors.

Communications: Communications cannot pass through a full-up black globe, but they can be "stuttered" to pass back and forth through a globe that is flickering. Any communicator that attempts to contact a vessel with a flickering black globe does so with a Diff Mod of the flicker level divided by 30 and rounded to the nearest

whole number. However, a ship with a flickering black globe may attempt communication tasks with other non-globed ships at no increase in difficulty because it can synchronize its transmissions to match the flicker. A ship which has already been so contacted may then contact the globed vessel at no increase in difficulty because it has received the proper synchronization data.

Sensors: A vessel with its black globe fully up may not make or maintain any sensor locks.

Sensor lock attempts against a full-up black globe have a +5 Diff Mod vs. active sensors (radar and active EMS) and a +3 Diff Mod vs. passive sensors (HRT and passive EMS) for the black globe, and the only additional Diff Mods that apply are those for Target Size, Retaining Lock, Target Hand-Off, Terrain, Area Jamming, and White Out.

Sensor lock attempts against a flickering black globe or out of one use all of the standard sensor lock Diff Mods, with the addition of the black globe flicker Diff Mods. For both active and passive sensors, divide the flicker rate by 30 and round to the nearest whole number to get + Diff Mods. Thus, 10% is 0 Diff Mod, 20-40% is +1 Diff Mod, 50-70% is +2 Diff Mod, and 80-90% is +3 Diff Mods.

As with normal bogey sensor tasks, the target player is responsible for calculating certain of the Diff Mods for the lock task, but the emissions signatures of a flickering black globe are distinctive enough that anyone who attempts a lock on a flickering black globe should be given that information whether the attempt is successful or not.

Q & A

Q: My ship, with a G-rating of 1G, has a velocity of 4, and I am attempting to make a heading change to port. I have 3 G-turns of thrust accumulated toward the heading change. In the next Plotting Phase, instead of firing the last G-turn of thrust to complete the heading change, I instead expend 1 G-turn of thrust to decelerate. This makes my velocity 3, and I notice that I now have sufficient accumulated G-turns of thrust to make a heading change based on my new velocity. What do I do?

A: Make the heading change. Whenever there is a question of precedence in a vector adjustment, change the velocity first and then check to see if a heading change results.

Q: My ship has a G-rating of 1G and a current velocity of 1. This turn it spent 1/2 G-turn to change its heading one position. For purposes of determining my final facing for the turn, do I use the facing deviation for greater than 1/2 but less than full G-rating, or for full G-rating?

A: Full G-rating. The rules state that fractional G-turns may not be retained, which means that a full 1G was spent in order to receive the 1/2 G effect.

TOURNAMENTS

GDW will periodically sponsor **Brilliant Lances** tournaments for the summer convention season beginning in 1994. These will involve dogfights between two or more players who have equipped themselves on a fixed budget and other technological constraints. Ships and weapons published by GDW will be eligible for these tournaments, as well as those designed using the accompanying ship design sequence and that in **Fire, Fusion, and Steel.** However, all such homemade designs must be submitted to GDW and approved before they can be used, at which time they may be used by any entrant. All details will be presented in issues of ***Challenge,*** The Magazine of Science-Fiction Gaming.

INTEGRATION WITH TRAVELLER: THE NEW ERA

Brilliant Lances is intended to stand alone as a game and not presuppose knowledge of the **Traveller: The New Era** roleplaying game. However, many **Brilliant Lances** players will also be players of the roleplaying game, and will use it to resolve situations that occur in their roleplaying campaigns.

Crew Quality

When a ship manned by PCs is used in **Brilliant Lances,** all tasks should be resolved using the crew's actual assets, rather than the Crew Quality asset levels.

Traveller players will note that the assets assigned to Green, Trained, Line, and Crack crews are the same as those assigned to Novice, Experienced, Veteran, and Elite NPCs. They are given different names because Novice, Experienced, Veteran, and Elite NPCs are so defined because of their Initiative and skill in personal combat, not space combat. A Crack starship crew will not be the equivalent of Elite NPCs in terms of Initiative and unarmed combat. Many of them might even be Novice NPCs, but with very good assets in Sensors, Screens, etc.

Task	*Asset*
Communications	Communications
Control missile/drone	Gunnery (Missile) or RCV Operations
Crash-start power plant	Ship's Engineering
Damage control	Ship's Engineering or Electronics
Defenses	Screens (appropriate cascade)
Evasion	Ship's Tactics
Fire	Gunnery (Energy Weapons)
Jam radio	Sensors
Jam sensor	Sensors
Land/take-off from planet	Pilot (Interface/Grav)
Man battle stations	Leadership
Sensor lock	Sensors
Surprise	Fleet Tactics

Play with a Referee

When **Brilliant Lances** is used as part of a **Traveller: The New Era** roleplaying campaign, there will obviously be a referee present. The presence of a referee allows many interesting variations to be played.

Double Blind Play: In this variation, no Bogey markers are used, and the referee coordinates sensor lock tasks by the players, only placing pieces on the map once they have been locked up. In addition, damage rolls are made by the referee so that the firing player does not know what damage has been done, except by watching the subsequent performance of the vessel.

Scanning for Damage: Getting detailed data on what is going on within an enemy vessel is impossible at ranges of greater than one hex. The referee may allow players to scan enemy vessels in the same hex for life, functioning power plants and weapons, etc. Such tasks will require the integrated use of active and passive sensors, including neural activity sensors or densitometers. These sensor rolls will be uncertain tasks, and the information that the referee reports to the sensing player may or may not be true.

SCENARIOS

The scenarios presented in the game are described using the following format:

Name: The scenario name and number.

Date: The date is given in the standard Imperial dating system, with day of the year followed by the year number itself.

Location: The star system in which the battle takes place is listed in the standard **Traveller** format: system name followed by a slash and then sector name.

Background: This is a brief presentation of the historical events which led up to the battle.

Situation: This describes the actual situation the scenario covers.

Maps: The three maps will always be placed between the players side by side. The outer two maps will be named after one of the two sides (for example, in the first scenario reference is made to the Zhodani map and to the Imperial map), while the map in the center is always called the "neutral map." This naming convention is used to ease set-up and description of victory conditions, but has no effect on the actual course of play.

Forces: Both players have a section where their forces are described with respect to three major considerations.

Ships: The actual ships available in the scenario are listed along with the quality of the ship's crew, its readiness level at the start of the scenario, and any special considerations, such as depleted ammunition, low fuel, battle damage, or other non-functional systems.

Vector: The heading and velocity of each ship. Often the players will be able to decide this themselves, within limits described in this section.

Winning: This section lists the conditions each side must achieve to win. Usually only one side has detailed victory conditions, the other side winning by preventing the achievement of those conditions by their opponent.

SCENARIO GROUP 1
PERFIDIOUS ZHODANE

Scenario 1: Deep Black

Date: 242-1106

Location: Shionthy/Spinward Marches

Background: The Fourth Frontier War, also called the False War, was a short (1082 to 1084), inconclusive war fought between the Third Imperium and the Zhodani Consulate, primarily in the Jewel Subsector. Although it ended in a Zhodani withdrawal due to the Imperial victory at the Battle of Two Suns, the war served mostly to show that both sides were unprepared for war. Over the next two decades, both belligerents built up their heavy battle units while engaging in dangerous, and often violent, intelligence gathering along their borders.

Situation: The Imperial Navy has hidden a secret maintenance depot in the Shionthy asteroid belt intended to service battle-damaged ships on short notice. Zhodani intelligence has found out that there is a depot in the belts, but is anxious to find out its exact location

Maps: The Imperial player will set up anywhere on the Imperial map and the Zhodani player will enter from the outside edge of the Zhodani map.

The 21 Asteroid counters are placed Asteroid side up and mixed up. Each player takes turns (with the Imperial player going first) placing an Asteroid counter on the neutral map. No asteroid may be placed adjacent to an already-placed asteroid.

Once all of the asteroids are placed, the Imperial player may examine the backs of each counter. The counter with the starburst is the location of the maintenance depot. All other asteroids are simple rock.

Zhodani Consular Scouts

Ships: 1 *Chatl*-class leader scout, 2 *Ninz*-class scouts. All crews Crack and at battle stations.

Vector: Enter the map with a velocity of at least 1 and any heading desired.

Imperial Navy

Ships: 3 *Gazelle*-class close escorts, all crews Crack. Any one ship at Condition 2, the others at condition 1.

Vector: Set up on the inner map with any vector desired.

Winning: The Zhodani player wins if any Zhodani ship achieves a sensor lock on the maintenance depot and then gets the information back. (Each sensor lock on an Asteroid counter allows the player to look at the other side. All Asteroid counters, including the maintenance depot, are treated as Very Small [VS] targets for purposes of these locks.) To get the information back, the ship must either exit the map at either end (but not the sides) with functional jump drive, or it must communicate the information to another Zhodani ship which then exits the map at either end with functional jump drive.

Failing this, the Imperial player wins.

Scenario 2: Rearguard

Date: 294-1109

Location: Saurus/Spinward Marches

Background: The Fifth Frontier War (1107 to 1110) was the last in a series of continuing wars between the Third Imperium and its spinward neighbors. Following several years of unrest and provocation, Zhodani forces attacked across the Imperial Borders while previously placed guerrillas on selected Imperial worlds began uprisings. Vargr and Sword World forces allied with the Zhodani Consulate and also participated in the attacks.

Situation: As the war began to go against the Outworld Coalition, the Sword Worlds opened peace feelers to the Imperium. A high-ranking Sword World delegation was picked up by the *Lightning*-class cruiser *Bard Refuge* for transport back to Rylanor and direct negotiations with Archduke Norris. However, a local Zhodani commander got wind of the mission and attempted to intercept it. In the ensuing battle, *Bard Refuge* was badly damaged, losing most of her weaponry and having both fighter launch tubes disabled. As *Bard Refuge* now attempts to reach jump point, two of her fighters and a surviving escort must hold off the remaining Zhodani ships long enough for *Bard Refuge* to escape with its all-important diplomatic passengers.

Maps: The Imperial player will set up on either the neutral or Imperial map (and may divide his ships between the two maps), and the Zhodani player will enter from the outer edge of the Zhodani map. *Bard Refuge* has already exited the far edge of the Imperial map.

The 21 Asteroid counters are placed Asteroid side up and mixed up. Each player takes turns (with the Imperial player going first) placing an Asteroid counter on the neutral map. No asteroid may be placed adjacent to an already-placed asteroid.

Zhodani Consular Navy

Ships: 1 *Vlezhdatl*-class strike cruiser, 1 *Zhdits*-class destroyer escort, and 2 military boats from the *Vlezhdatl*. Crack crews at battle stations.

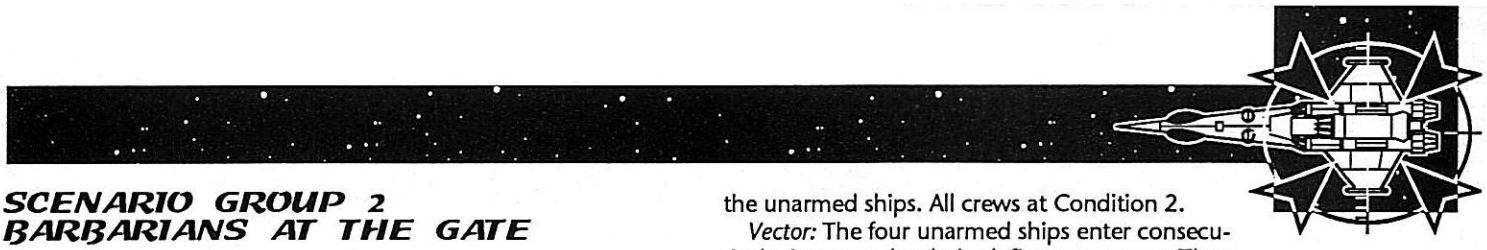
Vector: Maximum initial velocity of 3, any heading.

Imperial Navy

Ships: 1 *Chrysanthemum*-class destroyer escort, 1 *Valor*-class missile corvette, 5 Rampart fighters. Crack crews at battle stations. The *Valor* has expended half its missiles. The *Chrysanthemum* has had its starboard particle accelerator destroyed in the previous fight.

Vector: Any desired vectors.

Winning: The Zhodani player wins if the *Vlezhdatl* exits the far end of the Imperial map still able to maneuver and fire its particle accelerator, or if any two Zhodani ships (no more than one of which may be a boat) exit the far end of the Imperial map able to maneuver and fire at least one laser. In either case, the Zhodani player must do so before the end of the 20th turn, or *Bard Refuge* will have had time to reach its jump point and escape. Failing this, the Imperial player wins.



SCENARIO GROUP 2
BARBARIANS AT THE GATE

Scenario 3: Lackland Sons

Date: 049-1128

Location: Yaggoth/Reaver's Deep

Background: Aslan culture is both territorial and aggressive, and there is powerful pressure on unlanded younger sons (the *Ihatei*) to seek land at the expense of their neighbors. As central order began to break down in the Imperium during the civil war, the waves of Aslan invaders, particularly in the Reaver's Deep Sector, became almost a part of everyday life.

Situation: An Aslan clan transport, with an armed trader in company, move into the Yaggoth system to land an *Ihatei* storm group. With most of the first-line colonial naval vessels drawn away by the civil war, the local forces oppose the Aslan with a scratch force.

Maps: The Imperial player places a Planet counter (representing Yaggoth) anywhere on the Imperial map, but at least four hexes from any map edge.

Aslan *Ihatei* Squadron

Ships: 1 Aslan clan transport, 1 Aslan armed trader. Crews Crack and at battle stations.

Vector: The Aslan enter from the far edge of the Aslan map at any desired velocity and heading. Crews Line.

Colonial Squadron

Ships: 1 armed free trader, 2 system defense boats (SDBs), 1 modular cutter with TL 11 laser gunpack (see page 18, *Technical Booklet*). The SDBs have Line crews, the modular cutter has a Trained crew, the armed free trader a Green crew. All crews at battle stations.

Vector: Any one ship may begin anywhere on the Imperial map with any desired vector. The other ships begin in orbit around Yaggoth.

Winning: The Aslan player wins if at any time the Aslan clan transport is in orbit around Yaggoth, it is still capable of maneuvering, and there are no Colonial vessels capable of firing in orbit around Yaggoth at the same time. Failing this, the Colonial player wins.

Scenario 4: Corsair!

Date: 301-1128

Location: Flire/Vland

Background: Following the withdrawal of the Corridor Fleet to Capital, an avalanche of Vargr raiders swept through Corridor and Vland Sectors. Lacking any central direction, the Vargr moved here and there, bypassing many systems at first, and raiding haphazardly as they went.

Situation: A Vargr raiding group reached Flire in 1127, but found the local defenses too strong to overcome. Instead, the small squadron decided to lay low in one of the system's planetoid belts and jump one of the merchant vessels making the regular run from the colony worlds on the moons of the system's gas giants back to the main world of the system.

Maps: The 21 Asteroid counters are placed Asteroid side up and mixed up. Each player takes turns (with the merchant player going first) placing an Asteroid counter on the neutral map. No asteroid may be placed adjacent to an already-placed asteroid.

The Vargr player will set up on the neutral map, with each ship in a hex containing an asteroid. More than one ship may be placed in the same hex. The merchant player will enter from the far edge of the merchant map.

Vargr Corsairs

Ships: 2 Vargr corsairs, 1 Vargr trader. Crews Line, at battle stations.

Vector: Any desired vector.

Merchants

Ships: 1 Free Trader (unarmed), 2 Far Traders (unarmed), 1 Yacht (unarmed), 1 Patrol Cruiser, 1 *Gazelle*-class close escort. Crack crew on the patrol cruiser, Line crew on the *Gazelle*, and Green crews on the unarmed ships. All crews at Condition 2.

Vector: The four unarmed ships enter consecutively, in any order desired, five turns apart. They enter with a velocity of 3 and a heading directly down the grain of the map toward the far edge. The merchants may not change their heading or velocity unless and until a friendly ship obtains a sensor lock on a Vargr corsair. The two escorts may enter on any turn desired (or on separate turns) and with any vector desired. Escort crews Line, unarmed merchant crews Trained.

Winning: The Vargr player wins if, at any time, the Vargr trader ship loots an unarmed merchant and then escapes from the map. To loot a merchant, the merchant must be incapable of maneuver and the Vargr trader must spend the entire turn in the same hex and with a matched vector. To escape, it must leave the map by any map edge and still be capable of maneuver and jump.

Scenario 5: The Black War

Date: 111-1129

Location: Vahana/Diaspora

Background: With no resolution of the civil war in sight, Lucan initiated a campaign of terror called the Black War. Utilizing massive planetary bombardments, its aim was to intimidate worlds into surrender and, where that was not possible, leave behind scorched earth incapable of supporting the efforts of his rivals.

The Unity of Promise formed in 1127 in response to the collapse of Imperial authority and the growing anarchy. When it refused to support Lucan's bid for supremacy by sending ships and men, its outer worlds became Black War targets.

Situation: A long-range Black War squadron of Lucan's has been despatched to bombard Vahana into rubble. The Unity of Promise has only a few small vessels available, but they must prevent the bombardment at all costs.

Maps: The Unity player places a Planet marker anywhere on the Unity map, representing Vahana. The Lucan player enters from the far edge of the Lucan map. The Unity player begins in orbit around Vahana.

Lucan's Squadron

Ships: 1 *Kinunir*-class cruiser, 1 *Chrysanthemum*-class destroyer escort, and 1 *Valor*-class missile corvette. The *Valor*-class vessel has been converted to a planetary bombardment platform and carries no anti-ship missiles. The *Valor* has a Trained crew; all others have Crack crews. All crews are at battle stations.

Vector: Lucan's squadron enters with any vector desired.

Promise

Ships: 1 *Gazelle*-class escort, 1 *Fiery*-class escort, 1 system defense boat (SDB) with a full load of TL 11 missiles. Any 1 ship (player's choice) with a Crack crew, others with Line crews. All crews at Condition 2.

Vector: All ships begin with a vector of 0 (in orbit around Vahana).

Winning: Only the *Valor*-class vessel may bombard, and it may only do so while in orbit around Vahana. For each functional missile barbette on the ship, roll 1D20 for delivered planetary bombardment points. If the *Valor* does not have an operational fire director, halve the result. The Lucan player wins by inflicting over 200 cumulative points of planetary bombardment on Vahana.

SCENARIO GROUP 3
THE NEW ERA

Scenario 6: Smash and Grab

Date: 117-1201 (NE 1)

Location: Montezuma/Diaspora

Background: After the release of Virus, the final act in Lucan's Black War, most of explored space was plunged back to barbarism. Seventy years later, the revival of technology in the Old Expanses sector by the Hive Federation, and the resulting growth of the

Reformation Coalition, created an insatiable demand for high-tech equipment. This demand could most easily be met by salvaging pre-Collapse artifacts from The Wilds, the name given to the uncivilized stellar wasteland that comprised most of the territory of the Third Imperium. Sometimes the recovery of these artifacts brought Reformation Coalition ships into direct conflict with local indigenous dictators, and earned them the name Star Vikings.

Situation: Pre-Collapse records unearthed by the Reformation Coalition proved the existence of a large cache of processed lanthanum ore, the vital element required to produce jump drive coils, on the planet Montezuma. A "smash and grab" operation was quickly mounted, but would have to fight its way through the world's cobbled-together space navy.

Maps: The Montezuman player places a Planet counter anywhere on the Montezuman map. The Star Viking player enters from the far edge of the Viking map.

Star Viking

Ships: 1 clipper carrying 2 Rampart fighters. Crack crews at battle stations.

Vector: The Viking player enters the map with any velocity and heading desired.

Montezuman

Ships: 1 *Gazelle*-class close escort, 1 system defense boat (SDB), 1 modular cutter with TL-11 laser gunpack (see page 18, *Technical Booklet*). Crew quality: Trained on the *Gazelle*, Green on the other ships.

Notes: The SDB has a total of only seven Tech Level 8 missiles on board. None of the master fire directors on any of the ships are functional. The EMS arrays on the *Gazelle* and the SDB are not functional and have been replaced by radars (120,000 km close range on the SDB, 150,000 km close range on the *Gazelle*). Because of poor damage control procedures, none of the ships may repair any damage during the scenario. In addition, whenever the ship's life support fails (takes its maximum damage), the ship may conduct no actions for the next turn (may not fire, maneuver, communicate, or make sensor attempts) and it loses all existing sensor locks. (The crew is completely occupied trying to find and put on vacuum suits.) The *Gazelle* is at Condition 2; the other ships are at Condition 1.

Vector: The *Gazelle* is in orbit around the planet. The other two vessels are landed on the planet surface.

Winning: The Star Viking player wins by spending six turns with the long ship in orbit around Montezuma and then exiting the far edge of the Viking map without having any internal systems destroyed beyond repair by battle damage. The Star Viking player wins a marginal victory by spending six turns with the long ship in orbit around Montezuma and then exiting the far edge of the Viking map with its maneuver drive and jump drive still operational.

Balance: To make the scenario more even, give the Star Viking player a single *Gazelle* instead of the clipper and its fighters, and use the marginal victory condition as the Viking player's overall victory condition.

Scenario 7: Cold Recovery

Date: 011-1202 (NE 2)

Location: Beso/Diaspora

Background: Smash-and-grab operations were used only when the prize was particularly valuable. The preferred method of salvage was called a "cold recovery," meaning the machinery or data base recovered was abandoned, undefended, and free for the asking. Cold recoveries sometimes took place on inhabited worlds, but in areas remote from native settlements. More often, however, cold recoveries took place in space.

But even the most remote corner of space could sometimes be dangerous. In addition to the Reformation Coalition, The Wilds were also travelled by free traders, men and women who passed their carefully maintained ships down from generation to generation. Sometimes free traders went "rogue," turning to slavery and piracy for a living, and not above jumping a Coalition salvage crew.

Situation: Coalition-recovered shipping records gave a strong indication that a freighter carrying computer processing units had suffered some sort of accident in the asteroid belts of Beso, but that Virus had then hit the star system before a rescue mission could be mounted.

Maps: The Viking player will enter from the far end of the Viking map and the Rogue player will enter from the far end of the Rogue map.

The 21 Asteroid counters are placed Asteroid side up and mixed up. Each player takes turns (with the Viking player going first) placing an Asteroid counter on the neutral map. No asteroid may be placed adjacent to an already-placed asteroid.

Star Viking

Ships: 1 Seeker (armed scout). Crack crew at Condition 1.

Vector: The ship enters the map with any vector desired.

Rogue Trader

Ships: 1 armed fat trader (subsidized merchant) with 2 TL-12 120-Mj laser turrets, 1 missile turret with 2 TL-11 missiles, and 1 TL 8 sandcaster turret. Trained crew at Condition 2.

Vector: The ship enters the map with any vector desired.

Winning: A player wins by discovering the derelict freighter, spending a turn landed on the asteroid (stationary in the hex) to load the components, and then exiting the map at either end (but not the sides) still capable of conducting a jump. Alternatively, a player can win by destroying the enemy ship.

Discovering the Derelict Freighter: Whenever a ship obtains a successful sensor lock on an asteroid (use target size Very Small [VS] for this purpose), the player may secretly examine the back of the asteroid. The asteroid with the starburst on it is the one containing the derelict freighter.

Scenario 8: Vampire

Date: 217-1202 (NE 2)

Location: Nike Nimbus/Old Expanses

Background: When Virus, the self-aware and self-replicating experimental offensive computer program, was prematurely released near the end of the civil war, it brought down the entire technological base upon which the Third Imperium was built. Not all of the machinery infected with Virus destroyed itself, however. As the unstable virus spread, it also mutated, and some of the strains used the computer systems taken over to actively hunt and kill humans. When ships were taken over by viruses like this, they were called Vampire ships.

Situation: An old *Midu Agashaam*-class destroyer, its computer system infected with the "Doomslayer" strain of Virus, penetrated Reformation Coalition space, jumping into the Nike Nimbus system. The only armed vessels in the system were a new clipper on its shakedown cruise and a system defense boat.

Maps: The Viking player places a Planet counter (representing Nike Nimbus) anywhere on the neutral map. The Viking clipper will enter from the far edge of the Viking map, the Viking SDB begins landed on Nike Nimbus, and the Vampire ship will enter from the far edge of the Vampire map.

Vampire

Ship: 1 *Midu Agashaam*-class destroyer with no missiles. (Treat the virus-controlled computer as a Line crew at battle stations.)

Vector: The vampire ship enters with any vector desired.

Star Viking

Ships: 1 clipper, 1 system defense boat (SDB), two Rampart fighters. The clipper and Ramparts have Line crews, the SDB a Crack crew. All crews at Condition 2.

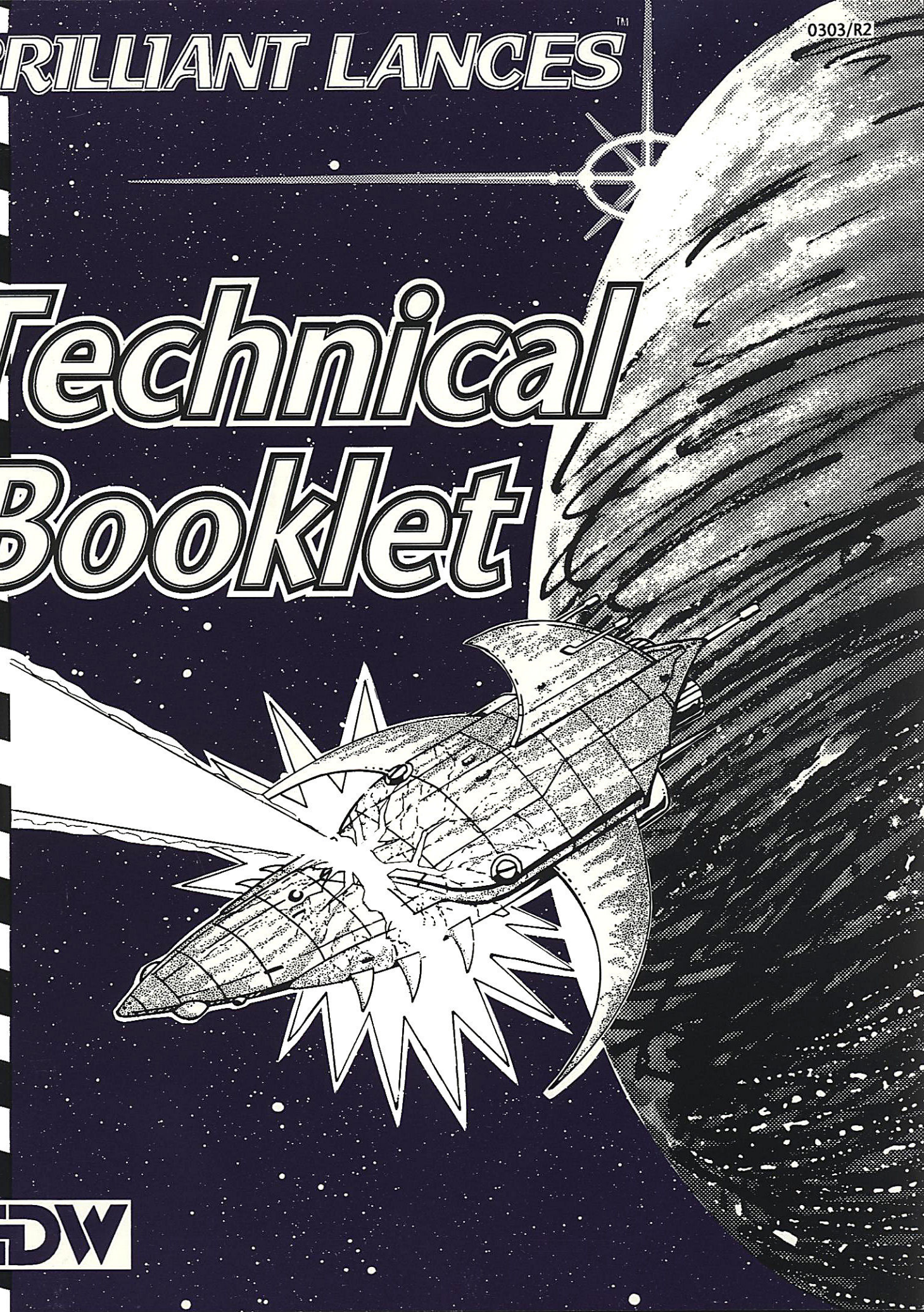
Vector: The clipper enters with any vector desired.

Winning: The player with the last ship capable of firing and maneuvering wins. If both players lose maneuver and/or firing capability from their last surviving ships on the same turn, the game is a draw.

BRILLIANT LANCES™

0303/R2

Technical Booklet



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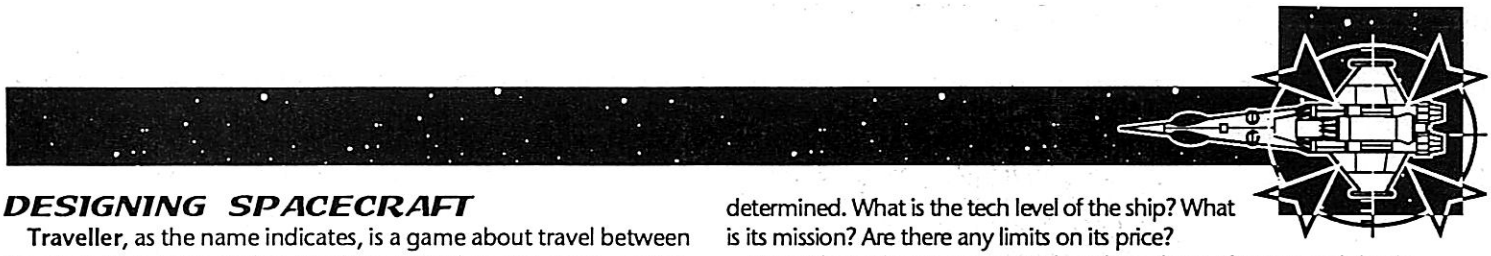


DESIGNING SPACECRAFT

Traveller, as the name indicates, is a game about travel between the stars. This focus makes starships central to the game, and so players and referees will want to take a hand at designing ships of their own. It is natural, then, to begin this book with the spacecraft design sequence.

Designing ships serves two functions. First, even if the players never own or use any of the ships designed, the designs can add diversity to the sorts of ships they will encounter. Second, working a design through from hull structure to final additions to the command bridge will give players a much deeper understanding of what starships are like and how they work in the **Traveller** universe.

Before starting the design, there are several items which need to be determined. What is the tech level of the ship? What is its mission? Are there any limits on its price?

Once these decisions are made, take a sheet of paper and divide the right two-thirds of it into five columns, and label them Volume, Mass, Power, Surface Area, and Price. This will be your worksheet as you do your design (pre-made worksheets of this type are available in **Traveller Players' Forms**). Whenever a component uses volume, mass, power, or hull surface area, write the amount in the correct column. Whenever a component contributes volume, surface area, or power (hulls contribute volume and surface area, power plants contribute power) write the amount in the correct column but indicate it with a plus sign or by enclosing it in brackets. This worksheet will make designing your vessel much easier.

STEP 1. HULLS

The first step in designing a space craft is to determine the size, shape, and special configuration of the hull. All other components will then be placed inside the hull or on its surface.

First select a basic hull size from the Hull Size table (page 2). All hulls have a rate (or "tonnage") which is the displacement of the hull in tonnes of liquid hydrogen (the most common starship fuel). Therefore, a ship with a rate of 7 could hold 7 tonnes of liquid hydrogen (provided nothing else was put in the hull). Thus, **Traveller** uses the term "ton" as a unit of volume where 1 ton equals 14 cubic meters (m^3) of internal volume (also measured as 14 kiloliters). The Hull Size table indicates the volume (in cubic meters), the material volume of the shell (assuming a uniform thickness of 1 centimeter) in cubic meters of hull material, and the length of the hull (actually its diameter, as all hull ratings are based on the characteristics of a sphere) in meters.

Next, decide on the hull's form and configuration. Hull form is the basic geometric shape of the hull. As indicated above, the base values for hulls assume a spherical shape. As all hulls of the same rate have the same interior volume, hulls in less space-efficient shapes than spheres will have more surface area, greater length, and require more hull material to achieve an equivalent volume. The Hull Form and Configuration table (page 2) indicates the various hull forms available and the effects on length and material volume.

Once the basic shape is determined, the designer specifies whether the hull has an unstreamlined, streamlined, or an airframe configuration. This decision will affect the cost of the hull (streamlined and airframe configurations are more expensive). In general, airframe hulls may enter any planetary atmosphere to land on the surface or skim fuel; streamlined hulls may skim gas giants but may not land on planetary surfaces with atmospheres of greater than Thin (if contragrav is installed, they may feely land on any world); and unstreamlined hulls may do neither.

Once the basic size and shape is determined, the hull itself is constructed. Hulls consist of hull plating and internal structure.

Hull plating may be thinner or thicker than 1cm, but all hulls must have an armor value of at least 1. Interplanetary and interstellar vessels must have a minimum hull armor value of 10 per G rating of the maneuver drive (to protect against micro-meteors). To determine the armor value of the hull plating, decide on a thickness (in centimeters) and multiply the thickness by the toughness of the material used to construct the hull (round to the nearest whole number).

The Hull Materials table (page 3) lists a variety of materials available at different tech levels, along with their toughness, mass per cubic meter, and their price per cubic meter. Once the designer has decided on a thickness, multiply the hull's material volume value by the hull thickness (in centimeters) to determine how many cubic meters of material is used for hull plating. Multiply this by the correct values on the Vehicle and Craft Construction Materials table (as modified by hull form and configuration) to determine mass and price.

Internal structure is also a function of the craft's acceleration and its hull material value. Multiply the hull material value from the Hull Size table (as modified by hull form, but not by configuration) by the craft's maximum acceleration in Gs, and divide the result by the hull material toughness value. The result is the volume of internal structure material used; use the Vehicle and Craft Construction Materials table to determine price and mass. The following equations recapitulate these procedures:

Hull Plating

Minimum Hull Thickness = (Gmax×10) ÷ Toughness of hull material from Vehicle and Craft Construction Materials table

Hull Plating Volume (Unstreamlined or Streamlined configuration): HPV = MV×MVM×Ht

Hull Plating Volume (Airframe configuration): HPV= MV×MVM×1.3×Ht

Hull Plating Mass (in tonnes) = HPV×Mass value of hull material from Vehicle and Craft Construction Materials table

Hull Plating Cost (in MCr) = HPV×Sm×Price of hull material from Vehicle and Craft Construction Materials table

Internal Structure

Internal Structure Volume: ISV = (MV×MVM×Gmax) ÷ Toughness from Vehicle and Craft Construction Materials table

Internal Structure Mass: ISV×Mass value of hull material from Vehicle and Craft Construction Materials table

Internal Structure Price: ISV×Price of hull material from Vehicle and Craft Construction Materials table

Gmax: Maximum rated performance in Gs

HPV: Hull plating volume, in cubic meters

Ht: Hull thickness in centimeters, chosen by designer, but at least equal to minimum hull thickness

ISV: Internal structure volume, in cubic meters

MV: Material volume from Hull Size table, in cubic meters

MVM: Material volume multiplier from Hull Form and Configuration table

Sm: Streamlining price modifier according to selected streamlining configuration

Note also that the hull form will affect the surface area of the hull. Note at this time how much surface area is available. Surface area is used for the attachment of weapons, sensors, communicators, launch ports, etc. Keep a running record of how much surface area is used as the ship is designed.

Hull Size Table

Rate	Vol	MV	L
1	14	0.4	3.2
2	28	0.5	4
3	42	0.7	4.6
4	56	0.9	5.2
5	70	1.1	5.6
6	84	1.3	5.8
7	98	1.4	6.2
8	112	1.6	6.6
9	126	1.8	6.8
10	140	1.9	7
15	210	2.1	7.5
20	280	2.3	8.0
25	350	2.5	8.6
30	420	2.7	9.2
35	490	2.9	9.8
40	560	3.1	10.4
45	630	3.4	10.8
50	700	3.8	11.2
55	770	4	11.4
60	840	4.2	11.6
65	910	4.4	12.1
70	980	4.6	12.5
75	1050	4.8	12.9
80	1120	5.1	13.2
85	1190	5.3	13.4
90	1260	5.5	13.6
95	1330	5.8	13.8
100	1400	6	14
200	2800	9	17
300	4200	12	20
400	5600	15	22
500	7000	17	24
600	8400	20	25
700	9800	22	27
800	11200	24	28
900	12600	26	29
1000	14,000	28	30
2000	28,000	43	36
3000	42,000	57	42
4000	56,000	70	47
5000	70,000	80	51
6000	84,000	90	53
7000	98,000	100	57
8000	112,000	110	60
9000	126,000	120	62
10,000	140,000	130	64
20,000	280,000	200	80
30,000	420,000	260	92
40,000	560,000	320	104
50,000	700,000	370	112
60,000	840,000	420	116
70,000	980,000	470	125
80,000	1,120,000	510	132
90,000	1,260,000	550	136
100,000	1,400,000	590	140
200,000	2,800,000	940	170
300,000	4,200,000	1220	200
400,000	5,600,000	1485	220
500,000	7,000,000	1730	240
600,000	8,400,000	1950	250
700,000	9,800,000	2160	270
800,000	11,200,000	2360	280
900,000	12,600,000	2550	290
1,000,000	14,000,000	2740	300

Rate: The hull rating is a standard measure of the volume of the hull expressed in tons of liquid hydrogen. Each ton of liquid hydrogen displaces 14 cubic meters of volume (and is referred to as a "displacement ton").

Vol: The enclosed volume of the hull in cubic meters (m^3). Each cubic meter contains 1000 liters of volume, and so the term kiloliter is sometimes used interchangeably with cubic meter.

MV: Material volume, the volume (in cubic meters) of material required to enclose the hull in a shell one centimeter thick.

L: The length of the hull in meters. For spherical hulls, this is also the diameter.

Surface Area: Surface area in square meters is the hull material volume (after hull form and airframe modifications, but without adjustments for hull thickness) multiplied by 100.

Price: The price of a hull in credits is its material volume multiplied by the price shown on the Hull Material Table.

Configuration: Hulls may be in any of several configurations. The values on the hull table are for a spherical hull. With a different configuration, modify the hull material and price as shown on the Hull Form and Configuration Table.

Hull Form and Configuration Table

		Streamlining Price Modifications			
Hull Form	*MVM*	*Unstrm*	*Stream*	*Airframe*	*LM*
Open Frame	2*	0.3	NA	NA	4
Needle	1.3	0.7	0.8	1.2**	3
Wedge	1.5	0.5	0.7	1.5**	2.5
Cylinder	1.1	0.6	0.8	2**	2
Box	1.2	0.4	0.6	NA	1.25
Sphere	1	0.8	1	NA	1
Dome/Disc	1.2	1.4	1.6	1.2**	1.5
Close Structure	1.4	0.3	NA	NA	1.75
Slab	1.5	0.5	0.7	1.5**	2.75

* Modifies hull material volume only. Surface area remains unchanged.

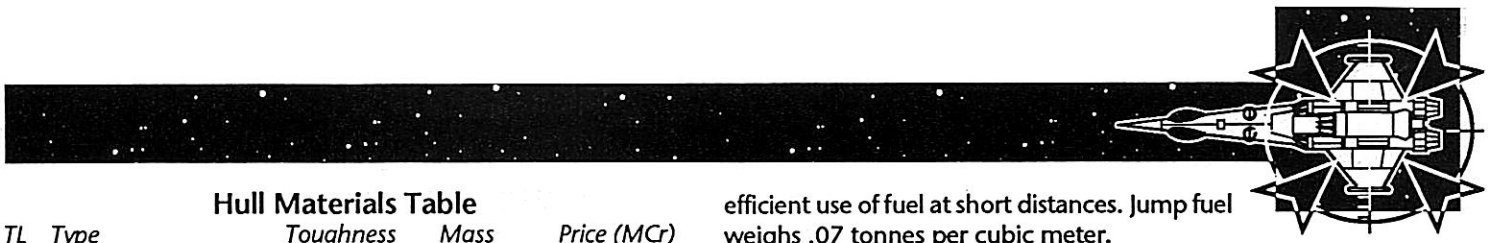
** Airframe configuration increases hull shell material volume (and surface area), but not internal structure. Modify hull shell material volume × 1.3 for airframe configuration hulls.

MVM: Material volume multiplier. Multiply the material volume (MV) from the Hull Size table to get the volume of 1cm-thick hull plating for a hull of the corresponding mass and configuration.

Perform the same calculation, then divide by hull material toughness, to get the volume of that hull's internal structure stressed to 1G.

LM: The length of the hull in meters. For spherical hulls, this is also the diameter.

NA: Not available; that configuration of hull may not be built with that streamlining option.



Hull Materials Table

TL	Type	Toughness	Mass	Price (MCr)
5	Soft Steel	1.7	8	0.0016
6	Hard Steel	2	8	0.002
6	Light Alloy	1.7	6	0.004
7	Composite	4	7	0.007
8	Composite Laminate	6	8	0.008
10	Crystaliron	8	10	0.009
12	Superdense (SD)	14	15	0.014
14	Bonded SD	28	15	0.028
17	Bonded Coherent SD	40	15	0.035

Toughness: Used to determine armor rating.

Mass: Metric tonnes per cubic meter of material volume.

Price: Price in millions of credits per cubic meter of material.

Armor Value: An atmospheric and near orbital craft must have a hull armor value of 1. Interplanetary and interstellar vessels must have a minimum hull armor value of 10 per G rating of the maneuver drive (for protection against micro-meteors).

Armor Value = cm thickness × toughness.

Target Size

Once the hull size has been selected, determine its target size based on the following table.

Tons	Size
<1	Sub-Micro (SM)
1+	Micro (Mc)
10+	Very Small (VS)
100+	Small (S)
1000+	Medium (M)
10,000+	Large (L)
100,000+	Very Large (VL)
1,000,000+	Gigantic (G)

STEP 2. JUMP DRIVE

If a vessel is intended to serve as a starship (i.e., travel between stars), it will need a jump drive.

Jump drive machinery requirements are tied to the volume of the hull and the maximum distance the drive is capable of jumping the ship. There are upper limits on how many parsecs a ship may jump based on the tech level of the drive. The volume of the jump drives, as a percentage of the total volume of the ship, is equal to 1 plus the maximum jump number (in parsecs). So, for example, a ship capable of jump 4 would have jump drives which filled 5% (1 + 4) of the internal volume of the ship. If it were a 100-ton ship (1400 cubic meters of volume), the jump drives would take up 70 cubic meters of volume.

Jump drives also take up hull surface area for radiators, coolant exhaust, etc.

The Jump Drive Table lists the maximum allowed jump number, mass, and price of jump drives at each tech level.

Important Note: The smallest jump drive possible, at any tech level, is 2 cubic meters in volume.

Jump drives require fuel, displacement mass, and coolant, all of which are collectively called jump fuel (liquid hydrogen being used for all three functions). The fuel necessary for a jump of 1 parsec is equal to the total volume of the jump drive machinery multiplied by 5 and divided by the drive's maximum jump number. Thus ships with higher jump performance make more efficient use of fuel at short distances. Jump fuel weighs .07 tonnes per cubic meter.

Fuel tankage itself is under Step 6, Power Supply.

To continue the example of the 100-ton jump-4 ship above, it would require ($70 \times ^5/_4$) 87.5 cubic meters of jump fuel per parsec jumped (up to a maximum of 4 parsecs, the limit of its drive). The ship would normally have at least 350 cubic meters of jump fuel tankage (enough for its 4-parsec maximum jump).

Jump Drive Table

TL	Max Jump	Mass	MCr
9	1	3	.3
11	2	3	.3
12	3	3	.3
13	4	3	.3
14	5	2.5	.3
15	6	2	.3

TL: Tech level of construction.

Max Jump: The longest jump allowed (in parsecs).

Mass: Mass in metric tonnes per cubic meter.

MCr: Price in millions of credits per cubic meter of jump drive.

Surface Area: Surface area in square meters equals cubic meters of jump drive ÷ 3.

STEP 3. ELECTRONICS

Electronics fall into six categories: Controls, Navigational Aids, Communicators, Sensors, Electronic Countermeasures (ECM), and Electronic Counter-Countermeasures (ECCM).

Players should be familiar with the **Brilliant Lances** space combat rules for how communicators, sensors, ECM, and ECCM systems work in order to decide which of these systems to install.

3A. CONTROLS

Control Systems

Control systems include the control consoles and workstations from which the crew of a craft control its systems, as well as the interior circuitry linking the major electrical and mechanical subsystems to the controls. Installed computers must be from the same tech level as the controls, and avionics and navigation aids may not be installed from a higher tech level than that of the controls. The control system chosen also determines the price of workstations installed in step 9.

TL	Type	Power	Price
5	Basic Mechanical	—	.0002
6	Enhanced Mechanical	0.0002	.0003
7	Electronic	0.0005	.0005
8	Enhanced Electronic	0.0005	.00075
9	Computer Linked	0.0005	.001
10-12	Dynamic Linked	0.001	.0015
13-16	Holographic Linked	0.001	.002

Power: MW per displacement ton of the craft.

Price: MCr per displacement ton of the craft, and per bridge or normal workstation (page 17).

All control systems displace 0.014 cubic meters and mass 0.0014 tonnes per displacement ton of the hull.

Computers

If a computer is desired, select one from the list below. Any orbital or deep-space craft must have at least one computer, and jump-capable craft require an additional computer. Space craft may use either standard or fiber-optic models of computers, or a mix of the two.

Spacecraft generally have at least two computers: one is the primary, the other is a dedicated maintenance troubleshooter and safety backup (see Maintenance Points on page 18); starships have three: one primary, one for jump capability/backup, and another for maintenance troubleshooting, which also functions as a backup.

Aircraft with computers may use flight computers (Model Flt). Hypersonic aircraft should have two computers (but are only required to have one); one is a safety backup. Supersonic and slower aircraft are not required to have computers, but may choose to do so to help with long-range sensors and weapons operations.

Important Note: A computer may not be installed which is from a different tech level than the craft's control system. A craft may not have installed sensors or master fire directors from tech levels higher than the installed computer or control system. St or Fb computers are required for any craft fitted with an MFD, or a sensor with a short range greater than 30 kilometers. (Sensors with a short range of 30 kilometers or less do not require a computer.)

Computers Table

TL	Mod	MW	Vol	Mass	MCr	Mult
5	St	0.50	50	10	1.5	1
6	St	0.10	10	2	1.0	0.8
7	St	0.15	5	1	0.5	0.7
8	St	0.20	5	1	0.4	0.6
9	St	0.25	5	1	0.6	0.5
10	St	0.30	6	1.2	1	0.45
11	St	0.35	7	1.4	2	0.4
12	St	0.40	8	1.6	3	0.35
13	St	0.45	9	1.8	4	0.3
14	St	0.50	8	1.6	5	0.25
15	St	0.55	7	1.4	6	0.2
16	St	0.60	6	1.2	10	0.15
17	St	0.60	5	1	11	0.13
18	St	0.60	4	0.8	12	0.11
19	St	0.55	3	0.6	13	0.09
20	St	0.50	2	0.4	14	0.07
21	St	0.45	1	0.2	15	0.05

TL: Tech level of availability.

Mod: Model St = Standard, Fb = Fiber-optic, Flt = flight.

Fiber-optic computers are available from TL 7 on. Multiply MW, volume, mass, and price by 2. Usually one or more of a starship's three computers are fiber-optic.

Flight computers are simplified versions of the above computers optimized to perform a set number of routine flight functions. They may be used in place of standard computers on atmospheric and sub-orbital craft, although full-size computers may be installed as well. Flt computers do not provide maintenance point reduction. Multiply volume, MW, and mass by 0.1 and price by 0.001.

MW: Power requirement in MW

Vol: Displacement in cubic meters

Mass: Mass in metric tonnes

MCr: Price in millions of credits

Mult: Control multiplier

3B. NAVIGATIONAL AIDS

Flight Avionics

TL	MCr	Vol	Mass	MW	Description
5	.01	.0001	.0001	—	Magnetic compass, barometric altimeter
6	.05	.0001	.0001	.01	Radar altimeter, gyrocompass, transponder
7	.10	.001	.001	.1	Weather radar, FLIR, inertial positioning
8	.20	.001	.001	.1	Imaging radar
10	.25	.001	.001	.1	Imaging EMS, inertial/ gravitational positioning

MCr: Price in MCr. If at any tech level higher than level of introduction, price × 0.1

Vol: Displacement in cubic meters.

Mass: Mass in metric tonnes.

MW: Power requirement in MW.

Description: TL 6 or better flight avionics necessary for a starship to land on the surface of a planet. Each level of avionics includes all features shown at lower tech levels as well. FLIR = forward-looking infrared, a focused high-resolution thermal-imaging device.

Terrain-Following Avionics

TL/Type	Vol	Mass	MCr	NOE
None	—	—	—	40
8	0.2	0.05	0.010	120
9	0.02	0.04	0.011	130
10	0.15	0.04	0.012	140
11	0.15	0.03	0.013	150
12	0.1	0.03	0.014	160
13	0.1	0.02	0.015	170
14	0.05	0.02	0.016	180
15	0.05	0.02	0.017	190
16	0.03	0.03	0.018	200

Vol: Volume in cubic meters (kiloliters).

Mass: Mass in metric tonnes.

MCr: Price in millions of credits.

NOE: Safe nape of the earth speed in kilometers per hour.

Power: Power requirement, in MW is equal to Mass .

Antenna: Antenna area, in square meters, is equal to Mass× 10.

3C. COMMUNICATORS

For all electronic systems which do not calculate antenna price separately, antenna price is equal to 0.25 times the total system cost, for purposes of replacing destroyed antennae.

Radio Communicators

			Volume at tech level						
Range	*MCr*	*MW*	*5*	*6*	*7*	*8*	*10*	*12*	*15*
3 km	.000075	.0001	.05	.01	.001	.0001	.0001	.0001	.0001
30 km	.00025	.001	.1	.05	.01	.001	.0001	.0001	.0001
300 km	.0005	.01	.15	.1	.05	.01	.001	.0001	.0001
3000 km	.005	.1	.3	.15	.1	.05	.01	.001	.0001
30,000 km	.030	1	.7	.3	.15	.1	.05	.01	.001
300,000 km	.090	10	—	.7	.3	.15	.1	.05	.01
1000 AU	.150	20	—	—	.7	.3	.15	.1	.05

Range: Short range in kilometers or Astronomical Units, as indicated.
Volume: Cubic meters (kiloliters).
MCr: Price in MCr. If TL 5, ×3. If TL 6, ×2.
MW: Power requirement, in megawatts.
Mass: Mass, in metric tonnes, equals volume × 2.
Antenna: Antenna area, in square meters, equals MW × 10.

Laser Communicators

			Volume at tech level				
Range	*MCr*	*MW*	*8*	*9*	*10*	*12*	*15*
3 km	.0012	.005	.004	.002	.001	.001	—
30 km	.005	.01	.016	.008	.006	.004	.001
300 km	.011	.02	.020	.010	.008	.005	.002
3000 km	.021	.04	.040	.020	.015	.010	.003
30,000 km	.036	.08	.070	.035	.025	.018	.005
300,000 km	.056	.15	.110	.055	.040	.028	.007
1000 AU	.180	.3	—	.120	.070	.050	.015

Range: Short range in kilometers or Astronomical Units, as indicated

Range Note: Maximum range in an atmosphere coded Thin or greater is 5000 km.

Volume: Cubic meters (kiloliters)
MCr: Price in millions of credits
MW: Power requirement in megawatts
Mass: Mass, in metric tonnes, equals volume × 2.
Antenna: Antenna area equals 1 square meter for all versions.

Maser Communicators

			Volume at tech level				
Range	*MCr*	*MW*	*8*	*9*	*10*	*12*	*15*
3 km	.0012	.01	.010	.005	.002	.001	—
30 km	.005	.02	.030	.015	.010	.002	.002
300 km	.011	.04	.040	.020	.015	.010	.004
3000 km	.021	.08	.080	.040	.030	.020	.006
30,000 km	.036	.15	.150	.070	.050	.040	.010
300,000 km	.056	.3	.200	.100	.080	.060	.015
1000 AU	.180	.6	—	.250	.150	.100	.030

Range: Short range in kilometers or Astronomical Units, as indicated.
Volume: cubic meters (kiloliters).
MCr: Price in millions of credits.
MW: Power requirement in megawatts
Mass: Mass, in metric tonnes, equals volume × 2.
Antenna: Antenna area equals 1 square meter for all versions.

Radio Receivers

All spacecraft are automatically equipped with radio receivers integral to their hulls at no additional cost. These allow radio reception and are destroyed by electronics hits (1h).

Vehicles of TL-8+ have the same integral radio receivers at no cost. At lower tech levels, vehicles may add radio receivers at no volume at MCr0.0001.

There is no power requirement for any of these receivers.

Finally (in the event that these receivers are destroyed in combat), all passive EMS sensors function as radio receivers, even, in the case of folding arrays, when retracted.

Meson Communicators

			Volume at tech level	
Range	*MCr*	*MW*	*15*	*16*
300 km	0.25	.05	.5	.3
3000 km	1	.2	2	1.5
30,000 km	2.5	1	30	16
300,000 km	5	3	150	80
1000 AU	20	5	500	220

Range: Short range in kilometers or Astronomical Units, as indicated.
Volume: Cubic meters (kiloliters).
MCr: Price in millions of credits.
MW: Power requirement in megawatts.
Mass: Mass, in metric tonnes, equals volume × 2.
Antenna: Antenna area, in square meters, equals MW × 10, with a minimum of 1 square meter.

3D. SENSORS

Radar

A radar requires a processor unit and an antenna

	Processor Volume by TL			
Short Range	*6*	*7*	*8*	*9*
0.3 km	0.3	0.04	0.02	0.01
3 km	3	0.4	0.2	0.1
30 km	30	4	2	1
300 km	300	40	20	10
3,000 km	—	400	30	15
30,000 km	—	—	40	20
60,000 km	—	—	50	30

Volume: Volume in cubic meters (kiloliters) as shown.

MW: Power requirement (in megawatts) equals processor volume in cubic meters × 0.2.

Mass: Mass of the processor, in metric tonnes, equals volume × 2.

MCr: Price of the processor, in MCr, equals volume × 1

Antenna: Antenna area (in square meters) equals volume times the tech level modifier shown below:

TL	*Modifier*
6	10
7	4
8	1
9+	0.5

Antenna Volume (cubic meters): Antenna Area × 0.1.

Antenna Mass (in metric tonnes): Antenna Area × 0.1

Antenna Price (MCr): Antenna Area × 0.05.

EMS Active

	Vol (Kiloliters) by TL				
Short Range	*10*	*11*	*12*	*14*	*16*
3 km	0.2	0.1	0.1	0.1	0.1
30 km	1.0	0.8	0.6	0.5	0.4
300 km	3.0	1.6	1.0	0.8	0.6
3000 km	7.0	3.0	1.6	1.0	0.8
30,000 km	10	5.0	2.2	1.2	1.0
60,000 km	13	6.0	2.5	1.4	1.2
120,000 km	16	8.0	3.3	1.8	1.4
180,000 km	19	10	4.0	2.2	1.6
240,000 km	23	11	4.8	2.6	1.8
300,000 km	26	12	5.5	3.0	2.0
360,000 km	31	15	7.0	3.4	2.2
420,000 km	36	17	8.5	4.2	2.4
480,000 km	42	20	10	5.0	2.6

Volume: Volume in cubic meters (kiloliters) as shown.

Power (MW): Volume × 5.

Price (MCr): Volume × 2.

Mass (metric tonnes): Volume × 2

Antenna (square meters): Volume × 2. Antenna volume, mass, and price are subsumed in the total sensor package above.

Ladar

	Vol (Kiloliters) by TL					
Short Range	*8*	*9*	*11*	*13*	*15*	*16*
3 km	0.1	0.01	0.005	0.001	—	—
30 km	0.4	0.04	0.02	0.004	—	—
300 km	0.8	0.08	0.04	0.008	0.002	—
3000 km	2.0	0.2	0.1	0.02	0.005	0.002
30,000 km	5.0	0.5	0.2	0.04	0.01	0.004
60,000 km	—	1.0	0.5	0.1	0.025	0.01
120,000 km	—	2.4	1.2	0.24	0.06	0.02
180,000 km	—	—	2.5	0.5	0.12	0.05
240,000 km	—	—	—	1.2	0.25	0.1
300,000 km	—	—	—	2.5	0.6	0.2

Power requirement (MW): Volume in cubic meters.

Mass (metric tonnes): Volume × 2.

Price (MCr): Volume × 10

Antenna Area (square meters): Volume × 1. Antenna weight, price, and volume are subsumed in the above figures.

Densitometer (Grav Shielded)

Densitometers are survey instruments which allow determination of celestial object mass and mapping of mineral deposits and gravitic anomalies.

TL	*MW*	*Vol*	*Mass*	*MCr*
11	2.5	30	10	0.75
12	1	15	5	0.9
13	0.9	12	3	0.95
14	0.5	9	2	1
15	0.4	7	1.5	1.5
16	0.3	4	1	1.5

MW: Power requirement in megawatts.

Vol: Volume in cubic meters.

Mass: Mass in metric tonnes.

MCr: Price in millions of credits.

Antenna Area (square meters): MW × 100.

Neutrino Sensor

Neutrino sensors are useful when surveying a star system. They enable a ship to measure the intensity of fusion taking place within a star as well as determine if any of the gas giants are failed stars. Note that the values below apply only to neutrino sensors installed aboard ships or other massive vehicles. These sensors use the mass of the ship itself, especially its hull and fuel tankage, as its antenna. Any stand-alone neutrino sensor would require a massive antenna, usually huge tanks of fuid and/or thick metal plates.

TL	*Vol*	*MCr*
10	100	1
12	10	2
14	5	3

Vol: Volume in cubic meters.

MCr: Price in millions of credits.

MW: All neutrino sensors require 0.01 MW of power for operation.

Mass: All neutrino sensors have a mass in metric tonnes equal to their volume.

Neural Activity Sensor

Neural activity sensors detect and classify life forms according to their level of brain activity.

TL	Range	MW	Vol	Mass	MCr
13	0.005	0.004	0.002	0.005	0.02
14	0.025	0.005	0.002	0.005	0.02
15	0.05	0.006	0.002	0.005	0.02
16	0.5	0.007	0.002	0.005	0.02

Range: Short range in kilometers.
MW: Power requirement in megawatts.
Vol: Volume in cubic meters.
Mass: Mass in metric tonnes.
MCr: Price in millions of credits.
Antenna area (square meters) = MW × 100.

HRT (High Resolution Thermal)

			Volume by TL		
Range	AD	AA	7	8	9
0.3	0.25	0.05	0.006	0.003	0.001
3	.0.5	0.2	0.06	0.03	0.01
30	.1	1	0.3	0.15	0.05
300	2.25	4	0.6	0.3	0.1
3000	3.5	10	1.5	0.6	0.3
30,000	5	20	—	1.5	0.6
60,000	10	80	—	3	1.5
90,000	20	300	—	5	2.5
120,000	40	1200	—	6	3
150,000	90	6000	—	7	3.5
180,000	200	30,000	—	8	4
210,000	400	125,000	—	9	4.5
240,000	800	500,000	—	10	5

Range: Short range (in kilometers)
AD: Antenna diameter, in meters. If the antenna diameter is greater than the hull length (unmodified by configuration), the antenna must be a folding array.
AA: Surface area of the antenna is square meters. At tech level 9, multiply antenna area by 0.5.
Processor Volume: The volume of the processor in cubic meters (kiloliters) as shown on the table.
Antenna Volume: The volume of the antenna in cubic meters (kiloliters) is equal to the antenna area × 0.05 for a fixed array or × 0.1 for a folding array.
MW: Power requirement, in MW, is equal to the processor volume × 0.1.
Processor MCr: The processor price, in millions of credits, is equal to the processor volume × 1.
Antenna MCr: The antenna price, in millions of credits, is equal to the antenna volume × 1.
Processor Mass: The mass of the processor, in metric tonnes, is equal to the processor volume × 2.
Antenna Mass: The mass of the antenna, in metric tonnes, is equal to the antenna volume × 1.

EMS Passive

			Processor Volume by TL				
Range	AD	AA	10	11	12	14	16
3	0.25	0.02	0.03	0.02	0.01	0.005	0.003
30	0.5	0.08	0.1	0.08	0.04	0.02	0.01
300	1	0.4	0.2	0.1	0.08	0.04	0.02
3,000	2.25	1.6	0.3	0.2	0.1	0.08	0.04
30,000	3.5	4	0.6	0.4	0.3	0.2	0.1
60,000	5	8	1.5	1	0.6	0.4	0.3
90,000	10	32	2	1.5	1	0.6	0.4
120,000	20	120	2.5	2	1.5	1	0.6
150,000	40	480	3	2.5	2	1.5	1
180,000	90	2400	3.5	3	2.5	2	1.5
210,000	200	12,000	4	3.5	3	2.5	2
240,000	400	50,000	4.5	4	3.5	3	2.5

Range: Short range (in kilometers).
Processor Volume: The volume of the processor in cubic meters (kiloliters) as shown on the table.
AD: Antenna diameter, in meters. If the antenna diameter is greater than the hull length (unmodified by configuration), the antenna must be a folding array.
AA: Base surface area of the antenna is square meters. The actual surface area of the antenna is this value multiplied by a tech level modifier, as shown below:

TL	Modifier
10	1
11	0.5
12	0.25
13	0.125
14	0.075
15	0.025
16+	0.01

Processor Volume: The volume of the processor in cubic meters (kiloliters) as shown on the table.
Antenna Volume: The volume of the antenna in cubic meters (kiloliters) is equal to the antenna area × 0.05 for a fixed array or × 0.1 for a folding array.
MW: Power requirement, in MW, is equal to the processor volume × 0.1.
Processor MCr: The processor price, in millions of credits, is equal to the processor volume × 2.
Antenna MCr: The antenna price, in millions of credits, is equal to the antenna volume × 1.
Processor Mass: The mass of the processor, in metric tonnes, is equal to the processor volume × 2.
Antenna Mass: The mass of the antenna, in metric tonnes, is equal to the antenna volume × 1.

3E. ECM

Radio, Radar, and EMS Jammers

Radio, radar, and EMS jammers have the same characteristics as radios, radars, and active EMS sensors, with three exceptions.

1. Power use and Price are multiplied by 2.
2. Antenna size for the radar jammer is divided by 10.
3. Jammers may not be used as sensors or communicators, only for jamming.

Radio jammers may only be used to jam radios; radar jammers may be used to jam radar or active EMS; and EMS jammers may be used to jam radios, radars, or active EMS.

Area Jammers

Area jammers degrade the effectiveness of sensors and communicators that attempt to function their area of effect.

TL	Vol	Mass	MW	MCr
10	30	30	95	60
11	15	15	50	30
12	8	8	20	16
14	6	6	16	12
16	5	5	12	10

Vol: Volume in m^3.
Mass: Mass in tonnes.
MW: Required power in megawatts.
MCr: Price in millions of credits.

Radio, Radar, and EMS Direction Finder

Direction-finding can be added as an option to any radar or active EMS array. (Passive EMS arrays already incorporate radio and radar DF capabilities.) Price is multiplied by 2 for radar, and by 1.5 for the EMS array. Stand-alone direction finders are also available beginning at TL 6. These have the same mass, volume, and antenna size of a radio of the same tech level, but the price is doubled, and the power requirement in MW is equal to the volume at all ranges and tech levels. All direction finders work equally well versus radio, radar, or EMS emissions.

3F. ECCM

Electromagnetic Masking (EMM)

An electromagnetic masking (EMM) package minimizes a craft's electromagnetic emissions in all bands (radio, IR, visible light, UV, X ray), and uses electromagnetic absorbent material (EMAM) on the hull surface, thus making detection by active and passive sensors (radar, ladar, active EMS, HRT, and passive EMS) more difficult.

EMM packages are available at TL 10 and higher. The following values are per displacement ton (14 cubic meters) of hull.

MW	Vol	Wt	Rad	MCr
0.014	0.28	0.14	0.14	0.07

MW: Power requirement in megawatts.
Vol: Volume in cubic meters (kiloliters).
Wt: Mass in metric tonnes.
Rad: Hull area used by IR radiators (in square meters).
MCr: Price in millions of credits.

STEP 4. WEAPONRY

Ships may be equipped with beam weapons, missiles, defensive screens, and the fire control systems that enable them to function effectively.

Fire Control

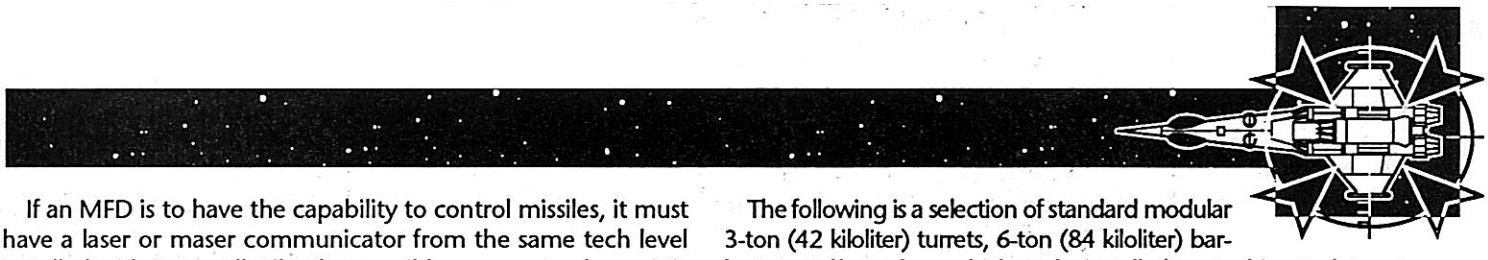
Ships may be equipped with master fire directors (MFDs) which enhance the performance of installed weapons. While many small ships with only one or two turrets rely on local turret control and do not contain MFDs, warships will want several directors. Each MFD must be provided with a pencil-beam active sensor of its own, with a short range equal to the listed range of the fire director. The values for this sensor must be chosen from the Radar table (for TL 8-9 fire directors) or Active EMS table (for TL 10+), except that the power requirement and antenna size listed are multiplied by 0.1 and the cost is multiplied by 0.5. Volume and Mass figures are unchanged. These numbers are added to those of the MFD, as they constitute one piece of equipment. The sensor is not used separately under any circumstances, but is necessary for the normal functioning of the MFD.

Sample Spinal Mounts

TL	Description	Bore	MW	Vol	Ms	Length	Short	Medium	Long	Extreme	Crew	MCr
12	1000 Mj Part Accel	2.14	27.8	792	899	144	10: 158	20: 103	40: 52	80: 27	2	57.844
14	2000 Mj Part Accel	2.14	55.6	736	1048	90	10: 224	20: 224	40: 123	80: 63	1	40.902
15	1000 Mj Part Accel	2.39	27.8	374	495	42	10: 158	20: 158	40: 98	80: 50	1	22.702
15	2000 Mj Part Accel	2.52	55.6	885	1097	105	10: 224	20: 224	40: 224	80: 196	1	59.802
12	1000 Mj Meson Gun	3.6	27.8	1730	1586	144	5: 158	10: 75	20: 38	40: 19	5	147.01
14	2000 Mj Meson Gun	5.05	55.6	2237	1883	90	3: 224	6: 129	12: 67	24: 34	5	185.81
15	1000 Mj Meson Gun	3.6	27.8	602	603	42	1: 158	2: 129	4: 65	8: 33	1	43.782
15	2000 Mj Meson Gun	5.05	55.6	2479	1962	105	4: 224	8: 120	16: 59	32: 29	4	213.628

Spinal mounts are the heaviest of ship-carried weapons. As the name suggests, they are usually carried in the spine of the ship, along its centerline where the weapon can take advantage of the length of the ship to acheive the performance it needs. The weapons above are only a sample of the two major types of spinal weapons, based on the specifications of some of the ships contained later in the book. Spinal mounts are custom-built to the parameters of the ships in which they are installed, and may be designed with the **Fire, Fusion, & Steel: Traveller Technical Architecture** sourcebook.

The two types of weapons are particle accelerators and meson guns. **Bore** is the diameter of the beam tunnel in meters, MW is the required power input in megawatts, volume is the volume of the entire system including crew positions in cubic meters. **Mass** is in metric tonnes, again, for the entire system, and **Length** is the length of the weapon in meters. The **Short, Medium, Long,** and **Extreme** columns give the weapons' performance at these ranges. The number to the left of the colon is the range in hexes, and to the right is the Penetration Value (for particle accelerators) and Damage Value (for meson guns) used at those ranges. **Crew** is the number of crew required (workstations are included in the listed mass, but they need to be provided with stateroom accomodations), and **MCr** is the price of the weapon in millions of credits.



If an MFD is to have the capability to control missiles, it must have a laser or maser communicator from the same tech level installed with it as well. Like the pencil-beam sensor above, it is considered part of the MFD and may not be used for any other purpose, but its full cost, power, and antenna size are used. This communicator should be the same type as installed on the missiles that will be used with the MFD, as the short (automatic contact) range will be limited to that of the MFD or the missile, whichever is shorter. The number of missiles that can be simultaneously controlled by an MFD is equal to the "Diff Mod" listing. When the missile detonates and fires, the missile can only use the MFD's ability to ignore Diff Mods if it is within the MFD's extreme range (8 × the short range shown on the table). Designers should choose the range of their missile control MFDs accordingly.

Note that the task-range performance of weapons that are being fired by an MFD are limited to the range of the MFD if that is shorter than that of the weapon. Therefore, players should take care to install MFDs whose range performance matches that of the installed weapons. A vessel equipped with an MFD must also be equipped with a St or Fb model computer of an equal or higher tech level.

MFD crew are not handled at this step. MFD crew are allocated workstations on the bridge or flight deck and are handled in that step of the design sequence.

Master Fire Directors

	Volume at tech levels					
Range	*8*	*9*	*10*	*12*	*14*	*15*
0.3	0.2	0.1	0.08	0.06	0.04	0.02
3	0.4	0.2	0.16	0.12	0.08	0.04
30	0.8	0.4	0.3	0.24	0.16	0.08
300	1.6	0.8	0.6	0.48	0.3	0.16
3000	3	1.6	1.2	1	0.6	0.3
30,000/1	6	3	2.4	2	1.2	0.6
60,000/2	12	6	4.8	4	2.4	1.2
90,000/3	18	9	7.4	6	3.6	1.8
120,000/4	24	12	10	8	4.8	2.4
150,000/5	30	15	12	10	6	3
180,000/6	36	18	14	12	7.2	3.6
210,000/7	42	21	16	14	8.4	4.2
240,000/8	48	24	18	16	9.6	4.8
270,000/9	54	27	20	18	10.8	5.4
300,000/10	60	30	22	20	12	6
Diff Mod	1	2	3	4	5	6

Range: Short range in kilometers/hexes.

Diff Mod: The number of cumulative adverse difficulty modifiers to hit the fire director ignores, as well as the number of missiles it may control at one time.

Mass: Mass in metric tonnes equals volume × 1.

MCr: Price in millions of credits equals volume × 1.

MW: Power requirement, in megawatts, equals volume × 0.01.

Sockets

If desired, a designer may install turret and/or barbette hardpoint sockets while the ship is being built. This allows easy installation of a standard turret or barbette later. Turret hardpoint sockets consume 3 displacement tons (42 cubic meters) while barbette hardpoint sockets consume 6 displacement tons (84 cubic meters). Both cost .005 MCr if installed during construction and, as they are empty, have negligible mass.

The following is a selection of standard modular 3-ton (42 kiloliter) turrets, 6-ton (84 kiloliter) barbettes, and larger bays which can be installed on starships. Each turret and barbette is designed to fit into a standard turret hardpoint socket or barbette hardpoint socket. The turret or barbette does not add to the displacement of the ship (as the socket itself takes up the full displacement of the mount), but does add weight as shown on the chart on page 10. Sockets may be included in a design even if no weapons are installed until later.

Turret Hardpoint Socket

Displacement: 3 tons
Price: MCr0.005

Barbette Hardpoint Socket

Displacement: 6 tons
Price: MCr0.005

Bays are built in 50-ton and 100-ton versions. There are no standard sockets for bays, and they are instead custom-installed when the ship is built. Bays are designed using the rules in the **Fire, Fusion, & Steel: Traveller Technical Architecture** book.

Weapons Listing

Each weapon includes a fire control workstation for a gunner and may either be fired from the turret/barbette workstation or patched into a master fire director (if the ship has such a device).

TL: This is the tech level of the weapon, and determines the lowest tech level world on which the weapon can routinely be purchased. Turret and barbette weapons and their beam pointers are self-contained systems and so the tech level of the ship's computer does not limit the tech level of mounted turrets. A tech level 15 laser turret, for example, can be mounted in any turret hardpoint socket in any tech level ship.

Description: This indicates power of the laser's pulse (in megajoules) and the mount type: turret (3 displacement tons), barbette (6 displacement tons), or bay (either 50 or 100 displacement tons).

MW: This is the continuous power requirement of the mount to fire each turn. If more power is provided to the weapon it increases the rate of fire (this is called "overpowering"). This does not allow the weapon to make more hit rolls in a turn, but rather allows it to ignore difficulty level increases the same as if it was using a master fire director. For every increase of a factor of 5 of the power input, the laser may ignore one difficulty level increase. Because of engineering limitations, no more than two such increases are possible.

For example, the TL 10 laser turret requires 1.7 MW per turn. If 1.7 MW were allocated to the turret, it would fire normally. If 8.5 MW were allocated, it could ignore 1 difficulty level increase. If 17 MW were provided, it could ignore 2 difficulty level increases.

Ships which are designed from the outset to allocate these higher power levels to their lasers experience no difficulties when firing them. However, if lasers not installed with these higher power levels are fired at these overpower levels (by diverting power from other systems), there is a chance of blowing power couplings, etc., not designed for this strain. Roll a Ship's Engineering task for each shot. If overpowering by one level (–0 Diff Mod to –1 Diff Mod or –1 Diff Mod to –2 Diff Mod), difficulty level is Difficult, level is Formidable if overpowering by two levels (–0 to –2). Failure indicates a System

Reset on the laser, and the laser loses its shot for the current turn. For Catastrophic Failure, roll 1D10: 1-5 indicates a Degraded Performance result plus a System Reset, 6-10 indicates a major hit on the laser. See *Rules Book* for damage descriptions.

Mass: The mass of the weapon in tonnes.

Short: The first number is the short range of the weapon in hexes (tenths of a light-second). The first number following the colon is the penetration rating of the weapon and the second number (following the dash) is the damage value of the weapon.

Medium, Long, Extreme: These show the same values as under "Short," but for the weapon's medium, long, and extreme ranges.

Starship Missiles

Both missile turrets and missile barbettes are equipped with a gunner's workstation and a 300,000-km range communication laser, which is used to control the missile in flight. The only performance difference between turrets and barbettes is the number of missiles carried: a missile turret carries two standard missiles while a barbette carries five.

Additional missiles may be carried in cargo spaces, but it takes an hour (two complete game turns) to reload a turret or barbette once its missiles are expended.

The listing below shows the characteristics of missile turrets and barbettes. Volume is in kiloliters, weight is in tonnes (loaded), Power is in megawatts, and price is in megacredits (without missiles).

Missile Launchers

Type	*TL*	*Missiles*	*Volume*	*Weight*	*Power*	*Price*
Turret	8	2	42	28.4	0.15	0.08
Barbette	8	5	84	70.4	0.15	0.11

All of the missiles listed below are all of the nuclear-detonation variety. The table below gives the type of guidance, warhead yield, mass in metric tonnes, its price in MCr, the number of G-turns of fuel carried (followed by the maximum number of G-turns which can be used in a single turn), the die rolled for number of hits from the laser, the damage value of each laser hit, absolute range in hexes (0 = same hex only), the short range (in hexes) and type of communicator (L= laser, M = maser, R = radio), and its sensor range (in hexes) and type (R = Radar, T = High Resolution Thermal, L = Ladar, A = Active EMS, P = Passive EMS). The Signatures column shows the missile's signature vs. radar, active EMS, HRT, passive EMS, and fire, and is copied into the blanks on the missile log sheet. Note that each of the missiles shown can, if desired, spend all of its G-turns of fuel in a single turn, or spread it out over several turns. This will not always be true of other missiles. All missiles on the Missiles table have a hull armor value of 3. Both semi-independent missiles have a power endurance of 10 hours for their sensors. After this time, they function as normal controlled missiles.

Sandcasters

All sandcaster turrets fit in the standard turret hardpoint socket. Each turret weighs 50 tonnes and requires 1MW of continuous power while in operation.

The table below lists the price of the turret in megacredits, the number of sand cannisters carried in the turret, and the beam reduction made per successful beam interception. Additional sand cannisters may be stored in cargo but it takes one hour to resupply a turret.

TL	*Price*	*Cannisters Carried*	*Beam Reduction*
8	0.6	16	1D6×5
9	0.65	18	1D6×5
10	0.7	20	1D10×5
11	0.75	24	1D10×5
12	0.8	30	1D10×5
13	0.85	35	2D6×5
14	0.9	40	2D6×5
15	1	50	2D10×5

Missiles

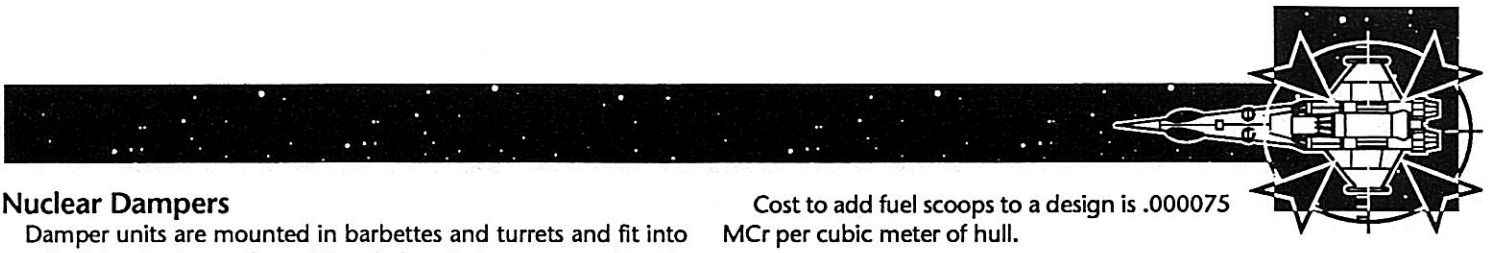
TL	*Guidance*	*Yield*	*Mass*	*MCr*	*G-Turns*	*Hits*	*Damage*	*Range*	*Comm.*	*Sensor*	*Signatures*
9	Controlled	50	7	0.85	12/12	1D6	1/14-43	0	10L	—	+2/+2/+2/+2/+1
11	Controlled	100	7	0.95	12/12	1D6	1/18-56	0	10L	—	+2/+2/+2/+2/+1
12	Semi-Ind.	500	7	2.0	9/9	1D6	1/25-79	0	10L	1P	+4/+3/+4/+3/+1
13	Controlled	200	7	1.15	12/12	1D6	1/21-66	0	10L	—	+2/+2/+2/+2/+1
14	Semi-Ind.	500	7	2.7	7/7	1D6	1/25-79	0	10L	3P	+4/+3/+4/+3/+1
15	Controlled	500	7	1.25	12/12	1D6	1/25-79	0	10L	—	+2/+2/+2/+2/+1
15	Controlled	500	7	2.43	11/11	1D6	1/25-79*	1	10L	—	+2/+2/+2/+2/+1

*Damage listed is at 0 hexes. Damage at 1 hex range is 1/8-25.

Socket Laser Turrets and Barbettes

TL	*Description*	*MW*	*MCr*	*Mass*	*Short*	*Medium*	*Long*	*Extreme*
9	70-Mj laser, 100-ton bay	1.9	267	1402	1:1/7-21	2:1/3-10	4:1/2-5	8:1-3
10	60-Mj laser turret	1.7	1.56	55	1:1/6-19	2:1/6-19	4:1/3-9	8:1/2-5
10	450-Mj laser, 50-ton bay	12.5	104	873	4:1/17-53	8:1/17-53	16:1/9-28	32:1/4-14
11	80-Mj laser turret	2.2	2.08	59	2:1/7-22	4:1/7-22	8:1/6-19	16:1/3-10
11	150-Mj laser barbette	4.2	6.56	119	10:1/10-31	20:1/5-17	40:1/3-8	80:1-4
12	120-Mj laser turret	3.3	0.94	65	4:1/9-27	8:1/9-27	16:1/6-19	32:1/3-9
13	150-Mj laser turret	4.2	0.72	68	1:1/10-31	2:1/10-31	4:1/10-31	8:1/10-31
13	106-Mj laser turret	2.9	1.45	59	10:1/8-26	20:1/6-20	40:1/3-10	80:1/2-5
14	150-Mj laser turret	4.2	0.72	63	2:1/10-31	4:1/10-31	8:1/10-31	16:1/10-31
14	300-Mj laser barbette	8.3	2.16	131	10:1/14-43	20:1/14-43	40:1/8-26	80:1/4-13
15	150-Mj laser turret	4.2	0.86	57	10:1/10-31	20:1/10-31	40:1/10-31	80:1/10-31

These weapons are only samples. Additional examples, including higher tech bays, may be designed with the **Fire, Fusion, & Steel: Traveller Technical Architecture** sourcebook.



Nuclear Dampers

Damper units are mounted in barbettes and turrets and fit into standard hardpoint sockets. Mass below is in tonnes, prices in megacredits, and power requirements in megawatts.

TL	Description	Mass (tonnes)	Price (MCr)	Power (MW)
12	Damper Barbette	75.2	1.95	15
13	Damper Barbette	72.2	2.7	9
14	Damper Barbette	60.2	4	6
15	Damper Turret	33.2	4.5	3

Meson Screen

A meson screen is an energy field surrounding the generator which slows and prematurely detonates high-energy mesons. The designer specifies only the power requirement (in MW) of the meson screen; all other values are derived from the power requirement, tech level, and size of the protected ship.

Vol: The meson screen generator's volume, in cubic meters equals MW × 20.

Mass: The meson screen generator's mass, in metric tonnes, equals Vol × 0.75.

AA: The meson screen generator's antenna area, in square meters, equals MW × 10.

MCr: The meson screen generator's price, in millions of credits, equals Vol × 0.1.

Each meson screen requires crew equal to the mass of the screen + 100, times the computer control multiplier (round to the nearest whole number, but must be at least 1). Each crewmember requires one normal workstation installed as part of the screen assembly (i.e., included in the total volume, mass, and price requirements of the screen as a single unit).

Performance

The meson screen generates a Protection Value for the ship which is used against incoming meson guns. The Protection Value is derived by the following formula:

$$PV = TLM \times \sqrt{MW+TSM}$$

PV= Protection Value
TLM = Tech Level Multiplier
TSM = Target Size Modifier

Tech Level Modifiers

TL	TLM
12	50
13	60
14	70
15	80
16	90

Target Size Modifiers

Size	TSM
Small or less	1
Medium	2
Large	4
Very Large	8
Gigantic	16

STEP 5. OPTIONAL FEATURES

Fuel Scoops

Fuel scoops may be added to any design. These allow a vessel to skim the free raw materials for liquid hydrogen (LHYD) fuel from oceans or gas giant atmospheres. They do not consume any volume or add to the mass of the vessel. Fuel scoops do consume surface area. Each 5% of a craft's total surface area given to fuel scoops allows the craft to scoop fuel equal to 20% of its total volume per hour (i.e., a 100-ton ship with fuel scoops covering 10% of its surface can scoop 40 displacement tons of fuel per hour).

Cost to add fuel scoops to a design is .000075 MCr per cubic meter of hull.

Fuel Purification Plant

TL	MW	Vol	Mass	MCr	MinVol
8	0.01	0.7	1.5	0.0002	135
9	0.009	0.6	1.2	0.00019	120
10	0.008	0.55	1.1	0.00018	105
11	0.007	0.45	0.9	0.00017	95
12	0.006	0.4	0.8	0.00016	80
13	0.005	0.35	0.7	0.00015	65
14	0.005	0.25	0.5	0.00014	55
15	0.005	0.2	0.4	0.00015	40
16	0.005	0.15	0.3	0.00016	25
17	0.005	0.1	0.2	0.00017	15

Vol: Cubic meters.
Mass: Metric tonnes.
MCr: Price in millions of credits.
MW: Power requirement in megawatts.
All values are per kiloliter of fuel processed per 6 hours.

Socket Extenders

Turrets and barbettes may be mounted on extended mounts to achieve better arcs of fire. These are only practical on larger ships. Bays and spinal mounts may not be mounted on extenders.

When mounted on an extender, a turret or barbette has its arc of fire increased by one arc on each side of its normal arc. For example, a turret mounted in hit location 6 of a box hull form would normally have an arc of fire of 2, 3, and 4. If mounted on an extender, it would cover 1-5. Because of location, many arcs of fire will only be increased by one arc. A turret at hit location 5 on the same box hull, normally arcs 1-3, would only be increase to 1-4.

Each extender is a projection from the hull which requires additional armor and internal structure to support it. Each turret extender requires a basic shell volume of 1.43 cubic meters, which is modified by the hull material and thickness values of the spacecraft's hull as calculated in Step 1. It also requires a basic internal structure volume of 1.43 cubic meters, which is modified by the same maximum G and hull material modifiers as the craft's hull.

Barbette extenders require 2.18 cubic meters of basic shell volume and 2.18 cubic meters of basic internal structure volume, also modified by the same hull thickness, G performance, and hull material values of the craft's hull.

Each such extender has a standard turret or barbette socket on the end of it which can accommodate any standard turret or barbette. The structural requirements of the extender itself are required for the spacecraft; no modifications are required for the weapon fitted in it. A spacecraft may mount no more than two turret extenders or one barbette extender per 500 displacement tons of hull. The minimum hull volume for a single turret extender is 250 tons.

Any spacecraft fitted with a turret or barbette extender becomes unstreamlined, regardless of its original hull configuration. Ships equipped with one or more extender are treated as being one target size larger (i.e., small becomes medium, medium becomes large) when being scanned by active sensors.

Vehicle Service Facilities

Description	*Vol*	*Mass*	*MCr*	*MW*
Internal Hangar (Minimal)	×2	0.2	.0002	—
Internal Hangar (Spacious)	×4	0.2	.0002	—
Docking Ring	×1	0	.0002	—
Launch Tube	×25	0.5	.00015	.01
External Grapple (USL)	×0.1	1.0	.001	—
External Grapple (SL)	×0.3	1.0	.002	—
External Grapple (AF)	×0.5	1.0	.003	—

Volume: Multiply the craft or vehicle volume by the value shown to determine the facility volume.

Mass: The mass in tonnes per cubic meter of installation.

MCr: The price per cubic meter of installation.

Surface Area: All of these facilities require surface area except for the hangars (which require launch ports, below). The launch tube requires area in m^2 equal to $2 \times L^2$, and the docking ring requires area equal to L2, where L equals the basic length as taken from the Hull Size table, unmodified by hull form, of the largest craft that will use the tube or ring.

Grapples require area equal to the square of the final length of the craft carried by the grapple.

MW: Power requirement per cubic meter of installation.

Hangar Space: Spacious hangars allow all repair and maintenance tasks to be conducted at normal difficulty levels. Minimal hangars increase the difficulty level of all such tasks by one level. This applies to damage or breakdown repair tasks. The expenditure of maintenance hours is unchanged.

Docking Ring: A docking ring may only accommodate craft of one specific displacement (in tons) and one specific hull form and configuration (i.e., 10-ton steamlined cylinder or 30-ton unstreamlined wedge), designated during the design sequence. Airframe configurations may not be accommodated in docking rings. Docking rings allow no maintenance or repair tasks, but does not prevent maintenance hours from being spent.

External Grapple: Types listed are for Unstreamlined (USL), Streamlined (SL), and Airframe (AF) hulls of the carrying ship, not the carried craft. Note that the volume of craft carried in external grapples is not subtracted from the available hull volume of the carrying ship, although the volume of the grapple is. Remember that the volume of the carrying ship plus all externally carried craft is used when calculating the required amount of maneuver drive and jump drive.

By selecting the type of grapple that corresponds to its hull streamlining, the vessel may carry externally mounted craft without compromising its streamlining configuration, so long as the externally mounted craft also meets that configuration. If the grapple or craft's configuration is lower than that of the overall hull, the ship is limited to the lower configuration if it is carrying the craft. If the craft is detached, the hull's configuration may be used.

Special Facilities

Description	*Vol*	*Mass*	*MCr*	*MW*
Electronics Shop	84	40	1	0.6
Machine Shop	140	120	2	1
Laboratory	112	50	5	0.8
Sickbay	112	50	5	0.8

Vol: Volume in cubic meters (kiloliters).
Mass: Total mass in metric tonnes.
MCr: Price in millions of credits.
MW: Power requirement in megawatts.

Internal Armor

Valuable internal systems may have additional armor added around them. Any time a hit is rolled against such a system, the remaining damage value must first penetrate this internal armor before it can damage the system.

Calculate the volume of the system(s) to be protected, and then design the armor as if it were a separate hull, using the same procedure used to calculate the hull shell (or chassis armor material volume, if it is a vehicle) volume, weight, and price of the ship. Select the armor thickness desired, and use the hull form modifier as used by the main hull. Do not, however, use the minimum armor level based on G performance, and do not apply the airframe configuration modifier. There is no internal structure requirement for internal armor.

Access Ports

Description	*Area*	*MCr*
Launch Port	L^2	0.001
Large Cargo Hatch	20 m^2	0.02
Small Cargo Hatch	12 m^2	0.012

Area: Hull surface area required.

L^2: The square of the craft's basic length as taken from the Hull Size table, unmodified by hull form.

MCr: Price in MCr per square meter of launch port, or per each cargo hatch.

Launch Port: At least one launch port is required if craft or vehicles are carried. More launch ports allow craft to be launched more rapidly.

Cargo Hatches: All craft require at least one large cargo hatch per 350 m^3 (25 tons) of cargo capacity. Vessels with under 100 m^3 of cargo space can get by with a single small cargo hatch.

Seats

Short-haul spacecraft will require passenger seats.

Access	*Vol*	*Wt*	*MCr*
Restricted	1.5	.02	.0001
Cramped	2.5	.02	.0001
Adequate	3.5	.02	.0001
Roomy	7	.02	.0001

Vol: Volume in m^3 per position/seat.
Mass: Mass in tonnes per position/seat.
MCr: Price in megacredits per position/seat.

These are simple seats with no controls. Paying passenger seats must be Adequate or better; seats for troops must be Cramped or better. "Restricted" access is the minimum possible accommodation for special purposes only.

Drop Tanks

Ships may be fitted with drop tanks if desired. A drop tank is an additional hull section filled entirely with fuel. Its material volume and mass are calculated just as if it were a separate ship, and it must use the same hull form and configuration modifiers as the ship it will be fitted to, and must be armored and have internal structure bracing sufficient to withstand the ship's rated acceleration.

If a drop tank is fitted to a ship with electromagnetic masking (EMM), the tank(s) must also be so fitted, with the volume and surface area taken out of the tank itself. Power requirements are assumed to be met by the carrying ship, which must allow for them in its own design. If any EMM-fitted ship is carrying non-EMM drop tanks, the ship loses all of its EMM benefits until the tanks are dropped.

A drop tank is designed to be released once it is drained, allowing improved performance by the ship.

STEP 6. POWER SUPPLY

Spacecraft need a source of power to supply their numerous on-board systems. The power supply should be sufficient to run all of a spacecraft's systems at the same time, and many vessels are built with a power excess, allowing other equipment to be installed later, or to allow power to be lost as a result of battle damage.

If a spacecraft's power supply is insufficient to power all of its systems, note the systems that are routinely shut down to allow the others to function (for examples of this, see the spacecraft data pages later in this booklet). These powered-down systems may not include life support (but may include artificial gravity/G-compensation systems, if the designer is willing to accept that risk) or the craft's required number of computers (page 4). A ship that is designed to take-off and land on worlds must be able to operate its contra-grav, maneuver drive (only 1G need be powered if craft is equipped with contra-grav), and at least one each of its communicators and sensors (minimum short range of 300 km for each of these) at the same time.

The plants below include low-tech chemical power plants, fuel cells, nuclear plants, plus some more specialized sources, batteries and photovoltaic ("solar") collector panels.

Fuel cells are like batteries in that they are both electrochemical cells and therefore work on similar principles. However, batteries are closed systems which electrochemically store energy for later withdrawal, while fuel cells are open systems which constantly process fuel and electrochemically convert it to energy.

Fuel: The type of fuel burned. All chemical power plants burn hydrocarbon distillates, but some substitutes are possible. Alcohol distillates may be substituted for hydrocarbon distillates in all power plants listed, but energy output is multiplied by 0.75. All power plants from tech level 7 and higher may be designed to burn liquid hydrogen (LHyd) instead of hydrocarbon distillates at no energy penalty. These plants all require an atmosphere containing oxygen in order to function, thus will not function in vacuum, trace, exotic, corrosive, or insidious atmospheres.

Turbine power plants modified to use LHyd may carry their own on-board supply of liquid oxygen in order to function in vacuum or other environments. The "LOx" is carried in the LHyd fuel tanks, half of the tanks being set aside for this purpose. When operating from on-board oxygen supplies like this, the plant's rate of fuel consumption is *doubled.*

This modification costs Cr50 per cubic meter of tank capacity, and does not prevent the tank from being filled purely with LHyd for standard atmosphere operations.

Chemical Power Plants

TL	Description	MW	Mass	MCr	Min Vol	KL/Hour	Fuel Type
5	Steam Turbine	0.35	2	0.002	1	0.15	Hydrocarbon Distillates
5	Imp. Int. Comb.	0.40	1	0.002	0.01	0.25	Hydrocarbon Distillates
7	Gas Turbine	0.50	1	0.005	0.5	0.3	Hydrocarbon Distillates
8	MHD Turbine	0.60	1	0.01	1	0.2	Hydrocarbon Distillates

Imp. Int. Comb.: Improved Internal Combustion; **MHD Turbine:** Magnetohydrodynamic turbine; **MW:** MW output per cubic meter of power plant; **Mass:** Metric tonnes per cubic meter of power plant; **MCr:** Price in MCr per cubic meter of power plant; **Min Vol.:** Smallest possible power plant in cubic meters; **KL/Hour:** Kiloliters (cubic meters) of fuel consumerd per hour per MW output.

Fuel Cells

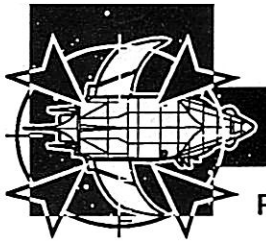
TL	Description	MW	Mass	MCr	Min Vol	KL/Hour	Fuel Type
7	Fuel Cell	0.5	1	0.02	.01	0.3	HG Hydro Dist.
12	Fuel Cell	0.75	1	0.02	.01	0.25	HG Hydro Dist.
14	Fuel Cell	1.5	1	0.02	.01	0.2	HG Hydro Dist.
16	Fuel Cell	1.75	1	0.02	.01	0.2	HG Hydro Dist.

MW: MW output per cubic meter of power plant; **Mass:** Metric tonnes per cubic meter of power plant; **MCr:** Price in MCr per cubic meter of power plant; **Min Vol.:** Smallest possible power plant in cubic meters; **KL/Hour:** Kiloliters (cubic meters) of fuel consumed per hour per MW output; **HG Hydro Dist.:** High-grade hydrocarbon distillates.

Nuclear Power Plants

TL	Description	MW	Mass	MCr	Min Vol	KL/Year	Fuel Type
6	Nuclear Fission	0.30	10	0.1	30	0.75	Radioactives
7	Nuclear Fission	0.60	8	0.1	20	0.25	Radioactives
8	Nuclear Fission	1.00	6	0.1	10	0.1	Radioactives
9	Fusion	2.00	4	0.2	100	0.15	Hydrogen
10	Fusion	2.00	4	0.2	50	0.15	Hydrogen
11	Fusion	2.00	4	0.2	20	0.15	Hydrogen
12	Fusion	2.00	4	0.2	10	0.15	Hydrogen
13	Fusion	3.00	3	0.2	1	0.1	Hydrogen
14	Fusion	3.00	3	0.2	0.25	0.1	Hydrogen
15	Fusion	6.00	2	0.2	0.1	0.1	Hydrogen
16	Fusion	7.00	1	0.2	0.075	0.1	Hydrogen

MW: MW output per cubic meter of power plant; **Mass:** Metric tonnes per cubic meter of power plant; **MCr:** Price in MCr per cubic meter of power plant; **Min Vol.:** Smallest possible power plant in cubic meters; **KL/Year:** Kiloliters (cubic meters) of fuel consumed per year per MW output.



Fuel Tankage

Fuel tankage in m^3 must be designated during the design sequence. There is no cost or mass associated with the internal tanks themselves, but the fuel does have mass as indicated on the table.

For nuclear power plants, the power plant fuel (measured by the year) should be thought of as separate from the other fuel.

Almost without exception, starships use liquid hydrogen (LHyd) fuel for all their needs. If, for some reason, a ship has power generated by more than one type of fuel, the tankage for these is calculated separately.

The LHyd tankage should be made sufficient for the ship's jump fuel and reaction mass needs, and this fuel can be used interchangeably for either purpose as needed.

Fuel

Type	*Mass*	*Price*
Hydrocarbon Distillates	1.0	250
HG Hydro Distillates	1.0	1000
Radioactives	12.5	75,000
Liquid Hydrogen (LHyd)	0.07	35

Mass: In tonnes per m^3.
Price: In credits per m^3.

Batteries

TL	*Description*	*MW*	*Mass*	*MCr*
5	Storage Batteries	0.06	2	0.001
6	Storage Batteries	0.08	2	0.0008
7	Storage Batteries	0.1	2	0.0008
8	Storage Batteries	0.2	2	0.001
9	Storage Batteries	0.4	2	0.002
10	Storage Batteries	0.8	2	0.003
11	Storage Batteries	1	2	0.004
12	Storage Batteries	1.5	2	0.005
13	Storage Batteries	2	2.5	0.008
14	Storage Batteries	2.5	2.5	0.01
15	Storage Batteries	3	2.5	0.015
16	Storage Batteries	3.5	2.5	0.02

MW: Maximum output, in megawatts, at the one hour discharge rate, per cubic meter of battery.
Mass: Mass of the battery, in metric tonnes, per cubic meter
MCr: Price in millions of credits per cubic meter

Battery Discharge Rate

The battery's discharge time is the time it takes to drain the battery's charge. The energy output on the table above assumes a discharge time of 1 hour. If the output is lowered, the discharge time is increased, as shown below.

Output	*Time*
×5	0.1 hour
×1	1 hour
×0.1	10 hours
×0.02	100 hours
×0.004	1000 hours

Values may be interpolated. For example, a time of 55 hours (halfway between 10 and 100) yields an input multiplier of ×0.06 (halfway between 0.1 and 0.2).

Solar Arrays

Solar arrays consist of solar collectors, which collect solar radiant energy, and solar cells, which convert radiant energy to electrical energy. Each cubic meter of solar cells requires 10 square meters of solar array if deployed in the inner zone of a star system, 100 square meters of solar collectors if deployed in the habitable zone of a star system, and 10,000 square meters of solar collectors if deployed in the outer zone of a star system.

Solar Collector Panels

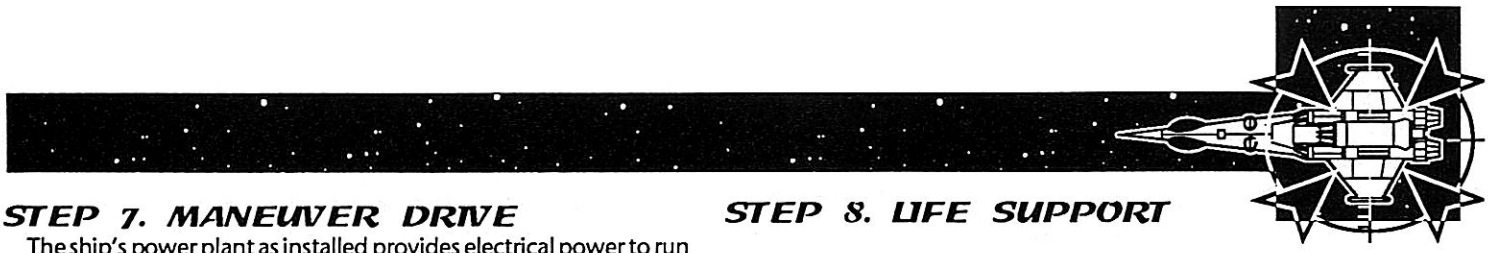
TL	*Vol*	*Mass*	*MCr*
6	0.3	0.008	0.005
7	0.2	0.006	0.004
8	0.15	0.004	0.003
9	0.1	0.003	0.002
10	0.06	0.002	0.001
11+	0.04	0.001	0.001

Vol: Cubic meters of volume required per square meter of installed collector panels, if permanently installed.
Mass: The mass of the collector, in metric tonnes, per square meter of panel.
MCr: The price of the collector, in millions of credits, per square meter of panel.
Retractable Array: The above values are for rigid, permanently installed solar collectors. If the solar collector is designed to be retracted and deployed at various times, double the price, mass, and volume.

Solar Cells

TL	*MW*	*MCr*
6	0.01	0.5
7	0.015	0.4
8	0.02	0.3
9	0.025	0.25
10	0.03	0.2
11	0.035	0.15
12+	0.04	0.1

MW: Output, in megawatts, per cubic meter of solar cell.
MCr: Price, in millions of credits, per cubic meter of solar cell.
Mass: All solar cells mass 2 metric tonnes per cubic meter.
Minimum Volume: The smallest allowed solar cell is 0.01 cubic meters.



STEP 7. MANEUVER DRIVE

The ship's power plant as installed provides electrical power to run the ship's basic systems. The power plant can be (and almost always is) also modified to provide thrust by the addition of a combustion chamber hich burns liquid hydrogen reaction mass in a process called "HEPlaR," or high-efficiency plasma recombustion. Thrust requires both energy and reaction mass, and so additional fuel tankage will be required as well.

Each ship requires 0.5 MW of power output per displacement ton (hull size number) for each G of acceleration. To determine the acceleration rating of the ship, multiply its power devoted to thrust (hereafter called its thrust MW) by 2 and divide the product by its hull number, rounding fractions down.

(This equation works for ships of "typical densities," i.e., those which mass of 15 or fewer metric tonnes per displacement tons. Find the total mass of the spacecraft in tonnes, divide it by its volume in displacement tons, and round to the nearest whole number. If the result is 15 or less, use the system above. If 16 or greater, use the following system for very dense ships. Each MW devoted to thrust produces 20 metric tonnes of thrust. Divide the craft's total mass by tonnes of thrust (thrust MW×20) to find the performance in Gs.)

Each thrust MW requires a heat exchanger/ignition chamber assembly 0.1 cubic meters in size. Mass = 1 tonne per cubic meter, and surface area in square meters is equivalent to the volume in cubic meters. Price is equal to 0.01 MCr per cubic meter of ignition chamber.

Each thrust MW consumes 0.25 cubic meters of reaction mass per hour in addition to the normal fuel cost of the power plant. Liquid hydrogen (LHyd) is used as the reaction mass, and is treated the same as normal LHyd fuel tankage.

Ships with a G rating greater than 1 may only use the acceleration for limited periods of time, unless they have G-compensators or G-tanks installed. (Prolonged periods of high acceleration will otherwise injure the crew.)

Many ships also have contra-grav (CG) lifters as fuel-efficient means of landing and taking off from a planet surface. CG lifters do not provide thrust and so cannot physically lift a ship. Instead, they neutralize most of the gravitational attraction of a world (approximately 99% of gravitational force, beyond which power use becomes prohibitive). This, combined with atmospheric pressure, will provide buoyancy in very dense atmospheres and so allow the craft to float at low altitudes, but usually CG is used only as an adjunct to the ship's thrusters. By neutralizing most of a world's gravitational field, a ship with only 1G of thrust can still escape the world's gravity well.

Note that CG does not reduce the mass of the ship, and so a 1G thruster will still only produce 1G of acceleration; CG merely negates the gravitaional vector of a world.

Contra-Grav Lifters

Type	*TL*	*MW*	*Kl*	*Mass*	*MCr*	*Min Vol*
Standard	9	0.3	0.5	0.4	.02	1
Improved	10	0.2	0.3	0.3	.025	0.3
High Efficiency	12	0.1	0.3	0.2	.03	0.003

TL: Tech level available.

MW: Power requirement per displacement ton (14 kl) of hull.

Kl: Volume in kiloliters (cubic meters) per displacement ton (14 kl) of hull.

Mass: Mass in metric tonnes per displacement ton (14 kl) of hull).

MCr: Price in millions of credits per displacement ton (14 kl) of hull.

Min Vol: Smallest installation volume allowed.

Surface Area: 10% of total hull surface area (used for spacecraft only, not ground vehicles). This includes space for landing gear/skids.

STEP 8. LIFE SUPPORT

Environmental Equipment

TL	*Description*	*MW*	*Vol*	*Mass*	*MCr*
5	Air Lock	0.001	3.000	0.200	.005
5	Basic Life Support	0.0001	0.005	0.005	.0003
6	Extended Life Support	0.0002	0.008	0.008	.0005
10	Artificial Gravity/ G Compensators*	0.005	0.010	0.020	.0005

Values are per air lock for the air lock and per cubic meter of hull volume for all others.

Airlocks required = Hull displacement (in tons)+100, rounded up. Each air lock requires 2 square meters of hull surface area.

Basic life support provides sealed environment, air, and water. Extended ls adds waste disposal/recycling and food, and is required for all craft that are operated for 8+ hours at a time. Ships with extended life support substitute this for basic life support.

*The amount of Gs which can be compensated vary by tech level as follows.

TL	*Compensated Gs*	*Max Accel/ Workstation*	*Max Evade/ Workstation*
10	1G	2G/3G	1G/2G
11	2G	3G/4G	2G/3G
12	3G	4G/5G	3G/4G
13	4G	5G/6G	4G/5G
14	5G	6G/7G	5G/6G
15	6G	7G/8G	6G/7G
16	7G	8G/9G	7G/8G

Compensated Gs is the number of acceleration or evasion Gs negated by the compensator. All crews can automatically withstand 1G, so the maximum acceleration without degrading crew performance is actually 1G above this level, as shown in the Max Accel column to the left of the slash. Evasion Gs, however, are applied erratically, and so cannot be withstood by crews without degrading performance, as shown in the Max Evade column to the left of the slash. Beyond these levels, all tasks are performed at one difficulty level higher (+1 Diff Mod) per G-turn applied.

Starship crewmembers who are strapped into workstations (for **Brilliant Lances** space combat, this is assumed to be everyone except damage control parties, maintenance crew, stewards, medics, and ship's troops) can withstand 1G additional of acceleration or evasion before their performance is degraded. These figures are shown to the right of the slash in the Max Accel and Max Evade columns.

Extended Accommodations

Description	*MW*	*Vol*	*Mass*	*MCr*
Bunk	—	14	0.5	.005
Low Berth	0.001	14	1.0	.05
Emergency Low Berth (for 4)	0.002	28	2.0	.1
Small Stateroom	0.0005	28	2.0	.04
Large Stateroom	0.001	56	4.0	.1

Staterooms are required for paying passengers: one large or small per High Passage passenger, and one large or small per Middle Passage (in the Regency) or one large per *two* Middle Passage in the Wilds.

Civilian crews are usually two per large or one per small stateroom. Military crews are often carried "double occupancy," four per large or two per small stateroom. Officers (except the most senior) may be carried at double occupancy, but enlisted may even be carried in bunks, up to three crew per bunk (by sleeping in shifts: "hot bunking").

Crew Requirements

Engineering: Ce=(P×Cp)÷30

Ce = Engineering crew
P = Power plant peak output in megawatts
Cp = Computer control multiplier

Electronics: Cl = (C+S)×Cp

Cl = Electronics crew
C = Number of installed communicators
S = Number of installed sensors
Cp = Computer control multiplier

Maneuvering: Cm=D

Cm = Maneuvering crew
D = Number of installed drives (maneuver drive = 1, jump drive = 1, maneuver and jump drive = 2)

Gunnery: Cg = FD+Wm

Cg = Gunnery crew
FD = Number of master fire directors
Wm = Sum of the installed weapon mounts which are to be manned in action, times the number of crew each

Maintenance Crew: Cr = Mp÷50

Ct = Maintenance crew
Mp = Maintenance points
= (Jm+Em+Wm+Pm+Mm+Sm)×(0.1×Cp)
Jm = Mass of installed jump drive, in tonnes
Em = Mass of all installed electronics, in tonnes
Wm = Mass of all installed weapons systems, in tonnes
Pm = Mass of all installed power plants, in tonnes
Mm = Mass of heat exchanger/ignition chamber, in tonnes
Sm = Mass of all carried spacecraft, in tonnes
Cp = Computer control multiplier

Ships Troops: Ct as desired.

Ct = Ship's troops

Flight Crew: Cf = Q×R

Cf = Flight crew
Q = Total number of carried craft
R = Crew required of each craft

Command: Cc = Z÷6

Cc = Command crew
Z = Ce+Cl+Cm+Cg+Cr+Ct+Cf

Stewards: Cs = [(Cc+Ph)÷8] + {[(Z+Pm)÷50]×Cp}

Cs = Stewards
Cc = Command crew
Ph = High Passengers
Z = Ce+Cl+Cm+Cg+Cr+Ct+Cf
Pm = Middle Passengers
Cp = Computer control multiplier

Medical: Cd = [(Z+Cc+Cs+Ph+Pm)÷120] + (Pl÷20)

Cd = Medical crew
Z = Ce+Cl+Cm+Cg+Cr+Ct+Cf
Cc = Command crew
Ph = High Passengers
Pm = Middle Passengers
Pl = Low Passengers

Note: Round all fractions down.

STEP 9. WORKSTATIONS AND BRIDGE

Workstations

Certain crewmembers require the installation of workstations at which they perform their duties of controlling or monitoring certain equipment. One standard workstation (7 m³, see table on next page) must be installed for each engineering, electronics, maneuvering, master fire director, and command crewmember as calculated in the Life Support step above. Workstations for weapons are included in the weapons themselves, and need not be allocated again.

If a ship requires a bridge (see section immediately below), the workstations for the electronics, maneuvering, master fire director, and command crewmembers are installed according to those guidelines, and do not need additional normal workstations. Each engineering crewmember requires one normal workstation, regardless of whether the ship requires a bridge or not.

Even if a ship does not require the specific fitting of bridge workstations as discussed below, the workstations for electronics, maneuvering, master fire director, and command crewmembers are still considered to be grouped together into an area called the "flight deck." This flight deck is treated as a bridge, and its crew as bridge crew for purposes of hits and damage in combat.

Bridge

The ship's bridge is a compartment in the vessel containing crew workstations for command, maneuvering, sensor, communications, and fire direction personnel. It is the ship's nerve center, particularly during combat.

The bridge consists of a number of 1-dispacement-ton (14 cubic meters) workstations. The larger size of the workstations is to allow room for easy movement and communication by command and replacement personnel as well as to allow inspections and conferences on the bridge itself without interfering with the crew's duties.

One workstation is required per electronics, maneuvering, and command crewmember, as determined in the Life Support step, as well as one workstation per master fire director. Each bridge workstation's characteristics are shown on the table on the next page.

Not all ships are large or complex enough to require a bridge. A ship requires a bridge if, during the Crew Requirements step, it is discovered that *two or more* command crew are required. If a ship is of sufficient size/complexity to require a bridge and does not have one installed (i.e., has only a flight deck installed instead), the following penalties apply:

- All sensor tasks are one level more difficult
- No sensor hand-offs are allowed
- Jamming tasks are one level more difficult
- Fire tasks for turrets under local control are one level harder
- MFD-directed fire tasks are one level harder on each turn that the battery composition is changed
- Jump tasks are one level more difficult

Auxiliary Bridge: A designer may wish to install one or more auxiliary bridges with as many or fewer bridge workstations as are installed on the operating bridge (auxiliary flight decks may be installed as well, using normal workstations). Fewer workstations will limit the number of fire directors, sensors, or communicators which can be operated from the site, calculated using the normal crew formulae. If an auxiliary bridge is constructed, additional crewmembers must be carried to man it.

Flag Bridge: If the vessel is to serve as the flagship of a group of ships, it should have a flag bridge. The flag bridge is the facility from which the flag officer commanding (admiral) exercises command and control. The bridge should have bridge workstations for the same number of sensor and communication crew as does the ship's command bridge, plus bridge workstations for additional command crew, depending upon the size of the force being commanded (3+0.25×[Number of ships in the fleet]). Ships which carry large numbers of small craft may have a fighter control bridge containing 3+0.06×(Number of fighters carried) bridge workstations. These bridges allow the application of Fleet Tactics skill to multi-vessel operations. Volume, weight, and price are calculated in the same way as for the ship's bridge.

Fire Control Bridge: On particularly large ships, the designer may wish to designate a number of MFDs that are not located on the main bridge, but are grouped together separately as their own bridge. This decreases the chance of fire control capabilities being lost from hits on the operating bridge.

Crew Workstations

Access	*Vol*	*Wt*	*MCr*
Bridge Workstation	14	0.2	below
Workstation	7	0.2	below

Vol: Volume in m^3 per workstation.

Mass: Mass in tonnes per workstation.

Workstations include control panels, readouts, etc., and are for the use of duty crewmembers. Price for the workstations depend on the type of control system used.

Price: Price of each workstation is determined by the type of control system installed aboard the craft. See Control Systems, page 3.

DESIGN EVALUATION

Once the design is complete, you will need to evaluate it to determine its game ratings.

1. Check Step

Go back and add up the volume, price, surface area, and mass of all the components. This is your chance to check to make sure that its internal occupied volume and area of surface fixtures are within what is allowed by the size of its hull. This step also provides you with a total price and mass.

Calculate two masses, loaded and empty. Loaded includes a full load of fuel, full load of cargo (assume 1 tonne per m^3), and all carried craft and vehicles on board. Empty is emptied of all jump fuel and reaction mass, all cargo, and all carried craft and vehicles.

2. Record Design Features

Most of the evaluation of your design will consist of recording the features already determined by the design, such as hull form, configuration, armor value, acceleration, jump number, computer type, installed electronics, etc.

If the ship is equipped with drop tanks, it is necessary to record its displacement and determine its G-rating and jump range both with and without the tanks. By the same token, a ship which carries other vessels by means of external grapples must calculate its jump and maneuver performance separately for when the vehicle(s) are attached and detached.

3. Allocate Damage Areas

Divide the volume (cubic meters) of the ship's components into the following categories:

Electronics: All sensors, communicators, ECM, ECCM, control systems, workstations, fire directors, and non-turret, barbette, or bay-mounted defensive screens.

Hold: All fuel, cargo space, hangars, labs, and shops.

Quarters: All life support systems (including the installed artificial gravity/G compensators), hull material volume, accommodations, sick bays and low berths.

Engineering: All power plant, maneuver drive, jump drive, CG lifters, and fuel-processing equipment.

Weapons Mounts: Each individual weapons mount, including turret, barbette, or bay-mounted screens.

Now take the total displacement of the ship and divide by 20. The result is the number of cubic meters of volume available in each of the 20 hit location areas. Allocate the above damage areas to distinct hit locations in proportion to how much of the volume of the ship they consume. Use the ships already rated as a guide.

In general, the bridge (i.e., the largest concentration of electronics) should be in the nose of the vessel to minimize the amount of circuitry between the bridge and the sensor arrays, which are usually mounted forward as well. If the ship has a maneuver thruster, the majority of the engineering space should be aft, but any ship with CG lifters can have engineering space forward on its ventral side as well. If you have a visual image of what the ship looks like, try to make the hit locations correspond with that as much as possible. When allocating the volume of a spinal mount to hit locations, divide it evenly among all 20 hit locations.

4. Place Surface Fixtures

Surface fixtures include all antennae, radiators, external grapples, and hatches. Surface area devoted to maneuver drive thrusters (aft), jump drive (aft), fuel scoops, and contra-grav (ventral surfaces) should also be allocated. These systems do not have surface hit locations listed on the ship's damage table (these have their damage handled by internal damage in the same hit locations), but are allocated in this step to ensure that other systems are not improperly placed where these engineering systems should be. Divide the total hull surface area by 20 to determine the surface area of each hit location and allocate surface fixtures accordingly.

When allocating antenna surface area, use the full unfolded surface area for folding EMS antennae. If the available surface area is too small for this, allocate surface area for all non-antenna surface area consuming systems, and then allocate all remaining surface area to "Antenna." However, this remaining area must be at least equal to 10% of the unfolded surface area of the folding antenna, plus the surface area required by the other antennae installed aboard the craft. If this requirement cannot be met, the systems cannot be accomodated aboard the vessel.

5. Evaluate System Damage

Record the tonnage of each major system in the vessel (each entry on the Damage Type chart, plus each separate weapons mount, plus each antenna on the hull surface) and determine its damage capacity. Systems can take 1 minor hit per 5 metric tonnes of mass (round to the nearest whole number of minor hits, to a maximum of 4), or 1 major hit per 100 metric tonnes of mass (21 or more metric tonnes rounds up to 1 major hit; above multiples of 100 tonnes, 20 tonnes or less round down, 21+ round up). Note that small components (such as laser communicators or active EMS antennae) always take 1 minor hit, even if they have no listed mass or a total mass much smaller than 5 tonnes.

The following specific systems should always be evaluated:

Electronics

Each sensor and its antenna, based on mass.

Each communicator and its antenna, based on mass.

Each master fire director and its antenna, based on its mass.

Each ECM system and its antenna, based on its mass. EMM is a special case. The EMM controller has its hits based on its total mass, using normal procedures. For the radiators, allow 1 minor hit for each whole MW of power allocated to the EMM system (i.e., drop fractional MW). Note that this is an exception to the rule that systems may only have a maximum of 4 minor hits.

Hold

Hangar: The total mass of the hangar spaces divided by 20 equals the number of major hits (round to the nearest whole number).

Labs: Based on the total mass of each lab.

Shops: Based on the total mass of each shop.

Cargo Space (CS): The total mass of the cargo carried is a measure of how much damage is absorbed when the cargo is hit. If cargo space is empty, reroll hits as excess damage.

Quarters

Stateroom (SR): Each large stateroom takes 1 major hit. Each small stateroom takes 2 minor hits.

Life Support: This value is based on the mass of all life support machinery (not including G compensators) plus the total hull material mass (hull shell and internal structure). Two-thirds of the total mass is used to determine the damage level of the main life support system (LS), and the remaining third determines the damage of the emergency life support (ELS) system.

Artificial Gravity (AG): Based on the total volume of the vessel's G compensators.

Low Berth (LBth): The low berths take 1 minor hit per low berth.

Engineering

Jump Drive (JD): Based on the mass of the jump drive itself.

Power Plant (PP): Based on the mass of the power plant.

Maneuver Drive (MD): Based on the mass of the heat exchanger/ignition chamber for the maneuver drive.

Contra-Grav Lifters (CG): The mass of the CG lifters.

Fuel Processing Plant (FPP): Based on the total mass of the plant.

Weapons Mounts

Each individual weapons mount: These may be laser turrets (LT), barbettes (LB), or bays (LBy); missile turrets (MT), barbettes (MB), or bays (MBy); particle accelerators (PA); meson guns (MG); etc. All weapons take hits based on their total mass.

6. Determine Arcs of Fire

The arc of fire of each weapon is determined by the hull location of the weapon and the hull form of the vessel. The following table shows which hull location weapon stations can fire into which arcs on each type of hull form available.

After determining which arcs a weapon can fire into, note the information on the ship's control panel data sheet.

Arcs of Fire by Hull Form

Hull Form	(1) Bow On	(2) Bow Quarter	(3) Broadside	(4) After Quarter	(5) Stern On
Open Frame	1-20	1-20	1-20	1-20	1-20
Needle	1-15	1-19	1-20	2-20	6-20
Wedge	1-19	1-19	2-19	16-20	16-20
Cylinder	1-5	1-15	2-19	6-20	16-20
Box	1-5	1-15	2-19	6-20	16-20
Sphere	1-11	1-15	2-19	6-20	10-20
Dome/Disc	1-11	1-15	2-19	6-20	10-20
Close Structure	1-9	1-15	2-19	6-20	12-20
Slab	1-5, 10-11	1-15	2-19	6-20	10-11, 16-20

7. Determine Maintenance Points

Take the loaded mass of the vessel, but subtract the weight of any carried craft and vehicles (their maintenance points are calculated separately), then subtract the mass of its hull shell. Divide the result by the TL modifiers here.

TL	Maint Modifier
4-5	2
6-7	3
8-9	4
10-12	5
13-15	6
16+	8

If the craft has two or more computers (three or more computers for jump-capable ships, St or Fb only, not flight computers) installed, one of these is considered to be a dedicated maintenance troubleshooting computer, which allows the current figure to be divided by 4. If there is only one computer (or two or less for a starship), the figure remains unreduced. This is the number of maintenance points required by the craft. (The loaded figure is used because items such as cargo and fuel do require regular attention to see that they have not shifted, leaked, etc.)

ADDITIONAL EQUIPMENT

The following items are not systems to be installed in a ship design, but are stand-alone pieces of equipment that can be carried and used by already designed vessels.

TL-11 Laser Gunpack

This item is a module designed for use with the 50-ton Modular Cutter, detailed later in this book. The Modular Cutter may be fitted with any of a variety of 29-ton (406 m³) modules. The gunpack is one such type. If carried aboard a vessel, it can be installed aboard a Modular Cutter in about an hour.

The gunpack contains two TL-11 150 Mj Laser Barbettes (see page 10), and an MFD with the same range performance (10-20-40-80). In addition, the pack contains a 180,000 km (6 hex short range) Ladar. Because ladars cannot obtain their own sensor locks, the gunpack-carrying cutter will rely on sensor lock hand offs, but the ladar's range will allow it to retain these locks at a respectable range. The power from an on-board 5.1 MW MHD turbine combined with the 46.27 excess MW from the cutter is more than sufficient for all of the gunpack's systems (includes 1.849 MW excess power), and includes overpowering both laser barbettes to –1 Diff Mod.

The pod is crewed by 2 crewmembers (sensor operator and MFD operator), although 4 may be used if the barbettes are to be capable of local control. Fuel is sufficient for 12 hours, or 24 combat turns.

Mass of the gunpack decreases the cutter's performance to 1G (at 4.95625 m³ of fuel per G-turn), and thereby frees up 35.35 MW, used above. Cutter carries fuel sufficient for 30 G-turns, and the module carries LHyd tankage for another 32 G-turns, for a total of 62 G-turns.

The gunpack masses 439.2 tonnes fully loaded, and costs 57.7 MCr.

Drones

These are carried as cargo, and can be used simply by launching them out of a cargo door. They may be operated via a missile-capable MFD, a missile turret or barbette, or via a normal bridge workstation using a ship's sensor that is compatible with that of the drone (i.e. maser communicators in the case of the two drones listed). When rolling for sensor locks using the drone's sensors, use the Sensor or RCV asset of the controlling crewmember, whichever is lower (or crew quality rating, of course).

Volume is given in displacement tons (14 m³), mass in metric tonnes, and price in millions of credits (MCr). Drones, like missiles, are given maneuver performance in terms of total G-turns available/G-turns which can be used in one turn. Duration is listed in hours (limited by the on-board battery) or "∞", where the drone is fitted with a fusion plant which allows unlimited power for its electronic systems. Communicators are listed in the same way as missiles (L = laser, M = Maser, R = Radio), plus the notation "∞" which indicates a 1000 AU communicator, which has an effectively unlimited range in terms of **Brilliant Lances** starship combat. Sensors are listed with their range in hexes and A for Active EMS and P for Passive EMS. The (F) notation indicates a folding array. Signatures are the drones signatures vs. radar, active EMS, HRT, passive EMS, and fire, respectively, and are copied into the blanks of the log sheet.

TL	Description	Vol	Mass	MCr	G-turns	Duration	Comm	Sensor	Signatures
12	Active/Passive Drone	2	59.1	13.8	56/1	∞	∞M	4A, 5P (F)	+1/+1/+1/+1/+1
14	Passive Drone	4	81.5	7.1	4/1	95	∞M	5P (F)	+1/+1/+1/+1/+1

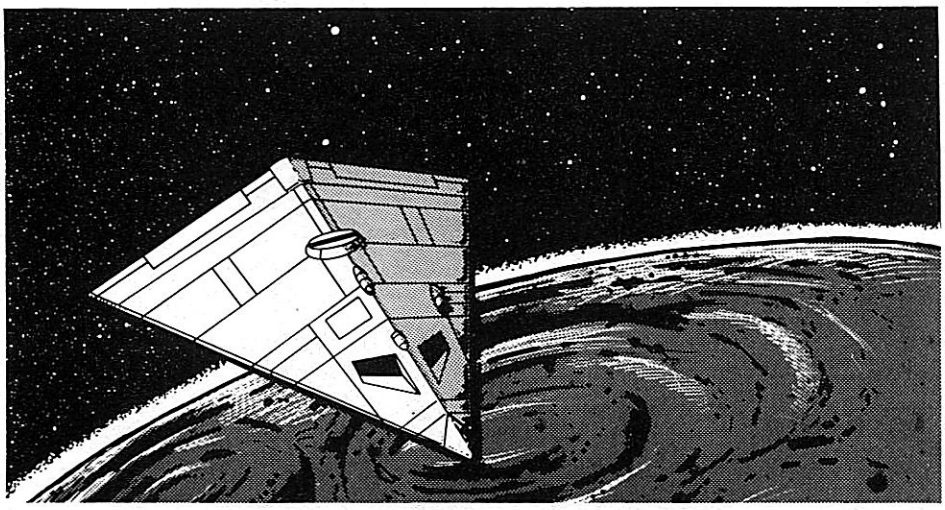
STARSHIP DATA PROFILES — Scout/Courier

HOW TO READ THE STARSHIP DATA PROFILES

The following abbreviations are used on the starship data profiles on the following pages. See the **Brilliant Lances** rules for guidelines on how to transfer the data profile information onto the control panel pages.

AEMS: Active Electromagnetic Sensor; **AG:** Artificial Gravity (environmental and G-compensating); **AL:** Air Lock; **Ant:** Antenna; **Brb:** Barbette; **BS:** Barbette socket; **CG:** Contra-Gravity Lifters; **CH:** Cargo Hatch; **Elec:** Electronics; **ELS:** Emergency Life Support; **EMM:** Electromagnetic Masking; **EMMR:** Electromagnetic Masking Radiators; **Eng:** Engineering; **FPP:** Fuel Processing Plant; **JD:** Jump Drive; **Las:** Laser; **LB:** Laser Barbette; **LBth:** Low Berth; **LP:** Launch Port; **LS:** Life Support; **LSR:** Large stateroom; **LT:** Laser Turret; **MB:** Missile Barbette; **MD:** Maneuver Drive; **MFD:** Master Fire Director; **MG:** Meson Gun; **MS:** Meson Screen; **MT:** Missile Turret; **ND:** Nuclear Damper; **NDB:** Nuclear Damper Barbette; **NDT:** Nuclear Damper Turret; **PA:** Particle Accelerator; **PEMS:** Passive Electromagnetic Sensor; **PEMS Ant:** Passive Electromagnetic Sensor Antenna; **PP:** Power Plant; **Qtrs:** Quarters; **RC Ant:** Radio Communicator Antenna; **Sand:** Sandcaster Turret; **SSR:** Small Stateroom; **Trt:** Turret; **TS:** Turret Socket, i.e., an empty socket where a turret could be installed. All empty sockets take 1 minor hit (1h). If a turret or barbette is in the socket, it takes damage normally.

Note: Prices for ships do *not* include carried small craft, cutter modules, vehicles, etc., which must be purchased separately.



General Data

Displacement: 100 tons
Length: 35 meters
Price: MCr50.48
Configuration: Wedge SL
Mass (Loaded/Empty): 697.9/477.0
Hull Armor: 28
Volume: 1400m³
Target Size: S
Tech Level: 15

Engineering Data

Power Plant: 147 MW Fusion Power Plant (147 MW/hit), 1 year duration (0.557 MW excess power)
Jump Performance: 2 (210 m³ fuel)
G-Rating: 2G (50 MW/G), Contra-Grav lifters (10 MW)
G-Turns: 80 (113.6 using jump fuel), 6.25m³ fuel each
Maint: 23

Electronics

Computer: 3×TL-15 Mod St Computers (0.55 MW ea.)
Commo: 300,000km radio (10 hexes, 10 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS folding array 150,000km (5 hexes; 0.15 MW), Active EMS 300,000km (10 hexes; 15 MW), TL-15 Densitometer (0.4 MW), TL-14 Neutrino detector (0.01 MW)
Controls: Flight deck with 3×Workstation

Armament

1 turret hardpoint socket fitted (Loc: 10; Arc: 1,2,3).

	Short	*Medium*	*Long*	*Extreme*
150-Mj Laser Turret	10:1/10-31	20:1/10-31	40:1/10-31	80:1/10-31

Accommodations

Life Support: Extended (0.28 MW), Grav Compensators (6G; 7 MW)
Crew: 3 (2×Maneuver, 1×Electronics). Seeker adds 1×Gunner.
Crew Accommodations: 2×Large Stateroom (0.001 MW ea.), double occupied if necessary.
Passenger Accommodations:
2×Small Stateroom (0.0005 MW ea.)
Cargo: 161.8 m³, one large cargo hatch
Small Craft and Launch Facilities: Air raft with internal hangar (Minimal) and one launch port
Air Locks: 1.

Notes

Standard practice is for one maneuver crewmember to double as the ship's electronics operator. Fuel purification machinery (1.05 MW), 20.28 hours to refine 710 m³ (50.7 tons).

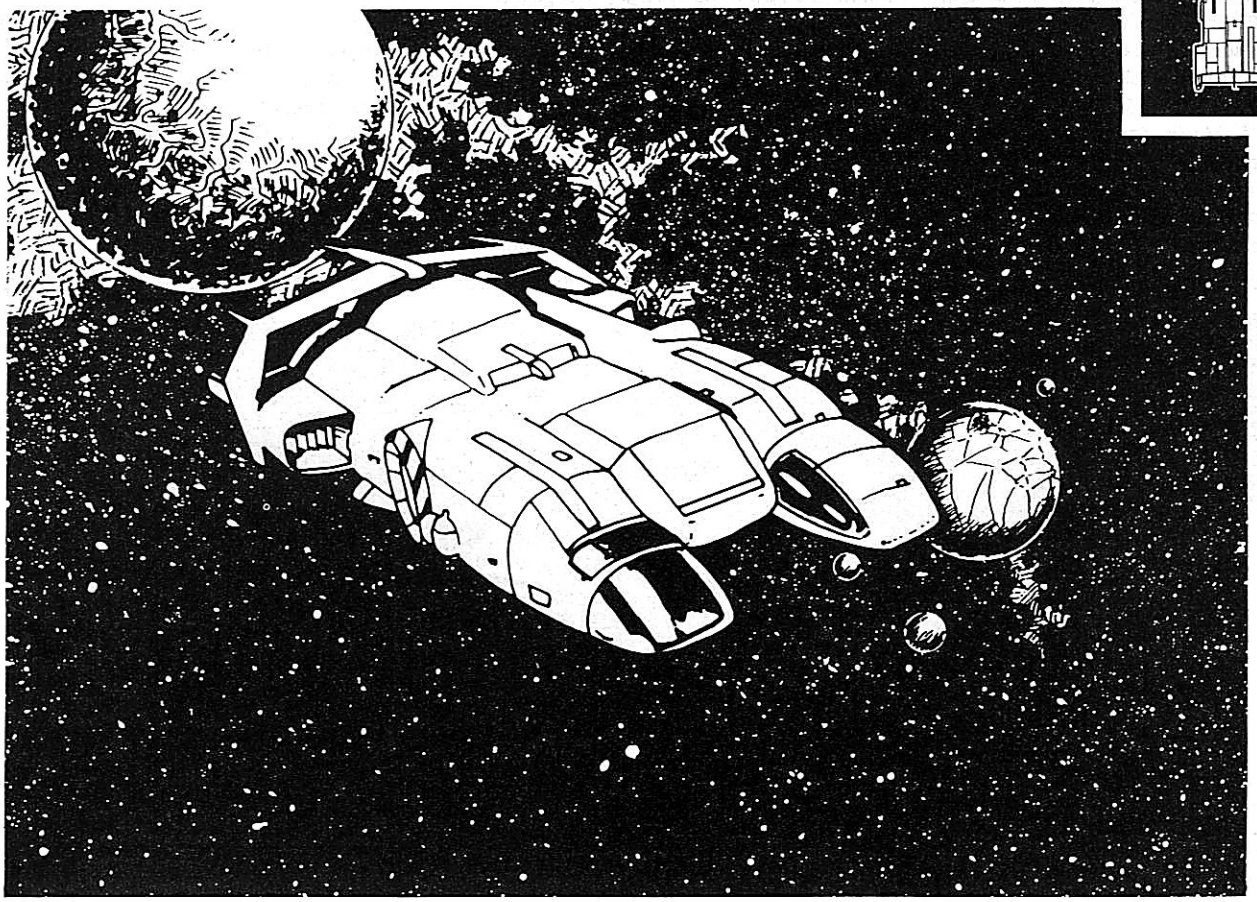
The Seeker is built on the Scout/Courier design, converting the two small staterooms and 116 m³ of the cargo hold into a special 172 m³ ore bay, and the addition of a 150-Mj TL-15 mining laser turret to the socket already installed, adding MCr0.86 to the price and 57 tonnes to its mass. (Turret Loc: 10; Arc: 1,2,3; 4.2 MW, 1 Crew)

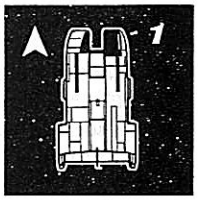
DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*
1	Ant	1-18: Elec, 19-20: Hold
2-3	Ant	1-12: Qtrs, 13-20: Hold
6-7, 12-13		1-10: Qtrs, 11-20: Hold
4-5, 8-9, 11, 14-15		Hold
10	1: AL	1-12: TS, 13-20: Hold
16-17		1-5: Eng, 6-20: Hold
18-19	1-5: Ant, 6-9: LP	1-6: Eng, 7-20: Hold
20		Eng

Systems	
JD-1H	LS-1H
PP-1H	SSR (2h)
CG-(4h)	Hangar-1H
ELS-1H	All Others-(1h)
MD-(2h)	
FPP-1H	
AG-1H	
LSR-1H	

Jayhawk-Class Far Trader





General Data

Displacement: 200 tons
Length: 43 meters
Price: MCr57.21
Configuration: Wedge SL
Mass (Loaded/Empty): 1918.38/1093.78
Hull Armor: 10
Volume: 2800m³
Target Size: S
Tech Level: 12

Engineering Data

Power Plant: 148 MW Fusion Power Plant (49 MW/hit), 1 year duration (0.7705 MW excess power)
Jump Performance: 2 (420 m³ fuel)
G-Rating: 1G (100 MW/G), Contra-Grav lifters (20 MW)
G-Turns: 48 (81.6 using jump fuel), 12.5 m³ each
Maint: 89

Electronics

Computer: 3×TL-12 Model St (0.4 MW ea.)
Commo: 30,000 km radio (1 hex, 1 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 30,000km (1 hex, 0.03 MW), Active EMS 3000 km (0 hexes; use long range for task difficulty in same hex; 8 MW)
Controls: Flight deck with 3×Workstation, 1 other workstation

Armament

2 turret hardpoint sockets fitted (Loc: 8,9; Arcs: 1,2,3)

Accommodations

Life Support: Extended (0.56 MW), Grav Compensators (3 G; 14 MW)
Crew: 5 (2×Maneuver, 1×Electronics, 1×Engineering, 1×Steward)
Crew Accommodations: 5×Small Stateroom (0.0005 MW ea.)
Passenger Accommodations: 10×Small Stateroom (0.0005 MW ea.)
Cargo: 743.8 m³, 2 large cargo hatches
Small Craft and Launch Facilities: Air raft with internal hangar (Minimal), 1 launch port
Air Locks: 2

Notes

Fuel purification machinery (1.53 MW), 24 hours to refine 1020 m³ (72.86 tons).

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*System*
1	1-4: CH, 5-9: LP, 10: Ant	Hold	JD-3H
2, 3	1: Ant	1-2: Elec, 3-20: Qtrs	PP-3H
4-5	1: Ant	1-2: Elec, 3-19: Qtrs, 20: Hold	FPP-2H
6-7, 10-15		Hold	AG-1H
8-9	1-4: CH	1-6: TS, 7-20: Hold	ELS-1H
16-17		1-7: Eng, 8-20: Hold	LS-2H
18-19	1: AL	1-7: Eng, 8-20: Hold	SSR-(2h)
20		Eng	MD-(2h)
			CG-1H
			Hangar-1H
			All Others-(1h)

Moraine-Class Free Trader

General Data

Displacement: 200 tons
Length: 43 meters
Price: MCr46.47
Configuration: Wedge SL
Hull Armor: 10
Volume: 2800m³
Target Size: S
Tech Level: 10
Mass (Loaded/Empty): 1908.146/1074.746

Engineering Data

Power Plant: 156MW Fusion Power Plant (52 MW/hit), 1 year duration (17.967 MW power shortfall)
Jump Performance: 1 (280 m³ fuel)
G-Rating: 1G (100 MW/G), Contra-Grav lifters (40 MW)
G-Turns: 56 (78.4 using jump fuel), 12.5 m³ fuel each
Maint: 89

Electronics

Computer: 3×TL-10 Model St (0.3 MW ea.)
Commo: 30,000km radio (1 hex; 1 MW), 1000AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 30,000km (1 hex; 0.06 MW), Active EMS 300km (0 hexes; use extreme range for task difficulty in same hex; 15 MW)
Controls: Flight deck with 3×Workstation, plus 2 other workstations

Armament

2 turret hardpoint sockets fitted (Loc: 16/17, 18/19; Arcs: All)

Accommodations

Life Support: Extended (0.56 MW), Gravitic Compensators (1G; 14 MW)
Crew: 6 (2×Maneuver, 1×Electronics, 2×Engineering, 1×Steward)
Crew Accommodations: 6×Small Stateroom (0.0005 MW ea.)
Passenger Accommodations: 8×Small Stateroom (0.0005 MW ea.), 8×Low Berth (0.001 MW ea.)
Cargo: 764.8 m³, 2 large cargo hatches
Air Locks: 2

Notes

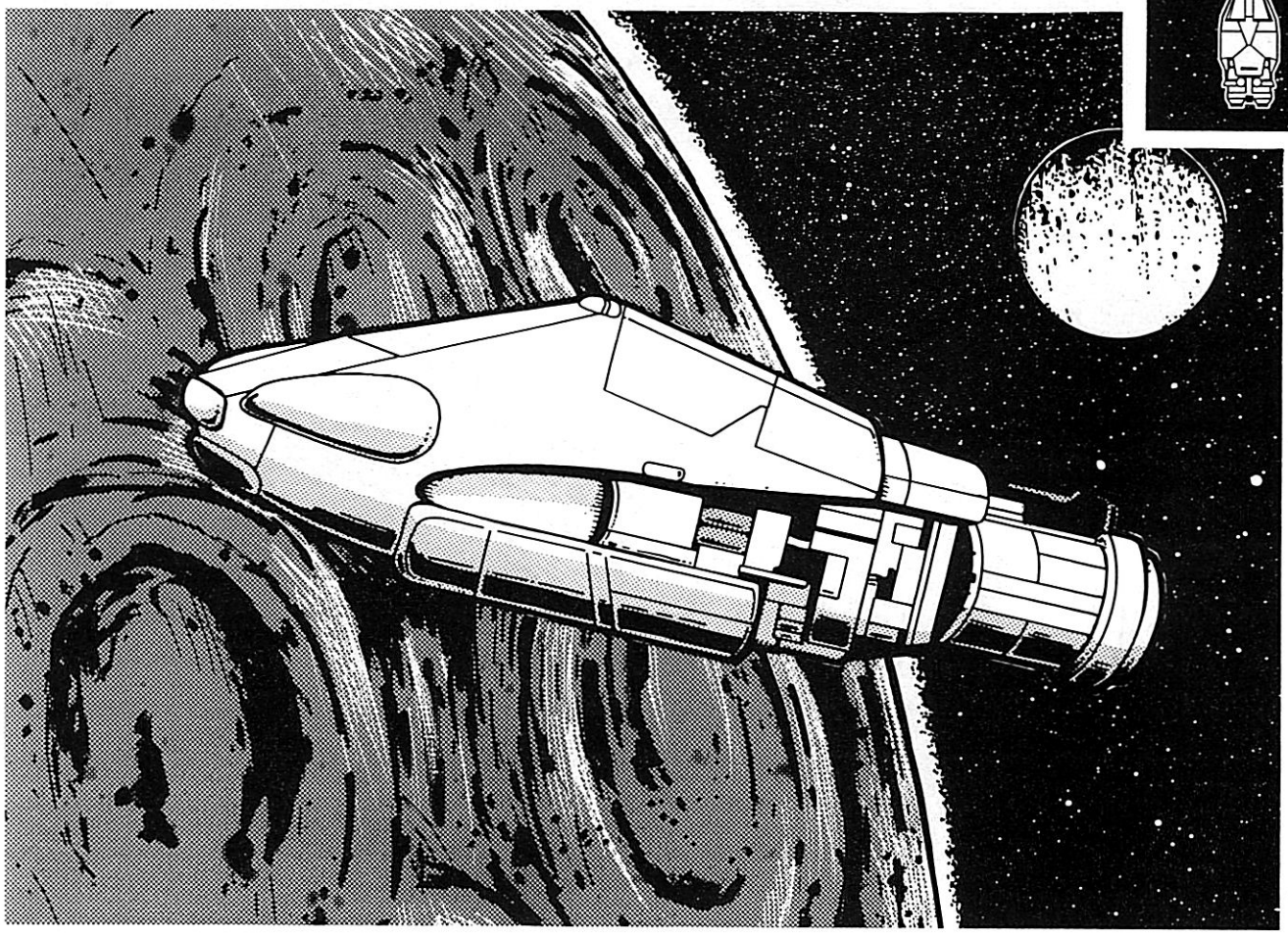
The *Moraine* is the TL-10 version of the more popular and useful *Beowulf*-class. The *Moraine*'s systems consume 174 MW of power, meaning that it cannot operate them all at once with its 156 MW plant. In space, the contra-grav drive is shut down to conserve power. When taking off from a planet, the *Moraine* cannot power its G-compensators, and thus all crew and passengers must be strapped in for this evolution.

Fuel purification machinery (1.53 MW), 30.8 hours to refine 980 m³ (70 tons)

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*
1	1-6: Ant	1-9: Elec, 10-20: Hold	JD-2H
2	1: AL	Qtrs	PP-3H
4		1-3: Eng, 4-20: Hold	FPP-2H
5, 8-9, 11		Hold	CG-1H
12-15	1-3: CH	Hold	SSR-(2h)
3, 6-7		Qtrs	AG-1H
10		1-3: Qtrs, 4-20: Hold,	LS-1H
16-19		1-3: TS, 4-8: Eng, 9-20: Hold	ELS-1H
20		Eng	MD-(2h)
			All Others-(1h)

Lord Baltimore-Class Yacht



General Data

Displacement: 200 tons
Length: 51 meters
Price: MCr84.8
Configuration: Needle USL
Mass (Loaded/Empty): 1502.83/1207.44
Hull Armor: 42
Volume: 2800m³
Target Size: S
Tech Level: 15

Engineering Data

Power Plant: 456MW Fusion Power Plant (228 MW/hit), 1 year duration (0.2275 MW excess power)
Jump Performance: 4 (700 m³ fuel)
G-Rating: 4G (100 MW/G), Contra-Grav lifters (20 MW)
G-Turns: 32 (88 using jump fuel), 12.5 m³ of fuel each
Maint: 48

Electronics

Computer: 3×TL-15 Model St (0.55 MW ea.)
Commo: 30,000km radio (1 hex; 1 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS folding array 150,000km (5 hexes; 0.15 MW), Active EMS 300,000km (10 hexes; 15 MW)
Controls: Flight deck with 3×Workstation, plus 3 other workstations

Armament

1 turret hardpoint socket fitted. (Loc: 10; Arcs: All)

Accommodations

Life Support: Extended (0.56 MW), Gravitic Compensators (6G; 14 MW)
Crew: 9 (2×Maneuver, 3×Engineering, 3×Small Craft Flight Crew, 1×Command). Air raft pilot doubles as Steward
Crew Accommodations: 9×Small Stateroom (0.0005 MW ea.)
Passenger Accommodations: 10×Small Stateroom (0.0005 MW ea.), 1×Large Stateroom (0.001 MW) (owner's suite)
Cargo: 125 m³, one large cargo hatch
Small Craft and Launch Facilities: 10-ton skiff and internal hangar (Minimal), air raft with internal hangar (Minimal), one launch port each
Air Locks: 2

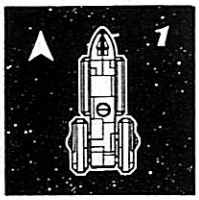
Notes

Fuel purification machinery (2.5 MW), 13.2 hours to refine 1100 m³ (78.57 tons)

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*
1	1-9: Ant	1-10: Elec, 11-20: Qtrs	JD-3H
2, 4		Qtrs	PP-2H
3	1: AL	Qtrs	CG-1H
5-6		1-10: Qtrs, 11-20: Hold	LS-2H
7		1-5: Qtrs, 6-20: Hold	AG-1H
8-9	1: LP	Hold	FPP-2H
12-17		Hold	LSR-1H
10		1-6: TS, 7-20: Hold	ELS-1H
11	LP	Hold	Hangar-3H
18		1-19: Eng, 20: Hold	SSR-(2h)
19-20		Eng	MD-1H
			All Others-(1h)

Gazelle-Class Close Escort



General Data

Displacement: 280/400 tons
Length: 48.5 meters
Price: MCr224.65 (+MCr6.78 tanks)
Configuration: Wedge SL
Mass (Loaded/Empty): 4662.15/4155.53 with tanks
4154.87/3742.43 without tanks
Hull Armor: 62
Volume: 3920 m³/5600 m³
Target Size: S
Tech Level: 14

Engineering Data

Power Plant: 891 MW Fusion Power Plant (99 MW/hit), 1 year duration
Jump Performance: 3 with tanks attached (1120m³), 5 without (1260 m³)
G-Rating: 3G with tanks (200 MW/G), 5G without (150 MW/G), Contra-Grav lifters (30 MW)
G-Turns: 112, 25 m³ fuel each, with tanks attached; 77.6, 18.75 m³ each, without tanks
Maint: 143

Electronics

Computer: 3×TL-14 Model Fb (1 MW ea.)
Commo: 300,000km radio (10 hexes; 10 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS folding array 150,000km (5 hexes; 0.15 MW), Active EMS 300,000km (10 hexes; 15 MW)
ECM/ECCM: EMS jammer (10 hexes; 30 MW), EM masking package (5.6 MW)
Controls: Bridge with 7×Bridge Workstation, plus 7 other workstations

Armament

Offensive: 2×TL-14 150-Mj Laser Turret (Loc: 16,17; Arcs: All; 4.2 MW, 1 crew ea.), 2×TL-14 300-Mj Laser Barbette (Loc: 4/5, 10; Arcs: 1,2,3; 8.3 MW, 1 crew ea.)
Master Fire Directors: 1 TL-14 (5 Diff Mod; Non-Msl; 10 hexes; 1.62 MW, 1 crew)

	Short	*Medium*	*Long*	*Extreme*
150-Mj Laser Turret	2:1/10-31	4:1/10-31	8:1/10-31	16:1/10-31
300-Mj Laser Barbette	10:1/14-43	20:1/14-43	40:1/8-26	80:1/4-13

Accommodations

Life Support: Extended (0.784 MW), Grav Compensators (5G; 19.6 MW)
Crew: 22 (7×Engineering, 1×Electronics, 2×Maneuver, 5×Gunnery, 1×Maintenance, 3×Small Craft Flight Crew, 3×Command)
Crew Accommodations: 2×Small Stateroom (0.0005 MW ea.), 8×Large Stateroom (0.001 MW ea.) (multiple-occupancy)
Cargo: 10.8 m³, one small cargo hatch
Small Craft and Launch Facilities: SL external grapple for 20-ton small craft
Air Locks: 3

Notes

As with many other small military designs, the *Gazelle* is very tight. Its 22 crewmembers share accommodations for 18, requiring some "hot bunking."

Without drop tanks, the *Gazelle* consumes 899.465 MW, requiring the contra-grav to be shut down, or the EMS jammer to function with a six-hex short range to make up the difference. With tanks attached, only 749.465 MW are needed.

Although it is streamlined with the drop tanks attached, the *Gazelle* only has contra-grav performance for 300 tons, not 400.

2800 m³ of fuel total (200 tons), 1345 (96 tons) carried in 2 50-ton drop tanks, 1455 (104 tons) internal. 1120 m³ fuel for jump 3 with tanks attached, 1260 m³ for jump 5 without tanks. Fuel purification machinery (7.6 MW), 11.05 hours to refine 2800 m³.

Drop tanks are armored to same level as ship, and equipped with EMM.

Damage tables below assume drop tanks are attached.

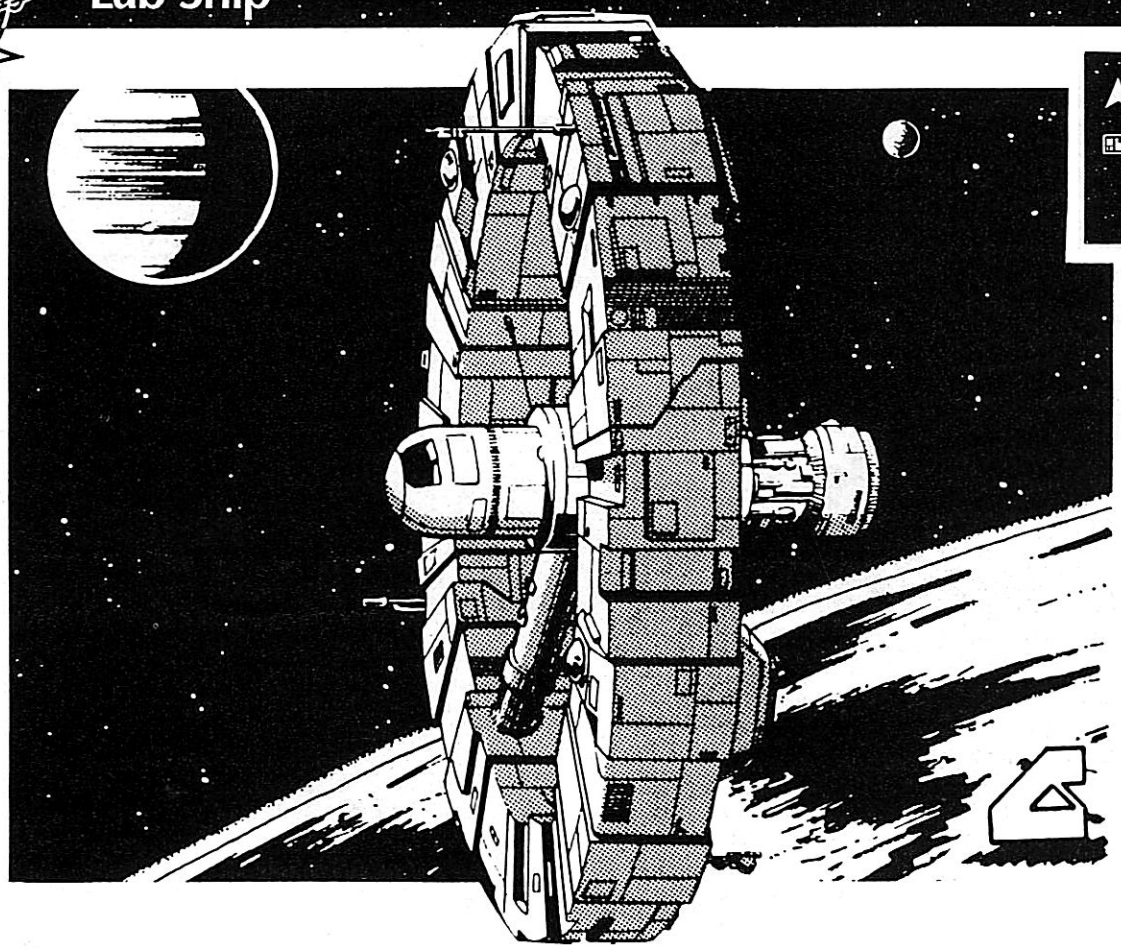
If small craft is not being carried, surface small craft hits are taken by the grapple.

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*
1	1-14: Ant	1-12: Elec, 13-20: Qtrs
2	Ant	Elec
3		Qtrs
4-5	1-10: Small Craft	1-4: LB, 6-20: Qtrs
6-7		Hold
8-9	1: EMMR, 2-14: Small Craft	Hold
10	1-2: EMMR, 3: AL	1-8: LB, 9-20: Hold
11	Small Craft	1-12: Eng, 13-20: Hold
12-13	1-2: EMMR	1-12: Eng, 13-20: Hold
14-15	1: EMMR, 2-14: Small Craft	Hold
16-17	1-2: CH	1-5: LT, 6-7: Hold, 8-20: Eng
18-19	1: Small Craft	1-14: Eng, 15-20: Hold
20		Eng

Systems	
PP-9H	EMMR-(5h)
JD-7H	CG-1H
LS-5H	SSR-(2h)
LB-2H	MD-1H
LT-1H	LSR-1H
FPP-8H	EMM-1H
Grapple-1H	MFD-(4h)
ELS-2H	All Others-(1h)
AG-1H	

Lab Ship



General Data

Displacement: 390/400 tons
Hull Armor: 10
Diameter: 76 meters
Volume: 5460/5600 m³
Price: MCr129.41
Target Size: S
Configuration: Open USL
Tech Level: 15
Mass (Loaded/Empty): 2032.38/1352.49

Engineering Data

Power Plant: 265.2 MW Fusion Power Plant (265.2 MW/hit), 1 year duration (0.355 MW excess power)
Jump Performance: 2 (840 m³ fuel)
G-Rating: 1 (200 MW/G), no contra-grav
G-Turns: 96 (129.6 using jump fuel), 25 m³ of fuel each
Maint: 74

Electronics

Computer: 3×TL-15 Mod Fb Computer (1.1 MW ea.)
Commo: 300,000km radio (10 hexes; 10 MW), 1000AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS folding array 180,000km (6 hexes; 0.2 MW), Active EMS 300,000km (10 hexes; 15 MW), TL-15 Densitometer (0.4 MW), TL-14 Neutrino detector (0.01 MW)
Controls: Flight deck with 4×workstation, plus 11 other workstations

Armament

4 turret hardpoint sockets fitted. (Loc: 12-15; Arcs: All)

Accommodations

Life Support: Extended (1.092 MW), Gravitic Compensators (6G; 27.3 MW)
Crew: 17 (2×Maneuver, 1×Engineering, 1×Electronics, 2×Small Craft Flight Crew, 1×Command, 10×Science Personnel)
Crew Accommodations: 17×Small Stateroom (0.0005 MW ea.)
Cargo: 359.7 m³, one large cargo hatch
Small Craft and Launch Facilities: USL External Grapple for 10-ton skiff, Internal Hangar (Minimal) for Air Raft (one of the crew doubles as air raft pilot), one launch port for air raft
Air Locks: 4

Notes

The Lab Ship itself displaces 390 tons, and with its launch attached displaces 400. Its jump, maneuver, contra-grav drives, and controls are configured to work with the 400-ton figure.

Workstations are provided for all 10 scientists.

Fuel purification machinery (3.55 MW), 27.38 hours to refine 3240 m³ (231.4 tons).

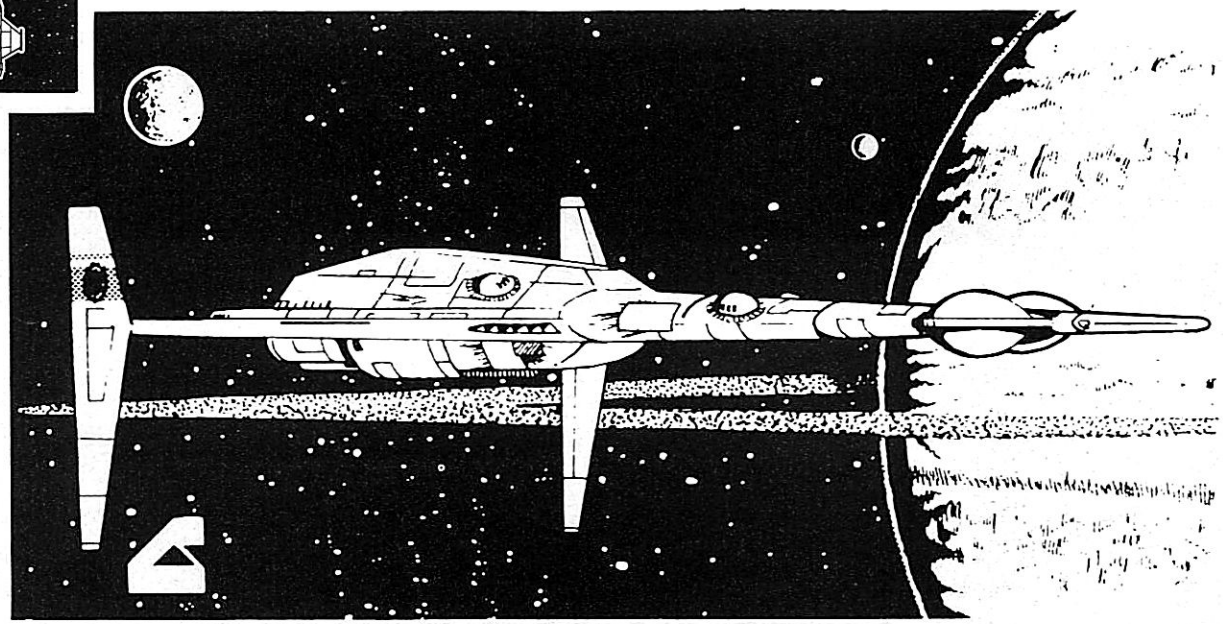
4×Laboratory

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*
1	1-4: LP, 5-9: CH	Hold
2-9, 16-20		Hold
10-11		1-13: Eng, 14-20: Hold
12-13	Ant	1-3: Elec, 4-6: TS, 7-17: Qtrs, 18-20: Hold
14		1-3: Elec, 4-6: TS, 7-17: Qtrs, 18-20: Hold
15	1-16: Ant, 17-18: AL	1-4: Elec, 5-7: TS, 8-18: Qtrs, 19-20: Hold

Systems	
JD-4H	Grapple-(3h)
PP-1H	MD-(4h)
LS-2H	FPP- 3H
Lab-1H	SSR-(2h)
AG-1H	All Others (1h)
ELS-1H	
Hangar-1H	

Patrol Cruiser



General Data

Displacement: 400 tons
Length: 66 meters
Price: MCr197.5
Configuration: Needle AF
Mass (Loaded/Empty): 3545.28/2933.8
Hull Armor: 42
Volume: 5600 m³
Target Size: S
Tech Level: 15

Engineering Data

Power Plant: 886.5 MW Fusion Power Plant (295.5 MW/hit), 1 year duration (39.65 MW power shortfall)
Jump Performance: 3 (1120 m³)
G-Rating: 4G (200 MW/G), Contra-Grav lifters (40 MW)
G-Turns: 60 (104.8 using jump fuel), 25 m³ of fuel each
Maint: 106

Electronics

Computer: 3×TL-15 Mod Fb Computers (1.1 MW ea.)
Commo: 300,000km radio (10 hexes; 10 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS folding array 180,000km (6 hexes; 0.2 MW), Active EMS 300,000km (10 hexes; 15 MW)
ECM/ECCM: EM Masking (5.6 MW)
Controls: Bridge with 7×bridge workstation, plus 5 other workstations

Armament

Offensive: 2×TL-15 150-Mj Laser Turret (Loc: 2,3; Arcs: 1,2,3,4; 4.2 MW, 1 crew ea.), 2×Missile Turret (Loc: 12,13; 2 ready Msls ea.; 0.15 MW; 1 crew ea.) (total of 4 ready Msls, plus 8 in cargo).
Master Fire Directors: 2 TL-15 (6 Diff Mod; Msl 10 hexes; 10 hexes; 1.71 MW, 1 crew ea.)

	Short	*Medium*	*Long*	*Extreme*
150-Mj Laser Turret	10:1/10-31	20:1/10-31	40:1/10-31	80:1/10-31

Accommodations

Life Support: Extended (1.12 MW), Gravitic Compensators (6 G; 28 MW)
Crew: 19 (2×Maneuver, 1×Electronics, 5×Engineer, 6×Gunnery, 3×Small Craft Flight Crew, 2×Command)
Crew Accommodations: 2×Small Stateroom (command crew; 0.0005 MW ea.), 5×Large Stateroom (multiple-occupancy; 0.001 MW ea.)
Cargo: 0 m³, plus storage for eight missiles, one large cargo hatch
Small Craft and Launch Facilities: 30-ton Ship's Boat with internal hangar (Minimal), and one launch port
Air Locks: 4

Notes

The Patrol Cruiser is a rather tight design. The 19 crewmembers share accommodations for 12, requiring "hot bunking" for the gunnery and engineering crew.

The cruiser's total power requirement is 926 MW, limiting it to only 3G performance when the contra-grav is engaged.

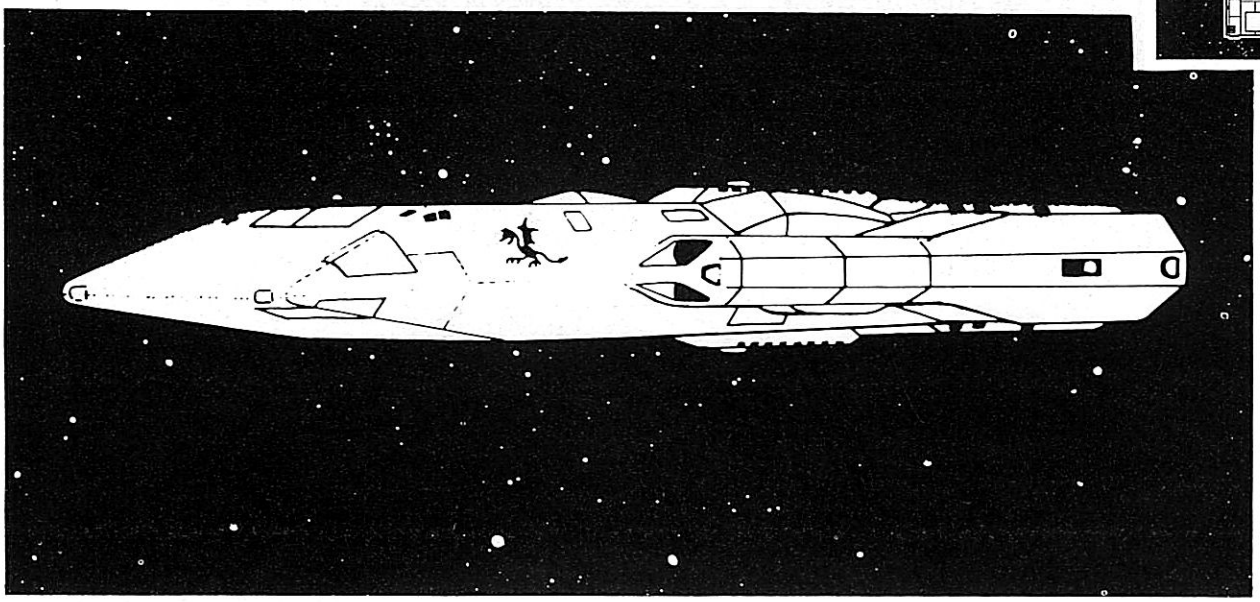
Fuel purification machinery (9.7 MW), 8.1 hours to refine 2620 m³ (187.14 tons).

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*
1	Ant	Elec
2	1-6: Ant	1-3: LT, 4-17: Hold, 18-20: Elec
3		1-3: LT, 4-20: Hold
4-5, 8-11, 14		Hold
6	1: AL	Qtrs
7		1-15: Qtrs, 16-20: Hold
12-13		1-3: MT, 4-20: Hold
15		1-19: Hold, 20: Eng
16-19	1-2: EMMR	1-12: Eng, 13-20: Hold
20		Eng

Systems	
JD-5H	MD-1H
PP-3H	LSR-1H
CG-1H	LT-1H
LS-5H	MT-1H
AG-1H	FPP-8H
ELS-2H	MFD-1H
SSR-(2h)	Hangar-8H
EMM-1H	All Others-(1h)
EMMR-(5h)	

Shukugan (Dragon)-Class System Defense Boat



General Data

Displacement: 400 tons
Length: 61 meters
Price: MCr166.79
Configuration: Slab SL
Mass (Loaded/Empty): 6075.18/5799.18
Hull Armor: 101
Volume: 5600 m³
Target Size: S
Tech Level: 12

Engineering Data

Power Plant: 920 MW Fusion Power Plant (48 MW/hit), 1 year duration (7.64 MW excess power)
G-Rating: 4G (200 MW/G), Contra-Grav lifters (40 MW)
G-Turns: 112, 25 m³ of fuel each
Maint: 203

Electronics

Computer: 3×TL-12 Mod Fb Computer (0.8 MW ea.)
Commo: 300,000km radio (10 hexes; 10MW), 1000AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 120,000km (4 hexes; 0.15 MW), Active EMS 3000km (0 hexes; 8 MW) (use long range for task difficulty in same hex)
ECM/ECCM: EM Masking Package (5.6 MW)
Controls: Bridge with 7×bridge workstation, plus 10 other workstations

Armament

Offensive: 2×TL-11 80-Mj Laser Turret (Loc: 10, 11; Arcs: All; 2.2 MW; 1 Crew ea.), 2×Missile Barbette (Loc: 12, 13; 5 ready Msls ea.; 0.15 MW; 1 Crew ea.; 10 ready Msls total, plus 12 in cargo)
Master Fire Directors: 2 TL-12 (4 Diff Mod; Msl 10 hexes; 2 hexes; 1.44 MW; 1 Crew ea.)

	Short	*Medium*	*Long*	*Extreme*
TL-11 80-Mj Laser Turret	2:1/7-22	4:1/7-22	8:1/6-19	16:1/3-10

Accommodations

Life Support: Extended (1.12 MW), Gravitic Compensators (3G; 28 MW)
Crew: 23 (1×Maneuver, 1×Electronics, 10×Engineering, 6×Gunnery, 2×Maintenance, 3×Command)
Crew Accommodations: 12×Small Stateroom (double-occupancy; 0.0005 MW ea.)
Cargo: 80 m³ (plus storage for 12 missiles), one small cargo hatch
Air Locks: 4

Notes

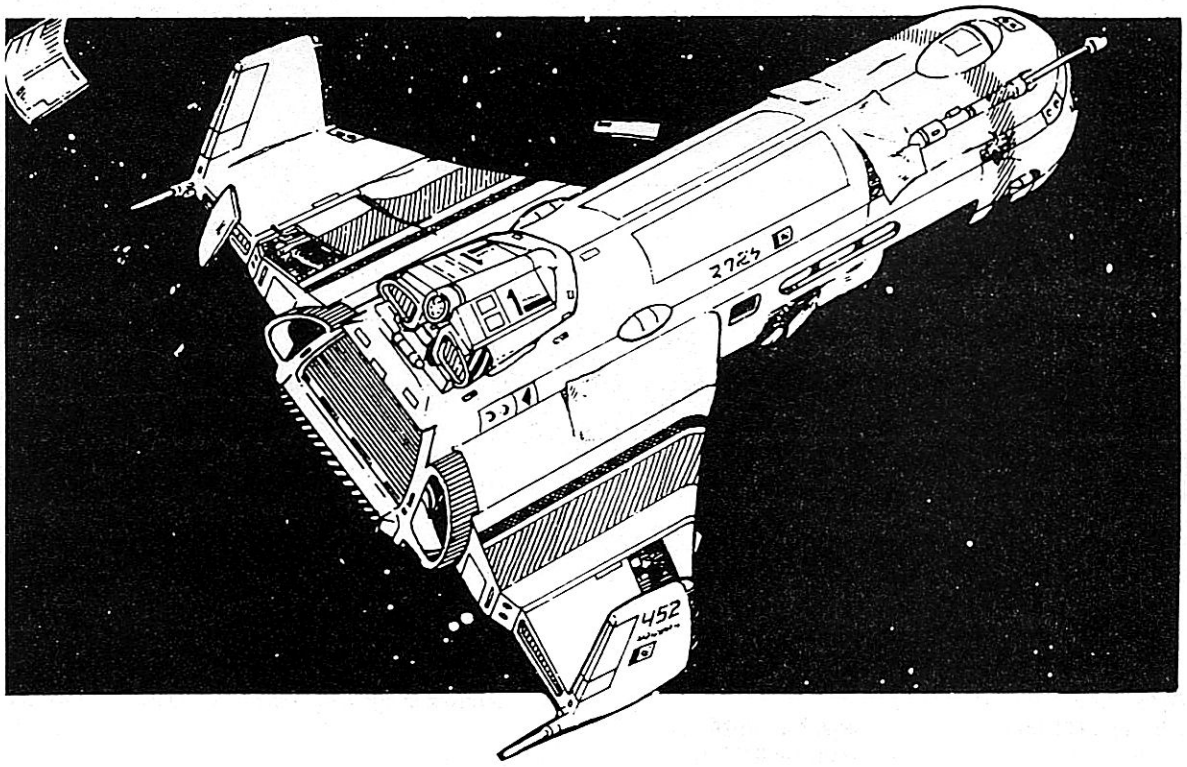
Fuel purification machinery (8.4 MW), 12 hours to refine 2800 m³ (200 tons).

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*
1	Ant	Elec
2		1-10: Eng, 11-20: Qtrs
3	1: AL	Qtrs
4-5, 20	1-2: EMMR	Hold
6-7		1-6: Qtrs, 7-20: Hold
8, 14-15		Hold
9		1-10: Eng, 11-20: Hold
10	1-3: Ant, 6-7: CH	1-3: LT, 4-8: Elec, 9-20: Hold
11		1-3: LT, 4-10: Eng, 11-20: Hold
12		1-6: MB, 7-20: Hold
13		1-6: MB, 7-20: Hold
16-17	1-2: EMMR	Eng
18-19		1-10: Eng, 11-20: Hold

Systems	
PP-19H	EMMR-(5h)
FPP-11H	MFD-(2h)
LS-15H	MD-1H
ELS-8H	SSR-(2h)
CG-1H	All Others-(1h)
LT-1H	
MB-1H	
EMM-1H	
AG-1H	

Petty-Class Subsidized Merchant



General Data

Displacement: 390/400 tons
Length: 44 meters
Price: MCr87.65
Configuration: Cylinder AF
Mass (Loaded/Empty): 3906.28/2371.59
Hull Armor: 10
Volume: 5460/5600 m³
Target Size: S
Tech Level: 12

Engineering Data

Power Plant: 286 MW Fusion Power Plant (48 MW/hit), 1 year duration (0.04 MW excess power)
Jump Performance: 1(560 m³ fuel)
G-Rating: 1G (200 MW/G), Contra-Grav lifters (40 MW)
G-Turns: 60 (82.4 using jump fuel), 25 m³ of fuel each
Maint: 180

Electronics

Computer: 3×TL-12 Mod St Computer (0.4 MW ea.)
Commo: 30,000km radio (1 hex; 1MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 60,000km (2 hexes; 0.06 MW), Active EMS 3000km (0 hexes; use long range for task difficulty in same hex; 8 MW)
Controls: Flight deck with 4×workstation, plus 3 other workstations

Armament

4 turret hardpoint sockets fitted (Loc: 2-5; Arcs: 1,2,3)

Accommodations

Life Support: Extended (1.092 MW), Gravitic Compensators (3G; 27.3 MW)
Crew: 9 (2×Maneuver, 1×Electronics, 3×Engineering, 2×Steward [double as Small Craft Flight Crew], 1×Command).
Crew Accommodations: 1×Small Stateroom (command; 0.0005 MW ea.), 4×Large Stateroom (double-occupancy; 0.001 MW ea.)
Passenger Accommodations: 13×Small Stateroom (0.0005 MW ea.), 13×Low Berth (0.001 MW ea.)
Cargo: 1306.5 m³, four large cargo hatches
Small Craft and Launch Facilities: 10-ton Skiff in AF External Grapple
Air Locks: 4

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*
1	1-3: Ant	1-6: Elec, 7-20: Qtrs
2-3	1: AL	1-3: TS, 4-17: Qtrs, 18-20: Hold
4-5	1-3: CH	1-3: TS, 4-16: Qtrs, 17-20: Hold
6-13, 16-17		Hold
14		1-9: Eng, 10-20: Hold
15		1-10: Eng, 11-20: Hold
18-19	1-4: CH	1-10: Eng, 11-20: Hold
20		Eng

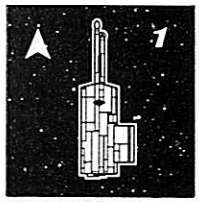
Systems	
JD-4H	MD-(4h)
PP-6H	SSR-(2h)
CG-1H	FPP-9H
AG-1H	ELS-1H
LSR-1H	All Others-(1h)
LS-2H	
Grapple-1H	

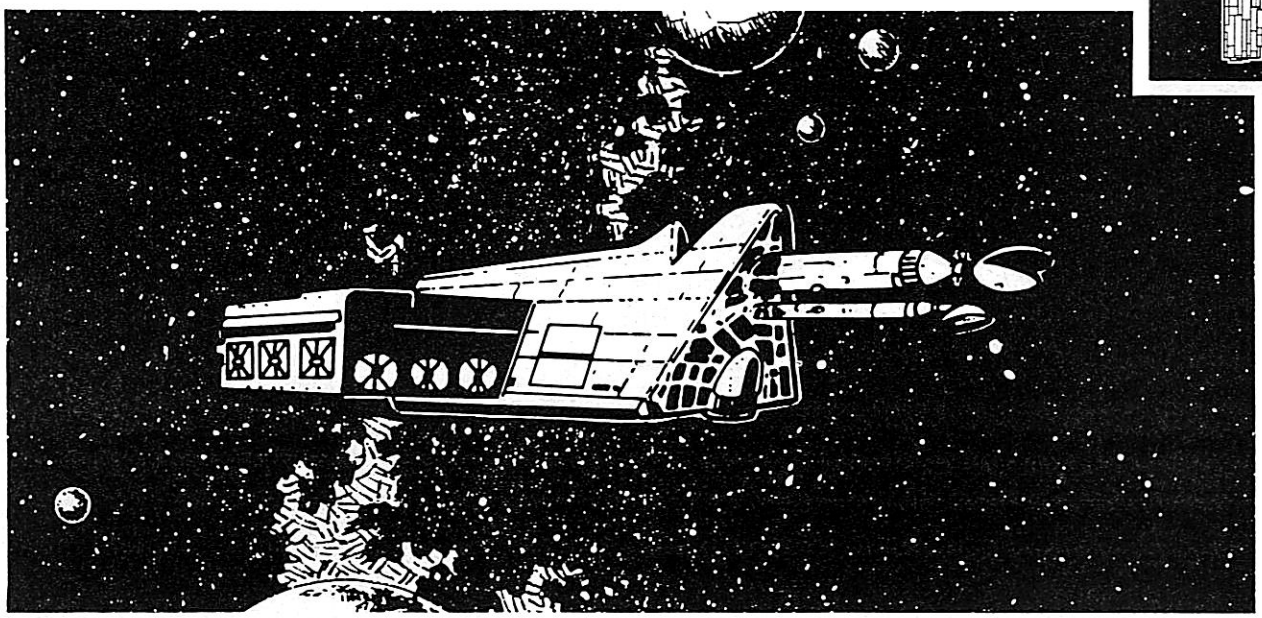
Notes

The ship itself displaces 390 tons; with its launch, it displaces 400. Jump, maneuver, and contra-grav drives are all configured to support the 400-ton figure.

Fuel purification machinery (6.18 MW), 12 hours to refine 2060 m³ (147.14 tons).

Donosev-Class Survey Ship





General Data

Displacement: 600 tons
Length: 44 meters
Price: MCr306.18
Configuration: Close Structure, USL
Mass (Loaded/Empty): 4076.99/2206.44
Hull Armor: 20
Volume: 8400 m³
Target Size: S
Tech Level: 15

Engineering Data

Power Plant: 705 MW Fusion Power Plant (235 MW/hit), 1 year duration (0.0035 MW excess power)
Jump Performance: 3 (1680 m³ fuel)
G-Rating: 2G (300 MW/G), no contra-gravity
G-Turns: 104 (148.8 using jump fuel), 37.5 m³ of fuel each
Maint: 112

Electronics

Computer: 3×TL-15 Mod Fb Computers (1.1 MW ea.)
Commo: 2×300,000km radio (10 hexes; 10 MW ea.), 2×1000 AU maser (∞; 0.6 MW ea.)
Avionics: TL-10+ Avionics
Sensors: 1×Passive EMS folding array 240,000km (8 hexes; 0.3 MW), 1×Passive EMS folding array 180,000km (6 hexes; 0.2 MW), 2×Active EMS 300,000km (10 hexes; 15 MW ea.), TL-15 Densitometer 0.4 MW), TL-14 Neutrino Sensor (0.01 MW)
Controls: Bridge with 6×Bridge Workstation, plus 4×Crew Workstation

Armament

4 turret hardpoint sockets fitted.

Accommodations

Life Support: Extended (1.68 MW), Gravitic Compensators (6G; 42 MW)
Crew: 15 (2×Maneuver, 2×Electronics, 4×Engineering, 1×Command, 6×Surveyor Specialist)
Crew Accommodations: 1×Small Stateroom (command; 0.0005 MW), 7×Large Stateroom (double-occupancy; 0.001 MW ea.)
Cargo: 388 m³, one large cargo hatch
Small Craft and Launch Facilities: 50-ton modular cutter with internal hangar (1 each Fuel Scoop and Lab modules carried), 3×Air Raft with internal hangars, all four with launch ports
Air Locks: 6

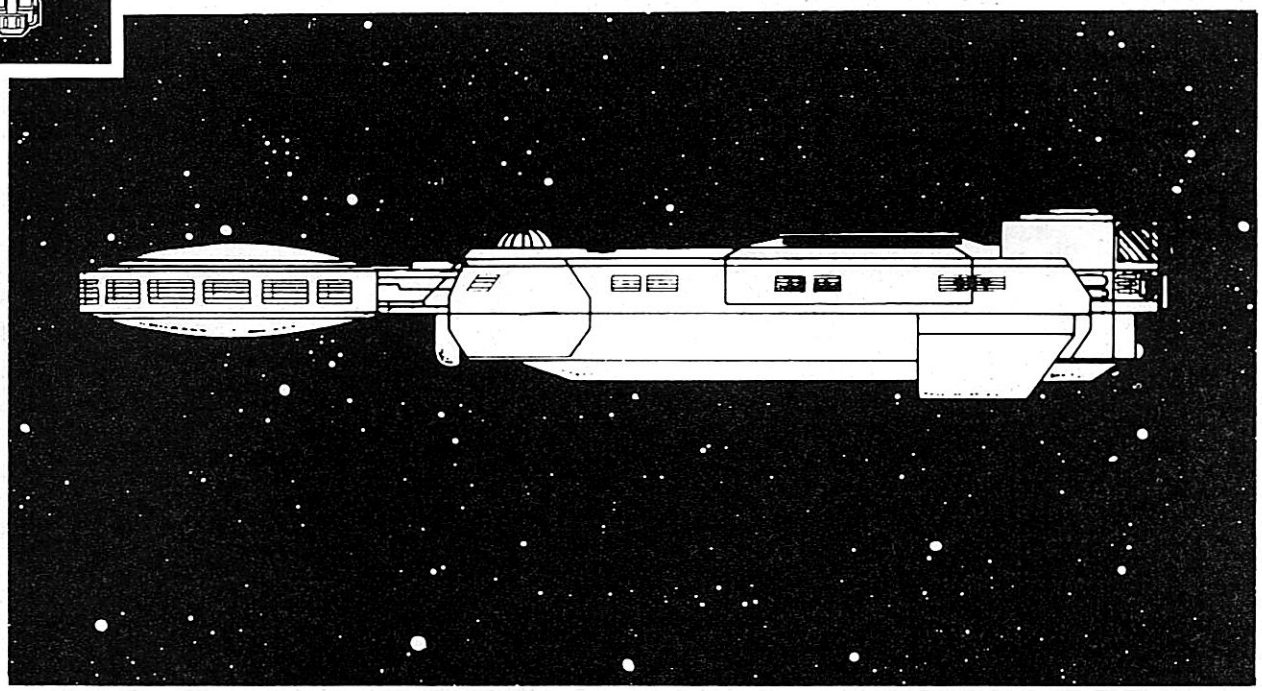
Notes

Fuel purification machinery (3.6 MW), 46.5 hours to refine 5580 m³ (398.6 tons)

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*	
1	Ant	1-15: Elec, 16-20: Qtrs	JD-7H	Sickbay-1H
2	1-2: AL, 3-20: Ant	Qtrs	PP-3H	All Others-(1h)
3	Ant	1-10: Qtrs, 11-20: Hold	SSR-(2h)	
4-5, 7, 10-12	Ant	Hold	LS-3H	
6		Hold	240K PEMS Ant-2H	
8	1-7: LP, 8-10: CH	1-2: TS, 3-20: Hold	ELS-2H	
9	Ant	1-2: TS, 3-20: Hold	LSR-1H	
13-15		Hold	Hangar-4H	
16	1-10: Ant	1-2: TS, 3-20: Hold	FPP-3H	
17	1-10: Ant	1-2: TS, 3: Eng, 4-20: Hold	MD-1H	
18-19	1-9: LP	1-5: Eng, 6-20: Hold	AG-2H	
20		Eng	Lab-1H	

Bastien-Class Subsidized Liner



General Data

Displacement: 600 tons
Length: 69 meters
Price: MCr169.55
Configuration: Slab SL
Mass (Loaded/Empty): 4985.02/4154.33
Hull Armor: 10
Volume: 8400 m³
Target Size: S
Tech Level: 12

Engineering Data

Power Plant: 426 MW Fusion Power Plant (47 MW/hit), 1 year duration (0.307 MW excess power)
Jump Performance: 3 (1680 m³ fuel)
G-Rating: 1G (300 MW/G), Contra-Grav lifters (60 MW)
G-Turns: 76 (120.8 using jump fuel), 37.5 m³ of fuel each
Maint: 249

Electronics

Computer: 3×TL-12 Mod St Computer (0.4 MW ea.)
Commo: 30,000km radio (1 hex; 1 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 30,000km (1 hex; 0.03 MW), Active EMS, 3000km (0 hexes; use long range for task difficulty in same hex; 8 MW)
Controls: Flight deck with 4×workstation, plus 4 other workstations

Armament

3 turret hardpoint sockets fitted (Loc: 11; Arcs: All; Loc: 12,13; Arcs: 2,3,4)

Accommodations

Life Support: Extended (1.68 MW), Gravitic Compensators (3G; 42 MW)
Crew: 12 (2×Maneuver, 1×Electronics, 4×Engineering, 1×Maintenance, 2×Stewards [double as Small Craft Pilots], 1×Command, 1×Medical).
Crew Accommodations: 1×Small Stateroom (0.0005 MW ea.), 6×Large Stateroom (double-occupancy; 0.001 MW ea.)
Passenger Accommodations: 21×Small Stateroom (0.0005 MW ea.), 20×Low Berth (0.001 MW ea.)
Cargo: 429.6 m³, one large cargo hatch
Small Craft and Launch Facilities: 10-ton Skiff in Internal Hangar (Minimal), with one launch port
Air Locks: 6

DAMAGE TABLES

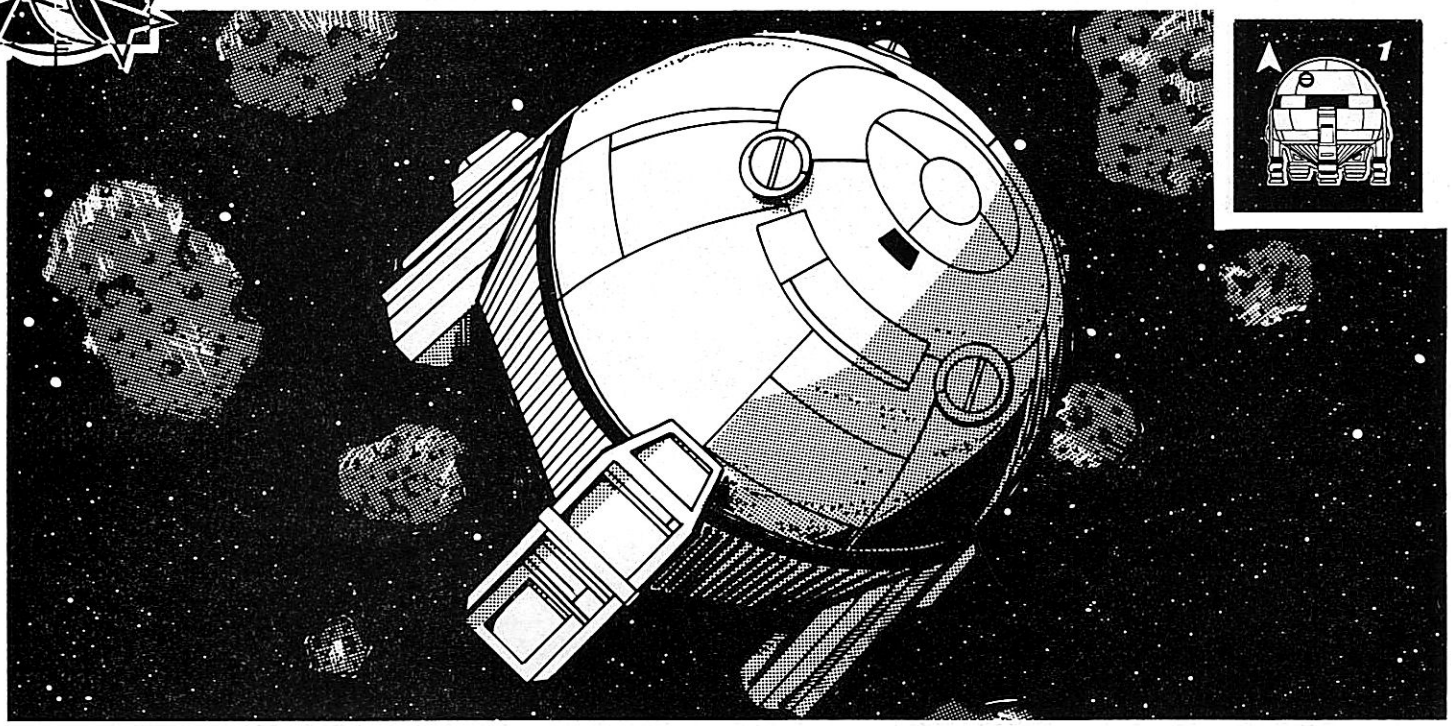
Area	*Surface Hits*	*Internal Explosion*	*Systems*
1	1-2: Ant	1-4: Elec, 5-20: Qtrs	JD-10H
2-3		Qtrs	PP-9H
4	1-2: AL	1-12: Qtrs, 13-20: Hold	CG-1H
5, 8-9, 14-15		Hold	LSR-1H
6-7	1-3: LP	Hold	SSR-(2h)
10	LP	Hold	FPP-14H
11-13		1-2: TS, 3-20: Hold	LS-3H
16-17	1: CH	1-5: Eng, 6-20: Hold	AG-2H
18		1-19: Eng, 20: Hold	ELS-2H
19-20		Eng	MD-1H
			Hangar-3H
			All Others-(1h)

Notes

The *Bastien*-class liner is quite similar to the more well-known Stellar class, but keeps its launch in an internal hangar, rather than in an external grapple, and carries a different arrangement of turret hardpoints.

Fuel purification machinery (10.44 MW), 15.62 hours to refine 4530 m³ (323.6 tons)

Broadsword-Class Mercenary Cruiser



General Data

Displacement: 800 tons
Length: 28 meters
Price: MCr315.16
Configuration: Sphere SL
Mass (Loaded/Empty): 6404.67/3636.90
Hull Armor: 28
Volume: 11,200 m³
Target Size: S
Tech Level: 15

Engineering Data

Power Plant: 1050 MW Fusion Power Plant (262.5 MW/hit), 1 year duration (5.206 MW power shortfall)
Jump Performance: 3 (2240 m³ fuel)
G-Rating: 2 (400 MW/G), Contra-Grav lifters (80 MW)
G-Turns: 48 (92.8 using jump fuel), 50 m³ of fuel each
Maint: 177

Electronics

Computer: 3×TL-15 Mod Fb Computers (1.1 MW ea.)
Commo: 300,000km radio (10 hexes; 10 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS folding array 150,000km (5 hexes; 0.15 MW), Active EMS 300,000km (10 hexes; 15 MW)
ECM/ECCM: 300,000km EMS jammer (10 hexes; 30 MW), EM Masking (11.2 MW)
Controls: Bridge with 15×Workstation, plus 7 other workstations

Armament

Offensive: 8×TL-15 150-Mj Laser Turret (Loc:2-5; Arcs: 1,2,3; Loc: 12-15; Arcs: 2,3,4,5; 4.2 MW ea.; 1 Crew ea.)
Master Fire Directors: 2 TL-15 (6 Diff Mod; No Msl; 10 hexes; 1.56 MW; 1 Crew)

	Short	*Medium*	*Long*	*Extreme*
150-Mj Laser Turret	10:1/10-31	20:1/10-31	40:1/10-31	80:1/10-31

Accommodations

Life Support: Extended (2.24 MW), Gravitic Compensators (6G; 56 MW)
Crew: 72 (7×Engineering, 1×Electronics, 2×Maneuver, 10×Gunnery, 2×Maintenance, 31×Ship's Troops, 6×Small Craft Flight Crew, 10×Command, 2×Steward, 1×Medical).
Crew Accommodations: 26×Small Stateroom (single/double-occupancy; 0.0005 MW ea.), 8×Large Stateroom (quadruple-occupancy; 0.001 MW ea.)
Cargo: 555 m³ (plus 812 m³ for cutter modules), 5 large cargo hatches
Small Craft and Launch Facilities: 2×50-ton modular cutters in docking rings (rings accommodate 50-ton streamlined needle hulls), each with its own launch port (each cutter with one fuel scoop module and one ATV module), 2×ATV (in modules), 1×Air Raft with internal hangar (Minimal) and launch port
Air Locks: 8

Notes

This *Broadsword* variant gives up G-hours and internal comfort for improved jump and maneuver performance, plus an ECM/ECCM suite. Because of its power shortfall, the ship's EMS jammer may only be run at the 180,000 km (6 hexes; 22 MW) power level while at full thrust or while the CG lifters are engaged.

The docking ring housings for the two cutters do not allow maintenance or repair work to be done on them while they are docked. The modules (carried as cargo, 406 m³ each) may not be swapped while the cutters are docked; this must be done outside of the ship.

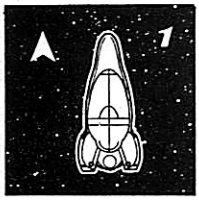
Fuel purification machinery (9.067 MW), 15.35 hours to refine 4640 m³ (331.4 tons).

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*
1	Ant	Elec
2		1-2: LT, 3-14: Qtrs, 15-20: Hold
3-5	1: AL	1-2: LT, 3-14: Qtrs, 15-20: Hold
6-9	1-5: EMMR	Hold
10-11		Hold
12		1-2: LT, 3-20: Hold
13	1-17: CH	1-2: LT, 3-20: Hold
14	1-3: LP	1-2: LT, 3-17: Hold, 18-20: Qtrs
15		1-2: LT, 3-17: Hold, 18-20: Eng
16-19	1-10: LP	1-6: Eng, 7-20: Hold
20		Eng

Systems	
JD-9H	MD-1H
PP-4H	FPP-8H
CG-2H	SSR-(2h)
ELS-2H	EMM-1H
LT-1H	EMMR-(11h)
LSR-1H	All Others-(1h)
LS-3H	
AG-3H	
MFD-(2h)	
Hangar-1H	

Eakhau-Class Aslan Trader



General Data

Displacement: 400 tons
Length: 55 meters
Price: MCr99.99
Configuration: Wedge SL
Mass (Loaded/Empty): 4525.05/2069.95
Hull Armor: 42
Volume: 5600 m³
Target Size: S
Tech Level: 14

Engineering Data

Power Plant: 292.5 MW Fusion Power Plant (97.5 MW/hit), 1 year duration (0.4565 MW excess power)
Jump Performance: 2 (840 m³ fuel)
G-Rating: 1(200 MW/G), Contra-Grav lifters (40 MW)
G-Turns: 30 (63.6 using jump fuel), 25 m³ of fuel each
Maint: 167

Electronics

Computer: 3×TL-14 Mod St Computers (0.5 MW ea.)
Commo: 30,000km radio (1 hex; 1 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 30,000km (1 hex; 0.02 MW), Active EMS 60,000km (2 hexes; 7 MW)
Controls: Flight deck with 4×workstations, plus 2 other workstations

Armament

Offensive: 2×TL-14 150-Mj Laser Turret (Loc: 16,17; Arcs: All; 4.2 MW ea.; 1 Crew ea.), plus 2 turret sockets fitted (Loc: 18,19; Arcs: All)

	Short	*Medium*	*Long*	*Extreme*
TL-14 150-Mj Las Trt	2:1/10-31	4:1/10-31	8:1/10-31	16:1/10-31

Accommodations

Life Support: Extended (1.12 MW), Gravitic Compensators (5G; 28 MW)
Crew: 9: 2×Engineering, 1×Electronics, 2×Maneuvering, 2×Gunners, 1×Command, 1×Medical
Crew Accommodations: 1×Small Stateroom (single-occupancy; 0.0005 MW), 5×Small Stateroom, (double-occupancy; 0.0005 MW ea.), Shrine (0.001 MW), 2×Emergency Low Berth (0.002 MW ea.)
Passenger Accommodations: 13×Small Stateroom (0.0005 MW ea.)

Cargo: 2343.8 m³, with 7 large cargo hatches
Small Craft and Launch Facilities: None
Air Locks: 4

Notes

Fuel scoop, purification machinery (3.975 MW), 12 hours to refine 1590 m³.

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*
1	1: Ant	1-6: Elec, 7-20: Hold	SSR-(2h)
2-5, 8-9, 16-17		Hold	LS-4H
6, 12-13		1-10 Qtrs, 11-20: Hold	ELS-2H
7	1: AL	1-10 Qtrs, 11-20: Hold	AG-1H
10	1: Ant	1-6: Elec, 7-12: Qtrs, 13-20: Hold	JD-4H
11	CH	1-18: Hold, 19-20: Qtrs	PP-3H
14-15		1-6 Qtrs, 7-20: Hold	MD-(4h)
16		1-18: Hold, 19-20: LT	CG-H
17		1-18: Hold, 19-20: LT	FPP-4H
18		1-10: Eng, 11-18: Hold, 19-20: TS	LT-1H
19		1-10: Eng, 11-18: Hold, 19-20: TS	All Others(1h)
20		Eng	

Khtukhao-Class Aslan Clan Transport

General Data

Displacement: 505/600 tons
Length: 24.05 meters
Price: MCr186.1
Configuration: Sphere SL
Mass (Loaded/Empty): 5301.87/3863.15
Hull Armor: 42
Volume: 7070/8400 m³
Target Size: S
Tech Level: 14

Engineering Data

Power Plant: 759 MW Fusion Power Plant (95 MW/hit), 1 year duration
Jump Performance: 2 (1260 m³ fuel)
G-Rating: 2 (300 MW/G), Contra-Grav lifters (60 MW)
G-Turns: 48 (81.6 using jump fuel), 37.5 m³ of fuel each
Maint: 165

Electronics

Computer: 1×TL-14 Mod Fb Computer (1 MW), 2×TL-14 Mod St Computers (0.5 MW ea.)
Commo: 30,000km radio (1 hex; 1 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 120,000km (4 hexes; 0.1 MW), Active EMS 300,000km (10 hexes; 15 MW)
Controls: Bridge with 7×Bridge Workstation, plus 6 other workstations

Armament

Offensive: 6×TL-14 150-Mj Laser Turret (Loc: 2,5; Arcs: 1,2,3; 4.2 MW ea.; 1 Crew ea.; Loc: 10,11; Arcs: All; 4.2 MW ea.; 1 Crew ea.; Loc: 16,19; Arcs: 3,4,5; 4.2 MW ea.; 1 Crew ea.)
Master Fire Director: 1×TL-14 MFD (5 Diff Mods; No Msl; 10 hexes; 1.62 MW; 1 Crew)

	Short	*Medium*	*Long*	*Extreme*
TL-14 150-Mj Las Trt	2:1/10-31	4:1/10-31	8:1/10-31	16:1/10-31

Accommodations

Life Support: Extended (1.68 MW), Gravitic Compensators (5G; 35.35 MW)
Crew: 26: 6×Engineering, 1×Electronics, 2×Maneuvering, 1×Maintenance, 7×Gunnery, 3×Flight Crew, 3×Command, 1×Stewards, 2×Medical
Crew Accommodations: 2×Small Stateroom (single-occupancy; 0.0005 MW ea.), 12×Small Stateroom, (double-occupancy; 0.0005 MW ea.), Shrine (0.001 MW)
Passenger Accommodations: 23×Small Stateroom (0.0005 MW ea.), 30×Low Berth (0.001 MW ea.)
Cargo: 271.4 m³, 2 large cargo hatches
Small Craft and Launch Facilities: 95-ton shuttle, external grapple (SL).
Air Locks: 6

Notes

Hull is 505 tons, plus shuttle in external grapple equals 600 tons.
Fuel purification machinery (7.65 MW), 12 hours to refine 3060 m³.

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*
1	1-7: Ant	1-5: Elec, 6-10: Eng, 11-20: Hold	LT-1H
2	1-3: AL	1-2: LT, 3-20: Qtrs	MFD-(4h)
3	1-2: Shuttle	Qtrs	Grapple-4H
4	Shuttle	Qtrs	LS-3H
5	1-18: Shuttle	1-2: LT, 3-17 Qtrs, 18-20: Hold	ELS-2H
6		Hold	AG-2H
7	1-9: LCH	Hold	SSR-(2h)
8	Shuttle	Hold	JD-7H
9	Shuttle	1-4: Elec, 5-9: Eng, 10-20: Hold	PP-8H
10	1-2: Ant	1-2: LT, 3-5: Elec, 6-18: Qtr, 19-20: Hold	MD-1H
11		1-2: LT, 3-20: Hold	CG-1H
12-13		1-5: Qtrs, 6-20: Hold	FPP-8H
14-15	Shuttle	Hold	All Others-(1h)
16		1-2: LT, 3-14: Eng, 15-20: Hold	
17	1-2: Shuttle	1-10: Hold, 11-20: Eng	
18	Shuttle	1-10: Hold, 11-20: Eng	
19	1-18 Shuttle	1-2: LT, 3-18: Hold, 19-20: Eng	
20		Eng	

Vargr Trader

General Data

Displacement: 200 tons
Length: 51 meters
Price: MCr55.35
Configuration: Needle SL
Mass (Loaded/Empty): 2088.2/1082.3
Hull Armor: 10
Volume: 2800 m³
Target Size: S
Tech Level: 13

Engineering Data

Power Plant: 150 MW Fusion Power Plant (75 MW/hit), 1 year duration (1.604 MW excess power)
Jump Performance: 2 (420 m³)
G-Rating: 1 (100 MW/G), Contra-Grav lifters (20 MW)
G-Turns: 48 (81.6 using jump fuel), 12.5 m³ of fuel each
Maint: 81

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*
1	1-3: Ant	1-5: Elec, 6-7: Qtrs, 8-20 Hold	SSR-(2h)
2	1: Ant	1-5: Elec, 6-20: Hold	LS-2H
3	1: AL, 2: Ant	1-5: Qtrs, 6-20: Hold	ELS-1H
4-5, 8		Hold	AG-1H
6	1: AL, 2-5: CH	1-10: Qtr, 11-20: Hold	JD-3H
7	CH	1-15: Qtrs, 16-20: Hold	PP-2H
9		1-5: Eng, 6-20: Hold	MD-(2h)
10-11		1-9 Hold, 10-14: Qtrs, 15-20: TS	CG-1H
12-13, 16-17		Hold	FPP-4H
14-15		1-15: Eng, 16-20: Hold	All Others-(1h)
18-20		Eng	

Electronics

Computer: 3×TL-13 Mod St Computers (0.45 MW for one)
Commo: 30,000km radio (1 hex; 1 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 30,000km (1 hex; 0.03 MW), Active EMS 3,000km (0 hexes, use long range for difficulty in same hex; 8 MW)
Controls: Flight deck with 4×workstations, plus 1 other workstation

Armament

2 turret sockets fitted (Locs: 10,11; Arcs: All)

Accommodations

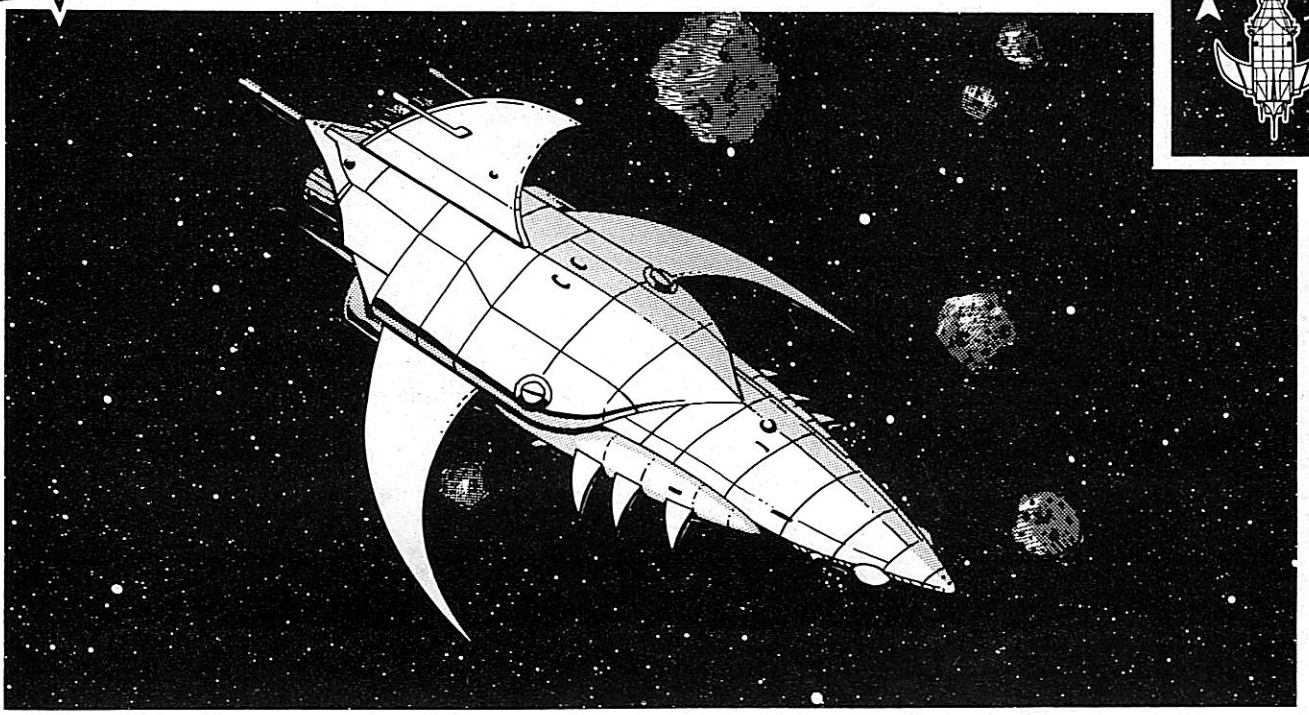
Life Support: Extended (0.56 MW), Gravitic Compensators (4G; 14 MW)
Crew: 5: 1×Engineering, 1×Electronics, 2×Maneuvering, 1×Command.
Crew Accommodations: 1×Small Stateroom (single-occupancy; 0.0005 MW ea.), 2×Small Stateroom, (double-occupancy; 0.0005 MW ea.)
Passenger Accommodations: 5×Small Stateroom (0.0005 MW ea.)
Cargo: 934.5 m³, with 3 large cargo hatches
Small Craft and Launch Facilities: None
Air Locks: 2

Notes

Fuel scoop and purification machinery (2.55 MW), 12 hours to refine 1020 m³.

Ship is built with a lower tech crystaliron hull.

Ueknou-Class Vargr Corsair



General Data

Displacement: 400 tons
Length: 55 meters
Price: MCr197.47
Configuration: Wedge SL
Mass (Loaded/Empty): 3980.65/3681.43
Hull Armor: 34
Volume: 5600 m³
Target Size: S
Tech Level: 14

Engineering Data

Power Plant: 746.4 MW Fusion Power Plant (93.3 MW/hit), 1 year duration (0.2245 MW excess power)
Jump Performance: 2 (840 m³ fuel)
G-Rating: 3 (200 MW/G), Contra-Grav lifters (40 MW)
G-Turns: 79.5 (113.1 using jump fuel), 25 m³ of fuel each
Maint: 149

Electronics

Computer: 3×TL-14 Mod Fb Computer (1 MW ea.)
Commo: 30,000km radio (1 hex; 1 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 120,000km (4 hexes; 0.1 MW), Active EMS 300,000km (10 hexes; 15 MW)
ECM/ECCM: EM Masking (5.6 MW), 240,000km EMS jammer (8 hexes; 26 MW)
Controls: Bridge with 9×Bridge Workstation, plus 7 other workstations

Armament

Offensive: 2×TL-14 150-Mj Laser Turret (Loc: 16,17; Arcs: All; 4.2 MW ea.; 1 Crew ea.), 2×Missile Turrets (Loc: 6,7: 2 ready Msls ea.; 0.15 MW ea.; 1 Crew ea.), total 4 ready Msls plus 4 in cargo
Master Fire Directors: 1×TL-14 MFD (5 Diff Mod; Msl 10 hexes; 10 hexes; 1.77 MW;1 Crew), plus 1×TL-14 MFD (5 Diff Mod; No Msl; 2 hexes;0.71 MW;1 Crew)

	Short	*Medium*	*Long*	*Extreme*
TL-14 150-Mj Las Trt	2:1/10-31	4:1/10-31	8:1/10-31	16:1/10-31

Accommodations

Life Support: Extended (1.12 MW), Gravitic Compensators (5G; 28 MW)
Crew: 22: 7×Engineering, 2×Electronics, 2×Maneuvering, 6×Gunnery, 1×Maintenance, 3×Command, 1×Steward.
Crew Accommodations: 3×Small Stateroom (single-occupancy; 0.0005 MW ea.), 17×Small Stateroom, (double-occupancy 0.0005 MW ea.), including allowance for up to 15 ships troops not included in crew total.
Passenger Accommodations: None
Cargo: 101.3 m³, plus 4 missiles, one large cargo hatch
Small Craft and Launch Facilities: None
Air Locks: 4

Notes

Fuel scoop and purification machinery (14.1375 MW), 6 hours to refine 2827.5 m³.

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*
1	1-6: Ant	1-10: Elec, 11-20: Qtrs	MFD-(3h)
2		1-10: Elec, 11-17: Hold, 18-20: LT	EMM-1H
3		1-10: Qtrs, 11-17: Hold, 18-20: LT	SSR-(2h)
4		1-15: Qtrs, 16-20: Hold	LS-4H
5	1: AL	1-10: Qtrs, 11-20: Hold	AG-1H
6		1-5: Qtrs,6-17: Hold, 18-20: MT	JD-5H
7		1-17: Hold, 18-20: MT	PP-8H
8-10		Hold	MD-1H
11		1-6: Elec, 7-9: Eng, 10-20: Hold	CG-1H
12	1-4: CH	Hold	FPP-14H
13-15	1-3: EMM rad	Hold	LT-1H
16-18, 20		Eng	MT-1H
19		1-10: Eng, 11-20: Hold	EMMR-(5h)
			ELS-2H
			All Others-(1h)

Fiery-Class Close Escort

General Data

Displacement: 380/400 tons
Length: 54 meters
Price: MCr239.29
Configuration: Wedge AF
Mass (Loaded/Empty): 4562.87/4102.28
Hull Armor: 56
Volume: 5320/5600 m³
Target Size: S
Tech Level: 14

Engineering Data

Power Plant: 945 MW Fusion Power Plant (94.5 MW/hit), 1 year duration (0.1345 MW excess power)
Jump Performance: 4 (1400 m³ fuel)
G-Rating: 4 (200 MW/G), Contra-Grav lifters (40 MW)
G-Turns: 56 (112 using jump fuel), 25 m³ of fuel each
Maint: 143

Electronics

Computer: 3×TL-14 Mod Fb Computers (1 MW ea.)
Commo: 300,000km radio (10 hexes; 10 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-8+ Avionics
Sensors: 150,000km Passive EMS folding array (5 hexes; 0.15 MW), Active EMS 300,000km (10 hexes; 15 MW)
ECM/ECCM: 120,000km EMS jammer (4 hexes; 18 MW), EM Masking (5.32 MW)
Controls: 7×Bridge Workstation, plus 7 other workstations

Armament

Offensive: 2×TL-14 150Mj Laser Turret (Loc: 12,13; Arcs: 1,2,3; 4.2 MW ea.; 1 Crew ea.), 1×TL-14 300 Mj Laser Barbette (Loc: 10; Arcs:1,2,3; 8.3 MW; 1 Crew), 1×Missile Turret (Loc: 1; 2 ready Msls; 0.15 MW; 1 Crew) with 2 ready Msls and 4 in cargo
Master Fire Director: 1×TL-14 MFD (5 Diff Mod; Msl 10 hexes; 10 hexes; 1.77 MW; 1 Crew)

	Short	*Medium*	*Long*	*Extreme*
TL-14 150-Mj Las Trt	2:1/10-31	4:1/10-31	8:1/10-31	16:1/10-31
TL-14 300-Mj Las Brb	10:1/14-43	20:1/14-43	40:1/8-26	80:1/4-13

Accommodations

Life Support: Extended (1.064 MW), Gravitic Compensators (5G; 26.6 MW)
Crew: 22: 7×Engineering, 1×Electronics, 2×Maneuver, 5×Gunner, 3×Gig Crew, 1×Maintenance, 3×Command
Crew Accommodations: 4×Small Stateroom (single-occupied; 0.0005 MW ea.), 9×Small Stateroom, (double-occupied; 0.0005 MW ea.), 1×Emergency Low Berth (0.002 MW)
Passenger Accommodations: None
Cargo: 26.8 m³, plus four missiles, plus one large cargo hatch
Small Craft and Launch Facilities: External grapple (SL) for 20-ton Military Gig
Air Locks: 4

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*
1	1-7: Ant	1-3: MT, 4-10: Elec, 11-20: Hold
2-3	1-7: Ant	1-5: Qtrs, 6-10: Elec, 11-20: Hold
4-5		Hold
8-9	1-4: EMMR	Hold
6	1: AL	1-5: Qtrs, 6-10: Elec, 11-20: Hold
7		1-8: Qtrs, 9-11: Elec, 12-20: Hold
10		1-7: LB, 8-20 Hold
11		1-10: Hold, 11-20 Qtr
12		1-3: LT, 4-8: Qtrs, 9-20: Hold
13		1-3: LT, 4-8: Qtrs, 9-18: Hold, 19-20: Eng
14-15		1-15: Eng, 16-20: Hold
16, 18-20		1-10: Hold, 11-20: Eng
17	1-3: CH	1-10: Hold, 11-20: Eng

Systems

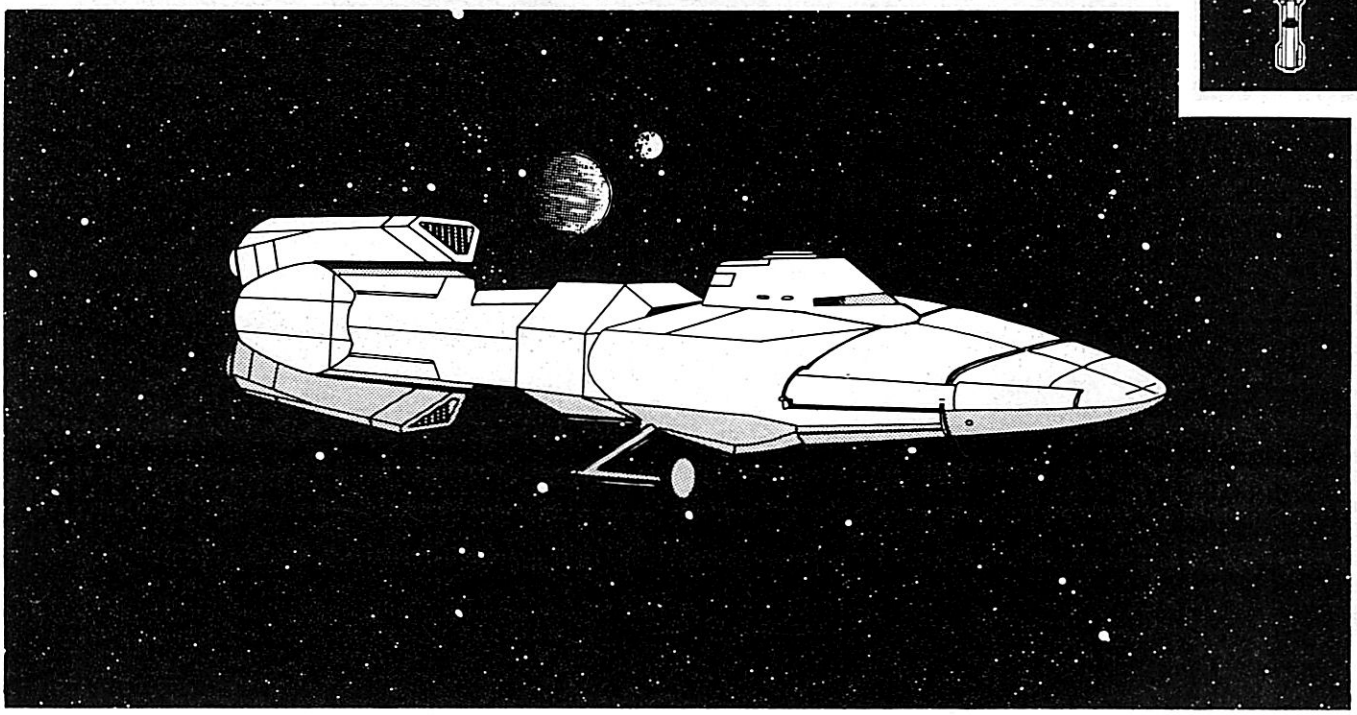
MT-1H, EMM-1H, LB-2H, MFD-(4h), LT-1H, Grapple-2H, SSR-(2h), LS-7H, ELS-4H, AG-1H, JD-7H, FPP-6H, PP-10H, MD-1H, CG-1H, EMMR-(5h), All Others-(1h)

Notes

Steamlined variant of the *Gazelle*-class ship's hull is 380 tons, 400 tons with small craft attached. All drives, etc., are scaled for operations at 400 tons.

Fuel scoops, purification machinery (6 MW), 14 hours to refine 2800 m³.

Valor-Class Missile Corvette



General Data

Displacement: 400 tons
Length: 44 meters
Price: MCr267.45
Configuration: Cylinder SL
Mass (Loaded/Empty): 3363.86/3026.86
Hull Armor: 64
Volume: 5600m³
Target Size: S
Tech Level: 15

Engineering Data

Power Plant: 1324 MW Fusion Power Plant (265 MW/hit), 1 year duration (0.115 MW excess power)
Jump Performance: 4 (1400 m³ fuel)
G-Rating: 6 (200 MW/G), Contra-Grav lifters (40 MW)
G-Turns: 52.8 (108.8 using jump fuel), 25 m³ of fuel each
Maint: 116

Electronics

Computer: 3×TL-15 Mod Fb Computers (1.1 MW ea.)
Commo: 300,000km radio (10 hexes; 10 MW), 2×300,000km Laser (10 hexes; 0.15 MW), 1000 AU Maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: 180,000km Passive EMS folding array (6 hexes; 0.2 MW), 300,000km Active EMS (with Direction Finder capability, 10 hexes; 15 MW), 4×300,000km Ladar (10 hexes; 0.6 MW ea.)
ECM/ECCM: EM Masking Package (5.6 MW)
Controls: Bridge with 11×Bridge Workstation, plus 9 other workstations

Armament

Offensive: 4×Missile Barbette (Loc: 6,7,8,9; 5 ready msls ea.; 0.15 MW ea.; 1 Crew ea.) with a total of 20 ready msls plus 20 in cargo
Master Fire Directors: 4×TL-15 MFDs (6 Diff Mods; 10 hexes Msl; 10 hexes; 2.25 MW ea.; 1 Crew ea.)

Accommodations

Life Support: Extended (1.12 MW), Gravitic Compensators (6G; 28 MW)
Crew: 24: 8×Engineering, 2×Electronics, 2×Maneuvering, 8×Gunnery, 3×Command, 1×Medical
Crew Accommodations: 4×Small Stateroom (single-occupancy; 0.0005 MW ea.), 10×Small Stateroom (double-occupancy; 0.0005 MW ea.)
Passenger Accommodations: None
Cargo: 5.9 m³, plus 20 missiles, one large cargo hatch
Small Craft and Launch Facilities: None
Air Locks: 4

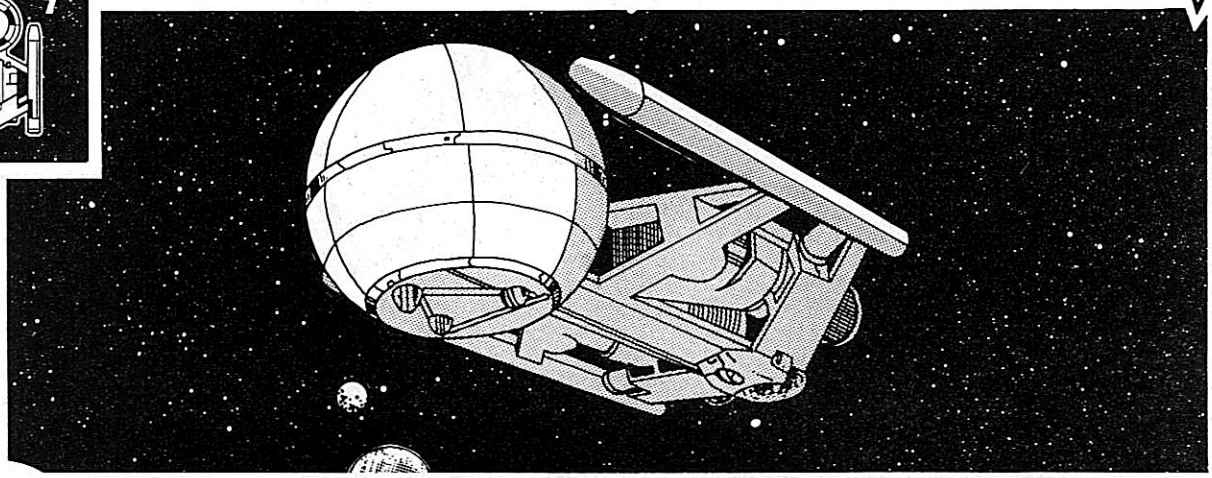
Notes

Fuel scoop, purification machinery (7.25 MW), 11.26 hours to refine 2720 m³.

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*
1	1-8: Ant	1-18: Elec, 19-20: Hold	LS-5H
2-3	Ant	1-6: Elec, 7-20: Hold	ELS-3H
4-5	1: AL, 2-8: EMMR	1-11: Qtrs, 12-20: Hold	AG-1H
6-9		1-6 MB, 7-20: Hold	JD-6H
10		1-11: Qtrs, 12-20: Hold	PP-5H
11		1-10: Qtrs, 11-20: Hold	MD-1H
12-15		Hold	CG-1H
16	1-5: CH	Hold	FPP-6H
17-18		1-17: Eng, 18-20: Hold	MB-1H
19-20		Eng	MFD-(2h)
			SSR-(2h)
			EMM-1H
			EMMR-(5h)
			All Others(1h)

Chrysanthemum-Class Destroyer Escort



General Data

Displacement: 950/1000 tons
Length: 51.6 meters
Price: MCr686.52
Configuration: Close USL
Mass (Loaded/Empty): 8341.6/7063.5
Hull Armor: 62
Volume: 13,300 m³
Target Size: M
Tech Level: 15

Engineering Data

Power Plant: 3264 MW Fusion Power Plant (297 MW/hit), 1 year duration (2.6105 MW excess power)
Jump Performance: 4 (3500 m³ fuel)
G-Rating: 6 (500 MW/G), no contra-grav
G-Turns: 54 (110 using jump fuel), 62.5 m³ of fuel each
Maint: 265

Electronics

Computer: 3×TL-15 Mod Fib Computers (1.1 MW ea.)
Commo: 2×1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS 240,000km folding array (8 hexes; 0.3 MW), Active EMS 480,000km (DF capable; 16 hexes; 25 MW), 4×300,000km Ladar (10 hexes; 0.6 MW ea.)
ECM/ECCM: 480,000km EMS jammer (16 hexes; 50 MW), EM Masking (13.3 MW)
Controls: Bridge with 15×Bridge Workstation, plus 21 other workstations

Armament

Offensive: 2×TL-15 1000-Mj Particle Accelerator (Loc: 6-12, 7-13; Arcs: 1; 27.8 MW ea.; 1 Crew ea.), 2×TL-15 150-Mj Laser Turret (Loc: 11—Arcs: 2,3,4; Loc: 20—Arcs: 4,5; 4.2 ME ea.; 1 Crew ea.), 3×Missile Turret (Loc: 4,5,20; 2 Ready Msls ea.; 0.15 MW; 1 Crew ea.), total 6 Ready Msls plus 30 in cargo
Defensive: 3×Sandcaster Turret (Loc: 4,5—Arcs: 1,2,3;Loc: 20—Arcs: 4,5;TL-15; 2D10×5 Reduc/Hit; 50 Cann ea.; 1 MW ea.; 1 Crew ea.), TL-15 Meson Screen Generator (PV=253; 20 MW; 1 Crew)
Master Fire Director: 2×TL-15 Beam MFD (6 Diff Mod; No Msl; 10 hexes; 1.56 MW ea.; 1 Crew ea.), and 2×TL-15 Beam/Msl MFD (6 Diff Mod; Msl 10 hexes; 10 hexes; 1.71 MW ea.; 1 Crew ea.)

	Short	*Medium*	*Long*	*Extreme*
150-Mj Laser Trt	10:1/10-31	20:1/10-31	40:1/10-31	80:1/10-31
1000-Mj Part Accel	10:158	20:158	40:98	80:50

Accommodations

Life Support: Extended (2.66 MW), Gravitic Compensators (6G; 66.5 MW)
Crew: 54: 21×Engineering, 2×Electronics, 2×Maneuvering, 15×Gunnery, 2×Maintenance, 3×Flight Crew, 7×Command, 2×Steward
Crew Accommodations: 8×Small Stateroom (single-occupancy; 0.0005 MW ea.), 23×Small Stateroom (double-occupancy; 0.0005 MW ea.)
Passenger Accommodations: None
Other Facilities: Electronics Shop (0.6 MW), Machine Shop (1 MW)
Cargo: 69.4 m³, plus 30 missiles, one large cargo hatch
Small Craft and Launch Facilities: External Grapple (USL) for 50-ton Cutter
Air Locks: 10

Notes

No fuel purification machinery, 6875 m³ fuel.

Because it is intended to serve as a Fleet unit, the *Chrysanthemum* is dependent on tankers for refueling.

Because the control panels are optimized for smaller ships, some systems on larger ships may require each hit box to record 2 hits (each hit is a slash; two slashes in the form of an "x" fill the box) or the use of additional unused boxes from other lines, such as "other."

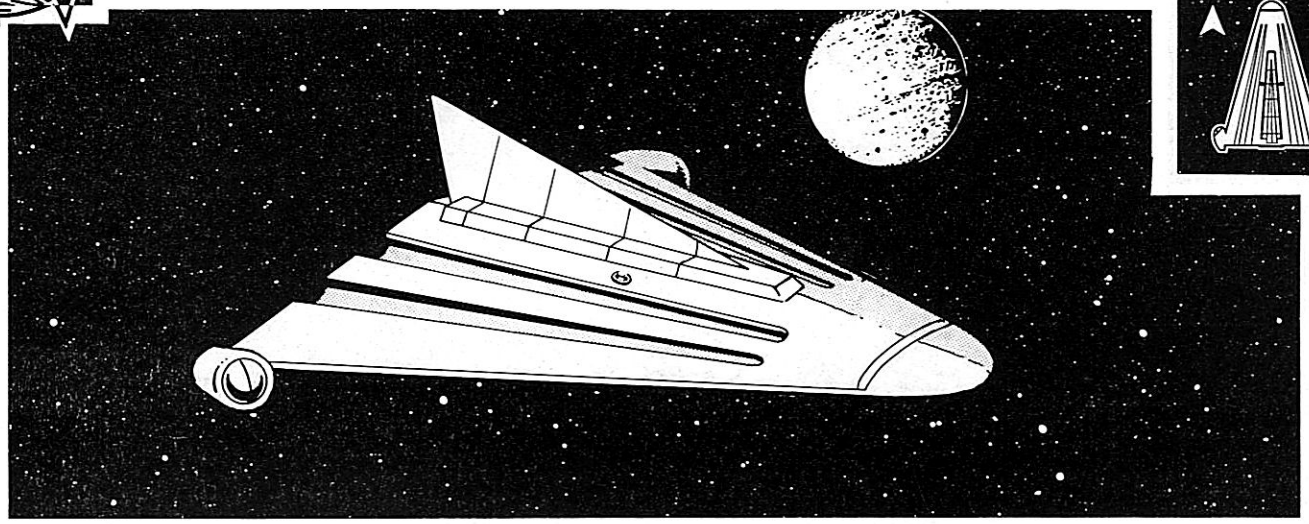
When the cutter is detached, "cutter" surface hits are taken against the grapple.

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*
1	Ant	Elec
2	Ant	1-5: Elec, 6-9: Eng, 10-20: Hold
3	Ant	1-5: Elec, 6-20: Hold
4-5	1-18: Ant	1: Sand, 2: MT, 3-5: Elec, 6-17: Qtrs, 18-20: Hold
6-7	1-6: EMMR	1-7 PA, 8-20: Hold
8	1: Ant, 2-3: AL, 4-20 Cutter	1-5: Qtrs, 6-20: Hold
9	Ant	1-5: Qtrs, 6-20: Hold
10	Ant	Hold
11	1-19: Cutter	1: LT, 2-20: Hold
12	1-2: EMMR	1-7: PA, 8-20: Hold
13		1-7: PA, 8-20: Hold
14	1-8: Cutter	1-10: Eng, 11-20: Hold
15	1-9: Cutter, 10-11: LCH	1-10: Eng, 11-20: Hold
16-17		1-4: Qtrs, 5-20: Hold
18	Ant	1-5: Eng, 6-20: Hold
19		1-5: Eng, 6-20: Hold
20		1: Sand, 2: MT, 3: LT, 4-13: Eng, 14-20: Hold

Systems	
AEMS-(2h)	PA-5H
EMS Jammer-(2h)	LT-1H
EMM-2H	PEMS Ant-2H
MS-3H	Sand-1H
Grapple-4H	All Others-(1h)
Elec. Shop-1H	
Machine Shop-1H	
SSR-(2h)	
LS-10H	
ELS-5H	
AG-3H	
JD-14H	
PP-11H	
MD-3H	
EMMR-(13h)	
MFD (2h)	
MT-1H	

Kinunir-Class Colonial Cruiser



General Data

Displacement: 1250 tons
Length: 78.75 meters
Price: MCr494.1
Configuration: Wedge SL
Mass (Loaded/Empty): 11,813.50/10,076.64
Hull Armor: 42
Volume: 17,500 m³
Target Size: M
Tech Level: 15

Engineering Data

Power Plant: 2856 MW Fusion Power Plant (285.6 MW/hit), 1 year duration (4.797 MW excess power)
Jump Performance: 4 (4375 m³ fuel)
G-Rating: 4 (625 MW/G), Contra-Grav lifters (125 MW)
G-Turns: 44 (100 using jump fuel), 78.125 m³ of fuel each
Maint: 414

Electronics

Computer: 3×TL-15 Mod Fb Computers (1.1 MW ea.)
Commo: 2×300,000km radio (ony one powered; 10 hexes; 10 MW), 2×1000 AU maser (∞; 0.6 MW ea.)
Avionics: TL-10+ Avionics
Sensors: Passive EMS 180,000km folding array (6 hexes; 0.2 MW), Active EMS 300,000km (DF capable;10 hexes; 15 MW)
ECM/ECCM: None
Controls: Bridge with 13×Bridge Workstation, plus 19 other workstations

Armament

Offensive: 2×TL-15 700-Mj Laser Barbette (Loc: 16,17; Arcs: All; 19.5 MW ea.; 1 Crew ea.), 2×TL-15 Missile Turret (Loc: 4,5; 2 ready msls ea.; 0.15 MW ea.; 1 Crew ea.) total of 4 ready msls plus 38 in cargo, 4×TL-15 150-Mj Laser Turret (Loc: 10,11—Arcs: 1,2,3;Loc: 18,19—Arcs: All; 4.2 MW ea.; 1 Crew ea.)
Master Fire Directors: 2×TL-15 Beam/Missile MFD (6 Diff Mod; Msl 10 hexes; 10 hexes; 1.71 MW ea.; 1 Crew ea.), and 2× TL-15 Beam MFD (6 Diff Mod; No Msl; 10 hexes; 1.56 MW ea.; 1 Crew ea.)

	Short	*Medium*	*Long*	*Extreme*
150-Mj Laser Turret	10:1/10-31	20:1/10-31	40:1/10-31	80:1/10-31
700-Mj Laser Barbette	10:1/21-66	20:1/21-66	40:1/21-66	80:1/21-66

Accommodations

Life Support: Extended (3.5 MW), Gravitic Compensators (6G; 87.5 MW)
Crew: 90: 19×Engineering, 1×Electronics, 2×Maneuvering, 12×Gunnery, 2×Maintenance, 35×Ship's Troops, 3×Flight Crew, 12×Command, 2×Steward, 2×Medical
Crew Accommodations: 26×Small Stateroom (single-occupancy; 0.0005 MW ea.), 14×Small Stateroom (double-occupancy; 0.0005 MW ea.), 9×Large Stateroom (ship's troops, quadruple-occupancy; 0.001 MW ea.)
Passenger Accommodations: None
Other Facilities: Electronics Shop (0.6 MW), Machine Shop (1 MW), Sickbay (0.8 MW), 4 Emergency low berths (0.008 MW ea.)
Cargo: 702.5 m³, plus 38 missiles, 4 large cargo hatches
Small Craft and Launch Facilities: Internal Hangar (Minimal) for 30-ton Ship's Boat and launch port, Internal Hangar (Minimal) for ATV, & air raft with launch port
Air Locks: 13

Notes

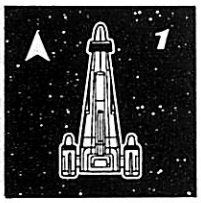
Fuel scoop and purification machinery (39.063 MW), 6 hours to refine 7812.5 m³.

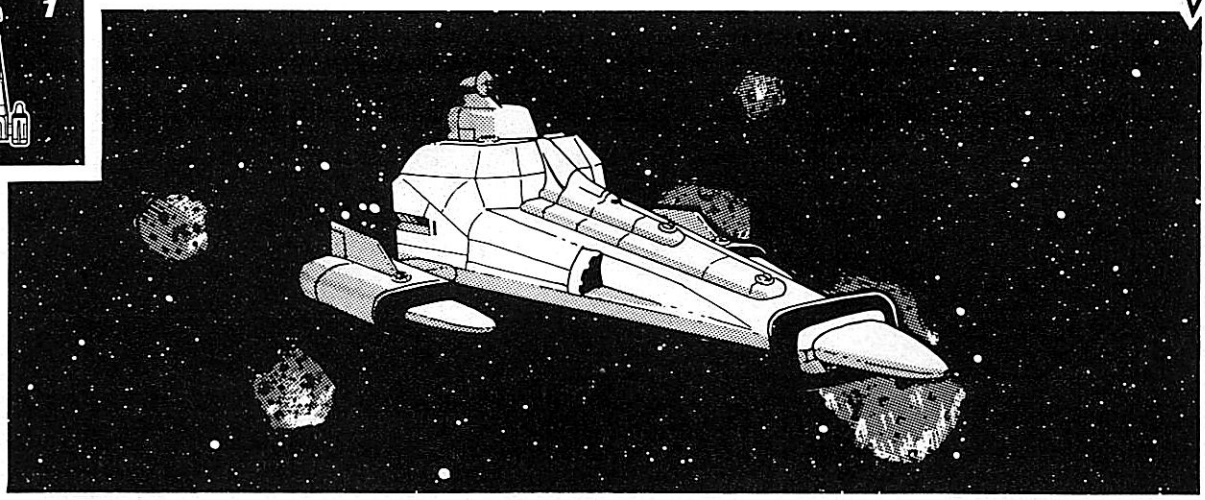
Because the control panels are optimized for smaller ships, some systems on larger ships may require each hit box to record 2 hits (each hit is a slash; two slashes in the form of an "x" fill the box) or the use of additional unused boxes from other lines, such as "other."

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*
1	1-5: Ant	1-5: Elec, 6-20: Hold	LT-1H
2	1-5: Ant, 3: AL	1-2: Elec, 3-7: Eng, 8-12: Qtrs, 13-20: Hold	MFD-(2h)
3	1-5: LP, 6-9: LCH	Hold	Elec. Shop-1H
4-5		1: MT, 2-6: Qtrs, 7-20: Hold	Mach. Shop-1H
6-7		1-10: Qtrs, 11-20: Hold	SSR-(2h)
8		1-5: Qtrs, 6-20: Hold	LSR-1H
9		Hold	LS-11H
10	1-3: Ant	1: LT, 2-4: Elec, 5-20: Hold	ELS-6H
11		1: LT, 2-6: Eng, 7-11: Qtrs, 12-20: Hold	AG-4H
12-13		1-5: Qtrs, 6-20: Hold	JD-18H
14		1-9: Eng, 10-11: Elec, 12-20: Hold	PP-10H
15		1-5: Eng, 6-20: Hold	MD-3H
16-17		1-4: LB, 5-14: Eng, 15-20: Hold	CG-3H
18-19		1: LT, 2-11: Eng, 12-20: Hold	FPP-32H
20		Eng	LB-3H
			MT-1H
			Hangar-11H
			Sickbay-1H
			All Others-(1h)

Midu Agashaam-Class Destroyer





General Data

Displacement: 3000 tons
Length: 105 meters
Price: MCr1549.59
Configuration: Wedge SL
Mass (Loaded/Empty): 28,767.43/25,583.88
Hull Armor: 62
Volume: 42,000 m³
Target Size: M
Tech Level: 15

Engineering Data

Power Plant: 9894 MW Fusion Power Plant (300 MW/hit), 1 year duration (0.7485 MW excess power)
Jump Performance: 4 (10,500 m³ fuel)
G-Rating: 6 (1500 MW/G), Contra-Grav lifters (300 MW)
G-Turns: 51.6 (107.6 using jump fuel), 187.5 m³ of fuel each
Maint: 1020

Electronics

Computer: 3×TL-15 Mod Fb Computer (1.1 MW ea.)
Commo: 1000 AU radio (∞; 20 MW), 2×1000 AU maser (∞; 0.6 MW ea.)
Avionics: TL-10+ Avionics
Sensors: Passive EMS 240,000km folding array (8 hexes; 0.3 MW ea.), Active EMS 480,000km (DF capable; 16 hexes; 25 MW), 4×300,000km Ladar (10 hexes; 0.6 MW ea.)
ECM/ECCM: 480,000km EMS jammer (16 hexes; 50 MW), EM Masking (42 MW)
Controls: Bridge with 26×Bridge Workstation, plus 65 other workstations

Armament

Offensive: TL-15 2000-Mj Particle Accelerator (Loc: Spinal; Arcs: 1; 55.6 MW; 1 Crew), 8×TL-15 150 Mj Laser Turret (Loc: 1,3,4,10,11,13,14—Arcs: 1,2,3; Loc: 20—Arcs: 4,5; 4.2 MW ea.; 1 Crew ea.), 6×Missile Turret (Loc: 1,3,4,13,14,20; 2 ready missiles ea.; 0.15 MW ea.; 1 Crew ea.) total of 12 ready missiles plus 36 in cargo
Defensive: 20MW TL-15 Meson Screen Generator (PV=253; 20 MW; 1 Crew), 6×Sandcaster Turret (Loc: 1,3,4,13,14—Arcs: 1,2,3; Loc: 20—Arcs: 5,6; TL-15; 2D10×5 per hit; 50 Cann; 1 MW ea. 1 Crew ea.)
Master Fire Directors: 2×TL-15 Missile/Beam MFD (6 Diff Mods; Msl 10 hexes; 10 hexes; 1.71 MW ea.; 1 Crew ea.), and 3×TL-15 Beam MFD (6 Diff Mods; No Msl 10 hexes; 1.56 MW ea.; 1 Crew ea.)

	Short	*Medium*	*Long*	*Extreme*
150-Mj Laser Turret	10: 1/10-31	20: 1/10-31	40: 1/10-31	80: 1/10-31
2000-Mj Part Accel	10: 224	20: 224	40: 224	80: 196

Accommodations

Life Support: Extended (8.4 MW), Gravitic Compensators (6G; 210 MW)
Crew: 129: 65×Engineering, 2×Electronics, 2×Maneuvering, 27×Gunnery, 5×Maintenance, 6×Flight Crew, 17×Command, 3×Stewards, 2×Medical
Crew Accommodations: 17×Small Stateroom (single-occupancy; 0.0005 MW ea.), 56×Small Stateroom (double-occupancy; 0.0005 MW ea.)
Passenger Accommodations: None
Other Facilities: Electronics Shop (0.6 MW), Machine Shop (1 MW), Sickbay (0.8 MW)
Cargo: 316.4 m³, plus 36 missiles, 2 large cargo hatches
Small Craft and Launch Facilities: Internal Hangar (Minimal) for 2×50-ton Cutter, two launch ports
Air Locks: 30

Notes

Fuel purification machinery (100.875 MW), 6 hours to refine 20,175 m³.

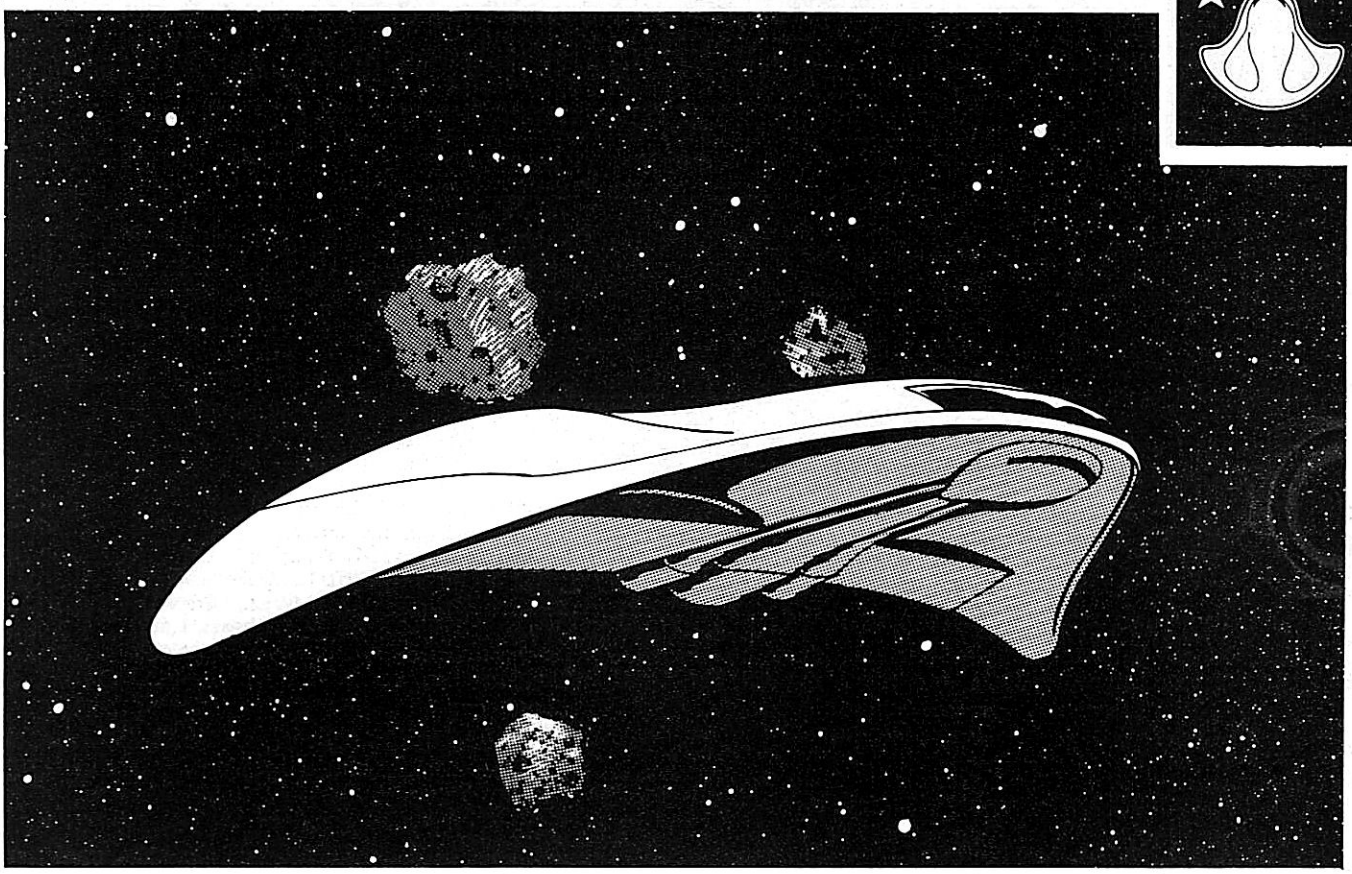
Because the control panels are optimized for smaller ships, some systems on larger ships may require each hit box to record 2 hits (each hit is a slash; two slashes in the form of an "x" fill the box) or the use of additional unused boxes from other lines, such as "other."

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*
1		1: Sand, 2: MT, 3-4: PA, 5: LT, 6-10: Elec, 11-13: Eng, 14-20: Hold
2	Ant	Hold
3		1: Sand, 2: MT, 3: LT, 4-20: Hold
4		1: Sand, 2: MT, 3-4: PA, 5: LT, 6-20: Hold
5		1-2: PA, 3-20: Hold
6-7	Ant	1-5: Elec, 6-10: Qtrs, 11-20: Hold
8	1: AL, 2-11: EMMR	1-2: PA, 3-7: Qtrs, 8-20: Hold
9	1-10: EMMR	1-2: PA, 3-7: Qtrs, 8-20: Hold
10	1-10: Ant	1: LT, 2-6: Elec, 7-11: Eng, 12-16: Qtrs, 17-20: Hold
11		1: LT, 2-6: Eng, 7-11: Qtrs, 12-20: Hold
12	1: AL	1-5: Eng, 6-20: Hold
13	1: AL	1: Sand, 2: MT, 3: LT, 4-20: Hold
14		1: Sand, 2: MT, 3: LT, 4-20: Hold
15	1-12: LPs, 13-14: LCH,	1-15: Eng, 16-20: Hold
16-19		1-10: Eng, 11-20: Hold
20		1: Sand, 2: MT, 3: LT, 4-20: Eng

Systems	
AEMS-(2h)	PP-33H
MD-9H	MFD-(2h)
PEMS Ant-2H	CG-6H
Jammer-(2h)	FPP-81H
PA-11H	Hangar-28H
LT-1H	Sickbay-1H
MT-1H	MS-3H
EMM-4H	All Others-(1h)
Sand-1H	
Elec. Shop-1H	
Mach. Shop-1H	
SSR-(2h)	
LS-23H	
ELS-12H	
AG-9H	
EMMR-(42h)	
JD-42H	

Zhodani *Ninz*-Class Scout



General Data

Displacement: 100 tons
Length: 35 meters
Price: MCr58.41
Configuration: Wedge AF
Mass (Loaded/Empty): 1100.25/957.05
Hull Armor: 56
Volume: 1400 m³
Target Size: S
Tech Level: 14

Engineering Data

Power Plant: 153 MW Fusion Power Plant (76.5 MW/hit), 1 year duration (1.2645 MW excess power)
Jump Performance: 2 (210 m³ of fuel)
G-Rating: 2 (50 MW/G), Contra-Grav lifters (10 MW)
G-Turns: 56 (89.6 using jump fuel), 6.25 m³ of fuel each
Maint: 31

Electronics

Computer: 3×TL-14 Mod St Computers (0.5 MW ea.)
Commo: 300,000km radio (10 hexes; 10 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: 150,000km Passive EMS folding array (5 hexes; 0.15 MW), Active EMS 300,000km (10 hexes; 15 MW)
ECM/ECCM: EM Masking (1.4 MW)
Controls: Bridge with 4×Bridge Workstation, plus 1 other workstation

Armament

Offensive: 1×TL-14 150-Mj Laser Turret (Loc: 10; Arcs: 1,2,3; 4.2 MW; 1 Crew)

	Short	*Medium*	*Long*	*Extreme*
TL-14 150-Mj Las Trt	2:1/10-31	4:1/10-31	8:1/10-31	16:1/10-31

Accommodations

Life Support: Extended (0.28 MW), Gravitic Compensators (5G; 7 MW)
Crew: 5: 1×Engineering, 1×Electronics, 2×Maneuvering, 1×Gunnery
Crew Accommodations: 1×Small Stateroom (single-occupancy, 0.0005 MW ea.) 2×Small Stateroom, (double-occupancy, 0.0005 MW ea.)
Passenger Accommodations: 6×Small Stateroom (0.0005 MW ea.)
Cargo: 94.6 m³, one small cargo hatch
Small Craft and Launch Facilities: Air raft in internal bay (Minimal), one launch port
Air Locks: 1

Notes

Fuel scoop and purification machinery (1.4 MW), 12 hours to refine 560 m³. Bridge has one excess workstation, for use by observer or psionic adept.

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*
1	Ant	Elec
2-5		1-10: Hold, 11-20: Qtrs
6-7	Ant	1-5: Elec, 6-10: Hold, 11-20: Qtrs
8		1-10: Qtrs, 11-20: Hold
9		1-17: Qtrs, 18-20: Hold
10	1: AL, 2-5: Ant	1-12: LT, 13-18: Elec, 19-20: Hold
11	1-6: EMMR	Hold
12-16		Hold
17	1-5: CH	Hold
18		1-18 Eng, 19-20: Hold
19-20		Eng

Systems

SSR-(2h)	FPP-2H
LS-3H	LT-1H
ELS-2H	MD-(2h)
AG-1H	EMM-(3h)
JD-1H	Hangar-1H
PP-2H	All Others-(1h)
CG-(4h)	

Zhodani *Chatl*-Class Leader Scout

General Data

Displacement: 150 tons
Length: 46.5 meters
Price: MCr100.073
Configuration: Needle SL
Hull Armor: 31
Volume: 2100 m³
Target Size: S
Tech Level: 14
Mass (Loaded/Empty): 1210.62/1044.02

Engineering Data

Power Plant: 324 MW Fusion Power Plant (102.6 MW/hit), 1 year duration (2.0715 MW excess power)
Jump Performance: 5 (630 m³ fuel)
G-Rating: 3 (75 MW/G), Contra-Grav lifters (15 MW)
G-Turns: 48 (115.2 using jump fuel), 9.375 m³ of fuel each
Maint: 44

Electronics

Computer: 3×TL-14 Mod Fb Computers (1 MW ea.)
Commo: 300,000km radio (10 hexes; 10 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: 150,000km Passive EMS folding array (5 hexes; 0.15 MW), Active EMS 300,000km (10 hexes; 15 MW)
Controls: Flight deck with 5×workstations, plus 3 other workstations

Armament

Offensive: 1×TL-14 150 Mj Laser Turret (Loc: 10; Arcs: All; 42 MW; Overpowered to –2 Diff Mod; 1 Crew)

	Short	*Medium*	*Long*	*Extreme*
TL-14 150-Mj Las Trt	2:1/10-31	4:1/10-31	8:1/10-31	16:1/10-31

Accommodations

Life Support: Extended (0.42 MW), Gravitic Compensators (5G; 10.5 MW)
Crew: 11: 4×Engineering, 1×Electronics, 2×Maneuvering, 1×Gunnery, 1×Maintenance, 1×Command, 1×Steward.
Crew Accommodations: 11×Small Stateroom (0.0005 MW ea.)
Passenger Accommodations: 2×Small Stateroom (0.0005 MW ea.)
Cargo: 91 m³, one small cargo hatch
Small Craft and Launch Facilities: None
Air Locks: 2

Notes

No fuel scoop or purification machinery fitted. The steward is present only as a reflection of the *Chatl*-class' main task as a VIP transport and liaison vessel.

Note that flight deck contains one extra workstation for use by VIP passenger or psionic adept.

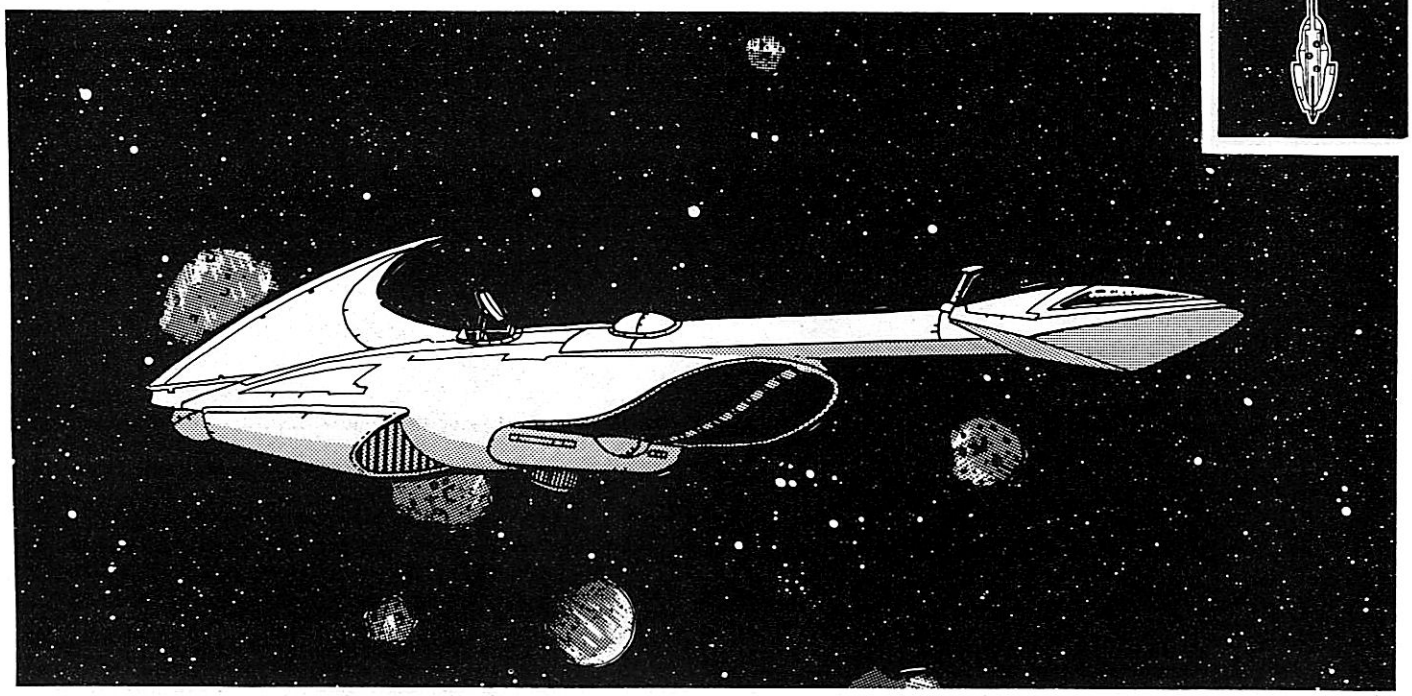
1080 m³ of fuel total.

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*
1-2		1-10: Qtrs, 11-20: Elec
3	1: AL, 2-4: ANT	1-10: Qtrs, 11-12: Elec, 13-20: Hold
4-5, 8-9, 11, 13-17	Hold	
6		1-15: Qtrs, 16-20: Hold
7	1: CH	1-15: Qtrs, 16-20: Hold
10		1-8: LT, 9-18: Qtrs, 19-20: Hold
12		1-10: Qtrs, 11-20: Hold
18		1-17: Eng, 18-20: Hold
19-20		Eng

Systems
AG-1H
CG-1H
ELS-1H
JD-3H
LS-2H
LT-1H
MD-1H
PP-4H
SSR-(2h)
All Others-(1h)

Zhodani *Zhdits*-Class Destroyer Escort



General Data

Displacement: 400 tons
Length: 66 meters
Price: MCr245.84
Configuration: Needle SL
Mass (Loaded/Empty): 5084.96/4780.06
Hull Armor: 62
Volume: 5600 m³
Target Size: S
Tech Level: 14

Engineering Data

Power Plant: 1335 MW Fusion Power Plant (103 MW/hit), 1 year duration (0.341 MW excess power)
Jump Performance: 2 (1400 m³ fuel)
G-Rating: 6 (200 MW/G), Contra-Grav lifters (40 MW)
G-Turns: 48 (104 using jump fuel), 25 m³ of fuel each
Maint: 185

Electronics

Computer: 3×TL-14 Mod Fb Computers (1 MW ea.)
Commo: 300,000km radio (10 hexes; 10 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: 150,000km Passive EMS folding array (5 hexes; 0.15 MW), Active EMS 300,000km (10 hexes; 15 MW)
ECM/ECCM: EM Masking (5.6 MW)
Controls: Bridge with 7×Bridge Workstation, plus 11 other workstations

Armament

Offensive: 4×TL-14 150 Mj Laser Turret (Loc: 10,10,10,11; Arcs: All; 4.2 MW ea.; 1 Crew ea.)
Master Fire Director: 1×TL-14 MFD (5 Diff Mod; 10 hexes Msl; 2 hexes; 0.874 MW; 1 Crew)

	Short	*Medium*	*Long*	*Extreme*
TL-14 150-Mj Las Trt	2:1/10-31	4:1/10-31	8:1/10-31	16:1/10-31

Accommodations

Life Support: Extended (1.12 MW), Gravitic Compensators (5G; 28 MW)
Crew: 25: 11×Engineering, 1×Electronics, 2×Maneuvering, 5×Gunnery, 1×Maintenance, 3×Command, 1×Steward, 1×Medical
Crew Accommodations: 3×Small Stateroom (single-occupancy; 0.0005 MW ea.), 11×Small Stateroom (double-occupancy; 0.0005 MW ea.)
Passenger Accommodations: None
Cargo: 122.9 m³, one large cargo hatch
Small Craft and Launch Facilities: None
Air Locks: 4

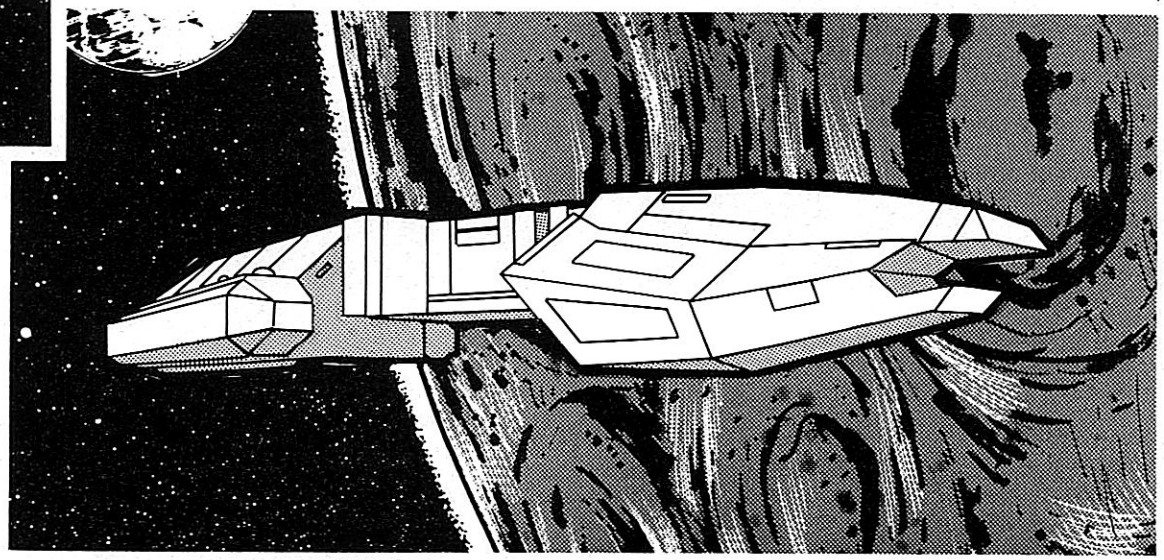
Notes

Fuel scoop, purification machinery (13 MW), 6 hours to refine 2600 m³.

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*
1	1-14: Ant	1-15: Elec, 16-20: Qtrs	SSR-(2h)
2-4		1-10: Hold, 11-20: Qtrs	LS-5H
5	1: AL	1-5: Qtrs, 16-20: Hold	ELS-3H
6		1-10: Elec, 11-13: Qtrs, 14-20: Hold	AG-1H
7-9, 12-14		Hold	JD-7H
10		1-3: LT, 4-6: LT, 7-9: LT, 10-20: Hold	PP-14H
11	1-5: EMMR	1-3: LT, 4-20: Hold	CG-1H
15	LCH	1-15: Eng, 16-20: Hold	FPP-13H
16-20		Eng	LT-1H
			MD-1H
			EMM-1H
			EMMR-(5h)
			All Others-(1h)

Zhodani *Vlezhdatl*-Class Strike Cruiser



General Data

Displacement: 2000 tons
Length: 90 meters
Price: MCr974.84
Configuration: Wedge SL
Mass (Loaded/Empty): 23,005.96/20,749.46
Hull Armor: 90
Volume: 28,000 m³
Target Size: M
Tech Level: 14

Engineering Data

Power Plant: 4614 MW Fusion Power Plant (100 MW/hit), 1 year duration (0.4415 MW power shortfall)
Jump Performance: 2 (4200 m³ fuel)
G-Rating: 4 (1000 MW/G), Contra-Grav lifters (200 MW)
G-Turns: 48 (81.6 using jump fuel), 125 m³ of fuel each
Maint: 794

Electronics

Computer: 3×TL-14 Mod Fib Computers (1 MW ea.)
Commo: 3×300,000km radio (10 hexes; only one powered: 10 MW), 2×1000 AU maser (∞; 0.6 MW ea.)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 150,000km (5 hexes; 0.15 MW), Active EMS 300,000km (DF capable; 10 hexes; 15 MW), 300,000km Ladar (10 hexes; 2.5 MW)
ECM/ECCM: 180,000km EMS jammer (6 hexes; 22 MW), EM Masking (28 MW)
Controls: Bridge with 21×Bridge Workstation, plus 38 other workstations

Armament

Offensive: 1×TL-14 2000-Mj Particle Accelerator (Loc: Spinal; Arcs: 1; 55.6 MW; 1 Crew), 4×Missile Barbette (Loc: 1,14,15,20; 5 ready Msls ea.; 0.15 MW ea.; 1 Crew ea.) total 20 ready Msls plus 40 in cargo, 4×TL-14 300-Mj Laser Barbette (Loc: 1,14,15—Arcs: 1,2,3; Loc: 20—Arcs: 4,5; 8.3 MW ea.; 1 Crew ea.)
Defensive: TL-14 Meson Screen Generator (PV=232, 20 MW, 1 Crew)
Master Fire Directors: 2×TL-14 Beam/Missile MFDs (5 Diff Mod, Msl 10 hexes; 10 hexes; 1.77 MW; 1 Crew ea.) and 2×TL-14 Beam MFDs (5 Diff Mod, No Msl; 10 hexes; 1.62 MW; 1 Crew ea.)

	Short	*Medium*	*Long*	*Extreme*
TL-14 150-Mj Las Brb	10:1/14-43	20:1/14-43	40:1/8-26	80:1/4-13
2000-Mj Part Accel	10:224	20:224	40:123	80:63

Accommodations

Life Support: Extended (5.6 MW), Gravitic Compensators (5G; 140 MW)
Crew: 141: 38×Engineering, 2×Electronics, 2×Maneuvering, 18×Gunnery, 5×Maintenance, 48×Ship's Troops, 4×Flight Crew, 19×Command, 3×Steward, 2×Medical
Crew Accommodations: 19×Small Stateroom (single-occupancy; 0.0005 MW ea.), 37×Small Stateroom, (double-occupancy; 0.0005 MW ea.), 12×Large Stateroom (ship's troops, quadruple-occupancy; 0.001 MW ea.)
Passenger Accommodations: None
Other Facilities: Electronics Shop (0.6 MW), Sickbay (0.8 MW), Machine Shop (1 MW)
Cargo: 686.5 m³, plus 40 missiles, 4 large cargo hatches
Small Craft and Launch Facilities: Internal Hangar (Spacious) for 2×30-ton craft, 2 launch ports
Air Locks: 20

Notes

Fuel scoop and purification machinery (51 MW), 6 hours to refine 10,200 m³.

Because the control panels are optimized for smaller ships, some systems on larger ships may require each hit box to record 2 hits (each hit is a slash; two slashes in the form of an "x" fill the box) or the use of additional unused boxes from other lines, such as "other."

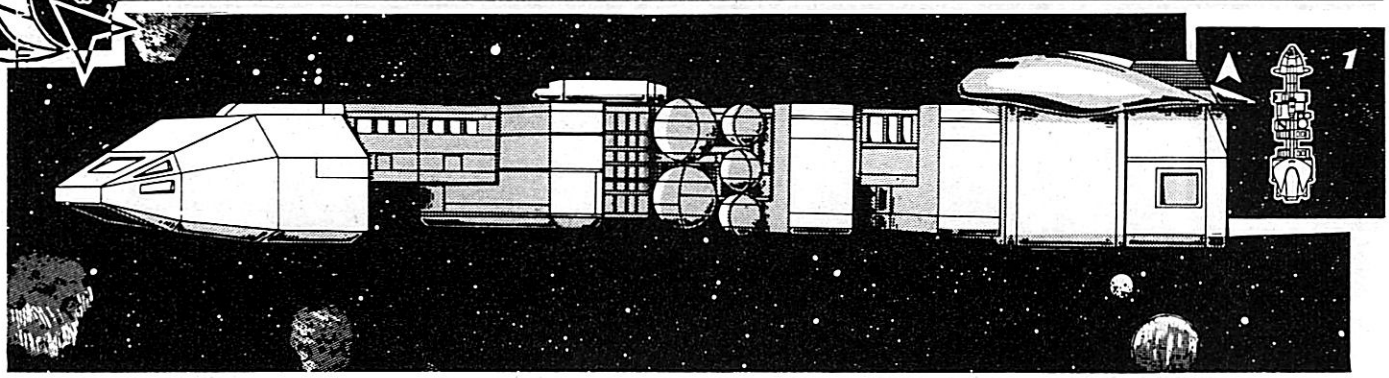
DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*
1	1-15: Ant	1: LB, 2: MB, 3-8: PA, 9-20: Elec
2-3	Ant	1-5: Elec, 16-20: Hold
4-5	1: AL	1-2: PA, 3-15: Qtrs, 16-20: Eng
6		1-19: Hold, 20: NDB
7	1: AL	1-2: PA, 3-20: Hold
8-9		1-11: Qtrs, 12-20: Hold
10-11		Hold
12-13	1-5: EMMR	Hold
14-15		1: LB, 2: MB, 3-9: Eng, 10-20: Hold
16	1-7: EMMR	1-7: Eng, 8-20: Hold
17	1-5: LP, 6-10: CH	1-7: Eng, 8-19: Hold, 20: NDB
18-19		1-15: Eng, 16-20: Hold
20		1: LB, 2: MB, 3-20: Eng

Systems

MS-3H
MFD-(3h)
LSR-1H
SSR-(2h)
MB-1H
LB-2H
Mach. Shop-1H
Elec. Shop-1H
LS-23H
ELS-12H
AG-6H
JD-21H
MD-4H
CG-4H
EMM-3H
EMMR-(28h)
PA-11H
FPP-51H
Hangar-34H
Sickbay-1H
PP-46H
NDB-1H
All Others-(1h)

Reformation Coalition *Aurora*-Class Clipper



General Data

Displacement: 600/1080/2080 tons
Length: 144 meters
Price: MCr749.86
Configuration: Open Frame USL
Mass (Loaded/Empty): 17,404.69/13,311.09
Hull Armor: 20
Volume: 8400/14,000/28,000 m³
Target Size: M (L)
Tech Level: 12

Engineering Data

Power Plant: 2280 MW Fusion Power Plant (50 MW/hit), 1 year duration
Jump Performance: 2 at 2080 tons, 3 at 1560 tons, 4 at 1248 tons (Group III only), 5 at 1040 tons (Group III only) (Fuel used per jump varies with displacement and jump distance, but is always 4368m³ for maximum jump at current displacement.)
G-Rating: 2 at all displacements, limited by hull construction. Divide displacement (in 14 m³ tons) by 2 to get MW needed per G of performance. No contra-grav lifters.
G-Turns: Assuming fuel from fuel skimmer (3500 m³) and 400-ton fuel module (4722 m³), 8222 m3 fuel is available, but fuel use varies with displacement. At 2080 tons, 130 m3 fuel per G-turn. For other configurations, divide MW/G by 8 to get m³ of fuel per G-turn for current displacement.
Maint: 630

Electronics

Computer: 1×TL-12 Mod Fb Computer (0.8 MW), 2×TL-12 Mod St Computer (0.4 MW)
Commo: 300,000km radio (10 hexes; 10 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 120,000km (4 hexes; 0.15 MW), Active EMS 300,000km (10 hexes; 27.5 MW)
ECM/ECCM: EM Masking (8.4 MW)
Controls: Bridge with 18×Bridge Workstation, plus 26 other workstations

Armament

Offensive: 8×TL-12 120-Mj Laser Turret (Loc: 4,5,5—Arcs: 1,2,3,4; Loc: 10—Arcs: All; Loc: 18,19,20,20—Arcs: 2,3,4,5; 3.3 MW ea.; 1 Crew ea.), TL-12 1000-Mj Meson Gun (Loc: Spinal; Arcs: 1; 27.8 MW; 5 Crew)
Master Fire Directors: 3×TL-12 MFD (4 Diff Mods; No Msl, 10 hexes; 2.95 MW ea.; 1 Crew ea.)

	Short	*Medium*	*Long*	*Ext*
120-Mj Laser Turret	4:1/5-27	8:1/5-27	16:1/5-20	32:1/5-10
1000-Mj Meson Gun	5:158	10:75	20:38	40:19

Accommodations

Life Support: Extended (1.68 MW), Gravitic Compensators (3G; 42 MW)
Crew: 85: 26×Engineering, 2×Electronics, 2×Maneuvering, 16×Gunnery, 7×Maintenance, 18×Flight Crew, 11×Command, 2×Steward, 1×Medical
Crew Accommodations: 20×Small Stateroom (double-occupancy; 0.0005 MW ea.). Additional accomodations for crew contained in 100-ton auxiliary quarters module.
Passenger Accommodations: None, but additional quarters modules may be added.
Cargo: 149 m³, plus cargo modules, one small cargo hatch
Small Craft and Launch Facilities: External grapples (USL) for 50-ton Cutter, 30-ton craft, 1×400-ton fuel skimmer, and 4×100-ton, 1×200-ton, and 1×400-ton auxiliary modules.
Air Locks: 6

Notes

Clipper carries no fuel of its own. All reaction mass and jump fuel carried in *Manta*-class fueler and fuel modules. Listed price does not include *Manta*, but *Manta*'s loaded mass is included with the clipper's loaded mass, along with loaded mass of one modular cutter and one 30-ton boat (which account for the extra 80 tons of displacement). Price and mass does not include any modules, although clipper is typically fitted at least with one 100-ton auxiliary quarters module and a 400-ton fuel module. The fuel module carries 4722.4 m³ of fuel, plus fuel purification machinery (9.9 MW) sufficient to purify that amount in 17.17 hours.

The Group III clippers are later models with recovered higher technology jump drives.

Fully loaded clipper only has an actual target size of medium (M), but because its laser turrets are all mounted on turret extenders, it is treated as a large (L) target when being scanned by active sensors.

On the damage table, modules A, B, C, and D are 100-ton modules, module E is a 200-ton module, and module F is a 400-ton module, almost always a fuel module.

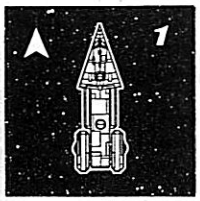
When clipper is empty, treat as Open Frame for purposes of hit location and fire arcs. When loaded with any modules, use Close Structure. When *Manta* is not docked, treat hits on areas 12, 13, 16, and 17 as a surface hit on its 400-ton grapple, then reroll for interior hit location on 1D10+10.

For hits on fuel module, use 1-18: Fuel, 19-20: Fuel Purification, with FP-13H. Hits on a 100-ton quarters module are treated as SSR hits, there are 43 such rooms. Other locations should be handled abstractly as cargo.

DAMAGE TABLES

Area (1D10)	*Surface Hits*	*Internal Explosion*	*Systems*
1	Ant	1-4: MG, 5-11: Elec, 12-20: Hold	AEMS-(2h)
2	30-ton Craft	1-5: MG, 6-10:, Qtrs, 11-20: 100-ton Module B	MG-16H
3	30-ton Craft	1-5: MG, 6-10, Qtrs, 11-20: 100-ton Module A	JD-27H
4	1-10: Ant	1: LT, 2-4: Elec, 5-9: Grapple, 10: Qtrs, 11-20: 100-ton Module B	EMM-1H PP-46H
5	1: CH, 2: EMMR, 3-12: Ant	1: LT, 2: LT, 3-4: Elec, 5-9: Grapple, 10: Qtrs, 11-20: 100-ton Module A	AG-2H MFD-1H
6, 8	1-10: Module C, 11-20: Module E	1-10: 100-ton Module C, 11-20: 200-ton Module E	SSR-(2h)
7, 9	1-10: Module D, 11-20: Module E	1-10: 100-ton Module D, 11-20: 200-ton Module E	LS-7H
10	50-ton Craft	1-9 Meson Gun, 10: LT, 11-18: Module Grapple, 19: 30-ton Grapple, 20: 50-ton Grapple	ELS-4H MD-2H
11, 14-15	Module F	Module F	LT-1H
12-13, 16-17	Manta Surface	Manta	All Others-(1h)
18	1-10: Module F	1-10: Fuel Module, 11: LT, 12: 400-ton Grapple, 13-20: Eng	EMMR-(8h) 30-ton Grapple-1H
19	1-10: Module F	1-10: Fuel Module, 11: LT, 12-20: Eng	50-ton Grapple-1H
20		1: LT, 2: LT, 3-20: Eng	100-ton Grapple-2H 200-ton Grapple-2H 400-ton Grapple-6H

Covenanter-Class Scout Cruiser



General Data

Displacement: 500 tons
Length: 75 meters
Price: MCr241.7
Configuration: Wedge SL
Mass (Loaded/Empty): 5340.61/4405.73
Hull Armor: 30/62
Volume: 7000 m³
Target Size: S
Tech Level: 12/15

Engineering Data

Power Plant: 891 MW Fusion Power Plant (99 MW/hit), 1 year duration, plus 38.4 MW auxiliary fusion plant (38.4 MW/hit), 1 year duration
Jump Performance: 2 (1050 m³ fuel)
G-Rating: 3 (250 MW/G), Contra-Grav lifters (50 MW)
G-Turns: 48 (59.2 allowing fuel for jump 1, 81.6 using all jump fuel), 31.25 m³ of fuel each
Maint: 156

Electronics

Computer: 3×TL-15 Model St (0.55 MW ea.)
Commo: 2×300,000km radio (10 hexes; 10 MW), 2×1000AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS folding array 150,000km (5 hexes; 0.15 MW), Active EMS 300,000km (10 hexes; 15 MW), TL-15 Densitometer (0.4 MW), TL-14 Neutrino Sensor (0.01 MW)
ECM/ECCM: EMS jammer (10 hexes; 30 MW), EM Masking package (6.58 MW)
Controls: Bridge with 7×Bridge Workstation, plus 6 other workstations

Armament

Offensive: 3×TL-14 150-Mj Laser Turret (Loc: 2/3; Arcs: 1,2,3; 4.2 MW; 1 Crew; Loc: 16,17; Arcs: All; 4.2 MW ea.; 1 Crew ea..), 1×300-Mj Laser Barbette (Loc: 10; Arcs: 1,2,3; 8.3 MW; 1 Crew), 1×Missile/RCV Barbette (Loc: 11; 5 ready Msls or recce drones; 0.15 MW; 1 Crew)
Master Fire Directors: 1 TL-14 (5 Diff Mod; Non-Msl; 10 hexes; 1.62 MW; 1 Crew)

	Short	*Medium*	*Long*	*Extreme*
150-Mj Laser Turret	2:$^{1}/_{10}$-31	4:$^{1}/_{10}$-31	8:$^{1}/_{10}$-31	16:$^{1}/_{10}$-31
300-Mj Laser Barbette	10:$^{1}/_{14}$-43	20:$^{1}/_{14}$-43	40:$^{1}/_{8}$-26	80:$^{1}/_{4}$-13

Accommodations

Life Support: Extended (1.036 MW), Gravitic Compensators (5G; 32.9 MW)
Crew: 35 (6×Engineering, 1×Electronics, 2×Maneuver, 6×Gunnery, 1×Maint, 3×Small Craft, 3×Command, 1×Medic, 6×Scouts, 6×Troops)
Crew Accommodations: 1×Small Stateroom (0.0005 MW), 17×Large Stateroom (0.001 MW)
Small Craft and Launch Facilities: External grapple for 30-ton small craft, Internal hangars for 2 air rafts, 2 tracked ATVs, 1 launch port each
Additional Fittings: 5×Air Lock, 247.5 m³ cargo with 1 large hatch, 8-ton sick bay (0.8 MW), 2×8-ton lab (0.8 MW ea.), 10-ton machine shop (1 MW), 6-ton electronics shop (0.6 MW)

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*
1	1-8: Ant	1-2: Elec, 3-20: Hold
2	1-8: Ant	1-2: Elec, 3: LT, 4-20: Hold
3	1-8: Ant, 9: AL	1-2: Elec, 3: LT, 4-20: Hold
4-5	1-8: Ant	1-2: Elec, 3-4: Eng, 5-12: Qtr, 13-20: Hold
6-7		Qtrs
8-9	1-3: EMMR	Hold
10	1: AL	1-5: LB, 6-20: Hold
11	1: AL	1-5: MB, 6-20: Hold
12-13		1-12: Qtrs, 13-20 Hold
14-15		Hold
16-17	1: AL	1-2: LT, 3-10: Eng, 11-20: Hold
18-19	Small Craft	1-8: Eng, 9-20: Hold
20	1-3: EMMR	Eng

Systems	
JD-6H	SSR-(2h)
PP-9H	MFD-(4h)
Aux PP-1H	Lab-1H
FPP-3H	Sickbay-1H
ELS-3H	Elec. Shop-1H
EMMR-(6h)	Mach. Shop-1H
MB-1H	All Others-(1h)
LB-2H	
LT-1H	
Grapple-2H	
AG-2H	
LS-6H	
CG-1H	
LSR-1H	

Notes

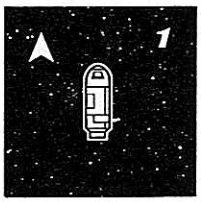
Built by the Covenant of Sufren from cannibalized TL-14 *Gazelle* and TL-15 Scout hulls, with locally manufactured TL-12 components.

Systems consume 929.4 MW. *Gazelle* drop tanks are now permanently attached.

2550 m³ of fuel (not counting 94.86 m³ reactor fuel), 1050 m³ needed for jump 2, 700 m³ for jump 1. Fuel purification machinery (3.1875 MW) sufficient to purify 637.5 m³ in 6 hours (24 hours for entire load).

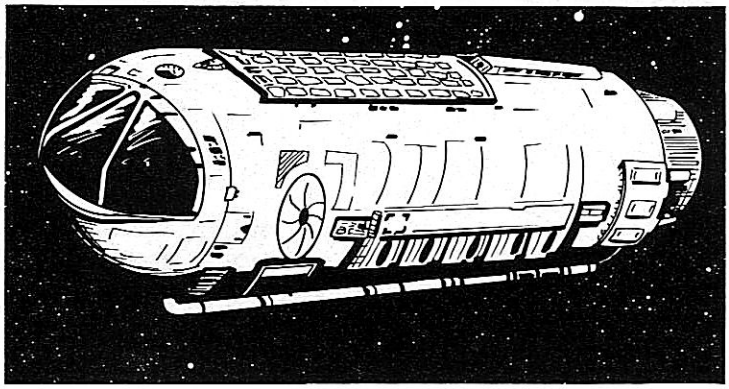
Surface hit locations 1-5 have armor 30, all others have 62.

Skiff & Ship's Boat



General Data

Displacement: 10 tons
Length: 14 meters
Price: MCr9.9
Configuration: Cylinder, SL
Mass (Loaded/Empty): 83.99/74.83
Hull Armor: 14
Volume: 140 m³
Target Size: VS
Tech Level: 12



Engineering Data

Power Plant: 14MW Fusion Power Plant (14 MW/hit), 1 year duration (0.255 MW power shortfall)
G-Rating: 1 (5 MW/G), Contra-Grav lifters (1 MW)
G-Turns: 16, 0.625 m³ of fuel each
Maint: 3

Electronics

Computer: 2×TL-12 Model St (0.4 MW each)
Commo: 30,000km radio (1 hex; 1 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 30,000 km (1 hex; 0.03 MW), Active EMS 300 km (0 hexes; use extreme range for task difficulty in same hex; 5 MW)
Controls: Flight deck with 2×workstation

Armament

None

Accommodations

Life Support: Basic (0.014 MW), Gravitic Compensators (3G; 0.7 MW)
Crew: 2 (1×Maneuver, 1×Electronics)
Crew Accommodations: 2×Workstation
Passenger Accommodations: 20×Seat (Adequate)
Cargo: 8.46m³, one small cargo hatch
Small Craft and Launch Facilities: None
Air Locks: 1

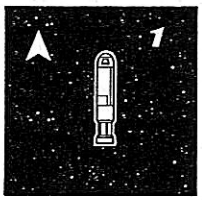
Notes

Passenger seats may be removed, each adding 3.5 m³ to the cargo capacity. Must shut down radio or maser when taking off.

No fuel purification machinery, 10 m³ (0.7 tons) of reaction mass is carried.

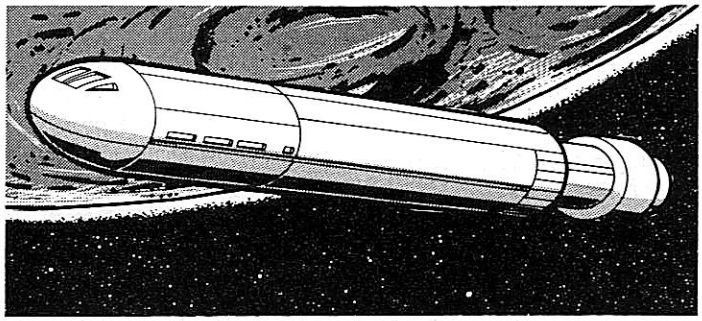
DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*
1		Hold	PP-1H
2-3		1-5: Elec, 6-15: Qtrs, 16-20: Hold	LS-1H
4-5, 8-9	1-2: Ant	Elec	ELS-(2h)
6	CH	Hold	All Others-(1h)
7	1-4: AL	Hold	
10-17		Hold	
18-19		1-5: Eng, 6-20: Hold	
20		Eng	



General Data

Displacement: 30 tons
Length: 27.6 meters
Price: MCr17.67
Configuration: Needle SL
Mass (Loaded/Empty): 428.08/378.48
Hull Armor: 40
Volume: 420 m³
Target Size: VS
Tech Level: 12



Engineering Data

Power Plant: 90MW Fusion Power Plant (45 MW/hit), 1 year duration (17.297 MW excess power)
G-Rating: 4 (15 MW/G), Contra-Grav lifters (3 MW)
G-Turns: 96, 1.875 m³ of fuel each
Maint: 14

Electronics

Computer: 2×TL-12 Model St (0.4 MW ea.)
Commo: 30,000km radio (1 hex; 1 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 30,000 km (1 hex; 0.03 MW), Active EMS 300 km (0 hexes; use extreme range for task difficulty in same hex; 5 MW)
Controls: Flight deck with 2×workstation, plus 1 other workstation

Armament

None

Accommodations

Life Support: Basic (0.042 MW), Gravitic Compensators (3G; 2.1 MW)
Crew: 3 (1×Engineering, 1×Electronics, 1×Maneuver)
Crew Accommodations: 3×Workstation
Passenger Accommodations: 20×Seat (Adequate)
Cargo: 37 m³, one small cargo hatch
Air Locks: 1

Notes

Passenger seats may be removed, each adding 3.5 m³ to the cargo capacity. No fuel purification machinery, 180m³ (12.86 tons) of reaction mass is carried.

The Ship's Boat design has 17.3 MW of power left over, which allows the mounting of weapons or more powerful sensors at the expense of cargo space.

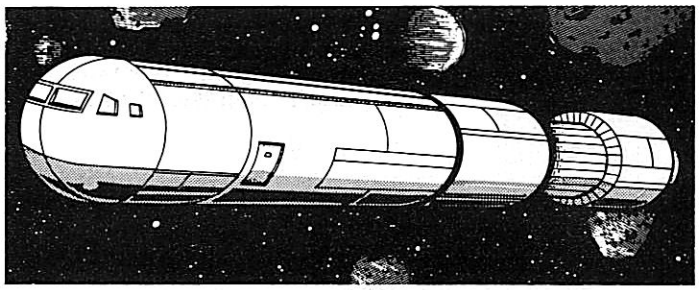
DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*
1		Elec	PP-2H
2-3	1-4: Ant	1-3: Elec, 4-8: Qtrs, 9-20: Hold	1-10: Elec, 11-4
4-5	1-4: Ant	1-4: Elec, 5-9: Qtrs, 10-20: Hold	LS-1H
6-7, 10-15		Hold	AG-(2h)
8	1-2: AL	Hold	ELS-1H
9	1-14: CH	Hold	All Others-(1h)
16-17		1-12: Hold, 13-20: Eng	
18-19		1-11: Hold, 12-20: Eng	
20		Eng	

Modular Cutter & Shuttle

General Data

Displacement: 50 tons **Hull Armor:** 30
Length: 33 meters **Volume:** 700 m³
Price: MCr18.98 (cutter alone) **Target Size:** VS
Configuration: Needle SL **Tech Level:** 12
Mass (Loaded/Empty): 353.82/340.72 cutter alone
727.45/684.96 with fuel module



Air Locks: 1

Engineering Data

Power Plant: 100 MW Fusion Power Plant (50 MW/hit), 1 year duration (10.9196 MW excess power used to power modules)
G-Rating: 3 (25 MW/G), Contra-Grav lifters (5 MW)
G-Turns: 48, 3.125 m³ of fuel each
Maint: 13, +13 for fuel module

Electronics

Computer: 2×TL-12 Model St (0.4 MW ea.)
Commo: 30,000km radio (1 hex; 1 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 30,000 km (1 hex; 0.03 MW), Active EMS 300 km (0 hexes; use extreme range for task difficulty in same hex; 5 MW)
Controls: Flight deck with 2×workstation, plus 1 other workstation

Accommodations

Life Support: Basic (0.0294 MW), Gravitic Compensators (3G; 1.47 MW)
Crew: 3 (1×Engineering, 1×Electronics, 1×Maneuver)
Crew Accommodations: Flight Deck
Passenger Accommodations: Varies depending upon module fitted.
Cargo: Varies depending upon module fitted (388 m³ in cargo module), 2.6 m³ in cutter

Notes

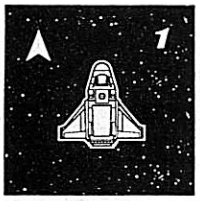
Modular Cutter may be fitted with a variety of 29-ton (406m³) modules, including lab module (336.3 tonnes loaded/284.4 empty, MCr14.12), passenger/cargo module (311.59 tonnes loaded/133.59 empty, MCr0.4, carries 30 passengers and 178 m³ cargo—passenger seats, 7 m³ each, can be traded for cargo or for smaller seats, but if cargo mass exceeds 284 tonnes, cutter G-rating will drop to 1G), ATV module (211.84 tonnes loaded/161.84 empty, MCr0.16, includes space for a single ATV of up to 50 tonnes).

Data assumes the fitting of a fuel scoop module (373.63 tonnes loaded/344.24 empty, MCr0.17). The module can scoop and carry 277 m³ (19.8 tons) of fuel and has fuel purification machinery sufficient to refine 277 m³ in 6 hours.

DAMAGE TABLES

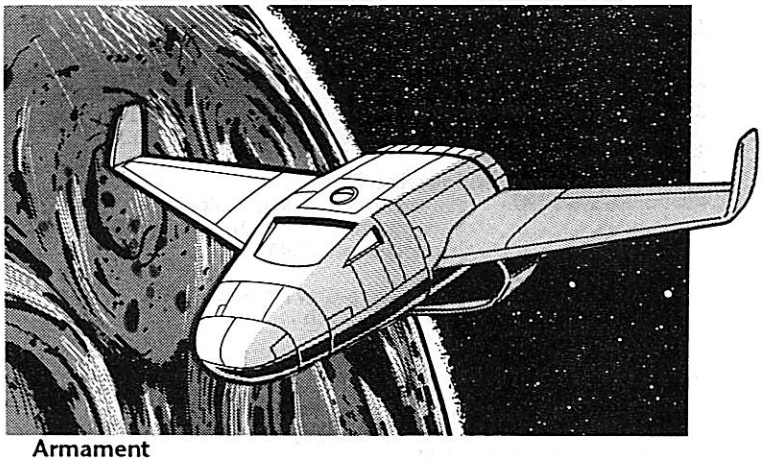
Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*
1	1-2: Ant	1-10: Elec (C), 11-20: Qtrs (C)	PP-2H
2-3	1-2: AL	1-5 Qtrs (C), 6-10: Elec, 11-15: Hold (C), 16-20: Eng (M)	FPP-3H
4-5		1-15: Hold (C), 16-20: Hold (M)	LS-1H
6-9, 11-15		1: Eng (M), 2-20: Hold (M)	MD-(2h)
10, 20		Eng (C)	ELS-1H
16-19		1-5: Hold (M), 6-20: Hold (C)	CG-(2h)
			All Others-(1h)

(C) = Cutter Component, (M) = Module Component



General Data

Displacement: 95 tons **Hull Armor:** 31
Length: 27.6 meters **Volume:** 1330 m³
Price: MCr29.04 **Target Size:** VS
Configuration: Cylinder AF **Tech Level:** 12
Mass (Loaded/Empty): 953.11/711.21



Engineering Data

Power Plant: 170 MW Fusion Power Plant (42.5 MW/hit), 1 year duration (3.591 MW excess power)
G-Rating: 3 (4.75 MW/G), Contra-Grav lifters (9.5 MW)
G-Turns: 96, 5.9375 m³ of fuel each
Maint: 34

Electronics

Computer: 2×TL-12 Model St (0.4 MW ea.)
Commo: 30,000km radio (1 hex; 1 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 30,000 km (1 hex; 0.03 MW), Active EMS 300 km (0 hexes; use extreme range for task difficulty in same hex; 5 MW)
Controls: Flight deck with 2×workstation, plus 1 other workstation

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*
1	1-7: Ant	1-12: Elec, 13-20: Qtrs	PP-4H
2		1-5: Qtrs, 6-20: Hold	LS-2H
3	1: AL	Hold	ELS-1H
4-10, 12-17	Hold		MD-(3h)
11		1-13: TS, 14-20: Hold	AG-1H
18-19	1-5: CH	1-11: Hold, 12-20: Eng	CG-(4h)
20		Eng	All Others-(1h)

Armament

1 turret hardpoint socket fitted (Loc: 11; Arc: 2,3,4)

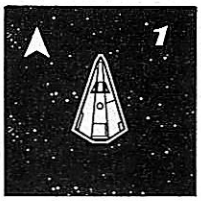
Accommodations

Life Support: Basic (0.133 MW, Gravitic Compensators (3G; 6.65 MW)
Crew: 3 (1×Engineering, 1×Electronics, 1×Maneuver)
Crew Accommodations: 3×Workstation
Passenger Accommodations: 80×Seat (Adequate)
Cargo: 202m³, one large cargo hatch
Air Locks: 1

Notes

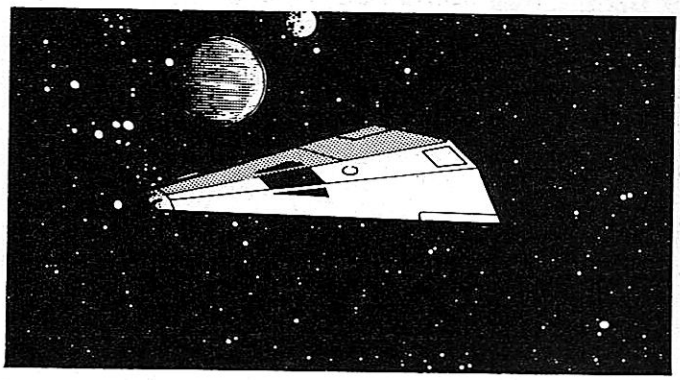
Passenger seats may be removed, each adding 3.5 m³ to the cargo capacity. No fuel purification machinery is fitted, 570m³ (8.14 tons) of reaction mass carried.

Armed Gig/Military Boat & Rampart Fighter



General Data

Displacement: 20 tons **Hull Armor:** 50
Length: 20 meters **Volume:** 280 m³
Price: MCr19.9 **Target Size:** VS
Configuration: Wedge SL **Tech Level:** 14
Mass (Loaded/Empty): 299.79/263.54



Engineering Data

Power Plant: 67.5 MW Fusion Power Plant (6.75 MW/hit), 1 year duration (0.001 MW excess power)
Jump Performance: None
G-Rating: 5 (10 MW/G), Contra-Grav lifters (2 MW)
G-Turns: 60, 1.25 m³ of fuel each
Maint: 9

Electronics

Computer: 2×TL-14 Mod St Computers (0.5 MW ea.)
Commo: 30,000km radio (1 hex; 1 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 60,000km (2 hexes; 0.04 MW), Active EMS 60,000km (2 hexes; 7 MW)
ECM/ECCM: EM Masking (0.28 MW)
Controls: Flight deck with 3×workstations

Armament

Offensive: 1×TL-14 144Mj Laser Lance (Loc: 1; Arcs: 1; 4 MW; Crew on Flight Deck)

Accommodations

Life Support: Extended (0.056 MW), Gravitic Compensators (5G; 1.4 MW)
Crew: 3: 1×Commander/Pilot, 1×Engineer/Gunner, 1×Electronics
Crew Accommodations: 3×Workstation
Passenger Accommodations: 3×Seat (Adequate), 1×Emergency Low Berth (0.002 MW)
Cargo: 61 m³, one small cargo hatch
Small Craft and Launch Facilities: None
Air Locks: 1

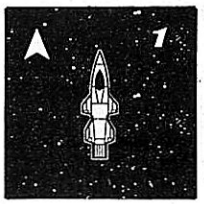
Notes

Laser is a fixed forward-firing mount.
Fuel scoop, but no purification machinery. 75 m³ of fuel carried.

	Short	*Medium*	*Long*	*Extreme*
TL-14 144-Mj Laser	10:1/10-30	20:1/7-21	40:1/3-10	80:1/2-5

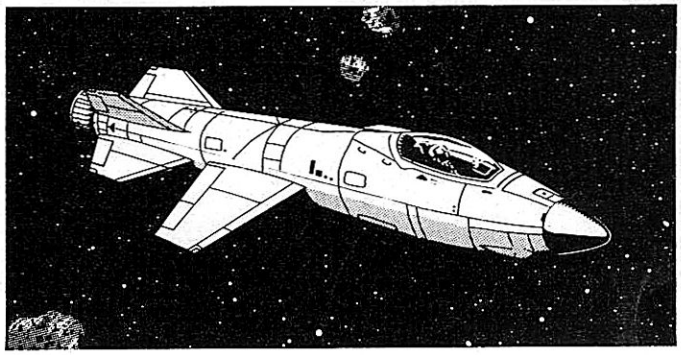
DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*
1		LT	LS-1H
2-5	1-2: Ant	1-10: LT, 11-20: Elec	ELS-1H
6-7	1: EM Rad	1-15: Qtrs, 16-20: Hold	PP-1H
8-9		1-15: Qtrs, 16-20: Hold	LT-1H
10	1-2: AL, 3-4:Ant	Qtrs	All Others-(1h)
11		Qtrs	
12-15		Hold	
16	1: EMM Rad	1-10: Eng, 11-20: Hold	
17		1-10: Eng, 11-20: Hold	
18-19		1-5: Eng, 6-20: Hold	
20		Eng	



General Data

Displacement: 15 tons **Hull Armor:** 62
Length: 15 meters **Volume:** 210 m³
Price: MCr21.84 **Target Size:** VS
Configuration: Cylinder AF **Tech Level:** 15
Mass (Loaded/Empty): 218.8/210.53



Engineering Data

Power Plant: 69 MW Fusion Power Plant (69 MW/hit), 1 month duration (0.656 MW power shortfall)
Jump Performance: None
G-Rating: 6 (7.5 MW/G), Contra-Grav lifters (1.5 MW)
G-Turns: 126, 0.9375 m³ of fuel each
Maint: 5

Electronics

Computer: 2×TL-15 Mod St Computers (0.55 MW ea.)
Commo: 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 60,000km (2 hexes; 0.04 MW), Active EMS 300,000km (10 hexes; 15 MW)
ECM/ECCM: EM Masking (0.21 MW)
Controls: 1×Workstation

Armament

Offensive: TL-15 144-Mj Laser Lance (Loc: 1/4/5; Arcs: 1; 4 MW; No Crew), USL Grapples for 4 missiles

Accommodations

Life Support: Basic (0.021 MW), Gravitic Compensators (6G; 1.05 MW)
Crew: 1: 1×Pilot/Gunner
Crew Accommodations: 1×Workstation
Passenger Accommodations: None
Cargo: None
Small Craft and Launch Facilities: None

Air Locks: 1 Hatch

Notes

Laser is a fixed, forward-firing mount. No fuel scoop or purification machinery. Power is inadequate to operate maser and radio communicators at the same time. 118.125 m³ of fuel carried.

	Short	*Medium*	*Long*	*Extreme*
TL-15 144-Mj Laser	10:1/10-30	20:1/10-30	40:1/5-15	80:1/2-8

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*
1, 3		1-10: LT, 11-20: Elec	LS-1H
2	1-3: Ant	1-15: LT, 16-20: Elec	ELS-1H
4-5	1-10: Ant	1-10: LT, 11-20: Elec	PP-1H
6-9, 12-15		Hold	LT-1H
10	1: Hatch	Qtrs	All Others-(1h)
11	1-2: EMMR	1-10: Elec, 16-20: Hold	
16-19		1-5: Eng, 6-20: Hold	
20		Eng	

TABLE OF CONTENTS

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BRILLIANT LANCES™

GDW

BRILLIANT LANCES™ Traveller®: The New Era Starship Combat Missile and Drone Log

Identification	Sigs.	1	2	3	4	5	6	7	8	Continues on line#
1	/ / / /									
2	/ / / /									
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25	/ / / /									

ABBREVIATIONS: H: Heading; **V:** Velocity; **NR:** Next Hex Right; **NL:** Next Hex Left; **AGP:** Accumulated G-Turns Port; **AGS:** Accumulated G-Turns Starboard; **E:** Evasion

Velocity/ Accumulated Gs Track: | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

Crew Quality and Target Numbers

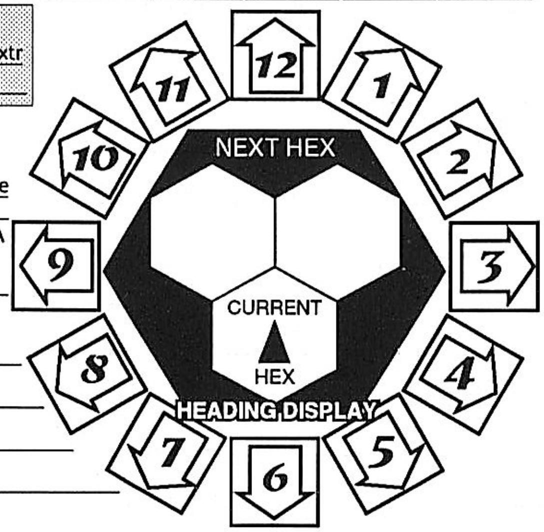
Quality	Easy	Ave/Short	Diff/Med	Form/Long	Imp/Extr
____	____	____	____	____	____

Constant Diff Mods vs. Detection and Fire

	Vs. Active Radar	Vs. Active Act. EMS	Vs. Passive HRT	Vs. Passive Pass. EMS	Fire
Target Size	____	____	____	____	____
EMM	____	____	____	____	N/A
Total	____	____	____	____	____

BRILLIANT LANCES™
Traveller® Starship Combat
Spacecraft Control Panel

Identification # ______
Class: ______
Name: ______
Player: ______



Crew

Bridge Crew ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐
Engineering Crew ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐
Damage Control Parties ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐
Ship's Troops ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐
Other Crew (______) ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐
Passengers ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐

Electronics

☐ Commo (______) ____ MW Ranges: Ave (__) Diff (__) Form (__) Imp (__) Ant: MJ/Mn ☐☐☐☐☐ Cntrl: MJ/Mn ☐☐☐☐☐
☐ Commo (______) ____ MW Ranges: Ave (__) Diff (__) Form (__) Imp (__) Ant: MJ/Mn ☐☐☐☐☐ Cntrl: MJ/Mn ☐☐☐☐☐
☐ Commo (______) ____ MW Ranges: Ave (__) Diff (__) Form (__) Imp (__) Ant: MJ/Mn ☐☐☐☐☐ Cntrl: MJ/Mn ☐☐☐☐☐
☐ Commo (______) ____ MW Ranges: Ave (__) Diff (__) Form (__) Imp (__) Ant: MJ/Mn ☐☐☐☐☐ Cntrl: MJ/Mn ☐☐☐☐☐
☐ Commo (______) ____ MW Ranges: Ave (__) Diff (__) Form (__) Imp (__) Ant: MJ/Mn ☐☐☐☐☐ Cntrl: MJ/Mn ☐☐☐☐☐
☐ Sensor (______) Folding ☐ ____ MW Ranges: Ave (__) Diff (__) Form (__) Imp (__) Ant: MJ/Mn ☐☐☐☐☐ Cntrl: MJ/Mn ☐☐☐☐☐
☐ Sensor (______) Folding ☐ ____ MW Ranges: Ave (__) Diff (__) Form (__) Imp (__) Ant: MJ/Mn ☐☐☐☐☐ Cntrl: MJ/Mn ☐☐☐☐☐
☐ Sensor (______) Folding ☐ ____ MW Ranges: Ave (__) Diff (__) Form (__) Imp (__) Ant: MJ/Mn ☐☐☐☐☐ Cntrl: MJ/Mn ☐☐☐☐☐
☐ Sensor (______) Folding ☐ ____ MW Ranges: Ave (__) Diff (__) Form (__) Imp (__) Ant: MJ/Mn ☐☐☐☐☐ Cntrl: MJ/Mn ☐☐☐☐☐
☐ Sensor (______) Folding ☐ ____ MW Ranges: Ave (__) Diff (__) Form (__) Imp (__) Ant: MJ/Mn ☐☐☐☐☐ Cntrl: MJ/Mn ☐☐☐☐☐
☐ Sensor (______) Folding ☐ ____ MW Ranges: Ave (__) Diff (__) Form (__) Imp (__) Ant: MJ/Mn ☐☐☐☐☐ Cntrl: MJ/Mn ☐☐☐☐☐

Computer (______) ____ MW Mn ☐ Computer (______) ____ MW Mn ☐
Computer (______) ____ MW Mn ☐ Computer (______) ____ MW Mn ☐
Computer (______) ____ MW Mn ☐ Computer (______) ____ MW Mn ☐

☐ ECM (______) ____ MW Ranges: Ave (__) Diff (__) Form (__) Imp (__) Ant: MJ/Mn ☐☐☐☐☐ Cntrl: MJ/Mn ☐☐☐☐☐
☐ ECM (______) ____ MW Ranges: Ave (__) Diff (__) Form (__) Imp (__) Ant: MJ/Mn ☐☐☐☐☐ Cntrl: MJ/Mn ☐☐☐☐☐
Electromagnetic Masking ____ MW Rad: MJ/Mn ☐☐☐☐☐ Cntrl: MJ/Mn ☐☐☐☐☐

Weapons

☐ Master Fire Director Ranges: Ave (__) Diff (__) Form (__) Imp (__)
Ignore ___ Diff Mods Msl ___ ______ MW MJ/Mn ☐☐☐☐☐ Crew ☐ Ant: MJ/Mn ☐☐☐☐☐
☐ Master Fire Director Ranges: Ave (__) Diff (__) Form (__) Imp (__)
Ignore ___ Diff Mods Msl ___ ______ MW MJ/Mn ☐☐☐☐☐ Crew ☐ Ant: MJ/Mn ☐☐☐☐☐
☐ Master Fire Director Ranges: Ave (__) Diff (__) Form (__) Imp (__)
Ignore ___ Diff Mods Msl ___ ______ MW MJ/Mn ☐☐☐☐☐ Crew ☐ Ant: MJ/Mn ☐☐☐☐☐
☐ Master Fire Director Ranges: Ave (__) Diff (__) Form (__) Imp (__)
Ignore ___ Diff Mods Msl ___ ______ MW MJ/Mn ☐☐☐☐☐ Crew ☐ Ant: MJ/Mn ☐☐☐☐☐
☐ (______) Ranges: Ave (__) Diff (__) Form (__) Imp (__)
Loc: ___ Arc/Msls: ____ ______ MW MJ/Mn ☐☐☐☐☐ Crew ☐☐☐☐☐ ☐☐☐☐☐
☐ (______) Ranges: Ave (__) Diff (__) Form (__) Imp (__)
Loc: ___ Arc/Msls: ____ ______ MW MJ/Mn ☐☐☐☐☐ Crew ☐☐☐☐☐ ☐☐☐☐☐
☐ (______) Ranges: Ave (__) Diff (__) Form (__) Imp (__)
Loc: ___ Arc/Msls: ____ ______ MW MJ/Mn ☐☐☐☐☐ Crew ☐☐☐☐☐ ☐☐☐☐☐
☐ (______) Ranges: Ave (__) Diff (__) Form (__) Imp (__)
Loc: ___ Arc/Msls: ____ ______ MW MJ/Mn ☐☐☐☐☐ Crew ☐☐☐☐☐ ☐☐☐☐☐
☐ (______) Ranges: Ave (__) Diff (__) Form (__) Imp (__)
Loc: ___ Arc/Msls: ____ ______ MW MJ/Mn ☐☐☐☐☐ Crew ☐☐☐☐☐ ☐☐☐☐☐
☐ (______) Ranges: Ave (__) Diff (__) Form (__) Imp (__)
Loc: ___ Arc/Msls: ____ ______ MW MJ/Mn ☐☐☐☐☐ Crew ☐☐☐☐☐ ☐☐☐☐☐
☐ (______) Ranges: Ave (__) Diff (__) Form (__) Imp (__)
Loc: ___ Arc/Msls: ____ ______ MW MJ/Mn ☐☐☐☐☐ Crew ☐☐☐☐☐ ☐☐☐☐☐
☐ (______) Ranges: Ave (__) Diff (__) Form (__) Imp (__)
Loc: ___ Arc/Msls: ____ ______ MW MJ/Mn ☐☐☐☐☐ Crew ☐☐☐☐☐ ☐☐☐☐☐
☐ (______) Ranges: Ave (__) Diff (__) Form (__) Imp (__)
Loc: ___ Arc/Msls: ____ ______ MW MJ/Mn ☐☐☐☐☐ Crew ☐☐☐☐☐ ☐☐☐☐☐
☐ (______) Ranges: Ave (__) Diff (__) Form (__) Imp (__)
Loc: ___ Arc/Msls: ____ ______ MW MJ/Mn ☐☐☐☐☐ Crew ☐☐☐☐☐ ☐☐☐☐☐

Target Locks

Defenses

☐ (______) TL ___ Reduc/Hit ___ CV+ ___ PV ___ Cann ___
Loc: ____ Arc: ____ ______ MW MJ/Mn ☐☐☐☐☐ Crew ☐ Cann used ____
☐ (______) TL ___ Reduc/Hit ___ CV+ ___ PV ___ Cann ___
Loc: ____ Arc: ____ ______ MW MJ/Mn ☐☐☐☐☐ Crew ☐ Cann used ____
☐ (______) TL ___ Reduc/Hit ___ CV+ ___ PV ___ Cann ___
Loc: ____ Arc: ____ ______ MW MJ/Mn ☐☐☐☐☐ Crew ☐ Cann used ____
☐ (______) TL ___ Reduc/Hit ___ CV+ ___ PV ___ Cann ___
Loc: ____ Arc: ____ ______ MW MJ/Mn ☐☐☐☐☐ Crew ☐ Cann used ____

Quarters

Large Staterooms ____ MW MJ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐
Small Staterooms ____ MW Mn ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐
Low Berths ____ MW Mn ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐

Hold

Lab ____ MW MJ/Mn ☐☐☐☐☐
Hangar MJ/Mn ☐☐☐☐☐
Machine Shop ____ MW MJ/Mn ☐☐☐☐☐
Electronics Shop ____ MW MJ/Mn ☐☐☐☐☐

Sick Bay ____ MW MJ/Mn ☐☐☐☐☐
☐ Life Support ____ MW MJ/Mn ☐☐☐☐☐
☐ Emergency Life Support ____ MW MJ/Mn ☐☐☐☐☐
☐ Grav Compensator ___ G ____ MW MJ/Mn ☐☐☐☐☐

Cargo (______ m³) Tons of Cargo ______ Dam. pts. per ton ______ Damage ______
Fuel Tankage (______ m³) Starting Fuel, m³ ______ Fuel Losses ______
Fuel per G-Turn ______ Fuel Use ______

Engineering

☐ Jump Drive MJ/Mn ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐
☐ Power Plant (____ MW ____ MW ea) MJ/Mn ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐
☐ Maneuver Drive (____ MW/G) MJ/Mn ☐☐☐☐☐ 6G ___ 5G ___ 4G ___ 3G ___ 2G ___ 1G ___
☐ Contra-Gravity ____ MW MJ/Mn ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐
☐ Fuel Purification Plant ____ MW MJ/Mn ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐
☐ Other (______) ____ MW MJ/Mn ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐
☐ Other (______) ____ MW MJ/Mn ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐

+17
+16
+15
+14
+13
+12
+11
+10
+9
+8
+7
+6
+5
+4
+3
+2
+1
0
–1
–2
–3
–4
–5
–6
–7
–8
–9

Difficulty Modifier

BRILLIANT LANCES™

Traveller® Starship Combat

Player Aids Card

SENSOR AND FIRE TASKS DIFFICULTY MODIFIER FLOWCHARTS

When calculating the Diff Mods below, use the scale provided on the left margin of this card to help in keeping a running total. Hold the card so that your left thumb and forefinger are free to move up and down the scale, "pinching" the current Diff Mod total.

SENSOR TASK DIFFICULTY MODIFIERS: SENSING PLAYER

The player attempting a Sensor Task computes a total Difficulty Modifier based on the following criteria and combines this cumulative Diff Mod with the cumulative Diff Mod reported by the target player. This final combined Diff Mod is applied to the base difficulty level based on the sensor's range performance when rolling the Sensor Task. No difficulty level may be reduced to less than Easy.

1. If task is an attempt to **retain a lock** from a previous turn, **–1 Diff Mod**. (Cannot be combined with 2.)
2. If task is using a **handed-off sensor lock** from another sensor on the same or a different ship, **–1 Diff Mod.** (Cannot be combined with 1.)
3. If sensing ship suffered a **Catastrophic Failure at an Evasion Task** this turn, **+1 Diff Mod**.
4. If sensor line of sight **passes through an Area Jamming** area of effect, **+1 Diff Mod per area**.
5. If a **Planet or Asteroid** counter is in the target's hex, **+1 Diff Mod.**
6. If there are any **White Out** (missile detonation) markers in the target's hex, **+1 Diff Mod per marker.**
7. If target has **gone active** on the current turn (using active sensors or radio) and the sensing vessel is within twice the active sensor's extreme range, and has a direction finder or passive EMS sensor with a tech level equal to or greater than the active sensor, **–1 Diff Mod.**
8. If target is the **source of Area Jamming**, and the sensing vessel is within 80 hexes of the area jammer, and has any form of functioning direction finder or passive EMS, **–2 Diff Mod.**

SENSOR TASK DIFFICULTY MODIFIERS: TARGET PLAYER

The player controlling the target of a Sensor Task computes a total difficulty modifier based on the following criteria and reports the total to the sensing player.

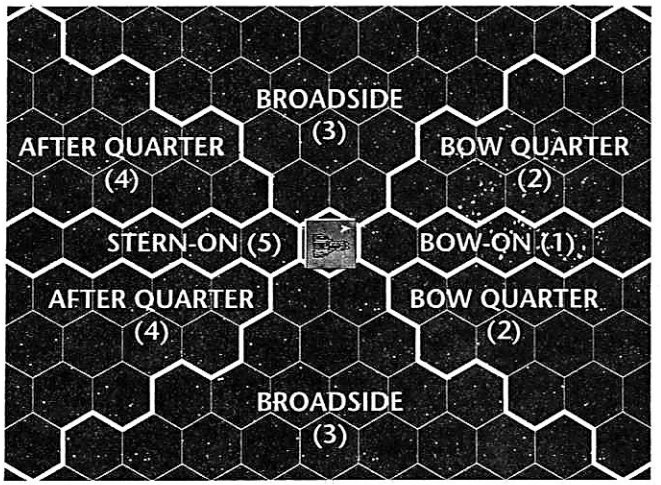
1. The **Constant Diff Mods** value which corresponds to the sensor being used by the sensing player, taken from the table on the Control Panel. Diff Mod ranges from **+4 to –5 Diff Mods**. This combined Diff Mod includes:
   A: Difficulty Modifer for target size (+2 to –5 Diff Mods), and
   B: EMM (Electromagnetic Masking) Difficulty Modifier according to type of sensor, +1 or +2 Diff Mods, or +0 if no EMM is fitted.
   If the EMM suite has been damaged so that it no longer functions, the player should remember to line out the EMM line of the Constant Diff Mods table and use only the target size difficulty modifier.
2. If successful **jamming** attempt was made against the sensor, **+1 Diff Mod** (or **+2 if Outstanding Success** was rolled).
3. Diff Mods **versus passive sensors only** (HRT or passive EMS) based on target's **use of power plant** for maneuver or evasion.
   - If target spent **no G-turns** this turn, **+1 Diff Mod**
   - If target spent **one or more G-turns** this turn, **+0 Diff Mod**
   - If target **powered down** in "cold mode," **+2 Diff Mod**
   - If target spent **one or more G-turns and is facing stern-on** (Arc 5) to the sensing vessel, **–3 Diff Mod**
4. If the target has a **Passive EMS Array Extended, –1 Diff Mod versus Active sensors only.**
5. If target made a successful **evasion** attempt, **+1 Diff Mod** (on **Outstanding Success, +1 Diff Mod per G-turns spent on evasion ÷2, drop fractions**).
6. If sensor is **ladar** and target has sandcaster and elects to expend a cannister, or already has sand up, **+1 Diff Mod.**
7. If target has a **black globe**, use the following difficulty modifiers:
   - If black globe is **full up**, use **+5 DIff Mod vs. Active Sensors**, and **+3 Diff Mod vs. Passive Sensors.**
   - If black globe is **flickering**, use **+1 Diff Mod per flicker rate ÷30** (round to nearest whole number for both active and passive sensors).

FIRING TASK DIFFICULTY MODIFIERS

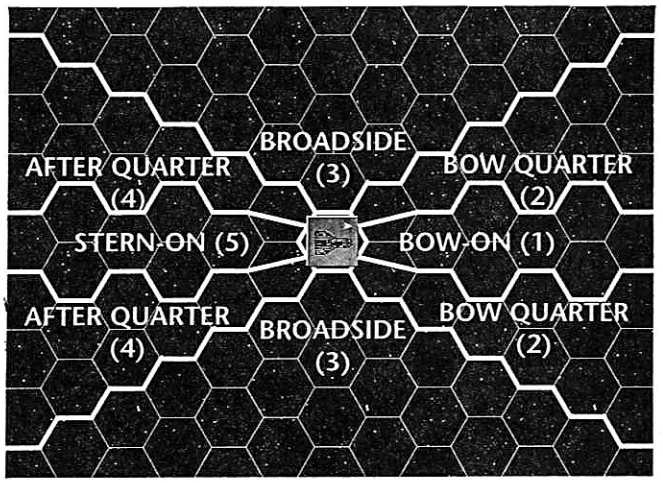
The player attempting a Fire Task computes a total cumulative Difficulty Modifier based on the following criteria. This total combined Diff Mod is applied to the base difficulty level based on the weapon's range performance when rolling the Fire Task. No difficulty level may be reduced to less than Easy.

1. Diff Mod based on **target size, +1 to –5**, take from Constant Diff Mods table on Control Panel.
2. If target made a successful **evasion** attempt, **+1 Diff Mod** (on **Outstanding Success, +1 Diff Mod per G-turns spent on evasion ÷2, drop fractions**).
3. **Absolute range** to the target in hexes, **divided by 3 (drop fractions) = + Diff Mods**, or see table above right.
   A: For controlled missiles, use range from controlling ship to target
   B: For semi-independent or fully independent missiles (with their own sensor locks), use range from missile to target.
4. If firing ship rolled **Catastrophic Failure on its own Evasion Task** for the current turn, **+1 Diff Mod.**
5. For **overpowered weapons, disregard 1 or 2 + Diff Mods,** based on additional power supplied, as indicated on control panel.
6. Weapons that are being fired with **MFDs** may **disregard 1 to 6 + Diff Mods,** based on TL, as indicated on control panel.

Arcs of Fire: Hexside (Even-Numbered) Facings



Arcs of Fire: Hex Vertex (Odd-Numbered) Facings



Diff Mods from Absolute Range

Range in hexes	*Diff Mod*
0-2	—
3-5	+1
6-8	+2
9-11	+3
12-14	+4
15-17	+5
18-20	+6
21-23	+7
24-26	+8
27-29	+9
30-32	+10
33-35	+11
36-38	+12
39-41	+13
42-44	+14
45+	NA*

*Not allowed: 44 hexes is the maximum range of any fire, assuming maximum TL of 15 and maximum target size of Gigantic.

0303/C2

SEQUENCE OF PLAY

(See page 5, Rules Booklet, for details)

Launch Phase
Plotting Phase
Movement Phase
Sensor Phase
Fire Phase
Damage Control Phase
Turn Record Phase

DEFENSES

Sandcasters

Base Difficulty: Difficult

Diff Mods: +1 difficulty level per 2 TLs sandcaster is exceeded by firing ship tech level, or -1 level per 2 TLs sandcaster exceeds firing ship's tech level.

Meson Screens

Base Difficulty: Difficult

Diff Mods: Based on meson gun Damage Value compared to screen Protection Value

+2 If meson gun damage value÷meson screen protection value = 4+
+1 If meson gun damage value÷meson screen protection value = 2+
-1 If meson screen protection value÷meson gun damage value = 2+
-2 If meson screen protection value÷meson gun damage value = 4+

Nuclear Dampers

Base Difficulty: Difficult

Diff Mods: Based on Tech Level

TL	*Difficulty Modifier*
12	+1 per closing velocity+2
13	+1 per closing velocity+3
14	+1 per closing velocity+4
15	+1 per closing velocity+5

DAMAGE

Arcs of Fire and Hit Locations by Hull Form

Configuration	*(1) Bow On*	*(2) Bow Quarter*	*(3) Broadside*	*(4) After Quarter*	*(5) Stern On*
Open Frame	1-20	1-20	1-20	1-20	1-20
Needle	1-15	1-19	1-20	2-20	6-20
Wedge	1-19	1-19	2-19	16-20	16-20
Cylinder	1-5	1-15	2-19	6-20	16-20
Box	1-5	1-15	2-19	6-20	16-20
Sphere	1-11	1-15	2-19	6-20	10-20
Dome/Disc	1-11	1-15	2-19	6-20	10-20
Close Structure	1-9	1-15	2-19	6-20	12-20
Slab	1-5, 10-11	1-15	2-19	6-20	10-11, 16-20

Table shows the weapon locations that can fire into the listed arcs (e.g., a laser in location 10 on a sphere hull form could fire into arcs 1, 2, 3, 4, and 5, but on a cylinder hull form could only fire into arcs 2, 3, and 4), as well as the hit locations which can be hit from those listed arcs. When rolling for hits from a particular arc, re-roll all hit locations which are not listed in the appropriate column.

Note: Firing meson guns are subject to arc of fire limitations, but always roll 1D20 for hit location, regardless of the facing of the target. Missiles that denonate and fire in the same hex as their targets also roll 1D20 for hit location, rather than worrying about the target's facing.

Damage Type Chart

D10	*Engineering*	*Electronics*	*Quarters*	*Hold*	*Weaponry*	*Antenna*	*Drones*
1	Jump Drive	Def Scrn	Ship's Troops	Lab/Hangar	Mount	Def Scrn	Weapon
2	Jump Drive	ECM	Ship's Troops	Lab/Hngr Crew	Mount	ECM	Weapon
3	FPP	Comm.	Sick Bay/LB	MES	Mount	ECM	Sensor
4	Power Plant	Comm.	Life Support	Cargo	Mount	MFD	Sensor
5	Power Plant	Sensor	Life Support	Cargo	Mount	MFD	Computer
6	Power Plant	Sensor	ELS	Fuel	Crew	Comm	Comm
7	Man Drive	MFD	DCP	Fuel	Crew	Comm	Fuel
8	Eng Crew	Computer	Grav Comp.	Fuel	Crew	Comm	Fuel
9	Eng Crew	Computer	Staterooms	Fuel	Crew	Sensor	Pow Plant
10+	Contra-Grav	Bridge Crew	Staterooms	Fuel	Crew	Sensor	Man Drive

Abbreviations: **DCP:** Damage Control Personnel; **Def Scrn:** Defensive Screen; **ECM:** ECM and ECCM; **ELS:** Emergency Life Support; **FPP:** Fuel Processing Plant; **Grav Comp:** Gravitic Compensators; **Hngr:** Hangar; **LB:** Low Berths; **Man Drive:** Maneuver Drive (heat exchanger/ignition chamber); **MES:** Machine or Electonics Shops; **MFD:** Master Fire Director (roll on Weaponry column for Mount or Crew)

DMs: **Engineering:** If no jump drive, +2; **Electronics:** If no Defensive Screens, +1, If no Def Screens or ECM, +2; **Quarters:** If no Ship's Troops, +2; if no Ship's Troops or Sick Bay, +3; **Hold:** If no Labs or Hangar, +2; if no Labs, Hangars, or Shops, +3; **Antenna:** If no Defensive Screens, +1, If no Defensive Screens or ECM, +2, If no Defensive Screens, ECM, or MFD, +4; **Drones:** If unarmed, +2

Spacecraft Damage

Damage Points	*Result*
0 or less	No effect
1 to 10	1 minor
11 to 20	2 minor
21 to 40	1 major
41 to 60	2 major
61 to 80	3 major
81 to 100	4 major
101 to 120	5 major

No more than 5 major damage hits can be done in a single location. Remaining damage points beyond 120 are rolled as excess damage in another location.

Excess Damage Location

1D6	*Area*
1	-1 internal area
2-3	same internal area
4	+1 internal area
5	-1 surface area
6	+1 surface area

Minor and Non-Destroying Damage Table

1D6	*Damage*
1-3	System reset, operation interrupted for 1 turn
4-6	Performance degraded: All tasks using system at +1 Diff Mod.

Note: If damage is against the crew, a minor damage is 1 crew casualty. If damage is against fuel, ship loses 1D6 tons of fuel before the tanks re-seal. If damage is against sensors, all locks are lost and must be re-rolled when operations resume.

Major Damage

Major damage to a crew section causes 1D6 casualties. If damage is against fuel, ship loses 1D20 tons of fuel before the tanks re-seal.

Penetration Rating Conversions

Damage Value÷Penetration Rating=Penetration Value
Penetration Value×Penetration Rating=Damage Value

Critical Hit

Vs. Manned Craft

2D6	*Result*
2	Bridge Destroyed
3	Fire Control
4	Power Plant
5	Sensors
6	Life Support
7	Fuel Explosion*
8	Artificial Gravity
9	Jump Drive
10	Maneuver Drive
11	Spine
12	Computer

*See Fuel Explosion Damage Value table

Vs. Unmanned Craft and Missiles

1D6	*Result*
1-2	Control system (missile goes inert)
3	Payload (warhead, sensor, or ECM package)
4-6	Fuel (target destroyed)

Fuel Explosion Damage Value

Ship Size	*DV*
SM	Destroyed
Mc	5
VS	10
S	20
M	30
L	40
VL	50
G	60

Critical Hits Table

Weapon Remaining Penetration Value (after penetrating the hull)

Ship Size	*1-20*	*21-40*	*41-60*	*61-80*	*81-100*	*101-120*	*121-140*	*141-160*	*161-180*	*181-200*	*201+*
SM	2	3	4	5	6	7	8	9	10	11	12
Mc	1	2	3	4	5	6	7	8	9	10	11
VS	0	1	2	3	4	5	6	7	8	9	10
S	0	0	0	1	2	3	4	5	6	7	8
M	0	0	0	0	0	1	2	3	4	5	6
L	0	0	0	0	0	0	0	1	2	3	4
VL	0	0	0	0	0	0	0	0	1	1	2
G	0	0	0	0	0	0	0	0	0	0	1

(The number is number of Critical Hits applied to the target.)

Proportional Movement Guide

Velocity	*Step 1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
1	—	—	—	—	M	—	—	—	—	—
2	—	—	M	—	—	—	—	M	—	—
3	—	—	M	—	—	M	—	—	M	—
4	—	M	—	—	M	—	M	—	—	M
5	—	M	—	M	—	M	—	M	—	M
6	M	—	M	—	M	M	—	M	—	M
7	M	—	M	M	—	M	M	—	M	M
8	M	—	M	M	M	M	—	M	M	M
9	M	M	M	M	—	M	M	M	M	M
10	M	M	M	M	M	M	M	M	M	M

For craft with a velocity greater than 10, use the line for 10 plus the line for velocity in excess of 10. For example, a vessel with velocity 15 uses the 5 and 10 line. In step 1 it moves one hex, step 2 moves two hexes, and so on. Missiles always detonate at closest approach, so that even if one of the vessels moves two hexes in a step, the missile may detonate before the second hex is moved.

Damage Control

# Pers	*System Reset*	*Minor Hit*	*Major Hit*
1	Difficult	Formidable	Impossible
2	Average	Difficult	Formidable
3	Easy	Average	Difficult

+17
+16
+15
+14
+13
+12
+11
+10
+9
+8
+7
+6
+5
+4
+3
+2
+1
0
–1
–2
–3
–4
–5
–6
–7
–8
–9

Difficulty Modifier

BRILLIANT LANCES™

Traveller® Starship Combat

Player Aids Card

SENSOR AND FIRE TASKS DIFFICULTY MODIFIER FLOWCHARTS

When calculating the Diff Mods below, use the scale provided on the left margin of this card to help in keeping a running total. Hold the card so that your left thumb and forefinger are free to move up and down the scale, "pinching" the current Diff Mod total.

SENSOR TASK DIFFICULTY MODIFIERS: SENSING PLAYER

The player attempting a Sensor Task computes a total Difficulty Modifier based on the following criteria and combines this cumulative Diff Mod with the cumulative Diff Mod reported by the target player. This final combined Diff Mod is applied to the base difficulty level based on the sensor's range performance when rolling the Sensor Task. No difficulty level may be reduced to less than Easy.

1. If task is an attempt to **retain a lock** from a previous turn, **–1 Diff Mod**. (Cannot be combined with 2.)
2. If task is using a **handed-off sensor lock** from another sensor on the same or a different ship, **–1 Diff Mod.** (Cannot be combined with 1.)
3. If sensing ship suffered a **Catastrophic Failure at an Evasion Task** this turn, **+1 Diff Mod**.
4. If sensor line of sight **passes through an Area Jamming** area of effect, **+1 Diff Mod per area**.
5. If a **Planet or Asteroid** counter is in the target's hex, **+1 Diff Mod.**
6. If there are any **White Out** (missile detonation) markers in the target's hex, **+1 Diff Mod per marker.**
7. If target has **gone active** on the current turn (using active sensors or radio) and the sensing vessel is within twice the active sensor's extreme range, and has a direction finder or passive EMS sensor with a tech level equal to or greater than the active sensor, **–1 Diff Mod.**
8. If target is the **source of Area Jamming**, and the sensing vessel is within 80 hexes of the area jammer, and has any form of functioning direction finder or passive EMS, **–2 Diff Mod.**

SENSOR TASK DIFFICULTY MODIFIERS: TARGET PLAYER

The player controlling the target of a Sensor Task computes a total difficulty modifier based on the following criteria and reports the total to the sensing player.

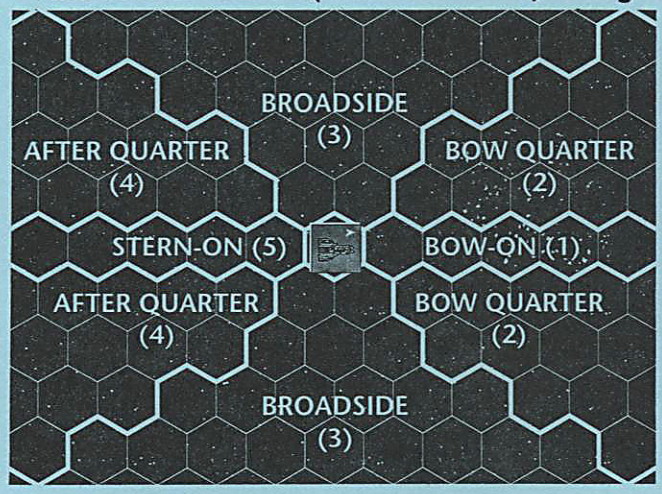
1. The **Constant Diff Mods** value which corresponds to the sensor being used by the sensing player, taken from the table on the Control Panel. Diff Mod ranges from **+4 to –5 Diff Mods**. This combined Diff Mod includes:
   A: Difficulty Modifer for target size (+2 to –5 Diff Mods), and
   B: EMM (Electromagnetic Masking) Difficulty Modifier according to type of sensor, +1 or +2 Diff Mods, or +0 if no EMM is fitted.
   If the EMM suite has been damaged so that it no longer functions, the player should remember to line out the EMM line of the Constant Diff Mods table and use only the target size difficulty modifier.
2. If successful **jamming** attempt was made against the sensor, **+1 Diff Mod** (or **+2 if Outstanding Success** was rolled).
3. Diff Mods **versus passive sensors only** (HRT or passive EMS) based on target's **use of power plant** for maneuver or evasion.
   - If target spent **no G-turns** this turn, **+1 Diff Mod**
   - If target spent **one or more G-turns** this turn, **+0 Diff Mod**
   - If target **powered down** in "cold mode," **+2 Diff Mod**
   - If target spent **one or more G-turns and is facing stern-on** (Arc 5) to the sensing vessel, **–3 Diff Mod**
4. If the target has a **Passive EMS Array Extended, –1 Diff Mod versus Active sensors only.**
5. If target made a successful **evasion** attempt, **+1 Diff Mod** (on **Outstanding Success, +1 Diff Mod per G-turns spent on evasion ÷2, drop fractions**).
6. If sensor is **ladar** and target has sandcaster and elects to expend a cannister, or already has sand up, **+1 Diff Mod.**
7. If target has a **black globe**, use the following difficulty modifiers:
   - If black globe is **full up**, use **+5 DIff Mod vs. Active Sensors**, and **+3 Diff Mod vs. Passive Sensors.**
   - If black globe is **flickering**, use **+1 Diff Mod per flicker rate ÷30** (round to nearest whole number for both active and passive sensors).

FIRING TASK DIFFICULTY MODIFIERS

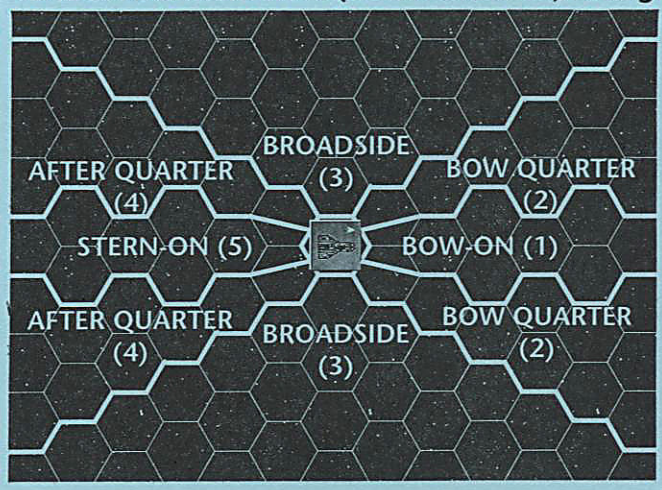
The player attempting a Fire Task computes a total cumulative Difficulty Modifier based on the following criteria. This total combined Diff Mod is applied to the base difficulty level based on the weapon's range performance when rolling the Fire Task. No difficulty level may be reduced to less than Easy.

1. Diff Mod based on **target size, +1 to –5,** take from Constant Diff Mods table on Control Panel.
2. If target made a successful **evasion** attempt, **+1 Diff Mod** (on **Outstanding Success, +1 Diff Mod per G-turns spent on evasion ÷2, drop fractions**).
3. **Absolute range** to the target in hexes, **divided by 3 (drop fractions) = + Diff Mods**, or see table above right.
   A: For controlled missiles, use range from controlling ship to target
   B: For semi-independent or fully independent missiles (with their own sensor locks), use range from missile to target.
4. If firing ship rolled **Catastrophic Failure on its own Evasion Task** for the current turn, **+1 Diff Mod.**
5. For **overpowered weapons, disregard 1 or 2 + Diff Mods,** based on additional power supplied, as indicated on control panel.
6. Weapons that are being fired with **MFDs** may **disregard 1 to 6 + Diff Mods,** based on TL, as indicated on control panel.

Arcs of Fire: Hexside (Even-Numbered) Facings



Arcs of Fire: Hex Vertex (Odd-Numbered) Facings



Diff Mods from Absolute Range

Range in hexes	*Diff Mod*
0-2	—
3-5	+1
6-8	+2
9-11	+3
12-14	+4
15-17	+5
18-20	+6
21-23	+7
24-26	+8
27-29	+9
30-32	+10
33-35	+11
36-38	+12
39-41	+13
42-44	+14
45+	NA*

*Not allowed: 44 hexes is the maximum range of any fire, assuming maximum TL of 15 and maximum target size of Gigantic.

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SEQUENCE OF PLAY

(See page 5, Rules Booklet, for details)

Launch Phase
Plotting Phase
Movement Phase
Sensor Phase
Fire Phase
Damage Control Phase
Turn Record Phase

DEFENSES

Sandcasters

Base Difficulty: Difficult

Diff Mods: +1 difficulty level per 2 TLs sandcaster is exceeded by firing ship tech level, or -1 level per 2 TLs sandcaster exceeds firing ship's tech level.

Meson Screens

Base Difficulty: Difficult

Diff Mods: Based on meson gun Damage Value compared to screen Protection Value

+2 If meson gun damage value÷meson screen protection value = 4+
+1 If meson gun damage value÷meson screen protection value = 2+
-1 If meson screen protection value÷meson gun damage value = 2+
-2 If meson screen protection value÷meson gun damage value = 4+

Nuclear Dampers

Base Difficulty: Difficult

Diff Mods: Based on Tech Level

TL	*Difficulty Modifier*
12	+1 per closing velocity÷2
13	+1 per closing velocity÷3
14	+1 per closing velocity÷4
15	+1 per closing velocity÷5

DAMAGE

Arcs of Fire and Hit Locations by Hull Form

Configuration	*(1) Bow On*	*(2) Bow Quarter*	*(3) Broadside*	*(4) After Quarter*	*(5) Stern On*
Open Frame	1-20	1-20	1-20	1-20	1-20
Needle	1-15	1-19	1-20	2-20	6-20
Wedge	1-19	1-19	2-19	16-20	16-20
Cylinder	1-5	1-15	2-19	6-20	16-20
Box	1-5	1-15	2-19	6-20	16-20
Sphere	1-11	1-15	2-19	6-20	10-20
Dome/Disc	1-11	1-15	2-19	6-20	10-20
Close Structure	1-9	1-15	2-19	6-20	12-20
Slab	1-5, 10-11	1-15	2-19	6-20	10-11, 16-20

Table shows the weapon locations that can fire into the listed arcs (e.g., a laser in location 10 on a sphere hull form could fire into arcs 1, 2, 3, 4, and 5, but on a cylinder hull form could only fire into arcs 2, 3, and 4), as well as the hit locations which can be hit from those listed arcs. When rolling for hits from a particular arc, re-roll all hit locations which are not listed in the appropriate column.

Note: Firing meson guns are subject to arc of fire limitations, but always roll 1D20 for hit location, regardless of the facing of the target. Missiles that denonate and fire in the same hex as their targets also roll 1D20 for hit location, rather than worrying about the target's facing.

Damage Type Chart

D10	*Engineering*	*Electronics*	*Quarters*	*Hold*	*Weaponry*	*Antenna*	*Drones*
1	Jump Drive	Def Scrn	Ship's Troops	Lab/Hangar	Mount	Def Scrn	Weapon
2	Jump Drive	ECM	Ship's Troops	Lab/Hngr Crew	Mount	ECM	Weapon
3	FPP	Comm.	Sick Bay/LB	MES	Mount	ECM	Sensor
4	Power Plant	Comm.	Life Support	Cargo	Mount	MFD	Sensor
5	Power Plant	Sensor	Life Support	Cargo	Mount	MFD	Computer
6	Power Plant	Sensor	ELS	Fuel	Crew	Comm	Comm
7	Man Drive	MFD	DCP	Fuel	Crew	Comm	Fuel
8	Eng Crew	Computer	Grav Comp.	Fuel	Crew	Comm	Fuel
9	Eng Crew	Computer	Staterooms	Fuel	Crew	Sensor	Pow Plant
10+	Contra-Grav	Bridge Crew	Staterooms	Fuel	Crew	Sensor	Man Drive

Abbreviations: **DCP:** Damage Control Personnel; **Def Scrn:** Defensive Screen; **ECM:** ECM and ECCM; **ELS:** Emergency Life Support; **FPP:** Fuel Processing Plant; **Grav Comp:** Gravitic Compensators; **Hngr:** Hangar; **LB:** Low Berths; **Man Drive:** Maneuver Drive (heat exchanger/ignition chamber); **MES:** Machine or Electonics Shops; **MFD:** Master Fire Director (roll on Weaponry column for Mount or Crew)

DMs: **Engineering:** If no jump drive, +2; **Electronics:** If no Defensive Screens, +1, If no Def Screens or ECM, +2; **Quarters:** If no Ship's Troops, +2; if no Ship's Troops or Sick Bay, +3; **Hold:** If no Labs or Hangar, +2; if no Labs, Hangars, or Shops, +3; **Antenna:** If no Defensive Screens, +1, If no Defensive Screens or ECM, +2, If no Defensive Screens, ECM, or MFD, +4; **Drones:** If unarmed, +2

Spacecraft Damage

Damage Points	*Result*
0 or less	No effect
1 to 10	1 minor
11 to 20	2 minor
21 to 40	1 major
41 to 60	2 major
61 to 80	3 major
81 to 100	4 major
101 to 120	5 major

No more than 5 major damage hits can be done in a single location. Remaining damage points beyond 120 are rolled as excess damage in another location.

Excess Damage Location

1D6	*Area*
1	-1 internal area
2-3	same internal area
4	+1 internal area
5	-1 surface area
6	+1 surface area

Minor and Non-Destroying Damage Table

1D6	*Damage*
1-3	System reset, operation interrupted for 1 turn
4-6	Performance degraded: All tasks using system at +1 Diff Mod.

Note: If damage is against the crew, a minor damage is 1 crew casualty. If damage is against fuel, ship loses 1D6 tons of fuel before the tanks re-seal. If damage is against sensors, all locks are lost and must be re-rolled when operations resume.

Major Damage

Major damage to a crew section causes 1D6 casualties. If damage is against fuel, ship loses 1D20 tons of fuel before the tanks re-seal.

Penetration Rating Conversions

Damage Value÷Penetration Rating=Penetration Value
Penetration Value×Penetration Rating=Damage Value

Critical Hit

Vs. Manned Craft

2D6	*Result*
2	Bridge Destroyed
3	Fire Control
4	Power Plant
5	Sensors
6	Life Support
7	Fuel Explosion*
8	Artificial Gravity
9	Jump Drive
10	Maneuver Drive
11	Spine
12	Computer

*See Fuel Explosion Damage Value table

Vs. Unmanned Craft and Missiles

1D6	*Result*
1-2	Control system (missile goes inert)
3	Payload (warhead, sensor, or ECM package)
4-6	Fuel (target destroyed)

Fuel Explosion Damage Value

Ship Size	*DV*
SM	Destroyed
Mc	5
VS	10
S	20
M	30
L	40
VL	50
G	60

Critical Hits Table

Weapon Remaining Penetration Value (after penetrating the hull)

Ship Size	*1-20*	*21-40*	*41-60*	*61-80*	*81-100*	*101-120*	*121-140*	*141-160*	*161-180*	*181-200*	*201+*
SM	2	3	4	5	6	7	8	9	10	11	12
Mc	1	2	3	4	5	6	7	8	9	10	11
VS	0	1	2	3	4	5	6	7	8	9	10
S	0	0	0	1	2	3	4	5	6	7	8
M	0	0	0	0	0	1	2	3	4	5	6
L	0	0	0	0	0	0	0	1	2	3	4
VL	0	0	0	0	0	0	0	0	1	1	2
G	0	0	0	0	0	0	0	0	0	0	1

(The number is number of Critical Hits applied to the target.)

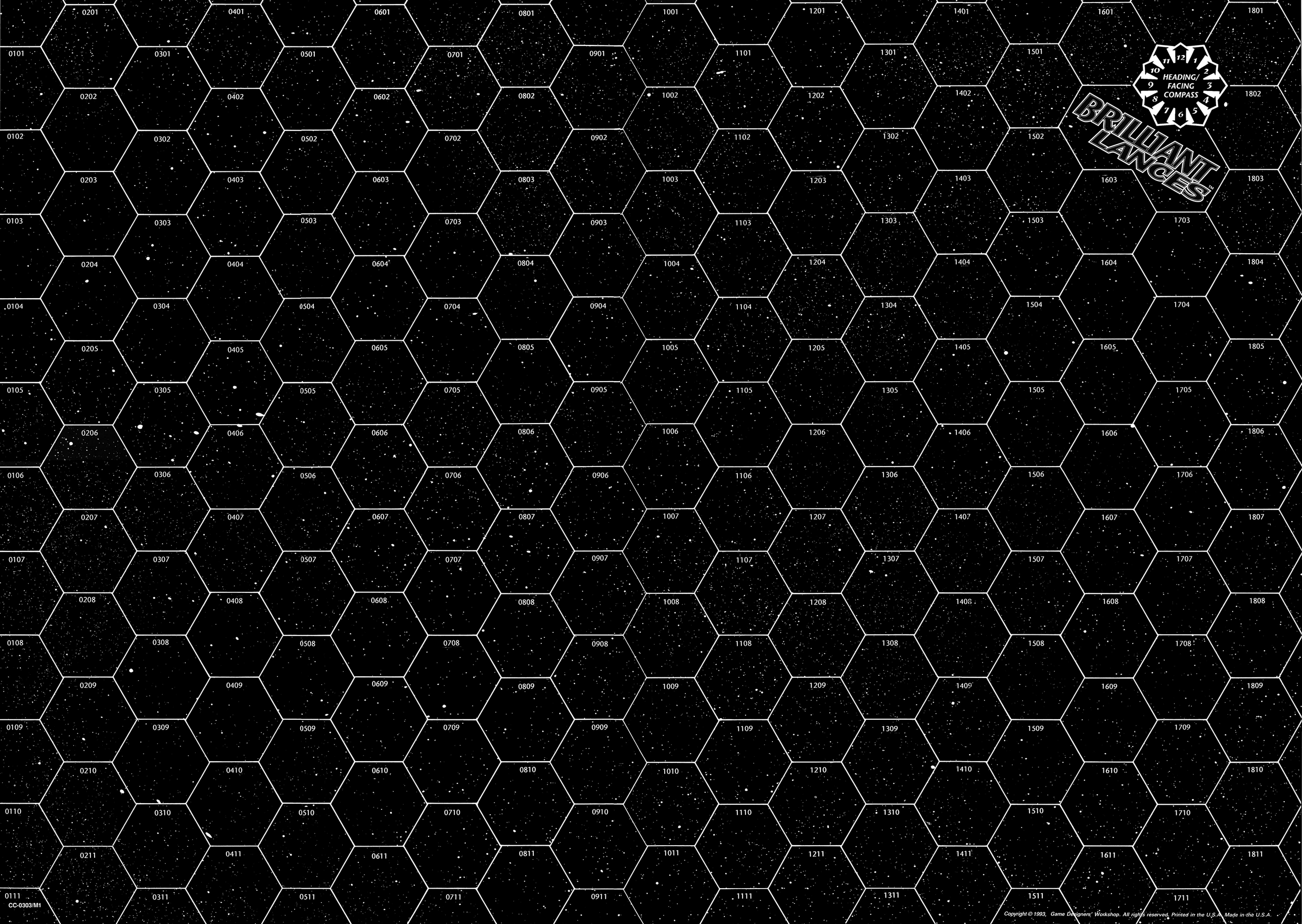
Proportional Movement Guide

Velocity	*Step 1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
1	—	—	—	—	M	—	—	—	—	—
2	—	—	M	—	—	—	—	M	—	—
3	—	—	M	—	—	M	—	—	M	—
4	—	M	—	—	M	—	M	—	—	M
5	—	M	—	M	—	M	—	M	—	M
6	M	—	M	—	M	M	—	M	—	M
7	M	—	M	M	—	M	M	—	M	M
8	M	—	M	M	M	M	—	M	M	M
9	M	M	M	M	—	M	M	M	M	M
10	M	M	M	M	M	M	M	M	M	M

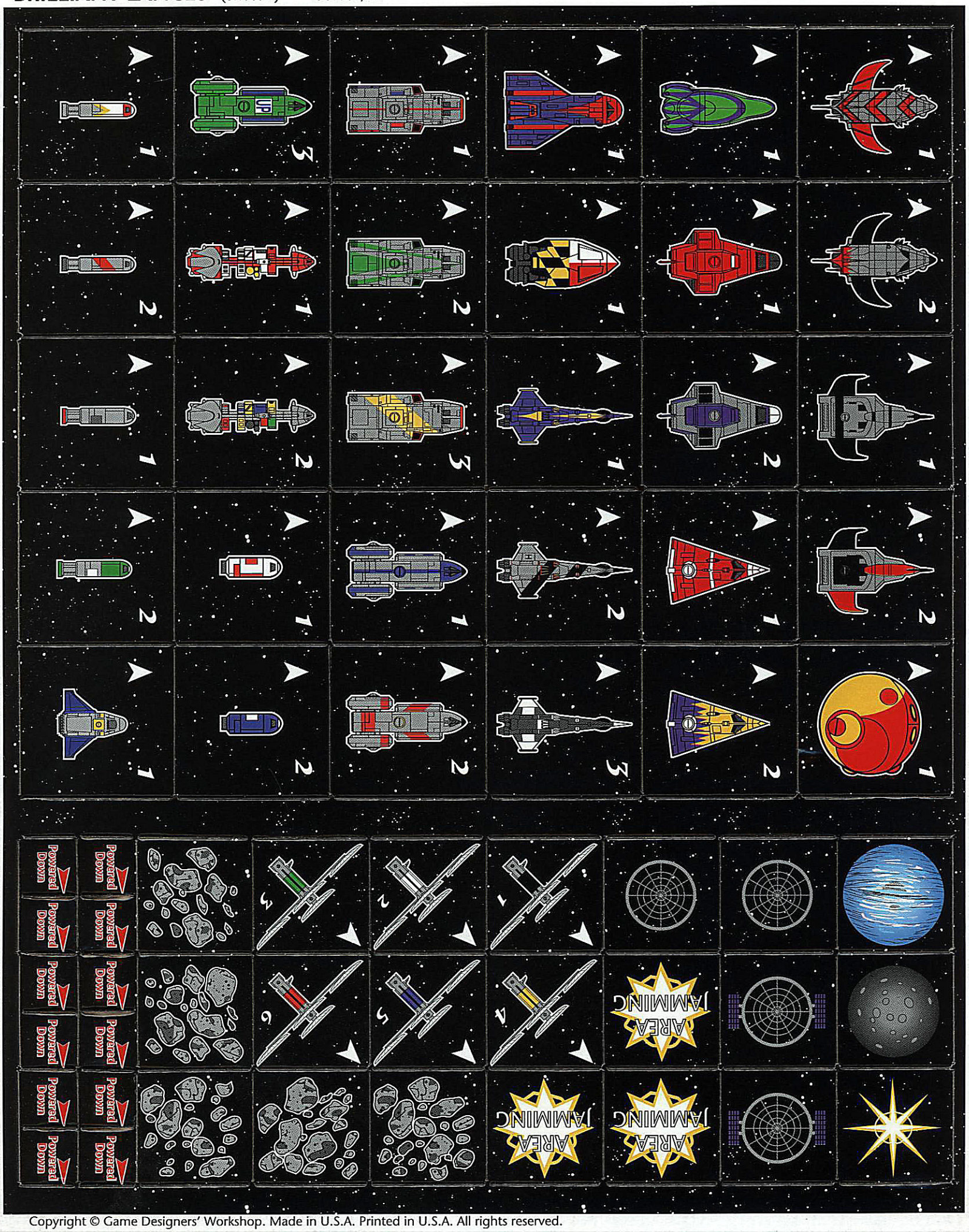
For craft with a velocity greater than 10, use the line for 10 plus the line for velocity in excess of 10. For example, a vessel with velocity 15 uses the 5 and 10 line. In step 1 it moves one hex, step 2 moves two hexes, and so on. Missiles always detonate at closest approach, so that even if one of the vessels moves two hexes in a step, the missile may detonate before the second hex is moved.

Damage Control

# Pers	*System Reset*	*Minor Hit*	*Major Hit*
1	Difficult	Formidable	Impossible
2	Average	Difficult	Formidable
3	Easy	Average	Difficult

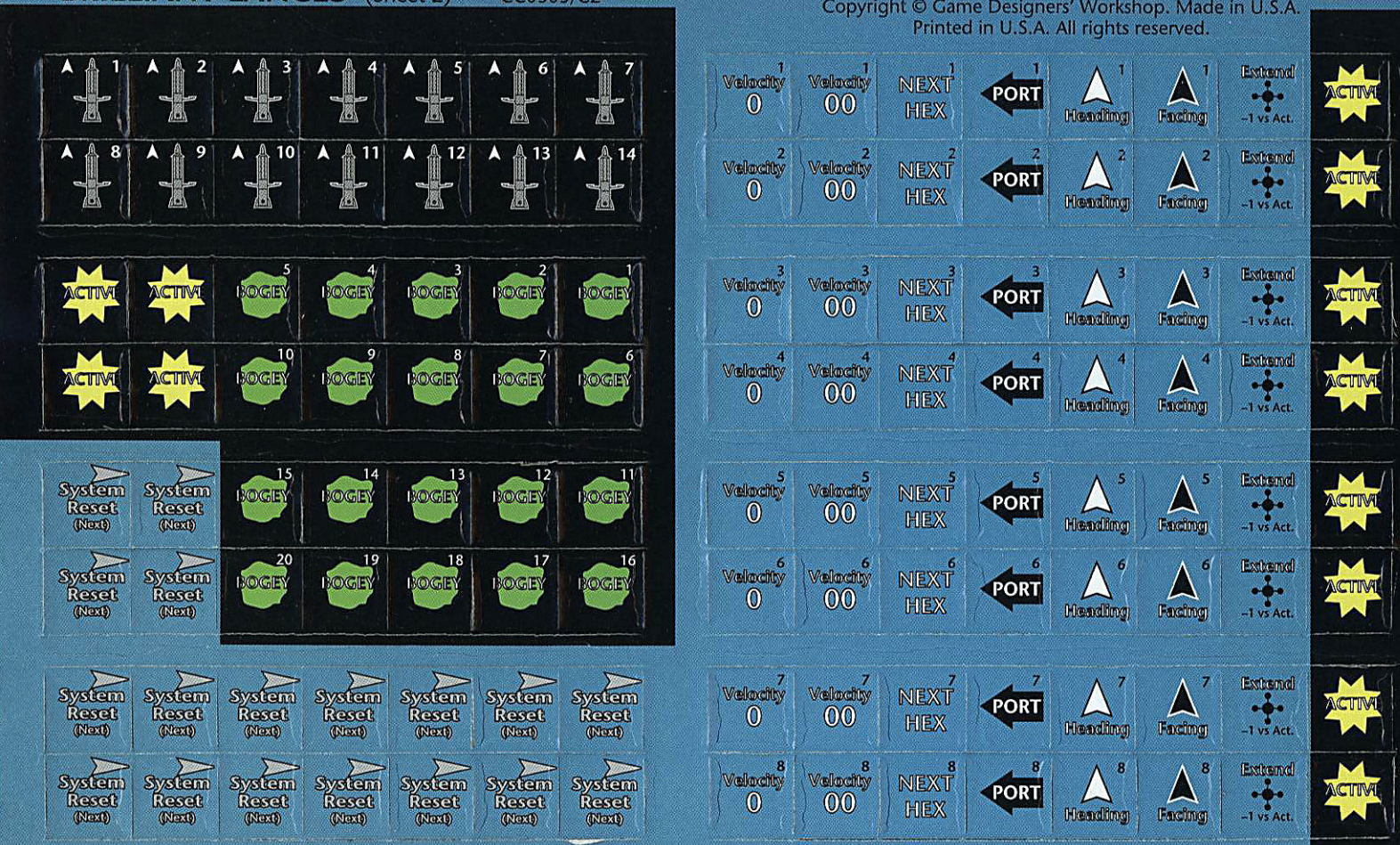


BRILLIANT LANCES (Sheet 1) CC0303/C1



Powered Down 2
Powered Down 3
Powered Down 4
Powered Down 5
Powered Down 6

BRILLIANT LANCES (Sheet 2) CC0303/C2



BRILLIANT LANCES (Sheet 2 Back)

PASSIVE	Retract ● No Locks	1 Facing	1 Heading	1 STBD	1 NEXT HEX	1 Velocity 00	1 Velocity 0
PASSIVE	Retract ● No Locks	2 Facing	2 Heading	2 STBD	2 NEXT HEX	2 Velocity 00	2 Velocity 0
PASSIVE	Retract ● No Locks	3 Facing	3 Heading	3 STBD	3 NEXT HEX	3 Velocity 00	3 Velocity 0
PASSIVE	Retract ● No Locks	4 Facing	4 Heading	4 STBD	4 NEXT HEX	4 Velocity 00	4 Velocity 0
PASSIVE	Retract ● No Locks	5 Facing	5 Heading	5 STBD	5 NEXT HEX	5 Velocity 00	5 Velocity 0
PASSIVE	Retract ● No Locks	6 Facing	6 Heading	6 STBD	6 NEXT HEX	6 Velocity 00	6 Velocity 0
PASSIVE	Retract ● No Locks	7 Facing	7 Heading	7 STBD	7 NEXT HEX	7 Velocity 00	7 Velocity 0
PASSIVE	Retract ● No Locks	8 Facing	8 Heading	8 STBD	8 NEXT HEX	8 Velocity 00	8 Velocity 0

WHITE OUT 1 DIT	WHITE OUT 1 DIT	WHITE OUT 1 DIT	WHITE OUT 1 DIT	WHITE OUT 1 DIT	WHITE OUT 1 DIT	WHITE OUT 1 DIT	
WHITE OUT 1 DIT	WHITE OUT 1 DIT	WHITE OUT 1 DIT	WHITE OUT 1 DIT	WHITE OUT 1 DIT	WHITE OUT 1 DIT	WHITE OUT 1 DIT	
1 LOCK	2 LOCK	3 LOCK	4 LOCK	5 LOCK	PASSIVE	PASSIVE	
6 LOCK	7 LOCK	8 LOCK	9 LOCK	10 LOCK	PASSIVE	PASSIVE	
11 LOCK	12 LOCK	13 LOCK	14 LOCK	15 LOCK	System Reset (Current)	System Reset (Current)	
16 LOCK	17 LOCK	18 LOCK	19 LOCK	20 LOCK	System Reset (Current)	System Reset (Current)	
System Reset (Current)	System Reset (Current)	System Reset (Current)	System Reset (Current)	System Reset (Current)	System Reset (Current)	System Reset (Current)	
System Reset (Current)	System Reset (Current)	System Reset (Current)	System Reset (Current)	System Reset (Current)	System Reset (Current)	System Reset (Current)	

BRILLIANT LANCES™

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In space combat, you never see your opponent until it's all over, if even then. With acquisition and tracking ranges measured in tens of thousands of kilometers, to human eyes the people that are trying to kill you are not even a speck. But they can hurt you, even though you can't see them. Precise laser arrays and big particle accelerators, honed by centuries of engineering, can reach out without warning to slit your hull like the belly of a fish, spilling life—oxygen, heat, and fuel—into the hard vacuum.

That's why space combat is a game of cat-and-mouse. Keep yourself wrapped in the mantle of space—cold, dark, silent. Keep your thrust burns to a minimum—they blaze like miniature suns for all to detect. Rig your passive sensors to greedily absorb data, but remain quiet yourself—give nothing away. Keep your weapons ready, in case…There! A faint trace of mid-wavelength infrared betrays a maneuver drive. Bring up the ladar dishes while the big passive array builds up a targeting solution. The moments seem endless while every crewmember shares the same thought: "Have they seen us?" Is the unseen enemy at this moment doing the same thing you are?

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