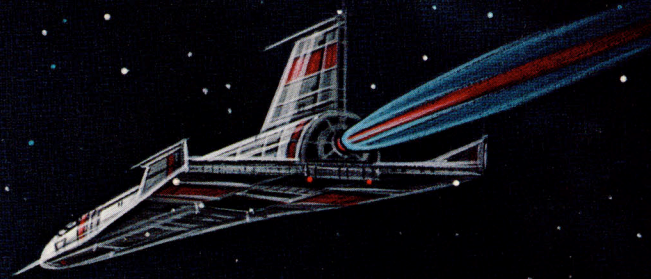


GURPS[®]

SPACE

Roleplaying in the Worlds of Tomorrow



*By Steve Jackson
and William A. Barton*

STEVE JACKSON GAMES

THE FUTURE IS YOURS!

At last . . . the star-spanning sourcebook for the *Generic Universal RolePlaying System*. In the 128 pages of *GURPS Space*, you'll find:

- Detailed, scientifically correct rules for creating star systems and planets . . . either randomly, or to fit a specific campaign.
- Descriptions of 21 character types . . . and new advantages, disadvantages, and skills for a far-future campaign.
 - Three variant human races – heavy-worlders, light-worlders and Spacers – and guidelines for creating new and different sorts of genetically-enhanced humans.
 - Four alien races: Meet the savage near-human Gormelites; the graceful, aggressive Sparrials; the weird, sex-changing Pachekki; and the powerful half-plant Treefolk.
 - Science-fiction gadgets, weapons, and medical technology.
 - Starship construction rules from TL8 (just around the corner) to TL15+ (science fantasy).
 - Quick but detailed *abstract* ship combat rules – no ship counters, just roleplaying . . . for a quick determination of fleet damage, individual ship damage, and injury to characters.

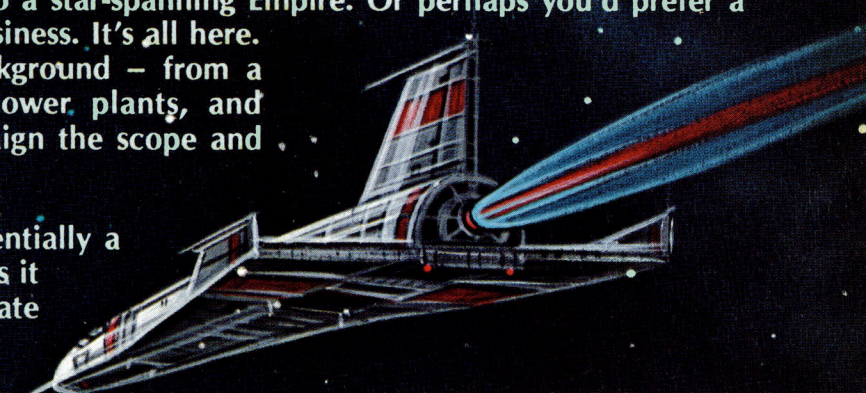
GURPS Space does not tie your game to a single background. Rather, it is designed for the creative GM who wants to develop his *own* universe! This book presents a wide variety of choices and background information, to let you recreate your favorite science fiction background – or build your own, from the homeworld out.

- Choose the scale of your campaign – one star system, or a million.
- Choose the type of campaign you want to run – space pirates or Star Patrol, hard-working merchants or hard-bitten mercenaries, clever smugglers or starry-eyed explorers, humans or aliens.
- Choose the political background – from scattered independent worlds, through a loose Alliance or Federation, to a star-spanning Empire. Or perhaps you'd prefer a Corporate State, run by big business. It's all here.
- Choose the technological background – from a wide variety of stardrives, power plants, and weaponry – to give the campaign the scope and flavor you choose.

Years in the making, *GURPS Space* is essentially a survey of the whole space-adventure genre as it relates to roleplaying. If you're ready to create your own future . . . it's yours.

This book is designed for use with the *GURPS Basic Set*, but can be used as a sourcebook for any roleplaying campaign in outer space.

By Steve Jackson and William A. Barton
Additional material by W.G: Armintrout, Stephen Beeman, Ben Ellinger,
John M. Ford, Don Gallagher, J. David George,
Mike Hurst, David Ladyman and Mike Moe
Cover by Michael Goodwin



0 80742 06005 0

SJG01495 6005

ISBN 1-55634-079-6

Made in the U.S.A.

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INTRODUCTION

There's this about space: It's big. Sometimes entirely *too* big. This project has been tough and long-delayed. But now that it's done, it's probably the *best* worldbook yet, and it's certainly the biggest . . . it just kept growing.

There's just so *much* to cover. In fact, this book "spun off" several other projects. Bill's original manuscript included over 30 complete world descriptions, enough to be a book in their own right. We solved that problem by *giving* them their own book — *Space Atlas*.

And three other subjects that got chapters in this book would be worthy of full-length treatment, too. Sourcebooks we'd like to do include a whole book of *Aliens*, with alien advantages and disadvantages; a whole book of *Ultra-Tech* devices for TL8 and above; and a whole book about tactical starship combat.

We'll also have a number of worldbooks about specific science fiction backgrounds. Two (*GURPS Autoduel* and *GURPS Humanx*) are already out. But this is something else: the (pardon the expression) *generic* book. It's a general sourcebook. You can use it to adventure in your own SF universe, or that of your own favorite SF author — or even that of the SFRPG you used to play (before switching to *GURPS*, of course).

One common question over the past year has been "Will *GURPS Space* be hard-SF or space opera?" Actually, it's both. We have *not* included any sort of pregenerated universe background. Instead, the book tells you how to create your own. Want detailed, state-of-the-art scientific guidelines for building star systems? They're here. Want quick random tables that give believable results? They're here, too. Descriptions of zap guns and aliens? No problem.

In some chapters, we've given very detailed information on (for instance) the way the Galactic Survey works, or the politics of an Interstellar Federation. But, again, this is resource material . . . suggestions. We don't expect the GM to feel locked into these names, or these details, for his own campaign.

We had a lot of fun developing the technical material — but reality testing had to go right out the viewport this time. Not too many blasters or stargate generators available to test, even at Frederick's of Altair VI. So if you disagree with any of our specifications — change 'em. We've done our best to keep the science straight in the *Stars and Worlds* section, but astronomy is a fast-evolving field; today's "facts" may be discredited next week. Until then, take it and run.

Where Credit is Due

We were certainly influenced by previous efforts in SFRP gaming (good or bad), and even more by that vast body of SF literature that has accumulated since the golden age of the '30s.

Our own favorites include the work of authors such as Robert Heinlein, H. Beam Piper, Andre Norton, Poul Anderson, Arthur C. Clarke, Larry Niven, Robert Silverberg, Philip Jose Farmer, Isaac Asimov, Jack Vance, Roger Zelazny, and many more. Overt influences from the SF gaming world would include that old favorite, GDW's *Traveller*; the works of Don Rapp and Chuck Kallenbach of Paranoia Press (which published some of the best *Traveller* supplements); and Richard Tucholka, designer of the too-often overlooked *FTL: 2448*.

And, finally, our sincerest thanks to the many who commented on the various stages of the manuscript. If this book holds together well, it is only because of the dedicated pickiness of all those rules-readers and playtesters. Whatever is missing is the fault of the authors . . . but let us know what you want, and we'll deal with it. After all, we've got a whole universe out there.

Hot jets!

— William A. Barton and Steve Jackson



About GURPS

Steve Jackson Games is committed to full support of the *GURPS* system. Our address is SJ Games, Box 18957, Austin, TX 78760. Please include a self-addressed, stamped envelope (SASE) any time you write us! Resources now available include:

Roleplayer. This bimonthly newsletter includes questions & answers, new races, rules, beasts, information on upcoming releases, and more. Please write for current subscription information.

New supplements and adventures. We're always working on new material. A current catalog is available for an SASE.

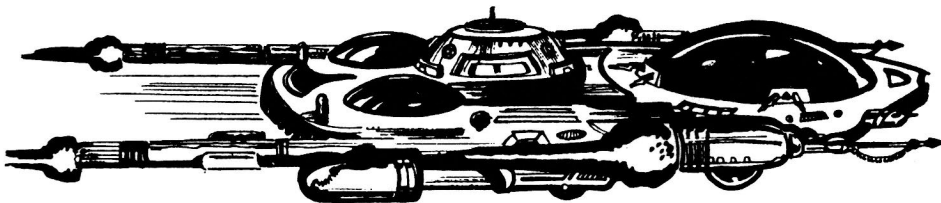
Errata. Up-to-date errata sheets for all *GURPS* releases, including this book, are always available from SJ Games; be sure to include an SASE with your request.

Q&A. We do our best to answer any game question accompanied by an SASE.

Gamer input. We value your comments. We will consider them, not only for new products, but also when we update this book on later printings!

independent military forces in central areas. In times of upheaval, mercs may be called in, but liaison officers will be assigned to ensure that they remain under strict control.

A federation may form its own legion of mercenaries. These troops are useful for prosecuting politically-unpopular wars, especially if they are recruited solely from frontier or foreign worlds — which have no representation in the Congress, and cannot easily complain about combat losses.



Law and Order

Unlike an alliance, which is concerned with the rights of its member worlds, a federation guards the rights of its citizens. The necessities of reelection help to foster this. Federation laws are designed to protect the individual citizen, and to provide security and unity for the society. On the whole, Federation citizens get more benefits, services and protections.

Police functions may be handled by planetary or sector law enforcement organizations or by the Patrol. The Patrol has full authority anywhere in Federation territory, but must cooperate with planetary police — it cannot investigate and arrest independently of local authorities, unless they are obstructing justice.

Extradition of accused criminals between worlds is mandatory under Federation law, provided the requesting world can guarantee a fair trial. Otherwise, the accused will be tried in a Federation court. Federation authorities (such as the Patrol) carry out the extradition process.

Terrorists may be present, but bases must be well-hidden to survive. Any world known to be harboring terrorists can expect swift reprisals from the Federation Marines.

Federations keep tabs on interstellar travel within their borders, routinely inspecting cargoes and travellers. Traffic entering and leaving the nation will be more restricted than that of an Alliance. Passports will be required — especially if the Federation has hostile neighbors — but the emphasis will be on the right of the average citizen to travel, limited by the security needs of the society.

The Patrol is on hand to combat pirates or terrorists and conduct rescue operations when needed. It will also ensure that citizens aren't taken advantage of by unscrupulous transport companies.

Interstellar trade involving Federation worlds is regulated by an Interstellar Trade Commission. The Congress may ban some goods — usually harmful drugs, proscribed weapons, dangerous animals, and so on. Tariffs and duties may exist to control imports that might harm world economies. This means there may be a lucrative business for smugglers in some areas, but that's what the Patrol is for. Customs offices are maintained at all starports in Federation space. Starports are considered Federation territory, and local police do not have jurisdiction there. The Patrol operates these ports, plus any additional posts needed at warp points or along trade routes.

Free news services thrive, restricted only in the name of Federation security.

Taxes may be collected by the Federation, sector and local governments. There may be a personal income tax, or taxes on commerce. Merchants and entrepreneurs will do their best to beat any such tax!

Origin

Federations often evolve when an alliance is forced to strengthen its central government by some threat. Federations last longer than alliances, because their society can quickly meet and deal with external threats, and often has the power and authority to deal with internal ones as well.

Effect on the Campaign

Campaigns set in a federation offer less freedom for those who play fast and loose with the law. However, law-abiding types may find it the safest place of all — if they are Federation citizens. PCs who run afoul of extremist planetary societies might find aid at the nearest Patrol office, unless the Federation approves of the laws they broke.

The Conquered/Insignificant Terrans

In this type of universe, Earth has been conquered or absorbed by a technological (or numerically) superior stellar state, already in existence when Earthmen reach the stars. Earth may be one of many member (or subjugated) worlds, perhaps even considered a provincial backwater of little significance in the galactic scheme. Humans (or Earthmen, at least, if the existing state is also dominated by humans or humanoids) may be second-class citizens, or worse, especially if Earth has been conquered by an alien-dominated federation or empire.

Even if Earth's absorption was peaceful and the rulers are benevolent, Earthmen may be considered children or primitives. This is especially likely if the overlords have superior technology. On the other hand, if the overlords are *too* civilized, Earthmen may be valued as warriors. (This might be as a great ploy on the parts of the stellar rulers — a way to keep those pesky wolfings busy.)

If the rule of the master state is *too* heavy-handed, however, Earth might be in rebellion. Earth might be in confederation with other worlds — or even other, smaller stellar societies.

The campaign then becomes military. PCs would be members of the Rebel forces, fighting for Earth's destiny. Or, to pose a moral dilemma, the GM could make the PCs members of the overlord forces, preparing for a punitive campaign against one of those insignificant worlds bucking imperial rule. The world's name? Oh, Dirt, or Earth, or something like that. Won't matter once you launch those planetbusters, eh? What an honor!



and six years to reach the center of our Milky Way galaxy. Very long trips take longer, of course. Other galaxies in our group are some 700 kiloparsecs apart. The next group of 20-50 galaxies is about 1,500 kiloparsecs away.

Comparative Speed

With warp drives, ships will probably have different speeds, depending on mass and thrust. This can also be true with hyperdrives. Alternatively, all travel in hyperspace is automatically (for instance) at 12 parsecs/hour. The *Ship Construction* section shows the relationship between mass and speed for each drive.

With jump drives, point-to-point speed is likely to be the same for any ship, though one ship can still have better *maneuver* drives than another.

Maximum Range

How far can a ship go at a time? Ships which have to refuel often, or which require lengthy calculations before “going FTL,” may have limits on the distance traveled before another jump or calculation is necessary. Possibilities:

Unlimited — The ship can go any distance, perhaps limited only by acquiring enough energy or suitable engines.

Great distances — A ship can travel a large number of parsecs (chosen by the GM) at a time. In fact, ships might not be capable of going small distances.

Small distances — A ship’s maximum travel range is small, relative to the distance between stars. For example, if the longest convenient trip is 2 parsecs without stopping, interstellar borders will be fairly easy to guard.

The distance traveled may also depend on other factors. For instance, very large ships might be able to jump further than small ones (or vice versa) for reasons inherent in the drive system.

Effects on the Campaign: If ships can travel undetected through hyperspace for long distances, then interstellar nations cannot defend their borders — a hostile ship might warp in at any time.

If ships can only travel short distances in FTL, then interstellar borders and border patrols become feasible. If the stops between voyage segments are long — while capacitors are recharged, or lengthy calculations are made — borders become likely.

Fuel Consumption

Spaceships vary wildly in the amount of fuel they need. Warp drives and hyperdrives must run continuously while the ship is in FTL mode. Jump drives operate for moments only, when “jumping” — but power requirements at that moment might be enormous. Drives consume either fuel or power from a separate power plant. Sublight “reaction drives” need both fuel and “reaction mass” (something to throw one way so the ship goes the other). And power plants don’t create their power from nothing — they too have fuel requirements.

Some fuels are plentiful. A ship that used hydrogen as reaction mass might dive through the outer atmosphere of a gas giant to “scoop” what it needs. A total-conversion power plant could burn *any* matter as fuel. Most restricted are those ships requiring processed fuels, such as radioactives — such ships must either refuel at fuelling stations, or carry their own fuel-processing equipment.

Another possibility: FTL engines themselves require some crystal, rare earth, or other scarce material, which wears out or is used up.

Effects on the Campaign: Availability of fuel will affect any strategic plans, military or otherwise. Ships must carry fuel or the means to get it.

Starships with bad fuel economy must refuel frequently. Refuelling points become strategically important; interstellar borders naturally expand around refuelling points; exploration depends on the location of new fuel sources. If hydrogen is the fuel, gas giants and cool stars may be the important specks of

Map Obstacles

Where can a starship go when travelling in FTL mode? Are there limits on where it can begin its FTL voyage? Jump drives are limited to jump points. Many warp drives and hyperdrives also have limits. Some options:

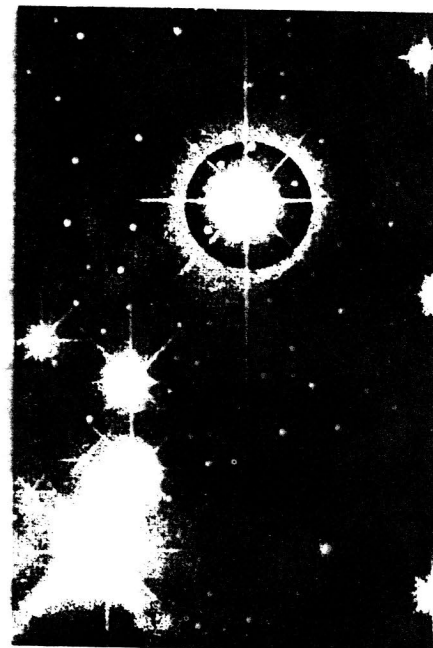
Gravity-limited. FTL travel might be impossible or dangerous within gravity fields of a certain minimum value (selected by the GM) — anything from distant orbit around a planet to dozens of AUs from any star. Planets are most defensible if starships cannot leave FTL travel within strong gravity wells.

Gravity-required. FTL jumps might be impossible except from *within* a strong gravity well — such as that within a few AU of a star or black hole.

Gas Density. Ships which travel in normal space — that is, warp ships — will be limited in speed by the density of gas present. Conversely, they travel faster in low-density regions.

Nebulas and other gas clouds may be dark (like the Coalsack), lit by nearby stars (like the Pleiades, for instance), lit from within (like a nova shell) or glowing by their own ionized light (like the Hourglass Nebula). These regions may be up to 30 parsecs across. Dark dust lanes are sometimes found on a galactic scale. An uncharted nebula will (at best) slow a journey, and (at worst) be a ship-wrecking hazard. Ships may make long detours rather than pass through large gas clouds.

However, space between galaxies or clusters of galaxies will be very open, and travel will be faster. Rifts between a galaxy’s spiral arms could become arteries of travel like terrestrial rivers. Journeys across a galaxy will arch above or below the galactic plane. Increasing speeds for low-density regions may also make otherwise long-distance travel possible.



CHARACTERS

3

Character Creation

Player characters should be built on 100 character points, with a general limit of 40 points of disadvantages and 5 quirks. Racial disadvantages of aliens and variant humans don't count against the 40-point limit.

The literature of science fiction is so diverse that dozens of character types are available for a *Space* campaign. Some important categories:

Starship Crew

Crew positions include Captain, First Officer, Pilot (or Helmsman), Astrogator, Communications, Medical, Science, and Security Officers, Engineer, Technician, Cargomaster, Steward, and Gunner (or Weapons Officer). On smaller ships, several positions are held by each crewman; larger ships have several crew for each position.

Skills of value to starship crew include Astrogation, Computer Operation or Programming, Electronics (especially Communications, Force Fields, Medical/Life Support, Sensors, Starship Weaponry), Engineering (any space specialty), Free Fall, Gunner (any starship weapon), Mechanic (any space specialty), Piloting (spaceship or auxiliary craft), and Vacc Suit.

Merchant

An interstellar trader who cruises the spaceways, buying and selling. Merchant, Fast-Talk, and Diplomacy skills are a must. Unless he's a full-time trade specialist, he'll also need crew skills — especially on a small trading vessel.

Navy

Crew on a regular military vessel. *Marines* are ground troops transported via starship. Military Rank is useful, unless you want to be a private all your life.

Patrolman

A member of the Interstellar Patrol (see p. 17), combining the skills of a police investigator with those of a soldier to keep the spacelanes safe. Sense of Duty is a must.

Pirate/Smuggler

The most common interstellar criminals. Smugglers run contraband from world to world — anything from guns to drugs to slaves — slipping past the Patrol in fast, well-protected starships. They can use any of the Thief/Spy skills. Pirates are the scourges of the spacelanes, attacking freighters, liners, lightly guarded colonies, prospectors and other prey. Combat skills and Odious Personal Habits are appropriate.

Survey Scout/First-in Scout

Scouts (see p. 16) find and explore new worlds. They might specialize in one or more sciences, or be "general specialists." Planetology, Xenobiology, and Survival skills will be vital.

Other Starfarers

These may be found groundside, or as starship passengers. They may have their own ships, but they might not have crew skills; they may have hired crew.

Assassin

The killer for hire (or for a cause). Skilled in many weapons (especially silent ones), stealth and disguise, interstellar assassins are among the most dangerous characters in space. All the Thief/Spy skills, appropriate weapon skills, and a good cover skill will be needed.

Bounty-Hunter

Adventurers who make their living tracking down criminals, traitors, spies and pirates along the frontier. They often go where official lawmen, such as the Patrol, cannot — by treaty, by convention or because the risk isn't worth the prize. They are often solitary, though teams also exist: the catch is easier but the bounty must be split. Their methods may be questionable, but they often get results when the law can't. Thief/Spy skills, especially Streetwise, and Carousing will help.

Colonist

The hardy folk who carve new lives out of the wilderness of a virgin planet. They may be part of a religious or ethnic group, sponsored by a government, part of a commercial venture, or on their own. Survival is the most important skill here.

Dilettante

Wealthy folk who travel because they've seen everything at home, often with an entourage or at least a servant or bodyguard. High Social Status is appropriate; so is Savoir-Faire, if the dilettante bothers to use it.

Diplomat

The silver-tongued negotiators that keep rival worlds cordial — or at least on speaking terms. They are assigned to newly discovered civilizations, often accompanying survey crews when a new world is known to have a sapient species. They also serve on embassies to other starfaring nations or races. They are usually government employees, though some may be skilled independent negotiators. And some may also be spies. Fast-Talk, Diplomacy and Savoir-Faire are musts. Xenology is useful.

Escort

Tough, competent characters, hired to guide and protect more peaceable starfarers. They may be individual guides or hired guns, small freelance teams, or corporate employees. Scientists, journalists, and diplomats are especially likely to need their services. Streetwise, Survival, vehicle and weapon skills will all be useful.

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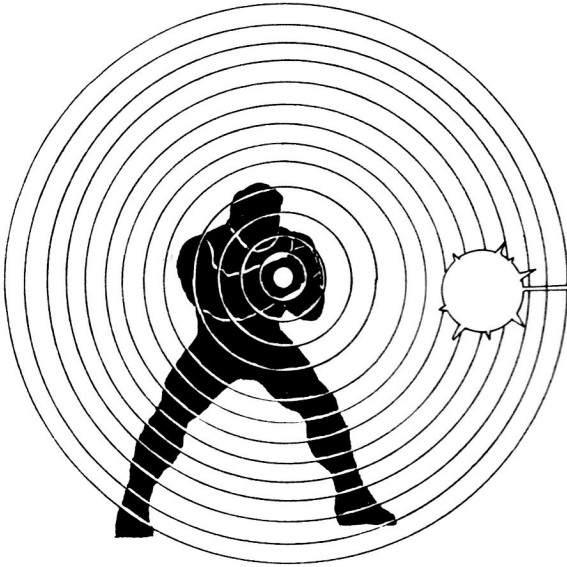
WEAPONS

This chapter lists a selection of futuristic weapons. GMs should decide which ones to make available. Perhaps there is only one standard weapon technology . . . everyone carries a laser. But if the campaign is set in a huge and diverse universe, with dozens of races and thousands of years of history, there may be *many* types of weapon available.

We have assumed that “civilian” weapons won’t get much deadlier on a shot-for-shot basis; that’s not necessary. They *will* become smaller, lighter, more penetrating, and, for the most

part, recoilless. Military weapons are deadly: wear armor, or don’t get hit. However, ranges will not increase indefinitely on military weapons; most firefights take place within 300 meters, and (except for special sniper weapons) hand-weapon range beyond that is a liability, not an asset.

The tables use the same format as the weapons tables in the *GURPS Basic Set*. Costs and weights assume a loaded or charged weapon, including one magazine if it uses magazines. Power cells are described on p. 53.



Weapon Legality

One question starfarers always ask, when reaching a new world, is “What weapons can we carry?” Each weapon has a *Legality* rating. The more lethal it is, the lower its Legality.

Class 6: Wholly nonlethal items, like short-range stunners.

Class 5: More powerful nonlethal weapons, like stun rifles.

Class 4: Hunting weapons, like single-shot laser rifles. This also includes knives and other low-tech weapons.

Class 3: Light concealable weapons, like most pistols.

Class 2: Medium weapons, such as single-shot disruptors.

Class 1: Military-style weapons, like automatic rifles.

Class 0: The heaviest personal weapons, such as grenades and squad-level military weapons.

The class of weapons and armor that will be *legal* at any given locale will generally depend on the local government’s Control Rating (p. 122). However, effective Control Rating may be reduced in some societies (e.g., 20th-century USA) where citizens insist on the right to go armed. It may be increased in others (e.g., 20th-century England, where the cop on the beat isn’t allowed a gun). The effective CR of an area determines who will be allowed to have what kind of weapon. A very violent society may have a *negative* CR with respect to weapons!

Note also that starship passengers aren’t likely to be permitted any weapons at all, and that even the crew won’t want to

use military-style weapons in space, for fear of wrecking the ship.

Legality = CR+2 or more: Any citizen may carry the weapon.

Legality = CR+1: The weapon may be carried by anyone except a convicted criminal or the equivalent. Weapon registration is required, but there is no permit fee.

Legality = CR: A license is required to own or carry this weapon. To get a license, one must show a legitimate need for the weapon. Generally, a license costs 10-60% of the price of the weapon itself. The GM may set this, or roll a die.

Legality = CR-1: This weapon is prohibited except to government agents, police, and bonded security troops.

Legality = CR-2: This weapon is prohibited except to police SWAT teams, military units, and perhaps secret intelligence agencies.

Legality = CR-3 or worse: This weapon will only be found in the hands of the military.

So, for instance, on a world with Control Rating 4, anybody could carry a stun pistol (Legality 6); registration would be required for a stun rifle (Legality 5); permits would be required for hunting weapons (Legality 4); and ordinary citizens could own nothing heavier.

Getting a Ship Without Buying It

In most campaigns, a prime goal of the PC group will be to get — or keep — their own starship.

They can be members of a military or other government service, which assigns them a ship. Of course, the service will also assign them specific duties, unless they are special agents or assigned to detached duty.

They can be employed by a corporation that provides a ship. Again, however, most adventuring will be limited to that which serves the company's purposes (usually pursuit of profit).

If they join a pirate or other criminal gang, they may be supplied a vessel and allowed some measure of freedom. But they must give the organization a healthy cut of any profits, and make themselves available for special services from time to time. The latter will usually be dangerous and always be illegal.

PCs can be free traders or work as crew on a ship owned by an NPC. Free traders will not allow the PCs to take the ship off on profitless adventuring. Other owners might be more liberal in allowing PCs a say in the ship's next destination or purpose.

The PCs could steal a ship. This might be one they've purchased but are unable to meet payments on, one they've leased, or one they've hijacked. This should always be played out as an adventure. If FTL communications exist, players who steal a ship might find it difficult to get far enough away to evade capture. And some rental companies, as well as those to whom ship payments are due, take precautions. The engines (or life support!) may be rigged to shut down after a certain period of time. If the computer is sentient, it may become a dangerous opponent if the ship is stolen. It should require high skill to deactivate such precautionary measures.

A party might be fortunate enough to find a ship that they can claim as salvage, either adrift in space or abandoned on a planet. This is also best played out as an adventure.

The PCs might accept a very dangerous job with a ship as the payment. This might be a freelance mission for an intelligence agency or the military, for a private firm or even a criminal organization. Or perhaps for that very rich NPC who needs a favor: "Rescue my daughter from the Death Planet, and this ship is yours!"

Or the group can get along without a ship, by buying (or working) whatever passage they need. They might also put down a deposit and *lease* a ship. Most major starports have rent-a-ship centers. They must return the ship in time or suffer penalties (financial at least; worse if they've kept the ship overtime without a valid reason).

Jump Drive

A jump generator masses 2 tons and takes 8 cy; it costs \$70,000. A ship requires one jump drive generator for each 500 tons of its total mass.

A jump drive requires energy only when it initiates the jump. Typical energy requirement for initiating a jump is 1 MW-h per ton of ship mass. A stargate requires 2 MW-h of energy per ton of ship transmitted, but stargates are huge and can afford large power plants and huge banks of capacitors.

Warp Drive

Warp engines come in different sizes. They produce FTL thrust, or "warp thrust," which works in a manner similar to the thrust produced by maneuver engines. One "warp thrust factor" (WTF) will propel 1 ton of mass at 1 parsec per day (1,100 times lightspeed). The maximum speed of warships should be set by the GM. Up to that limit, though, the higher a drive's WTF, the faster the ship goes.

A standard warp engine costs \$20,000, weighs 2 tons and takes up 5 cubic yards, *plus* \$5,000, ½ ton and 1 cy for every 10 WTF produced. Each 10 WTF requires 1 MW of power. Thus, if a ship has multiple engines, it can lose one and still continue at reduced speed. The drive can be overloaded to get extra speed — see *Engineering*, p. 35.

Crew and Passengers

Mass and space must be allowed for each person aboard ship. This accounts for the people themselves, accommodations, facilities and corridor space. Life-support systems are discussed below.

For short flights, only seating space is needed:

Crew, in pilot chairs during flight: ½ ton each, 1 ½ cubic yard, \$1,000 per position.

Passengers, seated during flight: ¼ ton each, 1 cubic yard, \$500 per position.

For longer voyages, living accommodations are required. The figures below allow for both command positions and living space.

Crew, including corridor, bridge, other controls, and living space: 1 ton each, 25 cubic yards, \$4,000 per crewman.

Passengers (steerage accommodation), including corridor and living space: ½ ton each, 12 cubic yards, \$1,000 per passenger.

Passengers (standard accommodation), including corridor and living space: 1 ton each, 20 cubic yards, \$3,000 per passenger.

Passengers (first-class accommodation), including corridor and living space: 2 tons each, 40 cubic yards, \$6,000 per passenger.

Passengers (luxury accommodation), including corridor and living space: 3 tons each, 100 cubic yards, \$30,000 per passenger.

Freeze capsules for crew or passengers in cold sleep: see p. 70. ½ ton each (full), 2 cubic yards, \$55,000.

Required Crew

Crew requirements vary widely from the averages given here. Military ships will have larger crews, to allow for losses in combat. Transports often run with a bare minimum of crew, to save money. A civilian yacht might not have anyone with these titles, but somebody needs to do the job. Ships with a very small crew need very talented crewmen, since several jobs are doubled up.

In general, crew should have a skill level of at least 14 in the skill(s) appropriate to their positions. But, especially at high TLs, good computers can make up for a lot, and a luxury yacht can go from star to star even though nobody aboard knows anything about piloting, astrogation, or the engine room.

If the GM feels a ship is under-crewed, he should assess penalties to appropriate skill rolls, especially in stress situations when one spacer has to be in three places at once.

Command: At least one, plus one more for every five non-command crew. However, the officer who supervises engineers will usually be an engineer himself; the same goes for other specialties. On small ships, the commander usually doubles as pilot or gunner.

Pilot: At least one unless the ship is being trusted to a piloting computer. All but the smallest military ships will have three pilots and one specialist astrogator. On very small ships, the pilot usually runs the sensors.

Medical officer: As a rule, one full-time medic if there are more than 20 aboard (or 10 for over a month), plus one more medic or assistant for every additional 50 aboard.

Engineering: One engineer for every 60 tons, or fraction thereof, of the total mass of the maneuver drive, FTL drive, and power plant.

PLANETARY CIVILIZATIONS

11

For each world with intelligent life, native or otherwise, the GM should determine basic facts important to the adventurer: the general structure of the society, tech level, basis of the economy, and existence of important facilities.

Population

The GM may assign population as he chooses, or calculate it based on the world's history and environment. The Population Rating (PR) is the "order of magnitude" of the world's population. Increasing the world's PR by 1 multiplies the actual population by a factor of 10.

There are three good ways to set PR. For a random determination, just roll 2 dice and subtract 2. To assign PR according to campaign needs, base it on the following:

- 0: less than 10. Research team, shipwreck survivors, etc.
- 1: 10-99. As above, or a very small startup colony.
- 2: 100-999. The smallest likely startup colony, or a military base.
- 3: 1,000-9,999. A fairly small colony (equivalent of a small town).
- 4: 10,000-99,999. A growing colony or very large military base.
- 5: 100,000-999,999. Equivalent to the population of a small city.
- 6: 1 million-9,999,999. Equivalent to a single large city.
- 7: 10 million-99,999,999. A huge city, like New York; a large colony.
- 8: 100 million-999,999,999. A very large and successful colony.
- 9: 1 billion-9,999,999,999. A long-settled world or homeworld.
- 10: 10 billion-99,999,999,999. A severely overpopulated world.

Calculating Population of Colony Worlds

It is also possible to calculate PR mathematically, based on the history of the world in your campaign. The initial PR might be anywhere from 2 (a very small colony) to 5 (from a huge colony ship or fleet). Growth of the original colony depends on how hospitable the world is. On a wholly Earthlike world, with medical technology of at least TL5, a human population will increase by a factor of 10 every 100 years, up to the maximum population for the planet (see below).

Non-Earthlike environments will reduce this *increase factor*, as shown below. If the increase factor is 0, population on the planet is static; if the increase factor is negative, the world is so hostile that population is in decline.

High Gravity: For gravity over 1 G, subtract the gravity, *cubed*, — e.g., if gravity is 1.2, subtract (1.2 x 1.2 x 1.2.)

Low Gravity: For gravity under 1 G, take (2-G) and subtract the result, *cubed* — e.g., if gravity is .7, subtract (1.3 x 1.3 x 1.3.)

Composition: Subtract 4 if the world is Metallic. Subtract 2 if it is High-Iron or Silicate.

Climate: Subtract 4 if the climate is Very Hot or Frozen. Subtract 2 if it is Hot or Very Cold.

Atmosphere: Subtract 2 if the atmosphere is Thin or less, or if it is Polluted; subtract 3 if it is both, or if it is Exotic or Corrosive.

Other factors: Continual war, savage or toxic native life, disease and so on will also lower the factor of increase. Deliberate attempts to increase the

Native Intelligence

When intelligent life is encountered, the GM may get basic information about it by rolling three dice on the table below. Add 3 if the planet is Hostile Terrestrial; subtract 1 if it is Earthlike. Assume a native race is perfectly adapted to its environment unless it is a colony, or unless the world is a dying one.

- 4 or less — Human colony (perhaps lost)
- 5-8 — Cold-blooded, four limbs
- 9 — Cold-blooded, six limbs
- 10 — Warm-blooded, four limbs
- 11 — Warm-blooded, six limbs
- 12 — Insect- or crab-like
- 13 — Boneless or worm-like
- 14 — Plant-like
- 15 — Two races living in a symbiotic relationship; roll twice more.
- 16 — Roll two dice on the "Psychological Oddities" table, and again on this table at a +2.
- 17+ — Physically very unusual; roll 2 dice on the next table.

Physical Oddities

- 2, 3 — Energy eater
- 4 — Gaseous
- 5 — Shapeless
- 6 — Roll twice more on this table, discarding contradictions
- 7 — Roll two dice on the "Psychological Oddities" table, and again on this table.
- 8 — Possesses a sense humans don't have, such as radar
- 9 — This is an outpost; race is not native to the planet and is not adapted to it.
- 10 — Artificial or mechanical life.
- 11, 12 — Silicon-based metabolism

Psychological Oddities

These creatures have cultures very different from the humanoid patterns described in the rest of this chapter. The GM may add details as he chooses.

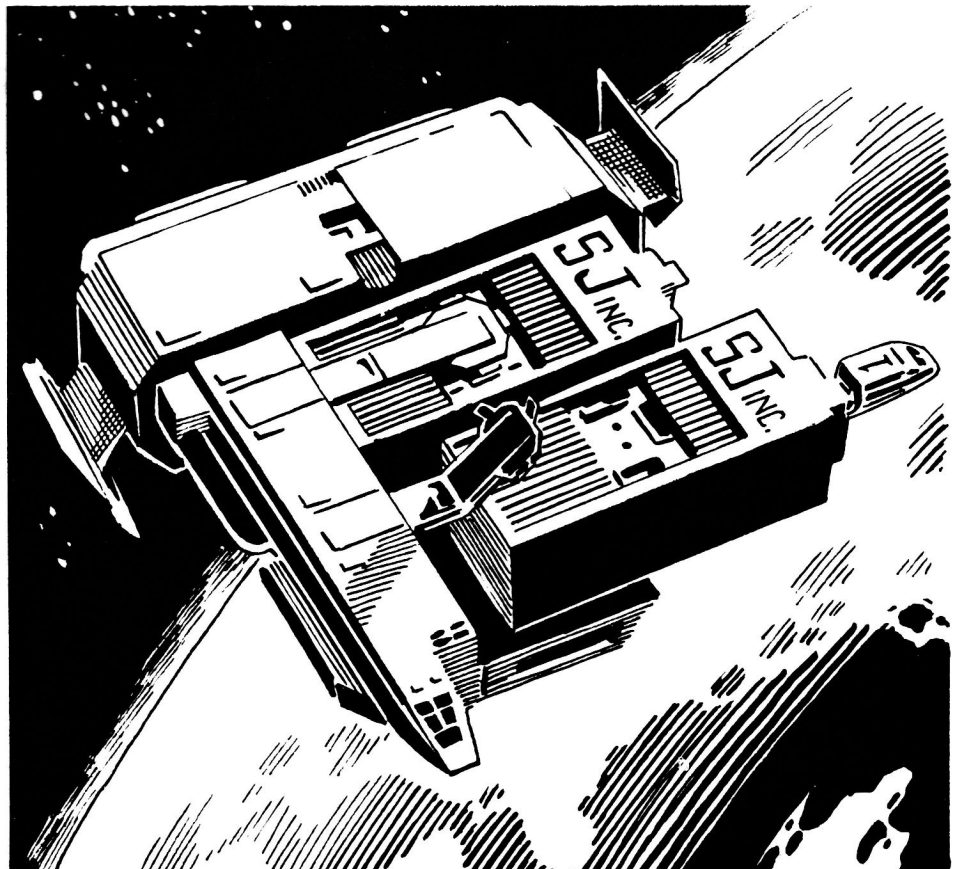
- 2, 3 — Simply incomprehensible to mankind
- 4 — Hive culture (telepathic)
- 5 — Hive culture (non-telepathic)
- 6 — Dislikes other intelligent life
- 7 — Extremely short life span
- 8 — *Secretly xenophobic:* dislikes other intelligent life
- 9 — Ignores attempts to communicate
- 10 — *Secretive;* avoids *all* contact!
- 11, 12 — Moves/thinks *very* slowly

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GLOSSARY

Technical and scientific terms, and some common science fiction abbreviations, used in this book:

AU: Astronomical unit. The distance from the Earth to the Sun — 93 million miles.
 biozone: The area around a star at which the temperature allows water to exist as a liquid. This is the area in which a habitable planet can orbit.
 c: the speed of light, 186,000 miles per second
 escape velocity: The speed at which a ship must travel in order to completely escape a planet's gravitational field. For Earth, this is 6.9 miles per second.
 FTL: faster than light
 G: A unit of acceleration equal to the gravitational pull of the Earth. Thus, Earth gravity is "1 G."
 gig, or gigabyte: A unit of computer data storage. 1 billion

bytes, or 1,000 megabytes.
 kiloparsec: 1,000 parsecs.
 light year (ly): 5.9×10^{12} miles.
 main sequence: The normal course of evolution for stars. Most stars are on the "main sequence."
 meg, or megabyte: A unit of computer data storage. 1 million bytes.
 megawatt: 1 million watts. A unit of power, used in this game to define power plant output.
 megawatt-hour: A unit of energy, equal to the output of a 1-megawatt power plant for one hour. Used to describe the amount of energy held by capacitors.
 parsec (pc): 3.26 light years.
 rad: A unit of radiation as it affects the human body.
 STL: slower than light.

where V_E is escape velocity; g is the world's gravity in Gs; R is the planet's radius in Earth radii. *Time* to reach escape velocity is [V_E divided by (ship's acceleration - g)] x 165 seconds.

Formula to determine the escape velocity from a planet:

$$V_E = 2 g/R \times 4.89 \text{ miles per second}$$

SHIP RECORD

Class _____ Size _____ TL _____
 Registration _____ Owner _____ Captain _____

				Total Cost	Mass	cy	Power
Hull: Size _____	cy	\$/cy _____	mass/cy _____				
Armor: DF _____	cy	\$/cy _____	mass/cy _____				
Force Field: DF _____							
Streamlining: _____							
Compartmentalization: _____							
Stress rating _____							
Power plant: _____			Base _____				
Output _____	MW	\$/MW _____	cy/MW _____	mass/MW _____			
Fuel _____							
Capacitors: MW-h _____							
Maneuver Drive: _____			Thrust _____	tons			
Reaction Mass: _____							
FTL Drive: _____							
Crew: _____							
Passengers: _____							
Lifesystem: _____							
Weapons: _____			Total FP _____				
_____			Total FP _____				
_____			Total FP _____				
_____			Total FP _____				
_____			Total FP _____				
Sensors: _____							
Computer: _____							
Airlocks: _____							
Accessories: _____							

Notes _____			Totals				
_____			Cargo Capacity				
_____			Loaded Mass				

Combat Record

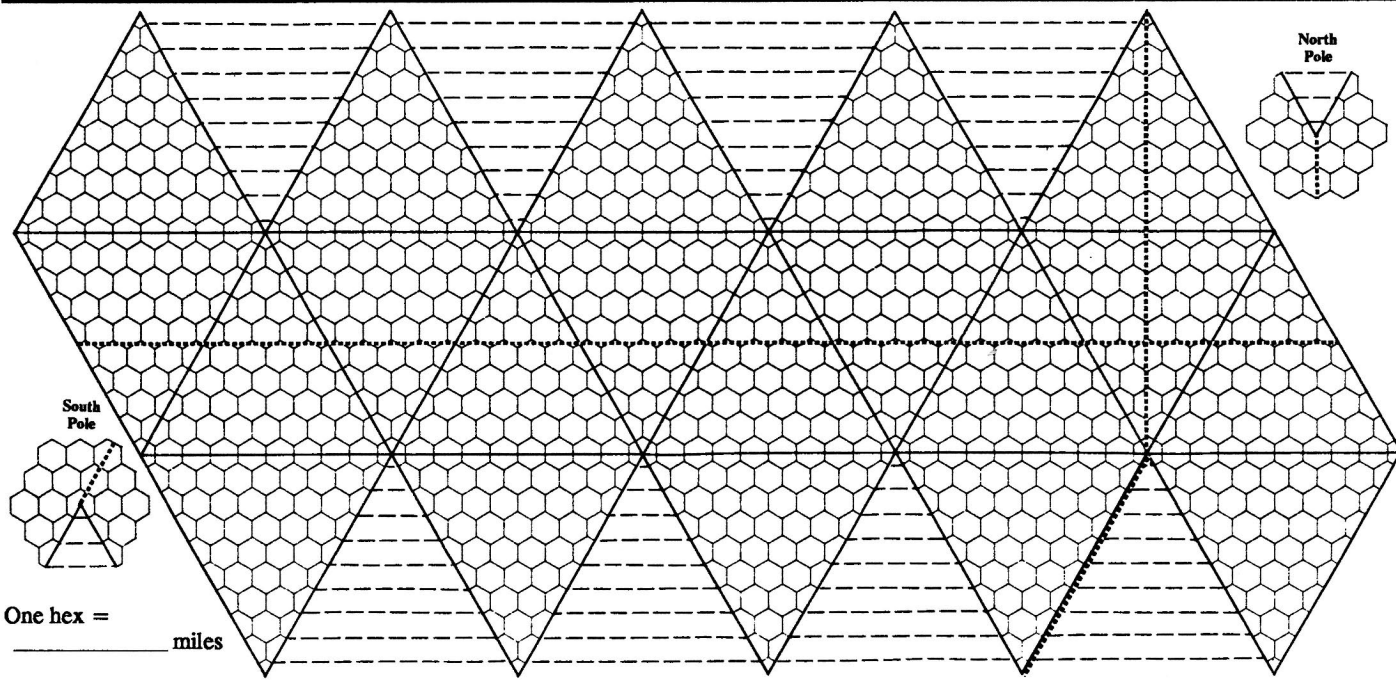
Name _____ Size _____ cy Capt. _____ (Tactics _____)
 TL _____ Compartmentalization _____ Hull Integrity _____
 Armor DF _____ Force Field DF _____ Other DF _____ Total DF _____ PF _____

Weapon	Gunner (Skill)	FP	Power	Weapon	Gunner(Skill)	FP	Power
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____

Missile Load	Type	FP	Qty.	Type	FP	Qty.
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

Damage: _____

PLANETARY RECORD



Planet type _____ Diameter _____ mi. Gravity _____ G Density _____ Composition _____
 Axial Tilt _____ ° Seasonal Variation _____ Length of Day _____ hrs. Length of Year _____ days/ _____ Earth years
 Atmosphere: Pressure _____ (_____) Type and Composition _____
 Climate _____ Temperatures at 30° latitude: Low _____ ° Average _____ ° High _____ °
 Surface Water _____ % Humidity _____ % Primary Terrain _____
 Mineral Resources: Gems/Crystals _____ Rare Minerals _____ Radioactives _____
 Heavy Metals _____ Industrial Metals _____ Light Metals _____ Organics _____
 Moons _____

Biosphere: Dominant life form _____
 Other significant life forms _____

Civilization: Population(s) _____ Tech Level(s) _____ Control Rating _____

Society _____
 Starports _____
 Installations _____

Economic/Production _____

Other notes: _____

System Information:

Star Name _____ Type _____ Location _____
 Biozone _____ Inner Limit _____ Number of Planets _____

Planet	Orbit Distance	Type	Diameter	Density	Gravity	Atmosphere	Notes
_____	1	_____	_____	_____	_____	_____	_____
_____	2	_____	_____	_____	_____	_____	_____
_____	3	_____	_____	_____	_____	_____	_____
_____	4	_____	_____	_____	_____	_____	_____
_____	5	_____	_____	_____	_____	_____	_____
_____	6	_____	_____	_____	_____	_____	_____
_____	7	_____	_____	_____	_____	_____	_____
_____	8	_____	_____	_____	_____	_____	_____
_____	9	_____	_____	_____	_____	_____	_____
_____	10	_____	_____	_____	_____	_____	_____
_____	11	_____	_____	_____	_____	_____	_____
_____	12	_____	_____	_____	_____	_____	_____
_____	13	_____	_____	_____	_____	_____	_____
_____	14	_____	_____	_____	_____	_____	_____
_____	15	_____	_____	_____	_____	_____	_____
_____	16	_____	_____	_____	_____	_____	_____
_____	17	_____	_____	_____	_____	_____	_____
_____	18	_____	_____	_____	_____	_____	_____
_____	19	_____	_____	_____	_____	_____	_____
_____	20	_____	_____	_____	_____	_____	_____
_____	21	_____	_____	_____	_____	_____	_____

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