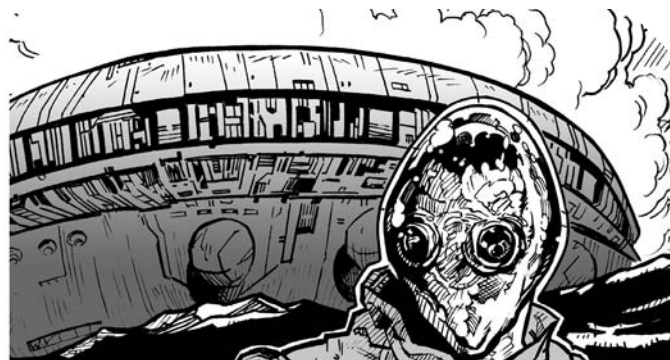


GURPS®

Fourth Edition

SPACESHIPS 2

TRADERS, LINERS, AND TRANSPORTS TM



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An e23 Sourcebook for GURPS®

STEVE JACKSON GAMES

Stock #37-0121

Version 1.0 – May 9, 2008



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INTRODUCTION

The lifeblood of a spacefaring civilization is the commercial ships that carry freight and passengers between worlds and the intrepid captains and crews who operate them.

This **GURPS Spaceships** supplement is a nuts-and-bolts tool kit intended to give **GURPS Space** Game Masters the ships and game mechanics for such campaigns. It presents a range of commercial freighters, passenger liners, and specialized transport ships such as ferries and yachts. Rules detail the expenses incurred in acquiring and operating a private spaceship for profit, and provide simple systems for interstellar commerce.



PUBLICATION HISTORY

Some of the rules on buying and financing ships, and the description of spaceports, include material from **GURPS Space** (Third Edition by William A. Barton, Steve Jackson,

About the Series

This is the second installment in the **GURPS Spaceships** series, which is designed to support **GURPS Space** campaigns by providing ready-to-use spacecraft descriptions and rules for space travel, combat, and operations. Each supplement provides vessel descriptions and supplementary rules. You'll need the core volume, **GURPS Spaceships**, to use this product.

and David Pulver; Fourth Edition by Jon F. Zeigler and James L. Cambias).

The economics and trade systems include concepts derived from rules in **GURPS Traveller: Interstellar Wars** by Paul Drye, Loren Wiseman, and Jon. F. Zeigler, with additional material by Christopher Thrash, which in turn were inspired by the more complex system of **GURPS Traveller: Far Trader**. GMs seeking a model for more detailed economics will find much of value in these books.

ABOUT THE AUTHOR

David L. Pulver is a freelance writer and game designer based in Victoria, British Columbia. He is co-author of the **GURPS Basic Set, Fourth Edition** and author of **Transhuman Space**, **GURPS Spaceships**, **GURPS Ultra-Tech**, and many other games.

About GURPS

Steve Jackson Games is committed to full support of **GURPS** players. Our address is SJ Games, P.O. Box 18957, Austin, TX 78760. Please include a self-addressed, stamped envelope (SASE) any time you write us! We can also be reached by e-mail: info@sjgames.com. Resources include:

Pyramid (www.sjgames.com/pyramid). Our online magazine includes new **GURPS** rules and articles. It also covers the **d20** system, *Ars Magica*, *BESM*, *Call of Cthulhu*, and many more top games – and other Steve Jackson Games releases like *Illuminati*, *Car Wars*, *Transhuman Space*, and more. *Pyramid* subscribers also get opportunities to playtest new **GURPS** books!

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Errata. Everyone makes mistakes, including us – but we do our best to fix our errors. Up-to-date errata sheets for all **GURPS** releases, including this book, are available on our website – see below.

Internet. Visit us on the World Wide Web at www.sjgames.com for errata, updates, Q&A, and much more. To discuss **GURPS** with SJ Games staff and fellow gamers, come to our forums at forums.sjgames.com. The **GURPS Spaceships 2 – Traders, Liners, and Transports** web page is www.sjgames.com/gurps/books/spaceships2.

Bibliographies. Many of our books have extensive bibliographies, and we're putting them online – with links to let you buy the books that interest you! Go to the book's web page and look for the "Bibliography" link.

Rules and statistics in this book are specifically for the **GURPS Basic Set, Fourth Edition**. Page references that begin with B refer to that book, not this one.

CHAPTER ONE

SPACECRAFT

Captain Winters was 34 years old, and he had two loves in his life. The first was his starship, the **Kiev**-class tramp freighter **S.S. Innsmouth**. The second was his wife, Fiona Sullivan, former third cargo officer of the freight liner **Sullivan's Rose**. They'd first met in a spacer's bar on Ambergris, then collided again when their ships crossed path seven months later at an orbital station on Nova Terra. Careful docking maneuvers were followed by a marriage proposal, which entailed complex negotiations with the Sullivan clan – any engagement between interstellar traders was more than a love match.

Winters gained a skilled cargo officer with the kind of contacts that came from service aboard a major freight liner. Fiona gained a husband and a promotion. She became first officer on the **Innsmouth**, finally escaping from under her great-grandmother's thumb. (The captain of **Sullivan's Rose** was an ancient matriarch whose supply of black-market immortality drugs had ensconced her in command for more than a century.) Fiona knew her only future lay in marriage or mutiny. She chose marriage.

But though she was now wife and first mate, Fiona had no illusions that she came first in her new husband's heart. Like all starship masters, Nathaniel Winters was first and foremost married to his ship. **Innsmouth** massed only 3,000 tons, but her holds could carry 1,000 tons of general cargo and her powerful little warp drive could make an impressive two parsecs a week. The ship, its small crew and dependents, and the few passengers she sometimes carried were Captain Winters' total responsibility. He was absolute ruler and monarch of a tiny world, and he ran the ship with both an iron hand and a sober intensity that were frightening to behold.

That is, until **Innsmouth** got safely into hyperspace. Then Nathan turned everything over to his wife and first officer, locked himself in his cabin, and drank himself into oblivion.

He drank because Fiona loved children, he couldn't say no, and now he had four pint-sized crew brats still too young for proper work taking up valuable space that could otherwise go to paying passengers.

He drank because his old girl **Innsmouth** was a fusion-drive freighter in an era of reactionless-drive ships, the fuel costs were eating his profits alive, and the bank had turned down his loan for a new engine.

He drank because of berthing fees, insurance fees, the looming annual maintenance inspection, and his mercenary, hired crew that refused to accept shares over salary.

And most of all, he drank because a high-G course to outrun a suspected pirate ship off Starkad's Drift had broken nearly all the expensive Akkadian peach brandy in the hold that his idiot crewman Dobbs had improperly stowed. Oh, they'd been insured, but it had taken a week to clean the sickly sweet mess out of the cargo hold. After Dobbs had finished swabbing it out, Nathan

had been so disgusted he'd just kept the 13 surviving bottles himself rather than even try reselling them. So now he drank one bottle a week, every jump.

Because he was scared he'd lose his ship.

On their most recent port call, Fiona had invested the last of their savings in a speculative lot: a half-price deal on 200 slightly used agricultural robots, which she was **sure** would sell on the agricultural world of Melchidezek III. She even had a contact over there, some pretty blue-eyed farm boy she'd met years back at a local square dance when **Sullivan's Rose** had visited. The kid was sweet on her. Had even written, for a while. A farm-boy-made-good who was now president of the planet's Agricultural Export Board. He would give them a good deal, Fiona promised. For old times' sake.

When we meet him, better not say we're married, she'd said.



But Melchidezek III was six parsecs away. And with half their holds full of farm machinery bought on spec, would they find enough freight and passengers to keep them out of the red until then? He'd done the numbers. There was only one thing to do. Skip on the insurance. Fake it. Hope nothing went wrong.

In his cabin, Captain Nathaniel Winters sighed. Then he reached for another bottle of peach brandy.

It was the last one left . . .

Commercial spacecraft are the thread that binds the worlds of a spacefaring society. This chapter presents several craft built using the **GURPS Spaceships** rules. However, since **GURPS** has no default interstellar background setting, only a few of the many possible combinations of spaceship systems, drive types, and degrees of superscience can be covered. These ships are a representative mix of hard science (mostly at TL8-10) and superscience (mostly at TL10-12) commercial and private vessels. Since the basic system in **GURPS Spaceships** is highly modular, GMs should find it fairly simple to swap out components and adjust their details to fit campaign assumptions. Feel free to replace any system with another, adjusting the statistics as described in the **GURPS Spaceships** rules.

Note: The abbreviation "C" is used for Complexity when referring to control-station computers; e.g., a "C8 computer" has Complexity 8. A high-energy system is indicated by a "I".

TRAMP FREIGHTERS

Also known as freehaulers or free traders, these vessels are merchant spaceships that don't follow fixed schedules. They tend to serve small colony worlds or stations on frontier worlds or along branches away from the main space lanes. They're owned by individuals, families, or small companies rather than major shipping lines. Tramps are smaller than the heavy freight liners since they operate in the margins of the larger operations, carrying mixed freight and passenger loads or surviving through speculative trading. Faster or longer-ranged traders are also used for exploratory trading ventures, going where no merchant has gone before to seek out profitable opportunities and open up new markets. They may also engage in risky and illegal activities such as smuggling, privateering, or slave trading, either out of greed . . . or simple desperation.

PIONEER-CLASS FREIGHTER (TL9⁺)

This is a small nuclear-powered rocket ship built for mixed cargo and passenger transport on relatively short, fast hops (e.g., Earth orbit to the moon, or to a Lagrange station). The spaceship lacks artificial gravity and has little in the way of creature comforts, but is inexpensive to operate. It is

constructed using an unstreamlined hull that masses 300 tons (SM +7) and is about 90 feet long. Ships are named after early aviation and space pioneers.

Front Hull	System
[1]	Light Alloy Armor (dDR 5).
[2-4]	Cargo Holds (15 tons capacity each).
[5]	Habitat (bunkroom, one-bed sickbay).
[6]	Habitat (two cabins).
[core]	Control Room (C5 computers, comm/sensor 5, three control stations).
Central Hull	System
[1]	Light Alloy Armor (dDR 5).
[2]	Cargo Hold (15 tons capacity).
[3-6]	Fuel Tanks (15 tons hydrogen providing .54 mps delta-V each).
Rear Hull	System
[1]	Light Alloy Armor (dDR 5).
[2-5]	Fuel Tanks (15 tons hydrogen providing 0.54 mps delta-V each).
[6]	Nuclear Thermal Rocket (0.5G acceleration).
[core]	Engine Room (one workspace).

The usual crew is a command pilot, a navigator, a ship's engineer (who splits his time between the engine room and bridge station), and sometimes a steward or cargo master.

TL	Spacecraft	dST/HP	Hnd/SR	HT	Move	LWt.	Load	SM	Occ	dDR	Range	Cost
9	Pioneer-Class	50	-2/5	13	0.5G/4.32mps	300	60.8	+7	8ASV	5/5/5	0	\$4.05M

OUTLANDER-CLASS DEEP-SPACE FREIGHTER (TL10)

This is a general-purpose medium freighter built for interplanetary cargo voyages to worlds or stations off the main routes. It has a 3,000-ton (SM +9) unstreamlined hull about 200 feet long. Most of its payload is devoted to cargo; it can also carry several passengers, although it lacks artificial gravity. It is not designed for planetary landings, but is equipped with a hangar bay for a shuttle or ferry, to facilitate cargo transfer when operating in frontier areas with limited spaceport facilities.

Ships are named after synonyms for wanderer, stranger, or traveler.

Front Hull	System
[1]	Light Alloy Armor (dDR 10).
[2-5]	Cargo Holds (150 tons capacity each).
[6]	Control Room (C8 computers, comm/sensor 8, four control stations).
[core]	Habitat (16 cabins, gym, two-bed automated sickbay).

Central Hull	System
[1]	Light Alloy Armor (dDR 10).
[2]	Hangar Bay (100 tons capacity).
[3-6]	Cargo Holds (150 tons capacity each).
[core]	Engine Room (two workspaces).
Rear Hull	System
[1]	Light Alloy Armor (dDR 10).
[2-4]	Fuel Tanks (15 tons hydrogen providing 30 mps delta-V each).
[5]	High-Thrust Fusion Rocket Engine (0.01G acceleration).
[6]	Cargo Hold (150 tons capacity).



The *Outlander* has spin gravity providing 0.15G, and has exposed radiators.

The usual crew is a command pilot, a navigator, a comm/sensor operator, a ship's engineer, two technicians, and a cargo officer.

TL	Spacecraft	dST/HP	Hnd/SR	HT	Move	LWt.	Load	SM	Occ	dDR	Range	Cost
10	<i>Outlander-Class</i>	100	-3/5	13	0.01G/90 mps	3,000	1,453.2	+9	32ASV	10/10/10	0	\$46.2M

KIEV-CLASS FARHAULER (TL10[^])

This tramp freighter is constructed using a streamlined hull that masses 3,000 tons (SM +9) and is about 200 feet long. Built with limited-superscience technology, it is intended for interstellar cargo hauling and transport in frontier sectors. Because it visits backwater planets that lack orbital facilities, the *Kiev* is designed with enough thrust and delta-V to land on or take off from an Earthlike world. It's a typical space-opera design, with a defensive armament to give it some chance when fighting off pirates and other hostiles.

Ships are named after port cities from either the space age or the nautical age.

Front Hull	System
[1]	Light Alloy Armor (dDR 7).
[2]	Habitat (18 cabins, two-bed automated sickbay).
[3-6]	Cargo Holds (150 tons capacity each).
[core]	Control Room (C8 computers, comm/sensor 8, six control stations).

Central Hull	System
[1]	Light Alloy Armor (dDR 7).
[2-3]	Cargo Holds (150 tons capacity each).
[4!]	Tertiary Battery (two turrets with 30 MJ UV lasers; 140 tons cargo).
[5-6]	Fuel Tanks (150 tons of water providing 5 mps delta-V each).
Rear Hull	System
[1]	Light Alloy Armor (dDR 7).
[2-3]	Fuel Tanks (150 tons of water providing 5 mps delta-V each).
[4]	Engine Room (two workspaces).
[5]	Fusion Torch Engine (with water, 1.5G acceleration).
[6!]	Stardrive Engine (FTL-1).
[core]	Fusion Reactor (two Power Points).

The typical crew consists of six bridge officers (captain, pilot, sensor officer, navigator/gunner, engineering officer, and comm officer/gunner), two engine-room technicians, and a cargo master.

TL	Spacecraft	dST/HP	Hnd/SR	HT	Move	LWt.	Load	SM	Occ	dDR	Range	Cost
10 [^]	<i>Kiev-Class</i>	100	-1/5	13	1.5G/20 mps	3,000	1,043.6	+9	36ASV	7/7/7	1×	\$139.7M

Top air speed is 2,450 mph.

ANTHEM-CLASS LIGHT STAR FREIGHTER (TL11[^])

This is a stock tramp trading vessel from a superscience civilization. It uses a streamlined hull that masses 1,000 tons (SM +8) and is 150 feet long. The design emphasizes cargo capacity, but it also carries a few passengers. Its drive is powerful enough to blast off from most planets.

Those *Anthem*-class ships that operate in war-torn or pirate-infested sectors may be heavily modified by their owners, replacing one or two cargo holds with weapons batteries, defensive ECM, or force-screen generators, and sometimes upgrading the power plant (removing the de-rated option) to better support these modifications.



Ships are named after folk songs, popular music, and national anthems.

Front Hull	System
[1]	Steel Armor (dDR 3).
[2-4]	Cargo Holds (50 tons capacity each).
[5]	Habitat (four cabins, two-bed automated sickbay).
[6]	Habitat (six cabins).
[core]	Control Room (C9 computers, comm/sensor 8, four control stations).
Central Hull	System
[1]	Steel Armor (dDR 3).
[2-5]	Cargo Holds (50 tons capacity each).
[6!]	Tertiary Battery (one turret with 10 MJ UV laser; 43.5 tons cargo).

<i>Rear Hull</i>	<i>System</i>
[1]	Steel Armor (dDR 3).
[2-3]	Cargo Holds (50 tons capacity each).
[4!]	Hot Reactionless Drive (2G acceleration).
[5!]	Stardrive Engine (FTL-1).
[6]	Engine Room (one workspace).
[core]	Fusion Reactor (de-rated, one Power Point).

The ship is equipped with artificial gravity.

The normal complement is four bridge crew (pilot/captain, navigator/gunner, and an engineering officer), an engine-room technician, and a cargo master.



<i>TL</i>	<i>Spacecraft</i>	<i>dST/HP</i>	<i>Hnd/SR</i>	<i>HT</i>	<i>Move</i>	<i>LWt.</i>	<i>Load</i>	<i>SM</i>	<i>Occ</i>	<i>dDR</i>	<i>Range</i>	<i>Cost</i>
PILOTING/TL10 (HIGH-PERFORMANCE SPACECRAFT)												
10 [^]	<i>Anthem-Class</i>	70	-1/5	13	2G/c	1,000	495.5	+8	20ASV	3/3/3	1×	\$25.9M

Top air speed is 3,500 mph.

DARK HORSE-CLASS FREE TRADER (TL11[^])

This is a “souped-up” star freighter designed with a fast maneuver drive and superior FTL performance, as well as defensive weapons and force screens. Its high cost and reduced payload mean it can’t compete on regular runs, so it must earn its keep hauling priority cargoes in dangerous sectors where hazard rates are offered, or through speculative trade or expensive charters. Its speed and defenses also make it appealing for “first-contact” merchant forays in uncharted space or for illegal activities such as smuggling. Ships are named after terms that suggest gambling, risk-taking, or quixotic ventures: *Serendipity*, *Four Aces*, *Dance with the Devil*, and *Double or Nothing*, for example. It has a streamlined hull that masses 1,000 tons (SM +8) and is 150 feet long.

<i>Front Hull</i>	<i>System</i>
[1]	Light Alloy Armor (dDR 5).
[2]	Habitat (four cabins, two-bed automated sickbay).
[3]	Hangar Bay (30 tons capacity).
[4-5]	Cargo Holds (50 tons capacity each).

<i>Front Hull</i>	<i>System</i>
[6]	Control Room (C9 computers, comm/sensor 8, four control stations).
<i>Central Hull</i>	<i>System</i>
[1]	Light Alloy Armor (dDR 5).
[2-4]	Cargo Holds (50 tons capacity each).
[5!]	Secondary Battery (two turrets with 30 MJ improved UV lasers, 40 tons cargo).
[6]	Habitat (six cabins).
[core!]	Light Force Screen (dDR 70).
<i>Rear Hull</i>	<i>System</i>
[1]	Light Alloy Armor (dDR 5).
[2-3!]	Super Reactionless Engines (50G acceleration each).
[4-6!]	Stardrive Engines (FTL-1 each).
[6]	Engine Room (one workspace).
[core]	Super Fusion Reactor (four Power Points).

It is equipped with artificial gravity and gravitic compensators.

The standard complement is four control crew (pilot/captain/navigator, two gunners, and an engineering officer), an engine room technician, and a cargo hand or steward.

<i>TL</i>	<i>Spacecraft</i>	<i>dST/HP</i>	<i>Hnd/SR</i>	<i>HT</i>	<i>Move</i>	<i>LWt.</i>	<i>Load</i>	<i>SM</i>	<i>Occ</i>	<i>dDR</i>	<i>Range</i>	<i>Cost</i>
PILOTING/TL11 (HIGH-PERFORMANCE SPACECRAFT)												
11 [^]	<i>Dark Horse-Class</i>	70	1/5	13	100G/c	1,000	322	+8	20ASV	5/5/5	3×	\$94.3M

Top air speed is 25,000 mph.

FREIGHT LINERS

As frontier colonies evolve into civilized core worlds, the commercial traffic increases to the point where small tramp freighters are no longer economical. They’re replaced by heavy freighters that ply the regularly scheduled routes between major spaceports.

A single heavy freighter can transport a massive load of goods. It costs hundreds of millions to billions of dollars and is owned by a major transplanetary or multistellar shipping corporation – or, in some civilizations, by a powerful space-trading clan.

Most follow tight schedules and have little choice as to what they carry, but some captains are allowed enough leeway to make independent judgments . . . as long as it ends up turning a profit. Reliable performance or successful risk-taking means bonuses and eventual promotion to the helm of a larger ship in the company fleet, and perhaps ultimately to a position as a corporate executive. Failure may mean a board of inquiry that strips them of their command.

TITAN-CLASS HEAVY SPACE-TRANSPORT VEHICLE (TL10)

The Titan HSTV is a large interplanetary spaceship built for low-cost freight transport rather than high speed or acceleration. It has room for a few passengers, but the ship has no artificial gravity. Constructed using an unstreamlined hull, the *Titan* masses 10,000 tons (SM +10) and is about 450 feet long. It is not designed to land on or lift off from an Earth-sized planet, and so must rely on orbital port facilities or shuttle craft. Ships are named for mythical giants and Titans.

Front Hull	System
[1]	Steel Armor (dDR 10).
[2]	Habitat (five cabins, two-bed automed sickbay, minifac fabricator, 260 tons cargo).*
[3-5]	Cargo Holds (500 tons capacity each).
[6]	Hangar Bay (300 tons capacity).*
[core]	Control Room (C9 computers, comm/sensor 9, four control stations).*
Central Hull	System
[1]	Steel Armor (dDR 10).
[2-6, core]	Cargo Holds (500 tons capacity each).
Rear Hull	System
[1]	Steel Armor (dDR 10).
[2]	Cargo Hold (500 tons capacity).
[3-5]	Fuel Tanks (500 tons hydrogen providing 60 mps delta-V each).
[6]	Fusion Rocket Engine (0.005G acceleration).*

* One technician mans each system.

It has spin gravity (0.2G) and exposed radiators.

The ship's usual complement consists of four bridge crew (pilot, captain/navigator, communications operator, and a chief engineer), and four technicians.

TL	Spacecraft	dST/HP	Hnd/SR	HT	Move	LWt.	Load	SM	Occ	dDR	Range	Cost
10	Titan-Class	150	-5/5	13	0.005G/180 mps	10,000	5,061	+10	10ASV	10/10/10	0	\$157.4M

PILOTING/TL10 (LOW-PERFORMANCE SPACECRAFT)

PROSPERITY-CLASS HEAVY STAR FREIGHTER (TL10^)

This giant heavy freighter is designed to transport great cargo loads across interstellar distances. A limited-superscience design, it is constructed with a 30,000 ton (SM +11) unstreamlined hull 450 feet long. Its FTL speed is unimpressive, but a high fraction of its mass is cargo, making it very economical to operate. Large, efficient bulk freighters like the *Prosperity* are the mainstay of corporate freight liner fleets. Individual vessels are named for words or places evocative of wealth and material success.

Front Hull	System
[1]	Steel Armor (dDR 15).
[2]	Habitat (eight cabins, two-bed sickbay, 190 tons cargo).*
[3-5]	Cargo Holds (1,500 tons capacity each).
[6]	Control Room (C9 computers, comm/sensor 10, four control stations).*
Central Hull	System
[1]	Steel Armor (dDR 15).
[2-6]	Cargo Holds (1,500 tons capacity each).
[core]	Stardrive Engine (FTL-1).*

Rear Hull	System
[1]	Steel Armor (dDR 15).
[2-3]	Cargo Holds (1,500 tons capacity each).
[4-5]	Fuel Tanks (1,500 tons of hydrogen providing 15 mps delta-V each).
[6]	Fusion Torch Engine (0.5G acceleration).*
[core]	Fission Reactor (one Power Point).*

* Three technicians man each system.

Spin gravity provides 0.3G, and it has exposed radiators.

The ship's complement consists of four bridge crew (pilot, captain/navigator, comm officer, and a chief engineer), three habitat techs, three fusion-torch mechanics, three stardrive mechanics, and three power plant mechanics. It also carries a cargo specialist.



TL	Spacecraft	dST/HP	Hnd/SR	HT	Move	LWt.	Load	SM	Occ	dDR	Range	Cost
10	Prosperity-Class	200	-2/5	13	0.5G/30 mps	30,000	15,191.6	+11	16ASV	15/15/15	1x	\$1,310.45M

PILOTING/TL10 (HIGH-PERFORMANCE SPACECRAFT)

RICARDO-CLASS LASH FREIGHT CARRIER (TL10[^])

This lumbering starship is an interstellar carrier vessel for smaller (but still substantial) cargo lighters or barges. LASH stands for Lighter Aboard Ship. The LASH carrier is intended for use by transport lines serving highly developed star systems, especially if the spaceship's stardrive requires it to appear out of hyperspace, warp, or a jump point at a considerable distance from a destination world. After arriving in a system, the freight carrier doesn't bother to head for the planet. Instead, it immediately launches its cargo-laden lighters (sometimes to multiple destinations) or releases its barges on an appropriate trajectory. Meanwhile, the local company office dispatches a fresh set of lighters to rendezvous with the carrier. It picks them up and exits the system, having saved fuel and several hours or days.

The *Ricardo* is built on an SM +10 hull massing 100,000 tons and measuring about 600 feet long. It does not include a maneuver drive; if it needs to visit a planet, it gets a lift from a tug or from its carried craft. Each clamp holds one vehicle no larger than the *Ricardo* itself; thus, it can carry five SM +10 lighters, tugs, etc. In settings where more FTL drives allow faster movement, a *Ricardo* may be underloaded to enable faster travel. Ships are named after famous economists.

Front Hull System

[1]	Light Alloy Armor (dDR 15).
[2]	Habitat (18 cabins, two-bed sickbay, 200 tons cargo).*
[3]	Hangar Bay (300 tons capacity).*
[4-5]	External Clamps.
[6]	Control Room (C9 computers, comm/sensor 9, 10 control stations).*

Central Hull System

[1]	Light Alloy Armor (dDR 15).
[2-4]	External Clamps.
[5-6!]	Stardrive Engines (FTL-1 each).*
[core]	Fusion Reactor (two Power Points).*

Rear Hull System

[1]	Light Alloy Armor (dDR 15).
[2-5!]	Stardrive Engines (FTL-1 each).*
[6, core]	Fusion Reactors (two Power Points each).*

* One technician mans each system.

The crew consists of 10 bridge workers (pilot, captain, navigator, chief engineer, and six comm/sensor officers), and 12 technicians, plus any lighter crew.

TL	Spacecraft	dST/HP	Hnd/SR	HT	Move	LWt.	Load	SM	Occ	dDR	Range	Cost
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PILOTING/TL10 (STARSHIP)

10 [^]	Ricardo-Class	150	-2/5	13	—	10,000	201.8	+10	36ASV	15/15/15	6×	\$951M
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BETELGEUSE-CLASS SUPER FREIGHTER (TL11[^])

This giant star freighter is designed to service main routes between major star systems. The *Betelgeuse* is a superscience design with an unstreamlined hull, massing 100,000 tons (SM +12) and measuring 600 feet long. It is not intended to land on a planet, and is fairly sluggish even with both maneuver engines and stardrive; over half its immense mass is devoted to payload. To reduce personnel costs, it is highly automated, using a surprisingly small crew for a vessel of its size. There is no onboard hangar capacity at all, so it is completely reliant on existing space stations or shuttles for unloading. Ships are named after super-giant stars.

Front Hull System

[1]	Steel Armor (dDR 20).
[2-5]	Cargo Holds (5,000 tons capacity each).
[6]	Habitat (two luxury cabins, eight cabins, three-bed automated sickbay, 2,925 tons cargo).*

Front Hull System

[core]	Control Room (C10 computers, comm/sensor 11, five control stations).*
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Central Hull System

[1]	Steel Armor (dDR 20).
[2-6]	Cargo Holds (5,000 tons capacity each).

Rear Hull System

[1]	Steel Armor (dDR 20).
[2-4]	Cargo Holds (5,000 tons capacity each).
[5!]	Stardrive Engine (FTL-1).*
[6!]	Standard Reactionless Engine (1G acceleration).*
[core]	Fusion Reactor (de-rated, one Power Point).*

* One technician mans each system.

The ship has artificial gravity and high automation.

The vessel's normal complement is five bridge crew (pilot, captain, navigator, comm officer, and a chief engineer), a cargo master, and five technicians.

TL	Spacecraft	dST/HP	Hnd/SR	HT	Move	LWt.	Load	SM	Occ	dDR	Range	Cost
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PILOTING/TL11 (HIGH-PERFORMANCE SPACECRAFT)

11 [^]	Betelgeuse-Class	300	-2/5	13	1G/c	100,000	62,927	+12	20ASV	20/20/20	1×	\$2,204.55M
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REGULUS-CLASS FRONTIER TRANSPORT (TL11[^])

This is a medium-sized freight liner built to serve major star systems located off the main trade routes, but which still generate more commerce than a tramp freighter could handle. Frontier transports are also employed for interstellar trading expeditions far beyond settled regions. It's a superscience design with a streamlined hull that masses 10,000 tons (SM +10) and is 300 feet long. It's intended for settings where multiple stardrive engines improve interstellar speed or range. In concert with its relatively heavy defensive armament, its high FTL rating makes it suitable as a naval auxiliary, carrying vital wartime cargoes. *Regulus*-class transports are named after large, bright stars.

Front Hull	System
[1]	Steel Armor (dDR 7).
[2]	Habitat (two luxury cabins, 12 cabins, four-bed automated sickbay, 200 tons cargo).*
[3-5]	Cargo Holds (500 tons capacity each).
[6]	Hangar Bay (300 tons capacity).*

Front Hull	System
[core]	Control Room (C10 computers, comm/sensor 10, 10 control stations).*

Central Hull	System
[1]	Steel Armor (dDR 7).
[2-5]	Cargo Holds (500 tons capacity each).
[6!]	Secondary Battery (four turrets with 300 MJ ultraviolet lasers; 200 tons cargo).*

Rear Hull	System
[1]	Steel Armor (dDR 7).
[2-5!]	Stardrive Engines (FTL-1 each).*
[6!]	Hot Reactionless Engine (50G acceleration).*
[core]	Super Fusion Reactor (four Power Points).*

* One technician mans each system.

The *Regulus* has artificial gravity and gravitic compensators.

Its usual complement is 10 bridge crew (pilot, captain, navigator, sensor operator, chief engineer, comm officer, and four gunners), a small craft pilot, and seven technicians. It also carries a cargo master and his assistant, and long-range trading missions into alien space may have specialists trained in making "first contact."

TL	Spacecraft	dST/HP	Hnd/SR	HT	Move	LWt.	Load	SM	Occ	dDR	Range	Cost
11 [^]	<i>Regulus</i> -Class	150	-2/5	13	50G/c	10,000	3,142.8	+10	28ASV	7/7/7	4×	\$889.4M

Top air speed is 18,000 mph.

PASSENGER LINERS

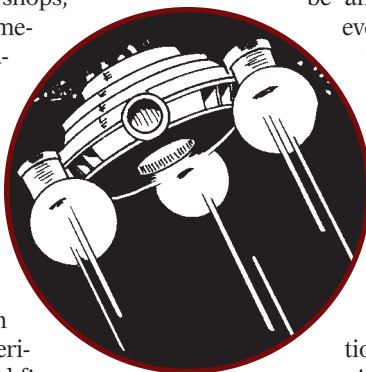
These commercial space liners are built to make a profit by transporting passengers on interplanetary or interstellar voyages. Their advent opens space travel to the ordinary person, as they affordably carry tourists, immigrants, and businessmen between worlds. Liners follow a regular route between two or more high-population planets, although they may visit less densely inhabited destinations if they lie astride the busier routes. To attract passengers willing to pay premium prices, larger vessels feature restaurants or bars, gift shops, promenades, ballrooms, swimming pools (sometimes with zero or variable gravity), observation decks, and other facilities.

Cruise ships are luxury liners built to provide an unforgettable vacation experience to travelers who want to get away from it all. Depending on a vessel's range and capabilities, voyages may take visitors past dramatic lunar mountains, gas-giant ring systems, or nebulae, or to exotic planetary destinations. Early cruise ships may be austere, with passengers paying high prices merely to experience space travel, but by TL10, vessels can rival five-star hotels in both opulent fittings and the attention paid to guests. On luxury cruise ships, the number of entertainers, activity leaders, and stewards can match that of the passengers. Trips may also be marketed to particular types of guest –

e.g., honeymooners, gamblers (with onboard casinos), popular-science enthusiasts (with guest lecturers), or elderly retirees (with extra medical care).

Those cruise ships or liners that regularly ply particularly exotic routes (such as a cross-border voyage between rival interstellar powers or different races) may become famous institutions in their own right, much like the Orient Express railway line on Earth. Merely to travel on such a craft may be an experience. Some wealthy eccentrics could even choose to take up permanent residence, while real or imagined meetings between spies and diplomats can add an aura of intrigue.

Space liners are normally owned by corporations rather than individuals, since they rely on regularly scheduled runs from major high-population worlds to attract passengers and make a profit. However, governments may subsidize larger liners in exchange for their use as naval auxiliaries (e.g., as troop transports or for refugee evacuation) in time of war. If so, it may be equipped with provision for defensive armaments, although under ordinary circumstances the only weaponry likely to be aboard is those sidearms issued to security teams. (On most passenger ships, a couple of stewards are also cross-trained as security officers.)



ENDYMION-CLASS TRANSLUNAR CRUISE SHIP (TL9)

These early pleasure spacecraft are designed to give a dozen wealthy tourists a taste of space travel. For example, a cruise itinerary might begin at a station in Earth orbit and loop around the moon and back. Accommodations are luxurious, at least when compared to the first generation of TL7-8 spacecraft and stations! Single or double cabins are provided for all guests, and there is a small dining room; recreation rooms for exercising and microgravity sports; and a large viewing area (with a giant transparent window).

Unlike most passenger ships, it does not have any provision for artificial or spin gravity, since the microgravity is part of the “space experience” being offered.

The *Endymion* is not a powerful ship, and lacks the ability to lift off from a planet. It follows slow transfer orbits, and its propulsion system is only there to provide an extra nudge. It uses an unstreamlined hull that masses 1,000 tons (SM +8) and is about 150 feet long.

Ships are named after mythical figures associated with the moon.

Front Hull	System
[1]	Light Alloy Armor (dDR 7).
[2]	Habitat (two bars, lecture hall).
[3]	Open Space (observation deck).
[4]	Habitat (six cabins).
[5-6]	Habitats (three luxury cabins each).
[core]	Control Room (C6 computers, comm/sensor 6, four control stations).
Central Hull	System
[1]	Light Alloy Armor (dDR 7).
[2-4]	Habitats (three luxury cabins each).
[5]	Hangar Bay (30 tons capacity).
[6]	Fuel Tank (50 tons hydrogen providing 0.8 mps delta-V).
[core]	Habitat (two briefing rooms, four-bed sickbay)

Rear Hull	System
[1]	Light Alloy Armor (dDR 7).
[2-4]	Fuel Tanks (50 tons hydrogen providing 0.8 mps delta-V each).
[5]	Nuclear Light Bulb Engine (0.01G acceleration).
[6]	Engine Room (one workspace).

The ship has exposed radiators.

Its typical crew complement is four bridge crew (pilot, captain, navigator, and a chief engineer), a purser and two stewards, a bartender, a guest lecturer or two, a couple of entertainers, a ship's doctor, and an engine-room technician.



TL	Spacecraft	dST/HP	Hnd/SR	HT	Move	LWt.	Load	SM	Occ	dDR	Range	Cost
9	Endymion-Class	70	-3/5	13	0.01G/3.2 mps	1,000	34.2	+8	42ASV	7/7/7	0	\$22.1M

PROSPERO-CLASS INTERPLANETARY LINER (TL10)

Built with a 3,000-ton (SM +9) unstreamlined hull about 200 feet long, this fusion-drive passenger spaceship is designed for fast interplanetary transits. The *Prospero* carries

10 first-class and 40 economy-class passengers, and has significant cargo capacity (much of it devoted to “cold-sleep” hibernation capsules) for their luggage. The central hull rotates to provide passengers with spin gravity, but otherwise there are only a few amenities compared to larger and more advanced vessels. It can't take off from a sizable planet, so the *Prospero's* hangar deck carries shuttles, which double as lifeboats or tugs when necessary. Ships are named for Shakespearean characters.

<i>Front Hull</i>	<i>System</i>
[1]	Light Alloy Armor (dDR 10).
[2]	Cargo Hold (150 tons capacity).
[3]	Habitat (80 hibernation chambers).
[4]	Habitat (two luxury cabins, 11 cabins, gym, office, 10 tons cargo).
[5]	Open Space (observation deck).
[6]	Habitat (bar, salon, gym, shop, 12-bed sickbay).
[core]	Control Room (C8 computers, comm/sensor 8, three control stations).
<i>Central Hull</i>	<i>System</i>
[1]	Light Alloy Armor (dDR 10).
[2]	Habitat (10 luxury cabins).
[3-4]	Habitats (20 cabins each).

[5-6]	Hangar Bay (100 ton capacity).
<i>Rear Hull</i>	<i>System</i>
[1]	Light Alloy Armor (dDR 10).
[2-4]	Fuel Tanks (150 tons of hydrogen providing 30 mps delta-V each).
[5-6]	High-Thrust Fusion Rocket Engines (0.01G acceleration each).
[core]	Engine Room (two workspaces).

The spacecraft has spin gravity (0.15G) and exposed radiators.

The usual complement manning a *Prospero*-class liner is four bridge crew (pilot, captain/navigator, comm officer, and a chief engineer), a purser and steward, a bartender, two hair-stylists, a personal trainer, the ship's doctor, and two technicians.

<i>TL</i>	<i>Spacecraft</i>	<i>dST/HP</i>	<i>Hnd/SR</i>	<i>HT</i>	<i>Move</i>	<i>LWt.</i>	<i>Load</i>	<i>SM</i>	<i>Occ</i>	<i>dDR</i>	<i>Range</i>	<i>Cost</i>
10	<i>Prospero</i> -Class	100	-3/5	13	0.02G/90 mps	3,000	172.6	+9	126ASV*	10/10/10	0	\$93.5M

* Plus 200 in suspended animation.

EMPRESS-CLASS STAR LINER (TL10[^])

This is a mid-sized passenger starship, designed to provide fast, comfortable interstellar transits for business travelers and tourists. The ship is built on a 10,000-ton (SM +10) streamlined hull about 900 feet long. Its fusion-torch engines are powerful enough to lift directly off a terrestrial planet into orbit, although it often docks with a space station. The "first-class" section is in the forward hull while the "economy-class" passengers and crew are in the central hull. The *Empress'* typical passenger manifest consists of 120 first-class and 120 economy passengers. Ships are named after impressive fictional titles (e.g., *Empress of Antares*) or famous royalty.

<i>Front Hull</i>	<i>System</i>
[1]	Light Alloy Armor (dDR 10).
[2-5]	Habitats (30 luxury cabins each).*
[6]	Habitat (two bars, massage parlor, two salons, two gyms, shop, nursery, two gift shops, 11-bed sickbay, and 150 tons cargo).*
[core]	Control Room (C9 computers, comm/sensor 9, 10 control stations).*

<i>Central Hull</i>	<i>System</i>
[1]	Light Alloy Armor (dDR 10).
[2-3]	Habitats (60 cabins each).*
[4]	Habitat (two luxury cabins, 46 cabins, 10-bed sickbay).*
[5]	Habitat (two bars, two gyms, two nurseries, four gift shops, 200 tons cargo).*
[6]	Fuel Tank (500 tons of water providing 5 mps delta-V).
<i>Rear Hull</i>	<i>System</i>
[1]	Light Alloy Armor (dDR 10).
[2-4]	Fuel Tanks (500 tons of water providing 5 mps delta-V each).
[5!]	Stardrive Engine (FTL-1).*
[6]	Fusion Torch Engine (1.5G acceleration using water).*
[core]	Fusion Reactor (de-rated, one Power Point).*

* One technician mans each system.

The usual crew complement is three bridge crew (pilot, captain/navigator, and a chief engineer), a purser and 10 stewards, four bartenders, three personal trainers, two child-care workers, six shop clerks, a masseur, a ship's doctor and nurse, and 13 technicians.

<i>TL</i>	<i>Spacecraft</i>	<i>dST/HP</i>	<i>Hnd/SR</i>	<i>HT</i>	<i>Move</i>	<i>LWt.</i>	<i>Load</i>	<i>SM</i>	<i>Occ</i>	<i>dDR</i>	<i>Range</i>	<i>Cost</i>
10 [^]	<i>Empress</i> -Class	150	-2/5	13	1.5G/20 mps	10,000	407.6	+10	576ASV	10/10/10	1×	\$391M

Top air speed is 18,000 mph.

XANADU-CLASS LUXURY LINER (TL11^)

Constructed using a streamlined, 30,000-ton hull (SM +11) about 940 feet long, the *Xanadu*-class super liner carries 400 first-class and 800 economy-class passengers on a comfortable cruise between civilized star systems. The interior is luxuriously appointed with amenities for its guests, including casinos, theaters, and a beautiful interior garden deck and shopping promenade. It has enough thrust to take off from an Earthlike world; given its size, this is an impressive sight, especially with the starship's hull lit up by its landing lights. *Xanadu*-class liners are named for fantastic places mentioned in epic poems (*Wonderland*, *Camelot*, *Troy*, *Inferno*, etc.), and are decorated (and attendants costumed) to match their name.

Front Hull	System
[1]	Light Alloy Armor (dDR 15).
[2]	Open Space (two gardens, two observation lounges, zero-G pool, tennis court, art gallery, and three theaters).*
[3-6]	Habitats (100 luxury cabins each).*
Central Hull	System
[1]	Light Alloy Armor (dDR 15).
[2-5]	Habitats (200 cabins each).*

Central Hull	System
[6]	Habitat (47 gift shops, three hair salons, five casino rooms, five bars, five gyms, and five nurseries, 10-bed sickbay, 250 tons cargo).*
[core]	Control Room (C10 computers, comm/sensor 10, five control stations).*
Rear Hull	System
[1]	Light Alloy Armor (dDR 15).
[2]	Habitat (five luxury cabins, 180 cabins, 20-bed sickbay).*
[3]	Hangar Bay (1,000 tons capacity).*
[4-5]	Stardrive Engines (FTL-1).*
[6]	Hot Reactionless Engine (100G acceleration).*
[core]	Fusion Reactor (two Power Points).*

* Three technicians man each system.

The *Xanadu* has artificial gravity and gravitic compensators.

A typical complement for one of these liners is 274 crew: five bridge crew (pilot, captain, chief engineer, communications officer, and a navigator), a purser and 77 stewards, 94 shop clerks, 10 bartenders, six hairstylists, 10 casino workers, five personal trainers, 10 child-care workers, a ship's doctor and a medic, and 54 technicians.

TL	Spacecraft	dST/HP	Hnd/SR	HT	Move	LWt.	Load	SM	Occ	dDR	Range	Cost
11^	<i>Xanadu</i> -Class	200	0/5	13	50G/c	30,000	1,527	+11	2,770ASV	15/15/15	3×	\$1,568.5M

Top air speed is 18,000 mph.

SLOWBOATS AND SUNJAMMERS

These are interplanetary spacecraft that use economical propulsion systems with modest accelerations, such as ion drives, magsails, or lightsails. Their low or nonexistent fuel consumption forces slowhaulers to build up to a respectable interplanetary cruising speed, but it can take weeks or even months to reach that velocity. It may take many days just to escape a planet's orbit using a long spiral trajectory.

Slowhaulers are primarily used for low-cost cargo transport in the early interplanetary age, in an era before the development of giant fusion-powered freighters, reactionless drives, or similar technologies. Unmanned designs are common, although some larger versions carry crew or passengers who spend much of a voyage in suspended animation.

Most slowhaulers are company-owned freight liners running on established routes, sometimes under government subsidy (it's difficult for them to make a profit otherwise). Some second-hand models operate as tramp freighters.

ICARUS-CLASS SUNJAMMER (TL9)

Little more than a robot cargo barge equipped with a giant space sail for maneuvering, this is a low-cost way of transporting

bulk cargo across interplanetary distances. It is built with an unstreamlined hull that masses 3,000 tons (SM +9) and is 100 feet long (excluding the sail). A similar design variant replaces the lightsail with a magnetic sail. Vessels are named after legends or figures associated with the sun. Most of the ship's cargo is attached to the external clamp as container barges, and the final acceleration is calculated based on the combined mass (see *GURPS Spaceships*, p. 15).

Front Hull	System
[1]	Light Alloy Armor (dDR 10).
[2-6]	Lightsails (0.0001G acceleration each).
[core]	Control Room (C6 computers, comm/sensor 7, no control stations).
Central Hull	System
[1-5]	Lightsails (0.0001G acceleration each).
[6]	External Clamp.
Rear Hull	System
[1-6]	Lightsails (0.0001G acceleration each).
[core]	Cargo Hold (150 tons capacity).

The vessel has no crew; the ship's computer AI serves as both pilot and navigator.

TL	Spacecraft	dST/HP	Hnd/SR	HT	Move	LWt.	Load	SM	Occ	dDR	Range	Cost
PILOTING/TL9 (LIGHTSAIL)												
9	<i>Icarus-Class</i>	100	-4/5	12	0.0016G/c	3,000	150	+9	0	10/0/0	0	\$515.9M

KAUFMAN-CLASS PACKET HAULER (TL9)

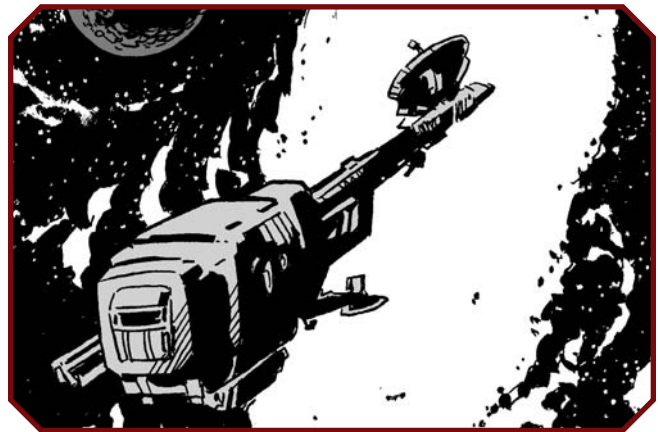
This is a small solar-electric freighter from the first era of interplanetary commerce, designed to carry vital cargo between inner-system planets. It has reasonable delta-V, but its anemic acceleration means it cannot lift off from anything larger than an asteroid, limiting it to journeys between space stations. In fact, its thrust is so low that it may require an additional boost from a tug to escape a planet's gravity field in a reasonable amount of time.

The *Kaufman* has a small crew requirement, and is easily operated by a couple of people or even a single family. It is an austere design, but quite inexpensive to run. The ship has an unstreamlined hull that masses 300 tons (SM +7) and is 90 feet long.

Ships are named after pioneering inventors in ion-drive and solar technologies.

Front Hull	System
[1]	Light Alloy Armor (dDR 5).
[2-5]	Cargo Holds (15 tons capacity each).
[6]	Control Room (C5 computers, comm/sensor 5, three control stations).
[core]	Habitat (two cabins).
Central Hull	System
[1]	Light Alloy Armor (dDR 5).
[2-6]	Fuel Tanks (15 tons ionizable reaction mass providing 3 mps delta-V each).

Rear Hull	System
[1]	Light Alloy Armor (dDR 5).
[2-3!]	Ion Drive Engines (0.0005G acceleration each).
[4-5]	Solar Panel Arrays (one Power Point each).
[6]	Cargo Hold (15 tons capacity).
[core]	Engine Room (one workspace).



The usual ship's complement consists of three bridge crew (pilot, navigator/captain, and a comm officer) and one engine room technician (sometimes stationed on the bridge). It may carry an extra person as a passenger or cargo hand.

TL	Spacecraft	dST/HP	Hnd/SR	HT	Move	LWt.	Load	SM	Occ	dDR	Range	Cost
PILOTING/TL9 (LOW-PERFORMANCE SPACECRAFT)												
9	<i>Kaufman-Class</i>	50	-4/5	13	0.001G/15 mps	300	75.4	+7	4ASV	5/5/5	0	\$6.65M

YACHTS

Yachts are small or medium-sized private spaceships. Most are owned by wealthy individuals or families for pleasure or business travel. Government agencies or major corporations also operate yachts as "executive couriers" or personal transports for executives, senior politicians, dignitaries, ambassadors, or company troubleshooters.

Some owners enjoy commanding their own spaceship (perhaps with computer-AI assistance). Otherwise, the captain and crew may be hired workers, company employees, or family retainers. Yachts for senior officials, such as presidential, ambassadorial, or royal vessels, may be crewed by military personnel as an official part of a space navy.

VEGA-CLASS EXECUTIVE TRANSPORT (TL9)

This is a fast deep-space vessel intended for the swift interplanetary transport of dignitaries and key executives. The *Vega* is hardly a cruise ship, but its spin gravity and luxury cabins permit passengers to travel in reasonable comfort. Its fusion pulse drive is expensive to operate, but provides the best all-around performance available at TL9. Spacefaring nations or corporations may operate this sort of vessel, allowing executives, engineers, or corporate troubleshooters to get where

they're needed in weeks rather than years. It has a 1,000-ton (SM +8) unstreamlined hull about 150 feet long. Spacecraft are named after bright stars.

<i>Front Hull</i>	<i>System</i>
[1]	Light Alloy Armor (dDR 7).
[2]	Habitat (four cabins, two offices).
[3]	Habitat (gym, bar, two-bed sickbay).
[4]	Habitat (three luxury cabins each).
[5]	Cargo Hold (50 tons capacity).
[6]	Hangar Bay (30 tons capacity).
[core]	Control Room (C6 computers, comm/sensor 6, four control stations).
<i>Central Hull</i>	<i>System</i>
[1]	Light Alloy Armor (dDR 7).
[2-6]	Fuel Tanks (50 tons fuel pellets providing 6 mps delta-V each).

<i>Rear Hull</i>	<i>System</i>
[1]	Light Alloy Armor (dDR 7).
[2-4]	Fuel Tanks (50 tons fuel pellets providing 6 mps delta-V each).
[5-6]	Fusion Pulse Drive Engines (0.02G acceleration each).
[core]	Engine Room (one workspace).

It has spin gravity (0.1G) and exposed radiators.

The usual crew is a command pilot, a navigator, a ship's engineer (who divides his time between the engine room and bridge station), and sometimes a steward or doctor.



<i>TL</i>	<i>Spacecraft</i>	<i>dST/HP</i>	<i>Hnd/SR</i>	<i>HT</i>	<i>Move</i>	<i>LWt.</i>	<i>Load</i>	<i>SM</i>	<i>Occ</i>	<i>dDR</i>	<i>Range</i>	<i>Cost</i>
9	Vega-Class	70	-4/5	13	0.04G/48 mps	1,000	81.4	+8	14ASV	7/7/7	0	\$29.4M

MALTESE FALCON-CLASS YACHT (TL10⁺)

This limited-superscience vessel is a fusion-drive starship. Although comfortable, it is not as luxurious as some yachts, but its fast interplanetary speed, defensive armament, and decent armor makes it a popular choice for those dignitaries who place a high value on speed and security. The passenger and crew habitats rotate to provide spin gravity, but must be locked down during maneuvers. It is a deep-space starship, not intended to take off or land on an Earth-sized planet. The ship uses a 1,000-ton (SM +8) unstreamlined hull about 50 yards long. Ships are named for fictional treasures.

<i>Front Hull</i>	<i>System</i>
[1]	Metallic Laminate Armor (dDR 10).
[2]	Habitat (two cabins, two bunkrooms, two-bed automated sickbay).
[3-4]	Habitats (two luxury cabins, 10 tons cargo).
[5]	Habitat (six offices).
[6]	Control Room (C8 computers, comm/sensor 7, four control stations).

<i>Central Hull</i>	<i>System</i>
[1]	Light Alloy Armor (dDR 7).
[2]	Hangar Bay (30 tons capacity).
[3-5]	Fuel Tanks (50 tons hydrogen providing 15 mps delta-V each).
[6]	Medium Battery (one turret with 100 MJ UV laser; 30 tons cargo).
[core]	Engine Room (one workspace).
<i>Rear Hull</i>	<i>System</i>
[1]	Light Alloy Armor (dDR 7).
[2]	Fuel Tank (50 tons hydrogen, 15 mps delta-V each).
[3]	Fusion Torch (0.5G acceleration).
[4-5!]	Stardrive Engines (FTL-1 each).
[6]	Engine Room (one workspace).
[core]	Fusion Reactor (two Power Points).

It has spin gravity (0.1G) and exposed radiators.

Its typical crew complement is four bridge crew (captain/navigator, pilot, engineering officer, and gunner), a ship's doctor, and an engine-room technician. The gunner also serves as a bodyguard. There is at least one steward aboard to serve the owner and any guests.

<i>TL</i>	<i>Spacecraft</i>	<i>dST/HP</i>	<i>Hnd/SR</i>	<i>HT</i>	<i>Move</i>	<i>LWt.</i>	<i>Load</i>	<i>SM</i>	<i>Occ</i>	<i>dDR</i>	<i>Range</i>	<i>Cost</i>
10	Maltese Falcon-Class	70	-1/5	13	0.5G/60 mps	1,000	71.6	+8	16ASV	10/7/7	2×	\$52.2M

TAJ MAHAL-CLASS LUXURY YACHT (TL11⁺)

This beautiful starship might be a billionaire's toy or a royal yacht. Using a streamlined hull that masses 1,000 tons (SM +8) and reaches 300 feet long, no expense has been spared to cre-

ate a private craft that's both luxurious and powerful. It has a small ballroom, a pool, and even a garden. Habitat space includes both luxury cabins and plainer accommodations for crew or servants. The diamondoid armor of the hull makes the entire ship a glittering jewel . . . and also gives its owner protection better than some naval frigates! Vessels are named after splendid works of architecture.

<i>Front Hull</i>	<i>System</i>
[1]	Diamondoid Armor (dDR 20).
[2]	Open Space (garden).
[3]	Open Space (ballroom).
[4]	Habitat (three luxury cabins).
[5]	Habitat (bar, gym, briefing room, three offices).
[6]	Habitat (three luxury cabins).
[core]	Control Room (C9 computers, comm/sensor 8, four control stations).
<i>Central Hull</i>	<i>System</i>
[1]	Diamondoid Armor (dDR 20).
[2!]	Medium Battery (one turret with 10 MJ rapid fire improved UV laser; 30 tons cargo).
[3-4]	Habitats (six cabins each).
[5]	Habitat (six-bed automated sickbay).
[6]	Cargo Hold (50 tons capacity).

<i>Rear Hull</i>	<i>System</i>
[1]	Diamondoid Armor (dDR 20).
[2-3!]	Stardrive Engines (FTL-1 each).
[4-5!]	Hot Reactionless Engines (2G acceleration each).
[6]	Engine Room (one workspace).
[core]	Fusion Reactor (two Power Points).

The vessel has artificial gravity and gravitic compensators.

The normal crew complement consists of three bridge crew (captain/navigator, pilot, and engineering officer), a gunner, a ship's doctor, a gardener, and an engine-room technician. A chief steward and at least four attendants take care of the owner's and guests' needs. Some crew may be cross-trained for security duties, or there may be a dedicated close-protection team of bodyguards quartered with the crew and servants.

<i>TL</i>	<i>Spacecraft</i>	<i>dST/HP</i>	<i>Hnd/SR</i>	<i>HT</i>	<i>Move</i>	<i>LWt.</i>	<i>Load</i>	<i>SM</i>	<i>Occ</i>	<i>dDR</i>	<i>Range</i>	<i>Cost</i>
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PILOTING/TL11 (HIGH-PERFORMANCE SPACECRAFT)

11 [^]	<i>Taj Mahal</i> -Class	100	-1/5	13	4G/c	1,000	83.6	+9	36ASV	20/20/20	2×	\$80.6M
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Top air speed is 5,000 mph.

ULYSSES-CLASS FRONTIER YACHT (TL11[^])

This compact, winged space yacht is designed for extended interstellar wanderjahrs, safaris, amateur archeology or xenobiology expeditions, and similar excursions. It uses a streamlined hull that masses 300 tons (SM +7) and is about 135 feet long. It isn't as luxurious as some yachts, but it is safe and self-sufficient, including full automation, onboard manufacturing gear, and total life support. Its modest science array is intended to support amateur research. The hangar is too small for a spaceship, but useful for roll-on/roll-off cargo such as the owner's limousine or sailboat. Vessels are named after legendary or famous travelers, adventurers, and explorers.

<i>Front Hull</i>	<i>System</i>
[1]	Advanced Metallic Laminate Armor (dDR 7).
[2]	Science Array (comm/sensor 9).
[3]	Hangar Bay (10 tons capacity).
[4]	Cargo Hold (15 tons capacity).
[5]	Habitat (cage with total life support).
[6]	Habitat (gym).
[core]	Control Room (C8 computers, comm/sensor 7, three control stations).

<i>Central Hull</i>	<i>System</i>
[1]	Advanced Metallic Laminate Armor (dDR 7).
[2-5]	Habitats (one cabin with total life support in each).
[6]	Habitat (two-bed automated sickbay).
<i>Rear Hull</i>	<i>System</i>
[1]	Advanced Metallic Laminate Armor (dDR 7).
[2-3!]	Stardrive Engines (FTL-1 each).
[4]	Engine Room (one workspace).
[5]	Habitat (robofac minifac, five tons cargo).
[6!]	Hot Reactionless Engine (2G acceleration).
[core]	Fusion Reactor (two Power Points).

The *Ulysses* has artificial gravity and total automation; the engine room is just a place where parts are stored.

The normal complement consists of a single bridge crewmember but with computer control. No crew is really necessary.



<i>TL</i>	<i>Spacecraft</i>	<i>dST/HP</i>	<i>Hnd/SR</i>	<i>HT</i>	<i>Move</i>	<i>LWt.</i>	<i>Load</i>	<i>SM</i>	<i>Occ</i>	<i>dDR</i>	<i>Range</i>	<i>Cost</i>
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PILOTING/TL11 (HIGH-PERFORMANCE SPACECRAFT)

11 [^]	<i>Ulysses</i> -Class	50	-1/5	14	2G/c	300	30.8	+7	8ASV	7/7/7	2×	\$24.13M
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Top air speed is 3,500 mph.

ZETA RETICULI-CLASS GALACTIC YACHT (TL12[^])

This 90-foot-diameter saucer-shaped starship is a fast, very expensive, and equally luxurious star yacht designed to enable its owner and a half-dozen companions to travel the universe in high style and reasonable safety. It is especially well-suited for an exotic stardrive such as a probability drive or blink-warp drive. Ships are named after well-known binary stars. It uses a 1,000-ton (SM +8) streamlined hull. The design allows owners to visit primitive worlds without attracting local attention, making it popular with rich eccentrics, joyriding alien princesses, and debonair secret agents.

<i>Front Hull</i>	<i>System</i>
[1]	Nanocomposite Armor (dDR 15).
[2]	Multipurpose Array (comm/sensor 11).
[3-4]	Habitats (three luxury cabins each).
[5]	Medium Battery (two fixed mounts with 100 MJ disintegrators; one fixed mount with 100 MJ tractor beam).
[6]	Hangar Bay (30 tons capacity).
[core]	Control Room (C10 computers, comm/sensor 9, four control stations).

<i>Central Hull</i>	<i>System</i>
[1]	Nanocomposite Armor (dDR 15).
[2]	Habitat (office, minifac nanofactory, Science lab, two teleport projectors).
[3!]	Light Force Screen (dDR 100).
[4]	Cargo Hold (50 tons capacity).
[5]	Habitat (four cabins, two-bed automated sickbay).
[6]	Engine Room (one workspace).
[core]	Total Conversion Reactor (five Power Points).
<i>Rear Hull</i>	<i>System</i>
[1]	Nanocomposite Armor (dDR 15).
[2!]	Subwarp Drive (500G acceleration).
[3-5!]	Stardrive Engines (FTL-1 each).
[6!]	Cloaking Device

The ship has artificial gravity, gravitic compensators, total automation, and both the stealth and dynamic chameleon hull features.

The usual complement is three bridge crew (captain/pilot, navigator/gunner, and engineering officer), and probably a few stewards, servants, or bodyguards. However, some or all of the yacht's crew may be replaced by AI computer programs.

<i>TL</i>	<i>Spacecraft</i>	<i>dST/HP</i>	<i>Hnd/SR</i>	<i>HT</i>	<i>Move</i>	<i>LWt.</i>	<i>Load</i>	<i>SM</i>	<i>Occ</i>	<i>dDR</i>	<i>Range</i>	<i>Cost</i>
12 [^]	<i>Zeta Reticuli-Class</i>	70	+1/5	13	500G/c	1,000	81.4	+8	14ASV	15/15/15	3×	\$65.7M

Top air speed is 56,000 mph.

HEAVY-LIFT BOOSTERS

As the saying goes, once a ship is in low orbit, it's halfway to anywhere . . . but getting into orbit can be tricky if reactionless drives don't exist, due to the requirements of high acceleration (greater than local gravity) and delta-V. Purpose-designed reusable shuttles (pp. 19-20) are one way to lift freight and people into space, but building such craft can be challenging at low TLs. If "beanstalk" space elevators or superscience drives such as torch engines are unavailable, the brute-force option may be the best: carrying cargo on a big heavy-lift booster, such as a chemical rocket!

BAIKONUR LAUNCH VEHICLE (TL7)

This system is designed to transport a 100-ton payload from an Earth-gravity world's surface to low orbit. It is a three-stage system consisting of two booster stages and the 100-ton spacecraft (the Space Transport Vehicle, or "STV"). Vessels are named after planetary spaceports.

First Stage (Two Boosters and STV) (TL7)

This stack consists of a chemical rocket engine and 650 tons of rocket fuel, onto which are bolted the second and third stages. The entire spacecraft is a streamlined SM +8 hull. It masses 1,000 tons. This stage adds 2.52 mps to delta-V.

<i>Front Hull</i>	<i>System</i>
[1-6]	Upper Stage (second stage; see below).
<i>Central Hull</i>	<i>System</i>
[1-6, core]	Fuel Tanks (50 tons of rocket fuel providing 0.21 mps delta-V each).
<i>Rear Hull</i>	<i>System</i>
[1-2]	Chemical Rocket Engines (3G acceleration each).
[3-6, core]	Fuel Tanks (50 tons rocket fuel providing 0.21 mps delta-V each).

Second Stage (Booster and STV) (TL7)

This stack consists of a chemical rocket engine and 195 tons of rocket fuel, onto which is bolted the final stage. The entire spacecraft is a streamlined SM +7 hull. It masses 300 tons. This stage adds 3.12 mps to delta-V (total 5.66 mps), enough to reach low orbit.

Front Hull	System
[1-6]	Upper Stage (third stage; see below).
Central Hull	System
[1-6, core]	Fuel Tanks (15 tons of rocket fuel providing 0.24 mps delta-V each).
Rear Hull	System
[1]	Chemical Rocket Engines (3G acceleration).
[2-6, core]	Fuel Tanks (15 tons rocket fuel providing 0.24 mps delta-V each).

Third Stage (Space Transport Vehicle) (TL8)

Any 100-ton streamlined spacecraft can be used for the fourth stage! The STV system shown below is a typical, automated

cargo spacecraft. Most of the payload is in 10 hangars joined to form a single bay with a 30-ton capacity. This can deploy any 30-ton payload (e.g., a ship, barge, or satellite).

The STV has a streamlined hull and masses 100 tons (SM +6). It boosts its own 0.45-mps delta-V with the 5.66 mps from the first and second stages, for a total of 6.09 mps.

Front Hull	System
[1]	Light Alloy Armor (dDR 2).
[2-6]	Hangar Bays (three tons capacity each).
[core]	Control Room (C1 computer; comm/sensor 2, no control stations).
Central Hull	System
[1]	Light Alloy Armor (dDR 2).
[2-6]	Hangar Bays (three tons capacity each).
[core]	Cargo Hold (five tons capacity).
Rear Hull	System
[1]	Light Alloy Armor (dDR 2).
[2]	Chemical Rocket Engines (3G acceleration).
[3-6]	Fuel Tanks (five tons rocket fuel providing 0.15 mps delta-V each).

TL	Spacecraft	dST/HP	Hnd/SR	HT	Move	LWt.	Load	SM	Occ	dDR	Range	Cost
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PILOTING/TL7 (HIGH-PERFORMANCE SPACECRAFT)

7	Baikonur First Stage	70	-1/5	13	6G/2.52 mps	1,000	300	+8	—	0/0/0	0	\$7.6M
7	Baikonur Second Stage	50	-1/5	13	3G/+3.12 mps	300	100	+7	—	2/0/0	0	+\$2.2M
8	Baikonur Third Stage STV	30	0/4	13	3G/+0.45 mps	100	35	+6	—	2/2/2	0	+\$0.9M

Top air speed is 6,100 mph.

CONESTOGA-CLASS HEAVY LIFT VEHICLE (TL9)

This is an advanced single-stage-to-orbit transport system using a streamlined 1,000 ton (SM +8) hull about 300 feet tall. It relies on high-energy-density propellant rocket engines using exotic (and volatile) fuels to boost a heavy freight load into high orbit or escape velocity. Ships are named after traditional transport vehicles.

Front Hull	System
[1]	Light Alloy Armor (dDR 5).
[2]	Hangar Bay (30 tons capacity).
[3]	Cargo Bay (50 tons capacity).
[4-6]	Fuel Tanks (50 tons HEDM rocket fuel providing 0.7 mps delta-V each).

Front Hull	System
[core]	Control Room (C6 computer; comm/sensor 6, two control stations).
Central Hull	System
[1]	Light Alloy Armor (dDR 5).
[2-6, core]	Fuel Tanks (50 tons HEDM rocket fuel providing 0.7 mps delta-V each).
Rear Hull	System
[1]	Light Alloy Armor (dDR 5).
[2-3]	HEDM Chemical Rocket Engines (2G acceleration each).
[3-6]	Fuel Tanks (50 tons HEDM rocket fuel providing 0.7 mps delta-V each).

A computer can run it, but it often carries a pilot and co-pilot/payload specialist.

TL	Spacecraft	dST/HP	Hnd/SR	HT	Move	LWt.	Load	SM	Occ	dDR	Range	Cost
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PILOTING/TL9 (HIGH-PERFORMANCE SPACECRAFT)

9	Conestoga-Class	70	-1/5	13	4G/9.1 mps	1,000	80.2	+8	2SV	5/5/5	0	\$13.1M
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Top air speed is 5,000 mph.

SHUTTLES

Shuttles are interface craft built to carry cargo or personnel between a planet's surface and low orbit. They may dock at space stations or be carried by spacecraft that lack the capability to land and take off from planets safely. Early shuttles are complex multi-stage designs that rely on a combination of shuttle and booster rockets to reach orbit – see the *Midnight Sun* (*GURPS Spaceships*, p. 7). More advanced designs are single-stage vehicles that can take off and land from ordinary airports (or anywhere, in some cases). If reactionless or warp drives are available, cargo and passenger shuttlecraft may be capable of interplanetary or even interstellar voyages. Such vessels differ from larger spaceships chiefly by their lack of long-term accommodations for crew or passengers.

CONDOR SPACEPLANE (TL9)

This is a winged shuttle equipped with nuclear ram-rocket engines that provide both good surface-to-space performance and conventional flight when in atmosphere. It is primarily intended for ship-to-surface freight transport, but carries a few passengers. Its streamlined hull masses 100 tons (SM +6) and is 90 feet long.

TL	Spacecraft	dST/HP	Hnd/SR	HT	Move	LWt.	Load	SM	Occ	dDR	Range	Cost
9	Condor Spaceplane	30	0/4	12	1.5G/5.67 mps	100	15.8	+6	2+6SV	3/3/3	0	\$9.17M

Top air speed is 2,450 mph (+4 to Hnd and +1 SR in atmosphere).

THUNDERBIRD CARGO LIGHTER (TL10^A)

This large-winged, wedge-shaped vessel is an advanced general-purpose cargo shuttle, built with a streamlined hull that masses 3,000 tons (SM +9) and measures 150 feet long. Thanks to its limited-superscience torch drive, it can do the same job as smaller shuttles with greater efficiency. It has enough delta-V for interplanetary travel, but its limited life support restricts it to relatively brief voyages. However, it has enough reaction mass to make several trips between a planet and high orbit, a nearby moon, etc. Due to its fairly “hot” drive, it has an auxiliary jet engine for use during atmospheric flight near populated areas.

Front Hull	System
[1]	Light Alloy Armor (dDR 7).
[2]	Hangar Bay (100 tons capacity).
[3-6]	Cargo Holds (150 tons capacity each).
[core]	Control Room (C8 computers, comm/sensor 8, two control stations).

Front Hull	System
[1]	Metallic Laminate Armor (dDR 3).
[2]	Control Room (C5 computers, comm/sensor 4, two control stations).
[3]	Passenger Seating (six seats).
[4-6]	Cargo Holds (five tons capacity each).
Central Hull	System
[1]	Metallic Laminate Armor (dDR 3).
[2-6, core]	Fuel Tanks (five tons hydrogen providing 0.63 mps delta-V each).
Rear Hull	System
[1]	Metallic Laminate Armor (dDR 3).
[2-4]	Nuclear Thermal Rocket Engines (ram-rockets; 0.5G acceleration each).
[5-6, core]	Fuel Tanks (five tons hydrogen providing 0.63 mps delta-V each).

It has a winged hull.
One or two bridge crew (a command pilot and a co-pilot) operate this shuttle.

Central Hull	System
[1]	Light Alloy Armor (dDR 7).
[2-6]	Cargo Holds (150 tons capacity each).
Rear Hull	System
[1]	Light Alloy Armor (dDR 7).
[2]	High-Thrust Fusion Torch Engine (3G acceleration using water).
[3]	Jet Engine (1G acceleration in atmosphere).
[4-6]	Fuel Tanks (150 tons water providing 2.5 mps delta-V each)
[core]	Fuel Tank (150 tons jet fuel, for one hour).

It is winged.
The usual crew is a command pilot and a navigator.



TL	Spacecraft	dST/HP	Hnd/SR	HT	Move	LWt.	Load	SM	Occ	dDR	Range	Cost
10 ^A	Thunderbird	100	-1/5	12	3G/7.5 mps	3,000	1,450.2	+9	2ASV	7/7/7	0	\$119.8M

Top air speed is 4,300 mph (+4 to Hnd and +1 SR in atmosphere).

ALPHA SHUTTLECRAFT (TL11[^])

This small but versatile reactionless-drive craft is designed as both a ship's boat and a shuttle. Its range is limited by its life support; in theory, it could travel at sublight speeds to other star systems in a few years, but it has only a few days' life support. Its streamlined hull masses 30 tons (SM +5) and is 45 feet long.

Front Hull	System
[1]	Advanced Metallic Laminate Armor (dDR 3).
[2]	Control Room (C7 computers, comm/sensor 5, one control station).

Front Hull	System
[3-5]	Passenger Seating (two seats each).
[6]	Hangar Bay (three tons capacity).
Central Hull	System
[1]	Metallic Laminate Armor (dDR 2).
[2-6]	Cargo Holds (1.5 tons capacity each).
Rear Hull	System
[1]	Metallic Laminate Armor (dDR 2).
[2-3!]	Hot Reactionless Engines (2G acceleration each).
[4-6]	Cargo Holds (1.5 tons capacity each).
[core]	Fusion Reactor (two Power Points).

It has gravitic compensators.
One or two bridge crew (a command pilot and a co-pilot) can operate the *Alpha*.

TL Spacecraft dST/HP Hnd/SR HT Move LWt. Load SM Occ dDR Range Cost

PILOTING/TL11 (HIGH-PERFORMANCE SPACECRAFT)

11 [^]	<i>Alpha</i> Shuttlecraft	20	0/4	12	4G/c	30	12.6	+5	2+6SV	3/2/2	0	\$743K
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Top air speed is 5,000 mph (+4 to Hnd and +1 SR in atmosphere).

COURIERS

Couriers are small spaceships used for delivery of important mail or personnel. The majority are operated by commercial messenger companies that follow a regular freight liner schedule, but specialize in the express-package trade, charging premiums for rapid delivery. In addition, major interstellar corporations or government agencies may own a private fleet of subsidized "executive couriers" for use as personal transport by troubleshooters or agents.

Courier vessels are small, devote lots of space to drives and reaction mass, and are sometimes armed, which makes them less economical than ordinary transports. Some free traders may operate courier ships (often second-hand or government-surplus) but they struggle to make ends meet against slower but cheaper vessels. Then again, they may charge higher rates than normal merchant ships as the premium for fast delivery. If a faster-than-light drive (but not FTL radio) exists, fast courier starships may be the swiftest form of interstellar communication. Along with any government-run mail service, they may be the thread that binds an interstellar society, carrying messages and data as well as packages.

Due to their ubiquity, speed, and armament, couriers are ideally suited for illegal and covert activities. Some intelligence agencies employ them for just this purpose, using the packet-delivery business as a cover for other operations. However, since couriers are *expected* to carry high-priority, valuable cargoes and important persons, customs agents take extra interest in them. Those run by government agencies or major corporations have appropriate papers to get them through customs quickly, but private citizens operating courier ships may come under added suspicion . . . The best way to use a courier ship illegally is to perform illicit activities while working for a legitimate government or corporate employer.

HERMES-CLASS INTERPLANETARY COURIER (TL10)

This is a fusion-drive courier intended for express delivery of vital mail packets and personnel across interplanetary distances. It is a deep-space vessel, incapable of taking off from a planet's surface, but it is extremely fast with a high interplanetary delta-V. The ship's missile launchers can be loaded with ordnance for self-defense, but they're mainly intended for drop capsules that can deliver packages from orbit. It uses an unstreamlined hull that masses 1,000 tons (SM +8) and is about 150 feet long.

Front Hull	System
[1]	Metallic Laminate Armor (dDR 10).
[2]	Habitat (five cabins, one-bed sickbay).
[3]	Secondary Battery (one fixed mount 24cm missile launcher; 45 tons cargo)
[4]	Enhanced Array (comm/sensor 9).
[5-6]	Cargo Holds (50 tons capacity each).
[core]	Control Room (C8 computers, comm/sensor 7, two control stations).
Central Hull	System
[1-6]	Fuel Tanks (50 tons hydrogen providing 72 mps delta-V per tank).
Rear Hull	System
[1]	Light Alloy Armor (dDR 7).
[2-5]	Fusion Rockets (0.005G each).
[6]	Hangar Bay (30 tons capacity).
[core]	Engine Room (one workspace).

It has exposed radiators.

Typical personnel includes two bridge crew (command pilot and a navigator/gunner/comm officer), one engine-room technician, and sometimes one cargo hand or guard.



TL	Spacecraft	dST/HP	Hnd/SR	HT	Move	LWt.	Load	SM	Occ	dDR	Range	Cost
10	<i>Hermes-Class</i>	70	-3/5	13	0.02G/432mps	1,000	131	+8	10ASV	10/0/7	0	\$49.2M

DART-CLASS INTERSTELLAR SPEEDSTER (TL11[^])

This needle-shaped vessel is a small but feature-laden superscience design, popular with elite, private, express-delivery companies carrying high-value cargoes. Living quarters are on a single deck, and consist of five small cabins and a galley. There are airlocks on the rear and port sides of the ship. The *Dart* uses a streamlined hull (SM +8) that masses 1,000 tons and is about 300 feet long.

Front Hull	System
[1]	Advanced Metallic Laminate Armor (dDR 15).
[2]	Enhanced Array (comm/sensor 10).
[3]	Habitat (four cabins, five tons cargo, one-bed automated sickbay).
[4!]	Secondary Battery (one turret with 30 MJ laser; 45 tons cargo).
[5-6]	Cargo Holds (50 tons capacity each).
[core]	Control Room (C9 computers, comm/sensor 8, four control stations).

Central Hull	System
[1]	Advanced Metallic Laminate Armor (dDR 15).
[2-5!]	Stardrive Engines (FTL 1 each).
[6!]	Light Force Screen (dDR 75).
Rear Hull	System
[1]	Advanced Metallic Laminate Armor (dDR 15).
[2-4!]	Super Reactionless Drives (50G acceleration each).
[5-6]	Fusion Reactors (two Power Points each).
[core]	Engine Room (one workspace).

The ship has artificial gravity and gravitic compensators. The normal complement consists of four bridge crew (pilot, co-pilot, navigator, comm officer/gunner) and one engine-room technician.



TL	Spacecraft	dST/HP	Hnd/SR	HT	Move	LWt.	Load	SM	Occ	dDR	Range	Cost
11 [^]	<i>Dart-Class</i>	70	0/5	13	150G/c	1,000	105.8	+8	8ASV	15/15/15	4x	\$101M

Top air speed is 31,000 mph.

FERRIES AND SHIP'S BOATS

The space around an ultra-tech industrial world swarms with ferry craft, cargo lighters, and ship's boats. These are short-range spaceships built to carry personnel or equipment between neighboring spaceships and stations inexpensively. They're also used for local-space journeys (e.g., from Earth to lunar orbit) and as ship's lifeboats.

AURORA ORBITAL TRANSFER VEHICLE (OTV) (TL8)

This ugly but functional short-haul vessel is a rocket-propelled utility craft intended to travel between low and high orbits. It has robot arms to assist in loading or unloading cargo. It uses an unstreamlined hull that masses 30 tons (SM +5) and is 50 feet long.

Front Hull	System
[1]	Steel Armor (dDR 1).
[2]	Control Room (C2 computers, comm/sensor 2, one control station).
[3-6]	Passenger Seating (two seats each).
Central Hull	System
[1]	Steel Armor (dDR 1).
[2-3]	Robot Arms.
[4-6, core]	Cargo Holds (1.5 tons capacity each).
Rear Hull	System
[1]	Steel Armor (dDR 1).
[2-3]	Cargo Holds (1.5 tons capacity each).
[4]	Chemical Rocket Engine (3G acceleration).
[5-6, core]	Fuel Tanks (1.5 tons rocket fuel providing 0.15 mps delta-V each)

It's flown by a single pilot (who also operates the robot arms).

TL	Spacecraft	dST/HP	Hnd/SR	HT	Move	LWt.	Load	SM	Occ	dDR	Range	Cost
PILOTING/TL8 (HIGH-PERFORMANCE SPACECRAFT)												
8	Aurora OTV	20	0/4	12	3G/0.45 mps	30	9.9	+5	1+8SV	1/1/1	0	\$808K

COPERNICUS CISLUNAR FERRY (TL9)

This small but rugged ferry uses an unstreamlined hull that masses 100 tons (SM +6) and measures 30 feet long. It uses nuclear thermal rocket propulsion to transport a mixed load of cargo and passengers over a relatively short distance, such as from high Earth orbit to Luna, or from Luna to a Lagrange-point space station. It lacks the delta-V to blast off from a sizable planet, but can land or take off from smaller bodies.

Front Hull System

[1]	Light Alloy Armor (dDR 3).
[2-6]	Passenger Seating (six seats each).
[core]	Control Room (C5 computers, comm/sensor 4, two control stations).

Central Hull

[1]	Light Alloy Armor (dDR 3).
[2-5]	Cargo Holds (five tons capacity each).
[6]	Fuel Tank (five tons hydrogen providing 0.45 mps delta-V).

Rear Hull

[1]	Light Alloy Armor (dDR 3).
[2]	Nuclear Thermal Rocket Engine (0.5G acceleration).
[3-6, core]	Fuel Tanks (five tons hydrogen providing 0.45 mps delta-V each).

The normal complement consists of two bridge crew (a command pilot and a co-pilot). Some commercial ferry flights also assign a flight attendant (with first-aid training), who can be especially useful in handling passengers unused to zero-G conditions!

TL	Spacecraft	dST/HP	Hnd/SR	HT	Move	LWt.	Load	SM	Occ	dDR	Range	Cost
PILOTING/TL9 (HIGH-PERFORMANCE SPACECRAFT)												
9	Copernicus Ferry	30	-1/4	12	0.5G/2.75 mps	100	23.2	+6	2+30SV	3/3/3	0	\$1.18M

BARGES

Barges are the least glamorous of all commercial spacecraft, but can be the most efficient. They lack maneuver drives, but are otherwise self-contained vessels. Unlike a space station, a barge is not intended to stay in one place. Most barges are cargo vessels, though some carry passengers.

Barges are sometimes towed by powered spaceships. Alternatively, one may be launched and released by a tug (or other method, like a giant rotating tether) on a trajectory that takes it toward its destination. It then drifts through space for days or even months before it is captured by a second tug at the other end of its journey. This is an efficient way to travel, but it's only practical in a safe, well-regulated solar system where traffic control monitors the barge through its flight and tugs are ready to intercept it.

100-TON CONTAINER BARGE (TL7)

This boxcar-shaped space barge is an economical way to ship bulk cargo between known destinations. Built with an unstreamlined hull, it masses 100 tons (SM +6) and is 60 feet

long. It is armored to protect against small meteor impacts (since it lacks any ability to maneuver). The barge's interior is devoted to 255 tons of cargo capacity. It has loading docks at either end plus a third on the port side. The loading doors and airlocks have security locks and anti-tamper seals. There are no provisions for living quarters, but barges with valuable cargo may have security robots.

Front Hull

[1]	Steel Armor (dDR 2).
[2-6, core]	Cargo Holds (five tons capacity each).

Central Hull

[1]	Steel Armor (dDR 2).
[2-6]	Cargo Holds (five tons capacity each).

Rear Hull

[1]	Steel Armor (dDR 2).
[2-6, core]	Cargo Holds (five tons capacity each).

TL	Spacecraft	dST/HP	Hnd/SR	HT	Move	LWt.	Load	SM	Occ	dDR	Range	Cost
7	Container Barge	30	-	12	-	100	85	+6	0	2/2/2	0	\$60K

30-TON DROP CAN (TL7)

This is a streamlined, aluminum cargo canister launched from high orbit (or via a mass driver, tether, etc.) on an aerobraking trajectory. The soft-landing system deploys its reentry shield and parachutes, and the container slows and safely lands. It is built with an unstreamlined hull, masses 30 tons (SM +5), and is 40 feet long.

<i>Front Hull</i>	<i>System</i>
[1]	Light Alloy Armor (dDR 1).
[2-6, core]	Cargo Holds (1.5 tons capacity each).

<i>Central Hull</i>	<i>System</i>
[1]	Light Alloy Armor (dDR 1).
[2]	Soft Landing System.
[3-6]	Cargo Holds (1.5 tons capacity each).
<i>Rear Hull</i>	<i>System</i>
[1]	Light Alloy Armor (dDR 1).
[2-6, core]	Cargo Holds (1.5 tons capacity each).

<i>TL</i>	<i>Spacecraft</i>	<i>dST/HP</i>	<i>Hnd/SR</i>	<i>HT</i>	<i>Move</i>	<i>LWt.</i>	<i>Load</i>	<i>SM</i>	<i>Occ</i>	<i>dDR</i>	<i>Range</i>	<i>Cost</i>
7	Drop Can	20	–	12	–	30	24	+5	0	1/1/1	0	\$95K

HEAVY CARGO BARGE (TL7)

This is a sizable cargo barge, designed for transport aboard a large spaceship such as a LASH carrier (p. 9). It is built with a streamlined hull that masses 3,000 tons (SM +9) and is 100 feet long.

<i>Front Hull</i>	<i>System</i>
[1]	Steel Armor (dDR 7).
[2-6, core]	Cargo Holds (150 tons capacity each).

<i>Central Hull</i>	<i>System</i>
[1]	Steel Armor (dDR 7).
[2-6]	Cargo Holds (150 tons capacity each).
<i>Rear Hull</i>	<i>System</i>
[1]	Steel Armor (dDR 7).
[2-6, core]	Cargo Holds (150 tons capacity each).

<i>TL</i>	<i>Spacecraft</i>	<i>dST/HP</i>	<i>Hnd/SR</i>	<i>HT</i>	<i>Move</i>	<i>LWt.</i>	<i>Load</i>	<i>SM</i>	<i>Occ</i>	<i>dDR</i>	<i>Range</i>	<i>Cost</i>
7	Heavy Cargo Barge	100	–	12	0	3,000	2,550	+9	0	7/7/7	0	\$1.8M



SLING LINER PASSENGER BARGE (TL9)

This bus-size space barge is meant for “local-space” voyages, between a station in high orbit and a moon, for example, or to a Lagrange-point space colony. Constructed with an unstreamlined hull, it masses 30 tons (SM +5) and is 40 feet long. Travel by “sling liner” is inexpensive compared to powered ferries. No propulsion system is installed, but a control room provides docking and attitude thrusters and communications capability. The only crew is a passenger attendant.

<i>Front Hull</i>	<i>System</i>
[1-2]	Steel Armor (dDR 1 each).
[3-6, core]	Passenger Seating (two seats each).
<i>Central Hull</i>	<i>System</i>
[1-2]	Steel Armor (dDR 1 each).
[3-6]	Passenger Seating (two seats each).
[core]	Control Room (C4 computers, comm/sensor 3, one control station).
<i>Rear Hull</i>	<i>System</i>
[1-2]	Steel Armor (dDR 1 each).
[3-5]	Passenger Seating (two seats each).
[6]	Cargo Hold (1.5 tons capacity).

<i>TL</i>	<i>Spacecraft</i>	<i>dST/HP</i>	<i>Hnd/SR</i>	<i>HT</i>	<i>Move</i>	<i>LWt.</i>	<i>Load</i>	<i>SM</i>	<i>Occ</i>	<i>dDR</i>	<i>Range</i>	<i>Cost</i>
9	Sling Liner	20	–	12	–	30	3.7	+5	1+24SV	2/2/2	0	\$216K

CHAPTER TWO

FINANCES AND EXPENSES

The purchase, registration, and financing of private and commercial spacecraft, and the costs entailed in operating such vessels, are serious business.

SPACEPORTS

The majority of commercial space flight involves travel from one spaceport to another. Depending on the campaign's technologies and the local TL, spaceports may be located in orbit, on the ground, or both. Ground ports service shuttles and those larger vessels that can take off or land. An orbital port, or one located on a tiny moon, asteroid, or space colony, allows non-landing ships to dock and provides shuttle service to any planet below. Some ports may also incorporate (or be adjacent to) star gates or jump points, if these are needed for star flight.

The size of a world's spaceport facilities is rated from Class 0 to Class V:

Class 0 – No Facilities: There's no orbital port, and there isn't even a designated landing site. No fuel is available. Ships planning to land must look for suitable terrain. If the world's TL is high enough, this might be an airport, paved road, or parking lot.

Class I – Emergency Facilities: This isn't a real spaceport, just a designated landing area. This could be a section of airport, a salt flat or crater, a region of ocean marked with landing buoys, a small orbital docking station, or even a military base. It may be nearly or completely unmanned, or part of a busy port facility devoted to air or sea traffic. There may be no facilities for repairing starships. Only a few reaction-mass or fuel types (water, and possibly hydrogen and jet fuel) may be available. It has adequate service facilities for vessels up to 300 tons (SM +7).

Class II – Frontier Facilities: These are intended for worlds that see an annual volume of space trade worth \$2 billion or more. Facilities are optimized for interplanetary ships and shuttlecraft. Only emergency repairs are likely to be available for large vessels. Ordinary rocket fuel and reaction mass is for sale, but the expensive materials used by antimatter, nuclear salt water, or pulse-drive engines are rarely available. There may be no facilities for repairing stardrive engines. Class II ports have adequate service facilities for vessels up to 3,000 tons (SM +9).

Class III – Local Facilities: A world with an annual space trade of \$50 billion or more needs Class III or better facilities. It includes basic repair facilities. Repairs for any system the GM deems uncommon, even for standard spaceships, may require off-planet parts, technicians, or facilities, or a special order from local industries. Class III ports have adequate service facilities for vessels up to 10,000 tons (SM +10).

Class IV – Standard Facilities: Worlds that see an annual space-trade volume of \$1 trillion or more need a Class IV or better spaceport. This includes construction facilities and ordinary repair yards. Class IV ports have adequate service facilities for vessels up to 30,000 tons (SM +11).

Class V – Full Facilities: Worlds with an annual space-trade volume of \$20 trillion or more need Class V ports. This class includes full spacecraft construction and repair facilities (within the limits of the world's TL). There are berths for hundreds or even thousands of vessels, multiple landing and launch facilities, surface-to-orbit shuttles, and every amenity imaginable, from crew union halls to high-tech training facilities. Class V ports have adequate service facilities for vessels up to 100,000 tons (SM +12).



“Adequate service facilities” represent appropriately sized loading docks, passenger and freight terminals, fuel bays, spare parts, and heavy equipment (cranes, repair robots, etc.) intended to accommodate the needs of vessels up to the specified tonnage. Greater-tonnage craft can still be accommodated, but if any single ship’s tonnage exceeds the rated service facilities (or if the port is Class 0), all loading and repairs take at least 10 times as long. In addition, at Class I and up, extra costs apply for all loading or unloading of cargo and personnel (\$10 per ton of cargo or \$100 per passenger).

As *GURPS Space* indicates, military, Space Patrol, and private ports are not included in a system’s spaceport class – only commercial spaceports. As a result, *GURPS Spaceships* assumes that the class of port possessed by a world directly reflects the amount of trade that passes through it. In those rare instances where one is built and maintained but not used to capacity (e.g., an oversized station in the middle of nowhere built as a “pork-barrel” project), downgrade the spaceport rating by one or more steps where the class modifies availability of freight, cargo, or passengers. This reduction doesn’t apply to the quality of port facilities themselves.

PORT OF REGISTRY

Governments may require spaceship owners to have appropriate licenses and registration. Spaceships are registered at a particular spaceport of Class III, IV, or V, called their “port of registry.” A listing through an obscure port, or one known for criminal activity, attracts unwelcome attention from customs officials!

A spaceship is the sovereign territory of the nation or organization that owns the port of registry. The ship and its crew are subject to that port’s laws, regulations, and taxes, including CR and weapon ownership. However, details depend on whether the vessel is registered with a major national government or with a “flag of convenience” (see below). Some cultures invest a ship’s captain with considerable legal authority inside his vessel.

Four broad categories of ship’s registry are detailed below: national governments, flags of convenience, dubious ports, and dual registry. Some form of registration is generally needed to operate as a commercial vessel on any port with CR1 or higher. Unregistered vessels may be legally forbidden from taking on cargo or passengers, or even seized by the authorities.

National Government Registry

Owners may register a merchant ship with their own national government. In some societies, this is a legal requirement for all vessels; in others, it’s optional.

The process can involve registering the vessel to a specific spaceport and polity (“We’re registered out of Port Lowell, Commonwealth of Mars”), to a specific world (“We’re registered to Terra of Sol”), or to a multi-world nation (“We’re a Galactic Federation starship”).

National government registration obliges the owner to pay income tax on his profits, if any are levied by his government, and to comply with its laws and business regulations. On the other hand, fees for national registration are generally reasonable, due to the government’s desire to support commerce. A typical charge is a flat \$0.5 per ton or \$1,000 (whichever is greater), with no annual dues.

Registration requires meeting certain minimum regulatory standards. It’s up to the GM what those are, but for commercial vessels something like this may be standard:

- Submit to an inspection to certify the vessel as safe.
- Follow the usual corporate or private business and employment laws of the society.
- Employ crewmembers who hold appropriate certifications or licenses, such as a pilot’s license. The GM may assume that anyone with appropriate skills and background has these, although non-citizens, minors, or convicted criminals may need false papers!
- Ensure the vessel is safely equipped with emergency gear; e.g., spacesuits or rescue bubbles (*Ultra-Tech*, p. 77) for all crew and passengers, plus medical and survival kits (rations, shelter, etc.) if the ship can land on a world.

There may be conditions to certify that it can perform particular commercial activities. For example, one requirement may be that any long-occupancy vessel carrying 10 or more paying passengers has a full-time doctor.

Many more regulations are likely; the GM can set whatever seems appropriate to the campaign. (“The Spacers Diversity Act requires one officer on all Earth Federation merchant ships to be of nonhuman origin: a robot, sapient animal, hybrid, or alien.”)

If the spacecraft encounters Navy or Patrol vessels from its own nation, the authorities may conduct spot-checks to ensure regulations are being met, with fines or worse if they aren’t. Penalties are *at least* equal to the basic registration fee.

National government registry is a subsidy prerequisite (p. 27), and in troubled times, port authorities, navies, and the Patrol may suspect, or be actively hostile toward, ships not registered to their own or an allied government. Also, since the spacecraft is considered the territory of the nation it’s registered to, violation of this sovereignty by agents of another power may be considered an act of war. International treaties may accept the right of a military or police force to stop, board, and search a ship in situations where criminal action (such as smuggling or piracy) or espionage is strongly suspected. But if a merchant craft is registered to a great power, the minions of less-powerful states are more likely to treat its crew gently should they blunder into trouble. For example, if the corrupt customs officials of a local dictatorship know that abusing one of Imperial Earth’s merchant vessels could trigger a messy diplomatic incident (at the cost of their careers), they may be less likely to engage in their usual shakedown tactics. On the other hand, should a conflict break out, ships registered to *enemy* governments may be impounded if caught on the “wrong side of the line” (a possibility if peace suddenly turns to war), and subject to attack by privateers and commerce raiders.

Flag-of-Convenience Registration

In many spacefaring societies, it may be common for merchants to register their vessels with small, neutral “flag-of-convenience” nations that are on good terms with most major powers. In exchange for higher initial fees, this offers exemption from taxes and fewer or no regulations. It might also allow a commercial ship to travel between rival or hostile powers easily, although neutrality may not protect a vessel in time of war! The primary benefit of a flag of convenience is not paying taxes on profits.

A typical set of requirements for a reputable flag-of-convenience port of registry for a new vessel, or for transferring registration from one port to another, is:

1. Present identification papers that allow the port of registry to perform a basic background check. Have no outstanding criminal record *with the port-of-registry government*, or with any governments it has extradition agreements with.
2. Provide proof of purchase or ownership of the vessel (e.g., valid sales documents).
3. Submit a technical certificate listing the tonnage of the ship and declaring it operational and in good repair. If it lacks such papers, place it in a dock for a thorough inspection by agents hired by the port of registry. A typical fee is \$0.1 per ton of ship; the inspection takes 1d days. Alternatively, if registration is being transferred, the new port may accept foreign certificates provided they're from a reputable, allied port. This obviates the necessity of docking prior to the registration and consequently saves the ship owners considerable expenses.
4. Pay a flat fee of \$2 per ton of spacecraft or \$1,000, whichever is greater, plus 10% of that as annual dues. There may be a "corporate fleet discount" of -50% to the initial registration fee (but not the annual dues) when registering 100,000+ tons shipping.
5. Agree to submit to whatever minimal regulations are required (basic safety measures like "a vacc suit or rescue ball for all crew and passengers").

Dubious Ports of Registry

Some ports may develop less-savory reputations, or be considered outright hives of scum and villainy. They have minimal registration fees, few or no requirements for technical certificates or proof of ownership, and a flat fee (e.g., \$100,000 with no dues). However, local authorities are probably aware of this laxity, and spacecraft operating from these ports may be hassled by customs agents, suspected of being pirates or smugglers, and so on. To simulate this, the captain should take a negative Reputation (the size depends on the port, while the frequency depends on its notoriety).

Dual Registry

States may have agreements that allow spaceships to be registered in two or more jurisdictions, under multiple governments or flags of convenience. This is useful for vessels that regularly engage in trade that takes them back and forth across interstellar borders, to reduce customs entanglements and ensure official protection. Basically, a ship pays twice the taxes, fees, and paperwork (unless a treaty waives this), but operates easily across national boundaries. Of course, if war flares up between the two jurisdictions, a ship with dual registry is automatically suspect by both governments. It may be caught in the middle, and its captain and crew forced to choose sides.

SHIPS AND CREWS

In many campaigns, the PCs may need to buy and crew a commercial ship.

BUYING A SPACECRAFT

Commercial spacecraft of any standard design can be ordered from shipbuilders and purchased from shipyards located at Class IV or V spaceports. The outright purchase of a starship is probably beyond the means of even a Filthy Rich character. However, multiple PCs with Multimillionaire may pool their funds for the purchase or a down payment. See *Financing* (p. 27) for details on bank loans and *Wealth* (below) for options for adventurers with sufficient starting wealth to buy a ship.

Wealth

see p. B25

Wealth at the Filthy Rich or Multimillionaire level is the most effective way for PCs to start with enough money to buy commercial spacecraft. The other options – Signature Gear or points for cash – are rarely cost-effective for expenditures greater than 10× average starting wealth. However, it's easy to have too much capital! The GM should cap the levels of Multimillionaire available to adventurers to suit the campaign. Some guidelines:

Filthy Rich: This may be just enough Wealth to place a down payment for bank financing of a tramp freighter in the 300-1,000 ton range, or to buy a smaller craft.

Multimillionaire 1: This buys a tramp freighter outright, or puts a down payment on a small freight or passenger liner.

Multimillionaire 2: This buys a large freight or passenger liner.

Multimillionaire 3: This buys an entire shipping line.

Multimillionaire 4: This is enough to afford a huge transplanetary or transstellar corporation that controls a great deal of society's commerce.

More than one level of Multimillionaire for a single PC is likely inappropriate for a typical space-merchants campaign!

Players may desire a ship without necessarily wanting their characters to be *rich*. Debt (p. B26) can reduce the utility of Wealth. The GM who seeks more flexibility in assigning enough starting wealth to purchase spacecraft should consider the options below.

Partial Multimillionaire Levels

Each level of Multimillionaire [25/level] multiplies starting wealth tenfold over the 100× that Filthy Rich provides. The GM may let PCs purchase *intermediate* levels. The effects and point costs are:

Level	Wealth Multiplier	Point Cost
0.2	×2	5 points
0.4	×4	10 points
0.6	×6	15 points
0.8	×8	20 points

For example, Multimillionaire 2.8 [70] grants $10 \times 10 \times 8 = 800$ times the starting wealth that Filthy Rich provides.

New Special Enhancement

Signature Assets: One or more large, expensive items (SM +2 or bigger, like vehicles or property) that you purchased with your starting money have the same characteristics as Signature Gear (p. B85). You must spend a fraction of your starting wealth on these assets before play begins. This enhancement is worth +1% per 5% of starting wealth subject to it, to a maximum of +20% for 100%. You cannot combine this with Conditional Ownership.

New Special Limitation

Conditional Ownership: Before play begins, you must spend a fraction of your starting wealth on valued possessions (equipment, real estate, etc.) that you cannot or will not resell – at least not for less than 20% of their purchase price. This can represent stolen goods, family heirlooms, items lent to you or that you are holding in trust for another, and so on. This limitation is worth -1% per 5% of starting wealth subject to it, down to -20% for 100%. You cannot combine this with Signature Assets.

Financing

The customary way to buy a commercial spacecraft is to finance it through a bank or other moneylender. The bank pays the seller when the vessel is delivered, the buyer gets the ship, and the buyer makes payments to the bank for a long, long time.

Rates are negotiable and depend on local economic conditions; the apparent wealth, honesty, and importance of the buyer; the need and greed of the seller; and the bargaining skills of the parties themselves. Typically, a down payment of 10-20% is required (paid directly to the seller). If the spacecraft is new, half this payment is made on order (nonrefundable, of course) and the rest on delivery. The delivery time for a newly built spacecraft is SM-4 months; e.g., an SM +8 ship is ready after a four-month lead time.

Interest rates on the balance typically range from 8% to 16%. If the GM is inclined toward realism, he may work out actual amortization tables. A quick-and-dirty replacement: at 8% compound interest, pay 1% of the amount financed, every month, for 12 years. At 12%, pay 1.5% of the amount financed, every month, for nine years. At 16%, pay 2% of the amount financed, every month, for six years. These payments include principal and interest; at the end of the period, the ship is paid off.

Example: A spacecraft costs \$33M. The down payment is \$3M; the remaining \$30M is financed at 8%, with a payment of 1% (\$300,000) every month. The vessel will be paid off in 12 years.

To get bank financing, a spacecraft must be properly registered (see *Port of Registry*, pp. 25-26); this is arranged as part of the financing agreement. Respectable institutions may not finance ships registered through dubious flags of convenience, and such ports have their own moneylenders, sometimes linked to criminal organizations, who are ruthless in ensuring that payments are made on time (and who may demand other favors as well).

A reputable bank also requires the owner to keep the spacecraft insured (see *Insurance*, pp. 32-33), and may attempt to set other limits on use to protect its huge investment.

Bank Financing for Upgrades

Banks may also fund modifications for a spacecraft, provided there is good commercial reason to do so – that is, it increases profitability. A good reaction roll from a financial officer may be necessary for borderline cases! Extra armor, force screens, or weapon batteries are rarely justifiable unless there is a high risk of piracy or war; then they may be encouraged to protect the investment.

Government Subsidies

Governments may subsidize bank loans to increase the size of their merchant fleet and provide auxiliaries in time of war. Only multiworld governments or independent worlds wealthy enough to support Class IV or V spaceports provide this sort of subsidy. It normally pays half the financial charges on the bank loan! However, there are at least two conditions:

1. First, the port of registry (p. 25) *must* be with the national government subsidizing it. This makes the merchant craft an extension of that body's territory, subject to its taxes and laws.
2. The vessel becomes part of the nation's emergency naval auxiliary or reserve and, with its crew, can be called up to military service in the unlikely event of war (see p. 33) or other national crises (e.g., mass evacuations due to a supernova). Failure to report for service when called is a felony and possibly a capital crime.

Other conditions may be imposed, such as a certain number of required visits to specific ports each year within the subsidizing nation's boundaries; an agreement to carry a minimum tonnage of mail at no cost; a promise to follow a particular route or schedule (even if a freehauler), to ensure outlying colonies are served; and so on.

Some governments require that subsidized ships have particular design features to facilitate naval auxiliary service; e.g., a hangar bay or weapon battery to carry combat spacecraft or armaments. However, most are happy to press auxiliary ships into military service as transports, even if they're unarmed.

Cheap and Used Ships

Lower-quality ships are often available for one reason or another. Such craft have a significantly lower purchase price, but any savings are balanced by increased expenses elsewhere. Thus the total operating cost, including financing, should be roughly constant regardless of original condition.

These rules assume a large portion of the cost of running a starship comes from payments on the initial investment. Space opera, however, is full of spacers running their own vessels with no apparent loans (though the ship may be stolen or otherwise have dodgy papers). Rather, they constantly struggle to keep ahead of maintenance expenses and other ongoing costs. For an adventuring party, this has two advantages:

1. Many operating expenses only accumulate when the ship is actually being used. This means that merchants can spend a week on a planet without losing vast amounts of money.
2. Breakdowns are an excellent source of plots. They can keep the PCs hungry for money without actually forcing them to give up their ship, or they can strand them on a planet for a week or two while waiting for parts.

Used vessels may be *cheap* or *very cheap*. A cheap ship costs half as much as usual, but requires maintenance equal to 1% of its value per month and has -2 to its basic HT. A very cheap ship costs 1/5 as much as usual, but requires maintenance equal to 1% of its value per *week* and has -4 to its basic HT. Maintenance is not required if the craft is not used during the maintenance period (that month or week).

GETTING A SHIP WITHOUT BUYING IT

A major goal for the PCs may be obtaining – or keeping – their own spaceship. As not every group has millionaires, here are some additional alternatives:

- The PCs work as crew on a trading vessel or yacht owned by an NPC. For example, they may be trusted mentors for a young, brash heir to the family business who nominally captains the vessel, or as officers for an “owner aboard” who has little experience in actual operations. They may even act as the voice of reason, especially if they have to answer to senior company officials or family members for their charge’s safety!

- They’re employed as captain and officers by a corporation (such as a merchant shipping line) that provides them with a spacecraft. Most adventuring is limited to whatever serves the company’s purposes (the pursuit of profit), but the PCs may have some freedom of action. Alternatively, they could be relatively junior crew: even if they aren’t controlling the ship, they may get into adventures while aboard or in foreign ports. As the security team aboard a large luxury liner, they could be responsible for solving a murder mystery, handling a mutiny or plague, investigating illegal activities among the crew (e.g., drug trafficking or smuggling), locating passengers who have gone missing ashore, and so on.

- They’re members of a military or other government service that assigns them a ship. To combine this with a trading campaign, they could be intelligence agents who use the merchant vessel as a cover for intelligence-gathering in foreign or disputed territory, or to carry special cargoes. Perhaps only the captain knows their true mission!

- They accept a dangerous job with a ship offered as the payment. It could be freelance work for an intelligence agency or the military, a private firm, or even a criminal organization. It may be a rich NPC who needs a favor: “Rescue my son from the imperial prison planet and this spaceship is yours!”

- They may be members of a pirate fleet or other organized criminal fraternity, supplied a vessel and allowed some measure of freedom. But they must give the organization a healthy cut of any profits and, in debt to the boss, make themselves available for special services or favors from time to time.

- They’re explorers fortunate enough to find a ship that they can claim as salvage, either adrift in space or abandoned on a planet. This is best played out as an adventure. The first part involves finding the ship; the second involves investigating it and getting it shipshape and registered (and possibly finding the money to fix various problems or disabled systems).

- They could steal a spaceship. It might be one they’ve purchased but are unable to meet payments on, one they’ve leased, or one they’ve hijacked. (This should be played out.) In an interplanetary setting, or an interstellar one where faster-than-light communications exist, thieves might find it difficult to get

far enough away to evade capture. And some rental companies, and institutions 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 sapient, it may become a dangerous opponent (or possibly a vital ally, if it can be subverted).

- They can get along without a permanent spacecraft, by buying or working for whatever passage they need (see *Working Passage*, p. 45). They might put down a deposit to lease a ship; some major spaceports have rent-a-ship centers. Of course, anyone leasing a vessel is expected to return it on time or suffer penalties (financial or worse).

MANNING THE SHIP: TYPES OF CREWS

A ship is not just steel; it requires a crew. Typically it has a captain (also known as its “master” or “commanding officer”), and the second crewmember, if any, is the senior or first officer. If it has more people, 10% should be classed as senior officers; the rest are junior officers and crew. These correspond with the following Merchant Ranks:

Vessels of 10,000+ Tons: Captain is Rank 3, first officer is Rank 2, other officers and senior enlisted crewmen are Rank 1, and ordinary crewmen are Rank 0.

Vessels of 300+ Tons: Captain is Rank 2, first officer is Rank 1, and other crewmen are Rank 0.

Smaller Vessels: Commanding officer is Rank 1 and other crewmen are Rank 0.

Specific crew requirements and functions are discussed in *GURPS Spaceships*, but just as important as skills is the crew’s relationship with the owner. There are several crew types – hired, family, etc. Some spacecraft use more than one type. For example, an independent tramp freighter may have two partners who serve as captain and chief engineer, but everyone else is either hired crew or working for passage.

Hired Crew

The hired crew is paid a regular salary (see *Crew Salaries*, pp. 29-30) by the spacecraft’s owner. On some vessels, members may receive performance bonuses as well as, or partially in lieu of, wages. Use the rules for hirelings (p. B517) to recruit new crewmembers. In some settings, space crew, or certain categories of crew (stewards, pilots, etc.), are organized into guilds or unions that have specific professional qualifications, membership dues, minimum salaries, and so on. Owners who attempt to hire spacers outside the organization may face labor action or sanctions . . . especially painful if those unions are further affiliated with spaceport personnel who could prevent the ship from being loaded or supplied by dock workers during a strike.

They may also be temporary hires supplied by other corporations. For example, passenger liners may contract with third parties for cleaning, cooking, or entertainment staff (as distinct from the ship’s officers and technical personnel). Many lines on 21st-century Earth employ cheap labor from less-developed countries for these jobs; the futuristic equivalent may be hiring aliens, androids, or colonials.

Partners

The crewmembers are business partners working for a share of the profits as well as or in lieu of salary. There are different degrees of partnership. The simplest is when they jointly own the vessel and share in expenses and profits. Partners may have a “ship share” representing the percentage of the vessel and its income to which they’re entitled. Profits, if any, are paid on a monthly or annual basis after subtracting expenses. More complex arrangements involve partners in a company that owns the spaceship (or several ships); in this case, members also receive a regular salary.

Family Crew

Some commercial vessels are run as a family business, with the crew being relatives. New crewmembers are born into the ship and apprentice during childhood, or join up through marriage or adoption (which sometimes requires rituals specific to the vessel). The spaceship may also be the family home, with children and the elderly living aboard. Large vessels may be inhabited by an entire clan, with each crewmember having dozens or hundreds of cousins aboard.

If family-run spaceships are common, they may form a distinct culture of their own, perhaps inspired by Romany (Gypsy) caravans, with complex social rules for intermarriage, inheritance, and ship status, and even their own language.

Family members get an allowance (typically 20% or less of what a salary would pay) but are also partners with a share in the ship and, if they’re adults, a place in its councils.

Pressed, Indentured, and Enslaved Crew

Privateers, smugglers, and occasionally legitimate vessels use shanghaied crew, captives, sapient pets, or slaves to fill

positions. They start in jobs where rebellion poses little threat to the craft (e.g., cargo hand or ship’s prostitute), but skilled positions may be available if loyalty can be assured through fear, long service, conditioning, coercive implants, hostages, or shared guilt in the ship’s crimes.

Even with such methods, a vessel run this way risks sabotage and mutiny, so involuntary crew are confined to quarters, limited to certain sections of the ship, brutally disciplined, or closely monitored. Crucial systems (bridge, weapons, engineering, etc.) may have functions “locked out” that require keys or identity checks to access. For guidelines on the loyalty of pressed and similar crew, see *Slaves* (p. B518).

Working for Passage

Skilled passengers may volunteer to work in exchange for a ticket to their destination, or for indefinite room and board. This is most common on tramp vessels and some cruise ships; corporate liners may have regulations against it (see *Working Passage*, p. 45).

Robots, Cyborgs, and Computer Programs

Crewmembers may also be robots, cybernetic brains built into the spaceship, or sapient computer programs. Such entities may be considered property, hired or indentured crew, full partners, or even family members, depending on the status that the owner and society at large accord to artificial intelligences and cybernetic organisms. If a single sapient program or cyborg brain runs the craft, it may consider the ship to be its body, and share the same legal identity and name as the vessel.

OPERATING EXPENSES

These “red-ink” entries keep independent captains and shipping-line accountants awake at night.

BANK PAYMENTS

Bank loan payments (see *Financing*, p. 27) can be the largest single expense for the owners of a commercial spaceship. Defaulters risk arrest by law-enforcement authorities and are favored targets for skip-tracing bounty hunters. An unlucky merchant who has trouble making a payment may be forced to find money elsewhere. Shortcuts include skimping on maintenance, reducing salaries (which could lead to the crew quitting or even mutinying), going into debt to crewmembers, or being drawn into risky deals or illegal activities like smuggling or piracy.

If an owner defaults, his bank may legally force him to reorganize his business. It might even try to repossess the ship. A moneylender may take more direct measures to ensure compliance: hidden programs in the ship’s computer, perhaps – or maybe hidden *bombs*, if he’s a criminal loan shark.

How do the proud owners earn the money to make their payments? That’s when the fun begins! If money is tight, desperate

owners trying to stay on the right side of the law can attempt to find a wealthy sponsor, perhaps offering part ownership in return. This can get *interesting* if he proves to be a criminal, an intelligence agent, or a rich eccentric.

CREW SALARIES

Hired crews want to be paid; some partnerships and family crew also get salaries or allowances. An owner or captain can make reaction rolls if he’s late with the cash. A positive outcome may afford him more time; otherwise, the crew threatens to quit, leave outright, or even mutiny. He may receive reaction bonuses by offering non-monetary concessions like better quarters, extra vacation time, a share in trade profits, or, if all else fails, part ownership of the craft. An unlucky captain might end up in debt to his crew, leaving the vessel to be run by committee.

Commercial ship salaries can vary widely, since each spaceship has its own needs and many crewmen wear multiple hats, performing a variety of jobs. On a tramp freighter, the captain is often the owner, and he may simply take any profits the ship makes rather than drawing a salary.

Crew Salary Table

Position	TL7	TL8	TL9	TL10	TL11	TL12
Merchant Rank 3	\$21K	\$26K	\$36K	\$56K	\$81K	\$106K
Merchant Rank 2	\$10.5K	\$13K	\$18K	\$28K	\$40.5K	\$53K
Merchant Rank 1	\$4.2K	\$5.2K	\$7.2K	\$11.2K	\$16.2K	\$21.2K
Merchant Rank 0	\$2.1K	\$2.6K	\$3.6K	\$5.6K	\$8.1K	\$10.6K

The table above offers a simple scheme for a monthly salary based on Merchant Rank. There may be fine gradations that depend on the job and skill level, but once health plans, dues, and pension benefits are rolled into it, wages tend to even out.

For mixed salary-and-shares (see *Partners*, p. 29), reduce salaries by the percentage of the vessel the character owns. For example, if a member of a merchant family has a 1/6 share of a ship, they get only 5/6 of the listed salary but 1/6 of the profits.

Crew Benefits

In addition to salaries, spacecraft owners are expected to provide, at minimum, room and board for their crew and medical treatment for any who are injured or sick. Crews expect liberty during port visits (at least two hours off per day the vessel is in port), although this may be curtailed for disciplinary reasons.

Union Dues

Unionized crewmembers are expected to pay about 2% of their salary in fees to their organization, and come out in support of any labor action called (e.g., strikes). In exchange, they get benefits: pensions, maternity leave, sick leave, grievance arbitration, and the chance to rise in influence in union politics should they decide to get involved. Unions can also face strikebreaking actions (possibly including violence) and may become bankrupt or corrupt . . .

FUEL AND PROVISIONS

These expenses are needed to keep the spacecraft flying. They're covered in detail in *GURPS Spaceships* (pp. 46-47).

Ammunition: This is necessary for launchers or guns. Laws may permit merchant ships to carry launchers or guns for use in time of war, but they tightly regulate or restrict the types and amount of ammunition sold. Merchants may load fewer than the maximum number of shots to save money – perhaps only one or two missiles or a few dozen gun rounds per weapon.

Power-Plant Fuel: Refueling costs must be paid to keep a power plant operational once its standard rated endurance is exceeded. This can be expensive, but for reactors, it is infrequent enough that owners don't have to worry much; for chemical power plants, it's a regular expenditure. Note that old or secondhand ships may have only a fraction of their normal power-plant fuel left and so may require refueling much sooner.

Provisions: Required for vessels that lack total life support or its equivalent (an open space devoted to farms). Each 500-man-day supply is \$1,000 and 1 ton. Gourmet supplies (suitable for first-class or luxury passengers) are 10x as expensive. Ships with replicator or nanofactory systems may create foodstuffs from waste or other matter.

Reaction Mass: This is required for vessels that have fuel tanks and reaction drives. Spacecraft fitted with refineries may



be able to avoid these costs, if the time needed to locate and refine fuel or reaction mass is acceptable.

Repair Costs: Required if something breaks down.

Stardrive Fuel: Required if the Stardrive Fuel design switch is used.

MAINTENANCE COSTS

It's assumed that the crew performs general maintenance. However, cheap and very cheap ships are constantly breaking down, and thus have additional monthly or weekly costs; see *Cheap and Used Ships* (pp. 27-28).

DOCKING AND SERVICE FEES

Spaceports may charge a variety of service fees to recoup expenses or turn a profit. Class 0 ports don't charge fees. Otherwise, use the costs listed below.

Docking and Berthing Fees

This is the basic charge paid to dock at a spaceport. It covers data, power, and life-support hookups, as well as physical occupancy. Standard fees are \$2 per ton for the first week and \$0.2 per ton per additional day thereafter. This is regardless of whether the spacecraft is in an internal hangar, since oversized vessels parked nearby obstruct traffic and other operations.

Transport Fees

If there's an orbiting spaceport, there's rarely any need to ship freight or cargo down to the planet; otherwise, it's necessary to reach the port using the vessel, its shuttles, or a paid service. If an orbiting spaceship plans to ship goods or personnel to or from the planet and lacks its own small craft, it has to pay regular shipping rates (see Chapter 3).

Customs Duties

These duties apply when a foreign party moves goods through a spaceport onto a station or world. A tramp-merchant crew isn't responsible for paying customs duties on *freight* (goods they're paid to ship) but must pay for their own *cargo* – that is, any speculative lots they own and try to sell for a profit. However, their vessel may still be delayed while freight is inspected.

Fudging It

The GM may find these rules too complex. Here are two ways to simplify.

1. Track only bank payments, insurance, salary, and fuel costs; ignore everything else.
2. Ignore *everything!* Assume that running a ship costs 1.5% of its total purchase price per month if bought via bank finance, or 0.5% of total purchase price if acquired outright. If that isn't paid, have things go progressively wrong, from the kitchen running low on fresh food to unpaid crew plotting mutiny.

Customs duties don't apply if the goods' source and destination both belong to the same political entity, or if a free-trade agreement exists (GM's option). Otherwise, fees depend on the local Control Rating: typically $CR \times (1d-1)\%$ on foreign imports. For example, a CR 4 society charges a $(4d-4)\%$ duty. A single charge may apply to *all* foreign goods, or specific classes of goods (luxuries, agricultural products, textiles, etc.) may have different duties, depending on the world or government's economic policies and how much detail the GM wants to go into. Appropriate Area Knowledge or Research rolls (or local Contacts) can reveal details of a world's customs duties in advance. Membership in a data clearinghouse like the Free Trade League (described in *GURPS Space*) can also provide this information.

On CR1+ worlds, customs inspections take at least (CR) hours per distinct freight shipment or cargo carried, plus one minute per passenger or crewmember disembarking. Divide this by the square of the spaceport class (big ports have more inspectors, but also more business). Multiply the time required on customs inspections by 1d if the spacecraft's port of registry belongs to a different national or international government. Further double all times for each of the following that apply: during time of war; if the port government is unfriendly to that of the spacecraft; and if the spacecraft comes from a port of registry with a dubious reputation.

LEGALITIES

Individual spaceships cost millions or *billions* of dollars. An accident involving one could easily devastate a trillion-dollar spaceport, a city . . . or an entire planet. It's no surprise that lawyers and governments want to get involved!

RED TAPE

Spaceships operate under regulations specified by their port of registry, as well as the laws of whatever region they're traveling through. These require captains to follow certain procedures, such as registering flight plans (telling the port where

the vessel is going next), keeping a daily ship's log, and maintaining accurate financial records.

Accountants and managers of shipping companies regularly check their captains' logs, and sloppy record-keepers may be demoted or fired. For independent contractors, failure to properly keep the books has no penalty . . . until the ship is boarded by Patrol or customs officials, gets investigated by revenue officers in a tax audit, or needs to back up an insurance claim. Then a lack of paperwork and proper procedures results in a -3 or worse reaction penalty from the investigating officials or agents, and may prevent insurance claims from being paid!

Failing to file a correct flight plan (or deviating from one) is more serious, as port authorities and Patrol agents may assume the ship is involved in illegal activities. If caught, a typical fine is \$1d per ton of spacecraft. A bad reaction roll, especially in piracy-plagued or war-torn regions, could result in authorities pursuing the ship to arrest the crew.

CORPORATE TAXES

If the owner's port of registry is *not* a zero-tax flag of convenience, he may be subject to annual business taxes on his revenue. For ordinary traders, assume this is 10% on declared profits after expenses. That figure includes accountants' fees and taking advantage of the numerous tax breaks offered shipping businesses. Traders with government subsidies pay less, typically 5%; this reflects various tax breaks aimed at supporting subsidized commerce.

If using a creative accountant to exploit every possible loophole, roll against his Accounting skill. Success reduces the taxes paid by 1% times the margin of success (minimum tax is 0%). Failure uses the base tax. Critical failure means that an inadvertent error triggers an audit in 2d months: pay back the full taxes plus a (1d)% penalty.

The PCs may cheat on their returns, using a lower declared value. To do this without getting caught requires an Accounting roll at -1 per 10% or fraction thereof declared below actual profits. Success means the faked statements look good.

Failure leads to an audit in 2d months, which may turn up the shady accounting practices. Roll a Regular Contest of Accounting with the government agent (whose skill level is up to the GM). In addition, any audit *will* result in hard-nosed individuals poking into the merchant's business – with disruptive and possibly unpleasant results should they uncover *anything*.

Critical failure means a blunder so obvious that the government doesn't need an audit – they immediately attempt to prosecute, possibly assisted by Patrol officers with guns and (if necessary) armed vessels.

INSURANCE

A prudent space captain always makes sure he has insurance, if it's offered. Insurance is inevitably *required* as a condition of a bank loan or liner contract. Interplanetary and interstellar insurance companies specialize in indemnity for vessels and cargoes. This generally covers all reasonable damage or loss from accidents, disasters, or criminal acts, including collisions, piracy, hijacking, malfunctions, or human error by subordinates.

There are two main types of insurance: *hull and machinery* (H&M) and *cargo*.

Hull and Machinery Insurance

This is insurance for the spaceship itself. Rates are based on analysis of the risk, but a monthly premium of 0.1% of the ship's insured value is typical.

If the craft has a volatile system (see *GURPS Spaceships*, p. 62) – e.g., an antimatter power plant – *double* the premium, due to the greater risk of accident and liability. If a used or



damaged vessel's HT is 9-10, multiply rates by 1.5. If its HT is 8 or less, it's considered too much of a junk heap to qualify.

Cargo Insurance

The vessel's owner doesn't have to worry about insuring his employer's freight or the passengers – they buy their own policy (or skip it) as they desire. However, anyone shipping their own cargo should consider insuring it against damage or loss.

Cargo insurance is bought by the shipper based on his assessment of its value. He should have the bill of sale as proof of the original value, but he can legally insure it for more than its purchase price if he hopes the cargo will make a profit in speculative trade.

Cargo tends to get damaged more often than ships. As such, its insurance is typically set at 1% of its value per voyage. Rates are doubled for hazardous, fragile, or dangerous shipments, or for living cargo such as livestock.

Additional Hazard Rates

Piracy: Both cargo and H&M insurance cover theft, hijacking, and space piracy. However, if *reported* acts of piracy are common in the region the ship operates in, premiums may *double*. The insurance company may reduce this to 1.5x the rate should they be convinced the shipper's vessel is especially survivable. This means it's fast, well-armed, or has appropriate defenses (such as force screens or ECM), or else the shipping company is providing anti-piracy escorts or patrols.

Bad Risk: If an insurance company is aware that a policyholder has a bad safety record, his rates go up. Generally, a payout for a lost or crippled vessel doubles the going rate for the next policy . . . but if it's proved the incident was no-fault,

there may be no increase. A Good or better reaction, or careful use of Administration, Diplomacy, and/or Law, may be needed.

War Insurance: Insurance does not cover any damage or losses due to acts of war. This is intended to discourage captains from traveling into disputed zones. However, sometimes it's necessary to do this (see below), so some insurers offer war hazard rates . . . which are *triple* normal, or double if the insurance company can be convinced the ship has greater-than-normal survivability.

Claims, Payouts, and Exclusions

Claims should be reported to an insurance office; large companies have branches at most Class IV and V spaceports. If the vessel is present and any damage can be inspected (which takes at least five days), a claim may be paid out within 1d weeks. If there is no FTL radio and the owner has moved on since filing, he may have to return to receive his payout, arrange to have it banked, or hope a courier can catch him! A successful Law (Space) or Administration roll may halve the time required by ensuring all forms are properly filled out. Honest claims substantiated by disinterested witnesses such as port authorities or the Space Patrol tend to go through easily. Million-dollar-plus claims (e.g., for the destruction or loss of an entire ship or cargo) or suspicious stories often require investigation, adding 1d months or more. Any claim might be denied or reduced; use the rules for Law skill (p. B204) to resolve contested cases.

An insurance policy excludes claims resulting from violations of criminal or civil law; gross negligence (e.g., if the captain didn't pay for maintenance and the ship breaks down as a result); and *barratry*, which is deliberately damaging the vessel or cargo to collect the money. It also omits expending resources, systems, or equipment during routine operations: launching missiles, dropping lower stages, burning fuel, etc. However, a policy may indemnify the holder for losses incurred to prevent greater loss. If a ship suffers damage and expends munitions to fight off a pirate, the insurance company may pay up (after an investigation).

There's normally an exclusion for the dangers mentioned under *Additional Hazard Rates* (pp. 32-33), unless those rates were purchased.

Insurance rarely pays more than 75% of third-party legal liability. For instance, if the ship crashes into a space station, the owner is liable for 25% of the damages if the station sues.

IN THE UNLIKELY EVENT OF WAR

Government subsidies for ships include a clause that, in time of war or national emergency, the vessel is placed under the command of the Navy or Patrol. When this happens, the merchant ship captain and crew are expected to follow orders. Called-up traders may be treated as civilians under contract to the armed forces, or they may hold reserve military commissions that are activated in time of war (and they receive military pay for the duration).

In theory, the government provides the ship's operating expenses for the duration of the crisis (including interest on bank loans). However, sometimes this payment comes in the form of promises of postwar reimbursement, which may not

be honored if the economy collapses or, worse, if their side loses the war.

There are worse risks than bankruptcy, however. A commandeered merchant has to go in harm's way, carrying troops, munitions, food, or necessities to threatened worlds within the war zone. Enemy raiders may attack commerce, attempting to destroy or capture merchant shipping to cut supply lines or enforce a blockade.

There's also a risk of privateers. To free up warships for other duties, some governments offer "letters of marque and reprisal" to civilian ships to engage in commerce raiding. Essentially a legalized space pirate, a privateer is authorized to hunt merchants belonging to enemy governments in exchange for a bounty. This might be a tonnage rate, such as \$10 per ton of shipping destroyed, or a prize rate of 10-60% of the book value for captured vessels and cargo.

This is also an opportunity, however. A suitably equipped merchant can be an effective privateer in his own right, with a couple of cargo holds replaced by gun or launcher batteries (or beams, if they have excess power), or with a hangar bay full of fighters.

Privateers and other commerce raiders are most effective when their targets are unescorted. There are too many merchants for the Navy to accompany each vessel individually, so convoy systems may be instituted where several trade space-ships organize into groups and travel under the protection of a couple of warships. To make up for a shortage of escorts, the Navy may pay to refit some merchants with defensive weapons of their own (and assign one or two Navy gunners or technicians to operate them, if the crew lacks appropriate skills). Such makeshift escorts may even receive a privateer-like bounty for the destruction of enemy raiders. Some auxiliary vessels are especially heavily armed, serving as decoy "Q-ships" to lure and destroy the enemy.

Although convoy operations are much safer than individual voyages, they're also inefficient. They put port facilities into a "feast or famine" mode: either the location is crowded with vessels or it's largely empty. In addition, the caravan is limited to the performance of the slowest ship. Simply by forcing them to convoy, raiders have won a small victory. Knowing this, it may take either an obvious threat or several months of heavy losses to convince the military to order convoy operations in a new conflict.

Factories and Trade

Advanced factory systems such as those detailed in *GURPS Spaceships* (p. 16) have sufficiently high outputs that some settings have little need to ship the majority of products from world to world! To avoid this becoming an issue, the GM may wish to apply a Slower Factory design switch: reduce the base production rate of all factory systems from \$/hr. to \$/day. (The GM may further wish to restrict nanofactories to the same output as robofacts, and either make replicators unavailable or limit them to very simple bulk items.)

CHAPTER THREE

CARGO AND PASSENGERS

Spaceship operators can make money through freight and passenger transport, and cargo speculation.

LINER OPERATIONS

In many universes, trade is handled by established shipping lines. They usually operate *freight liner*, *passenger liner*, or *courier* ships, though some run multiple types of vessel.

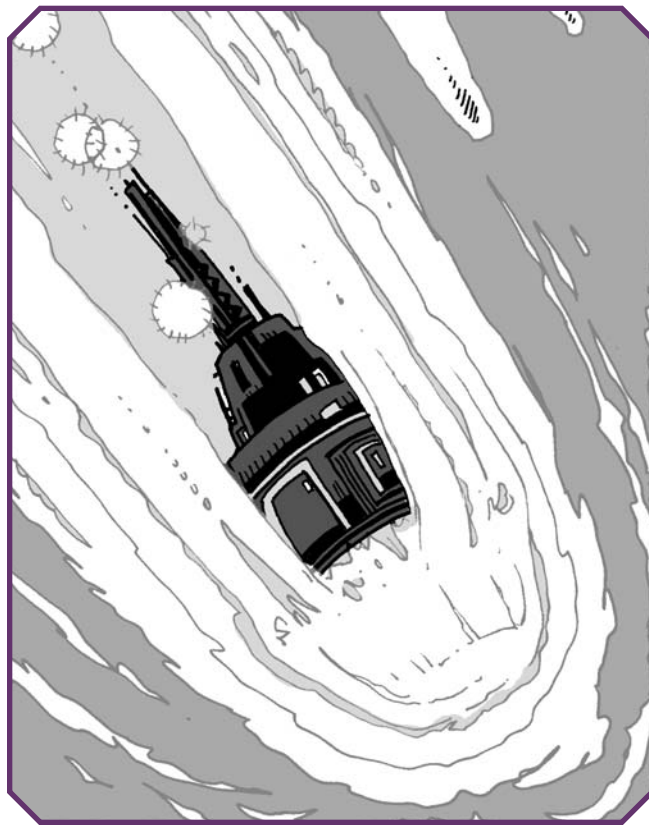
A liner follows a regularly scheduled route between several spaceports (typically 2-12), eventually returning to its port of origin. Companies rely on standing arrangements with port and postal authorities, shipping brokers, import/export companies, travel agents, and governments along the route to ensure that passengers or freight are waiting when the vessel arrives. These itineraries are the fruit of years of careful negotiations by shipping company executives and lawyers, although sometimes they're purchased (e.g., from a defunct corporation).

A liner's route is normally decided by the considerations of economics, based on the volume of trade flowing along it (see **GURPS Space** for details on calculating trade routes and volumes), and by the presence or absence of competitors. However, governments may subsidize shipping to their colonies or outposts to support territorial claims or to buy votes or influence, and this can justify seemingly unprofitable routes that take ships into interesting frontier areas.

The economics of running a multi-vessel shipping line are beyond the scope of this book, but a game can still center on PCs serving as officers and crew of individual craft.

A liner's schedule is supposed to guarantee that it has nearly full freight and passenger loads along its route. The captain is obliged to follow the itinerary unless war or some emergency requires a deviation. Most stops are at Class III, IV, and V spaceports. The corporation maintains branch offices at these stations to handle freight or passenger operations, and provide support, fuel, legal aid, etc.

A courier vessel may follow a regular liner route, especially if it's a mail ship, or it may be based at a specific port and dispatched to where it's needed. It may be required to go to one port, pick up something, and ship it elsewhere; or to head out to deliver an urgent package and return empty. Speed and safe delivery are a courier's most important considerations. As they carry high-value freight or VIPs, crews get some security training and the vessel may itself be armed.



A liner captain and crew's responsibilities are to the safety of their ship, passengers, and freight, and to keep a tight schedule on their route. Excitement comes from visiting exotic ports when off duty, and coping with whatever events the GM presents: troublesome passengers, hijackings, malfunctions, hazardous freight, medical emergencies, mutinies, random encounters with hostile or distressed ships, or large-scale problems – such as disasters or wars – that disrupt the normal routine.

Courier, freight liner, and passenger liner captains don't need to worry about finances – at least as long as their company is solvent. In many cases, they don't even handle income or expenses, which are taken care of by branch offices at each port.

Even on company craft, though, there's some opportunity for commercial speculation, because few ships operate at 100% capacity. On any given voyage, liners and couriers have unused cargo and passenger capacity each equal to $\frac{1}{3}$ (sum of spaceport classes) percent of the total. For example, if a freighter is traveling between a Class II port and a Class V one (sum of 7), roll $(13-7)d = 6d$ for the percentage of capacity not being used. If the dice total 21, the ship is 21% empty; so if its load is 18,000 tons, 3,780 tons are available.

Many shipping companies allow the captain and officers to rent unused cargo space, typically at 50% of normal freight rates, to carry their own speculative cargo (but not tramp freight). Companies have strict regulations forbidding any hazardous or illegal commerce that may risk the vessel's safety or the firm's reputation, and some shipping lines forbid *any* use of empty tonnage. Ultimately, the captain is responsible for enforcing the regulations – and if he provides cargo space to an officer who misuses it, both face corporate disciplinary action if discovered.

Unused passenger capacity traditionally isn't sold off; instead, the captain may be allowed to issue (but not profit from) free tickets. These are assigned to such individuals as he believes would enhance the efficiency or reputation of the line: "working passage" for local entertainers, free trips for travel journalists or space-restaurant critics, benefits to port charities, etc. On the other hand, many freight liner and courier

companies *don't* give captains discretionary use of excess passenger capacity, in order to avoid security risks and reduce financial liability. Still, some captains bend the rules . . .

TRAMP SPACESHIP OPERATIONS

Freight and passenger liners and professional courier companies operating on scheduled routes may dominate most space commerce. However, it's impossible to plan *all* of a civilization's travel months or years in advance. Some worlds are too small or far away to support high-volume traffic. Even on a main trade route, a large freight liner may occasionally fail to arrive on time, or a shipping company could suddenly go out of business, forcing local trade brokers to scramble for replacements to meet contracts and avoid penalty clauses. Passenger overbooking and unexpected events such as war, depression, disasters, or "gold rushes" of prospectors or settlers to a newly prosperous region cause unplanned demand.

All this results in a significant "marginal trade" that supports small, usually independently owned tramp freighters, often called "freehaulers" or "free traders." Most tramps are owned by their captains, or operated by tiny, family-run corporations. A corporate-run spaceship may even function as a tramp trader, should its captain or officers decide to use excess capacity to engage in any speculative trade on their own.

SPECULATIVE TRADE

Cautious tramp merchants earn money by carrying freight and passengers at fixed rates; see *Freight and Passengers* (pp. 39-45). This minimizes risk because it's easy to predict about how much freight and how many passengers are available. On the other hand, this approach is unlikely to yield great profits.

Ambitious businessmen accept greater risk for the chance of greater reward by engaging in *speculative trade*: the art of buying low and selling high. Rather than signing contracts to carry someone else's freight, a merchant buys goods using his own money and then tries to sell them elsewhere for a profit. If everything works well, he can make a real killing – if it doesn't, he may sell at a loss simply to pay his operating costs.

Speculative trade is most practical in interstellar settings where the speed of space travel is greater than that of radio or other communication systems. In interplanetary settings, or interstellar backgrounds where fast or instant "FTL radio" exists, there's little need for speculation since deals can be concluded between the interested parties well before ships leave port. Speculative trade is still *possible*, but it's rarely as lucrative.

A tramp freighter may carry different cargoes, never knowing which will sell first, and may fill the rest of its hold with freight as necessary. A canny trader can maximize his profits by matching likely goods with receptive markets. This makes advance information about the region of space where he's trading a valuable commodity!

BUYING THE CARGO

Starting the first full day after the ship reaches port, a merchant's crew may search for speculative cargoes to purchase.

Finding Goods for Sale

Each attempt takes a day, with adjustments producing the modifiers under *Time Spent* (p. B346). Use the best skills from among the trade team members. If an attempt fails, repeated attempts may be made at no penalty other than lost time, unless a critical failure occurs (see below). This can be done at the same time as attempts to find buyers for goods already in the cargo hold (see *Selling Cargo*, p. 38).

To find goods, roll against Merchant or Streetwise, whichever is *lower*.

Modifiers: Any penalty for lacking appropriate Cultural Familiarity; any penalty for not being a native speaker of the local language; any applicable Reputation (good or bad); +1 if anyone on the team has Area Knowledge for the local planet at 12+, or +2 at 20+; a modifier equal to the local spaceport class-3 (e.g., -1 for Class II, 0 for Class III, or +2 for Class V).

In some settings, there may be a trade association such as the Free Trade League (see *GURPS Space*, p. 205). If such a thing exists, membership in good standing may give +1.

Traders may optionally perform a focused search for a specific type of commodity (see *Focused Cargo Searches*, p. 38); if so, the additional modifiers detailed there apply.

Trade Classifications

These economically meaningful world characteristics influence the cost of and demand for goods. Assign them to planets when creating a universe! It's possible that multiple classifications – or *none* – apply to any given world.

Agricultural (Ag): The economy is dominated by the production of foodstuffs, timber, and similar biological products. This is characteristic of garden worlds (or those terraformed to that standard) with TL1+ and populations of at least 1,000 but no more than 100 million.

Extreme (Ex): The world is inhospitable, at least to the dominant trading species in the region. The population lives in artificial habitats, and extensive protective gear (such as environment suits or sealed vehicles) is required to venture outside.

Industrial (In): The economy is highly industrialized and produces plentiful manufactured goods for export. This is characteristic of worlds with a 100 million+ population, a Wealth level of Average or better, and a TL that's equal to, greater than, or no more than one below the average campaign TL.

Militarized (M): Applies if there are significant rebel, terrorist, or naval installations present, or the world is embroiled in a war, cold war, or arms race with its neighbors.

Non-Agricultural (Na): The world lacks the capability to produce sufficient food to feed itself, due to environmental or economic conditions. Many Extreme environments also qualify as Non-Agricultural (though some produce sufficient food in domes, by using hydroponics, food replicators, etc.).

Non-Industrial (Ni): The world has little or no heavy industry, and imports all major equipment. This may represent a shortage of factories or resources. This is characteristic of worlds with populations under 10 million, or with higher populations at TL4 or less.

Poor (Po): The world suffers from a poor standard of living, with little buying power. This is typical of worlds with an average Wealth level of Poor or Dead Broke. The GM may class all TL0-2 worlds as Poor.

Rich (Ri): The population enjoys a high standard of living. This is typical of worlds where the average Wealth level is Comfortable or better.

Success indicates one lot of speculative cargo has been located for purchase; success by three or more indicates two lots; critical success indicates *three* lots. Failure means no cargo is available that day, but another attempt is possible the next day.

Critical failure results in the crew inadvertently running afoul of local laws, customs, or authority figures. No one from the ship can contact the world's speculative cargo markets again until they make amends. What this involves ranges from

paying a fine for an arcane violation of planetary laws to performing some sort of favor for a local dignitary (which may require an adventure in itself).

On some worlds, more dire consequences are possible. Most planetary governments are careful in their treatment of off-world merchants (to avoid offending powerful commercial associations or foreign powers), but traders may run afoul of local zealots, bloodthirsty clans, or paranoid secret police who aren't so circumspect. Merchants may be thrown into a local secret-police prison on suspicion of being a foreign spy, or face an angry mob for accidentally violating a religious taboo.

Example: *S.S. Innsmouth* is looking for new speculative cargo. Cargo Master Fiona has Merchant-13 and, having been to the planet before, also possesses Area Knowledge-13, for a further +1. It's a Class III port; no modifier. She rolls a 14 and just barely succeeds. What has she found? See below . . .

Determine Available Goods

Unless using *Focused Cargo Searches* (p. 38), once a lot of speculative cargo has been located, determine what was for sale by rolling two dice, one at a time. If the world is TL5 or less, halve the *first* roll, rounding up. Then apply the following modifiers:

First Die: -1 if the world is Non-Industrial; +1 if Industrial.

Second Die: -1 if the world is Non-Agricultural; +1 if Agricultural.

Treat results less than 1 as 1, and those greater than 6 as 6. Read the two modified numbers consecutively as a two-digit number from 11 to 66, and consult the "Commodity" column on the *Cargo Table* to find out what sort of lot was discovered.

Next, look in the "Lot (tons)" column for the formula to determine the lot size in tons.



Cargo Table

Dice Roll	Commodity	Price/Ton	Lot (tons)	Price Modifiers	Conditions
11	Heavy Metals	\$800,000	4d×10	Ex-3	biohazard (5)
12	Grain, Flour, Baked Goods	\$500	6d×10	Ag-2, Ex+2, Na+2	
13	Radioactives	\$100,000	1d×10	In+4, Na-3, Ni-2	biohazard (8)
14	Chemicals	\$500	3d×100	In+1, Na-4	biohazard (6), volatile (6)
15	Artwork, Antiques	\$50,000	1d	Po-2	fragile (8), low legality (6)
16	Wood, Paper	\$400	3d×50	Ag-4, In+1, Ex+4	
21	Industrial Metals	\$6,000	2d×25	Ex-2	
22	Ceramics, Glass	\$1,500	2d×10	–	fragile (12)
23	Gems, Precious Metals	\$10,000,000	1d	In+1, Ni-2, Ri+1	
24	Spices, Oils	\$8,000	3d×5	Ag-2, Ex+1, Ni-1	
25	Liquor, Stimulants	\$10,000	2d×7	Ag-3, Ex+1, In+1	fragile (8), low legality (8)
26	Fruits, Vegetables, Nuts	\$500	4d×50	Ag-2, In+3, Ex+2, Na+2	
31	Special Minerals or Crystals	\$75,000	1d×10	In+1, Na-3	
32	Livestock	\$6,000	5d×2	Ri-2	biohazard (5), low legality (8), live
33	Polymers	\$2,500	3d×25	In-2	
34	Light Metals	\$2,000	2d×125	–	
35	Textiles, Clothing	\$7,500	3d×20	Ag-2, Ex+2, In-1	
36	Fish, Meat	\$4,000	1d×40	Ag-2, In+2, Ex+2, Na+2	live (8)
41	Survival or Life-Support Equipment	\$40,000	3d×5	Ex+1, In-1, Na+2	
42	Computers	\$500,000	2d×5	In-2	
43	Ammunition	\$100,000	1d×7	Mi+3	low legality (14), volatile
44	Software, Prerecorded Media	\$25,000	3d	Ex+1, Ni+2	data, low legality (6)
45	Mechanical Parts, Tools	\$10,000	8d×50	In-1, Ni+1	
46	Pharmaceuticals	\$1,000,000	6d	Ag-1, In+3, Ni-3	fragile (8)
51	Environment Suits	\$200,000	1d×2	Ag-4, Ex+4, In-2, Ni+1	
52	Robots	\$600,000	1d×10	Ex+2, In-1	low legality (7)
53	Consumer Goods	\$6,000	3d×10	Ex+2, In-1, Ni+1	
54	Farm Machinery	\$20,000	1d×50	Ag+2, Ex-1, In-2	
55	Bio-Tech	\$200,000	3d	Ag+1	biohazard (6), live (8), low legality (8)
56	Scrap, Junk, Waste Products	\$100	2d×50	In-4, Ri-2, Po+2	biohazard (7)
61	Scientific Equipment	\$500,000	2d×7	In-3, Ni+3	fragile (8)
62	Electronic Parts	\$50,000	1d×10	In-1, Ni+1	
63	Surface Vehicles	\$15,000	8d×5	In-2, Ni+2	low legality (6)
64	Aircraft	\$1,000,000	6d×10	In-2, Ni+2	low legality (8)
65	Weapons	\$100,000	3d×10	In-2, Mi+2, Ni+2	biohazard (5), low legality
66	Nanotech	\$500,000	2d×5	In-3, Mi+1, Ni+2	biohazard (7), low legality (9)

Some cargo has special conditions (p. 39). If a condition has a number in parentheses, roll 3d against it to see if it applies; e.g., bio-tech products are a biohazard on 6 or less. If there's no number, the condition applies *automatically*.

Example: What was Fiona's cargo? Her player rolls 1d twice and gets 2, 4. The planet is Agricultural so there's a +1 to the second die, which raises it to 2, 5. It's a load of alcoholic beverages – the famous local whiskey, in fact. Rolling the indicated 2d×7 for lot size reveals that there's 49 tons of it. There are also two checks for special conditions: fragile (8) and low legality (8). Rolls of 7 and 13 indicate it's fragile but perfectly legal . . . Fiona groans, remembering the fate of the Akkadian brandy her captain purchased months ago. Also, 49 tons of alcohol is expensive and she only has \$150,000 in the ship's cash reserves. But Fiona feels time is money, and decides to look into purchasing it anyway.

Determine Purchase Price

First, determine the asking price. Roll 3d on the *Actual Price Table* (p. 38). Subtract 2 if the port's world is Poor; add 4 if the world is Rich. Also add or subtract any price modifiers from the *Cargo Table* that apply to the world where the goods are purchased. For example, Ni+2 means there's a +2 to the roll if buying the commodity on a Non-Industrial world. Look up the result to find the percentage modifier to the asking price given on the *Cargo Table*.

One member of the team may negotiate to lower the asking price using Merchant skill, engaging in a Quick Contest with the seller according to the rules on p. B209. A typical opposing Merchant skill is 1d+10. Victory *lowers* the price by 10% while defeat *raises* it by 10%. For more options on bargaining, see pp. B560-562; the GM may choose to play out the meeting with the seller.

If the lot is larger than desired, buying only a portion is possible. This requires a favorable reaction roll from the seller. Alternatively, one member of the merchant team may attempt an Influence roll (p. B359); modifiers for Cultural Familiarity and language apply. If desired, the crew may offer to pick up a partial lot at the point of origin on that world to receive a +1 reaction modifier – but then they're responsible for paying (or evading) local transport fees, customs, or duties, if any, charged between the pickup and the spaceport.

Once a lot is purchased, it's normally delivered by the seller to the docking bay or portside area outside the buyer's cargo ramp or hatch (unless the crew agreed to pick it up). It's the buyer's responsibility to load each lot into the hold, although at Class II and better spaceports they can hire stevedores, robots, etc. See *Cargo Handling* in **GURPS Spaceships** (p. 44) for the time and skill rolls required to load or off-load cargo.

Actual Price Table

Roll	Actual Price
3 or less	30%
4	40%
5	50%
6	60%
7	70%
8	80%
9	90%
10-11	100%
12	110%
13	120%
14	130%
15	140%
16	150%
17	160%
18 or more	170%

Example: Fiona gets the asking price of the lot of alcohol she's been offered. The GM rolls 3d and gets a 12. Alcoholic beverages have an Ag-3 price modifier and this is an agricultural world. That reduces the roll to 9, so they're going for 90% of list price. Not great, Fiona decides, but worth negotiating for, though she can't afford 49 tons of it.

First, she wants to break up the lot. Since she's negotiating with an old lover (see the Chapter 1 vignette!), Fiona chooses to roll against her Sex Appeal skill. She arranges an intimate dinner at a fancy restaurant. The GM adds +3 for their history. The result is a Very Good reaction, and the lot is broken up.

Next, she moves in for the kill: a Quick Contest of Merchant to reduce the price. Fiona is also successful here, so the price drops another 10%, to 80%, making \$10,000 a ton into \$8,000 a ton. She decides to get 17 tons for \$136,000 . . . using the last of her ship's cash reserve.

SELLING CARGO

Beginning the first full day after arrival at a new port, a merchant crew may search for buyers for any speculative cargoes their ship is carrying. Each attempt to find a buyer for any one lot takes a day – and as with buying, *Time Spent* (p. B346) applies. Use the best skills from among the members of the merchant team performing the search.

Focused Cargo Searches

The GM may allow merchants to look for a *specific* lot of cargo. To do this, the trader must specify the commodity sought before checking its availability. Look up the cargo on the *Cargo Table* and note its price modifiers. Effective skill is at -4, plus -2 × (applicable price modifiers for that world).

Success finds one lot of the specified cargo; critical success finds *two* lots (which may be of different sizes). Failure has the usual effects. Determine lot size and price normally.

Example: If a merchant is looking for a cargo of wood or paper, which has price modifiers Ag-4, In+1, and Ex+4, effective skill would be at +4 on an Ag world, -6 on an In world, -12 on an Ex world, and -4 on worlds with none of those classifications.

If an attempt fails, repeated attempts are usually possible by taking another day at no penalty. If the ship has more than one lot of speculative cargo in its holds, the crew may split into teams to find buyers for each load, while others search for more goods to purchase.

Attempts to sell cargo use the same skills and modifiers as *Finding Goods for Sale* (pp. 35-36). Success finds a buyer. Critical failure means the crew again runs into difficulties with local law or customs.

Determine Selling Price

Once a potential buyer has been found for a given lot, determine the price using the process in *Determine Purchase Price* (pp. 37-38). However, the applicable price modifiers are now based on the trade classification of the world where the goods are being *sold*.

As with buying goods, a Quick Contest of Merchant may improve the sale price. Victory *raises* the price by 10% while defeat *lowers* it by 10%.

A potential buyer's price doesn't have to be accepted, but refusal to sell means no other buyer can be sought for these goods for an entire *week*.

The crew is responsible for unloading their goods, clearing them through inbound customs, and paying (or evading) any duties owed on them.



Special Conditions

These apply to certain commodities whether transported as speculative cargo (pp. 35-39) or as freight (pp. 39-42).

Biohazard: This shipment has the potential to contaminate the spacecraft or station if seals are broken or the hold is disabled (e.g., via combat or accident). Safe loading and unloading requires a Hazardous Materials+3 roll to avoid a leak of $1d \times (\text{margin of failure})\%$ of cargo mass – or of *all* the material, on a critical failure. Decontamination requires a successful Hazardous Material skill roll and 100 man-hours per ton lost per attempt. There may also be time-consuming paperwork or safety inspections. A successful Administration skill roll may be needed to avoid a day or more of delays. If biohazard cargo is transported as freight, the shipper pays a +20% safety premium.

Data: Instead of being measured in tons, this may be rated in terabytes (or some other unit, depending on TL) of recorded proprietary data stored in the ship's computers rather than in the hold. This is only applicable in interstellar settings (where you wouldn't just beam such data via radio or laser).

Fragile: A G-sensitive shipment. Although it's securely packed, sudden lateral accelerations can damage or destroy the commodity. Any collision that inflicts damage to the ship; any Dodge maneuver performed at 0.1G or greater (20G or more if the ship has gravitic compensators); or any rough landing (the result of a failed Piloting roll) risks damage to the cargo. In such a case, roll against the Freight Handling skill of whoever supervised its loading; failure means the loss of $10 \times (\text{margin of failure})\%$ of the cargo. This may also cause a mess that needs cleaning up, depending on the goods! If it's freight, losses

won't make the recipient happy, and could lead to legal action unless the captain can prove (via logs) he had a legitimate emergency. However, as freight, the shipper pays a 2% bonus per 10% that arrives undamaged.

Live: The cargo requires *habitat* cargo space. Each week of travel requires a roll against an appropriate medical skill (e.g., Veterinary for animals). Failure means 1% of the cargo is lost, reducing its value. If it's freight, a bonus of 1% is paid per 10% of the cargo that reaches the destination alive.

Low legality: The commodity consists of low-Legality Class (usually LC0-3) goods or products that may raise legal or moral concerns: weapons, combat robots, illegal drugs, pleasure androids, cultural icons, pornography, etc. The GM should roll 1d against the CR of any port the merchant visits to see if the goods are illegal there; usually this information can be uncovered beforehand for nearby ports on a successful Research or Area Knowledge roll, or through merchant-information clearinghouses like the Free Trade League. In the case of low-legality freight, the GM can assume the shipper arranged all permissions; otherwise, attempts to sell illegal goods require getting them past customs. This means eluding patrols (use the rules for detection and space combat in *GURPS Spaceships*), smuggling the load, bribing customs officials, etc. If trying to sell successfully smuggled goods, apply -2 when looking for a buyer but add +4 to the roll for the selling price.

Volatile: The commodity is highly unstable – ammunition, explosive chemicals, etc. The way it is stored is treated as a highly volatile system that may explode in the event of damage (see *GURPS Spaceships*, p. 62). If freight is this dangerous, a +20% hazard bonus is paid on safe delivery.

FREIGHT AND PASSENGERS

Freighters may arrange to transport freight ("other people's cargo") or paying passengers. The ship's captain announces where his vessel is going next, usually posting the destination at the spaceport terminal and on the port's computer network. The GM should then determine the basic rates for freight shipments and passenger tickets.

BASIC SHIPPING AND PASSENGER RATES

Basic freight rates are calculated per ton of freight per unit of distance. Basic passenger rates are per passenger ticket sold per unit of distance. The exact rate depends on whether a maneuver drive or stardrive is used for the voyage.

Deep-Space Rates

Use these rates when passengers and freight are carried on ships propelled by reaction engines, reactionless engines, or space sails. The table assumes commercial space travel is viable at TL8+.

The rate is not based on the *ship's* drive but on the *standard* drive in use in the setting, since that determines what the competition is using! For example, if the standard is a TL11 hot reactionless engine, the freight rate is \$10 per AU, even if the PCs are using another drive on their ship.

The rate is calculated based on the distance from the port of embarkation to the destination port, in astronomical units (AU).

Deep-Space Rates Table

<i>Standard Drive</i>	<i>Freight Rate per Ton</i>	<i>Ticket Rate per Passenger*</i>
TL8 reaction engine	\$1,700 per AU	\$17,000 per AU
TL9 reaction engine or space sails	\$1,000 per AU	\$10,000 per AU
TL10 reaction engine	\$500 per AU	\$5,000 per AU
TL11 reaction engine	\$400 per AU	\$4,000 per AU
TL12 reaction engine	\$300 per AU	\$3,000 per AU
Rotary reactionless engine	\$30 per AU†	\$300 per AU†
TL10 standard reactionless engine	\$15 per AU†	\$150 per AU†
TL10 hot reactionless engine	\$12 per AU†	\$120 per AU†
TL11+ standard or hot reactionless engine	\$10 per AU†	\$100 per AU†
TL11 super reactionless engine	\$2.5 per AU†	\$25 per AU†
TL12 super reactionless engine	\$2 per AU†	\$20 per AU†
Subwarp engine	\$1 per AU	\$10 per AU

* For first-class passengers. Halve for economy or hibernation; triple for luxury class.

† For greater realism, use the square root of distance in AU.

Hazard Rates: Double in a war zone, pirate-infested area, etc.

Stardrive Rates

Use these rates when passengers and freight are carried on vessels using stardrives.

Hyperdrive or Warp Drive: These rates assume that warp drive or hyperdrive vessels with an FTL-1 drive (*GURPS Spaceships*, pp. 40-41) take one day to travel one parsec. If the campaign's drives are faster, reduce the rate proportionately; if slower, increase them proportionately. For example, if the baseline FTL-1 drive produces a hyperspace skip that lets it travel one parsec every six days (that is, one-sixth standard speed), the freight rate per ton would be $10 \times 6 = \$60$. On the other hand, if the baseline warp speed was a galaxy-spanning

one kiloparsec per day (1,000× faster), that rate would be \$10 per kiloparsec per ton – or a mere \$0.01 per parsec per ton.

Jump Drive or Probability Drive: These drives are capable of instant jumps, so distance is usually immaterial. However there's a small "per jump" rate. For example, if a flight requires three successive jumps, the cost is \$1.5 per ton.

The GM may adjust rates to reflect other factors that might affect drive costs. For example, if stardrive fuel rules are in use, he may multiply hyperdrive, warp drive, jump drive, and probably drive rates by 1.5 or more. (This may be adjusted if fuel is especially cheap, overly expensive, or rapidly consumed in the setting.)

Stardrive Rates Table

<i>Standard Drive</i>	<i>Freight Rate per Ton</i>	<i>Ticket Rate per Passenger*</i>
Hyperdrive or Warp Drive	\$10 per parsec	\$100 per parsec
Jump Drive or Probability Drive	\$0.5 per jump	\$5 per jump

* For first-class passengers. Halve for economy or hibernation; triple for luxury class.

Hazard Rates: Double in a war zone, pirate-infested area, etc.

Interface Rates

These are the rates to carry freight and passengers from surface to orbit or vice versa. They're based on the cheapest transport available at the particular world. In systems with Class II or better spaceports, there's usually an orbital station or a port located on an asteroid, small moon, etc.; in such

situations, shippers and passengers normally only pay rates to and from the station. Especially with the more advanced drives, the cost may represent extra loading or unloading and infrastructure expenses (e.g., fees for airspace around ports).

Space elevators are usually only built on worlds with Class V spaceports and surface gravity of 1G or less.

Interface Rate Table

<i>Technology</i>	<i>Freight Rate per Ton or Passenger Rate per Ton*</i>
TL7-8 reaction drives	\$300,000 (up) or \$30,000 (down)
TL9+ reaction drives	\$50,000 (up) or \$5,000 (down)
TL9^ and up torch drives	\$50 (up) or \$20 (down)
Reactionless drives and/or contragravity	\$20 (either way)
TL9 space elevators	\$10,000 (either way)
TL10+ space elevators	\$100 (either way)
TL10^+ space elevators	\$10 (either way)

* Multiply this by the world's surface gravity. This is the rate to reach low orbit. To reach a high orbit, multiply all costs by 10 for TL7-9 reaction drives, or by two otherwise.

Hazard Rates: Double in a war zone, pirate-infested area, etc.

Combination Rates

For voyages that involve a combination of deep space, interface, or stardrive travel, calculate the rate based on each leg of the journey.

In particular, many stardrives – especially jump and probability drives – function only in specific environments (far from a gravity well, at a particular jump point, etc.). For example, a starship may need to travel to a point at least 0.1 AU from a sizable planet before it can activate its hyperdrive. If this is the case, shipping rates are based on the sum of the deep-space and stardrive rates.

LOOKING FOR FREIGHT OR PASSENGERS

The captain or his representative may look for freight and/or passengers. The same procedure applies for either. Roll *separately* if seeking both!

Each attempt takes two days to arrange and requires a roll against Merchant skill. If seeking both freight and passengers, no extra time is required. *Time Spent* (p. B346) applies, and further modifiers may adjust both freight and passenger availability rolls.

At Class 0 spaceports *only*, apply any penalty for lacking an appropriate Cultural Familiarity or for not being a native speaker of the local language.

Any Reputation (good or bad) applicable to the ship or its captain always modifies effective skill.

Most tramps find their best pickings at Class III ports, which are small enough not to attract big liners, annoying regulations, or monopolies, but busy enough that there's still plenty of commerce. Apply -1 per spaceport class above or below Class III for the ports at *either* end of the voyage. For example, there's no modifier to seek freight or passengers going from one Class III port to another, but going from a Class V port (-2) to a Class II port (-1) incurs a -3.

Optionally, membership in good standing in an appropriate commercial association such as the Free Trade League (*GURPS Space*, p. 205) may give +1.

Repeated Visits: Tramps exist in the margins of the big liner operations. A tramp freighter can't expect to be able to repeat the same route – if this were possible, a liner company would be doing it! So if they revisit the same route (e.g., Port A to Port B) within a short period (three months), the GM should apply a cumulative -2 penalty when seeking passengers and freight. If the craft has been away from that route for a long time (GM's option, but usually at least six months), erase any cumulative penalties.

Lack of Commerce: The GM may rule that some destinations are too far away for any significant commerce to take place, or are closed to trade (e.g., a hostile world, or one that's blockaded or interdicted by the authorities). If so, only a critical success results in passengers or freight.

Success on the Merchant roll means there's one freight shipment (if looking for freight) or one group of passengers (if seeking passengers) going out to the ship's posted destination. Success by 3-5 means two shipments or passenger groups; success by 6+ means *three* shipments or groups. On any critical success, there's a special-delivery option attached (see below).

Slower-Than-Light Interstellar Trade

If no faster-than-light drive is available, interstellar freight or passenger transit costs per ton may range from millions of dollars (with superscience drives) to hundreds of billions!

At those rates, about the only things one can justify shipping are nearly priceless “unobtainium” items (*GURPS Space*, p. 181) – cargoes that are themselves valued at billions (or more) per ton. These include anti-matter, alien artifacts, samples of unique biologicals (such as a rare plant that might make longevity drugs), exotic matter constructs like mini-black holes and negative matter, or the other end of a wormhole portal.

One-of-a-kind originals may also be valued at this rate. If a trillionaire on Alpha Centauri wants to own something like the *Mona Lisa* (or the last bottle of vintage wine made on Earth before civilization collapsed, or whatever), he might be willing to pay enough to get it. Even today, major cultural and artistic treasures are valued at hundreds of millions of dollars.

Another possibly priceless item is a colonial “star-seed” package, consisting of self-replicating factories, genetic material, and artificial wombs . . . In this case, the justification is not so much the cargo's value (though it may be extremely expensive) but the deed itself: the settlement of a new world.

There might also be “data” that's so valuable or secret it has to be sent in person rather than beamed through space. Examples might include uploaded minds, technological secrets, cryptographic one-time pads that allow secure decoding of messages sent via radio or laser beam, or quantum-entangled data intended for use in a superscience, faster-than-light, instant-comm system.

It's barely possible that a market for sublight passengers might exist, especially with slower-than-light vessels using reactionless or superscience drives. The fruits of face-to-face diplomatic and scientific contact with an alien civilization or a chance to study extraterrestrial life might justify paying the resulting exorbitant prices, with the results radioed back and arriving decades later.

For freight shipments, see *Tramp Freight* (p. 42); for passengers, see *Passengers* (pp. 43-44).

Failure means there are no customers. Repeated attempts are possible (see below).

Critical failure means an unpleasant situation arises and blocks further attempts (both freight and passenger) until resolved. For example, the ship might be accused of violating obscure regulations or local taboos, or suspected (rightly or wrongly) of criminal activity by the port authorities. Resolution may require Administration or Law skill, or a personal meeting with a port official and a favorable reaction roll.

On any roll except a critical failure, repeated attempts are possible by spending another two days looking. There's no penalty if the ship has so far failed in the search for that category (freight or passengers) but each attempt made after the first *success* has a cumulative -2 penalty. The captain may also give up and announce a different destination, unless already committed to taking passengers or freight.

TRAMP FREIGHT

For each freight shipment available, roll two dice, one at a time, to generate a number from 11 to 66, applying the same modifiers used to determine the nature of a speculative cargo (pp. 35-39), and then referring to the *Cargo Table* (p. 37). This indicates the type of commodity the exporter wants the freighter to ship. These goods may be native to the port's world, or something that's being transshipped through that port from another world.

Refer to the "Lot (tons)" column on the table and roll to determine the actual tonnage of freight shipped. If this exceeds the freighter's capacity, the load is too big to fit. However, meeting with the shipper in person and gaining a favorable reaction roll or succeeding with an Influence roll may convince him to split the load.

The shipper pays a fee equal to the standard rate for the voyage per ton of freight, in advance (see *Basic Shipping and Passenger Rates*, pp. 39-41). The price is not dependent on the cost per ton of the commodity unless using the following optional rule:



Optional Rule: Realistically, cheap commodities aren't shipped if it costs more to transport them than they're worth! Refer to the *Cargo Table* to find the freight's price per ton. (For extra detail, if any price modifiers apply to either this port's world or the destination, adjust the price per ton by $10\% \times$ the sum of the *difference* between the exporting world and destination world's price modifiers.) Assume that even the most desperate shipper doesn't pay more in freight fees than half the price of the goods. Thus, 50% of the price per ton is an effective ceiling on the freight rate per ton.

Some commodities have special conditions attached. If these can be met, there may be a bonus (see *Special Conditions*, p. 39).

Shipments are expected to be delivered in a timely fashion, although most ordinary freight is not urgent. Since spaceship speeds and distances vary immensely depending on the setting and technology, details are up to the GM. A ship that fails to deliver freight without good reason may gain a negative Reputation or suffer legal sanctions.

Special-Delivery Options

These may apply to both freight (in addition to any special conditions) and passengers. On a critical success, the GM should roll 1d *secretly* for one of the freight shipments or passenger groups.

- 1 – **Roll twice.** Roll *twice* on this table, re-rolling if the same result comes up.
- 2 – **Express.** They need to get there fast! The GM should work out how long a typical merchant vessel takes to reach the destination, assuming it leaves in two days. If the PCs can get there faster, by either leaving immediately or having a faster ship, there's a 20% bonus per 10% they can shave off the usual time.
- 3 – **Accompanied.** A freight shipper wants to send his own team of 1d people (guards, specialists, etc.) to accompany the freight (as first-class passengers). A passenger insists on carrying 2d tons of baggage (at usual freight rates).
- 4 – **Out-Port.** Passengers or freight are to be delivered to a Class 0 or Class I port (relatively) near the planned destination, but not on the route (e.g., instead of going to the main world in a system, the stop may be at the world's moon). If the ship agrees to this diversion, it nets the additional rates plus 50%.
- 5 – **Surge.** The freight lot or passenger group is unusually large. Double the numbers involved.

- 6 – **Illegal.** There's something fishy going on. Passengers are not what they seem; they may be disguised fugitives, or be smuggling small valuable items (such as drugs). Freight may be black-market or stolen goods, or might conceal contraband (e.g., heavy weapons hidden inside containers marked "Farm Machinery"). The GM may allow a Detect Lies, Electronics Operation (Security), or other roll by a crewmember to notice something is wrong. If the PCs choose to confront the shipper or passenger rather than contact the authorities, make a reaction roll. A favorable reaction may net a bribe of 1d times the usual rate or ticket price for the crew's cooperation and silence; if the crew gets an unfavorable reaction or doesn't accept a bribe, they may be threatened! Regardless of whether the PCs realize what's going on, carrying illegal goods or fugitives can be trouble; roll 3d against the destination port's CR+3 to see if authorities are tipped off or some other problem (such as rival gangs) arises. If the crew agreed to cooperate, the criminals may be able to help them get past such a roadblock (using Smuggling skill or otherwise hiding the goods or people). Otherwise, this hiccup may come as a nasty surprise . . . and authorities might not believe the crew is innocent of collusion!

PASSENGERS

Most travelers are carried by large passenger liners on main or minor routes. However, any vessel with unoccupied hibernation capsules, bunkrooms, cabins, or luxury cabins may

solicit for them. Each passenger is expected to pay for his ticket in advance, either when making travel reservations or when boarding the ship.

To find out who the passengers are, roll two dice, one at a time, on the *Passengers Table*.

Passengers Table

<i>Roll</i>	<i>Passengers</i>	<i>Class</i>	<i>Per Diem*</i>	<i>Number</i>
11	Colonists	Economy or Hibernation	\$1	6d-5
12	Prospectors	Economy or Hibernation	\$5	3d-2
13	Immigrants	Economy	\$3	4d-3
14	Well-Off Immigrants	First Class	\$10	2d-1
15	Merchants	First Class	\$10	1d
16	Executives	Luxury	\$50	1d
21	Explorers	Economy	\$5	2d-1
22	Scientists	First Class	\$2	1d
23	Mixed Travelers	First Class	\$50	3d†
24	Students	Economy	\$10	3d-2†
25	Mixed Tourists	First Class	\$20	5d-4†
26	Wealthy Travelers	Luxury	\$50	1d
31	Prisoners	Economy or Hibernation	\$0	4d-3
32	Mixed Travelers	Economy	\$5	4d†
33	Soldiers	Economy or Hibernation	\$10	6d-5
34	Refugees	Any	\$0.5	5d-4†
35	Journalists	First Class	\$20	1d†
36	Diplomat (and entourage)	Luxury	\$10	1d
41	Hunters or Adventurers	First Class	\$20	1d
42	Missionaries or Activists	Economy	\$1	1d
43	Salespeople	Economy	\$10	1d†
44	Emergency or Aid Workers	Economy	\$1	2d-1
45	Struggling Artists or Performers	Economy	\$5	1d
46	Celebrities (and Entourage)	Luxury	\$100	2d-1
51	Migrant Workers	Economy or Hibernation	\$1	5d†
52	Skilled Technicians	Economy	\$5	3d-2†
53	Engineers	First Class	\$10	2d-1
54	Corporate Troubleshooters	First Class	\$10	1d
55	Business Travelers	First Class	\$10	2d†
56	Senior Executives	Luxury	\$20	1d
61	Children	First Class	\$1	1d
62	Government Agents or Investigators	First Class	\$5	1d
63	Notable Entertainers	First Class	\$50	2d-1
64	Bureaucrats, Lawyers, or Lobbyists	First Class	\$20	1d
65	Politician (and Entourage)	Luxury	\$50	2d
66	Exotics	Luxury	\$0	1d

* \$0 for hibernation-class passengers.

† Group can be broken up.

The “Passengers” column shows the type of people in the group. This may not be apparent! “Travelers” means a mixture of passengers rather than any particular group.

Passengers seek a specific class of service, as noted in the “Class” column. If the ship can’t provide it, they go elsewhere. The requirements and ticket prices they pay are:

Luxury-Class: Passengers expect their own luxury cabin. The spacecraft must have at least one attendant per two luxury passengers, at least one establishment (bar, gym, shop, etc.) per 10 luxury cabins, and at least one open space. Luxury passengers pay *triple* ticket price.

First-Class: Each passenger expects his own cabin or half a luxury cabin. The ship needs at least one attendant per five

passenger cabins and at least one establishment per 100 first-class cabins. First-class passengers pay full ticket price.

Economy-Class: Passengers may be carried one or two per cabin (or luxury cabin). There should be at least one attendant per 20 passengers. The ship must have at least one establishment per 1,000 economy-class passengers. Economy-class passengers pay half ticket price.

Hibernation-Class: These are passengers who wish to travel in suspended animation, one per hibernation chamber. The spaceship must carry a doctor or medical technician with Electronics Operation (Medical) skill at 10+. Hibernation-class passengers pay half ticket price.

Notes on Passengers

Celebrity: The passenger group includes a famous celebrity plus his entourage. They can cause disruption through imperious demands and attract security threats in the form of paparazzi, assassins, autograph-seeking or obsessed passengers or crew, etc., but may be a useful Patron or Contact if treated properly. It's also possible that they're traveling incognito, eloping, etc.

Children: Either unaccompanied or with a single adult to care for them. As a result, they're likely to get underfoot!

Exotic: These passengers have unusual medical, environmental, social, or dietary requirements (the critically ill, aliens, xenophobic cultists, etc.). They require special care or make extra demands (GM's discretion) but may pay 2d× normal ticket price.

Prisoners: These may be ordinary criminals, political prisoners, or even mental patients. At least one member of the group is a guard or other attendant. Due to the security risk, a 50% bonus to the fee is offered when transporting prisoners.

Refugees: Desperate people fleeing persecution, war, or disaster. Some may have post-traumatic stress disorder or various medical problems, and the group may also include unaccompanied children or, occasionally, wanted political dissidents, rebels, and other "trouble-makers" (or their families). Roll 1d for each group of refugees; on a 1-2, they don't have the full ticket price and ask for a 50% discount on humanitarian grounds, possibly becoming hysterical or violent if refused passage; on a 6, they're sufficiently well-off *and* desperate to pay double the rate, but may also be pursued by the authorities.

Soldiers: This is a unit of military personnel, mercenaries, security guards, corporate troops, guerrillas, etc. Those traveling in Economy or Hibernation are enlisted soldiers; those on First-Class or Luxury tickets are officers (or possibly elite black-ops troops or rich mercenaries). Their baggage normally includes uniforms, body armor, and personal weapons, which must be stored securely. The entire group must be taken as a single unit.

On interface-only journeys (space to orbit or vice versa) or any short trip (under 24 hours), passengers of any class can be carried in seats but still require the specified ratio of attendants.

If two service classes or "any" are listed, the passengers accept whatever is offered and the group can be mixed.

Passengers (unless hibernating) spend extra money on services (drinks, shopping, tips, etc.) during the voyage. The "Per Diem" column shows the daily average spent per passenger in that category. Optionally, at the end of the voyage, add (3d-10)% (treating negative results as negatives, not as 0); e.g., -2 means -2% to profits.

"Number" is the number of passengers in this category who apply for tickets. Treat any roll of 0 or less as 1. In general, a group of passengers travels together and won't be broken up unless they're marked with a †.

Special Passenger Events

Passengers can sometimes be trouble . . . and this is especially likely for those willing to travel by tramp freighter. The GM may roll 3d when they're carried. On an 18 (17-18, if any passengers are from war-torn or otherwise troubled ports, or the group includes exotics, celebrities, refugees, or prisoners), a special event occurs during the voyage; roll 1d on the table below.

Special Passenger Events Table

Roll	Event
1	Medical Emergency
2	Crime
3	Hijacker or Terrorist
4	Pet
5	Spy
6	Stowaway

Medical Emergency: One or more members of the passenger group are ill, give birth, attempt suicide, or carry a pathogen or parasite that evaded spaceport detection.

Crime: A passenger commits a crime, either on the spur of the moment or with careful planning. This could be anything from a drunken assault to a series of thefts, rapes, or murders. The target may be other passengers, the crew, or the cargo.

Hijacker or Terrorist: One or more passengers (or possibly hired crew) are hijackers or terrorists. They could be casing the vessel for a "dry run" against another target, or the PCs' ship may be their objective. They may intend to capture or destroy the craft, seize hostages, or secure the particular passengers or freight the ship happens to carry.

Pet: A passenger has an exotic pet that requires special care, feeding, etc., so it cannot simply travel in hibernation or as cargo. He agrees to pay up to twice normal ticket price if it can be transported and cared for.

Spy: One or more passengers are undercover police or secret agents working a mission for a government or corporate agency. A spy may contact, kidnap, or assassinate another passenger or crewmember; sneak into the hold and examine some item of freight that contains an object of interest (possibly hidden in it); or try to escape the region with information (pursued by his enemies).

Stowaway: Someone gets past port security and tries to sneak aboard the vessel! The GM must decide who the stowaway is (runaway, fugitive, saboteur, animal, etc.). Whether they get aboard or are caught depends on the crew's precautions. If someone is discovered after the ship is underway, space law often gives a captain the right to dispose of him (usually out the airlock – sometimes with a rescue ball or suit, sometimes not) should his presence endanger the craft. Otherwise, common options are to lock him up and turn him over to the authorities at the next port, make the stowaway work for his passage, or, perhaps, take pity and allow a free ride. Ruthless captains might opt to sell the criminal into slavery or force some other cruel fate. Anyone caught stowing away on a merchant ship needs to make a reaction roll (usually at -5).

FULL CHARTER

This is the best deal a tramp freighter can get . . . and it's often too good to be true! A full charter involves a client hiring the entire spacecraft and buying out *all* the freight and passenger capacity, usually at full price, but with the caveat that the spacecraft go to a specified destination. Odds of a full charter are fairly slim.

If the ship is open for it, roll 3d when the tramp freighter enters port and again every week thereafter. On a 3, someone may be seeking a ship to charter. Add +1 to the weekly chance in time of war, rebellion, etc. Add a further +1 if the vessel makes it known that "no questions are asked" . . . but if that's the case, the charter is almost always illegal, dangerous, or both. Even if a charter is available, the captain needs to meet with and gain a favorable reaction from the person offering it.

Working Passage

Merchant ships may offer to let passengers or even stowaways "work" their passage, if they have skills the vessel needs and an extra hand would be useful. In exchange for serving as an unpaid crewmember, a worker receives room and board for one on the ship until he reaches his destination.

Working passage is at the discretion of the captain or, on large ships, the purser or first officer. A Good or better reaction roll may be required; add +1 if the passenger can demonstrate a useful skill at 15+, or +2 at 20+.

Working passage is most common on privately owned tramps (where the captain doesn't have to worry about pesky corporate rules or union regulations), and on cruise ships that may be happy to employ non-paying experts who serve as unpaid entertainers, guest lecturers, doctors, gourmet cooks, etc.

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