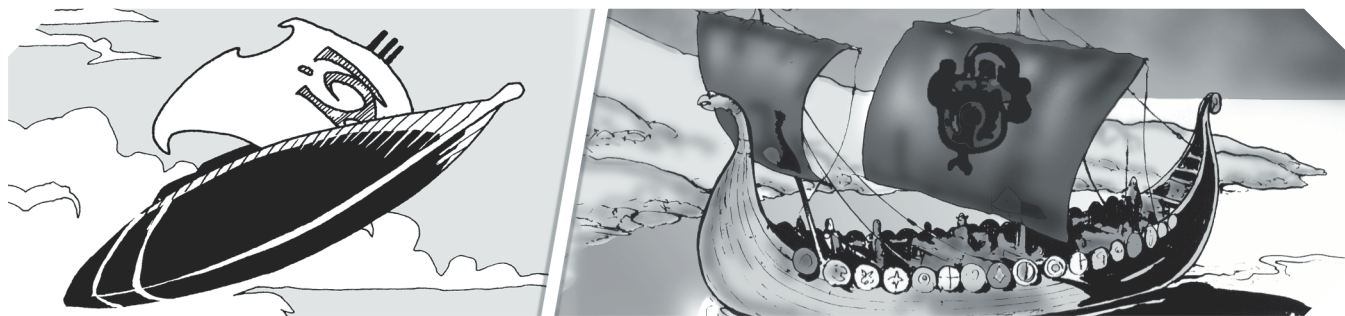# GURPS® Fourth Edition

VEHICLES
Transports of Fantasy™

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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.

INTRODUCTION

Most "fantasy" roleplaying-game settings are low-tech worlds, more or less loosely based on the real world's history. Hence, when a *GURPS* fantasy game needs a vehicle, the first stop is often the historical vehicle materials in the *Basic Set,* followed by *GURPS Low-Tech* (the line's historical-tech reference book) or one of its supplements – *GURPS Low-Tech Companion 2: Weapons and Warriors* has notes on chariots and military transportation, and game details for an assortment of military vehicles, while *GURPS Low-Tech Companion 3: Daily Life and Economics* has information on transport infrastructure and various cargo vehicles. In addition, *GURPS Fantasy* has a range of vehicle descriptions, mostly (but not entirely) based on historical examples.

However, fantasy can go well beyond history! After all, players are accustomed to the huge variety of land, sea, and air vehicles found in the modern world. They may find historical-style vehicles (restricted by low-tech engineering and the limitations of muscle and wind power) less than exciting – and fantasy is all about stretching plausibility for fun. *GURPS Fantasy-Tech 1: The Edge of Reality* devotes a chapter to imaginary transport technologies derived from legends or historical speculation, some of them marginally plausible as real-world ideas. *GURPS Dungeon Fantasy Treasures 2: Epic Treasures* has a short chapter of weird and highly fantastical vehicles. Building on those options, this *GURPS Vehicles* volume is all about fantasy. It takes realism as its baseline, but goes further, applying genre-fantasy thinking to the subject. Of course, not every vehicle described here belongs in every fantasy setting, but most should be quite adaptable.

REFERENCED WORLDS

For convenience, and to illustrate the sort of fantasy assumptions involved with these vehicles, this volume makes frequent references to pre-existing *GURPS* fantasy settings. These include:

- Yrth, the world of *GURPS Banestorm*.
- Azoth-7, an "Alchemical Enlightenment" world described on pp. 112-113 of *GURPS Infinite Worlds*.
- *GURPS Dungeon Fantasy,* which represents various ultra-generic high/heroic fantasy settings.
- *GURPS Thaumatology: Alchemical Baroque,* a fairy-tale setting known in *Infinite Worlds* games as "Marchen-1."

Where a vehicle may be associated with one of these settings, the fact is noted in the heading. However, those references are intended to illustrate, not to restrict; nothing stops the GM from borrowing any of these vehicles for their own settings.

TABLE FORMATS

The vehicle details tables in this book follow the format defined on pp. B462-463. Variations and complications are discussed in the table notes; in particular, many vehicles have different DR on different components.

TECH LEVELS

All of the vehicles detailed in this book are assigned a tech level, as per p. B22 and p. B27. Quite a few of them are from divergent technology paths or involve a sort of super-science, all as described on p. B513. (Actually, "superscience" on fantasy worlds is usually supernatural, involving quasi-scientific ideas such as alchemy.) However, it's fair to say that not all fantasy settings pay a lot of attention to this subject. Genre fantasy tends to be set in a version of the technological "olden times," casually blending equipment from TL0 to TL4 or sometimes beyond. Its treatment of vehicles is especially prone to this, particularly at sea; expect a fantasy port's harbor to be bustling with TL1 galleys, TL2 longships, and TL4 galleons. This isn't entirely ahistorical – cultures of different levels of technological sophistication historically came into collision quite frequently – but fantasy heroes might not notice the contrast. Moreover, some *GURPS*-based fantasy games, such as *Dungeon Fantasy,* ignore the TL rules entirely. Even in games which use tech levels for some purposes, the GM may choose to ignore TL qualifiers on vehicle skills (and not sweat issues of familiarity too much either), so that, for example, heroic sailor PCs can crew coracles, dhows, and advanced junks, all with equal competence.

PUBLICATION HISTORY

This is the first edition of *GURPS Vehicles: Transports of Fantasy.* A few of these vehicles have previously been discussed in various Third or Fourth Edition *GURPS* books. In some cases, game statistics have been borrowed from those previous books, as noted where appropriate in the text.

ABOUT THE AUTHOR

Phil Masters is the author of numerous *GURPS* books, including *GURPS Banestorm, GURPS Thaumatology,* and the Fourth Edition *GURPS Steampunk* line – as well as of several books for other games and a roleplaying game of his own creation, *The Small Folk,* which can be found at **warehouse23.com/products/the-small-folk**. He is qualified to operate a horseless carriage of TL8 construction, but prefers that it not be subject to supernatural influences.

CHAPTER ONE
LAND VEHICLES

Once upon a time, Hogan the peddler was driving home from market late at night through the forest. Hogan was quite well off, as peddlers went in those days, which was why he owned a wagon. He had made his money by chasing every chance of a sale like a dog chasing a rat, and that day there had been a lot of customers come along late in the day, which was why he was still out in the woods when night fell. So Hogan huddled down on his seat, kept his hand on his sword-hilt, and listened for wolves.

But it wasn't wolves he saw when his cart rolled round a bend in the track. There, on the road in front of him, was a carriage with a wheel twisted askew. For all that, it was canted and not going anywhere, its horses restless and skittish, and its driver and footman clearly unhappy, it seemed to Hogan to be the most beautiful carriage that he had ever seen. The moonlight glinted off the gilding on its lacquered body. Curtains of silk brocade covered its windows. The horses that drew it were long-maned grays. Even its wheels were large and slender, with rims that seemed to have been forged of something finer than mere iron. But whatever they were made of, one had suffered badly from a deep pothole which Hogan knew of old and always steered around.

Now, Hogan was a decent man, and seeing the two tall, handsome fellows scratching their heads helplessly, he thought to see if he could help. So, he stopped his cart, hitched his horse to a nearby branch, and sauntered over.

"Hey, fellows," he said as he neared the coach, "let's see if two of us can lift that between us. Looks like we might get that wheel back on straight – enough to get you home, anyway . . ."

"You do not know of our home," said one of the servants coldly, and when he turned to stare at Hogan, the peddler saw that his eyes were all golden, with no white and no pupil.

"That I don't," said Hogan, somehow more offended by the rudeness than afeared, "but what matters that to you?"

The servant seemed ready to be rude again, but then a voice spoke from within the coach. "Halt your tongue, Esperance," it said, "and treat this good mortal as his courtesy deserves."

But Hogan paid little heed to those words, for the voice had caught him. It was a voice to make the angels weep, more golden than the coach's decoration or the coachman's eyes, and just to hear it seemed reward enough for whatever aid he could offer. And so began his tale.

In ages where human or animal muscle-power is the only thing generally available to propel vehicles, and roads are often little more than dirt tracks, land vehicles are inherently limited. Carts and carriages are the largest feasible conveyances for the conditions, and chariots are the only military type that historically saw widespread use. However, carts and wagons are essential for goods transport in many places, and coaches of some kind may be a major form of long-distance transport.

HUMAN CIVILIAN VEHICLES

Some cultures managed quite well without many wheeled vehicles. Historically, for practical reasons, the medieval Middle East got by mostly with pack animals, and pre-Columbian New World civilizations never really developed the wheel at all. In others, wheels were crucial. The vehicles in this section may not seem very exciting, but they can be an important part of setting furniture. See p. B464 and **GURPS Low-Tech,** pp. 135-137, for basic concepts, and **GURPS Low-Tech Companion 3: Daily Life and Economics** for details of the economics of transportation.

CARGO CARTS AND WAGONS

Simple wheeled vehicles are essential to many farmers. Smallholders who works the land solely to feed their families may not need one, but anyone hauling significant loads of grain or fruit to store in a barn or sell in a nearby town will find it handy to have something to move quantities of goods. Wagons also loom large in "pioneering" settings. Adventurers in a fantasy setting might end up hiding on a cart (under a load of crops) to infiltrate a town, or press a wagon into service as an improvised barricade, while colonists crossing a wilderness might circle their wagons, in best Old West style, if they come under attack.

A *cart* is a simple two-wheeled vehicle pulled by one or two animals, while a *wagon* is larger, with four wheels and generally at least two draft animals. The driver of a cart can walk in front and lead the animals, while a wagon driver usually has a seat on board.

The basic *oxcart* and *wagon* details here are repeated from **GURPS Low-Tech** for convenience. Two oxen typically draw the former, while two horses pull the latter. In practice, whatever large animals are best suited to local conditions may be relied on for this purpose.

The *heavy wagon* is a big four-horse vehicle. Something this size may only show up when technology and economics have encouraged the growth of industrial-scale farms, which often means TL4+. However, a TL3 society could build something like this if it needs to.

Either type of wagon could be built at TL2, though pre-TL4 technology would make for lower reliability; reduce Handling and HT by 1 each at TL3 or below. Likewise, even if the vehicle is built at TL4 or better, a cart or wagon might only have TL3-equivalent suspension – or even *no* suspension – to keep the cost down.

Wagons vary a lot in size. The classic Old West "prairie schooner" was usually somewhere between these two. Heavy TL5 wagons could carry as much as 6 tons.

Carts and wagons are, realistically, too slow and cumbersome to make for exciting chase scenes. However, in a cinematic game, horses drawing a lightly laden cart might be persuaded into a panicky gallop (roll Teamster at -2), giving it Move 2/5. The driver must also make a control roll (p. B466) at -2 or worse just to keep thing stable when starting the gallop *and* then every five turns after that to negotiate bends, large potholes, etc.

As U.S. pioneers heading west demonstrated on occasion, some wagons could be converted to float across rivers. This takes about half a day for a team of three or four people to remove and stow the running gear and calk the body with tar to prevent leaks. Refitting the wagon on the other side takes as long. Both tasks require a Mechanic (Wagons) roll. A converted wagon is *improvised equipment* for Boating (Unpowered) (-5 to skill). Simply poling it slowly across a slow-flowing river is a very easy task (+6 or +7 to skill), but not all rivers are slow. Swimming the draft animals across needs an Animal Handling skill roll. Results of failure on any of these rolls are left to the GM's imagination, ranging from minor inconvenience to loss of life.

PASSENGER VEHICLES

Even once horse-riding is commonplace, coaches and carriages provide the usual form of long-range transport for many people. For example, steppe nomad families may travel in wagons, with the shepherds and warriors riding out on horseback to look after herds or flocks, guard against enemies, and perhaps conduct raids on others. Likewise, traveling theatre troupes, low-tech circuses, and well-off itinerant merchants may spend a lot of time on their wagons on the road, even sleeping on or under them between towns. A wealthy household on the move might use wagons to carry their possessions, with some members of the group finding space on the same vehicles. With added structure and some homey fittings, wagons can evolve into early gypsy-style caravans.

Although the Romans even seem to have employed purpose-built passenger wagons, with suspension systems, most low-tech wagons have poor or no suspension, making them *miserable* to ride (see *Rough Travel*, see box). Travelers may well prefer to walk alongside. Each person of average build who wants to ride in a wagon or cart (pp. 4-5) uses 0.1 ton of the vehicle's Load.

ROUGH TRAVEL

Historically, travel in pre-modern wheeled vehicles was typically *uncomfortable*. Roads were often poor (very few would rate as "good" before TL5). Few vehicles had *anything* in the way of suspension before TL4 (though the Celts and Romans may have used some suspension systems at TL2, and the *chariot branlant*, p. 6, is a rare example of TL3 suspension); modern-quality suspension systems only appeared at TL6. Pioneers heading for the U.S. West often walked alongside the wagons rather than riding them. On roads, coaches are faster than walking but if speed is the issue, using animals trained for riding is a better choice when available.

To reflect this, the GM may assign a fatigue cost to vehicle travel in any but the best conditions. Some suggested guidelines:

- TL6+ suspension on good roads: No FP cost. Passengers can rest to *recover* FP and even sleep if they have enough space.
- TL6+ suspension on adequate roads, or TL5 suspension on good roads: No FP cost. Sleep may require the Deep Sleeper perk, but passengers can rest well enough to recover FP.
- TL6+ suspension on poor roads, or TL5 suspension on adequate roads: No FP cost or recovery.
- TL6+ suspension off-road, TL5 suspension on poor roads, or TL4 suspension on adequate roads: 1 FP per hour.
- TL5 suspension off-road, TL4 suspension on poor roads, or TL2-3 suspension on adequate roads: 2 FP per hour.
- TL4 suspension off-road, TL2-3 suspension on poor roads, or no suspension on adequate roads: 3 FP per hour.
- TL2-3 suspension off-road, or no suspension on poor roads: 4 FP per hour.
- No suspension off-road: 5 FP per hour.

Flat, open plains and meadows may be treated as equal to poor roads rather than off-road conditions, especially if the driver can choose the route. The GM can also impose extra penalties for hot weather, *really* bad terrain, etc., or allow a small benefit to someone riding on a mound of cushions.

"Road-Bound" Vehicles

Many of the vehicles in this chapter are marked as "road-bound," with a * in their Move rating in the statistics section. Do *not* take this too literally! Aside from the fact that many pre-TL5 roads were so poor that they would be considered "off-road" conditions by modern drivers, farm carts spent much of their time driving across fields, Old West wagon trains struck out across the prairies, and chariot armies fought battles on open plains. Such vehicles can generally survive such flat country well enough, although the drivers may have to make frequent control rolls (p. B466) if they push their luck or drive at top speed. Rather, "road-bound" vehicles are merely unable to handle *really* folded country, mountainsides, bogs, etc., and passengers suffer fatigue penalties as above. Additionally, some plains and meadows may be treated as equivalent to poor roads.

In cinematic games, the GM might treat "road-bound" vehicles as simply suffering a generic -1 to -4 to control rolls when off road, depending on the nature of the ground, or even ignore the problem except when a fancy aristocratic coach proves unable to leave the road to escape pursuit.

ANIMAL-POWERED VEHICLES IN COLLISIONS

Vehicles ramming or colliding with each other or with creatures use the *Damage from Collisions* rules (p. B430). Problematically, the rules base damage on the vehicle's HP, even when animal-powered vehicles are involved and much of the momentum and propulsive force involved actually comes from the draft animals. Chariots in particular often consist of lightweight bodies pulled by teams of powerful beasts.

To better reflect reality, base the collision damage calculation on the HP of one of the animals (the weakest, if there is a difference, but most teams consist of matched animals), multiplied by 1.4 for a team of two animals, 1.7 for three, or 2 for four. (For even larger teams, use the square root of the number of animals.) Thus, a pair of 18 HP ponies towing a light chariot do collision damage as if a 25 HP object, and a team of four 22 HP horses towing a heavy chariot are treated as 44 HP for this purpose.

HARNESSING UP

The process of attaching draft animals to a vehicle at the start of a journey or job is routine for competent handlers, but takes a little time, which may be significant in action scenes. For a simplified rule, use the following guidelines.

Harnessing and hitching a team of animals to a vehicle requires an appropriate Teamster skill roll. Having all the gear ready and the animals reasonably calm gives +6 to the roll. Normal time for the task is three minutes per animal (two minutes to fit the harness to the animal, one to hitch it to the vehicle), but the time spent can be adjusted as per p. B346. Add two minutes per animal to the time if the harness is not in good order, so that it needs disentangling or several straps need to be fastened or adjusted. On a critical success, Teamster rolls to control the vehicle are at +2 for the next hour. A normal success simply gets the job done. On a normal failure, the person must restart the whole process. On a critical failure, some minor inconvenience of the GM's choice is suffered – the person thinks that the job was done correctly, but after 2d minutes they find they have to do it all over again; a minor equipment breakage occurs; or the process must be restarted *and* the animals are annoyed, giving -2 to all skill rolls when working with them for the next hour.

Examples

Chariot Branlant: This is not a chariot as understood today, but a late-medieval luxury vehicle, a predecessor of the carriage. Its body is suspended between the axles by iron chains, partially damping out bumps (that is, TL3 suspension). This version has an open cabin with a fancy awning over cushioned seats for two passengers, and a driver riding on one of the two horses rather than getting in the way of the passengers. Some Roman luxury carriages may have been similar to this, even at TL2.

Carriage and Coach: These are from **Low-Tech.** The carriage is a small, open vehicle used to get around large towns and cities, while the coach is actually a stagecoach, used for long-distance commercial transportation – the natural prey of villainous NPC or swashbuckling PC highwaymen. Both have bodies suspended on leather straps for greater comfort (TL4 suspension). Although the coach is listed as having an open cabin, those passengers willing to pay more ride inside. In many cases, they are protected from the weather by glazed windows.

Court Coach: This is a posh refinement of these concepts: a highly decorated, luxury vehicle with an enclosed, glazed-window cabin for up to four passengers (a lady in a big dress or anyone who wants some elbow room can reduce the number). A fancily uniformed driver and footman ride outside. The driver may be a *postilion*, who rides on one of the horses instead of sitting atop the coach. This is a natural form of transport for fairytale rulers, especially on formal occasions; the decoration is worth +1 reactions from anyone impressed by displays of wealth. In fact, a coach might be a real mobile work of art, if the owner is willing to pay for that; raise the cost to $50K for a vehicle which gets +2 reactions from people who can appreciate the quality of the decoration, or $100K for +3. (This is an application of the *Styling* rules from **Low-Tech,** p. 14.)

Traditional Civilian Ground Vehicle Table

TL	Vehicle	ST/HP	Hnd/SR	HT	Move	LWt.	Load	SM	Occ.	DR	Range	Cost	Loc.
TEAMSTER (IQ-5, Animal Handling (same)-4, Riding (same)-2)													
1	Oxcart	34†	-3/3	11c	1/1	0.9	0.6	+1	–	2	F	$340	2D2W
3	Wagon	35†	-3/4	12c	4/8*	0.84	0.5	+2	1	2	F	$680	2DE4W
3	Heavy Wagon	55†	-3/4	12c	3/8*	3.8	2.5	+3	1+1	2	F	$2K	4DE4W
3	*Chariot Branlant*	37†	-3/3	10c	3/8*	0.8	0.4	+2	1+2	2	F	$2K	2DEO4W
4	Carriage	47†	-1/2	10c	4/10*	1.6	0.8	+2	1+6	2	F	$7.5K	2DO4W
4	Coach	54†	-2/3	12c	4/9*	2.4	1.2	+3	1+9	2	F	$11K	4DO4W
4	Court Coach	55†	-2/2	12c	4/9*	2	0.7	+3	2+4	2	F	$20K	4DEG4W

HISTORICAL MILITARY VEHICLES

Military wheeled vehicles go back to TL1 in the form of chariots, but historically those were largely superseded by cavalry by the middle of TL2; they're just too cumbersome, expensive, and inflexible. Big, heavy "war wagons" appeared late in TL3, but those were a specialist weapon. In fantasy worlds, military vehicles might have more uses that are exotic; they can certainly look impressive, and they are often associated with deities.

CHARIOTS

Historical chariots are discussed on p. 137 of **GURPS Low-Tech.** Three standard types from there are detailed in the table for reference.

The *heavy chariot,* pulled by four ponies, is built to charge head-on at enemies. It has a crew of three. Driver, spearman, and shield-bearer are typical, though all sorts of weapon load-outs for the crew are possible.

The *light chariot,* drawn by two horses and crewed by a driver and a warrior, shows up in various roles. In some cases, it's a skirmishing vehicle, and the warrior is an archer (see **GURPS Egypt** for one nation that used chariots this way). In more "heroic" cultures, such as Heroic Age Greece (**GURPS Greece**) or the Celtic world (**GURPS Celtic Myth**), light chariots served as "battle taxis," delivering noble warriors into action wherever they thought that they could do most good or earn most glory.

The *battle car* is a Celtic variation on the light chariot concept, built for minimum weight, and therefore provides no protection at all for the crew; it's simply a platform. It might be constructed well enough *not* to rate as road-bound (p. 5); Celtic chariot warriors were noted for their tactical flexibility in rough terrain.

Chariots rarely have suspension systems, even when such have been invented – they add too much to the weight, and these are tactical weapons, not civilian transports. Even so, Celtic designs may have had basic suspensions to compensate for rough terrain. Heroic warrior PCs should consider taking their drivers as Allies, hopefully with enough smarts to act as tactical advisors.

Note that chariots require a fair amount of space to operate safely and a reasonably level ground, and they cannot turn sharp corners. Taking a chariot down into the dungeon is *not* an option.

Command Platform

Even once chariots have ceased to be effective battlefield weapons, a few may show up in armies with the commanding general on board. A chariot can be a useful platform, lifting the commander above surrounding troops so that the leader can be seen and give speeches. Chariots can provide a better view of the battlefield while looking inspiringly impressive.

SCYTHED CHARIOTS

Quite a few modern depictions of chariots show them with scary blades and spikes attached to the wheel hubs or chassis, obviously intended to inflict horrible injuries on enemy troops at close quarters. There is some historical justification for this; scythed chariots may go back to the Assyrians and were certainly deployed by the ancient Persians. A little evidence exists of them being used by other cultures. Their chief purpose in Persian service seems to have been to break up close-order infantry formations by plowing through them. If they could get enough speed up, they could do serious damage. However, they weren't overly effective. Disciplined troops could scare off the chariot horses by presenting a solid hedge of spear-points or simply by yelling determined battle cries. Sometimes, they would part ranks to let the chariots pass harmlessly through to be destroyed at leisure by support troops. In fantasy worlds, of course, scythed chariots might be deadlier weapons, especially if the horses could be magically mind-controlled or shielded from harm, or even replaced entirely by telekinetic magic.

Adding sword-like "scythe" blades to the sides of a chariot costs $1,000. On a close pass, they inflict cutting damage as for a collision (p. B430), using the chariot's current move rate and HP calculated with the *Animal-Powered Vehicles in Collisions* rule (p. 6). Cutting damage from collisions is usually *half* what crushing damage from the same collision would be, but the GM may choose to ignore that rule in cinematic games to make scythed chariots terrifying.

Unlike most cutting attacks, this damage can cause knockback (p. B378) whether or not it penetrates the victim's DR. If a victim is knocked down or back, has a body part cut off, or is killed by the attack, that person falls, is thrown away from the chariot, or is cut through. Otherwise, the chariot must make a HT roll or the scythe on that side breaks off, and the chariot driver must make a control roll (p. B466) to avoid being thrown off-course by the impact.

It is also possible to fit a chariot with heavy spear-points, projecting forward from the chariot pole, for $100, enabling it to do impaling damage on direct collisions. It otherwise uses the same rules as above. However, persuading horses to run straight into targets is *difficult,* requiring a Teamster roll at -5. Moreover, unless everything in the way is knocked down or back, the animals will take collision damage themselves from hitting whatever is still standing, very likely disabling themselves and the vehicle.

A command platform is usually a heavy chariot, carrying a driver, the commander, and an aide or bodyguard. In fantasy worlds, "battle wizards" might use chariots similarly. The vehicles grant mobility and a better view of the battlefield, allow more free movement of hands and feet than is possible on horseback, and can carry a box or two of magical "material components."

Magic and Chariots

Wizards who cast spells on chariots or on their crews or horses should keep a few things in mind. When casting Area spells, two yards of radius suffices to cover the *body* of a heavy chariot, and one yard of radius just covers a light chariot or battle car. Either case excludes the chariot pole and the horses. Covering those separately or with the chariot body included requires at least three yards of radius in all cases, and four yards might be needed for a heavy chariot with three horses with breathing space between them. When casting Regular spells, a wizard needs to affect the chariot body (SM as on the table) or each horse (SM +1) as separate targets. Casters expecting to magically reinforce their chariots might therefore prefer light vehicles (SM +1, double casting cost) instead of heavy (SM +2, triple cost).

WAR WAGONS

War wagons were probably inspired by experience of using farming wagons (pp. 4-5) as improvised mobile barricades. In the late Middle Ages, the Hussite peasant rebels of Central Europe developed the concept into purpose-built mobile fortresses with wooden armor and firing slits for crossbows or early firearms. (See **GURPS Low-Tech,** p. 136, for more on the historical version.) Resourceful fantasy heroes might come up with something similar, adding magical spells or devices to a war wagon force's defenses and firepower.

Historical Military Ground Vehicle Table

TL	Vehicle	ST/HP	Hnd/SR	HT	Move	LWt.	Load	SM	Occ.	DR	Range	Cost	Loc.
TEAMSTER (IQ-5, Animal Handling (same)-4, Riding (same)-2)													
1	Heavy Chariot	23†	0/2	11c	3/7*	0.39	0.3	+2	1+2	2	F	$660	4DE2W
1	Light Chariot	16†	+1/1	11c	4/9*	0.23	0.2	+1	1+1	1	F	$330	2DE2W
2	Battle Car	14†	+2/1	11c	4/10*	0.22	0.2	+1	1+1	1	F	$250	2DE2W
3	War Wagon	50†	-4/5	12c	3/6*	3	2	+4	2+18	5	F	$2K	4DE4W

FANTASTICAL LAND VEHICLES

In fantasy settings, even if they seem to resemble historical settings, land vehicles can get a little strange. Nonhuman construction, magical materials, supernatural or anachronistic propulsion systems, or unusual requirements can all lead to designs never seen in the real world.

VARIANT AND FANCIFUL CARTS, WAGONS, AND CHARIOTS

For exotic effect, the chariots, coaches, and carriages described on pp. 5-6 might be constructed from unusual materials, decorated very strangely, or drawn by animals which are simply imaginary or which always resisted domestication historically, such as wolves or tigers. (In the latter case, for a degree of realism, note that a tiger is almost as strong as a pony, whereas three wolves are needed to match a single pony's strength.) Apply the *Styling* rules from **GURPS Low-Tech,** p. 14, to create embellished vehicles. Also, the simplest vehicles can look a little unusual if they're intended for very large, small, or nonhumanoid beings.

Examples

Monowheel Chariot: This ultra-lightweight and very cinematic vehicle might be built for racing, or used for courier, scouting, or skirmishing duty in a setting where the available fast draft animals can't carry a rider on their backs. It consists of one outsize wheel and a cycle seat, and is pulled by a single creature.

Wildlands Wagon: This somewhat cinematic vehicle is used to transport high-value loads across a lawless and bandit-ridden wilderness. It looks like a stagecoach at first glance, but the body is mostly just a hollow (but rugged) box; some of the load space may be concealed, to facilitate smuggling. The driver, and optionally a single guard or passenger, ride inside, using a periscope to look around and with reins passing through a slot in the bodywork. Riding outside to return fire at enemies is a desperation option. The draft horses (or whatever beasts are used) typically wear armored barding (see **GURPS Low-Tech, p.** 117).

Faerie Coach: In many fantasy worlds, the elves or "fair folk" have a discreetly wealthy culture, advanced craft skills, and a lot of style. This is an example of the sort of vehicle that such a race's nobles or lords use. It resembles the court coach (p. 6), but is even more elegant and stylish, appearing almost too fragile to function. It glitters even in moonlight. Two faerie horses comparable to the finest racehorses from human lands draw it. The driver sits at the front of the body, and a footman stands at the back. The passenger compartment can hold up to four people, though humans, being less slender than the usual passengers, would find that many very cramped. Often, just one gorgeously dressed individual uses it. If the builders have an aversion to iron and steel, as in many fairy stories, the coach may be built using fittings of bronze or perhaps some kind of supernatural silver. It could even be a masterpiece of brilliant artisanship with no metal components at all. It's light in weight but uncannily resistant to damage. Its TL is given a "superscience" qualification because its materials are subtly beyond normal human understanding. The price is a nominal value that *might* be achieved if one could sell such a thing to a human buyer; the fair folk may well not have a money-based economy. Human observers with any appreciation for wealth or beauty react to this vehicle at +3 (though some may think it looks far too flimsy); the faerie folk themselves consider it the least that one of their nobles should ride.

Gnome Cart: On many fantasy worlds, gnomes are talented artificers and gadget-makers; on Yrth, some take to such craftsmanship, while others are well placed to purchase works from their cousins, the dwarves. This is the sort of vehicle that a gnome trader or (successful) farmer might drive in such a setting; in other cases, it might be used by a halfling. It looks like a simple miniature cart, drawn by a single small pony, but it's actually a TL4 design, or perhaps even a bit more advanced than that. It has a spring-based suspension system that makes it surprisingly comfortable for the driver, who sits on board rather than leading the pony. A larger being who attempts to drive it takes a skill penalty equal to the difference between their SM and that of the usual gnome driver.

PEDAL TECHNOLOGY

If dwarves have a talent for somewhat anachronistic mechanical technology, one thing they could quite plausibly

develop without completely changing a fantasy world is pedal-driven muscle-powered machinery. On Yrth, this idea may have arrived through a Banestorm – which means that, in human lands, the appearance of this invention could lead to a worrying visit from the Ministry of Serendipity or its local counterpart. The dwarves, however, are less doctrinaire in such matters. Dungeon-fantasy worlds, meanwhile, just feature a lot of clockpunk-style tech as part of the scenery.

Dwarven Battle-Ram (Yrth, Dungeon Fantasy): This application of dwarven pedal-tech is a lumbering metal box with four wheels. Inside, 11 dwarves work furiously at cranks and treadles. The driver is in the front, and the others are in two lines of five each behind him. It's functionally limited to operating on roads and other smooth, flat surfaces. It may be found hurtling around the beautifully cut main tunnels of dwarf mines and cavern-cities. Or it might sally out onto open, smooth plains (where there are any), to drive off besiegers, mostly by spreading terror (or at least confusion) amongst them. It might also show up on the attacking side in a siege, to assault gates or doors with flat approach roads.

METAL VEHICLE ARMOR

Very few pre-industrial military vehicles carried much (if any) metal armor. Metal-hulled warships appeared in the 19th century; armored land vehicles only appeared in the 20th. It wasn't that builders didn't appreciate the protective value of metal, but it was expensive by the standards of those times, especially if it was intended to provide anything like complete protection for crew members. Better to stick to wood, and issue crew and draft animals with personal armor as funds allowed. Some chariot riders seem to have worn especially extensive armor panoplies, though ships' crews likely preferred something lighter, to preserve their agility on rolling decks.

In a fantasy world, of course, things can be different. Metal-obsessed dwarves haul tons of iron ore out of the ground and work it in huge furnaces, magical races have access to strange alchemical arts, or creator gods can exert divine power. Thus, metal vehicles are at least conceivable. Further hand-waving can even provide them with better propulsion, giving them the speed and reliability of post-steam-age transport. One option is for those dwarves (or whoever) to build high-TL, steampunk-style steam engines; another might be mighty magical golems.

Of course, in game terms, once vehicle DR values approach double figures, they become effectively immune to (almost) any weapon powered by human muscles, siege engines aside. This, though, is an opportunity for resourceful PCs to strut their stuff, sabotaging enemy weapons development or construction projects, booby-trapping the battlefield with pit traps, recruiting superhuman allies, acquiring extraordinary abilities (such as Power Blow skill or powerful spells), or cutting loose with well-placed siege engines.

RAMS

A vehicle fitted with a ram gets +1 damage per die on the damage it *inflicts* in a frontal collision. It also reduces the damage *suffered* by the vehicle in a frontal collision by 1 point per die.

It is fitted with an ornate ram (p. 9); if it hits a stationary target at top speed, it does 5d+5 cr damage (including the bonus for the ram).

Orcish Foe-Reaper (Yrth, Dungeon Fantasy): During one skirmish between dwarf and orc forces, one dwarf battle-ram (p. 9) suffered a serious mechanical failure that left it immobilized on the battlefield. The crew was forced to bail out and retreat, suffering the humiliation of seeing their vehicle dragged away in triumph by a crowd of taunting orcs. Worse, a few months later, the same orc tribe showed up with a vehicle that was clearly based on that battle-ram. The dwarves insist that the chassis must have been repaired and adapted by a foul renegade of their own race, or (they admit grudgingly) it's just possible that a human mechanic was somehow involved. (Any suggestion that an orc mechanical genius may have done the job is taken as an insult.) The "foe-reaper" is a ramshackle vehicle with a wooden body (the old metal armor has evidently been removed for other uses). It is crewed by 11 sweating, flatulent, irritable orcs, who spend their time cursing dwarven mechanical design ("short-legged little . . ."). It lacks a ram, but as its name suggests, it has a whole lot of scythe blades (p. 7) projecting at all angles. At top speed, the blades do 2d cutting damage to opponents on a close sideswipe. Mostly, though, the orcs use it to carry their standard while the tribal shaman stands on the top and jeers at any dwarves in sight. The dwarves would do a lot to capture or destroy the foe-reaper, but would never accept any aid to do so, or talk about it much to anyone else.

> *. . . they drive about in all directions and throw their weapons and generally break the ranks of the enemy . . .*
> – Julius Caesar, **De Bello Gallico**

Fantastical Ground Vehicle Table

TL	Vehicle	ST/HP	Hnd/SR	HT	Move	LWt.	Load	SM	Occ.	DR	Range	Cost	Loc.
TEAMSTER (IQ-5, Animal Handling (same)-4, Riding (same)-2)													
4	Monowheel Chariot	19†	-1/1	10c	4/10	0.15	0.1	0	1	1	F	$160	1DE1W
4	Wildlands Wagon	58†	-1/4	12c	1/10*	2	0.5	+3	1+1	5	F	$5K	4D4W
4^	Faerie Coach	50†	-1/2	12	5/10*	1.6	0.6	+3	2+4	4	F	$250K	2DEG4W
4+1	Gnome Cart	32†	-3/4	12c	5/8*	0.5	0.25	+2	1	2	F	$300	1DE2W
DRIVING/TL (AUTOMOBILE) (DX-5, IQ-5, Driving (Heavy Wheeled)-2, other Driving-4)													
4+1	Orcish Foe-Reaper	75	-2/2	10c	1/6*	4.4	1.1	+3	11	5	F	$4.4K	4W
DRIVING/TL (HEAVY WHEELED) (DX-5, IQ-5, Driving (Automobile)-2, other Driving-4)													
4+1	Dwarven Battle-Ram	83	-1/4	12	1/6*	5.5	1.1	+3	11	8	F	$16K	4W

STEAMPUNK FANTASY

In several fantasy settings, some nations and races (especially dwarves and gnomes) have gone full clockpunk or steampunk – or at least have a few workshops churning out mechanical marvels, including the odd steam engine. In those cases, the GM can feel free to raid *GURPS Vehicles: Steampunk Conveyances* for designs and ideas; on land, the various historical personal vehicles on pp. 5-6 and 8 of that book, and the iron horse on pp. 7-8, might be especially appropriate. Fitting them with scythes (p. 7) or rams (p. 9) would turn them into formidable weapons.

Size Adjustments

A steampunk vehicle that is built for use by a nonhuman race which is significantly bigger or smaller than human may itself be bigger or smaller – though this isn't automatic. For example, **Dungeon Fantasy** gnomes are SM -1, but they weigh about the same as a human. Thus, they would need vehicles with similar carrying capacity (though maybe built lower and squatter, so the driver's feet can reach the pedals).

As a general rule: Add the race's usual SM to the vehicle SM. Multiply HP and DR by 1.45 for each SM increase or divide by the same number for each decrease (rounding all fractions down but with a minimum of 1 in each trait). Multiply by 3 all weights and fuel (and water) consumption for each SM increase or divide by 3 for each SM decrease. Multiply by 2 the cost for each SM increase, or multiply by 2/3 for each SM decrease.

Weapons don't scale easily. Just try and find something of appropriate TL, size, and weight somewhere in a **GURPS** book.

Example: A Stanley steam car (**Steampunk Conveyances,** pp. 6, 8) is HP 63, LWt. 2.6, Load 0.7, SM +3, DR 4, and Cost $40K, with a 20-gallon fuel tank. A "steam carriage" used by SM -1 halflings is thus HP 43, LWt. 0.87, Load 0.23, SM +2, DR 2, Cost $27K, with a 6.7-gallon tank. One built for a race of SM +2 giants is HP 132, LWt. 23.4, Load 6.3, SM +5, DR 8, and $160K, with a 180-gallon tank.

WATERCRAFT

The great hulk was remarkably intact, considering that it had been adrift on the open ocean for an unknown period, and then wedged against the sandbank, battered by waves and tides, for at least the last five days. The skipper of the small merchant cutter didn't like it. It was not only bigger than anything that could sail had any right to be, it had to be tougher than he could believe of anything that big and made of wood. However, he was being paid well, so he took his craft within a hundred feet. Then the wizard twirled his fingers and rose straight up in the air, high enough to scan the hulk's deck. He called down that it was clear, and then drifted closer and hurled a grapnel over to lodge on the deck-rail while the skipper carefully took his cutter alongside. The shady-looking half-elf in the leather armor swarmed up the rope and then fixed a rope ladder, and the other three adventurers climbed up that.

With the strangers safely aboard the hulk, the skipper put back out to the open sea, holding off a half-mile or so, and dropped anchor. He'd sworn before the village priest to wait a full day for a signal to pick the strangers up again. The whole business was too weird for his tastes, but the strangers' gold was good.

On board the hulk, the five strangers looked around the deck. Then the dwarf warrior shouldered his axe so he could take a deep swig from his ale-flask. "I agree with that sailor," he declared, "I don't like this."

"What's the problem?" the human bard who acted as their leader, or at least spokesperson, asked cheerfully. "Think of this as just another ruin. We've cleared out bigger castles than this in half a day."

"The damned sea is the damned problem," the dwarf said. "It's no place for sensible folk. And none of those castles rocked and shook like this."

"That one up on the mountains east of the Burning Fells did," the party's cleric observed. The dwarf just grunted.

"Come on," the bard said. "Let's go find out what happened to those salvage parties. I'll wager they just fell through some rotten stairs."

"All eight of them?" the cleric asked. But before the bard could think of a clever answer, the half-elf, who'd been turning and watching the whole time, blade in hand, gave a yell of warning and scuttled backward to the dwarf's side.

"Perhaps that's our answer," the cleric suggested, as a dozen slimy green tentacles erupted from a cargo hatch and began flailing toward the group.

In a world of medieval-style roads or worse and no mechanical engines, the most efficient way to get around over any significant distance is by water when that's conveniently located. Indeed, maritime cultures may refer to the sea as a road or a highway. Even river travel can be the most efficient option in many circumstances, though going downstream is frequently much easier than heading upstream.

Naval warfare is also a common feature of fantasy worlds. In a pre-gunpowder setting, that tends to mean mostly ramming and boarding. Cinematic assumptions notwithstanding, pre-gunpowder artillery lacks the speed of fire and accuracy to be used effectively at sea.

For more on naval combat, see **GURPS Low-Tech Companion 2: Weapons and Warriors,** pp. 34-36. Sailing Move rates given in this chapter assume a favorable wind; other conditions can complicate matters (see *Water Travel*, p. B466).

MARITIME TECH LEVELS IN FANTASY

Many people think of "generic fantasy" worlds as TL3 in **GURPS** terms. After all, they have castles and knights in armor, but no gunpowder. In other words, they are "medieval," and the Middle Ages define TL3. On that basis, ships and sea travel in those worlds may seem anachronistically advanced – or rather, a wild mixture of outdated and advanced, but with many at TL4. The point is that romantic notions of "olden times" may focus on castles and knights, but look to the fully rigged galleons of the later "Age of Sail" and the golden age of piracy for images of seafaring, rather than to smaller, inelegant medieval cogs.

However, it might be more accurate to say that those fantasy worlds are really early TL4 throughout, with the big anachronism being the absence of gunpowder rather than the presence of galleons. After all, the heaviest fantasy plate armor present resembles Renaissance jousting plate, and castles survived for a while historically and would remain useful in any world in the absence of cannon. Either way, those outdated nautical exceptions may include classical-style (TL2) galleys (which did last well into the Age of Sail on the Mediterranean, albeit with significant changes; see pp. 15-18), medieval Viking ships, and the ageless Arab dhow. This anachronistic admixture is justified by setting design on parts of Marchen-1 and Yrth and in backward corners of Azoth-7.

If GMs or setting designers want to use the TL rules in detail, they can classify their fantasy worlds as either "TL3, advanced in shipbuilding and navigation" or "TL4, delayed in firearms." Either way, the resulting TL4 galleons lack cannon, possibly leading to some detail variations from historical patterns; see pp. 20-21.

Rigging Types

The history of ships' sails and rigging is a moderately complex subject which is also very significant for vessels' performance and *look*. Different rigging types definitely represent skill familiarities (p. B169) for their crews, even at the same TL.

The oldest type is *square rigged,* appearing at TL0 – a rectangular sail hanging from a horizontal pole. A simple single-mast square rig is fine for running before the wind, but is less efficient when sailing across it. In fantasy stories, such a rig is associated with Viking-style longships and classical-style galleys, and is often combined with oars for calm days and fancy maneuvering.

Fore-and-aft rigs use various sail shapes, placed more along the line of the hull; they come in many types, of which the most familiar is perhaps the triangular *lateen.* Such rigs appear on small and specialist craft at TL1, become more common at TL2, and grow widespread as TL3 progresses. Fore-and-aft rigs permit much more sailing across the wind, and are associated in fantasy with fancy, sophisticated ship designs. All else being equal, a fore-and-aft rigged ship can sail rings round a square-rigger, although the latter may be faster in a straight downwind race.

Complex rigs are arrangements combining several sails on multiple masts, giving them flexibility at the cost of complexity. Some types combine both square and fore-and-aft sails; the true "fully rigged ship" has at least three masts, all carrying square sails. They are still more efficient sailing across the wind rather than running before it, however. Such rigs appear at TL4 and are associated with imposing galleons, Napoleonic-style warships, and fast clippers.

HOLED BELOW THE WATERLINE!

An obvious and deadly threat to watercraft is suffering penetrating damage below the waterline, so that the hull floods and the ship likely sinks. However, some vessels are much more vulnerable to this than others – and the difference is a key feature of technological advance, with crucial consequences for military tactics.

The following optional rules can represent this. Start with the *Leaking* rules (p. B470). After suffering a major wound below the waterline and failing the ensuing HT roll, a vessel isn't "knocked down" – it's flooding and in clear danger of sinking, with half Move and -3 to control rolls until the hole is patched. However, the HT and repair rolls involved in the flooding take modifiers based on the type of boat:

- *Soft-Skinned Craft* (e.g., hide boats such as the Brendan ship): -5 to HT rolls; -2 to skill rolls to perform repairs.

Leather hides rip horribly, but at least the repairs are mostly a matter of stitching.
- *Rigid-Hulled Craft up to TL2:* -2 to all rolls. Low-TL vessels are usually built as shells with only light internal frameworks; smashing them in can cause catastrophic damage. Traditional dhows (pp. 12, 19-20) should be treated the same way, even if they're built at TL3 or higher.
- *Rigid-Hulled Craft at TL3+:* +2 to HT rolls; no modifier to repair rolls. These craft are built around robust-but-flexible frames which absorb damage much better.
- *Partial Compartmentalization* (e.g., the ninja stealth boat, p. 12): An additional +1 to HT rolls.
- *Full Compartmentalization* (e.g., junks, p. 21, and most TL6+ ships): An additional +2 to HT rolls. However, any systems or crew trapped in a flooded compartment may have serious problems.

LIGHT CRAFT

This section describes craft which are operated using Boating skill rather than Shiphandling and Crewman. Most have crews of more than one person, but they operate as small teams with similar skills, rather than being organized by a captain on a bridge or command deck. The largest craft here may overlap in size range with the ships described in other sections, and may be large and robust enough to spend extended periods at sea, but they still function more as boats.

GURPS Low-Tech has a section on this subject on pp. 138-143; a few useful examples from there are repeated here, along with some other interesting options for fantasy games. Any generic fantasy world with sea or river travel almost certainly has craft like something from this section.

HIDE BOATS

A Stone Age invention which has lasted to the present day, a hide boat has a lightweight wooden framework covered in waterproofed skins or hides. A small, well-made hide boat, such as an Inuit kayak or a Celtic coracle, makes a handy one-person rowboat, able to resist moderate waves or minor bumps by flexing rather than breaking. But the technology can also scale up; the medieval Irish legend of St. Brendan (see **GURPS Atlantis,** pp. 34-36) recalls a time when Irish seafarers roamed widely on the North Atlantic in hide boats. The 36' long *Brendan ship* detailed in the table is an ocean-going "currach," essentially a more robust version of the large hide boat described in **GURPS Low-Tech,** with two masts (and square-rigged sails) to save the crew from having to row full-time.

Crews of small boats operate as teams.

On long voyages, it may well carry less than its maximum complement of crew, giving more space for cargo and supplies, although of course then its rowing speed will be much reduced.

Plank Boats

GURPS Low-Tech, pp. 140-142, details a variety of sailboats and rowing boats built of wooden planks – the most serviceable small-craft construction method from TL1 until the modern era. The *square-rigged sailboat* and *sloop* from there appear in the table because adventuring parties may well employ them. The square-rigged boat is a basic TL2 inshore cargo carrier, 37.5' long; the sloop is a much more maneuverable, fore-and-aft rigged TL4 type, 21' long and capable of deep-sea voyages. They both have cargo space that could easily be adapted to carry passengers.

Dhows are a long-established type, mostly encountered on the Red Sea and the Indian Ocean on Earth. (*GURPS* books generally categorize dhows as TL3, but the basic design may go back to TL2 times. Little of the technology involved would have been impossible at TL1 or even late TL0.) A traditional dhow is constructed of planks sewn side by side with vegetable-fiber cords, with little or no internal frame, and has a simple lateen-style sail which is too large and heavy for the crew to perform complex maneuvers such as tacking. Nonetheless, the type survived into the 20th century and even the present day, sometimes with engines installed. Larger dhows are described on pp. 19-20.

The *small dhow* on the table represents something suited for fishing and local transport. The *Wazifi dhow* is an evolution of the technology encountered on Yrth. When Muslim traders and fishers arrived through the Banestorm on the shores of the Mare Medium, they brought the dhow with them. They have improved it over the years, with frame-based construction and other ideas imported from Araterre. Thus, the best local vessels are rigged to TL4 standards, costing a little more but much better able to handle to unpredictable winds of the region.

Polynesian-Style Craft

The spectacular accomplishment of the TL0-1 Polynesian people in colonizing the Pacific Ocean involved some highly distinctive watercraft, making much use of outriggers and double hulls. On fantasy worlds, these might be the mark of a similarly successful boat-building culture, such as the "Seafarers" described in *GURPS Thaumatology,* pp. 231-235. Polynesian vessels were originally constructed with hulls that were basically hollowed-out logs. These evolved into sewn-plank constructions in societies such as the Marshall Islands and Fiji. Indeed, outrigger vessels can be constructed perfectly well in other ways; in modern times, builders of high-tech racing boats have adopted the idea.

An outrigger vessel has a main hull with one or occasionally two smaller "outriggers" attached in parallel by spars. Because an outrigger keeps the whole assembly very stable in the water even without a significant keel, the vessel can use a large sail, and both the outrigger and the main hull can be made very slim and hence streamlined. This makes Polynesian outrigger vessels impressively fast; sustained sailing speeds of 20 mph (Move 10) have been reported. Polynesian vessels also use the highly efficient triangular *proa* or "crab-claw" sail, which can be used to reverse direction by simply rotating the whole assembly 180 degrees, allowing "shunting" movement against the wind (see *GURPS Low-Tech,* p. 141); they are therefore built to sail equally well in both directions.

The table includes two example outrigger boats from the Marshall Islands, the 30' long *tipnol* and the 100' ocean-going *walap.* The latter is large enough to have an enclosed cabin on a platform supported by the outrigger spars, and can carry whole extended families to colonize new islands. An outrigger is designated as an "R" hit location, like a runner or skid.

Exotica

The table includes one unusual fantasy design.

Ninja Stealth Boat (Yrth): This design, of which three examples exist, was created by the order of a clique of younger, unconventional Sahudese ninjas who had acquired some influence in a clan based near the coast, and who want to bring change and innovation to the arts of ninjutsu. They had received garbled accounts of Korean "turtle ships" (**Low-Tech Companion 2,** pp. 38-39) through the Banestorm, and liked what they heard. Their invention is a small craft, 23' long, fully enclosed, built to resemble a giant turtle, and painted black for stealth. It is usually propelled by six oars (with well-muffled oarlocks) but has a folding auxiliary mast with a square sail, also black. (Deploying the sail takes five minutes and requires a couple of the crew go up on top of the boat.) Its construction is partially compartmentalized, like some other Sahudese vessels. A light bolt-thrower (Dmg 3d imp, Acc 4, Range 220/275, Shots 1(10), ST 17M) is mounted inside the turtle's head. It can fire either ordinary bolts or barbed harpoons with an attached cable (half range; lodge in the target if they penetrate its DR). The harpoons have various applications, including assisting infiltrators to get ashore where they're not wanted and towing away small craft to confuse and humiliate their owners.

Light Watercraft Table

TL	Vehicle	ST/ HP	Hnd/ SR	HT	Move	LWt.	Load	SM	Occ.	DR	Range	Cost	Loc.	Draft	Notes
BOATING/TL (SAILBOAT) (DX-5, IQ-5, Boating (Large Powerboat)-4, Boating (Motorboat)-3, Boating (Unpowered)-3)															
1	*Tipnol*	40†	0/2	12c	2/10	1	0.5	+5	2+10	2	–	$8K	MOR	2	
1	*Walap*	130†	-2/2	12c	1/5	25	8	+8	5+45A	2	–	$150K	MRS	3	
2	Brendan Ship	50†	0/2	12	0.5/4	4.8	3.8	+6	10+1	2	–	$2K	2MO	2	[1]
2	Square-Rigged Sailboat	61†	-1/2	12c	1/4	7	5.25	+6	3	1	–	$15K	MO	1	
3	Small Dhow	40†	+1/2	11c	1/3	2.2	1.7	+4	4	1	–	$1.4K	MO	1	
4	Sloop	43†	0/2	12c	1/3	2.4	1.8	+4	3+3	2	–	$5K	M	3	
4	Wazifi Dhow	47†	+1/2	12c	1/3	2.5	1.7	+4	5	1	–	$2.5K	MO	1	
BOATING/TL (UNPOWERED) (DX-5, IQ-5, Boating (Large Powerboat)-4, Boating (Motorboat)-3, Boating (Sailboat)-3)															
3	Ninja Stealth Boat	67	-1/3	12c	0.25/3	3.6	1.25	+5	8+3	6	F	$25K	rM	2	[2]

Notes

[1] Under sail. Using oars, Move is 0.05/2 and Range is F, and the craft is operated using Boating (Unpowered) skill.

[2] Using oars. Under sail, Move is 0.15/2 and Range is –, with 2E added to the hit locations, and the craft is operated using Boating (Sailboat) skill.

LONGSHIPS AND GALLEYS

Oar power can be applied to quite large vessels – amazingly large in the case of the greatest classical "polyremes." The vessels described here also have masts and sails, allowing the rowers to rest when the wind is favorable, but most of the ships are primarily oar-powered. However, oars have problems on rough seas, and a hull pierced near the waterline by rowing ports is vulnerable to flooding during storms. In any case, a ship that is carrying enough rowers to achieve any sort of speed won't have room for much cargo. Hence, on our world, large oared ships are mostly associated with military use on the relatively calm Mediterranean, with occasional ventures into the Atlantic, where the Vikings showed just how much was possible with oar-and-sail designs. Fantasy worlds are mostly likely to follow this pattern.

LONGSHIPS

Viking-style longships are hybrid vessels, with square sails for long-distance travel and the option to have the crew run out the oars on calm days and for close-in maneuvering. They are clinker-built (with overlapping planks) and impressively robust. The crew double as warriors, and there's enough cargo space for valuable plunder – or for trade goods when raiding isn't the current option of choice. On Yrth, coastal tribes in the Nomad Lands (including those operating on Lake Styx) *obviously* use longships; some tribes function at TL3 in regard to shipbuilding, while others use TL2 vessels (HT 11c, Move 0.5/3).

Orc Raider (Dungeon Fantasy): In highly generic settings such as the worlds of **Dungeon Fantasy,** orcs and other goblin-kin are usually depicted as barbarian raiders taken to the extreme, so some of them will surely be sea raiders, riding longships with monstrous prows to conduct vicious pirate raids and attacks on coastal communities. Adventurers can track them down, fight them at sea or in their hidden bases, and recover holds full of plunder. (*Ethical* delvers can then return that to the original owners.) Goblin-kin aren't great artisans – indeed, enslaved or renegade humans may well have built their ships – but they understand their own need for rugged vessels.

These raiders substitute raw courage (of the type that's hard to tell from stupidity) for sailing skill or technological sophistication, driving hard into their victim's harbors or ships while the humans are still plotting clever tactics. Orcs' greater-than-human-average strength partly compensates for the greater weights of their ships and crew, but these vessels aren't terribly well designed. The example on the table is about 75' long.

Viking Ship: This is a fairly typical Norse *snekke*, 60' long and light enough for the crew to haul it modest distances overland. Smaller craft (down to maybe half this size) were used for fishing and small-scale trade but could occasionally show up in warfare. The largest ships of the period could be up to twice as large as this. Although Viking society was early TL3, similar vessels went back to the TL2 period, and possibly TL1. The *snekke* was most useful for raiding and military service. A Norse transport ship (or *knarr*) might be about the same length but twice as broad in the beam. The vessel relies mostly or entirely on sails for propulsion, making it less agile but able to operate with a smaller crew, which gives it several tons of cargo capacity.

GALLEYS

Although galley-style ships have been employed in other parts of the real world, they are mostly associated with the Mediterranean, where conditions made them useful warships and occasionally suitable for trade; see *GURPS Greece,* Chapter 7, for one part of this story and more on some of these ships. The Romans inherited the technology from Greece but limited themselves to smaller ships for much of their history (after the wars with Carthage), as the Empire fought few major naval powers but mostly had to deal with pirates and small-scale barbarian raiders. The Byzantines operated more advanced (TL3) *dromons,* and galley warfare continued through the TL4 period. It faded out at the end of the 16th century with the development of massed banks of cannon, which worked better on sailing ships. For an example of a later-period naval power which made heavy use of galleys, see *GURPS Hot Spots: Renaissance Venice;* the Vienna's Arsenale *mass-produced* galleys.

In fantasy, galleys are thus most likely to show up in settings inspired by ancient Greece, Rome, or Byzantium, or by the Italian Renaissance. For example, galley technology arrived on Yrth with the Byzantines (who founded the Empire of Megalos), and TL3 galleys are still used extensively on Lakes Styx and Acheron, on the Empire's sheltered northern coastal waters, and for harbor defense on Keyhole Bay. On Marchen-1, TL4 galleys are the "capital ships" of the Golden Archipelago and the Sutherlands, but are terribly outclassed by the cannon-laden galleons and frigates of the Solar Empire.

Some of these types are equipped with rams (p. 9).

Homeric Galley

The sort of Bronze Age ship that took the Greek armies to Troy in Homer's *Iliad,* with 20 oars, two deck crew, and two officers. Everyone aboard goes ashore to fight as a warrior on arrival. The craft has a ram for naval combat, and enough cargo space for a few trade goods or passengers. Small galleys may also appear at higher TLs, possibly with improved HT and sailing performance.

Penteconter

Developed in the Bronze Age, the penteconter is a 50-oared galley with enough room for a few deck crew and a little cargo. The legendary *Argo,* which carried Jason and the Argonauts on the quest for the Golden Fleece, must have been a penteconter, given how many Argonauts are named in the legends. At TL2, penteconters with similar capabilities acted as light support vessels to trireme fleets, and vessels of much the same size continued in use throughout the history of galley warfare. Likewise, TL3 ships of this size (Hnd/SR -4/4, HT 12c, DR 4) can represent the earliest and lightest Byzantine dromons, and are common on Lake Styx on Yrth. Skeletons (see above) row the dread warships of the city-state of Abydos, which means more space for marines or plunder.

Historically, by the 16th century, small galleys were known as *galiots* and carried lateen sails and small cannons. These were the standard vessel of the Barbary pirates of the period, as they were fully capable of tackling most merchant ships. Galiots were drafted into the Ottoman Turkish navy in wartime for skirmishing and scouting duties. A TL4 galiot has Hnd/SR -3/4, HT 12c, Move 1/5 when under sail, and DR 4.

ZOMBIE OARSMEN

The obvious issue with large oar-powered ships is that they need a lot of people to row them. Historically, these were either professionals (who needed pay), or slaves or convicts (who weren't always reliable, needed watching, and still required feeding). In fantasy settings with necromantic magic, ethically challenged rulers might consider a low-maintenance alternative: zombies or animated skeletons at the oars. See *GURPS Banestorm: Abydos* for one example of necromantic seafaring.

This is in many ways a sound idea. Undead not only don't need feeding but won't complain about the often-unpleasant conditions below decks on a galley. (Of course, if they're prone to decomposition, they'll make those conditions increasingly *worse* as time goes on, to the point where living maintenance crews may find it hard to work on the ship.) Most undead have around human strength, or a little more for zombies; skeletons may be less strong but are also lighter than human or zombie oarsmen. Hence, undead-powered ships may be marginally faster than those with living crews. Also, Range "F" becomes Range "–" for these vessels; undead oarsmen aren't limited by fatigue, only by decomposition.

There are, though, problems if the undead are vulnerable to countermagic or repulsions known to folklore. Certainly, if good priests or wizard with the right spells can "turn" undead at significant distances, one well-protected specialist on an opposing ship might disable a zombie galley or throw it into total confusion. Still, if nothing else, a necromancer might well have fast, reliable, low-maintenance water transport. "Recruiting" undead crews is unlikely to be an insurmountable problem for a determined necromancer who is interested in operating warships.

Some early galleys may have rams, but any pirate craft would probably *not* have one, as pirates don't like sinking ships they could appropriate.

Trireme

The standard warship of the Classical Greek city-states, the trireme is a pure weapon, with 170 rowers manning three banks of oars on each side, plus nine officers, 10 sailors, around 18 marines, and *no* cargo space – the ship must spend every night in port or beached. A superstructure on each side of the hull houses the upper banks of oarsmen. Triremes exist to sink enemy ships by ramming; the marines are there to fend off enemy boarders. The largest Byzantine dromons, and the largest Megalan galleys on Yrth, can be treated as TL3 triremes, with lateen sails on two masts, more deck crew, and DR 5. They also generally lack rams, because ramming becomes less deadly at TL3 (see *Holed Below the Waterline!,* p. 12) and boarding actions or incendiary weapons are thought to be more effective. Ramming still happens at TL3+, but as a precursor to boarding. Some are fitted with bow "spurs" to rip away enemy oars with sideswipe attacks, though.

Quinquereme

Arms races in the Greek world after the time of Alexander the Great produced some monstrously big ships. This version is merely *large.* It has three banks of oars, but each oar on the top two banks has two rowers. As with the trireme, it has a double superstructure to house the upper rows of oarsmen. Its hull is broader than that of the trireme, making it slower but more stable and robust and able to carry more marines (up to 100) and possibly artillery. Tactics therefore consist primarily of getting in close, not worrying *too* much about being rammed (though the ship has a ram of its own), and bombarding and then boarding the enemy. Both the Roman Republic and their Carthaginian enemies used quinqueremes; the Carthaginians were generally better sailors, so the Romans concentrated on boarding actions.

Atlantean Galley (Atlantis)

The Greek philosopher Plato described the legendary ancient island-nation of Atlantis (see *GURPS Atlantis*) as having a fleet of triremes, much like the Greek city-states of his own time. However, ships operating in the open Atlantic could make better use of sails than triremes did, would need to withstand worse seas, and would have to be capable of long-range operations. The Atlantean Galley on the table is a hybrid design that would broadly fit with Plato's picture of Atlantis while also acknowledging these issues. The ship is mostly built with TL2 technology (matching Plato's time), including a TL2 hull of rare and robust Atlantean timber, but with some TL3 features to represent Atlantean sophistication. It uses its fore-and-aft-rigged sails for long-range travel, and its 20 oars in battle and on calm days. It is armed with a stone-throwing engine and a ram.

AREA SPELLS AND VEHICLES

In fantasy games, adventurers sometimes want to cast Area spells on vehicles, for various offensive and defensive purposes. This raises the question of how to be sure that the vehicle is completely covered by the spell.

By the **GURPS** magic rules, a standard Area spell affects a circle with a radius determined by the energy put into the casting, including anything within that circle up to a height of 12'. Normally, this is 12' up from "ground level," but for practical purposes, especially when dealing with castings onto water or on things in midair, the caster can be allowed to set the base wherever they like, within reason. In other words, the spell generates a vertical cylinder, 12' high, within which its effects apply. This makes casting on small vehicles – chariots, rowing boats, etc. – easy; few such are more than 12' from bottom to top, even including crew or passengers. Thus, as long as the vehicle fits within the circular area, there are no issues.

Bigger vehicles (and buildings, and gigantic creatures), though, may well be more than 12' high, especially if they have masts or deep keels, or just multiple decks. For a general rule if full details aren't available, allow 7' per deck, plus listed draft for water vehicles, and assume that sailing craft have masts anything from 50% of their length for slow trading schooners to 150% of length for racing boats. Don't count "castles" as decks if there are masts, which will extend up from the main deck much higher than the castles.

Example: A Renaissance galleon (p. 21) with three full-length decks and a draft of 10' has an estimated hull height of 31'. It probably carries a fair amount of sail, so add 90' for mast height, giving a total of 121'.

An Area spell intended to encompass a large vehicle should be given a diameter equal to its longest horizontal dimension (usually its length). The *height* of the effect can be extended by 6' (two yards) by spending energy equal to the *base* cost of the spell; this can be done repeatedly.

Example: A 17-yard-radius spell can encompass a 100'-long Renaissance galleon. If the GM rounds the estimated height down by 1' (because insisting on including the very tip of the mainmast seems petty), the spell can cover the entire height of the vessel by extending the area upward by 108' (36 yards, for a total of 120'), adding 18× the spell's base cost to the energy requirement. Thus, casting a Darkness spell (p. B250; base cost of 2) to engulf the entire ship costs 34 energy for the radius + 36 for the height = 70 energy.

Obviously, enchanting large vehicles this way, even temporarily, will need large rituals or expensive Powerstones (see **GURPS Magic** for details on both).

The GM should be reasonably flexible with the guidelines. If a vehicle fits within an area or space except for a bowsprit, pennant, or whatever, it's best to assume that the magic has a little flex and ability to flow around surfaces, especially for vessels that are narrower in one dimension than another. For example, the estimates for the galleon ignore the possibility that it carries a 20' bowsprit.
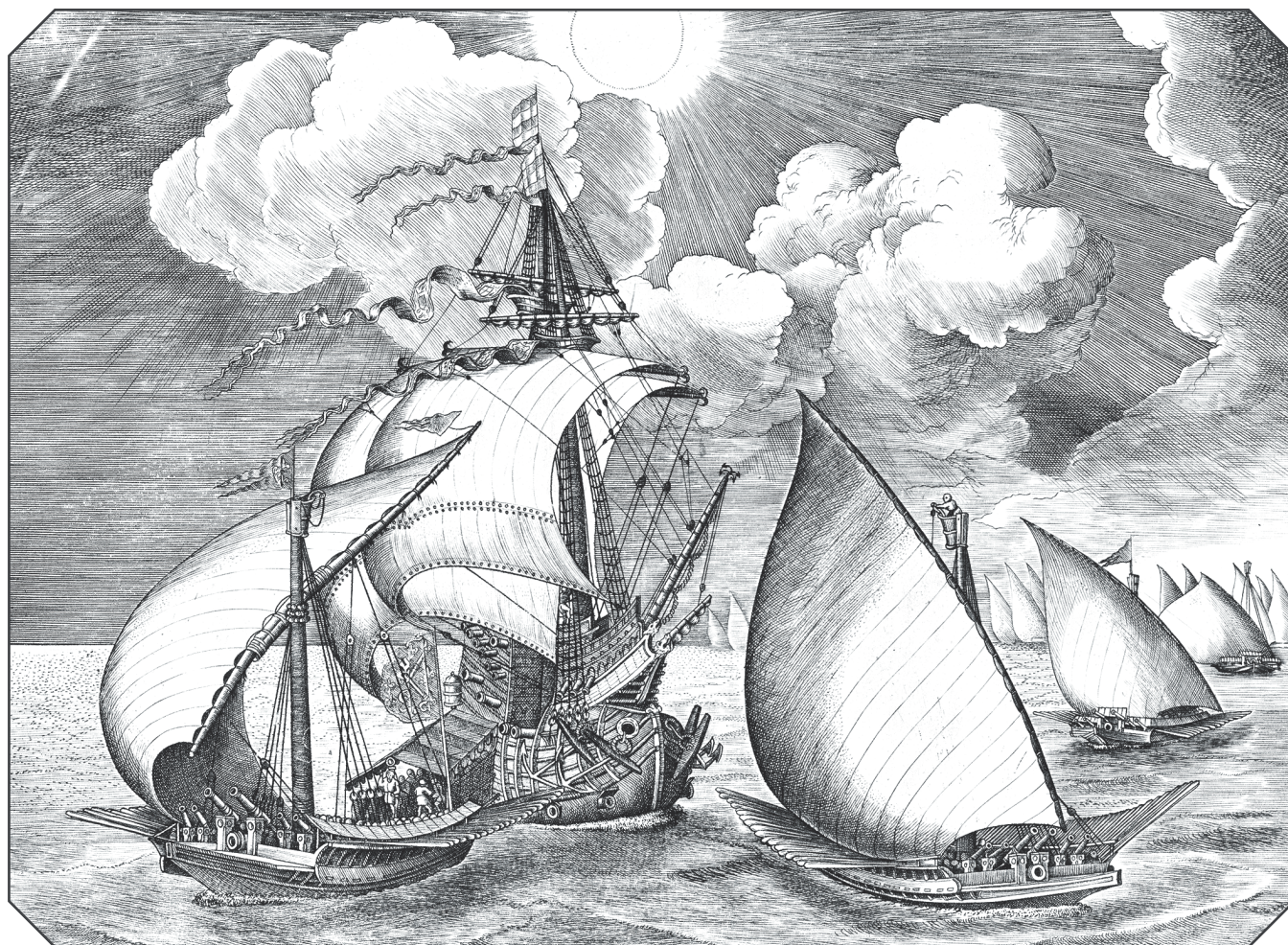
The captain has a cabin in the forward superstructure, and two other officers share a cabin in the aft superstructure. The vessel also has a steersman, 20 oarsmen, 24 sailors, and 15 "auxiliaries," who may serve as reserve oarsmen or as marines. See *GURPS Atlantis*, p. 85, for more information on this type of ship.

Renaissance Trade Galley

By the Renaissance period, large Mediterranean-based galleys built for trade were operating in the Atlantic, venturing as far as Northern Europe; the version here is a "Flanders" trade galley. In some cases, some of the cargo space was adapted to carry passengers; a lot of pilgrims on their way to Jerusalem took passage on galleys from northern Italy. Trade galleys primarily used lateen sails for propulsion, but also retained oars for calm days and fine maneuvering. In this period, galleys could have five people per oar. With up to 15 pairs of oars, this ship carries 150 rowers and up to 50 other crew. Up to 20 of the other crew could be specialist missile troops if trouble was anticipated, though all the crew would be expected to fight if faced with pirates or other foes.

Eventually, similar large vessels were adapted for military use as "galleasses," with heavy cannon armament. A galleass could fire formidable broadsides, but unfortunately, like the merchant ship on which it was based, it depended primarily on sail propulsion. This meant that it couldn't always keep up with a force of oar-powered galleys. Still, a group of galleasses were something of a European secret weapon at the great Battle of Lepanto (1571), blasting the oncoming Ottoman Turkish fleet before the two sides engaged at close quarters and started boarding.

To convert the trade galley to a galleass, simply assume that most of the cargo capacity is assigned to cannon, ammunition, and marines. It may also gain a forecastle and a sterncastle to give missile troops a height advantage (add "2s" to the hit locations).

Renaissance War Galley

While trade galleys and galleasses (above) focused on size and sail propulsion, traditional military designs continued to emphasize oars and speed. However, the adoption of fore-and-aft lateen rigging improved their sailing capabilities a little, and hand-held firearms and later cannon offered more opportunities for ranged combat. The details on the table represent a 15th-century Venetian galley, 127' long. The 120 rowers are seated on the same level, in "balconies" on either side of the ship, three to a bench. The benches are angled so that each oar has one person. (Later ships might have several rowers to each oar, especially if convicts or slaves replaced skilled professionals.) The ship might also have about 20 other sailors and 80 marines. It has a sterncastle (with room for a little cargo inside) and a smaller platform at the front, to give missile troops a height advantage.

When cannon become available, they are mounted in the forward superstructure, firing ahead, often with one large central gun and two lighter flanking pieces; small swivel guns might also be mounted on the deck railings. With counter-weighting to prevent the forward cannons unbalancing the ship, galleys thus become somewhat larger and heavier.

Such war galleys can't really handle the open Atlantic Ocean, but are useful in close-quarters combat, making them good for harbor defense on any coast. They may risk open-sea ventures in calm weather. In peacetime, galleys can carry small, high-value cargo loads, perhaps reducing the number of marines to make space.

Longship and Galley Table

TL	Vehicle	ST/ HP	Hnd/ SR	HT	Move	LWt.	Load	SM	Occ.	DR	Range	Cost	Loc.	Draft	Notes
SHIPHANDLING/TL (SHIP) (IQ-6, Seamanship-5, Boating (Sailboat)-5)															
1	Homeric Galley	72†	-3/4	10c	0.5/4	5.5	2.6	+6	24	3/2	–	$20K	MO	2	[1]
1	Penteconter	86†	-4/3	11c	1/4	12.5	7.5	+8	55	3	F	$84K	MO	6	[2]
2	Orc Raider	105†	-5/3	10c	0.5/3	18	9	+7	40	5	F	$40K	MO	3	[2]
2	Trireme	194†	-2/3	12c	1/5	77.7	20.7	+8	207	3	F	$1.2M	2M2S	4	[3]
2	Quinquereme	234†	-3/4	12c	1/4	142	42	+9	420	3	F	$2.5M	2M2S	5	[2]
3	Atlantean Galley	209†	-2/2	12c	0.1/9	82.3	11.3	+7	63A	7	–	$1.6M	2M2sX	5	[4]
3	Viking Ship	73†	-3/2	12c	0.8/3	7.5	4.5	+6	30	4	F	$28K	MO	2	[2]
4	Renaissance Trade Galley	295†	-5/4	12c	0.1/5	400	200	+9	200	6	–	$1.5M	3M	14	[5]
4	Renaissance War Galley	241†	-2/3	12c	1/4	140	30	+8	220	5	F	$750K	2M2s	4	[6]

Notes

[1] Under sail. Using oars, Move is 0.05/3 and Range is F. DR is 3 on sides and front, 2 underneath (top is open).

[2] Using oars. Under sail, Move is 1/4 and Range is –.

[3] Using oars. Under sail, Move is 1/6 and Range is –.

[4] Under sail. Using oars, Move is 0.05/5 and Range is F.

[5] Under sail. Using oars, Move is 0.1/3 and Range is F.

[6] Using oars. Under sail, Move is 0.5/5 and Range is –.

SAILING SHIPS

This section details vessels which qualify as *ships,* with a captain controlling a crew, and which rely entirely on sails rather than oars.

SMALL SAILING SHIPS

History provides a huge assortment of small sailing ships, which were generally the preferred option for small-scale maritime trade. Likewise, a pirate flotilla might include a galley or two to run down and capture prey, and a small sailing ship to carry the loot and captives away. Such ships can also serve as couriers and scouts in wartime. The examples here are drawn from fantasy and European history.

Cog: This is the workhorse European sailing-ship design for much of the Middle Ages. The vessel can thus appear in fantasy settings modeled on the period. The craft has a simple, rounded construction with a single deck and a single mast carrying a square sail. The ship small by later standards but is the ancestor of some larger types. (In fact, cogs grew larger over time; the ship on the table is a basic type, 60' long.) Cogs were sometimes used in combat; basic tactics were to close, grapple, and fight hand to hand. A fleet with skilled bowmen or crossbowmen could gain an advantage by opening with volleys of missiles before contact. If a cog was

being adapted for military use, high fore and stern castles might be added to give troops a height advantage (add "2s" to the hit locations). Fleets fighting on defense might chain their ships together, but then they ran the risk of being out-maneuvered by skilled enemies.

Goblin Trade Yacht (Yrth): The goblins of **Banestorm's** Yrth are a clever and civilized folk, with a taste for technical ingenuity, and some of them engage in maritime trade. Their ships tend to be quick, agile, and pretty – goblins have enthusiastically adopted the lateen sail – but rather fragile. They also tend to have goblin-scaled headroom below decks, making them uncomfortable for human passengers. Goblins average about 5" shorter than humans, and 35 lbs. lighter; use a weight allowance for a goblin crewman or passenger of 160 lbs., giving this vessel 23.24 tons of actual cargo capacity including stores. This ship is 60' long, with a single deck, and a rather minimal foremast. It has a small sterncastle, mostly to provide accommodation for the captain and the richest of the independent merchants who take passage on it. It is usually unarmed, but pirates may be cautious about it, as you never know when a goblin crew member or merchant will pull some sneaky magical trick. It would most likely be found on the Mare Medium or maybe being adventurous on the Erythraean Sea.

Mage-Cutter: This ship type could show up on a variety of fantasy worlds. It is an exceptionally light design by TL3 standards, with little load capacity. The best feature is a large sterncastle holding a capacious cabin for one or two skilled spellcasters, and a slightly smaller cabin for the captain (or the chief officer if one of the spellcasters is in command). The vessel either belongs to a financially successful magus or is assigned by a patron or government which wants this valuable specialist to be as mobile as possible. It carries trunks full of wizardly equipment and movable screens that allow the spellcaster to work on deck while shielded from observation or attack. The ship is 40' long, with a simple square sail, but some users are competent weather-workers. In other cases, the mast is enchanted with Wind (**GURPS Magic,** p. 195; this adds $9,900 to the ship's cost) or other Weather spells, allowing a wizard with an adequate energy supply to more or less ignore weather conditions for travel purposes and take the ship on a straight course to its destination at top speed. A powerful weather-worker can be a complete terror in naval combat, and fire magic can frighten sailors just as badly. Casting Essential Wood (**GURPS Magic,** p. 164) on this entire vessel would require a ceremony to provide 56 energy, but would give it HP 249 and DR 9 until dispelled.

Caravel: A Mediterranean design with wide-ranging capabilities, the slender, fast single-decked, lateen-rigged caravel was much used for exploration; two of Columbus' ships on his famous voyage were caravels. On Yrth, caravels are used around Araterre as quick trade ships and naval scouts, and have also been adopted by flamboyant Cardien traders. Adventuring parties who need to get somewhere *fast* and who have a budget to match may find that taking passage on a caravel is their best option.

DHOWS

A small dhow is described under *Plank Boats* (p. 13), but dhows could also be full-sized ships. They were used by medieval Arab seafarers for long-range trading exhibitions on the Indian Ocean, regularly visiting India and sometimes venturing as far as China. The limited flexibility of the classic dhow rig was no problem given the predictability of the Indian Ocean monsoon; sailors simply scheduled their journeys for the seasons when they knew the winds would be in their favor. This heroic tradition inspired the famous tales of Sinbad the Sailor (see **GURPS Arabian Nights**).

WARSHIPS WITHOUT GUNPOWDER

Historically, warships built at mid-TL4 or later are platforms for a *lot* of guns. They progress from guns on the top deck, to an enclosed gun deck, to multiple gun decks. Boarding actions remain an option throughout the Age of Sail, but the ships involved will have battered each other with gunnery first, if only to suppress opposing marines.

However, while *ships* may be at TL4 in fantasy settings, for the visual effect, *weapons* may be firmly stuck at TL3, with only low-power, unreliable, bulky gunpowder weapons at best, and probably not even that. (See *Maritime Tech Levels in Fantasy,* p. 11.) This will logically have consequences for naval design!

Without cannon, ship combat is likely to remain mostly in the pre-gunpowder pattern of boarding actions, possibly preceded by an exchange of missile fire from hand-held weapons. Earlier ships did occasionally mount some mechanical artillery pieces, but these had limited effectiveness for their cost and size. Bolt throwers lacked the hitting power to destroy enemy hulls or rigging, and so were mostly used for antipersonnel purposes. Stone throwers had a low rate of fire and couldn't be installed below decks. Moreover, lobbing stones on a high arc from a rolling ship is a recipe for terrible accuracy. Realistically, if they were mounted on a ship, it would be for use against shore fortifications during sieges.

Hence, these imaginary ships would lack gun decks, which would probably mean that they had much lower profiles than the "wooden walls" of the Napoleonic Wars, unless they were built to carry a *lot* of marines into battle. They would be unlikely to mount rams, which had largely disappeared by the TL3 period, but might carry ingenious boarding and grappling systems. What they would surely have is the raised "castles" to fore and stern so typical of medieval warships. These provide light missile weapons with a crucial height advantage, or enable smaller ships to grapple and board larger vessels, the boarders crossing from the castle to the enemy main deck. The overall visual effect would, unsurprisingly, be closest to the greatest galleons of the Renaissance period, but exaggerated.

Greek Fire

Another option for non-gunpowder naval combat is incendiary weapons – notably "Greek fire." This sticky, strongly burning liquid incendiary was the wonder-weapon of the Byzantine Empire. The material shows up, thinly disguised, in some fantasy stories. Even historically, some Byzantine dromons (see p. 15) were actually built as specialist Greek-fire delivery systems, with one or more "fire siphons" (**GURPS Low-Tech,** pp. 84, 86) mounted in the bow. A fantasy treatment, in which some nation can *really* afford to go to town with this technology, could feature "dragon" tanker ships that could obliterate an enemy ship with one blast.

Of course, the danger here is literally return fire from the enemy, or clever sabotage by daring enemy infiltrators. In a fantasy game, the worst threat of all is wizards who can hurl magical fire from afar, or just ignite the fuel, perhaps using the Telecast spell (**GURPS Magic,** p. 128). A ship-sized tank of Greek fire all catching at once would be a memorable sight, best observed from a mile or two away. Conversely, those fantasy games do at least offer the possibility of magical defenses such as Fireproof or Spell Shield (**GURPS Magic,** p. 73 and p. 124, respectively). See *Area Spells and Vehicles,* p. 16, for some relevant rules.

Boum: A classic dhow, capable of trans-oceanic voyages given a daring crew. A Sinbad-style trading expedition might commit, say, three tons of cargo capacity to providing accommodation for a dozen or so merchants, and another five tons for supplies for them and the crew. This leaves up to 50.8 tons of capacity divided between the merchants for speculative trade goods or extra supplies for longer-range ventures.

Baghlah: A large, later-period dhow – strictly speaking from rather too late in history to fit with the Sinbad stories, but fine for Arabian Nights fantasy that wants a generally appropriate look but with big, fancy ships. Although it's built at TL4, treat it as having a TL2 hull (see *Holed Below the Waterline!,* p. 12). The high stern allows space for some reasonable accommodation for the captain or owner.

Cardien Baghlah (Yrth): Like the Wazifi dhow (p. 13), this vessel combines a traditional dhow profile with more advanced rigging and hull construction techniques, brought through the Banestorm, imported from Araterre, or developed independently – most likely a little of each. Hence, it has something approaching a complex rig, suited to the unpredictable winds of the Erythraean Sea, and its hull is built to full TL4 standards; it somewhat resembles an overgrown caravel. It's bigger and faster than a typical Aralaise carrack (below), with an impressive cargo capacity, and *almost* as capable in crosswinds – but not quite. A few brave captains have even circumnavigated the entire of Ytarria on such ships. Armed baghlahs are the mainstay of the Cardien navy, and are good for anti-piracy work, but can't stand up to a serious Aralaise warship, even when crammed with marines.

CARRACKS TO GALLEONS

European sailing ship designs, which provide the model for maritime craft in a lot of fantasy stories, evolved from what were little more than outsize boats into towering galleons. The key difference between these and Mediterranean galleys *(Renaissance Trade Galley,* p. 17) was that these had to be capable of surviving year-round on the Atlantic Ocean. Hence, the classic late medieval-through-Napoleonic ship pattern has a broad, rugged hull, extensive sails, and no oars except on the smallest craft.

Carrack: An evolution of the cog (p. 18) with two or three masts – the standard ocean-going ship for a setting based on late medieval or early Renaissance Europe. Three-masters have square sails on the first two masts and a lateen on the third. An early carrack would have a single main deck plus raised superstructures to bow and stern. Later carrack-type ships had two or even three full decks, especially if they were warships with enough cannon to justify a gun deck. Columbus' flagship, the *Santa Maria,* was such a carrack; on Yrth, the type survives in Araterre as a common type of merchantman, while on both Azoth-7 and Marchen-1, such ships are considered more than a little out of date, but can still be found as shabby traders in backwoods areas. The table entry represents a modest-sized carrack with a small forecastle and large sterncastle.

Aralaise Frigate (Yrth): The shipbuilders of Araterre function at TL4, building efficient ships with complex rigs that are the best on Yrth, and have been doing so for centuries. This type is used for pirate-hunting and for support duties in wartime. While on Earth a frigate would carry an array of light cannons, Araterre (officially) has no firearms. Also, the Aralaise navy doesn't go in for globe-spanning expeditions, and so rarely assigns much space for supplies. Hence, this ship is built a little lighter than the frigate in *Low-Tech Companion 2,* but carries *more* people, many of them marines armed with crossbows and boarding weapons. It also has a small forecastle with space for a bolt-throwing artillery piece and a few crossbowmen, as well as a substantial sterncastle.

Aralaise Fleet Galleon (Yrth): The pride of Araterre's formidable navy, this class of very heavy warship sees little action outside of wartime, unless the Prince decides a pirate faction needs crushing (and the pirates don't run fast enough). Nonetheless, it's really good for flag-waving expeditions. It is, again, built without a gun deck, but it's still almost as bulky as a comparable Earth galleon, because it has a lot of space to carry either troops for boarding actions or military expeditions, or cargo in which the Prince has a personal interest. It also has a forecastle which mounts a pair of heavy bolt-throwing engines and provides space for a couple of dozen crossbowmen. The space within that structure has a lot of fire-prevention features, as it's used to store special incendiary ammunition. The sterncastle is given over to relatively comfortable accommodation for the captain and officers or any battle wizards assigned to the ship. At 225' long, the ship is comparable in size to the Earth galleon *Vasa,* which proved wildly top-heavy and capsized and sank on its maiden voyage. Unlike the *Vasa,* the Aralaise vessel is stable, thanks to a ballasted keel and the absence of heavy cannons. In wartime, it carries 140 full-time sailors and 320 marines.

Elven Palace-Ship (Dungeon Fantasy): Start with an image of the grandest galleons of Earth's history, enlarge further, add elven sophistication and grace, and assume the wealth and technical skill to build a really *big* ship for the elven court to tour sea-coasts and island provinces, or to supervise expeditions against orcish incursions. Even with four masts and elven skill, this multi-decked ship is slow and cumbersome – it's more squat, broad, and tall than some serious military galleons – but that's not the point. Most of the load capacity is used for luxury and imposing effect, worth *at least* +2 reactions from anyone likely to be impressed by such things. Depending on the nature of elven society in the setting, the passenger quarters may be the venue for breathtaking culture, formality, and grace, or a hotbed of timeless scheming and inhuman arrogance.

Our ships were driven sidelong by the wind, and the force of the gusts tore their sails to rags and tatters. With the fear of death upon us, we lowered these onto the decks, and rowed the bare ships landward with all our might.

– Homer, **The Odyssey**

Renaissance Galleon: The class of vessel that early European empires used for serious power projection (including privateering) and to deter privateers and pirates from attacking their own trade, galleons were generally used as warships or armed merchantmen. The type evolved from the carrack (p. 20), growing longer but with less of a forecastle. Galleons had three or four masts and three or four decks (though a gun deck might be very low, forcing the gunners to move around bent double). Once cannon became common, some were built with two gun decks, though this could make them dangerously unstable. The ship on the table is mostly based on English ships involved in the battle against the Spanish Armada in 1588 – a little over 100' long, mounting 45-55 guns of various sizes and carrying around 268 sailors, 32 full-time gunners, and 100 marines. Trading expeditions might get by with much smaller crews, especially if they don't expect serious trouble and so don't mount so many cannon.

JUNKS

While Europe offers one maritime history to plunder for fantasy uses, East Asian shipbuilding went its own way. The best-known Chinese sailing-ship type is the *junk,* which can be classed as TL4, having evolved over a long history to a very sophisticated form. Some junks were quite small, but the technology could *definitely* scale up, producing sailing ships bigger than anything known in Europe in the same period.

Junks have extensive internal compartmentalization, making them very hard to sink, and a distinctive type of fore-and-aft rigging with sails made up of horizontal strips that can easily be raised or lowered from the deck, making them simple to sail. They, or something like them, are more or less mandatory in any fantasy setting modeled on East Asian cultures,

such as **Banestorm**'s Sahud. (Technically Sahud is TL3, but it may have learned something of Earth-ship technology through the Banestorm, or just quietly advanced in that area of technology.) Historically, the type became known around the China Seas and Indian Ocean, at least at times when China was inclined to trade with its neighbors.

Giant Treasure Ship: In 1405-1433, the Chinese admiral Cheng Ho (also spelled "Zheng He") led a series of expeditions around the Indian Ocean to demonstrate Chinese power and establish diplomatic relations with other parts of the region. The biggest ships under his command were said to be very large indeed, although quite how large is debated by historians. At 440' long and 180' wide, with four decks, the ship on the table is at the high end of claimed sizes, though some suggestions run as high as 660'. (Engineers have questioned both the reasons for that number and whether it is physically possible to build an all-wooden ship that large.) It's possible that if any really big ships existed, they were used purely for maritime parades and inspections by the Emperor, remaining safely in harbor or on calm rivers while Cheng Ho commanded his fleet from something more practical (that is, about half this size). Regardless of history, the numbers on the table are based on a Chinese historical novel, and so this can be described as a fantasy ship. It is large enough to carry vegetable gardens grown in tubs to supplement the crew's supplies, as mentioned in some accounts, as well as 24 cannons and perhaps 500 sailors and 500 soldiers, diplomats, bureaucrats, and family members.

Sahudese Court-Boat (Yrth): Sahud is not a major naval power, although its merchants operate a fair number of trade junks (below). The government also commands a number of similar-sized vessels adapted to carry troops, which generally prove adequate to see off impertinent raiders from the Nomad Lands. However, the Heavenking and the Eyes of Heaven each have direct control over a small number of slightly larger, fantastically ornate vessels. (The decorations alone are worth at least +1 reactions from anyone who can appreciate Sahudese aesthetics.) These are officially described as being employed for "irrelevant inspections of territory and frivolous amusements" – which is true, but it's considered hopelessly crass to acknowledge that the 30 bodyguards included in each court-boat's crew are formidably well-trained marines, and the ships themselves are actually designed to act as the nucleus of a fleet in time of war. Also, various fitments hint that they could if necessary mount weapons which would defy the customary taboo on gunpowder. However, the Eye of Heaven Glimpse of Falling Leaves (**GURPS Banestorm,** p. 155) uses an Aralaise-built caravel (p. 19) as her personal transport, and nobody knows what to say about that.

Trade Junk: A small (70') cargo carrier – the type of junk most likely to be encountered and used by most adventurers, most of the time.

Sailing Ship Table

TL	Vehicle	ST/ HP	Hnd/ SR	HT	Move	LWt.	Load	SM	Occ.	DR	Range	Cost	Loc.	Draft
	SHIPHANDLING/TL (SHIP) (IQ-6, Seamanship-5, Boating (Sailboat)-5)													
3	Boum	137†	-2/3	10c	0.15/4	80	60	+7	12	2	–	$37K	2M	10
3	Cog	147†	-3/4	12c	0.1/4	85	60	+7	18	5	–	$140K	M	13
3	Goblin Trade Yacht	101†	-2/3	11c	0.2/4	33	25	+7	14+8A	4	–	$90K	2Ms	8
3	Mage Cutter	83†	-1/3	11c	0.5/4	8	3.5	+6	6+2A	3	–	$25K	MS	2
4	Aralaise Frigate	241†	-5/5	12c	0.2/5	490	380	+9	250A	6	–	$1.3M	2MSs	13
4	Aralaise Fleet Galleon	371†	-6/5	11c	0.1/4	1100	700	+11	140+320A	8	–	$3.2M	3M2S	16
4	Baghlah	208†	-4/4	11c	0.1/6	350	280	+9	15A	2	–	$130K	2MS	15
4	Caravel	165†	-3/4	12c	0.1/6	100	65	+7	24A	4	–	$325K	2MS	7
4	Cardien Baghlah	249†	-4/4	12c	0.1/6	400	280	+9	45A	4	–	$900K	2MS	13
4	Carrack	234†	-3/4	12c	0.1/5	200	100	+8	42A	6	–	$650K	3MSs	10
4	Elven Palace-Ship	675†	-6/6	12c	0.1/3	4400	2000	+10	400+300A	8	–	$50M	4M2S	16
4	Giant Treasure Ship	1086†	-5/5	12c	0.1/4	18,000	8,000	+12	1,000A	10	–	$16M	9M	25
4	Renaissance Galleon	268†	-4/4	12c	0.1/5	350	200	+9	400A	6	–	$1.4M	3MS	10
4	Sahudese Court-Boat	134†	-3/4	13c	0.1/4	49	30	+7	25+40A	5	–	$400K	4M	6
4	Trade Junk	96†	-3/4	13c	0.1/4	23	16	+7	12A	4	–	$65K	3M	4

FANTASTICAL SHIPPING

Many fantasy-world ships resemble craft from Earth's history; some do not. This section offers an assortment of entirely imaginary vessels.

ALCHEMICAL GALLEONS (AZOTH-7)

On Azoth-7, weird alchemical science and gemstone-powered technology make many things achievable. Improved sea travel is just one possibility, for those who can afford it. Aerial craft are swifter, of course, but large flyers require multiple gemstones of exceptional size and perfection. Even the largest of them have limited lifting capacity; bulky and less urgent cargoes are still carried by sea. Nonetheless, old-fashioned sailing ships are increasingly out-competed by the spread of technologies based on the Philosopher's Stone over the last eight decades.

Alchemical Galleon

Typical of medium-sized vessels empowered by modest Stones, this somewhat resembles a sailing ship of a century past, long and slim with an upward-flaring stern, sitting low in the water when at rest (it rises markedly once it is under way). It gleams silver in the slightest light; its wooden hull is plated with alchemically enhanced metal. Glazed portholes pierce the hull at a few points. What might be taken at first glance for conventional rigging on its two masts proves, on closer inspection, to be a fine tracery of wires, which direct and diffuse the forces generated by the alchemical furnace in the heart of the vessel; at speed, the galleon moves under a pulsing blue aetheric nimbus. The Stones periodically require realignment, polishing, and sometimes replacement, giving the craft a finite range; very long expeditions require stop-offs at alchemical stations, or flotillas of support vessels.

Although they are primarily freighters, many such vessels are armed, as piracy remains a threat even since the revelation of the Ritual of Qauqabel. Typical primary weapons are smoothbore breech-loading cannon using alchemically created propellants (Dmg 6d×8 pi++, Acc 8, Range 2,000/3,000, RoF 1, Shots 1(15)), the product of Newtonian-mystical craft skills and arcane mathematics but in themselves quite mundane. Typically, a ship carries one on the bow and two on the stern, all concealed under rigid covers when not in use. The cannon can be angled upward as well as at enemy seacraft, as "sky dogs" are the most common type of pirate. A few ship-owners of sufficient wealth and with a particular fear of piracy replace the bow gun with a Regulan flame-cannon (Dmg 6d×15 burn, Acc 10, Range 5,000/10,000, RoF 1/3, Shots 20(10)). This can only fire every once every three seconds as the flame-chamber must draw fresh energies from the 20-shot ruby cartridge, but that is still a higher rate of fire than conventional single-shot cannons can manage. The power of each blast is devastating.

ANACHRONISTIC CLOCKPUNK AND STEAMPUNK

While fantasy worlds tend to the pre-industrial, individual inventors and minority communities may have access to more advanced technology, especially if the setting creator doesn't mind playing fast and loose with dull realism. To begin with, any watercraft from *GURPS Vehicles: Steampunk Conveyances* could be borrowed for fun, but do note that the warcraft in that book would likely make their owners rulers of the oceans in short order, unless they were somehow magically sabotaged. The launches and steam yacht have little effect on setting balance, although their ability to carry adventuring parties and the like to remote parts of the game world could change the flavor of the setting. Apply the quick and dirty rules for size adjustments on p. 10 if necessary. Other designs can be created at whim . . .

Gnomish Clock-Galley (Dungeon Fantasy)

An example of a steampunk incursion into the wildness of dungeon fantasy, this vehicle assumes that some gnomes and dwarves have access to strange secrets. Specifically, while mining deep in the roots of the mountains, the dwarves discovered the ores of a strange metal that *glowed* as it was purified, but showed no signs of detectable magic. Unfortunately, it also appeared to be divinely cursed, as many dwarf metalworkers fell horribly sick while working with it. So the dwarves are happy to offload any of the ore they find to a coastal community of tinkering gnome metalworkers, who have determined that the curse cannot penetrate a modest thickness of lead, and that the fully pure metal is a wonderful source of heat.

The gnomes combined this with a device that they had created which converted heat to mechanical action (a crude Stirling engine, in Earth terms), and installed some of these devices in small seagoing ships. On each such vessel, the engine drives an array of 10 pairs of iron oars through a complex system of pistons and cranks; to observers who don't know the secret (and the gnomes aren't talking), these fully enclosed, iron-hulled galleys seem to be driven by clockwork perpetual motion machines. (Yes, it's really fantasy nuclear power. This is dungeon fantasy, though, not realism, so don't worry about the details.) Humans find the crew compartments *horribly* claustrophobic, with ceilings 5' high and illumination from dim alchemical lamps.

The ships are unarmed apart from bow rams (p. 9), but can largely ignore many mundane attacks. They sit low enough in the water that they are functionally quite stealthy. They have effectively unlimited range, although they do require maintenance every few months. The gnomes have taken to hiring them out as fast couriers and occasionally as blockade runners; a small adventuring party who had to get somewhere by sea in a hurry might book passage at merely somewhat exorbitant rates. Also, should one ever somehow be stolen or captured, the gnomes would pay *very* well for its return, preferably achieved by an adventuring party doing something final to the thieves; the price on the table is more of a nominal value for reward purposes than anything else.

> *We imitate also flights of birds; we have some degrees of flying in the air. We have ships and boats for going under water, and brooking of seas . . .*
>
> – Sir Francis Bacon,
> ***The New Atlantis***

SEA ELF SUBMERSIBLES (YRTH)

Advanced aquatic races such as the sea elves of Yrth may develop vehicles for use in their native environment. From their point of view, what humans would call a "submersible" is more like a chariot – though if domesticating aquatic animals to draw such things is a challenge, oars might be adopted. These can be much simpler than human submersibles, as sea elves don't have to worry about sealing, internal air supplies, or flotation technology; they just need to be built with something close to neutral buoyancy. Hence, they can easily be created by TL3 skills – though elven refinement can add a lot to that.

The submersible in the table is constructed from aquatic plant materials, made rigid and strong by sea elf crafter arts. It is roughly teardrop shaped, with mineral-glazed portals at the front and sides, planes to control vertical angle (and hence direction) near the bow, and a large rudder at the back. It is propelled by six oars (three a side), projecting through ports and cleverly shaped to function efficiently underwater. The steersman sits at the front, operating the rudder and planes using levers with mechanical connections. There is also room for three passengers. The steersman controls the vehicle using a new specialty of Submarine skill, *Submarine (Unpowered)*.

Exotic Watercraft Table

TL	Vehicle	ST/HP	Hnd/SR	HT	Move	LWt.	Load	SM	Occ.	DR	Range	Cost	Loc.	Draft
SHIPHANDLING/TL (SHIP) (IQ-6, Seamanship-5, Boating (Large Powerboat)-5)														
4+2^	Alchemical Galleon	371	-3/2	11	2/10	650	250	+8	40A	18	6,000	$5M	g2M	15
3+3	Gnomish Clock-Galley	222	-4/5	11	1/6	90	5	+7	8A	25	–	$3M	g	7
SUBMARINE/TL (UNPOWERED) (IQ-6, Boating (Unpowered)-4, Submarine (Mini-Sub)-5)														
3+1	Sea-Elf Submersible	47	+1/1	12	0.5/3	2	1.2	+3	7+3	2	F	$8K	G	N/A

CHAPTER THREE
FLYING CREATIONS

Caradew Willis, navigator of the **Fancy Free,** *climbed the bucking steps to its main deck more slowly than usual, being lost in nervous thought. He'd just spent two hours talking through a cabin door to Jacob Trent, the sky-brig's alchemist. After the* **Fancy Free** *had plunged through the ragged halo of fire in the sky over Sirius, Trent had spent five hours remaking the ship's aether filters so they'd stop screaming warnings. He had then retreated to his cabin, sweating and shaking and clutching a rum flask. Willis had been the first crew member to persuade Trent to talk in the three days since. As the second-best-educated person aboard, he'd been able to induce Trent to explain a little of what had frightened him. It seemed that Trent had a half-forbidden volume by Giordano Bruno among his books. Now he claimed that it might be the key to explaining what had happened to them. Willis didn't understand more than half of Trent's ramblings, but that was bad enough.*

"There y'are, ver-damn your eyes!" bawled Captain Aarhus from by the steering levers. The Dane had mastered a full set of English curses over the years.

"You need me, skipper?"

"No, you whoreson dolt, we need yourn fancy Prussian spyglass. Get your carcass to the bow."

Willis obeyed, relieved that he was being sent forward. If he'd needed to look astern, it might have meant that the Spanish pirate-hunter squadron had mustered the courage to pursue them through the mysterious halo. The **Fancy Free** *had taken that course in the desperate hope that it didn't mean destruction and that the Spaniards wouldn't follow their example. They'd survived, but that was the best that Willis could say. They'd been left in the skies above an unknown world, where they now lurked, dipping in and out of the clouds while they worked to make their furnace stable once again. The greater constellations said that this might be* **Earth,** *but a thousand lesser stars gave that the lie. Anyway, the continents below were definitely not those of home.*

Reaching the bow, Willis saw immediately what the captain wanted spied out. Something was moving through the skies below them. For a moment, Willis wondered if it was a gigantic fish; it had the shape. But no, it was a craft of some kind. Through his spyglass, Willis saw first something like a windmill, attached to the craft's tail and spinning, and then a boat-like hull slung below the main body. He focused on that . . . and then he swore softly.

There were soulless aliens among the stars, of course, but none of 'em had better than stone tools and rowboats. **These** *creatures, though, shaped like men but squat and broad, flew the skies and carried axes, and were eyeing the* **Fancy Free** *as Willis scanned them.*

Perhaps Trent had guessed some terrifying truths.

Historically, low-tech societies (almost certainly) had no aerial vehicles. However, fantasy worlds have access to many strange possibilities, depending on the nature of the fantasy.

LIGHTER-THAN-AIR VEHICLES

Balloons were historically the first technology to enable flight by humans. Airships are in some ways easier to invent than powered heavier-than-air aircraft, so lighter-than-air craft can make some sense in a low-tech fantasy setting. This section deals with balloons, dirigibles, and more fantastical craft using lift mechanisms that achieve similar results, just passively raising things upward.

BALLOONS

Balloons aren't a difficult idea to come up with – toy hot air balloons, far too small to carry human beings or other useful loads, may go back to prehistory. In practice, crewed balloons were a TL5 invention. A highly debatable theory states that TL1 Nazca people of ancient Peru may have used hot air balloons (see **GURPS Fantasy-Tech 1,** pp. 16-17, and **GURPS Low-Tech Companion 3,** p. 42), but provable examples begin in the 18th century. This isn't too hard to explain.

Constructing a large enough gasbag of sufficiently airtight material, with a properly attached basket, requires non-trivial resources, materials, and organization. The balloon must then be filled with lifting gas, meaning either hot air or some chemically purified or created substance. The former in turn requires either that the balloon carries enough fuel for the duration of the flight, which is heavy and potentially dangerous, or that it flies for only as long as the hot air from a fire at its launch point can last. Historically, hot air balloons were a technological dead end until TL7 brought lightweight, safe gas burners. However, lifting gases need TL5 science, and may be dangerously flammable.

And then, while balloons give a dramatic new view of the world and allow a bit of military reconnaissance (see *GURPS Vehicles: Steampunk Conveyances*) and some interesting scientific research projects, they're at the mercy of the winds, with only altitude under the pilot's control.

Fantasy settings offer ways around all of these problems! Magical fire can surely heat air in huge quantities, and weather-control spells could steer balloons wherever they were needed. Equally, if alchemists can be persuaded to divert their attention from turning lead into gold or distilling elixirs of immortality, they might emulate TL5 chemists' production of gases such as hydrogen, and perhaps make cloth completely gas-proof as well. The only snag with this is that magic or alchemy this potent might well also grant the ability to fly directly, without messing about with balloons.

But perhaps someone doesn't want to be using active magic when flying over enemies who might detect or dispel it, or that person needs to visit a no-mana area. If the GM defines the setting's magic and alchemy restrictively enough, balloons could easily be a feature of a fantasy game. The alchemist's balloon in the table is based on a very large 19th-century balloon detailed in *GURPS Vehicles: Steampunk Conveyances,* rendered a little more reliable and less vulnerable to disasters by extra development time and the use of an alchemically created gas that's less dangerous than hydrogen. It has a large cabin that can hold 15 people in some comfort. The nominal crew is two pilots, usually working shifts, but the passengers may include weather mages to steer the balloon and protect it from storms. The cabin has a flat roof which can be used as an observation platform.

CLOCKPUNK/STEAMPUNK DIRIGIBLES

Dirigibles are more complex than balloons, and really need fairly high-tech engines. Flexing that requirement a little, perhaps with some references to alchemically based clockpunk, allows a setting to feature some *entertaining* flying vehicles.

Gnomish Aircar (Yrth)

On Yrth, a community of gnomes dwells in hill country on the edges of the Great Forest and the Fence of God (see *GURPS Banestorm,* p. 120). They mostly live by farming and mine their own metals as needed, but few of their neighbors realize that they have become quite well off from selling metalwork to the forest elves and mining equipment to nearby dwarves. They are also a long way from any settled human nation, and hence pay little attention to human attempts to suppress technological progress. Their workshops and inventors may have collected some ideas from Banestorm victims or materials swept in from other worlds, or may just be very ingenious. The "aircar" is one of their more impressive creations; fortunately, the inventor has some idea how much trouble could be caused if outsiders found out about it. His apprentices may not be cautious enough, though.

It is, in fact, a small dirigible, very similar to the "adventurer's dirigible" in *GURPS Vehicles: Steampunk Conveyances.* Its gasbag is filled with hydrogen, produced by chemical techniques on the edge of alchemy. It is powered by an ingenious and ridiculously intricate sextuple-expansion steam engine driving a single propeller at the stern. Meticulous gnomish craftsmanship makes it more reliable than it has any right to be. The enclosed gondola (SM +4 if targeted specially) is made of alchemically fireproofed wood, making it no particular fire risk. The crew consists of a pilot, a navigator, and a (very necessary) full-time mechanic. The biggest problem is the continual need to replenish the hydrogen between flights, which can cost thousands of *GURPS* $ a month and can't be accomplished at all when away from home. However, one of the passengers on test flights is often an alchemist who might be able to improvise something in a laboratory.

Dwarven Steam Airship (Dungeon Fantasy)

In a realm of dungeon fantasy, some dwarf engineers have *definitely* plunged into steampunk, though details of their inventions are jealously guarded and involve a lot of barely reproducible inspiration. This Gothic-looking airship has a thin metal skin on its main hull. It is powered by a pair of weirdly intricate steam engines driving large propellers mounted on spars projecting from the large gondola (which is SM +7 if specifically targeted). It has light bolt-throwing engines with dwarf-made sights and winding mechanisms (Dmg 3d imp, Acc 5, Range 220/275, RoF 1, Shots 1(7)). The weapons are on flexible mounts at the bow and stern of its gondola, and to port and starboard at the midpoint, with a fifth mounted atop the hull to defend against attacks from above.

BILIT ISLAND HOT AIR BALLOONS (YRTH)

Among the tales told by survivors of the last Megalan attempt to conquer Bilit Island (*Banestorm,* p. 108) were stories of observers rising from some of the local towns to spy out the invaders' dispositions, without use of detectable magic or flying creatures. Most hearers discount these as tall tales, but the truth is that some of the islanders have actually constructed crude, basic hot air balloons. These are indeed useful in wartime, and to give warning of the approach of the huge monsters that infest the local jungles.

It's possible that Banestorm victims brought this idea from Peru, but more likely, it's a local invention. The balloons do resemble attempted reconstructions of possible Nazca creations (see *Fantasy-Tech 1,* pp. 16-17). The gasbags are made of tightly sewn textiles, further sealed with rubbery tree-sap. A simple, crude harness is suspended beneath. The assemblage weighs 35 lbs. and has a nominal cost of $600. The balloon is filled with hot air from a fire pit, using 50 lbs. of wood as fuel, and takes a minute to inflate. Once launched, it rises to a height of 100 yards for two minutes; it is usually tethered to prevent it from being blown away. It cannot lift more than 100 lbs., so pilots are foolhardy young teens. Landing counts as a fall from a height of five yards.

However, it is not really intended to be a warcraft. Rather, it is used to transport dwarf dignitaries and diplomats between mountain strongholds, occasionally to carry small high-value cargoes, and sometimes to intimidate other races by overflying their communities. Some trick of dwarven materials handling makes the lift gas – which should "logically" be hydrogen – less flammable than it ought to be.

MARCHEN-1 SKYBOATS

The world of Marchen-1 has a radically different form of lighter-than-air flight, as detailed in **GURPS Thaumatology: Alchemical Baroque,** p. 13: "Levitational Salts," an alchemical concoction which can be used to treat porous materials. The materials then rise upward whenever the sun is *not* in the sky. The other drawback of the salts is that they only provide 5 lbs. of lift per square foot treated. In practice, this means that flying vehicles have to be terribly flimsy; they need large areas of thin wood or sailcloth to lift even small loads. **Alchemical Baroque** suggests that they use Piloting (Lighter-Than-Air) skill, but really, the exotic propulsion systems used tend to require their own unique skills. Two example vehicles are detailed here.

Bird-Drawn Raft: This is a simple, even improvised creation, though it requires that someone train domestic geese to fly in harness, which is a good trick. It consists of a thin raft of lightweight softwood, just over 7' square, with just enough shaping to provide a degree of stability, harnessed to a dozen trained geese, which pull it through the air. It can carry one driver with minimal luggage; they need the new Piloting specialty, *Bird-Drawn Airboat.*

Night-Sky Boat: This ingenious creation of alchemy, natural philosophy, and boat-building is the largest such craft

*Eärendil was a mariner
that tarried in Arvernien;
he built a boat of timber felled
in Nimbrethil to journey in;
her sails he wove of silver fair,
of silver were her lanterns made,
her prow was fashioned like a swan,
and light upon her banners laid.*

– J.R.R. Tolkien, "The Song of Eärendil"

ever constructed on Marchen-1. It resembles a lightweight three-person wooden boat. It has three masts – one vertical and the other two projecting sideways and angled slightly above the horizontal. These carry a large and incredibly complex rigging system. Normally, lighter-than-air craft cannot use sails, as lack of water resistance means that they are simply blown before the wind. In this case, the night-sky boat's sails are all treated with levitational salts. Careful furling and angling enables them to create torsional forces on the masts, giving the craft a limited cross-wind sailing capability. It can also be taken into slow, shallow glider-like dives. Its listed Move is what is usually expected given a fair wind in approximately the correct direction, but the boat can just as easily end up becalmed. It can always run before the prevailing wind at the wind's current speed – although storm-force conditions are dangerously prone to tearing the sails and damaging the masts. The crew customarily consists of an alchemist-master, a navigator-rigger, and a steersman; all three must have the new Piloting specialty *Sailing Airboat.*

Lighter-Than-Air Vehicle Table

	TL	Vehicle	ST/HP	Hnd/SR	HT	Move	LWt.	Load	SM	Occ.	DR	Range	Cost	Loc.	Notes
PILOTING/TL (BIRD-DRAWN AIRBOAT) (IQ-6, Animal Handling (Geese)-5, Piloting (Lighter-Than-Air)-5,)															
	4^	Bird-Drawn Raft	15†	-4/2	10c	1/7	0.125	0.1	+1	1	1	F	$7.8K	12DE	
PILOTING/TL (LIGHTER-THAN-AIR) (IQ-6, other Piloting-5)															
	4+1^	Alchemist's Balloon	68†	-2/4	10c	0	5.5	3	+11	2+13	1/2	–	$40K	S	[1]
	4+2	Gnomish Aircar	101	-4/5	9f	1/6	9	0.9	+9	3+3	1/4	100	$20K	GS	[2]
PILOTING/TL (SAILING AIRBOAT) (IQ-6, Piloting (Lighter-Than-Air)-6)															
	4^	Night-Sky Boat	37†	-6/3	10c	1/10	0.7	0.3	+5	3	1	–	$100K	3MO	[3]
SHIPHANDLING/TL (AIRSHIP) (IQ-6, Airshipman-5, Piloting (Lighter-Than-Air)-5)															
	4+2^	Dwarven Steam Airship	179	-4/4	12c	0.25/25	60	15	+12	20+10	3/5	600	$2M	gSX	[4]

Notes

[1] Balloon DR 1; cabin DR 2.
[2] Gasbag DR 1; gondola DR 4. Gondola holds the engine and crew accommodation, and is not flammable.
[3] Move is highly dependent on wind conditions; see the description.
[4] Hull is DR 3; gondola is DR 5. Gondola holds the engines and crew accommodation and is not combustible.

GLIDERS

Gliders are another type of flying vehicle which it seems fairly easy to imagine a low-tech society inventing. They're relatively simple constructions, don't require any sort of engine, and could surely be inspired by observing birds or playing with kites.

In reality, this isn't as simple as it sounds. As **GURPS Vehicles: Steampunk Conveyances** explains, experiments have shown that it's *possible* to build a simple hang-glider with TL4 materials, but the result would likely be horribly unstable. Even if one could be built and developed to a usable state without killing too many test pilots, it would lose altitude rather quickly in regular flight. However, low-tech fantasy gliders aren't actually inherently crazy. The vehicles in this section are cinematic rather than superscientific; that is to say, they are better than could plausibly be expected to exist at their TL, but don't actually violate the laws of physics.

Note that gliders are listed as having an Acceleration of 0. Without engines, they can only gain velocity from launch mechanisms, being towed, or tailwinds, or by diving.

STICKS AND STRING

Early low-tech gliders, with frames made of wood (or, if dungeon-fantasy dwarves are involved, amazing super-light silver-grey metal) and coverings of plant-fiber cloth, would likely be hang-gliders, which require less material and fewer complex connections to control surfaces. They would lack the carrying capacity to be useful transports or warcraft or the range to serve as fast couriers, but they might be employed for reconnaissance and the occasional clandestine assault, if a way could be found to launch them to an adequate altitude and range.

Mountain-Folk Glider (Dungeon Fantasy): "Mountain folk" are tribal peoples occupying certain remote mountain ranges. They are generally regarded as barbarians, and are certainly hardy and individualistic enough that PC adventurers from this background often use the barbarian template. Like many "low tech" peoples from specific environments, they have developed some remarkably sophisticated technologies to solve particular problems – including these hang-gliders. They resemble the clockpunk hang-glider in **Steampunk Conveyances,** but benefit from years or centuries of development, giving them greater stability and useful range (their "glide ratio" can be set as high as the GM thinks will make for a good story). They are usually launched from stations on the highest accessible peaks, using clever weight-and-pulley mechanisms.

NONHUMANS AND GLIDERS

Fantasy nonhuman races might also have uses for gliders, even if they are rather fragile and vulnerable to flying monsters. The following is one example.

Pixie Throne-Kite (Dungeon Fantasy): This contraption is manufactured for the leaders of friendly pixie clans by gnome artisans and then embellished by pixie artists. It looks like an oversized toy, just under 3' long and with a similar wingspan. However, it is in fact a fully functional two-seat sailplane, with a complex aerodynamic control system – just sized for pixies, who use it as a prestige transport in clan gatherings and migrations. Gnome craftsmanship and the innate pixie grasp of the principles of flight make it an efficient, agile flyer. It has an open double cockpit; the passenger (always a pixie clan chief or someone equally important) sits in a very comfortable seat behind and slightly above the pilot. The conveyance is decorated beautifully enough to receive +2 reactions from anyone who appreciates such work.

SAHUDESE MANNED KITES (YRTH)

Historically, kites may go back to TL1. They were probably invented in Asia, where silk and bamboo – excellent kite-making materials – were widely available. Once kites existed, using one to lift a human being was a simple matter of scale; the problem was lowering the unfortunate individual safely to the ground afterward. (Stories tell of a TL2 Chinese monarch using the technology as a sadistic form of execution.) So, despite other stories from various lands, useful, *reliable* person-lifting kites weren't actually developed until TL6, in the West. Powered aircraft then quickly superseded them.

However, Sahudese culture has incorporated a lot from its Chinese antecedents, including a fondness for kites of all sizes. In this field, Sahud has gone one better than its inspiration. Sahud has a few person-lifting kites serving various purposes. Along with military reconnaissance and cartography, they are sometimes used to insert ninja into hostile cities or castles without triggering magic-detecting alarms. (This requires a dark night, a black kite with a black cable, a well-lubricated and hence quiet winch, a crew with good night vision, and an acrobatic and lucky ninja.) A typical set-up consists of a one-person basket suspended from an *array* of kites, all together weighing 50 lbs.; if necessary, treat it as a vehicle with ST/HP 15, HT 10c, SM +2, DR 1, and Loc OWi. A cable to a winch mechanism (which weighs another 200 lbs.) connects it. The complete assembly costs $1,500.

The kite can be launched in moderate to strong winds, ascending 100' per minute to a maximum height of 600', always somewhere downwind of the winch. Controlling it is largely the task of the four-person ground crew. The crew must include and be supervised by someone with the IQ-based Professional Skill "Kite Operator"; roll against that to, for example, bring the kite level with a castle tower, or keep it under control if the wind changes suddenly. This is a mature technology; dangerous crashes are only likely to happen on critical failures on the skill roll, or during very tricky missions.

It is usually launched from mountain ledges or very tall trees. However, pixie strength means that a practiced crew can give it a respectable enough launch speed when they are obliged to start from lower elevations, or a team of three burly pixies can tow it up to top speed in the air.

Glider Table

TL	Vehicle	ST/HP	Hnd/SR	HT	Move	LWt.	Load	SM	Occ.	DR	Range	Cost	Loc.	Stall
PILOTING/TL (GLIDER) (IQ-6, Piloting (Light Airplane or Ultralight)-2, other Piloting-4)														
4+1	Mountain-Folk Glider	17†	-2/4	11c	0/15	0.14	0.1	+4	1	3	–	$650	EWi	5
5+1	Pixie Throne-Kite	7†	-1/2	11c	0/12	0.0045	0.0015	-1	1+1	1	–	$3K	OWi	2

The wing is the corporeal element which is most akin to the divine, and which by nature tends to soar aloft and carry that which gravitates downwards into the upper region, which is the habitation of the gods.

– Plato, "Phaedrus"

ALCHEMICAL FLYERS

"Alchemical" is defined broadly here; this section covers various sorts of machine built using more or less "magical science" effects to fly, without merely being hoisted into the air by somebody casting a spell. However, it excludes lighter-than-air flyers, even if alchemy is involved with them – see pp. 24-26.

EARLY AND EXPERIMENTAL DEVICES

Given some kind of alchemy, settings without regular non-magical flight operated by people can still feature the occasional weird experiment or marginally useful "philosopher's toy."

Spherical Chariot (Marchen-1)

Building on the principles involved in the manufacture of levitational salts (p. 26), a suspiciously well-funded alchemist in Marchen-1's Green Archipelago has recently invented a heavier-than-air flying machine, supposedly to investigate the workings of the celestial spheres. This invention is thus known as the "spherical chariot." Other alchemists in several lands are racing to emulate it.

A whirling cage-like structure of exotic alloys surrounds a glass-and-metal inner hull with a clockwork mechanism at its heart. (The pilot or passenger must occasionally rewind the mechanism, whenever the GM decides it suits the plot.) In flight, the vehicle seems to slide along beams of moonlight. The only range constraint, crew endurance aside, is that a small supply of alchemical salts occasionally needs refreshing. On long journeys, the passenger may serve as a navigator.

The chariot is 12' long, 6' high, and 7' broad. The flight system has two peculiarities. First, it works much more efficiently by night than by day (see the table notes). Secondly, two such mechanisms in proximity tend to interfere with each other. If two active spherical chariots come within 30' of each other, both stop working. If they are within 1,000', either pilot may attempt to initiate deliberate interference. Roll a Quick Contest of Piloting every three rounds until they move out of range, with both pilots rolling at -1 per 100' distance. If neither makes the roll, there is no effect. Otherwise, if neither wins the Contest by more than 2, both craft remain stationary until the next test. If one wins by 3 or more or with a critical success, the other loses lifting power and goes into free fall until the next Quick Contest or until the fall takes it out of range of the other ship.

Sky-Cutter (Azoth-7)

This is an old design on Azoth-7, predating the discovery of the Ritual of Qauqabel and hence interstellar flight, but developed enough to rate as a mature technology. It is a straightforward flying machine for in-atmosphere use, without any sort of life support system. Such vehicles are still found on many places on Earth, in civilian roles and as support craft in military operations. Alchemical galleons (pp. 29-30) sometimes carry them as ships' boats.

The first experimenters to build such machines based the hull on that of a boat, partly out of sheer habit and partly to facilitate landings on water – descents sometimes got a little bumpy in the early days – and the habit has persisted.

It thus resembles an open-hulled, shallow-draft river boat, with a hull of coppery-red alchemical alloy over a wooden frame. It has an alchemical furnace amidships. It is steered using aether "rudders" (actually transmission surfaces for elemental impulses) at the bow and stern. The rudders resemble the tailfins of an exotic fish and shimmer a lambent red when in use. The crew consists of a "serving alchemist" (who manages the furnace) and a steersman. The furnace periodically requires recharging with chalcedony and opal dust, but the primary limitation on range is the need periodically to purify the mechanisms of sulfur encrustations.

SHIPS OF THE SKIES

These are examples of full-sized flying craft which use fully developed fantastic technologies or magics to fly. The crews use a new Crewman skill, *Flying Sailor,* and the captains uses another new specialty, *Shiphandling (Flying Ship),* which has as prerequisites Flying Sailor, Leadership, and Navigation (Air), and defaults to Flying Sailor-5.

High Elf Skyship (Dungeon Fantasy)

This is the sort of thing that the most imposing high elf leaders sometimes use for rapid travel or visiting otherwise inaccessible spots. They might just give an adventuring party a lift in one if such an inaccessible spot turns out to have been infected and corrupted by Evil Forces™ of the sort which delvers are best qualified to extirpate. It looks something like a 60' Norse longship (pp. 14-15), but a *really* stylish fancy one, with small, ornate superstructures on the bow and stern for the comfort of passengers. It is apparently built of naturally occurring "essential wood" (as per the spell in **GURPS Magic**) and held aloft by Ancient Magics™. Its shiny sails catch subtle etheric winds of which lesser beings are unaware (but which clearly blow reliably, as the skyship's Move is independent of mundane weather). Thus, it doesn't function in no-mana areas. (Those sails are also largely permeable by mundane air. Even the strongest mundane headwind doesn't slow the skyship by more than a quarter of the wind speed.)

The carved figurehead is magically imbued with the wisdom of the serpent. In game terms, it can cast three spells per day, chosen from Astral Vision, Divination (Augury), Know Location, or Seeker (see **GURPS Magic**), at effective skill level 20. It conveys the information gained by speaking in terse but elliptical and poetic words. The ship is unarmed, but it usually turns out that several of the crew or passengers have spent centuries perfecting their archery skills, and some may be packing serious magic weapons.

The listed cost is strictly nominal. The elves certainly don't sell these things, and don't appear to be able to build more, although their mystic high craftspeople can fix any damage one suffers.

Star Galleon (Azoth-7)

When the Immortal Newton first determined the nature of the Fixed Stars and their angels, the four great kingdoms of his world were hurled into a race to attain the other worlds and gain access to their gemstones. Building on the skills which had created craft like the sky-cutter (pp. 28-29), they ended up with fleets of craft resembling galleons made of pale coppery metal. The ships are empowered by outsized alchemical furnaces to rise above the lower airs to a realm where the pure angelic mathematics propounded by Newton held sway unimpeded.

Once such a star galleon transcends the lower air, the alchemist, navigator, and helmsman can cooperate to invoke the names of the Heavenly Virtues and the mathematics of their realms. Performed correctly, over a period of some hours in a correctly chosen area, such operations carry the vessel to the other worlds. Of course, the philosophers involved in this development understood that the higher realms were unlikely to be hospitable to human life – Newton had identified the nature of gravity even before he attained the Philosopher's Stone, and anyone who breathes should understand the need for air. But the most basic elemental theories, enhanced by a careful reading of Paracelsus, offered a complete solution to such problems. Forces from its alchemical furnace (focused through symbolic invocation of the four elements) can englobe a sky-craft in a sphere of terrestrial normality, with perceived gravity, pleasant temperatures, breathable air, and drinkable water.
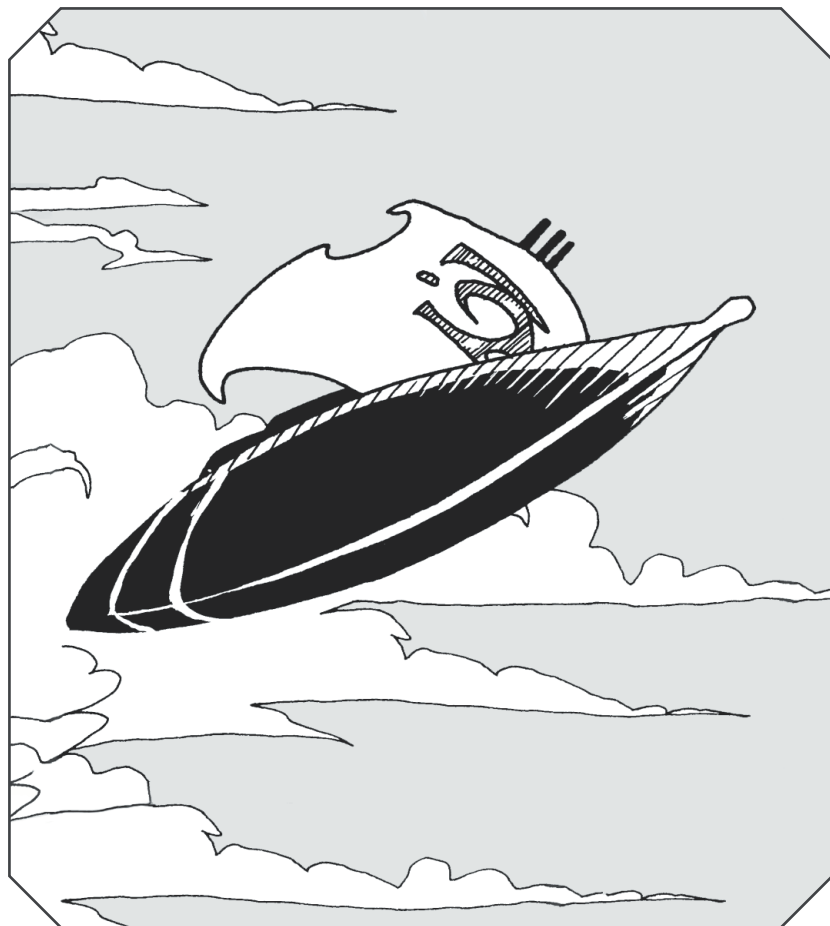
The ship's alchemist merely has to keep the sphere balanced against ambient aetheric influences. The ship's lower decks can be sealed in the event of a disaster, but refreshing the air there would soon become a problem.

The sky-galleon detailed on the table is typical of those used for both large-scale trade and military operations in the outer realms. Quite a few smaller "sky-brigs" exist, but have some trouble matching the larger craft for economic efficiency (which is why some of them end up performing distinctly questionable duties). Occasional larger designs put too much stress on their alchemical furnaces, and so require frequent maintenance. This type has a substantial sterncastle and a pair of what look like vestigial masts, but which are actually "dissipation staves," intermittently employed to channel or expel imbalanced essences. They can also be used to hoist signal flags, and some captains have improvised actual old-fashioned sails after making emergency landings on water.

Alchemical technology of this sophistication can go a long time between refurbishment stops or the need for significant replacements of important gemstones. Range is thus hard to assess in ordinary numeric terms. In addition to the resilience of the alchemical-metal hull, while in flight, one side effect of the standard elemental evocation is an immaterial shield which grants +30 DR from all directions.

This is a freight carrier, but the chanciness of life among the other worlds ensures that every ship goes somewhat armed. This one has six Regulan flame-cannons mounted on its top deck (Dmg 6d×15 burn, Acc 10, Range 5,000/10,000, RoF 1/3, Shots 20(10); each cannon can only fire every once every three seconds because the flame-chamber takes that long to draw fresh energies from the 20-shot ruby cartridge).

A star galleon fitted out for war is similar, but carries marines rather than civilian passengers. Most of the ship's cargo space is taken over by a gun deck with more flame-cannons in highly flexible mounts. It typically also carries a Rigellian diamond buckler, which can erect a shield of force to defend the galleon. This provides DR 500 divided by the number of faces it is set to protect – DR 250 in two directions, DR 167 in three, and so on – but disrupts the galleon's motive capability, halving its Acceleration and Move while in use.

Alchemical Flyer Table

TL	Vehicle	ST/HP	Hnd/SR	HT	Move	LWt.	Load	SM	Occ.	DR	Range	Cost	Loc.	Notes
PILOTING/TL (CONTRAGRAVITY) (IQ-6, some other Piloting specialties-5)														
4+1^	Spherical Chariot	74	-1/5	11	5/50	3.4	0.23	+3	1+1	20/60	1,000	$600K	G	[1]
4+2^	Sky-Cutter	58	0/3	10	1/35	2.15	0.6	+3	2+4	0/6	250	$15K	O	[2]
SHIPHANDLING/TL (FLYING SHIP) (IQ-6, Flying Sailor-5)														
3^	High Elf Skyship	73	0/5	12	4/60	7.5	4.5	+6	12+12A	12	–	$10M	MO2s	
4+2^	Star Galleon	279	-1/3	10	8/150	350	180	+9	100+80ASV	12	–	$5M	S	[3]

Notes

[1] Move is while the sun is *not* in the sky; between sunrise and sunset, it becomes 1/30. The structure involves a semi-open framework which moves rapidly and unpredictably while the vehicle is in flight; base DR is 20, with a 3 in 6 chance that part of the framework will get in the way of any attack, giving +40 DR.

[2] Usually, DR 0 from above and 6 from all other directions. However, by making a Piloting skill roll and reducing Acceleration and Top Speed by 50%, the serving alchemist can generate an immaterial shield which grants +23 DR from all directions.

[3] Move is in atmosphere. Once among the higher spheres, travel speeds and times can only be described by extensive use of advanced mathematics. Listed DR is as provided by the hull; see the description for additional protections.

The appearance of the wheels and their work was like unto the colour of a beryl: and they four had one likeness: and their appearance and their work was as it were a wheel in the middle of a wheel.

– **Ezekiel** *1:16*

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