PYRAMID

Issue 3/49 November '12

WORLD-HOPPING

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by Matt Riggsby

A SONG OF MANY WORLDS
by Christopher R. Rice

GENERATION SHIPS
by David L. Pulver

HYPERJUMPING
by Jason "PK" Levine

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PYRAMID

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Each article is color-coded to help you find your favorite sections.

Pale Blue: In This Issue
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Purple: Systemless Features

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In This Issue

From Earth-rooted tales of the maybe-today to far-flung, impossible space opera, moving from world to world has been a staple of science fiction for nearly a century. In this *Pyramid,* we focus our sensor arrays on all things related to world-hopping: how to get to other planets, what to do when you get there, and interesting places for interplanetary explorers to visit.

In some settings, the most efficient way to get from point A to Point B is to go through *The Fast Reach;* it may not be the *safest* way, but it's always *interesting.* Matt Riggsby – the explorer who delivered delights found within ***GURPS Fantasy-Tech 1: The Edge of Reality*** – describes a curious cluster of 11 star systems that connect more civilized regions. This article, suitable for any starfaring setting, includes both full-color and printer-friendly maps for this cluster of worlds.

Sometimes the intelligent life that explorers encounter doesn't live on the planet – it *is* the planet. With *A Song of Many Worlds,* you'll know the ***GURPS*** stats for living planets, new plant-centered psionic abilities (built off the foundation of ***GURPS Psionic Powers***), and a ***GURPS*** template for someone who can really commune with nature.

Moving into space is the trip of a lifetime . . . sometimes literally! When interplanetary voyages take more than a few decades, you need to rely on *Generation Ships.* In the latest installment of Eidetic Memory from David L. Pulver, you'll get tips for dealing with social and physiological issues, ideas for campaign usage, and guidelines and new ***GURPS Spaceships*** rules rom the designer himself for creating generation ships, including an example vessel.

When faster-than-light abilities exist in a setting, *Hyperjumping* might be the best way to represent it. ***GURPS*** Assistant Line Editor (and intergalactic scholar) Jason "PK" Levine suggests ways for expanding the Hyperjump-limited version of the Warp advantage. Now you have more FTL options than ever!

Planet-hopping might not mean traveling around the universe but visiting parallel Earths. Discover the malfunctioning cross-temporal marvel known as *The Time Punch* in this systemless campaign framework perfect for ***GURPS Atomic Horror*** or ***GURPS Infinite Worlds.***

This issue's Random Thought Table explores what makes safe landings on planets possible, while Odds and Ends offers another method for safely going to other worlds and a Murphy's Rules that's not "ordinary." Whether you're stepping through warpgates, firing up FTL drives, or boldly going where none have before, this month's *Pyramid* should give you planet-sized possibilities!

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From the Editor

A World of Ideas, A-Whirl'd of Ideas?

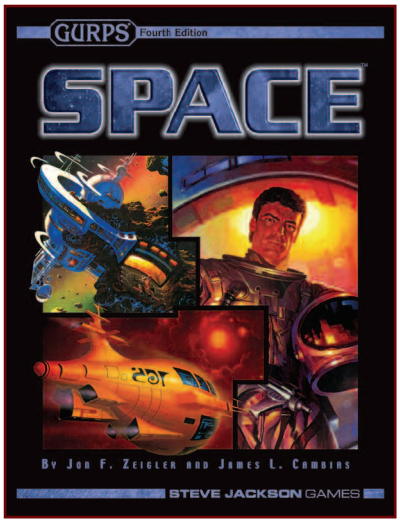
One of the great things about a world-hopping campaign is that it's feasible to do just about anything from installment to installment. Whether it's a seemingly endless parade of varied civilizations (like *Star Trek* or *Star Wars*), or a tightly clustered set of mostly or fully defined planets (like ***Fading Suns*** or the *Firefly* universe), the potential for adventure erupts with each new destination.

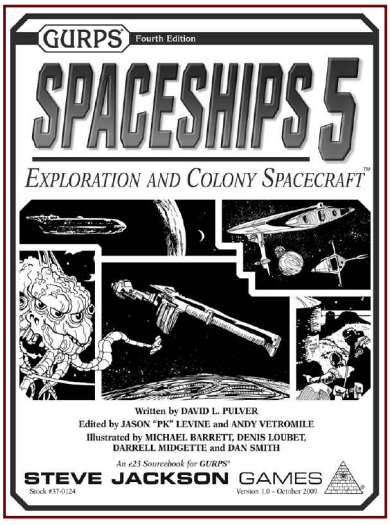
In this way, multi-world campaigns almost have an embarrassment of riches. After all, it's certainly possible to fill a lifetime of adventures on one world; that's what every one of us is doing right now. And it's equally possible to set an immensely satisfying campaign that centers around one city or even space station. However, when designing on a smaller scale, there's always a sense that you can't go completely nuts with revelations; after all, if the adventure centers on one city, it stretches credulity to suddenly reveal that 90% of the population is a robot. However, this isn't a limitation in a multi-planet campaign; why *can't* nearly all the citizens of this never-before-visited city be androids?

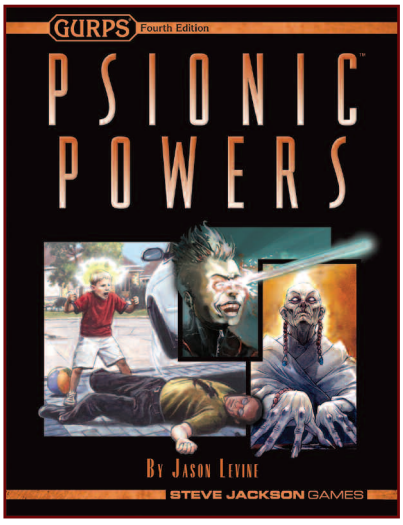
It is in this spirit of never-ending adventure that we present this issue of *Pyramid*. Whether you're seeking new ways to move across space and time to visit someplace new, or discovering unusual entities with abilities far different from humanity, or uncovering the secrets of a new part of space, this issue should have something to add to your campaign.

Write Here, Write Now

Did you enjoy our visit to strange new worlds? Or should we stay closer to home next time? Let us know privately what you thought about our interplanetary voyages, at **pyramid@sjgames.com**. Alternatively, you can share your thoughts about your extraplanar exploits at **forums.sjgames.com**.







Additional Material: Scott Paul Maykrantz

The Fast Reach

by Matt Riggsby

In a universe full of distant civilizations, one region offers relatively rapid but difficult and dangerous travel between them: the Fast Reach. The Fast Reach is a desolate area of space that just happens to provide the most direct path between a variety of more densely populated regions full of more hospitable worlds. The Reach itself consists of a series of barely inhabitable star systems tracing out paths where each hop is near the practical limit of FTL travel. The worlds themselves are largely resource-poor and provide little but stepping stones between true destinations. However, they occupy important strategic locations. For exploration, trade, or warfare, adventurers must start from their home system and make their way across the systems of the Fast Reach . . . one at a time.

A map of the Fast Reach region is on p. 9.

Zen: The freighter's present course will take it into Zone Nine in four hours at present speed.

Blake: Where in Zone Nine?

Zen: The freighter is on course for the only habitable planet in Zone Nine.

*– **Blakes 7** #2.4*

History of the Reach

Clear signs of habitation along the Fast Reach, involving at least one precursor society, vastly predate the current crop of galactic civilizations. However, "precursor" doesn't necessarily mean "superior." Archaeological investigation suggests that the Reach was initially plotted out and the first permanent bases placed by civilizations with somewhat *lower* technology than current standards.

The earliest visitors to the Fast Reach were the Chantaur, who were present in the region from 12,000 to 15,000 years ago. They laid down the Old Foothold stations (p. 6) that form vital links along the Fast Reach. They also left traces of occupation on many of the Fast Reach worlds. Most of their settlements indicate that the Chantaur were comfortable living with a relatively low material standard of living, using sparse information networks and little in the way of what might be called consumer goods. Clothing, for example, appears to have been purely utilitarian and only worn in extreme climates. Even so, they also performed much of the terraforming that has made some Reach worlds inhabitable. This suggests some of their technology was paradoxically high.

For the next several millennia, the Reach saw little traffic, though some evidence hints at as-yet-unidentified visitors. The past thousand years have hosted renewed activity. Breakaway factions from the Sarrat empire (p. 7), expeditions from the Dacsi region (pp. 8-9), native civilizations from Ngapa (p. 6) and Patek (p. 6), and migrations out of the Sparse Rim (p. 7) all flourished temporarily on various worlds. Most left small footholds at best.

Currently, the Fast Reach remains sparsely populated. Habitable planets are, indeed, inhabited, but none currently serve as extensions of larger interstellar nations. Even so, that situation could easily change. Unlike many earlier periods of the Fast Reach, the region has multiple active civilizations surrounding it. Now that there's somewhere to go at each end, the Fast Reach is becoming a strategic conduit, not just a barren curiosity.

Systems of the Fast Reach

Though other uninhabited and generally uninhabitable systems are contained within the boundaries of the region, the Fast Reach is generally thought of as consisting of 11 systems. They can be divided into two arms: the longer Sarrat arm, leading from Kashta to the Sarrat empire, and the Dacsi arm, spanning from Kashta to Dacsi space. Two short routes also exist from Kashta to Fazza (p. 7) space and to the adventurers' own home space.

Littleplain

Littleplain is the step between the adventurers' home space and the Fast Reach. The planet is small, cold, and dry, essentially Mars-like but with more heavy metals; prospecting for and mining the many small deposits is the planet's main industry. The atmosphere is not quite dense enough to breathe unaided, but inexpensive pressure masks fill that particular gap. Miners are supported by a network of small industrial towns providing equipment sales and maintenance, medical facilities, recreation, and sales-brokering. Littleplain's shipping operations have recently been enlarged to support increasing traffic into the Reach. However, it remains largely a backwater.

Its most notable attribute is that it's the last system associated with the adventurers' own civilization before Kashta and the Reach proper.

Heval's Step

Heval's Step, named after an obscure culture hero of the Fazza, resembles Littleplain, save for higher temperatures, a bit more water, and a lack of useful minerals. Like Littleplain, it's also a gateway to the Fast Reach. It is home to a number of Fazza monasteries, small industrial settlements, and a military garrison. It doesn't have anything remotely resembling the force necessary to take and hold any other systems of the Reach, but it does provide a strong defensive position at the edges of Fazza space and signal that the Fazza are taking a military interest in the region.

Kashta

Kashta is the hub of the Fast Reach, and it's one of the more hospitable worlds along the way. Air pressure and composition, gravity, and other aspects are well within inhabitable norms. It has very little in the way of topography, though. Shallow seas cover over 90% of the planet's surface, and much of the remainder is made up of a series of low archipelagoes in the southern hemisphere, which are prone to flooding during severe storms. The highest point on the planet is a mere 300 meters above sea level.

At the moment, Kashta is occupied by a mixed population of heretical (and relatively pacifistic) Fazza, members of the adventurers' civilization and a handful of others living under the authority of an oligarchy of a dozen or so members which controls shipping through the system. They make their money on tariffs, brokerage fees for facilitating transactions, and maintenance and other services to travelers. The oligarchs style themselves as a paternalistic benevolent dictatorship. Indeed, they're practically local media stars themselves. Vocal dissent is kept to a minimum, because the leaders make a great show of providing charity and civil services. For example, police and other emergency services incorporate the personal crests of the oligarchs who sponsor them.

Grufeld

Grufeld is typical of the sort of partly inhabitable world commonly found along the Reach. The atmosphere is a bit thin and has a touch more carbon dioxide than most people might prefer, but it's breathable without special gear. However, it's extremely close to its primary star, which, despite being a red dwarf, is still near enough to make it uncomfortably warm over most of the surface. Below the polar regions, Grufeld is too hot for long-term survival. The poles, though still quite warm, are livable. The south polar region is entirely underwater, but about a third of the inhabitable region of the north (two million square miles out of a total of six million) is solid ground.

Grufeld shows signs of occupation by early Dacsi and Chantaur. Notably, evidence points to the Chantaur modifying Grufeld's ecosystem to make it more suitable for organically productive ends. Despite the small habitable zone, it produces a number of hardy yet high-yielding crops edible by many species. Additionally, a wide variety of sea life produce complicated organic molecules whose effects are still being studied. Some have clear medicinal uses, while others are candidates for various industrial applications (high-temperature lubricants, fire retardants, etc.).

The current residents were a tentative colony set up by Kashta about 250 years ago. After a century, Grufeld became independent in a violent conflict, setting up a contentious republic. Since then, relations have settled, though they're not entirely warm. Kashta espionage on Grufeld is an open secret, though the old homeworld appears more inclined to cultivate local governments that are favorable to it than to attempt to retake Grufeld by force.

The Fast Reach and Your Campaign

The Fast Reach is designed so that it can be used as a setting in itself or tacked on to an existing science-fiction campaign. A great deal, therefore, is left rather vague. The setting parameters assume that FTL travel is available but the range of FTL trips is in some way limited. This can be because of fuel requirements (travel from system to system require a big gas tank), navigational issues (travel within the Reach becomes dangerous or unpredictable after a certain distance), or physical limitations of the environment (the systems of the Reach contain the only known jump gates or similar points in the region), as is most appropriate to an existing setting or the details of the GM's favorite FTL drive.

Adventurers are assumed to come from a "home" area, left unspecified save for its location relative to the Fast Reach. For an existing campaign, this is probably the region in which the campaign to date has occurred.

Tech levels are mostly unspecified. In ***GURPS*** terms, anything below TL9 as the base TL for civilizations around the Reach is difficult to justify, simply because space travel is common in this setting. Nonetheless, a very low-tech planet-hopping campaign might be based on TL8 spaceships with FTL. Tech levels 9 and 10 are best for most Fast Reach campaigns, since they leave room for advanced areas of technology held by various civilizations around the Reach.

Circu I

Circu I is an Old Foothold (p. 6) system. Though it shows signs of visitation by the Reach's various civilizations, it is currently home to a sizable collection of Dacsi settlements. Some are Ascendist research facilities, which are centered around a monastic colony of about 5,000 devoted to service to travelers as part of their missionary activity. All visitors are welcomed enthusiastically and provided such maintenance and medical aid as they require at the cost of constant, though friendly sermonizing. However, research areas are kept quietly off-limits.

For the past 40 years, Circu I has also been home to an isolationist breakaway Sarrat group. They occupy a series of asteroids outside the system's nominal habitable zone and have been constructing orbital habitats for what looks to be permanent occupancy.

Ngapa

Ngapa is one of two planets in the Fast Reach known to have developed indigenous intelligent life. It used to be the most hospitable planet in the Fast Reach, but not any more. Its mineral resources were thoroughly depleted, and the environment damaged by toxic waste and indiscriminate exploitation. Most of the planet was finally devastated by a nuclear and biological war that destroyed Ngapa civilization about 600 years ago. Most population centers were destroyed outright, and most of the survivors didn't last much longer. Only a few remote corners of the planet retained meaningful populations.

The planet has undergone a slow recovery since then. Most of the radiation has faded and toxic chemicals have been dispersed and absorbed. However, disruption to the ecosystem has been tremendous. The Ngapa maintain a tenuous TL5, using metals recovered from destroyed cities and driven by biofuels. These, in turn, are derived from none-too-abundant crops. In recent decades, the Sarrat have established a presence on the planet, nominally to assist and educate the Ngapa, making the system something of a client state. Many believe that the Sarrat are also there to establish a buffer against possible Dacsi expansion. However, the only sign of the Dacsi is a small presence of Ascendists performing similar relief work.

Old Footholds

When first exploring the region, the Chantaur found systems with few planets, none in comfortably habitable zones or suitable for terraforming. These made gaps in paths across the Fast Reach, so the Chantaur created artificial bases in relatively hospitable orbits, where solar energy is plentiful and it's not too difficult to keep habitats at a comfortable temperature. The Old Footholds, as they've come to be called, were apparently constructed by collecting debris already in such systems and bringing it together in a large lump. Each is a flattened spheroid six or seven miles across, with a metallic and rocky shell filled with ice. They were originally constructed with a variety of tunnel networks (the Chantaur appear to have been tall, but not giants), bays for spacecraft, and remarkably efficient but simply constructed solar arrays. Unfortunately, most of the arrays no longer function. Though not habitable without additional life support, they provide many of the basics: water, living space, safe refuge from solar storms, and docking facilities.

Circu II

Circu II *was* an Old Foothold system. However, it suffered a massive disaster about 500 years ago. Signs point to a poorly explained event at an Ascendist research facility blowing the Foothold apart. The system is now home to a small Sarrat presence. The Sarrat have attempted partial reassembly of the artificial planetoid, but full restoration is expected to take much generations.

Gittev

Gittev is the gateway to Sarrat space. It is home to a Sarrat base with extensive ground and orbital facilities and a large military presence. Gittev is probably the most terraformed planet in the Fast Reach. Analysis has determined that its atmosphere was created by the Chantaur, mainly using ice asteroid bombardment and bioengineering to free up oxygen. The atmosphere is eminently breathable, but the Chantaur withdrew before completely establishing a biosphere. When first visited by other civilizations, the oceans contained a number of microorganisms resembling algae, yeast, and bacteria. However, there was no multi-cellular life, nor was there a significant presence of life on land. Without organic material in the soil, the surface was sand and dust, hostile to almost all plant life.

The Sarrat have, over the past several centuries, strived to continue the work of the Chantaur. They have imported large quantities of biomass to mix into the dust, and found plants that can grow in poor soil. The Sarrat bases are surrounded by areas of cultivated fields and orchards. These are ringed by regions of deep-rooted plants that can survive on a minimum of organic nutrients. Beyond the Sarrat enclaves, the planet is barren.

Tunlun

Tunlun is an Old Foothold system, containing a Dacsi settlement. Ascendist researchers mix with more secular merchants and tradesmen, as well as token Kashta and Fazza presences. Since parts of the Foothold were damaged some time ago by meteors, settlements are clustered together in a single tunnel network. So far, residents have coexisted peacefully.

Patek

Patek is another world that produced intelligent life. On Patek, though, intelligent life developed in the oceans and rarely leaves them behind. The natives of Patek, who resemble sea turtles with hand-like flippers, are technically amphibious but spend most of their time in the water. Their technology is unusual, relying on biotechnology and closed-container chemistry (TL1+5 with tailored organisms for materials and many powered applications).

Though the temperature and atmosphere are generally hospitable, Patek has high levels of chemicals toxic to many species in its soil, which makes agriculture by off-worlders exceedingly difficult. Much of its native life is also venomous or toxic to non-native species, so even a casual visit is risky.

The presence of off-worlders is limited to a small Ascendist contingent and a handful of Fazza. The Patek are aware of the alien habitations, particularly since Ascendist engineers are *very* interested in their technology. However, it's unclear how the natives feel about off-worlders occupying the unused parts of their world.

Tanaya

Tanaya is in some ways the opposite of Grufeld (p. 5). Instead of having habitable poles and uninhabitable equator, Tanaya's equator is habitable while most of the planet is deeply glaciated. This world shows signs of Chantaur modification. The more subtle change was adding greenhouse gasses to the atmosphere to warm it to the point of marginal habitability. The less subtle one was populating it. The planet contains a colony of Ngapa, taken from their home planet and placed there during Ngapa's prehistory for reasons that are not yet understood.

These Ngapa never reached the technological level of their distant cousins. Even now, the most sophisticated of them hail from stone-walled, iron-using city-states (early TL2). The Dacsi have a presence here and are observing the Ngapa, but there has so far been no concerted move toward reuniting them with their homeworld. Some research facilities are here, and the system's orbital facilities for servicing spaceships are particularly well-developed. Three different Dacsi worlds can be reached from Tanaya, and from there, the denser core of Dacsi space.

Final Destinations

Without somewhere interesting to go at the far end, the Fast Reach would be an interstellar curiosity. However, it serves as a conduit between spaces controlled by several different civilizations.

Fazza

The Fazza are an ideologically driven, expansionist confederation, determined to bring together all intelligent life under their banner. However, they are as content to convert as to rule, and their behavior is moderated by a streak of pragmatism. There's also considerable internal debate about how to apply Fazza codes of moral rectitude (an age-based hierarchy of respect and authority, harsh physical punishment for crimes, restrained sexual behavior) to species with different modes of reproduction, life cycles, and so on. These dilemmas make it difficult to build a consensus and bring force to bear against new opponents.

The Fazza are noted for producing compact, efficient power sources, stealth technology, and most medical technology. However, they have ideological qualms about genetic engineering, retarding their capabilities in that area.

A particularly notable aspect of the Fazza is their proximity to the adventurers' own civilization. Though their spheres of influence aren't quite touching, the Fazza can be reached reasonably easily along a broad front. Both the Fazza and the adventurers's civilization have access to the Fast Reach through different paths converging on Kashta.

Sarrat

The Sarrat are a large and technologically advanced interstellar empire, but they have strong isolationist leanings. They make heavy use of AI, cybernetic monitoring, and mind-control technologies to regulate their massive society. On Sarrat worlds, vast quantities of data are recorded via implants carried by more than one in 10 Sarrat, including everyone in a position of any authority. This data is transmitted to local processing centers, summarized and annotated for transmission to larger processing centers, and so on up a large hierarchy. At each stage, the mass of data is used to make decisions and coordinate actions involving everything from traffic routing to provision of supplies to criminal justice. These decisions are largely carried out by a mass of human bureaucrats and agents who get their orders via the same cybernetic systems that they use to provide the AI network with data.

This has produced a remarkably large and, over the long term, stable society. However, the system has some odd, even alarming, quirks. The decentralized AI network is a collection of nodes that share the same general programming but have a significant amount of autonomy. As a result, they sometimes develop divergent goals and policies. This results in conflict among them, issuing contradictory orders or trying to requisition the same resources. Typically, this leads to a bit of localized confusion as human agents try to work out what's going on and various AI nodes attempt to resolve any issues. In extreme cases, this has led to states of affairs indistinguishable from civil war, and on rare occasions, AI nodes and their associated populations break away permanently. The system as a whole is resilient and supports vast populations, but it can be intermittently very hard on individuals.

One of the hallmarks of the Sarrat is that they frequently have companions. Officials are rarely without an entourage of 10 or 12 people, and merchant vessels venturing into the Reach typically carry sizable crews and entire extended families.

The Sarrat are known for high-quality cybernetics and large-scale manufacturing. They're willing to hire out capacity for the latter, producing large quantities of desired goods cheaply, but refuse to traffic in the former. Successfully smuggling Sarrat cybernetics and control systems would be a lucrative goal, but a difficult one, since tracking and alarm technology is built into it at fundamental levels. Were they ever to take an interest in military expansion, the Sarrat would be a formidable opponent, but current trends suggest that they intend to remain in their current sphere of influence.

Sparse Rim

The Sparse Rim is a lightly populated region of star systems between Dacsi space and the Sarrat empire. It's a potential alternative to the Fast Reach for those who want to travel between the two, but much less direct. More importantly, it's dangerous. The Sparse Rim is occupied by a number of traditionally warlike systems. Though they've left no lasting settlements, the systems of the Rim have united to expand into the Fast Reach several times through history. If that happens again, anyone else traveling through the Reach will be in danger.

Dacsi

The Dacsi region is home to a cluster of civilizations with advanced biotechnology. They use it indiscriminately on themselves as well as organisms for industrial use, so it can be difficult to tell if the Dacsi are descended from multiple species swapping genes with one another or a single species that has modified itself into a diverse family. However they got that way, Dacsi civilization is made up of a number of politically small federations and independent systems. These nevertheless maintain close ties of language and culture with one another.

Dacsi civilization is old and has been through several waves of expansion and contraction. The Fast Reach is dotted with the remnants of Dacsi outposts, many constructed by a quasi-religious faction called the Ascendists. The Ascendists are devoted to "rising to a higher plane of existence."

Though Ascendist thought is quite common throughout the Dacsi region and is pursued through meditation and various forms of ecstatic experience, the "Ascendist engineers" continue working toward it through scientific means. They especially seek to develop psionic abilities in individuals and groups. Their goal is to create a being that can transcend its physical body and become an entity composed purely of complex energetic states. It's unclear whether any attempts have succeeded, or if the Ascendist engineers' pursuits are just mystical mumbo-jumbo.

Hopping Along the Fast Reach

The topology of the Fast Reach requires that anyone traveling along it go from one system to the next in strict order. So what is one to do in the process?

Exploration

If the Reach is a new discovery for the adventurers' civilization, scouts can be involved in mapping it out. There may be other systems than those listed above, but it'll take some work to figure out the network of systems that can take travelers from one end of the Reach to the other with stops for repairs and resupply along the way. Even when the basic routes are mapped out, scouts can still explore the uninhabited systems, looking for lost Old Footholds, new resource planets, and overlooked inhabitable systems in hope of blazing new trails across the Reach.

Once the Reach has been mapped, there's work for archaeologists. In addition to the obvious historical work to be done, there may be industrial secrets to tease out. Chantaur artifacts, lost Sarrat AI, abandoned Ascendist research stations, hidden secrets of the Patek and the Ngapa, and the possibility of other lost civilizations can provide endless work, and not a little danger.

Trade and Espionage

In peacetime, the Fast Reach provides a highway between very different civilizations, which means opportunities for trade and profit. Ambitious travelers can follow the entire path from one civilization to another to arrive at the source of exotic goods and negotiate with the unusual people they find there. This may be arduous and risky, but even just the knowledge of far-off civilizations they bring back with them might be valuable.

However, they need not go so far if they don't want to. Kashta, for example, is a hub of travel and activity where visitors and cargo from across the entire Reach and beyond may meet. Merchants who stop may not find prices as favorable (somebody else has already done the difficult part of getting goods there), but it might be easier to put together a deal that involves exchanging a Fazza fusion generator for a Dacsi gengineereed drug mule. Alternatively, traders may do short hops between worlds of the Reach, ferrying people and supplies and encountering adventure along the way as they travel through what is still a semi-explored frontier.

What adventurers can't trade for, they might try to take anyway. Many state-of-the-art items produced by other civilizations, such as stealthed Fazza vessels and Sarrat AI cores, are simply not for sale at any price. Instead of purchasing them, adventurers can attempt to steal a sample, or gather information on them in hopes of reverse-engineering one themselves, or just selling that information to the highest bidder back home.

Warfare

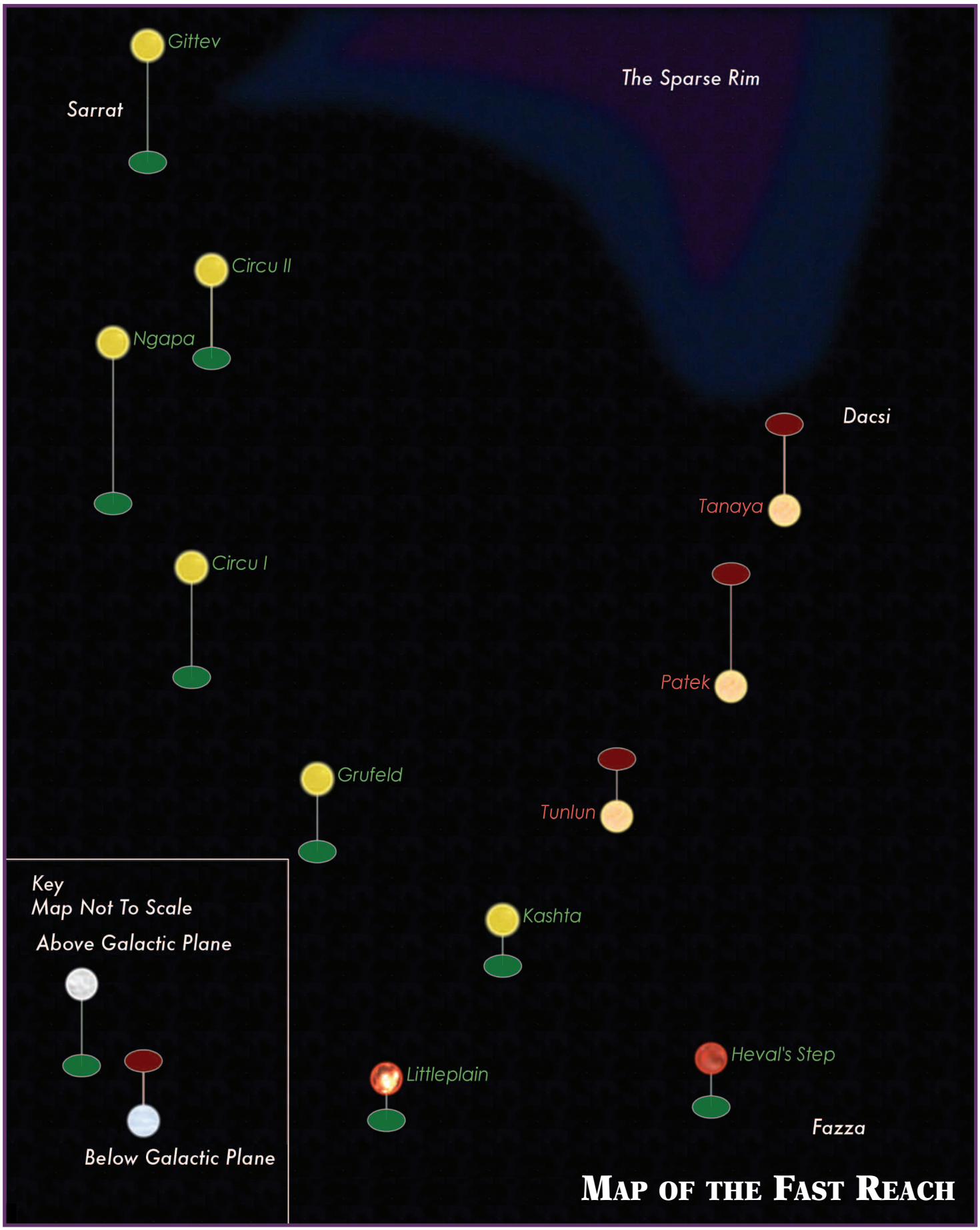
In times of war, fighting along the Fast Reach becomes a tough slog from one system to the next. This means long, vulnerable supply lines in the event of general conflict. There's also the need to fight in a variety of environments in order to take and hold ground, from the sparse air of Littleplain to the tundra of Tanaya to the tunnels and airless space of the Old Footholds. Soldiers also have more reasons than usual to avoid weapons of mass destruction. Normally, a few nukes here and there on most planets leaves the rest of it in reasonably good condition. However, because there's a lot less habitable territory along most of the Fast Reach, every acre is all the more valuable. Anyone who wants to take usable territory must be that much more careful not to destroy what he's fighting for.

About the Author

Matt Riggsby started his journey by studying anthropology and archaeology, then moved on to working with computers. At that point, he branched out into multiple paths including working for a large corporation producing medical systems and writing for a game company. Life-forms he has encountered along the way include his heavenly spouse, out-of-this-world son, and several primitive canines.

It's the ship that made the Kessel Run in less than twelve parsecs. I've outrun Imperial starships. Not the local bulk cruisers, mind you; I'm talking about the big Corellian ships now. She's fast enough for you, old man.

– Han Solo, in ***Star Wars: A New Hope***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Kashta
Below Galactic Plane
Littleplain
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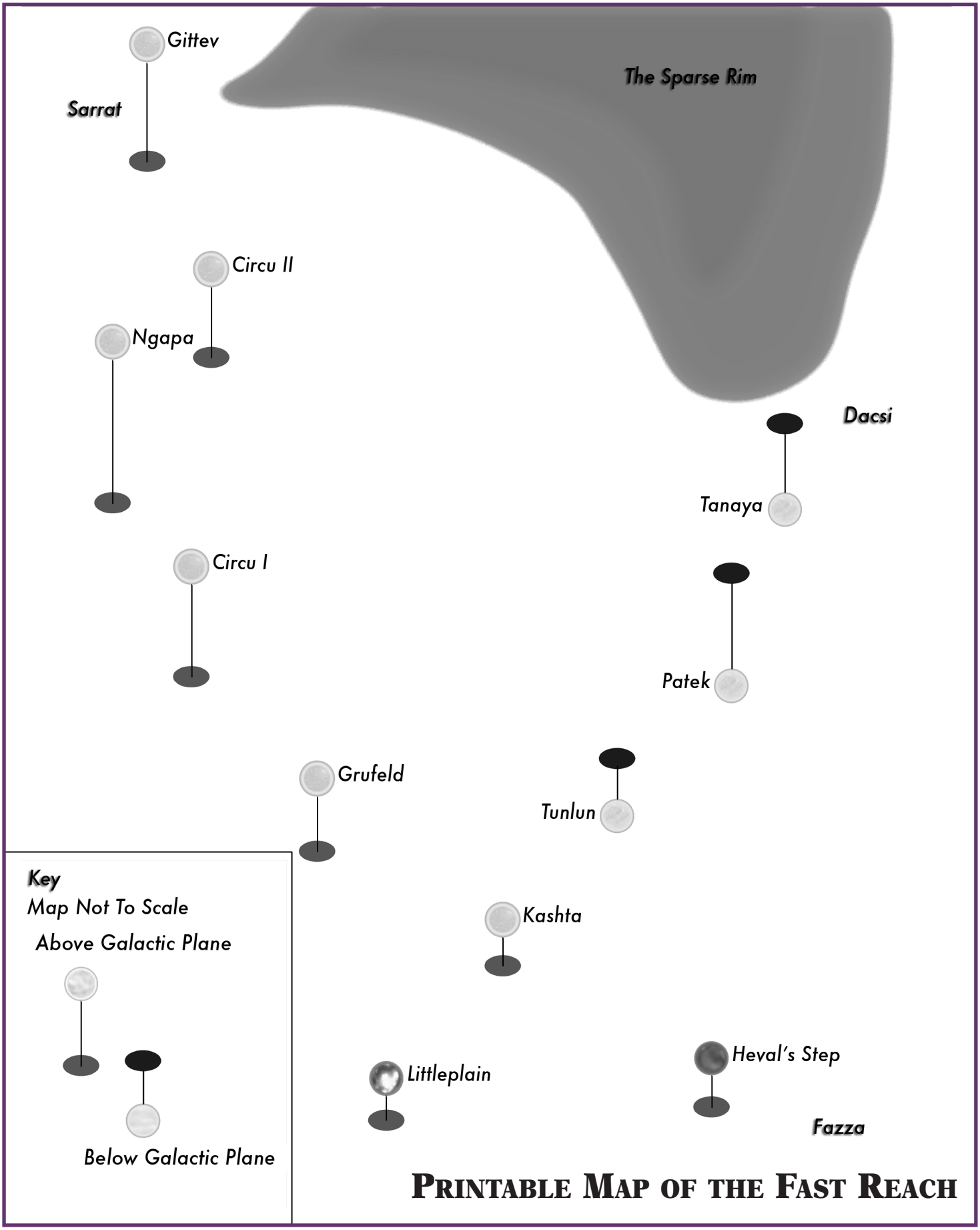
Fazza
Map of the Fast Reach



Printable Map of the Fast Reach

A Song of Many Worlds

by Christopher R. Rice

Every planet having a form of intelligence is the basis of some of the more outlandish interpretations of the "Gaia Hypothesis" and other similar pseudoscience. But what if these speculations *were* true? What if our planet had its own spirit? Its own intelligence? What if *other* planets had the same? This opens up all sorts of possibilities (and concerns) for space exploration. After all, if a planet is alive, mining it for valuable minerals would be tantamount to torture. That is where a special breed of psi comes in: the worldsinger. Worldsingers are a form of telepath who can understand and communicate with these *gaia,* or world-intelligences.

> *I am the Lorax. I speak for the trees. I speak for the trees for the trees have no tongues.*
>
> – Dr. Seuss, ***The Lorax***

This article makes use of ***GURPS Psionic Powers***, though the GM might also find ***GURPS Psi-Tech***, ***GURPS Psis***, and ***GURPS Psionic Campaigns*** helpful. The information on plant HP and "IQ" was obtained from ***GURPS Magic: Plant Spells***.

Global Intelligences

Not all worlds are living, and even among those, fewer are actually sapient. Even self-aware, intelligent gaia should not be thought of as *human*. These globe-spanning consciousnesses are billions of years old and view all life (not just human) as a human would an ant – that is to say, not at all.

Three such types of global intelligences can be found.

- *Unaware:* The planet has an IQ of 1 or 2. It thinks and reacts like a wild animal, which can be dangerous for those seeking to plunder its natural resources.
- *Aware:* The planet has an IQ of at least 3 but no higher than 6. Although it reacts like a wild animal, with a kind of instinct more often than calculation, it can be quite cunning.
- *Conscious:* The planet has an IQ of 7 or greater. It is fully aware and might even be capable of vocalized communication! Such intelligences are quite rare.

Despite their alien mentation, these entities can be contacted by mere humans. This is where the *worldsinger* comes in. The worldsingers' unique telepathic power allows them to commune with – and potentially influence – planetary gaia. However, *anyone* with access to mental communication (telepathy, Communication and Empathy spells, ultra-tech, etc.) might be able to contact a planet's gaia. The GM may gain inspiration from ***GURPS Powers: Divine Favor,*** as it has much advice and use for omnipotent beings.

Each attempt requires at least eight hours, during which the person must "open himself" to the gaia, and make an appropriate skill roll. Those with the Worldsinging ability (see p. 13) can do this more quickly as they gain experience with their power. When contact is achieved, make a reaction roll (pp. B559-562) and consult the chart on p. 12. Influence skills can be used normally on conscious gaia (see above); Appearance modifiers do not add, but Charisma does. Time Spent modifiers (p. B346) may be used; this represents the supplicant spending extra time mediating, being alone with, or otherwise engaging the gaia in a positive way.

Use the following modifiers for all reaction rolls with a gaia.

+1 if you carefully avoid interfering with the local flora and fauna; e.g., you do not kill any animals or harvest any plants. +2 if you minimize all possible impact on the environment; e.g., setting foot on the planet only to commune with it, not setting up a tent, etc.

+1 if you do nothing more strenuous than eating, sleeping, etc.; +2 if you also seclude yourself while you seek communion with the gaia.

+1 if your request is something simple: the location of a lost member of the exploration team, the harvesting of a particular plant's fruit, etc.

+1 for a successful roll against Dreaming *or* Meditation skill (not both).

-1 per *additional* request made of the gaia within the last 24 hours. If you score an Excellent reaction, you may ignore this penalty for any future rolls for *that* one request.

-2 for a request that could cause minor loss of wildlife, damage to the environment, etc.; -5 for requests that would cause major losses.

-5 for an unaware gaia (see above).

-10 if you do not have the gaia you are communicating with as a Patron; Spirit Empathy; or the Worldsinging ability.

Gaia Reaction Roll Results

Excellent: The person can get nearly anything the planet can provide (see *Phenomenal Cosmic Powers . . . Itty-Bitty Living Space,* below). The gaia will even help by making it easier for him to gain access to something, clear an area of dangerous animals, etc. This is the *minimum* reaction required for the planet to permit strip-mining or other resource exploitation that causes lasting harm! The gaia will *not* be helpful after such exploitation; further requests for assistance or resources are at -5 to the reaction roll.

Very Good: The gaia does what was asked of it and perhaps offers additional aid. The gaia may be independently helpful, attempting to protect or assist the person on its own initiative. (This may become smothering; no one can "helicopter parent" like a planet . . . There is also no guarantee the planet's idea of aid will always be *appropriate*.)

Good: This is the minimum needed to do any sort of overt actions on the gaia itself, such as harvesting a valuable fruit or mining a needed metal from existing caves.

Neutral: This is the minimum required for any positive interactions with the planet. It may provide vague information (e.g., general location of a lost explorer or edible plants) but not specific details or actions.

Poor: Nothing happens; the gaia ignores you.

Bad: The gaia make's its displeasure known in a nonharmful though obvious way. Further pleas for aid are at -2 per request for the next 24 hours.

Very Bad or *Disastrous:* As for *Bad,* above, but you have just angered the gaia! Its reaction will be harmful – though not deadly to PCs or vital NPCs, such as falling rocks or lightning strikes causing (HP/2) points of damage; severe allergic reaction (treat as severe pain, p. B428, lasting 1d days); animal attacks on vital equipment; psychic backlash (gain the Supersensitive trait for 1d days); etc.

Example

Sentoros is a fully conscious planet, who also happens to be rich in unobtainium ore – a priceless material used for FTL travel. Although the initial contact team does not include a worldsinger, the team's botanist, Tobias Grey, has Psychic Healing abilities and is a minor empath. While in orbit, he observes patterns of plant growth and weather consistent with sapient planets, which adds to his hunch that the planet has a personality. With the captain's permission, he takes the ship's shuttle to the planet's surface. Deciding it best to stay inside his craft, he deliberately sets down in a spot with rocky vegetation (+1 to his roll). He begins to commune with the planet, doing nothing more than resting and taking care of his own needs (additional +1 to his roll). Deciding to take his time, he spends the next 10 days meditating and waiting for the planet to make contact (a further +5 to his roll for time spent). Still, Grey is no worldsinger and has never been to this planet before (-10 to his roll). Rather than start with requests for resources (the precious unobtainium), Grey decides on a simpler "getting to know you" approach (Diplomacy skill, and +1 to reaction roll). This gives a total modifier of -2 to Grey's player's roll; after rolling 3d, he scores a total of 13. This gives a Good reaction. Sentoros senses why the exploration team is there and produces a few valuable nuggets outside the door of Grey's spacecraft and gives the tiny biped its name. Grey thanks the planet and returns to his ship with the samples. Further negotiations will be made by a worldsinger.

Grey's captain now calls in a worldsinger, Gabriella Legend, to negotiate with Sentoros. Gabriella is a well-known worldsinger who refuses to compromise her ethics for anyone; she informs the captain that she will not ask the gaia for the right to strip-mine the unobtainium. Instead, she heads to the surface and uses her Telespeak ability to explain to the planet why she is there. Since she has the Worldsinging ability at level 3, she gains +3 to her reaction rolls, along with her natural Charisma bonus of +1. She gains a further +4 as she sends the landing craft away while she waits for the gaia to contact her, secluding herself. Shaft mining the unobtainium will cause major damage to the environment, giving her -5. She spends 20 minutes communing with the gaia, giving her +1. Gabriella's player has a total of +4 on her die roll; she rolls 15! Her modified reaction roll is 19, an excellent reaction. Sentoros agrees to the mining of the ore, but only if Gabriella stays the whole time on the planet. It even goes further, causing much of the ore to "float" to the surface of the soil, so the material only needs to be gathered rather than mined.

Phenomenal Cosmic Powers . . . Itty-Bitty Living Space

Living planets possess near-complete control over their geography, weather, oceans, and non-sapient plant and animal life. They can sprout a volcano beneath intrusive resource thieves as quickly as the GM deems plausible, and alter the paths of hurricanes if they are so inclined. They are not suitable as PCs, though they might act as a god-like, alien Patron. This typically costs 30-points (the same as a true god) with the Special Abilities modifier; the Highly Accessible and Minimal Intervention modifiers are also common. By default, frequency of appearance should be no higher than 9 or less; a campaign with more intervention from the planet could result in the PCs sitting around, asking Mother Earth to solve their problems.

Among the possibilities, sapient natives may . . .

- Be under the sway of their gaia, acting as its pawns.
- Be its beloved pets.
- Live in pragmatic harmony with it.
- Be convinced the planet is out to kill them, and has a cruel sense of humor when doing so.
- Be convinced that their planet is a god, so they serve it faithfully (or at least strive to placate it).

New Psionic Powers

The following psionic powers are suitable for fantasy or space-opera campaigns with living landscapes.

New Telepathy Power

In a campaign including gaia, the following ability and its techniques are considered the pinnacle of expertise among telepaths.

Worldsinging

4/6/8/10/14 points for levels 1-5*

Skill: Worldsinging (Per/Hard).

You can comprehend the alien thoughts of gaia, grasping concepts that other biological life-forms can barely fathom. When encountering a sapient planet, a successful skill roll gives you the benefits of Empathy (p. B51), but only toward the target gaia. At minimum, you get a feeling for the general intentions of the gaia.

The Worldsinging ability functions as "Planetary Empathy" – as Animal Empathy allows use of Influence skills on animals, so does Worldsinging permit their use on any gaia, regardless of its level of consciousness. Each level of Worldsinging also provides +1 to reaction rolls from living planets, and +1 to Influence skills used on them.

At level 1, this ability requires eight hours to "tune" into a given gaia's wavelength. At level 2, this takes only one hour. At level 3 it takes 10 minutes. At level 4, it takes one minute. A desperate psi might try to use his Worldsinging without any preparation beforehand, but this weakens the power, giving -3 to all rolls to use it. At level 5, it can be used without any preparation at all.

Statistics: Spirit Empathy (Specialized, Gaia, -50%; Requires Per Roll, -5%; Telepathy, -10%; Weakened Without Immediate Preparation, 8 hours, -45%) [2] + Charisma 1 (Accessibility, Gaia only, -50%; Telepathy, -10%) [2]. Further levels increase Charisma one level at a time [+2/level] and reduce Weakened Without Immediate Preparation to 1 hour [2], then 10 minutes [2], then 1 minute [2], then remove Weakened Without Immediate Preparation [4].

* The GM may allow further levels of this trait (increasing the Charisma bonus) for 2 points per additional level.

Distant Song

Hard

Default: Worldsinging-5. Cannot exceed Worldsinging.

You can use your power at a distance, allowing you to "read" any gaia you can see, hear, or contact with other psionic or supernatural abilities, such as Telesend. This works through live media (e.g., scanners, FTL video, etc.), but not static photographs, paintings, or the like.

Voice of the Gaia

Hard

Default: Worldsinging-8. Cannot exceed Worldsinging.

You can allow a gaia to borrow your body to communicate with others, draw maps, experience a different point of view, etc. Treat this as a use of the Channeling advantage (p. B41). For an additional -5 (which can be bought off), you can permit another willing individual to do this instead of you!

Plant Telepathy Powers

In game worlds where Animal Telepathy exists (***Psionic Powers,*** pp. 71-72), so might Plant Telepathy. Plant Telepathy helps a psi to communicate with and control normal plants. The user remains human; he does not gain any plant-like characteristics or the ability to shapeshift into one (those would be separate powers, if the GM permits them at all).

Floral Speech

8/9/11/14/17/20/23/26/29 points for levels 1-9

Skill: Floral Speech (IQ/Hard).

You can communicate with plants. You must make some sort of sound: speaking, humming, singing, etc. With a successful skill roll, your telepathic link translates the rustle of leaves and creak of branches into words. Most plants are IQ 0, and can only transmit impressions of things that happened near them that might bear to its well-being: if it rained, if they were walked on or trampled, if something nibbled them, etc. They have no sense of color, sound, clothing style, or other unimportant (to a low-IQ plant) details. It would not be able to tell you if someone was speaking near it, what they were wearing, and so on.

*House: No! Doctor, stop this! **Ow!** Stop this now!*
*The Doctor: Oh, look at my girl, look at her go! **Bigger on the inside!***
You see, House?
House: Make it stop!
The Doctor: That's your problem. Size of a planet, but inside you're just so small!

– ***Doctor Who*** *#6.4*

Sapient plants use their own IQ to communicate, and may require a reaction roll to answer questions. For trees and other similarly long-lived plants, use the following table instead.

Average IQ for Long-Lived Plants

Age	Average IQ
Up to 6 months	IQ 1
Up to a year	IQ 2
Up to 18 months	IQ 3
Up to 3 years	IQ 4
Up to 6 years	IQ 5
Up to 12 years	IQ 6
Up to 25 years	IQ 7
Up to 50 years	IQ 8
×2	+1

At level 1, it takes four minutes of conversation to get a useful answer to a question. This drops to two minutes at level 2; one minute at level 3; 30 seconds at level 4; 15 seconds at level 5; eight seconds at level 6; four seconds at level 7; two seconds at level 8; and one second at level 9. At levels 1 through 3, you must make a skill roll to translate each answer. For higher levels, you need only roll once per minute.

Statistics: Speak with Plants (Nuisance Effect, Psi's and plant's speech are audible, -10%; Requires IQ Roll, -10%; Plant Telepathy, -10%; Takes Extra Time 2, -20%) [8]. Further levels remove Takes Extra Time, one level at a time [+1.5/level], and then add Reduced Time, one level at a time [+3/level].

Lend Sentience

Hard

Default: Floral Speech-4. Cannot exceed Floral Speech.

By projecting a portion of your own intelligence into a plant, you can temporarily "boost" its IQ. It's still limited to its own perceptions of events, but responds as if it had your IQ.

Shared Speech

Hard

Default: Floral Speech-5. Cannot exceed Floral Speech.

You can touch another person and allow him to "hear" what the plants are saying.

Plant Control

5 points/level*

Skill: Plant Control (IQ/Hard).

You can take control of a living plant, but not intelligent or mobile ones; if they have an ST, DX, or IQ score that is 1+, this ability *cannot* affect them. Since most normal plants have ST, DX, and IQ of 0, this limits its use to them.

Using the ability requires your power level to be equal to or greater than half of the plant's total HP (rounded up). You must make a skill roll; long-distance modifiers (p. B241) apply. The newly animated plant can grab, lift, strike, and throw with ST equal to the psi's Plant Telepathy power. Its DX is equal to your Plant Control skill. It can walk and jump if it is not rooted in place, or it will tear itself out of the ground after (20 – skill) rounds, minimum of 1; Move equals your Plant Control level minus the level needed to animate it and cannot exceed the margin of success of your initial skill roll.

Average HP of Plants

Plant	Average HP	Plant Control Level Needed
Bamboo (6' length)	11	6
Bush, average (5')	39	20
Bush, full grown (100')	780	390
Coconut, single	10	5
Flower, bush	8-23	4-12
Flower, single	1	1
Fruit/vegetable, hard	1-12	1-6
Fruit/vegetable, soft	1	1
Grass/grains, tall (1 hex)	6	3
Ivy (1 hex)	6	3
Moss (1 hex)	10	5
Palm tree (20' tall)	157	79
Seaweed (1 hex)	33	17
Tree, living (20' tall)	145	73
Tree, living (50' tall)	752	376

You can use skills through animated plants – for example, Axe/Mace when using a tree branch to bonk someone on the head, Whip for using a vine to entangle someone, Wrestling for grabbing someone. However, *most* plants cannot grasp weapons because they have No Fine Manipulators (though vines can . . .). You may substitute an IQ-based roll for the skill needed, if better.

Plants return to their rest state once you give up control, though they remain in whatever position that you left them. You may affect any plant you can see, using normal range penalties (p. B550). For more information on the physical characteristics of plants, see ***Plant Spells*** (p. 5).

Statistics: Telekinesis (Accessibility, Living Plants Only, -30%; Animation, -30%; Based on IQ, Own Roll, +20%; Increased Range, LOS, +70%; Plant Telepathy, -10%; Requires IQ Roll, -10%; Short-Range 1, -10%) [5/level]. The variant Plant Control (Short Range) reduces Increased Range to ×2 and raises Short-Range to 3 [1/level].

* The variant Plant Control (Short Range) costs 1 point/level. This replaces the normal range penalties with a flat -1 per yard, to a maximum of 20 yards.

Corpse Flower

Hard

Default: Plant Control-3. Cannot exceed Plant Control.

You can use your ability on dead plant matter such as bailed hay, fallen logs, wooden beams, and so on. This psi technique may not be appropriate for every campaign, and the GM should be consulted before purchasing it.

Independent Animation

Hard

Default: Plant Control-7. Cannot exceed Plant Control.

You can animate more than one plant at once. You must have enough Plant Control (half of *all* the animated plants' total HP, as above). You still get the usual penalties for multiple subjects or feats. You may only take personal actions if *every* subject under your control has been handed off to your subconscious or if you have Compartmentalized Mind (p. B43).

Petal Mind

Hard

Default: Plant Control-7. Cannot exceed Plant Control.

You can use your ability on *intelligent* or *mobile* plants! A successful skill roll permits you to make a Quick Contest to take over the target, using *half* your power level (round down) vs. the subject's ST. If you win, you have complete *gross* control over its body, using your skill level as its DX. You do not have fine control over speech, body-language, etc., and anyone familiar with the plant will almost certainly realize it is "possessed."

Rapid Growth

Hard

Default: Plant Control-10. Cannot exceed Plant Control.

You can cause a plant to rapidly grow or gain maturity. Every two levels of Plant Control – or *10* of Plant Control (Short Range) – allows you to increase a plant's size or speed up its growth by 10%. This growth or size lasts for as long as you concentrate and for one second afterward. You may increase the amount of additional time the change lasts by taking an additional penalty as shown by the chart below.

Time	*Penalty*
3 seconds	-2
10 seconds	-4
30 seconds	-6
100 seconds	-8
5 minutes	-10

If the GM allows, permanently affecting a given plant may be possible at a -14 penalty.

Far Use

Hard

Default: Plant Control-5. Cannot exceed Plant Control.

You ignore range penalties completely. For Plant Control (Short Range), you use normal range penalties (p. B550) instead of -1/yard.

Plant Sense

18/28/38/58 points for levels 1-4

Skill: Plant Sense (Per/Hard).

You can detect nearby plant-life by homing in on its unique telepathic signature. When you use this ability, the GM rolls against your skill, minus range penalties (p. B550) to the nearest source of plant life. On a success, you learn the information below and can use any ranged abilities you might have against the vegetation even if you cannot see it.

Successful use of Plant Sense 1 reveals that there is plant life in the area in question – nothing else. Plant Sense 2 also reveals his direction; you may follow up with a second skill roll (with no range penalties) to determine what type of plant it is and what properties it may have. Plant Sense 3 reveals the precise location (distance and direction) of the plant life, as well as allowing a follow-up roll for more information. A successful roll with Plant Sense 4 automatically provides the exact location of the plant life and details about what sort of plant it is or what properties it may have.

Note that this ability is highly useful to pharmacists seeking new plants for drugs and to psionic "druids."

Statistics: Detect Plants (Lock-On, +50%; Plant Telepathy, -10%; Vague, -50%) [18]. Further levels remove Vague [28], then replace Lock-On with Precise [38], and then add Analyzing [58].

Far Use

Hard

Default: Plant Sense-5. Cannot exceed Plant Sense.

Your scan uses the long-distance modifiers (p. B241) instead of normal range penalties.

Jake, Eywa has heard you. Eywa has heard you!
– Neytiri, in ***Avatar***

Additional Plant Telepathy Abilities

Further abilities for this power can be built on the following advantages.

- Control (Wood) (Plant Telepathy, -10%; Vital Manipulation, p. 16, +0%) [18/level]. *Skill:* Control Wood (Per/Hard). With this trait, you can control living plants in a variety of different ways, causing them to grow, change, blossom, and so on. See ***Powers*** (pp. 90-92). Ask your GM before you take this trait!
- Create (Wood) (Plant Telepathy, -10%; Vital Creation, p. 16, +0%) [18/level]. *Skill:* Create Wood (Per/Hard). Accessibility, requires soil (-10%) is a common limitation. With this trait you can create living plants *ex nihilo*. With the Transmutation (+50%) enhancement, you can change one sort of plant to another. See ***Powers*** (pp. 92-94). Ask your GM before you take this trait!
- Enhanced Defenses (Limited, Plants, -60%; Requires IQ vs. Will Roll, -20%) [Varies]. This reflects your ability to know how to react to plants who have a more "active" means of getting nutrients (mutant Venus flytraps, swamp monsters, triffids, etc.). The GM should limit the number of levels of these traits to half the psi's Plant Telepathy Talent (rounded up), plus one.
- Mind Control (Plants Only, -25%) [38].
- Mind Probe (Plants Only, -25%) [15].
- Mind Reading (Plants Only, -25%) [23]. Sensory (+20%) is a common enhancement.
- Mindlink (Plant Telepathy, -10%) [Varies]. No skill needed; passive ability.
- Plant Empathy [5]. This is a key ability; it often has Based on Perception, Own Roll (+20%).
- Possession (Plants Only, -25%) [75].
- Protected Power (Plant Telepathy, -10%) [5]. No skill needed; passive ability.
- Psychometry (Plants Only, -25%) [15]. Sensitive (+50%) is a common enhancement as most plants lead very boring lives.
- Telesend (Plants Only, -25%; Universal, +50%) [38].

New Traits

The following are new traits used in this article.

Code of Honor

see p. B127

Worldsinger: Defend the gaia from those who attempt to give lasting harm. Keep the secrets of those worlds who wish to be left in peace. Use a gaia's resources in a respectful way. Be respectful to those who are respectful to the gaia. Oppose any plans that would cause the gaia to be permanently injured (clear-cutting, strip-mining, etc.). *-10 points*.

Control and Create

see *Powers* pp. 90-92 and 92-94

Both of these advantages disallow them affecting living matter, though a GM may permit the following enhancement on Control (Wood) and Create (Wood), extending their usefulness from dead plant matter to *living* plant matter. This could be adapted to other forms of Control or Create, but the GM should be cautious.

New Special Enhancements

Vital Creation/Manipulation: Your ability ignores the prohibition against creating or controlling living beings, when said living beings fall into the category of Control or Create you have. Use of this enhancement is *taxing*, anytime you create or control a living being you must spend an additional 2 FP above and beyond what it otherwise might have cost you.

For Control, this ability becomes resisted by the *higher* of Will or HT, and lasts for one second only. Living creatures like plants have a IQ of 0 (and therefore a Will of 0), so they automatically fail this roll. The target is aware that his body does not respond to his commands, this ability is *not* subtle. The GM may decide that a suitably modified Mind Control, Possession, etc. is more appropriate than Control with this modifier.

For Create, this ability allows you to make *living* things, usually plants or animals, though it could also be used for bacteria or other tiny microorganisms. You do not need this for machines or other shaped inanimate matter (***Powers,*** p. 93).

This enhancement is called Vital Manipulation for the Control advantage and Vital Creation for the Create advantage. If you can only affect complex materials, this is a +0% modifier; otherwise, it is+100%.

Hidden Lore

see p. B199

The following two new specialties are relevant to worldsingers or those who wish deeper knowledge of the entities they entreat.

Gaia: You know about the variations in gaian consciousness. You know best how to deal with them, what they might allow if approached properly, and how to recognize the signs they send. You might even know the location of secret or undiscovered gaia if the GM allows.

Psis: You know all sorts of psionic secrets. This includes details about underground institutes, who the factions are (and their agendas), and which famous people are secretly psis.

New Perks

The following perks are appropriate to plant telepaths.

Detect Plant Sapience: With a touch and an IQ+4 roll, you can determine if a plant is sapient. This includes any tree that is currently the subject of the Arboreal Immurement spell (***Magic,*** p. 165). This trait originally appeared in ***Plant Spells***.

Little Green Digit: Once per day, you can modify a skill roll as if you had Green Thumb (p. B90) at the same level as this perk (you may have up to four levels). You cannot take this perk if you have Green Thumb. This trait originally appeared in ***Plant Spells***.

Floating Blossom: You have a minor form of Plant Control (p. 14) – you can cause plants to move in small ways. This may take the form of a cherry-blossom tree "raining" petals on you; leaves rustling on a bush, or having the fruit of a plant drop into your hand (make a DX roll to catch). While this has no real combat applications, the GM may deem otherwise in certain situations. If you later buy Control Plants, the GM may let you "spend" the point from this perk on it.

One Voice, Many Worlds

It is up to the GM whether worldsingers are common or rare, though it is probably best if they are rare, making them a valued commodity. The same holds true on how common gaia are. If they are rare while worldsingers are common, the psis will feel less special than they should be.

Worldsingers are in many ways like a fantasy druid – they converse with animals and plants, and are beloved by nature itself. Some may act as intermediaries between gaia and humans. Others may see themselves as protectors of intelligent worlds, not allowing them to come to harm. This could provide all sorts of challenging interactions between worldsingers (and other psi) and their non-psi expansionist or capitalist brethren.

WORLDSINGER

175 points

You have the ability to communicate with sentient worlds (called *gaia*), enabling you to act as an intermediary between them and others. While your abilities are not limited to just communication, they *are* your most potent. You function somewhere between a diplomat, a shaman, and an explorer. Indeed, your exceptional skill set makes you a valuable commodity, with every exploration or first-contact team wanting a worldsinger on their crew. Depending on the rarity of the worldsinger's main psionic power (see above), this profession may attract frauds who claim to be able to "talk to the gaia of a planet."

Attributes: ST 10 [0]; DX 11 [20]; IQ 13 [60]; HT 12 [20].

Secondary Characteristics: Damage 1d-2/1d; BL 20 lbs.; HP 10 [0]; Will 13 [0]; Per 13 [0]; FP 12 [0]; Basic Speed 6.00 [5]; Basic Move 6 [0].

Advantages: Telepathy Talent 2 [10] *and* Worldsinging 2 [6]. ● 20 points in Animal Telepathy†, ESP, Plant Telepathy†, Psychic Healing, or Telepathy psionic powers or Talents. ● A further 20 points chosen from among additional psionic powers, or IQ +1 [20], HT +1 or +2 [10 or 20], Will +1 to +4 [5/level], Per +1 to +4 [5/level], FP +1 to +6 [3/level], Absolute Direction [5], Acute Senses (any) [2/level], Allies (Animal companions, apprentices, etc.) [Varies], Animal Friend 1-4 [5/level], Autotrance [1], Green Thumb 1-4 [5/level], Languages [Varies], Less Sleep 1-4 [2/level], Luck [15], Outdoorsman 1 or 2 [10 or 20], Patron (specific gaia, trading consortium, etc.) [Varies], Psionic Perks [1/apiece], Reduced Consumption 1-2 [2/level], Social Regard (Venerated) 1-4 [5/level], Single-Minded [5], Wealth (Comfortable or Wealthy) [10 or 20], or additional Talent for your psionic power(s) [5/level].

Disadvantages: -20 points chosen from among Code of Honor (Worldsinger; p. 13) [-10], Curious [-5*], Disciplines of Faith (Ritualism *or* Mysticism) [-5 or -10], Duty (to an organization, a specific gaia, etc.) [Varies], Fanaticism (Protect all gaia) [-15], Sense of Duty (Fellow worldsingers *or* Gaia) [-5], Vow (Chastity *or* Vegetarianism) [-5], Vow (Own no more than you can carry) [-10], or Wealth (Struggling, Poor, *or* Dead Broke) [-10, -15, or -25]. ● A further -30 points chosen from among the previous traits or Enemies (Other worldsingers, former employers, etc.) [Varies], Intolerance (Environmental exploiters, particular corporation, etc.) [-5], Loner [-5*], Odious Personal Habit [Varies], Overconfidence [-5*], Reputation (Itinerant wanderer *or* Superstitious mystic) [Varies], Shyness [Varies], Stubbornness [-5], Supersensitive [-15], Weirdness Magnet [-15], or Xenophilia [-10*].

Primary Skills: Diplomacy (H) IQ+1 [8]-14; Naturalist (choose planet type) (H) IQ [4]-13; Meditation (H) Will [4]-13; *and* Survival (any; choose planet type) (A) Per+1 [4]-14. ● *Four* of Navigation (Air, Land, *or* Sea) (A) IQ [2]-13; Naturalist (choose planet type) (H) IQ-1 [2]-12; Biology (choose planet type) or Herb Lore, both (VH) IQ-2 [2]-11; Mental Strength (E) Will+1 [2]-14; Autohypnosis or Dreaming, both (H) Will-1 [2]-12; Survival (any; choose planet type) (A) Per [2]-13; Esoteric Medicine (Psychic Healing) (H) Per-1 [2]-12; or spend 2 points to increase one of these by one level.

Secondary Skills: *Eight* of Beam Weapons (any), Brawling, Guns (any), or Knife, all (E) DX+1 [2]-12; Boating (any), Driving (any), Piloting (any), Riding (any), Scuba, Shortsword, Staff, Vacc Suit, or Wrestling, all (A) DX [2]-11; Camouflage (E) IQ+1 [2]-14; Animal Handling (any), Cartography, Hidden Lore (Psis *or* Gaia; p. 16), Meteorology, Navigation (Air, Land, Sea, or Space), Prospecting, or Weather Sense, all (A) IQ [2]-13; Geography (Physical; choose planet type), Mimicry (Animal Sounds *or* Bird Calls), Pharmacy (Herbal), Religious Ritual (any), Theology (any), or Veterinary, all (H) IQ-1 [2]-12; Swimming (E) HT+1 [2]-13; or Survival (any) or Tracking, both (A) Per [2]-13.

Background Skills: Climbing and Stealth, both (A) DX [2]-11; *and* Hiking (A) HT-1 [1]-11. ● *Three* of Computer Operation, First Aid, or Gesture, all (E) IQ [1]-13; Animal Handling (any), Electronic Operation (Communication, Scientific, *or* Sensors), Hidden Lore (any), or Teaching, all (A) IQ-1 [1]-12; Diagnosis, Expert Skill (Xenology), Linguistics, or Poisons, all (H) IQ-2 [1]-11; Fishing (E) Per [1]-13; or Observation (A) Per-1 [1]-12.

Psionic Skills: Worldsinging (H) Per+2 [4]-15‡. ● 8 points to be divided into further psionic skills of choice.

* Multiplied for self-control number; see p. B120.

† These psionic powers do not exist except in game worlds where the GM splits Telepathy into those categories. Ask the GM before taking these traits.

‡ Includes +2 for Telepathy Talent.

Lens

Talented (+50 points): Spend a total of 40 points to increase DX [20/level] and/or IQ [20/level] ; alternatively, spend 40 points in additional traits listed under advantages. ● Increase Worldsinging to 3 [8], for 2 points. ● Choose *three* additional primary or secondary skills, and *two* additional background skills.

Customization Notes

Depending on how the GM views worldsingers in the setting (and by extension psis in general), he might require you take either Social Regard (Venerated) or Reputation (Itinerant wanderer *or* Superstitious mystic).

Evolution is no linear family tree, but change in the single multidimensional being that has grown to cover the entire surface of Earth.

– Lynn Margulis, ***What Is Life?***

While combat skills are a component of this template, *most* worldsingers make due with one or two, typically Staff and a more modern weapon (Beam Weapons or Guns). The more militant-minded worldsinger would take additional disadvantages to gain points for skills like Armoury, Battlesuit, Explosives, Gunner, or Solider.

Militant worldsingers are eco-terrorists cranked up to *11*. They are xenophobic, violent zealots who will do anything to protect the gaia. A player wishing to create such a character should take both Fanaticism (Protect the gaia) and Intolerance, along with numerous combat or weapon skills. He should probably take Psychic Healing abilities enabling him to recover quickly from any damage he sustains. However, the ESP Combat Sense ability is also highly useful.

The *wise old man* focuses on Autohypnosis, Dreaming, Esoteric Medicine, Religious Ritual, and Theology. Judicious use of ESP abilities allow him to divine the future, making him seem wiser than he may actually be. Oracle (ESP, -10%) [14] (and disadvantages to get those points) is a *must* for this archetype.

The "have psi, will travel" is yet an another archetype. Unlike the "militant" or "wise old man," he views his powers as a means to wealth rather than a calling. Thus, being able to communicate with gaia is just a means to an end. Patrons with corporations are common for this archetype, as is a higher Wealth.

Campaigns

Worldsingers and gaia can be either the focus of a campaign or merely another piece in the backdrop. However, if gaia are real, it raises several questions about mining such worlds for their natural resources. In fact, it could be argued that doing such a thing is tantamount to assault, rape, or even *murder*. Without going too deeply into the ethical quandaries of what is the right way to treat living planet, it is best to assume that nondestructive means of harvesting the natural resources of a planet would be acceptable to most gaia, with methods that are increasingly more destructive to the environment being less acceptable. This means clear-cutting, strip-mining, overfishing, and so on would cause the gaia to "encourage" those performing such actions to leave or at least make it so expensive that it becomes unprofitable. The GM may also decide that planets with a gaia show an unnaturally high frequency of special ores or materials that are otherwise available nowhere else.

If gaia are not real, then worldsingers are con artists or mystical hoodoo men who have convinced everyone they are needed. In campaigns like this, the Worldsinger psionic ability should not be allowed. Instead, replace those points with points in other skills or Telepathy abilities (assuming that psi is actually a real phenomena and not a sham as well).

The material presented here could also be used in settings other than sci-fi. Worldsingers might make an interesting take on a fantasy druid. Perhaps only some races have the capability to "worldsing." If this is the case it could make for a very interesting race resembling some interpretation of elves.

In a campaign where Plant Telepathy is available as a psionic power, separate from Telepathy, a neo-druidism revival could occur and make psionic eco-terrorists downright frightening. After all, how can you cut the forest down if it is fighting back?

For a darker tone, perhaps these global intelligences are in fact extensions of Things Man Was Not Meant To Know. If this is the case, worldsingers are cultists to these planet-sized servitors, or the psis might be shepherds trying to steer humanity away from these places of madness and death.

Inspirational Resources

There are but a few examples of living planets in comics, fiction, and film. The following is a small sampling.

McCaffrey, Anne and Scarborough, Elizabeth Ann. *Powers That Be* (Ballantine Books, 1993)*; Power Lines* (Ballantine Books, 1995); *Power Play* (Ballantine Books, 1996). The original trilogy and the follow-up series *Twins of Petaybee* (*Changelings, Maelstrom,* and *Deluge*) cannot be recommended highly enough.They are prime example of a living planet and how humans come to grips with living on it.

Avatar (James Cameron, 2009). Possibly the best example in film, Pandora is a living planet who communicates with her chosen people, the Na'vi.

Doctor Who, "The Doctors Wife" (Neil Gaiman, 2011). A entity simply called "House" tries to consume the heart of the TARDIS in this episode. While technically not a planet, it does nevertheless deserve to be noted.

Earth 2 (Michael Duggan, Carol Flint, Mark Levin, and Billy Ray, 1994-1995). Follows the plight of a billionaire trying to save her son who is dying from a mysterious illness that can only be cured via an Earth-like environment.

Asimov, Isaac. *Foundations Edge* (Doubleday, 1982). A living planet named Gaia is thought to be the home of the Mule, a powerful psi in the Foundation series.

Lee, Stan and Kirby, Jack. *Thor #132* (Marvel Comics, 1966). The first appearance of Ego the Living Planet is in this issue; though he does go on to appear in numerous other comics.

About the Author

Christopher R. Rice is an amateur gardener (at best). When not trying to activate his late telepathic abilities, he tends his garden. From Portsmouth, Virginia, he likes to walk barefoot through his tiled earth hobbit-style, often drawing strange glances from onlookers. He dreams of being able to write full-time one day, or at least eke out a living doing it. He wishes to thank L.A., his own personal muse (who truly inspired this article – thank you, darling!); the rest of his gaming group; his good friend Antoni Ten Monrós; and Beth "Archangel" McCoy, for being most excellent sounding boards.

Eidetic Memory

Generation Ships

by David L. Pulver

One of the first science-fiction paperbacks I read, back when I was nine years old, was *Non-Stop* (1959) by Brian Aldis. I used to come over to my grandparents' house for lunch every school day, and I discovered it in grandfather's well-stocked bookshelf hidden among about 500 volumes of *Mack Bolan: The Executioner.* Each day, I'd read a few pages of it and be absorbed in a story of battling tribes of primitive humans and mutants who had forgotten they were actually living aboard giant starship. *Non-Stop* is one of several classic interpretations of the generation-ship concept, which include Robert Heinlein's prototypical *Orphans of the Sky,* the *Star Trek* episode "For the World Is Hollow and I Have Touched the Sky," and James Ward's early SF roleplaying game *Metamorphosis Alpha* (TSR, 1976).

Fast-forward to several years later: I was re-reading *Space Gamer* #42 in which W.G. Armintrout described his *Metamorphosis Alpha* campaign. I'd never seen that game, but the article brought back memories of Aldis' novel. A few weeks later, I had designed a giant generation starship for my science-fiction campaign for the party's free trader *Hungry Iguana* to stumble onto and explore. Filling a dozen sheets of hex paper, this mega-adventure provided weeks of fun – initial encounters with mutants in the hydroponics jungles to a climatic pirate-ship battle inside the ship's half-full fuel tank – and established plot lines that influenced the campaign for years to come.

The Nature of Generation Ships

Generation ships are large starships designed for interstellar voyages whose duration exceeds their crew's lifespan. These space arks are intended to support an entire community who live out their lives and bear children aboard the vessel for generations. After centuries of flight, the descendents of the original crew will disembark at the final destination, often a habitable star system intended for colonization.

This type of world hopping is justified by the limits of realistic space drives. A colony-sized payload cannot cross interstellar distances within a single human lifetime, but one spanning several lifetimes is reasonable.

Generation ships are briefly described in ***GURPS Space*** and ***GURPS Spaceships 5: Exploration and Colony Ships.*** This article expands on these treatments to suggest the challenges and opportunities of generation ships and provide tips on constructing them using ***GURPS Spaceships***.

Inside the Starship

The most common portrayal of a space ark is a mobile variant of the standard space-habitat station found in the Lagrange points or orbital space of many future Earths. Such a vessel is a large hollow cylinder or torus spun to create artificial gravity, either built with a conventional hull or formed from an asteroid or comet. The interior surface is landscaped, the view gently curving away in all directions. Some generation ships may be large enough to have weather and haze or clouds. On a more typical smaller craft, a person can see all the way across to the other side of the "world." Usually a single light source is focused through the center (a "linear sun"), dimming or brightening periodically for a day/night cycle.

A generation ship's builders may stock the ship with various forms of plants and livestock (chickens, fish, goats, bees, etc.), working beasts, and pets. They probably won't include dangerous wild animals. However, a wider variety of animals, including nasties that eat adventurers, could be "in stock" in genetic seed banks, or be live or robotic versions in a zoo or theme park. In the case of a degenerate ship, a disaster or deliberate tinkering may have released them, and some may have bred true. In a science-fantasy game, radiation or the like may create mutant animals.

Not all generation ships follow this model; some may have multiple landscaped layered decks. This is especially true for superscience designs with artificial gravity generators or high thrust reactionless drives with sustained, constant 1G acceleration

The contrast between the open spaces of the ship and what lies beneath can be an interesting part of a ship's character. The front and back ends of a cylinder ship, the inside of any hills, and possibly spaces under the landscaped "ground" provide room for the ship's machinery.

The entrances to these might be hidden out of view for aesthetic reasons. These areas provide a very different sort of "terrain": a vast interior labyrinth of corridors and chambers. They could even contain include the equivalent of underground rivers (huge sewage systems, for example), lakes (half-empty reservoirs), and jungles (hydroponics farms). Some of the machinery spaces near the front or back of the ship may even be in 0G, while others, perhaps closest to the ship's power plant or drive, might be dangerously radioactive.

In bed above or deep asleep,
while greater love lies further
deep. This dream must end,
this world must know:
We all depend on the beast below.
– Amy Pond,
in ***Doctor Who*** *#5.2*

Social Issues

Perhaps the biggest difficulties confronting a generation ship are social ones, for the ship is a self-contained mobile world to a far greater extent than a vessel that merely travels in space for a few months or years before returning to its home port. The crew will be asked to live in a confined artificial environment. Moreover, unless longevity technology also exists, they will never live to reach their destination. Who would volunteer for that mission?

Much depends on why the ship is launched and the ideology that has led to such an epic endeavor. A generation ship requires a vast outlay of blood and treasure both for building and fuelling the ship and in the potential sacrifice of the lives of those exiled to it.

The usual justification for building such a vessel is the discovery of a habitable and Earth-like world around another star, via telescope or unmanned probe, leading to a natural burning desire to study and colonize it. This might be given extra urgency if there is a looming existential catastrophe in the home system that can only be avoided by getting far, far away. For instance, if a hostile ideology is gradually taking over the solar system, their outmatched rivals may first flee to local planets; if they see eventual defeat looming, they may decide to flee the system. Perhaps their enemies will even encourage them to do so to avoid a final showdown.

The next question is how large a population is needed? Refugees will try to cram as many people as possible, but a more deliberate colonial expedition may want the minimum numbers needed to sustain the mission, to keep size and costs down. In order to ensure genetic diversity, a breeding population aboard a generation ship seems to require anywhere from 50 to 5,000 people. The number will depend on the length of journey, gender ratio – 1:1 is probably best – average lifespan, how genetically diversified the population was to begin with, and the childbearing age. Carrying frozen genetic material of further diversified stock and ensuring some percentage of the population serve as surrogate parents can also help. Most fictional concepts seem to suggest at least 500 is a good idea, with some ships built for thousands or even hundreds of thousands of people.

A generation ship is a mobile town or city, but unlike terrestrial small towns, it's one strangers never pass through, and no one new ever moves into or out of. The first generation may have a lot to do as they work out problems aboard the ship. After that, people may get bored! It doesn't do anyone any good if the first generation of committed pioneers have children, who grow into teenagers or young adults that find they're trapped in a tin can for all their lives with nothing to do except have kids and work on a farm or maintaining the ship's boilers. Revolt looms!

Or maybe not. "Live in the same village, have kids, and work on a farm" describes an awful lot of human history. The people raised on the ship won't have known anything else, and depending on how they're brought up, may not know what they're missing.

The best type of crew for a generation ship would seem to be people who already live in a giant space can. Thus, the logical choice would be former inhabitants of an existing permanent space station, lunar, or asteroid colony. (Such a group would also be well-placed to escape a threat that was spreading from Earth.) Once the ship launched, the main change in their lives would be a gradually increasing isolation from their home system as the ship traveled farther and farther away. However, there is one down side to this selection of crew: Spacers who had lived all their lives aboard a station may be less interested in settling a new planet. Even so, they will still have the promise of an entire new solar system full of resources, moons, and asteroids that their descendents can explore and exploit. That reason, along with scientific interest or the need to get out of Dodge, may be enough.

Nonetheless, life aboard a functional generation ship seems to offer few openings for people who enjoy adventure, politics – except of the small-town variety – or capitalist ventures. (This may be why most depictions feature a ship after it has fallen into anarchy or disaster.) However, it does provide many opportunities for those who like sports or the humanities; the ship's libraries could easily store almost all recorded human art and literature. (Of course, stocking the ship's libraries with books or videos that detail the wonders of planetary living may not be great for future on-ship generation's morale, but hiding the truth could also be a problem!) Additionally, ultra-tech neural-interface virtual-reality sims that could be available in a TL9-12 ship may be so effective at absorbing everyone's time and interest that the crew might not care they can't get out. This could be a problem, though, if the zoned-out are expected to work and raise kids.

To keep them busy and purposeful, at least some of a generation ship's crew could engage in various ongoing scientific programs, such as engineering research aimed at continued modest improvements of the gear and systems aboard the ship. The ship could also mount astronomical and astrophysical instruments, and as it travels into interstellar space, it may become its cultures' prime deep-space observatory. It will constantly be getting closer to its destination star system, allowing onboard instruments to gather more and better data on it (or any other systems it passes by).

Campaign Seeds

War Between the Stars: In a fleet of generation ships in deep interstellar space, an ideological shift or coup has created political rivalries and a "cold war" between different vessels in the fleet. Espionage and covert ops are common, but no one dares risk open conflict due to fragile ecosystems. The ships are a decade or two from their destination, so the price of victory is the domination of an entire star system.

Dungeon Space Fantasy: The starship *Warden* in *Metamorphosis Alpha* is a good example of this. The adventurers live in a regressed society inside a generation ship. The ship's open spaces house villages, rival kingdoms, or mutant infested jungles. The machinery below is a dungeon filled with robots, exotic artifacts, and mysterious *others*. Functioning tech are the ship's magic items; priests talk to semi-functional computers as if they were divine oracles.

Records: In the far future, a historian is searching for long-lost archives that describe the location of a legendary generation ship that left the home planet before faster than light travel was invented. The records place the ship in deep space . . . and also mention certain famous historical treasures that were carried off by the group who left aboard it. Rival groups of treasure-hunting archeologists could be after the map-archives and the ship!

Graveyard Ark: A generation ship whose life support has failed may be a dead ship filled with the bones of thousands of victims. This could be a spooky encounter, a great prize for tomb robbers, or a mystery over what killed them and if it's still onboard. The novels *Rendezvous With Rama* by Arthur C. Clarke and *Eon* by Greg Bear also have twists on a seemingly "empty" generation ship that isn't.

Doomsday or Opportunity: A "giant comet" on a dangerous course toward Earth or another inhabited system is an out-of-control alien (or lost human) generation ship. The PCs have the only spacecraft in position to rendezvous with it, either before it crashes into something or passes out of the system. After they discover it's a ship – possibly still inhabited – the best solution may be to adventure inside, encounter its occupants, if any survive, and try to get it working again. Unless its full of alien invaders!

Passing Through: A huge, ancient generation ship may be traveling through the galaxy at near-light speed. No one can stop it, but different races may visit, conquer it, or settle on it, creating a cosmopolitan mobile society. Robert Reed's novel *Marrow* is an example of this trope.

Although a generation ship is popularly seen as a completely isolated world of its own, that doesn't really have to be the case. Unless it's fleeing some catastrophe back home, for at least the first century or so, it should be feasible to remain in regular radio contact with the home system that launched it. After a while, the passage of time could result in "home" being sufficiently altered or alien that contact is either lost or potentially disturbing. Regular contact with home allows a steady stream of information – delayed only by the speed of light – to reach the ship. If the destination is a nearby solar system, the lag should be only a few years' time. Contact with home can pose risks, though. Among the possibilities:

War: The generation ship might have been launched by a multinational alliance. At least in the first few generations, crewmembers may still have allegiances to the now warring factions and the conflict could spread aboard. Censorship may be imposed by ship's officers to avoid it, but this could break down.

Toxic Memes: Fads, cults, philosophies, or crimes from the homeworld could spread to the ship, which may lack the ability to safely absorb them.

Disruptive Technologies: The classic horror is the invention of a faster-than-light drive back home, rendering the space ark's voyage tragic. Advances in longevity might affect a carefully balanced population plan. If AI or "ghost" uploading technology is developed at home, sapient programs could be beamed onto the ship at the speed of light to visit (or capture) it.

Alternatively (or additionally), the ship might not be isolated because it's part of a flotilla of generation ships, perhaps a few dozen or hundred miles apart. The advantage is redundancy – a disaster on one ship can be salvaged by a rescue mission – and the ability to cope with the "boredom" of living in one community. Ships may be close enough shuttles can travel between them yet distant enough to seem like different cities or countries. The disadvantage is cost – in a choice between several large or one huge ship, the latter offers more comfort.

Yet another variant is the traveling hobo star city that (usually with FTL drive) is part of a broader interstellar culture, but has no final destination, instead visiting star systems to find work or explore. James Blish's *Cities in Flight* and the anime series *Macross Frontier* depict this sort of vessel; the sapient Ships of Iain Banks' *Culture* series are a related concept.

The Thousand-Year Reich: Utopia or Dystopia

The best type of society and government for a generation ship has been hotly debated. What is stable enough to last for centuries, yet flexible enough to deal with problems en route and transition from a star-faring to a planetary culture at the end of the voyage? The question may answer itself – whatever society finds the desire and resources to build and crew a ship will likely replicate itself aboard that ship.

Still, socio-economic systems aboard a vessel require careful design, and will likely differ from those that would work on a planet. A city-sized ship could have most of the job opportunities that a human-sized city has. Modern capitalist societies have generally been more successful than communal ones, but that may not apply in a solo town or city-sized starship that has little or no means of trading with the outside universe. Historical planetary capitalist societies have enjoyed abundant resources or foreign trade and growth potential. Allowing disparities of wealth may lead to tensions that risk revolutionary turmoil in a fragile environment.

Aboard a starship crossing the desert of interstellar space, the limits to growth are starkly finite, even if a ship is part of a fleet. Even so, a shipboard economy might still be based around innovation and growth in those types of products that are not constrained within a ship, such as media.

The type of government will probably be oriented toward ensuring the ship remains safe. Since the most likely threat during the interstellar journey is a breakdown of order or mechanical malfunctions, stability and precision may be prized above all. Combined with the limits to growth mentioned above, this may discourage any form of anarchic or libertarian systems. Especially in smaller vessels, the government may lean more toward a communal or socialistic structure, perhaps with everyone considered part of a single family.

Autocratic societies have often succeeded in sustaining multi-century projects that do not materially benefit the participants, such as building great pyramids or cathedrals. Moreover, there's a long tradition of autocracy within naval and commercial vessels – the captain is the "absolute monarch" aboard a ship, the officers are his aristocracy, and the crew are the proles. This could also lead to a form of caste system distinguished by profession (farmers, bridge crew, engineers, educators, etc.). However, a rigid autocracy or caste system may breed resentment, and that could lead to revolt.

Some democracies have proven relatively stable for a century or more, even if they do change direction every few years. If the ship-building society was democratic in character, then stability benefits form a continuity of traditions. Regular elections may be held for a ship's captain or officers. It's also possible that everyone will own a "stake" in the ship itself.

Theocratic societies have a successful track record of focusing the faithful on a particular cause over a long time period, although heresies and schisms are possible. History offers examples of people who accepted isolation in the service of a higher calling, such as the monastic movement.

The artificial establishment of a deliberately primitive society aboard the ship is an unpleasant option, but one that ruthless builders might use. An automated ship may require a small trained crew, leaving the majority of the occupants aboard mainly as breeding stock to ensure genetic diversity for the future planetary colony. If, so a second and subsequent ark generation could be raised in ignorance of their mission to live "pastoral" lives amid the ship's biosphere, perhaps with a synthetic religion or ideology that explained away their world. Should rebels arise, the isolated low-tech society (TL4-) will, despite its numbers, be no match for the TL9+ crew members, or maybe a supervising AI. The more advanced group might conceal their existence, or appear as godlike or supernatural figures to the low-tech populace.

The already-mentioned contrast between the pastoral or wilderness open spaces of a generation ship and the deep engineering sections can also suggest a social divide, especially in a ship that has been traveling long enough to establish a rigid caste system. Inspired by H.G. Well's *The Time Machine,* many authors have imagined pastoral "Eloi" farmers who live a rural life on the surface while a literal underclass of "Morlocks" – perhaps descended from the original ship's engineering and bridge crew – tend the machines below. Of course, numerous other arrangements are possible!

Any society aboard a space ark should change over the centuries or millennia the vessel is voyaging. The classic trope is a gradual loss of identification with the outside world (perhaps abetted by a disaster), leading to future generations forgetting they are on a ship or losing all understanding of what "ship" and "planet" actually mean. Continued maintenance becomes a matter of ritual and rote. Eventually, no one is left capable of steering or stopping the ship, and it sails past its destination into the void, forever. If society is more robust or luckier, it won't change so drastically that it cannot maintain the ship or the mission, but, for instance, a democratic society might mutate into a dictatorship or theocracy.

Technologies that Work Against Generation Ships

If a society has certain technologies, they might have no reason to ever develop generation ships. Besides FTL, these include the following.

Terraforming: The prolonged time scale required to terraform a world like Mars is not that different from that required to cross the stars at generation-ship speeds. Still, there are other reasons to travel than colonization – e.g., exploring an alien world.

Sapient AI: If robots are clever, maybe they'll be the ones doing the colonizing, either on their own or by acting as midwives to ships full of frozen genetic material and artificial wombs.

Suspended Animation: If there are reliable methods of placing people into stasis for decades, centuries, or millennia, than a "sleeper ship" may make more sense. However, this can also be used in a generation ship: crew live part of their lives helping maintain the ship, then go to sleep so that they will live to reach their destination.

High Relativistic Speeds: A ship propelled by a sublight drive efficient enough to reach near-light speed, like a reactionless or a total conversion drive, can benefit from relativistic time dilation. At 99.9% of light, for example, a 120-year flight from the ship's perspective is four years, reasonable for a single-generation crew.

Design Guidelines

Spaceships 5 describes three example generation ships: *Universe* (p. 21), *Endeavor* (p. 21), and the superscience transgalactic *Magellan* (p. 22), but other designs are possible.

TL: A generation ship is often considered a "near term" solution to interstellar flight but keeping a complex, self-contained machine and life system going for centuries means TL10+ technology is recommended.

Size: A ship should be large enough to hold a town inside it. Most are SM +13 or more.

Armor: To save on construction costs, stone (a hollow asteroid) or steel are usual. A typical design has one system of armor in each section.

Open Space: This serves as farms and prevents the population from going stir-crazy. If using the ecological life support (p. 24) design switch in this article, the amount of open space sets an absolute limit on occupant size.

Habitats: To ensure sufficient genetic diversity, a generation ship should be built to support at least 20 people for a voyage of a few decades, at least 200 for a few centuries, and least 2,000 for a few millennia. Use luxury cabins – good-sized apartments or houses – and add lots of establishments!

Reaction Drives and Fuel Tanks: What distinguishes a space ark from a conventional space-station habitat is the engine and fuel. The more fuel carried, the faster the journey but the less room for interior space. The best arrangement in a conventional ship is to put fuel tanks in front and back of the ship, for extra shielding against impacts and radiation from ship's drive, with the hollow habitat in the center hull.

The engine's delta-V per fuel tank is crucial – the higher it is, the faster the ship can reach the destination and the less space needed for fuel. Unlike some craft, an ark can't afford to devote more than about 25-30% of its total systems to fuel tanks and drives, since it needs room for open space, crew habitats and the like. Realistically, this limits TL9-12 drive choices to fusion rocket, advanced fusion pulse drive, or, with costly fuel, antimatter plasma or pion drive. A useful value is the percentage of light speed (c) the ship can practically reach. Find this by halving the delta-V in miles per second (since it needs to decelerate to a stop) and then dividing by 186,000 mps (the speed of flight). Distance in light years divided by the fraction of light speed gives flight time in years (excluding time for acceleration, often a minor part of the total). For time required to travel a parsec, multiply by 3.26.

Power Plants: Generation ships can get by without needing many Power Points – usually only for factory systems and perhaps the odd self-defense weapon. However, it's necessary to design the power plant for the long haul. See *Power Plants and Long Voyages* (p. 25).

Weaponry: Few fictional generation ships are heavily armed, but a small "meteor defense" system can be useful to destroy space debris in its path.

Hangar: A generation ship will benefit from having hangar space. Most are too big to land, so will need smaller craft for solar system and planetary exploration, not mention to disembarking thousands of passengers. A ship could carry a full squadron of vessels, possibly including armed craft. Some of these might even fly escort ahead of the vessel to intercept dangers.

Cargo: Although the vessel needs enough cargo capacity to transport colonization equipment, spare parts, and supplies, habitat steerage cargo is often adequate.

Factory: Over the years, things are going to break down. A generation ship should have a factory system, lots of minifacs, or both. Another advantage, especially with laboratories, is that this allows the ship to potentially advance in TL and improve its systems as it travels, especially if it can receive signals with the latest new theories and inventions from "home."

Mining and Refinery: This capability is very useful at the end of the trip, but may be useless through much of the ship's voyage. As such, these systems may be better installed on mining craft carried in a hangar bay.

Design Options and Switches: Spin gravity and, in some instances, exposed radiators are typical of these designs.

Design Switch: Ecological Life Support

GURPS Spaceships (p. 19) allows a single open space to provide total life support for a full ship. This is optimistic – it may supply enough oxygen, but to grow food would require farming so intensively that the space can't really be considered "open." However, many generation-ship concepts assume food production is handled by conventional but more efficient farming techniques inside the vessel. Plentiful interior area for fields, orchards, and the like gives the space ark its unique character.

If the ecological life support switch is used, total life support (see ***Spaceships***, p. 17) can't be reliably sustained for the centuries required on a generation ship – at least not without revolt! Instead, the ship needs sufficient open space devoted to agriculture to support a varied diet, as well as provide oxygen. Each "area" of open space is 1/20 of an acre, so using estimates for productivity of agriculture aboard space habitats, a one-acre mixed farm could provide a comfortable, varied diet for about 400 people, which translates to a total life-support capacity of 20 people per open space "area." (This could be doubled with more restrictive diets, but that might not be practical for decades at a time!) The actual number of "areas" in an open space system depends on the size of the ship.

For example, a SM +14 ship gets 100 "areas" per open space system, so each would support 2,000 people. A SM +15 vessel gets 200 "areas," or 4,000 people. For a typical mid-size space ark with 10,000 to 20,000 people, five to six open space systems is suitable.

If the space ark becomes primitive, the productivity may or may not decline, depending on the society, automation, etc. Some spaces could revert to desert or wilderness, reducing overall population capacity.

Ziusudra-Class Generation Ship (TL10)

This design is intended to showcase the optional ecological life support switch (above) and power plant rules (p. 25). It uses the core ***Spaceships*** rules with that variant plus the "smaller systems" rule from ***GURPS Spaceships 7: Divergent and Paranormal Tech*** and ***GURPS Spaceships 8: Transhuman Spacecraft***.

The *Ziusudra* is an unstreamlined 3,000,000-ton (SM +15) generation ship. It is 2,000' long and is built for a voyage of up to 4,200 years, limited by onboard reactor fuel. It spins slowly to generate artificial gravity at 1G. It can reach about 0.001c (1/1,000 light speed) using half its delta-V to accelerate and the other half to slow down.

It is a typical cylindrical space ark resembling a modest-sized space habitat with an engine and fuel tank cluster at one end. To ensure occupant comfort and life support, much of it is open space. It is designed to start with about 3,500 people but slowly grow to perhaps 24,000 (the most its open spaces support).

During the early voyage, the ship's open spaces may be utilized as parkland rather than farmed. Its habitats take the form of buildings that extend up into the hollow center, interspersed between farms and orchards.

Front Hull	*Systems*
[1]	Steel Armor (dDR 70).
[2!]	Smaller Systems, SM +14: Fabricator Factory†, Hangar Bay (30,000 tons capacity)†, Major Battery† (one 30 GJ rapid fire UV laser turret).
[3]	Habitat (5,000 luxury cabins, 500 briefing rooms, 500 establishments, 500 labs, 1,500 offices, 500-bed hospital sickbay, 500 minifacs, and 25,000 tons steerage cargo).*
[4-6]	Open Space (600 areas, equivalent to 30 acres).*
[core]	Control Room (C11 computer, comm/sensor 14, and 60 control stations).*
Central Hull	*Systems*
[1]	Steel Armor (dDR 70).
[2]	Habitat (7,000 luxury cabins, 30,000 tons steerage cargo).*
[3-5]	Open Space (600 areas, equivalent to 30 acres).
[6]	Cargo Hold (150,000 tons).
Rear Hull	*Systems*
[1]	Steel Armor (dDR 70).
[2]	Advanced Fusion Pulse Drive (0.005G acceleration).*
[3-6]	Fuel Tanks (total 600,000 tons nuclear fuel pellets and 400 mps delta-V)
[core]	Smaller Systems, SM +14: (Fusion Reactor† with two smaller Power Points; two Fuel Tanks with a total of 4,000 years of Reactor fuel).

* 300 workspaces per system.
† 100 workspaces per small system.

The vessel has spin gravity (1G) and exposed radiators. Minimum crew are 40 control crew, 1,600 technicians, and up to 1,800 farmers.

Power Plants and Long Voyages

Most ***GURPS Spaceships*** power plants are good for only a few centuries. To get around, this use one of the following options.

Sequential Reactors: Install extra reactors, but don't bring them online until the first one is exhausted (or fails).

Fusion Fuel Tanks: The most common power plant for generation ships is the fusion or super fusion reactor, and extra fusion fuel is easily stored in a tank. Each fuel tank allocated to fusion fuel provides 10 × usual reactor duration. A tank of fuel costs half as much as the reactor itself – a 50% discount from the costs in *Power Plant Refueling* (***Spaceships,*** p. 46), as overhaul isn't required if maintained by the crew. Alternatively, assume the reactor fuel could be scooped and refined from a gas-giant atmosphere (as would be the case for reactors using deuterium-helium-3 fuel cycles, for example).

TL	*Spacecraft*	*dST/HP*	*Hnd/SR*	*HT*	*Move*	*LWt.*	*Load*	*SM*	*Occ*	*dDR*	*Range*	*Cost*
PILOTING/TL10 (LOW-PERFORMANCE SPACECRAFT)												
10	*Ziusudra*	1,000	-6/5	13	0.005G/400 mps	3,000,000	237,400	+15	24,000ASV	70	0	$145.67B

We're a long way from home. We've jumped way beyond the Red Line, into uncharted space. Limited supplies, limited fuel. No allies, and now, no hope? Maybe it would have been better for us to have died quickly, back on the Colonies with our families, instead of dying out here slowly, in the emptiness of dark space. Where shall we go? What shall we do?

– William Adama, in ***Battlestar Galactica*** *miniseries part 2*

About the Columnist

David L. Pulver is a Canadian freelance author. An avid SF fan, he began roleplaying in junior high with the newly released ***Basic Dungeons & Dragons.*** Upon graduating from university, he decided to become a game designer. Since then, David has written over 70 roleplaying game books, and he has worked as a staff writer, editor, and line developer for Steve Jackson Games and Guardians of Order. He is best known for creating ***Transhuman Space,*** co-authoring the ***Big Eyes, Small Mouth*** anime RPG, and writing countless ***GURPS*** books, including the ***GURPS Basic Set,*** *Fourth Edition,* ***GURPS Ultra-Tech,*** and the ***GURPS Spaceships*** series.

Hyperjumping

by Jason "PK" Levine

In ***GURPS*** *Fourth Edition,* Warp with the Hyperjump limitation is the preferred way to represent FTL travel as a character ability. For everyone from galaxy-hopping superheroes to semi-realistic spaceship Allies, Hyperjump is the most efficient means of traversing intergalactic distances . . . and is thus deserving of more detail.

Warp Modifiers

At the GM's option, the more detailed version of Hyperjump below replaces the one found on pp. B98-99.

Hyperjump

Variable

Instead of teleporting to your destination instantly, you shift into another dimension known as *hyperspace,* travel at great speeds, and then shift back into normal reality, having arrived at the destination. The whole process is known as a "hyperjump." Neither your start nor end point can be within an atmosphere, and you must travel a minimum of one light-second (186,000 miles or 0.002 AU); hyperjumping is intended for *space* travel. See *Making the Jump* (pp. 27-28) for further details.

The GM is free to define the environment of hyperspace as he wishes; the default assumption is that it's much like that of normal space. (This is less of a drawback than it sounds, as anyone who'll be hyperjumping has to be able to tolerate space already!) Thus, at a minimum, you'll also want some form of Doesn't Breathe, Temperature Tolerance, and Vacuum Support to stay comfortable and unharmed. When designing a vehicle, also consider a combination of Payload and Sealed, to protect the passengers. On long trips, remember to bring food, water, fuel, or whatever else you need to survive.

The size of the Hyperjump limitation depends on your travel speed; see the *Hyperjump Table* for details. Note that the table's progression does not extend in either direction; the value of Hyperjump is always between -50% and -10%.

Reliable

see p. B98

For many hyperjumpers, this enhancement is a poor value; it works out to 5 points per +1, while improved Navigation (Hyperspace) is 4 points per +1 at most. However, Reliable is still worthwhile for vehicles with Compartmentalized Mind (Controls or Dedicated Controls), as the person rolling against Navigation will not necessarily be the one who paid for the Warp advantage.

Requires (Attribute) Roll

see *GURPS Powers,* p. 112

Add this limitation if your Warp requires an extra attribute or skill roll just to *enter* hyperspace. For a skill roll, take this limitation for the attribute the skill is based on; e.g., if you must make an Mechanic (Hyperdrive) roll to enter hyperspace, that's Requires IQ Roll (-10%), because Mechanic is an IQ-based skill. (The shift from attribute to skill is a special effect.) This roll takes the same modifiers as your IQ or Navigation roll. If it fails, each repeated attempt costs you 1 FP until you are successful; if you are reduced to 3 FP or fewer, you must rest until *all* FP are regained before trying again (still for 1 FP).

For a vehicle, there are two changes. First, this may apply to a skill roll that the vehicle itself has to make *or* to one a crewman must make to prepare it; decide when taking it. Second, if the vehicle lacks FP, HT drops by 1 instead, as per *Machines and Fatigue* (p. B16).

Restricted Distance

Variable

Use this limitation in combination with Hyperjump instead of Range Limit.

When you hyperjump, your distance traveled must fall within a single, contiguous span of predefined distances. Look up this span on the *Distance Table* (p. 27). This limitation is worth -40% if the span falls within a single row (e.g., 18 to 170 light-years), -20% if it falls within two rows (e.g., 2 to 170 light-years), -10% for three rows (e.g., 2 to 1,700 light-years), or -5% for four rows (e.g., 2 to 17,000 light-years). A larger span is not a meaningful limitation.

Hyperjump Table

Speed in Terms of			Limitation
c	*Light-Years*	*AU*	
1*c*	1 ly per year	7.2 AU per hour	-50%
3*c*	1 ly per 4 months	21.6 AU per hour	-45%
12*c*	1 ly per month	86.6 AU per hour	-40%
36*c*	1 ly per 10 days	4.3 AU per minute	-35%
120*c*	1 ly per 3 days	14.4 AU per minute	-30%
365*c*	1 ly per day	43.9 AU per minute	-25%
8,766*c*	1 ly per hour	17.6 AU per second	-20%
525,960*c*	1 ly per minute	1,054 AU per second	-15%
31,556,900*c*	1 ly per second	63,241 AU per second	-10%

Distance Table

Distance In				Penalty
Light-Seconds	*AU*	*Light-Years*	*Parsecs*	
1 to 5.4	0.002 to 0.01	–	–	-10
Up to 54	Up to 0.1	–	–	-11
Up to 540	Up to 1	–	–	-12
Up to 5,400	Up to 10	–	–	-13
Up to 54,000	Up to 100	–	–	-14
Up to 540,000	Up to 1,000	Up to 0.017	Up to 0.005	-15
Up to 5.4M	Up to 10,000	Up to 0.17	Up to 0.052	-16
Up to 54M	Up to 100,000	Up to 1.7	Up to 0.52	-17
Up to 540M	Up to 1M	Up to 17	Up to 5.2	-18
Up to 5.4B	Up to 10M	Up to 170	Up to 52	-19
Up to 54B	Up to 100M	Up to 1,700	Up to 520	-20
Up to 540B	Up to 1B	Up to 17,000	Up to 5,200	-21
Up to 5.4T	Up to 10B	Up to 170,000	Up to 52,000	-22
Up to 54T	Up to 100B	Up to 1.7M	Up to 520,000	-23
Up to 540T	Up to 1T	Up to 17M	Up to 5.2M	-24
–	Up to 10T	Up to 170M	Up to 52M	-25
–	Up to 100T	Up to 1.7B	Up to 520M	-26
–	–	Up to 17B	Up to 5.2B	-27
–	–	Up to 170B	Up to 52B	-28
–	–	Up to 1.7T	Up to 520B	-29
–	–	Up to 17T	Up to 5.2T	-30
×10	×10	×10	×10	-1

M = million, B = billion, T = trillion. A dash means that it's inconvenient to express such a distance using the given units, not that it *can't* be done.

While it may seem odd at first that Restricted Distance, 0.02 to 0.1 AU gives the same discount as Restricted Distance, 11,000 to 100,000 AU, this is intentional. Being restricted to greater distances allows you to travel with fewer rolls, but also makes precision very difficult. The farther away you *must* jump, the less the specific distances matter.

If your ability to travel is *further* limited in some meaningful way, represent this with a Nuisance Effect.

Example: A ***Traveller*** J-3 ship must choose from three distances when it hyperjumps, traveling exactly one, two, or three parsecs. It thus has Restricted Distance, 1 to 3 Parsecs (-40%) *and* Nuisance Effect, Must hyperjump in whole parsecs (-5%).

Risky Blind

+10%

You can hyperjump to places you've never seen and have no data on (*Where Am I Going?,* p. 28), as if you had the Blind enhancement. However, when jumping blind, *any* failure on your IQ or Navigation roll is treated as a critical failure!

The Third Imperium . . . is a far-flung interstellar community encompassing more than 11,000 worlds . . .

– GURPS Traveller

Making the Jump

You must roll against IQ or Navigation (Hyperspace) to use Warp with Hyperjump. Unlike with normal Warp, this is not an activation roll; the transition into hyperspace is automatically successful unless you have Requires Attribute Roll (p. 26). Instead, this roll is to determine how accurately you've plotted your course. Thus, do not roll until the *end* of the trip.

Your roll is modified by the following factors:

1. *Preparation Time:* As per p. B98.
2. *Distance:* Use the *Distance Table* (above).
3. *Reliable:* This enhancement provides its usual bonus.
4. *Removal:* See *Where Am I Going?* (p. 28) for details.
5. *Equipment:* If you are using Navigation (Hyperspace) *instead* of IQ, apply any modifiers for equipment quality (p. B345), software (see ***GURPS Ultra-Tech***), etc.
6. *Fatigue Points:* +1 per FP spent – or +1 per *2 FP* spent if you're hyperjumping blind, which requires Blind (p. B98), Blind Only (from ***Powers***), or Risky Blind (above). Vehicles without FP might be able to spend HT here (GM's option).

The result determines exactly what happens:

Critical Success: You end up exactly where you want to be, *and* the hyperjump takes less time! Move up one step on the *Hyperjump Table* (p. 26) to determine your effective speed; if you're already traveling at one light-year per second, the hyperjump takes 1/10 as long.

Success: Your journey is effective and accurate.

Failure: You didn't navigate quite right. Multiply your margin of failure by the greater of 1 AU *or* the total distance you were traveling and divide by 10; you pop out into normal space *that* far from your intended destination. The GM determines the direction. As well, your power is now strained (unless you have the No Strain enhancement from ***Powers***); you are at -5 to use it again in the next 10 minutes.

Critical Failure: You end up somewhere *wrong*. Multiply the distance you were traveling by 1d+1; that's how far you end up from your *origin*. The GM determines the direction, and is *expressly* allowed to place you somewhere weird, unlikely, and/or unpleasant. Even worse, your power burns out (unless you have No Strain); you can't use your Warp at *all* for the next 1d hours!

Where Am I Going?

Your removal penalty (if any) depends on how much data you have regarding your destination. Always use the most favorable modifier.

Nothing (N/A): You know the name of the destination and perhaps its description, but not where it is. Roll at an extra -10. Anything but a critical failure counts as a failure, with a minimum margin of failure of 10. Critical failure produces the usual bad results!

Blind (N/A or -5): You have only basic data on where the destination is. You *must* have Blind, Blind Only, or Risky Blind to even attempt this (at -5) *and* all FP costs are doubled; if not, you automatically fail, as for *Nothing,* above.

Astronomical Charts (-4): You know *exactly* where your destination is, taking into account your planned arrival time, its orbit(s), the movement of its star system relative to the galaxy, and so on. At a bare minimum, this requires star charts and either a high-end computer or an Astronomy roll at -4 (along with *plenty* of pencils and paper).

Hyperjump Data (-2): You have detailed information – usually a massive computer file, but in low-tech settings, this may be a book – explaining *exactly* how to get there via hyperspace. This includes all of the information described in *Astronomical Charts,* above, plus the explicit hyperspace details. Such information *cannot* be calculated on the fly; if you have to improvise, see *Astronomical Charts.*

Previous Visit (-2): You have hyperjumped there before.

Hyperjump Data ***and*** *Previous Visit* (-1): You have detailed information *and* you've made this hyperjump before.

Direct Observation (0): You can see the destination, using your own eyes, special senses, or sensors.

> *Arthur Dent: What are you doing?*
> *Ford Prefect: Preparing for hyperspace. It's rather unpleasantly like being drunk.*
> *Arthur Dent: What's so wrong about being drunk?*
> *Ford Prefect: Ask a glass of water.*
>
> *– **The Hitchhiker's Guide to the Galaxy** #1.1*

About the Author

Rev. Jason "PK" Levine is intimately familiar with transport between planets, having dealt with the mysterious Men from Planet X on many an occasion. When not hiding Xists from NASA for J.R. "Bob" Dobbs, PK is the Assistant ***GURPS*** Line Editor – a position that has taught him that humans can be more difficult to interact with than any Xist. He is currently building hyperspace jump pads in the woods of northwestern Georgia with his unearthly beautiful wife and assortment of minions.

The Time Punch

A Malfunctioning Cross-Temporal Marvel for the Atomic Age

by J. Edward Tremlett

The group of scientists watched in hiding as the procession went on, far down in the valley below them. The white-robed, solemn participants appeared to be going to a shrine of some kind, further down. Or perhaps this was a funeral offering, judging from the litters they carried, heaped with fruit and flowers.

"Unquestionably Minoan," one of the observers said, putting his fieldglasses down. "And if Smithers is right about the date, and this is at or around 1700 B.C., then it would be their Middle Period."

"Love the outfits," Carson, the team's electrical engineer, said, taking picture after picture. He didn't have much else to do, in this reality.

"So why are they here, in Tunisia?" Don Holding, the team leader, asked. "That doesn't look like a weekend excursion, Harold."

"Well, the Middle Period was a time of upheaval," Smithers replied. "We don't know exactly what happened – earthquake, invasion, something. But their main palaces were destroyed, and their population was decimated, at least."

"That's one dead in 10, Harold," Lilly said, taking Don's fieldglasses and looking through them. "I heard the numbers were higher."

"Did they abandon Crete then?" Don mused. "Is this what we're seeing?"

"Maybe they're more powerful, here," Smithers said, not appreciating that impudent woman's unnecessary gibe at his vocabulary. "Maybe they have colonies and vassal states. Perhaps they're going to become Rome before Rome even exists."

"I'm sure the Department of Defense will be thrilled when we bring back a chariot for deployment against the Soviets," Don groused.

Lilly was about to offer her opinion on that when a flash of light erupted in the distance, in the direction the procession was headed. The two soldiers with the group took up arms, instinctively, but Don waved for them to hold their ground.

Through their fieldglasses, they saw a hole in space, wavering in the air above the end of the valley. Through that hole came a large, silver, saucer-like spacecraft, which descended silently to the ground. A cheer erupted from the procession, and they all bowed.

"I think you got your answers solved," Carson opined, too shocked to keep taking photographs.

"Them again," Lilly sighed. "Think we can steal a ray gun without losing half the team this time, Don?"

Don set his jaw, crunching the numbers in his head. They had only 24 hours left before they were recalled to their own time. Could they grab an artifact and evade capture for that long? Or should they just observe from a distance, and see what those big-headed alien bastards wanted with this Earth's version of the Minoans?

In the early 1950s, while trying to harness time as a weapon, a scientist accidentally created a time machine of sorts for the American government. Unfortunately, the Time Punch only takes its users into the past of *parallel Earths* – along with numerous other drawbacks. However, as the device occasionally provides an opportunity to discover and retrieve – however temporarily – advanced technology to use against the Soviets, the Cold War military has continued Project Whirligig.

Now in its sixth year of operation, the Time Punch supplies numerous opportunities for discovery and adventure. As written, it provides the GM with a Macguffin for an episodic, ever-changing, parallel-worlds campaign, with some recurring "adversaries" and areas of concern. It could also be used as the "science gone wrong" for a ***GURPS Atomic Horror*** campaign, or provide an adversarial or cooperative relationship for one of the organizations from that sourcebook. The article also suggests a way to dovetail this amazing device with the ***GURPS Infinite Worlds*** setting.

Sixty-Minute Man

The story of the Time Punch stretches back to before World War II, when a brilliant but unorthodox physicist named Dr. Hans Tunell came to Hitler's attention. The young fellow's radical theories on the pliable nature of time captured the Fuhrer's imagination – especially the doctor's notion that it could be sped up or slowed down on a localized basis. Thoughts of a *zeitwaffe* (Time Weapon) slowing down his enemies delighted Hitler, so he made sure Tunell received what he needed to develop his ideas.

Unfortunately for the Third Reich, Tunell's theories never went anywhere. At the war's end, he was captured by American forces, and like many other surviving German scientists, was "paperclipped" over to the United States of America by the OSS. Once hidden over here as Dr. Henry Pierce, his new military masters put him to work on their many weapons programs, hoping to gain an edge over the Soviets. But where most of his fellow émigrés were improving America's atomic arsenal, the good doctor's areas of expertise saw him being pointed toward more *unusual* weaponry – namely, the *zeitwaffe*.

Ensconced at the Department of Defense's Zorilla facility in western Utah, Dr. Tunell worked for years, eventually getting his theories developed enough to create a prototype. The machine took the form of a series of three large, long magnetic tubes – each slightly thicker and longer than the last – nestled within each other in such a way that the inner and outer tubes would spin in different directions while the center tube stayed still. Large and complicated machinery at both ends provided spin. A focusing mechanism "stoppered" one end and directed the energy, sending it to a target bed 20' away.

By adjusting the rate of spin, and the intensity of the magnetic field, the device would theoretically create a "time wave." This wave could be focused and projected at the target bed, slowing or stopping that area's flow of time so long as the device remained on and focused there.

While impractical in an actual firefight, the device could be used as a strategic weapon or a line of defense. Mobile emplacements could negate advancing columns of the enemy, the better to surround them with troops, move past them, or retreat. Enemy planes could be stopped in mid-bombing run, and oncoming nuclear missiles could be paused long enough to launch countermeasures, or at least turn a second strike into a first strike.

That was the plan, anyway.

That's When Your Heartaches Begin

When Dr. Pierce turned the device on, in the autumn of 1953, the *zeitwaffe* did not perform as hoped. Something even more extraordinary occurred: It opened a small, localized field of temporal distortion *within* the enclosed end of the tube. The scientists didn't get a good look at the hazy hole in space before the machine turned off, and the field dissipated, but those with the sharpest eyes claimed they saw a cityscape beyond those mists.

Subsequent activations, viewed with bright lights and a pair of binoculars, did indeed reveal a cityscape: an unrecognizable one, with wildly unfamiliar architecture, but signs in mostly understandable English. The scientists watched for five minutes and then the machine's timer turned it off before it overheated. When they turned it on again, they saw a wide open space with no buildings, and what looked like winged dinosaurs fighting in the distance.

They turned the machine on and off 10 more times, that day. Each time, they saw something different, and no two sights repeated themselves.

This was not what Dr. Pierce had been working toward, obviously, but it was even more exciting. A special platform was built to allow someone to walk to the end of the cylinder, and special recording equipment was brought in. When they next turned the machine on, a group of scientists marched to the end of it, and looked out on a strange reflection of their own world. They could see – but, curiously, not *hear* – a Cairo that was more temple than building, in which motorized, steam-powered chariots raced down expertly cobbled streets, and neon hieroglyphs adorned the buildings.

Then someone, perhaps overcome by vertigo, stumbled and fell, landing face-down in the dirt of a strange, new world. Another scientist reached through to try and get him, and, finding he couldn't pull his arm back, had to go forward. A few more joined them, either out of concern for their well-being or unable to resist such an opportunity.

That was the moment that everything truly changed.

How many lives has been lost
on the cutting edge of discovery?
– Robert Doniger,
*in **Timeline***

Heartaches by the Number

The first, somewhat-disastrous expedition through the time field taught Dr. Pierce and his military superiors a great deal. So far, they've been able to nail down eight certainties.

1. The time field opens doorways to the past, but not *their* Earth's past. Curiously, the machine seems to focus on the most extreme evidence of the difference between their Earth and the alternate one: capitol cities, centers of commerce, the aftermath of pivotal battles, graveyards the size of New England states, impact craters, and so on.

2. The time field is one-way – those who go through cannot come back the way they came. Fortunately, all members of the group fade away from the other reality exactly 72 hours and 23 minutes after the device is turned off. The entire party of explorers – including any dead ones – reappears inside the device at the exact same time.

3. Once the time field closes, the party is completely cut off. Various forms of communication have been attempted, utilizing the electro-magnetic technology that creates the field, but to no avail. Every temporal communicator they try out has failed to do anything but crackle and hiss.

4. Teams cannot leave anything behind. Everything they take with them comes back: food, waste, spent bullets, notebooks, things they burned to keep warm at the end of another Earth – *everything.* This is fortunate, as any lost, stolen, or confiscated records of their discoveries will return to the base for study, even if the explorers, themselves, don't survive.

5. Teams *can* bring things, and people, back with them, but they will only exist in the current reality for exactly 72 hours and 23 minutes. This often gives the scientists just enough time to rip open advanced devices, read history books, and conduct interviews. So far as they know, things and people that are taken into this world fade back into their own, but exactly where they land remains a mystery.

6. The device cannot support two groups of explorers in different worlds at the same time. If the operators send people to one Earth, turn the device off, and power it up again, the previous group will be instantly recalled. There's talk of making a second device, but no one seems ready to commit to its construction yet.

7. The device seems impossible to "aim." The operators can spin the tubes at the same speed, with the same focus, at the same time of day as a previous trip, and it will almost likely show them someplace different. On the rare occasions they've been able to return to a world, it's been later – never earlier – than the previous arrival. Dr. Pierce thinks that changes in the newly confirmed Van Allen Belts are playing a part in the difficulty, but he's not entirely sure how to correct for this.

8. So far as the scientists can tell, the Time Punch cannot take anyone into the future. All attempts to aim it past the current date – by spinning the inner tube faster than the outer – go nowhere: the field won't even form. No one is sure why this is, but the military's top brass is hoping that Dr. Pierce can fix it, and provide them with more futuristic weapons.

I have to object. We need to spend more time exploring. We should gather more information, collect more samples . . .

– Dr. Karen Fast, in ***Ferocious Planet***

No More Than Forever

It is now 1959. Project Whirligig has been going on for six years, and in that time, a number of interesting discoveries have been made. None of them have given Dr. Pierce the time-weapon he was hoping for, but his military superiors are willing to overlook that shortcoming – for now.

The project is housed within the Zorilla facility, located 10 miles west of Beryl, Utah (unincorporated; population: 300). From the outside, Zorilla looks like a railroad stockyard that's seen better days. Only the tight security and hidden armaments give a hint as to what lies below the desert sands: a large, underground parking garage atop numerous concrete bunkers, each housing its own special project.

Zorilla – named after the extremely smelly, African "striped polecat" – is run by the Department of Defense. Since the end of WWII, it's been tasked with various secret military projects that have potential, but are either too weird or dangerous (sometimes both) to have associated with more legitimate weapons research. The joke is that the Pentagon sends the government's favored kooks out to Zorilla so they don't have to smell them. Psychic research, gravity guns, biofeedback, mind control, and battlefield-ready robots are just some of the projects, and there are whispers of darker things going on at the deepest levels – arcane, evil sciences wrested from the Third Reich during the European Occupation.

Lieutenant Colonel Lionel G. Bergman oversees the many secret projects going on within the facility. Stentorian and cocksure, Bergman is keenly aware that – so far as the colonel he reports to is concerned – Project Whirligig is *the* make-or-break effort for the whole facility. He's also keenly aware that it's the make-or-break for his own career, which is reputed to be quite spotty in places: strange and scandalous goings-on in postwar Europe, they say. If he ever wants to make colonel, and get out of Utah, he'd better find them a ray gun or the mother of all A-bombs.

Bergman's put his favorite major, a human bulldog named Roger Smythe, onto the case. Major Smythe delights in making frequent unscheduled visits, and isn't above dressing down scientists at work. The lieutenant colonel also makes a point to frequently have Pierce and Smythe up for lunch in his office – meals Pierce does not enjoy, given Bergman's tendency to harp on what the German scientist did during the war, and Smythe's brutal assessments of his personnel and progress.

Pierce is in charge of Project Whirligig's operations, giving him dominion over the Time Punch itself and the three regular "Go Teams" who travel through it. He is also in charge of overseeing the recruitment of new talent to replace team members who don't make it back alive or who prove unsuitable.

The DOD always has an eye out for scientists without much in the way of family or friends who could possibly "disappear" into western Utah for a few years. Such persons are subjected to a rigorous clandestine security check, and then brought out to Salt Lake City for Pierce and Smythe to evaluate them. If they can handle Pierce's oddball questioning and Smythe's tendency to look like he wants to eat their skin, they're at least halfway there. If they see films of the Time Punch in operation and look amazed instead of scared – or a little *too* eager to go through it – they've probably got the job.

Rock Around the Clock

Whirligig maintains a "three weeks on, one week off" rotation. The Time Punch is activated at 0600 hours Monday for five minutes, the scientists on the Go Team return starting at 0623 hours Thursday, and any artifacts and "guests" go home Sunday starting at 0646 – like clockwork. The last week of the month is maintenance, overseen by Pierce, Smythe, and a small army of engineers and mechanics. No one else is allowed to enter, much less watch. Anyone that's broken this rule has been quickly and harshly "reassigned," never to be heard from again.

Three Go Teams are maintained at all times. Each team consists of a total of 20 persons – mostly scientists – led by a historian. Only 10 go on a mission, and who participates is decided by the leader, who makes the selections based on what he sees through the field. As they've only got five minutes to hustle through the field, the decision has to be made pretty quickly, and isn't always the best one.

In addition to the lead historian, the other fixed members of the Go Team are two soldiers, both of whom have extensive training in first aid and unarmed combat. They take their orders from the team leader, regardless of how unorthodox or questionable those orders may be. If there's any question as to those orders, the matter can later be addressed to Major Smythe when the team returns.

The other 17 members of each team are scientists with a wide variety of specializations and language skills, and many individuals having cross-discipline training. Cultural anthropologists, specialized historians, linguists with a wide command of languages, and electrical and mechanical engineers almost always make the cut. The leader can then round the team out with archaeologists, astronomers, botanists, chemists, geologists, geographers, literature experts, paleontologists, physicists, and psychologists, depending on his gut instincts.

Once the field turns on, one of the two soldiers goes first, wearing a specialized oxygen mask and carrying various atmospheric and radiation sensors. While the team leader's makes his initial assessment, the soldier secures the area and determines if the environment is nonhazardous. If he gestures thumbs-up, the other soldier follows, the team leader starts shouting out names, and the team members hustle on through. If he gives thumbs-down, then that poor soul is on his own, and can hopefully find breathable air before his supply runs out.

The overall mission is simple – find useful things to bring back for examination. "Useful things" generally means items of advanced technology from realities that are further along the curve than this one, especially in weapons research. If such items aren't to be found, then the most advanced or intriguing things that can be discovered will do. Written histories are a massive plus, and the team almost always takes numerous photographs with special, miniaturized cameras.

The complications are in determining where they are, what year it is, and learning as much about the history and culture of the area as they can. Most important of all, the team should avoid being detected by the natives at all costs. Fortunately, even if they're captured, they'll come back to Earth in exactly 72 hours, but they run the risk of being tortured or killed during that time.

Meanwhile, the other half of the Go Team prepares a suite for whatever, or whomever, the away team brings back. When the "away" team reappears, any artifacts they retrieve are taken away to be photographed, described, scanned, and then taken apart and tested to see how they work. Any "guests" they bring back are kindly but firmly interrogated about their lives and livelihoods; those with weapons-engineering skills are put to work creating weapon diagrams, or explaining how they work.

Once the artifacts and people fade back home, Sunday morning, the team spends the next two weeks recording everything they can remember about their experience, and being extensively debriefed. The interviews are normally done by other members of their Go Team, though on the occasions that something really promising is uncovered, Major Smythe and a number of imported DOD scientists sit in on the interviews, quickly turning them into interrogations.

If any strange commands were given by the team leader, this is also the time he's made to account for them. Smythe just *loves* going over such things, as it means he can file a complaint with Bergman, and possibly get the offending team leader busted down or even thrown out of the Project altogether. Such occurrences rarely happen, but on those rare times that the two officers can justify getting one over on the scientists who get to tell their soldiers what to do in the field, they take full advantage.

Following the interviews, the entire team gets a week's paid vacation. They aren't allowed to leave Utah, due to security reasons, so most of them can be found in Provo or Salt Lake City. They're supposed to buddy up to avoid trouble, as well as keep an eye on each other, but this mandate is not always followed (see *Spies,* above).

Spies

Bergman is right to be suspicious: There are *two* spies at work in or around Project Whirligig.

One is a scientist on Go Team 3. Codename Heel-Toe is a metallurgist/electrical engineer who has worked on weapon artifacts from the Electric Renaissance, and kept secret notes about what he's found out. He drops them off to a Soviet agent in a particular diner on the way to Provo, telling his anti-tobacco vacation buddy he's going outside for a smoke.

His reward is $1,000 per piece of useful information tendered, kept in a bank account under a false identity the Soviets set him up with. When he retires from the Project, he plans to collect his money, assume the identity, and go live the good life somewhere tropical.

The other spy is a winsome but dopey-seeming young lady who's taken a shine to a rather homely anthropologist on Go Team 1. She meets up with him in Salt Lake City (once his ladies' man travel partner's gone off to chase skirts), and spends the week showering him with affection.

Codename Lonely Heart realized very early on that the fellow wasn't going to talk directly about work, as he takes his job quite seriously. So she pretended to be interested in science fiction, and asked him to tell her stories instead. He, knowing a good thing when he had it, decided to tell her what happened on their missions, but pretend it was just crazy pulp stories. The girl, who is *anything* but dopey, records these sessions on a hidden, miniaturized recorder, and funnels the information back to her Kremlin masters.

Maybe Tomorrow

So what do you do with a machine that can temporarily send people to any place or time on any parallel Earth, but can't be aimed worth a broken vacuum tube? Anything you want.

The Time Punch gives the ability to have a new world of the week, without a massive time and work commitment on the part of the GM. Since the PCs get only 72 hours to play in it, this means the GM doesn't have to design an *entire* civilization every few game sessions. All that's needed is a location, a historical period, a few "what ifs," and a plot hook, and away you go.

To fully utilize the setting and device, the adventurers should be members of a particular Go Team: scientists who spend their time jumping into holes in reality, or the soldiers who protect them. It might work best to have a number of those scientists be "community property," so that every player can play on the Go Team. However, if the GM and players don't mind splitting the narrative, the game could switch back and forth between those hunting for artifacts, and the ones preparing to receive them.

While worlds of adventure wait through the Time Punch, there's also wonder, intrigue, and hidden danger back at Zorillo. Apart from having Major Smythe crawling into the PCs' business every time they turn around, there's also scientific rivalry and one-upmanship, and the usual early Cold War-period worries about Soviet spies and espionage. Lieutenant Colonel Berg is convinced the Commies have gotten into the facility, and is near-ruthless in trying to ferret them out, creating all kinds of opportunities for off-mission action and investigation. Getting to play with, and recreate, artifacts from other Earths can prove challenging and dangerous, especially if the scientists don't know what all they do.

Other hazards are also associated with any kind of "weird science" outfit. What happens if the killer robots from the next project over get loose and go on the rampage? Is there any truth to the rumor about what's going on in the basement with those weird "tech manuals" they found in Berlin? Will the gravity bomb cause a massive sinkhole if it malfunctions?

Moments to Remember

In its six years of operation, the Time Punch has deposited Go Teams on hundreds of different Earths, and shown them both wonders and terrors. Some of the wonders come in the form of worlds that the device takes them to more than once, as if it's trying to show them something important. Some of the terrors come in the form of "adversaries" who are also engaged in time-hopping, of a sort, and may someday appear on this Earth – and may have already.

The Electric Renaissance

One of the project's earliest success stories, resulting in more than a few interesting artifacts, was a highly technological version of Renaissance Italy. Go Teams have encountered it a total of five times over the years. Each time they return, that reality is much more advanced, yet more unsettling than the time before.

The first trip landed Go Team Two in Florence in 1650. The city had power lines and telephone poles, and its streets were full of three-wheeled vehicles that ran on electricity. The reality hadn't gone very far with handguns yet, but the city guards carried battery-powered, electrical "stunners" that could knock a healthy-sized man down. The Go Team took a few stunners back for investigation, but never discovered how this Earth's Florence had become so advanced.

Subsequent encounters took place in 1670, 1683, and 1703, and each time the technology was slightly more advanced, and the city guards even less friendly than the time before. The last time a Go Team made contact, in 1715, the technology level had jumped exponentially: cities were plastic and steel, power was conducted through the air, and teleporter tubes were everywhere. People were seamless amalgams of man and machine, mostly seen standing around in public squares like marble statues, eyes closed and seemingly talking to themselves.

The Go Team was not accosted, this time; no city guards were to be seen anywhere. Although they got the distinct feeling they were being watched, and even followed, they thankfully reverted back to their Earth before their observers caught up with them.

No new records or books could be found, so how this Earth's technology accelerated that far that fast remains unknown. The artifacts they brought back were so advanced that the scientists who disassembled them couldn't figure them out in the scant timeframe. Most shocking of all, they tried to hold on to someone and bring him back, but when they faded away, he did not come with them – something that has *never* happened, before.

One note of interest: records they brought back from earlier visits made no mention whatsoever of the Black Plague, or Leonardo da Vinci. What this could mean is unknown – it seems highly unlikely the lack of plague and polymath could have affected things *that* much. But until the history of this Earth is better understood, it remains a starting point.

The Flying Saucers

First encountered in a version of 400 B.C. Tibet, the large, highly advanced, sphere-headed aliens have proven to be an infrequent but daunting thorn in Whirligig's side over the last six years.

The aliens are humanoid, but their exact features are unknown, as they have never been seen out of their sleek, silver spacesuits. They stand roughly 8' tall, and two of those feet of height are the featureless, spherical helmets they wear. They carry short, silver beam pistols with hexagonal barrels. They occasionally have small, handheld "scanners" that don't seem to do anything except maybe relay information to their helmets or spacecraft.

The beam pistols fire silent, white beams, and are capable of assuming full or partial molecular control of their targets. Victims often have their molecules locked – freezing them in place – so the aliens can examine them or carry them back to the ship. More belligerent or useless victims are usually completely disintegrated, though there have been instances where the aliens have only destroyed a small part of a target, such as a limb or hand.

The aliens travel in large flying saucers, measuring 50' in diameter and 30' high. The spacecraft resemble two tea saucers seamlessly placed atop one another, and have no visible weapons, or means of propulsion. A hexagonal door silently slides open when they disembark, revealing an interior so brightly lit that nothing can be seen. It then quickly slides shut once they're out. The ships have no visible exterior source of illumination, but at night, the craft is clearly visible, resembling an object front-lit by the sun ahead of a dark thunderstorm.

It's Almost Tomorrow

A GM who is well-versed in ***Infinite Worlds*** may be thinking of ways to fit the Time Punch into that campaign setting, or wondering if Project Janus from the Theoretical Science Project featured in ***Atomic Horror*** is up and about. He may also wonder what happens to scientists who stumble into the lab during the ultra-secret "off week" when the Time Punch is supposedly being cleaned.

One answer can put the different pieces together: the ultra-top-secret Project Pinwheel.

The truth is that the Time Punch *can* take people into the future, but no one who has gone there has ever come back. Worse still, the time field that's created is pitch-black, and no one can see through it to where they're going. They *can*, however, hear it, and if the noises they hear are judged to be "safe sounding," a volunteer is sent through on behalf of Project Pinwheel.

The volunteers come from the pool of scientists for Whirligig. Those who wash out are sometimes given a chance to try out for this instead, but hapless fools who blunder into Pinwheel are often "volunteered" in their place. Volunteers are loaded with survival gear, cameras, and a journal. They are instructed to find out everything they can about the future – especially its weapons. If they can find a way back, they should do so, but they're promised that, when the project develops a way of coming to get them, they will be retrieved.

This is the reason for Project Janus, at the Theoretical Science Foundation. The scientists there – who have no idea of their backers' true motives – are using modified Time Punch technology to create a time machine that can go *forward*, hopefully with better control. Unfortunately, while their device shows what appear to be alternate futures, anyone who goes through the field does not return either. Janus' scientists are baffled.

Why does no one return from the future? Infinity Unlimited grabs them, garbles their memory, and puts them to work for the company. But the I-Cops do not seek to shut down any of the projects, knowing that both devices will burn out in 1966, when a coronal mass ejection causes a massive geomagnetic storm almost as bad as the 1859 event. Dr. Pierce will have sadly died of a heart attack the year before, and, without his guiding hand, neither machine will be repairable.

The useless devices will eventually be destroyed, but not before careful records are made of how they worked and didn't. Those records eventually find their way into the hands of a Dr. Paul van Zandt, who uses their failings to create his own, successful device, and with it, Infinity Unlimited. Thus does the perfect circle of history close.

Of extreme interest to the project is the spacecraft's tendency to appear through what seems to be a time fissure. It has been hypothesized that the aliens have harnessed the same forces the Time Punch uses in order to travel through time and space. However, they do not seem to be under a time limit, and have not been seen to fade away. When they leave, they re-enter their spacecraft, open a time fissure, and go through it just before the hole vanishes.

Project Whirligig has made 10 confirmed contacts with these aliens. The first one resulted in the near-annihilation of the Go Team when they tried to open peaceful communications with the beings. All subsequent encounters have consisted of the Go Team observing from a distance, and trying – when possible – to retrieve samples of their advanced equipment and weaponry. So far, these attempts have proven unsuccessful.

Go Teams have also landed in up to 50 Earths where the beings have clearly been there. On some of those Earths, their presence is recorded on the monuments and temples of thriving civilizations, and seems to indicate that their visits were peaceful, perhaps even beneficial. On others, the celebratory markers are crumbling, and the civilizations are missing, with their last records often indicating that the sphere-headed beings were unhappy with them. Some speak of annihilation, others of being harvested like wheat.

Temporally Broken Worlds

Some Earths that are visited are dead – killed by meteorites, plague, war, invasion, or strange cosmic hazards the Go Teams can sometimes only guess at. One such hazard is the horrible tragedy that occurs when the walls of time itself break down, and all history happens at once.

On such worlds, time is seriously out of joint: Day turns into night, and winter into summer, within seconds. Dinosaurs attack medieval kingdoms and are repelled by B-1 bomber raids. Fiery cataclysms erupt, then freeze, and go backward. Small tendrils of Earth's molten and toxic past – or possibly its far future – erupt without warning into the present moment, and then vanish as quickly as they came, leaving scores dead in their wake.

The DOD loves it when these kinds of expeditions happen, because the chance of finding usable technology is almost certainly 100%. But the Go Teams hate them, and often try to abort the jaunt if they know they're heading into one. To be left mostly unprotected in the face of such terrible forces is bad enough, but the populations of such words have almost always been driven desperate and insane by these temporal shifts, and tend to blame any strangers for their misfortune. If the elements don't kill the Go Team, the combined armies of Stalin, Tamerlane, Cheops, and human monsters yet to be born probably will.

About the Author

By day an unassuming bookstore clerk, J. Edward Tremlett takes his ancient keyboard from its hiding place and unfurls his words upon the world. His bizarre lifestyle has taken him to such exotic locales as South Korea and Dubai, UAE. He is a frequent contributor to *Pyramid,* has been the editor of *The Wraith Project,* and has seen print in *The End Is Nigh* and *Worlds of Cthulhu.* He's also part of the *Echoes of Terror* anthology. Currently, he writes for Op-Ed News, and lives in Lansing, Michigan, with his wife and three cats.

Random Thought Table

Safe Landings!

by Steven Marsh, *Pyramid* Editor

*"This is the maiden planetary survey for the **Epiphany** crew," said Captain Carlton. "Keep your eyes sharp and your mind sharper. It's dangerous out there!" The captain and his crew stepped into the transportation beam.*

Unfortunately, they beamed onto an unstable patch of ground and immediately plummeted to their deaths.

*The announcer's voice booms: "We hope you have enjoyed . . . **Space Trek!**"*

One of the core assumptions of any planet-hopping game is that the act of hopping to another planet doesn't have any inherent problems; the genre presumes that the primary dangers of landing on any random galactic mudball have been mitigated enough to allow for adventure on the planet itself. This makes sense – unlike our intro, it's not good gaming to kill off the heroes before the opening credits – but it can lead to even cooler adventure possibilities to examine why this is the case. Here, then, are some broad ideas for how the inherit dangers of putting your boots on an alien world have been mitigated – and what the implications of those ideas are for adventure.

The Machines Are Good

The default presumption for most superscience settings (such as *Star Trek*) is that the transportation method's scanners and computers are advanced enough to detect unusual or dangerous disembarking situations. These ultra-tech systems then reroute or modify the disembarking destination so that the transporter/shuttlecraft/wormhole drops its explorers somewhere nonfatal.

This assumption makes a fair bit of sense. If our modern ***Angry Birds***-playing computers are able to detect planets in other *solar systems,* it's not entirely unrealistic to presume they'll be able to pinpoint quicksand and subterranean plutonium by the time we're hopping around to other worlds.

However, trying to pin down computers' capabilities a bit opens up new possibilities, and can help shape the gaming universe.

"Ah Need Moore Time, Captain!"

Let's say that spaceships' systems are sophisticated enough to unerringly determine a spot suitable for landing humans. Does this process need to be instantaneous? If the aforementioned modern-day computers can take months or years to verify the existence of planets in other solar systems (not even counting the time required for peer review of those findings), why should superscience systems be instantaneous in its assessments?

Tweaking this default assumption opens the door to a number of options. Let's say it normally takes 18 hours for the computer to find a safe spot for its heroes. After 18 hours, the transport's systems are assumed to get its travelers to their destination with no environmental danger; otherwise, it's only safe on a 3d result that's under the number of hours spent scanning (after 17 scanning hours, it's safe on 17 or less; after 11 hours, it's safe on 11 or less; etc.). It's up to the GM to determine what effect, if any, skill or ability has on this evaluation process. Those 18 hours are easy enough to handwave away in most situations, where it can be assumed to be done before the opening credits, while the ship is traveling in-system, or whatever. However, by having a hard-and-fast system in place, you can start building adventure possibilities around it.

It's Perfectly Safe! (Outside of the Immediate Mortal Peril, That Is . . .)

The genre abounds with examples of the heroes beaming onto an alien world only to be immediately captured by armed guards or attacked by Galactasmanian hellbeasts. That's completely fine! However, it's exceptionally rare in the genre for the disembarkation point itself to pose a hazard; one of the few iconic examples is Luke getting his X-wing stuck in a swamp in Dagobah. Our discussion here limits itself to how the campaign gets its heroes safely to the planet surface so they can start adventuring – don't take any ideas here as suggesting that you shouldn't place explorers in immediate adventuring peril as soon as the wormhole closes!

- Having arrived safely the first time and gotten into mischief, the heroes need to beam elsewhere on the planet before Something Bad happens. They must balance "getting there quickly" against "getting there alive."
- The explorers are in a race for a MacGuffin, before a competing agency gets there first.
- It's been 19 hours since the sensors began scanning this planet, and they still don't report a safe landing spot. What's going on?

A technique like this also neatly answers the long-standing question, "Why don't they just beam off the planet and beam back somewhere more useful?"

The Humans Are Smart

As a flipside to assuming that computers are good at ensuring human safety, it's logical to presume that humanity itself does what it can to ensure it isn't beamed into a block of rock.

This might be represented as a skill roll of some sort, although given that the price of failure is often "whoops, everyone dies," it might be better to handwave it away as an "always works" feature. This might be a variant of the Standard Operating Procedure perk (see ***GURPS Power-Ups 2: Perks,*** p. 15), say:

Safe Lander: You always double-check the immediate safety of any new-world landing destination, ensuring you don't arrive in mudpits, atop radiation deposits, amid unbreathable gasses, etc. This doesn't obviate the need for appropriate survival gear or other precautions; rather, it ensures that if material needs are resolved, you've done everything in your power to ensure it'll be a safe disembarking (or you know it's *not* a safe disembarking ahead of time).

If 1 point seems too cheap for such an ability (which, again, exists more as a lampshade of "why don't the heroes die before the adventure begins"), the GM might require specialization. One possibility is based on *World Types and Skills* from ***GURPS Space*** (p. 75) – thus: Safe Lander (Standard (Garden)), Safe Lander (Asteroid Belt), etc. – but other subdivisions are possible.

By codifying the technique that the party relies on to ensure a safe landing, you can use any modifications normally permissible within the rules. For example, with one of the design systems from *Pyramid #3/46: Weird Science,* you could build this perk into a device; the ability to land safely on a world now depends on having the right thingamabob – and where there are thingamabobs, there's the ability to fight over them, lose them, etc.

The Humans Are Lucky

For a really unusual campaign, what if humans are just *lucky?* This isn't as preposterous as it seems; one of the assumptions of FASA's old ***Star Trek*** roleplaying game was that humans were innately luckier than other alien races. This might be bought as:

Serendipity (Accessibility, Only when landing on an alien planet and only to do so safely, -60%, Preparation Required, 1 minute, -20%) [3].

The 60 seconds of preparation time is the standard "pushing random buttons and prepping the away team" filler that every sci-fi show seems to have. This modified advantage means that humans (or at least those who possess this advantage) have an innate knack for stepping into the transporter/shuttlecraft/wormhole and ending up someplace that isn't going to kill them. In a universe that's even remotely realistic – at least, as realistic as a setting that casually utilizes Serendipity can be – this would give humanity a huge intergalactic advantage; being assured that you're not going to die when you set foot on a planet is a leg up on the less-advantaged competition.

In fact, humans might have a more generalized version of this:

Serendipity (Accessibility, Only when landing on an alien planet, -40%, Preparation Required, 1 minute, -20%) [6].

Not only does this get heroes safely to their planet-bound destination; it also allows them to wind up in the thick of the action on occasion. (When beaming down to a populated planet the size of Earth, how do the crew happen to end up amid the coronation ceremony of the crown-price, at the exact moment an assassination attempt is about to be made? Just lucky . . .) Again, if this is a feature of humanity, then it gives them an edge and explains why 80% of the galaxy is human or humanoid (outside of budgetary constraints, of course), and also justifies including at least one human on any away team.

Putting It Together

As we've done many times in the past here at Random Thought Table, one of the joys of poking these obscure corners is that you can come up with interesting ideas that weren't possible before. For example, none of the preceding ideas are exclusive, and they might all be used in the same campaign.

Example: The Galactic Spaceways

In this example worlds, the Terrans use a modified Serendipity to explain their niche in the universe; captains tend to have the 6-point level while the rest of the crews have the 3-point version.

Meanwhile, the savage Stickons have had to use their smarts rather than innate luck; they each spend points on the perk that lets them get planet-bound safely. Dedicated teams might all be devoted to one type of planet (freeing up some points to give them a slight edge against those smarmy Terrans), while more general-purpose warriors typically spend more points on the perk's different varieties . . . putting them at a disadvantage point-wise while not being left to the whims of the gods (GM).

The rest of the alien species make do as best they can with computers and sensors, putting them about 18 hours behind Terrans and Stickons in the same situation . . . or less, if they're willing to take a risk (which isn't so risky, for any alien captains who happen to have the Luck advantage).

About the Editor

Steven Marsh is a freelance writer and editor. He has contributed to roleplaying game releases from Green Ronin, West End Games, White Wolf, Hogshead Publishing, and others. He has been editing *Pyramid* for over 10 years; during that time, he has won four Origins awards. He lives in Indiana with his wife, Nikola Vrtis, and their son.

Odds and Ends

Legacy Devices

Safe Landings! (pp. 35-36) looks at a few possibilities for how interplanetary explorers might land safely on alien worlds. One possibility that isn't mentioned is that the method of planet-hopping *itself* assures that the travelers will arrive intact. This is often the case with (for example) legacy alien technology, such as trans-planetary portals or unusual artifacts.

The fact that the utilized tech is keeping the heroes safe can lead to its own adventure possibilities, especially if the method of transport is limited (once per day, preprogrammed locations only, no more than 10 lbs. of gear per traveler, or the like). From an adventuring standpoint, the primary door this opens is that anyplace the artifact doesn't permit access to is . . . well, inaccessible. If an interplanetary gate always dumps voyagers on the equator of one world, and it's not easy to bring vehicles (or vehicle parts) through the portal, then it's going to take some effort to get to the poles or across that gargantuan ocean. It's time to negotiate with those Viking-like natives!

This option combines well with the others listed in *Safe Landings!* If an event-free landing takes 18 hours to get anywhere on the planet, or instantaneously (and safe) if landing on one preprogrammed spot, then this can help shape the campaign: The preprogrammed instantaneous locale will likely be a hub of activity, while the rest of the planet is still open to adventures off the beaten path. And if humans are the only ones with enough luck to reach the rest of the planets in the solar system safely . . . well, a whole other avenue of adventure opens up . . .

Harmless!

– The Hitchhiker's Guide to the Galaxy, *on the topic of Earth.*

About *GURPS*

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

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

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

GURPS rules and statistics in this magazine are specifically for the ***GURPS Basic Set,*** *Fourth Edition.* Page references that begin with B refer to that book.