

FREELANCE TRAVELLER

The Electronic Fan-Supported Traveller® Magazine and Resource



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Freelance Traveller is published monthly in PDF form by the editor. The current issue is available from the Freelance Traveller web site, <http://www.freelancetraveller.com>.

From the Editor



In some sense, this month's issue represents a milestone for *Freelance Traveller*—it's one year since we posted our initial eight-page proof-of-concept issue. We don't consider this the last issue of our first year—or the first of our second—as we didn't actually start regular monthly publishing until January of this year. So far, the *Traveller* community has contributed 290 pages of material to us, and we expect the total to be around 320 when next month's issue (December 2010) is made available for download. That's a *very* respectable body of material for an Annual, and it's the *Traveller* community that has made it possible to do it without dipping into our sizeable “backlist” of articles posted to our website from the pre-magazine days. Thank you for your support, and please keep it up!

Our editor went to TravellerCON/USA for the first time this year, and “had a blast”. It was a great opportunity to meet some of the *Traveller* community in person, including some of the third-party Traveller publishers, and to actually *play* instead of

just talking, and watching from the sidelines. A venture into miniatures gaming (under Full Thrust rules) was less successful in terms of game goals than it might have been, but was loads of fun, and opened up a new vista. We fully intend to support Traveller miniatures gaming in future issues of the magazine, and urge the community to submit miniatures-related material in addition to the types of material that is represented in 290 pages of our magazine.

Our experiment with forums hasn't worked too well, quite honestly. The feedback we've gotten suggests that part of it is organization, part of it is the poor software we're using, and part of it is lack of focus. So... we're temporarily shutting them down, and rethinking them. They'll be back in the new year, with new software and a focus on supporting the magazine first, and the general Traveller community second. ‘We'll have forums for submitting articles and commenting on them, for the Essay Questions, and for some other ideas that we'd like to test out. We hope you'll come back in January to join us!

Critics' Corner

d66 Compendium

reviewed by Jeff Zeitlin

d66 Compendium. Dale C. McCoy, Jr. and Albert Beddow, Jr.

Jon Brazer Enterprises <http://www.jonbrazer.com>

48pp, softcover

US\$12.99

Jon Brazer Enterprises has taken a simple idea and turned it into a convenient tool for the rushed referee.

On the Shelf

The black cover is centered around a large graphic of a starship-over-planet scene. Below the graphic are the Foreven Free Sector logo and the Traveller Compatible Product logo; above is the Jon Brazer Enterprises logo (done in black with a dark-green 'glow') and the product title. The 'd66' is rendered as the letter 'd' followed by two die images displaying the six side, rather than as numerals.

Initial Impression

The book is laid out well; with comparatively large type and alternating grey and white bands in the lists, it is not at all difficult to read. Most pages have two lists per page; several have only one list and some artwork (but the list items are long enough to preclude putting a second list on the page), and a very few pages – basically, just the first page of a section – are essentially full-page art.

On Closer Inspection

The individual lists are generally unexciting, and 'prosaic' would not be inappropriate for some. Few of the entries provoke sufficient interest in and of themselves to cause players to ask 'what is that?'; it is left up to the referee to establish the context to provoke such questions. Arguably, that's the right place for it, but would a referee who feels the need to use a product like this feel himself generally to be in a position to expand upon a mere three-word description?



For some of the lists – especially some of the 'ethnic' name lists – the player or referee that is familiar with the Traveller canon in some detail could question the sources for the lists, but this doesn't really detract from the utility of the product.

Summary

One can play Traveller, and one can play with Traveller. Those who do the latter probably don't need a product like this; in fact, they're the ones that are most likely to create such products. Nevertheless, for the referee who seeks to minimize the time preparing for an adventure, or who suddenly finds himself at a loss for a name or an item of some sort, lists and compilations of lists like this can be quite useful. On that basis, the sheer number of lists makes this a good value.

Early (TL8-10) Gauss Rifles

by Scott Diamond

15mm Railgun (1st Gen Gauss Rifle)



The first generation of gauss rifles comes in at TL-8 with the 15mm Materials Demolition Weapon, otherwise known and operated as the first man-portable railgun. The weapon throws a heavy armor penetrating slug at high velocity and with minimal drop. It has similar damage, range, and armor penetrating statistics as the earlier Light Assault Gun, but both the gun and ammunition are lighter since the rounds don't require propellant and the gun's construction is simpler and uses more composites.

The sabot round accelerates the length of the two rails with spin imparted by fins. The rounds come in solid tungsten AP darts or kinetic energy armor penetrator-high explosive (KEAPER). High explosive armor piercing (HEAP) rounds were found to not function well given the extremely high velocity of the weapon which caused them to merely shatter on impact with a hard target.

The weapon has no heat signature, but the rounds do make a distinctive crack when leaving the rails towards the target. Nonetheless, the weapon is far stealthier as a sniper weapon than CPR designs that were equipped with suppressors.

To power the weapon a laser carbine power pack is used to provide enough power for 20 shots. A 10 round box magazine is inserted behind the pistol grip while the power cable is connected at a jack in front of the trigger guard. The weapon is equipped with a scope, bipod, and collapsible stock.

Length: 850mm, Weight, Unloaded: 3500g (Magazine 300g). Base price: Cr9,000 (Magazine 300Cr). Tech Level 8

20mm Railgun (2nd Gen Gauss Rifle)



The second generation of gauss rifles is the TL-10 20mm Squad Support Gun (SSG-20r). This weapon development incorporated lighter materials with a more efficient railgun acceleration system to propel a 20mm slug at near-hypervelocity. The weapon requires the use of a laser rifle power pack jacked into the socket in front of the trigger guard which powers the weapon for 40 shots. The 10 round box magazine is inserted behind the pistol grip. The operator fires the weapon from a prone or rest position using the bipod and included battlesight (image enhancement and telescopic).

The weapon uses fin-stabilized discarding sabot armor-penetrators, KEAPER, and HE rounds. It fires either single shots or a 5 round auto-burst. Care must be taken when firing in burst mode not to overheat the mag-rails or they can warp, rendering the weapon useless since it will require an armorer's shop to replace and align rails. This is why the magazine capacity was decided to be limited to 10 rounds; the extra time taken to reload also allows for cooling between bursts. The weapon is most useful in single shot mode against light armored vehicles and reinforced positions by taking advantage of the greater velocity and kinetic impact of the penetrator rounds than can be fired by other man-portable weapons other than ATGM's.

Length: 1,000mm, Weight, Unloaded: 3,700g (Magazine 400g). Base price: Cr10,000 (Magazine 250Cr) Tech Level 10

(Range, Armor, and Dexterity Modifier tables for both weapons may be found on the next page.)

In A Store Near You

15mm Material Demolition Gun (MDG Mk VI)

TL-8

Range Modifiers						
Ammunition Type	Close	Short	Medium	Long	Very Long	Damage
KEAP	-6	0	+3	+2	-1	3D
KEAPER	-6	0	+3	+1	-2	3D+4
Armor Modifiers						
Ammunition Type	None/Jack	Mesh	Cloth	Reflec	Ablat	Combat
KEAP	+4	+3	+2	+4	+4	+1
KEAPER	+3	+1	+1	+4	+4	0
Dexterity Modifiers						
	Required Level	DM		Advantageous Level	DM	
	6	-1		9	+2	

20mm Squad Support Gun (SSG-20r)

TL-10

Range Modifiers						
Ammunition Type	Close	Short	Medium	Long	Very Long	Damage
KEAP	-7/-8	0/-1	+4/+5	+3/+4	0/+1	4D
KEAPER	-7/-8	0/-1	+4/+5	+2/+3	-1/0	4D+4
HE	No	No	+2/+4	+1/+3	-1/+1	3D
Armor Modifiers						
Ammunition Type	None/Jack	Mesh	Cloth	Reflec	Ablat	Combat
KEAP	+4/+6	+3/+5	+2/+3	+4/+6	+4/+5	+1/+3
KEAPER	+3/+5	+1/+3	+1/+2	+4/+6	+4/+5	0/+1
HE	+4/+6	+3/+4	0/+1	+4/+6	+3/+4	-1/0
Dexterity Modifiers						
	Required Level	DM		Advantageous Level	DM	
	7	-1		10	+2	

Dead Hand

by Jeffrey Schwartz

The party completes an adventure in which the payoff is a deed to a large amount of land/wealth/ship... however, it must be signed off by Count Lassar for the transfer to be legal.

After a long journey to his fief, they discover the Count is in residence.... and is, in fact, the Last Count of Fallen Lassar. If he dies without heir, the title and fief, and all holdings revert to the Imperium, which includes the item the players have deed to. The count is well into old age, and the medication used to deal with nerve injuries from years ago interferes with anagathics.

During his last aging crisis, the Count fell into a coma. Thinking fast, the Count's personal physician

stuck him in a low berth... and then talked it over with the Seneschal.

In effect, the staff have staged a 'palace coup', with the administrator of the Count's fief handling all affairs in his name, and no one telling the outside world the Count is on ice, since doing so would mean the entire staff losing their cushy jobs, and numerous starship crews finding their ship's ownership in question, etc.

In come the players, asking for just a minute of the Count's time to sign this paper...

Optional additional complication:

An Imperially-chartered megacorporation has a production facility on the same world. If the world reverted to Imperial holding, their tax rates would go way down.

Doing It My Way

The Psiren – A New Psionic “Talent” for *Traveller*

by Jeff Zeitlin

In incarnations of *Traveller* to date, the focus of psionics has been giving PCs active talents – talents that they can use voluntarily to accomplish certain aims. This overlooks an entire class of talents: passive talents, which the PC cannot voluntarily invoke, and which generally act to thwart the ability of active psions to use their talents in some way. This article covers one such, which I've chosen to call the “psiren”.

General Description

The psiren's ‘ability’ is completely involuntary, being invoked automatically whenever the ‘fight-or-flight’ reflex or the ‘startle’ reflex is activated. It causes the psionic talents of all other psions in the vicinity to go haywire, turning them back on their possessors. The effects are both random and predictable; that is, the exact results cannot be predicted, but what generally will happen to a particular psion can be predicted reliably. In all cases, the psiren is

(psionically) unaffected. The psiren's effect lasts until the psiren character has had time to evaluate the situation consciously, usually no more than thirty seconds – but in those thirty seconds, quite a lot can happen to nearby psions.

Psiren Effects

The specifics of the psiren's effect is dependent not only on the ‘targeted’ psion's talent(s), but on the psionic strength of both the psiren and the target. In all cases, use the greater of the two strengths to determine the magnitude of effect. Specific effects should be determined by the referee; in general, the idea is that any psionic talent in the vicinity – except other psirens – is turned against its possessor. In all cases (except for the psiren and any psirens in the vicinity, who are not affected (but who may be triggered by the unexplained and unexpected events happening to other psions in the vicinity)), the application of the effect also causes expending of all available psionic strength points, with the normal requirements for regeneration. Some examples:

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- A teleport will suddenly find himself teleported away in a random direction, to the maximum possible range given the greater of his own psionic strength or the psiren's. Any talent-related protections against materializing in solid objects, or requirements that the teleport know his destination, are not in effect.
- Psionic shields will, instead of deflecting psionic energy, draw it to the psion, effectively resulting in a psionic assault.
- Pyrokinetics will find themselves set on fire by their own talent.
- Telepaths and clairvoyants (including clairaudients and danger-sensors) will suffer the psionic equivalent to sensory overload. If there is enough psionic strength involved, the overload could result in permanent damage to the psion.

Discovering the Psiren

In any situation where a participant may have their startle reflex or fight-or-flight reflex triggered, and where there are known psions, roll 4- on 4D6. If this roll succeeds, someone whose startle/fight-or-flight reflex has been triggered is a psiren, and the referee should apply effects on each psion in the area as outlined above. If there are no known psions in the vicinity, secretly roll 4- on 4D; if this roll succeeds, arbitrarily select one character – PC or NPC; it doesn't matter – and designate him a latent psion. Then roll 4- on 4D again, and apply an effect of a psiren being “set off” to the character. If the effect is recognized as a psiren being triggered, the psiren may be identified by any psion with the ability to detect psionic potential in a person.

If a PC seeks to learn whether he has psionic potential (or knows he does and is seeking training), he may be a psiren. To determine this, roll psionic testing normally. If the test succeeds, the PC has the talent, as normal. If the test fails (the player does not have talent tested for), note the difference between the roll required for success for the player, and the

actual roll (this is called the “failure margin”, or “FM”). The referee should then roll the same task as the player, with an additional *negative* DM of the player's FM. If the referee's roll succeeds, the player is not triggered, and the player should proceed to the next test (after which, the referee rolls for triggering again, if the player fails). If any referee triggering roll fails (the PC is triggered, and thus a psiren), no further psionic testing is carried out; the player is told that he is a psiren and untrainable. If the player succeeds (and the PC therefore has a ‘normal’ psionic talent), the referee does not roll any further triggering tests; the PC is not a psiren.

Examples

These examples use the Mongoose Traveller Core Rules. June and Bill wish to have their characters tested for psionics. Both have served two terms in the Scouts; thus, their Psionic Strengths are determined by 2D6-2.

Bill's PSI is 8. He elects to test first for Telepathy. This requires that he roll 8+ on 2D6, with no characteristic DM, and a learning DM of +4. He rolls 3; $3+4=7$, so he does not have Telepathy. He missed the roll of 8+ by 1; his Failure Margin (FM) is 1. The referee now rolls 2D6 for 8+, with a DM of +4 (the same as Bill rolled), plus an additional DM of -1 (Bill's FM). The referee rolls 6; $(6+4)-1=9$, so Bill is not triggered, and may roll for his next talent test. He elects to roll for Teleportation. His DMs are zero for his Characteristic DM, zero for the learning DM, and -1 for having tested for one talent previously. Bill rolls 6; $6-1=5$, so he does not have Teleportation. He missed the roll of 8+ by 3; his FM is 3. The referee now rolls 2D6 for 8+, with DMs of -1 (Bill's DMs for the test) and -3 (Bill's FM). The referee rolls 9; $(9-1)-3=5$, so Bill is triggered, causing much panic and consternation among the testing staff, as the Telepaths on the staff all seem to have experienced psionic Assaults, the Teleports have all disappeared, and every Clairvoyant is complaining about a major headache, except for the three that were knocked unconscious. Bill is hustled out the door,

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Doing It My Way

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told he's a psiren, and not to come back; there is nothing that anyone can do with him, psionically.

June's PSI is 10. Her Characteristic Modifier for PSI is +1. She elects to test first for Teleportation. This requires that she roll 8+ on 2D6, with DM +1 for her PSI Characteristic DM, and zero for the learning DM for Teleportation. She rolls 4; $4+1=5$, so she does not have Teleportation. She missed the roll of 8+ by 3, so her FM is 3. The referee now rolls

2D6 for 8+, with DMs +1 (the same as June's) and -3 (June's FM). The referee rolls 10; $(10+1)-3=8$, so June is not triggered, and may roll for her next talent test. She elects to roll for Telepathy. Her DMs are +1 for her PSI Characteristic DM, +4 for the learning DM for Telepathy, and -1 for having tested for one talent previously. She rolls 6; $((6+1)+4)-1=10$, so June has successfully tested for Telepathy, and cannot be a psiren. The referee makes no further tests for June being a psiren; complete psionic testing normally.

Essay Question

Essay Question is designed to allow our readers to share their experiences and ideas in playing or refereeing *Traveller*, or in designing things to be used in campaigns. Each issue, we'll print one or more questions, either submitted by one of our readers, or invented by the Editor. Readers are invited to send their answers (and their questions for future issues) to us at questions@freelancetraveller.com; we'll print a selection of the answers received in each issue.

This month, we get replies to some of our previous questions, and we add two new questions.

New questions for this month:

What books—or series of books—that you've read would you consider “Travelleresque”? Why? Would you recommend them to someone who wanted to know what Traveller is like, but couldn't play at the time she asked?

It is widely held that there are three overall styles of gaming: Gamism, Narrativism, and Simulationism (see http://en.wikipedia.org/wiki/GNS_Theory). Which do you think is best supported by Traveller, and which do you prefer? Why? (Your answer to this may be a reasoned refutation of the validity of the GNS model.)

Previous questions:

Do you feel that a well-developed “canonical” background is essential for Traveller gaming? Why, or why not?

“kafka” answers: My take on canon is that it is

important for it to be logically consistent yet not hamper sandbox play. The Imperial Campaign is often cited as too constraining because of its vast history. However, players usually only interact with a very small portion of that history.

Therefore, I liken Traveller canon to an impressionist painting where every dot on its own is a world of colour but only when you stand far enough back do you actually see the painting for all its beauty. Similarly, the pageant of the Imperial Campaign should frame certain assumptions but the only person who can have that perspective is the referee for it allows him or her to frame action within certain parameters or not.

The Players' role is to have fun. I don't think that it's really fun to poke apart the setting. It is enough for the Referee to hopefully drop little bits and dribbles of canon to reward the old timers/grogards but never enough show the entire painting to the players.

Gamemastering, like painting, is an art form: the Referee, like the master artist, is never satisfied...and is always going back to improve her/his own game.

When running/playing in an adventure, do you feel that accuracy should take precedence over story, or vice-versa? Why?

“kafka” answers: Accuracy is important in Traveller. As it is a Hard Space Opera, it is grounded in the real world as much as it does have the elements of the fantastical. I play with real world science in

Essay Question

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mind; true, handwaves are necessary to explain some things but again grounding it in the real world keeps the game authentic. Notwithstanding, RPGs are power trips (even low powered ones like Traveller) for the ego, therefore, the relationship between fun and accuracy is that fun should trump accuracy if the fun is accurate. Similarly, when it comes to special effects, everyone knows that players cannot hear the lasers or ships do not go: “w-whosh-sh-sh” but these are effects that people expect and help form the mental images for enjoyable play. Therefore, they certainly should be used in the course of play, because it adds to the excitement and thrill in the adventure even if it is not accurate.

Previous questions, not yet answered:

What is your favorite type of “one-off” adventure? Why?

What is your favorite type of campaign adventure? Why?

Other questions previously appearing in this column can be found on Freelance Traveller’s website, at <http://www.freelancetraveller.com/features/columns/eq/>.

We encourage our readers to answer any question that has appeared in Essay Question, past or present, previously answered or not. We also encourage our readers to propose new Essay Questions to questions@freelancetraveller.com.

Fifth Imperium

Shannon Appelcline



This column is intended to be a referee's guide to Mongoose's Traveller, the fifth incarnation of the Traveller game system. Often it'll talk about the many printed resources out there and available to the gamemaster, supplementing my own reviews on those topics, but sometimes it'll offer more specific advice for GMing the game.

Editor's note: The initial Fifth Imperium column was published on the RPG.Net website in July 2009, and appeared in Freelance Traveller's initial issue in November 2009. This column originally appeared on the RPG.Net website in October 2010.

In recent months I've investigated a unique way of creating adventures in *Traveller*: by choosing a specific genre and then adapting it for play within your *Traveller* universe. The previous articles in this series have covered mysterious stuff, spooky stuff, and fantastic stuff.

This month I'm going to take a look at a trio of two-fisted action genres, all centered more on physical activity than cerebral thoughts: adventure, war, and westerns. In the process I'll talk about how these genres can produce great *Traveller* stories. In many ways I think that they are some of the best alternate genres for *Traveller* because they tend to be more about the activities than the settings (with the possi-

ble exception of westerns), meaning that they can fit into the *Traveller* setting fine.

The Adventure Genre (and Pulp)

Though the pulp genre could widely include all of the magazines published in the first half of the 20th century, when we speak of it as a genre, we're generally talking about the adventure heroes like Doc Savage, The Shadow, and Tarzan and their modern-day descendants like Indiana Jones and even James Bond. Thus, the genre shades into espionage (covered in my first article) and super heroes (covered in my third).

The most important attribute for a pulp adventure is action itself: you want to put the PCs in physical danger and to require them to make daring escapes from relentless foes. However, if you really want to convey the feel of adventure pulps to your players, you probably need to use some of their common tropes.

The best one for *Traveller* is doubtless the “Lost World”, where a hitherto unknown civilization is discovered, probably amidst savages. They might be a lost colony from the Vilani Imperium that's maintained their technology or something even older, such as contemporary of the Ancients (in age if not

technology). It'd be easy to place such a World in the outskirts of the Imperium, such as in the Spinward Marches—or even in the backwaters of a more civilized system. Combine that with frenetic action and constantly escalating danger and you'll have a great start to an adventure-genre adventure.

Searches for lost artifacts of the ancient past are another closely related subgenre that would work well with Traveller. Though these could be TL 16 artifacts from the Darrians or the Vilani, it'd be more pulpish if they are ancient, mystical items from the even further past (though one must suspect that they eventually have some technological basis).

Traveller References. GDW didn't tend to go in this direction in their adventures. *Shadows* is a fine example of an adventure about exploring an ancient culture, but it was more of a dungeon crawl than a pulp adventure. Some of the FASA adventures feel more pulp-y to me, particularly *Uragyad'n of the Seven Pillars*, but I think that's more a matter of setting than genre—which suggests that setting is very important to your presentation of genre adventures.

Other References. The pulp adventure genre has been treated well in recent years and so there's plenty of places you could go to for material. I think that any of the Indiana Jones movies could be fine background for Traveller adventures, but they'd require some obfuscation due to their popularity. I'm also fond of Alan Moore's Tom Strong books, though they trend more toward super-heroes at times. If you go back to the hey-day of pulps, you could use just about anything that suits your fancy, and that'd have the advantage of being material that your players probably aren't familiar with.

The War Genre

The war genre of course centers around the activity of war: taking territory, spying on the enemy, and (unfortunately) destroying the morale of enemy civilians. It also focuses on a number of themes: brotherhood, loyalty, courage, patriotism, and (unfortunately) xenophobia.

The *Traveller* universe itself offers plenty of places to tell war stories. To start with, you have any number of balkanized governments. Even if a world

isn't government level 7, there might be competing populations. The battle between natives and corporations is a constant one in the universe of *Traveller*.

Moving up to the next level, you can have wars between planets. They might be fighting over some supposedly neutral resource or over some ancient wrong, whose specifics are long-forgotten. Beyond that you have wars between interstellar governments. In the Spinward Marches, the Darrians and the Sword Worlders are always at each others' throats, but it's the Fifth Frontier War (1107-1110) which will offer the best opportunity for wartime stories.

And, there are plenty of them. The PCs could be mercenaries coming in to help one or the sides or just to train them. You'll probably have more meaningful stories, though, if one or more of the PCs is actually a member of a world or state that's at war. Will they run arms for their home country? Fight? Does it put two members of a PC group at odds?

If you don't want the depressing day-to-day of wartime, then you can use it to send off PCs on auxiliary missions: to retrieve some info or some object that's crucial to the war effort, to save some general, or to negotiate a peace with some third-party who must stay neutral, lest the good guys (whoever they actually are in wartime) be overcome. While playing with any of these plot threads, just be sure to include wartime action: gunfights with agents from the other side; the need to save populations caught in the middle; and the patriotic desire to keep those flags flying!

Traveller References. The classic Traveller corpus is full of great wartime adventures set in the Fifth Frontier War. Background material and an Amber Zone can be found in JTAS #9, which announced the war. GDW's *Expedition to Zhodane* and *Broadsword* are adventures set in the middle of the War. FASA offered their Fifth Frontier War adventure in *Ordeal by Eshaar*, while QuickLink Interactive published an unfinished series of Golden Age EPIC Adventures in the same time period. Finally, the Keith brothers' *Flight of the Stag* adventures offered yet another perspective of the war.

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Fifth Imperium

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Though not exactly a war, the bug hunts found in *Traveller Double Adventure 5: The Chamax Plague / Horde* also fit into the war genre.

Other References. This is another situation where the genre is large enough that you can probably pick up any book or show that interests you. Personally I enjoyed the TV show *Band of Brothers* for a realistic look at war. If you want a more literary view, Garth Ennis wrote two interesting volumes of War Stories for DC Comics.

The Western Genre

Of the three action genres presented here, the western is the one most tied to a specific setting. But, it doesn't have to be the United States of the 1800s. Rather, the setting for a Western can be any frontier where men are lawless, life is cheap, and justice is rare. More than one creator has drawn the connection between those themes and the setting of science-fiction. Gene Roddenberry called *Star Trek* a "wagon trail to the stars" and explicitly marketed it as a western, while *Firefly* even took up the trappings of the western.

The easiest way to play upon the western genre in *Traveller* is simply to play up the idea of the frontier: that the PCs are out there on their own and that bandits and other outlaws might be just around the corner. Of course, you shouldn't forget the precepts of the western as an action genre. Mainly, that means gunfights and duels paired with gambling and other less high-brow activities.

Within the Imperium, you really need to go to the outskirts to find the proper material for a western—as the Imperium itself is just too civilized. In the Spinward Marches, District 268 and Five Sisters are the best places for this sort of adventure, though you could also introduce western elements on any low-

tech planet or on any planet off the traditional Xboat lines.

When you put together a Western adventure, you could place the PCs in the roles of protagonists or antagonists. They could be the outlaws robbing the poor folk of the area or the poor folk of the area who are beset upon by outlaws. Alternatively, a "Seven Samurai" adventure is always a favorite, where the PCs are called in to protect a village from bandits. Prospecting for valuable minerals is another western favorite that can tie in well with the *Traveller* world of belters and other miners. You just need to introduce some outlaw elements there too, perhaps presenting a mineral find that's beyond the reach of the law.

Traveller References. Not a lot of *Traveller* material has explicitly referenced the western, so you might be trailblazing new ground.

Other References. Joss Whedon's *Firefly* is the most perfect combination of western and science-fiction that you can imagine. Without the explicit trappings, you could probably grab many episodes for your *Traveller* usage.

Conclusion

That's it for my look at how to use the more action-oriented genres in *Traveller*. Though there are many more genres that I could cover here, I'm just going to touch upon one more, next month: science-fiction. There are numerous sub-genres of science-fiction which could each provide you with interesting and unique *Traveller* adventures.

If you want more genre thoughts, let me point you to a new RPGnet column, **Tropes**. It's offering an excellent, in-depth look of a different genre each month. October's Tropes focus in on pulp adventure, nicely tying to this article; take a look for much more information than I could possibly provide on the topic.

Multimedia Gallery

We've been advised that due to external issues, Chapter Four of *The BurrowWolf* would not be available in time to be included in this month's issue.

We will resume printing *The BurrowWolf* as soon as the artists make the next chapter available, and our apologies are extended to the fans of the story.

The Shipyard

Krolic-class Star Scout (TL9)

by William Ringland

Neu Samara's first jump capable ship class, capable of 40 days constant operation and 3 consecutive Jump-1s in a row (1 week ea, per parsec). Because of the lack of sophistication of local Grav Plate and Inertial Compensator technologies, the *Krolic* (or Russian Rabbit) class scouts were all tail standers, with the decks stacked one on top of each other.

Though capable of 2G acceleration when within a gravity well, once the *Krolic* hits interplanetary space, its thrusters lose efficiency to only 1G constant acceleration—making the ship perfectly livable while in transit.

At turnaround points midway to the ship's destination, and during the week long periods of jump-space where acceleration isn't possible, the crew has to adapt to a zero G environment until normal acceleration (or deceleration) can be reapplied. A small gymnasium is standard on the *Krolic* to help prevent loss of muscle and bone during these periods.

Though 'state of the art' for its era, the *Krolic*'s appearance led to it being given nicknames such as 'The Gale House' and 'Witch Crusher'. The arrangement of the cargo room's external door contributes to this appearance, and is not helped at all that the architect added a porch-light and a 'doorbell' style communicator next to the hatch.

Deckplan Key

(Deckplans appear following the text, on page x)

1. **Gunner Deck.** Access through the entire ship is available through side by side access hatches and elevators that end on this deck. Though the turret is overhead, control and magazine storage are located, along with the majority of the communications equipment, on this deck.

2. **Bridge Deck.** A bit tiny, with a closet containing one of the spare ship's computers. 2 control stations are installed, in case the ship has a double sized crew, with one favoring navigation and command functions, and the other favoring piloting.

3. **Common Area.** The table folds away, and the chairs can be stowed or moved about to create a

number of different arrangements, depending on crew preference, and zero-G necessities. A large entertainment monitor rests against the back wall, and zero-G bubble hydroponics often hang from the ceiling as decorative additions.

4. **Life Support.** Storage areas containing the air filtration, recycling, water purification, ration storage, and algae food supplement tanks.

5. **Staterooms.** All the furniture is by default, clasped to the decking. Bathrooms are zero-G accommodation by default, even when working under gravity, so aren't the most popular even by old hands in the Neu Samaran Space Service. Beds all have automatic webbing frames that double as emergency acceleration couches, as well as prevent Zero-G sleepers from floating about the cabins in their sleep.

6. **Zero-G Gym.** Includes exercycles, resistance based exercise gear, and a big screen flatscreen monitor for inspiration during workouts.

7. **Vehicle Hanger.** An extendable ramp leads down to ground level. *Krolic*-class Star Scouts were still used heavily when there weren't that many reliable grav vehicles being made on planet, and so often would have ATVs custom built to fit their hangers.

8. **Cargo.** Cargo, mission gear and extra provisions, were stored here. Unfortunately this was also the only primary access besides the vehicle hanger the crew had to the outside world when the ship was planetside. Often trash that wasn't jettisoned into space for whatever reason would accumulate in this room, making it an embarrassing antechamber to lead 'guests' through into the rest of the ship. Most captains took great pains to keep the room tidy as possible, since often the first glance at human and minsk 'technological superiority' was through this ship's ... cargo room.

9. **Access Corridor.** Emergency gear is stored in the corners of the ceiling or in webbing along the walls in this room, giving the deck a 'cramped and close' feeling.

10. **Main Power.** The ship's fusion plant resided in this chamber, along with the second computer

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The Shipyard

(Continued from page 11)

backup. In a pinch, the ship could be operated from this station.

11. **Maneuver Drive.** Prior to thruster technology, ships like the *Krolic* had to use advanced contra-grav for acceleration not just off the planets themselves, but across interplanetary space. Though contra-grav still provided some thrust against the universe's background gravitational forces, its efficiency would invariably be cut to half roughly past the 10 diameter limit of any significant gravitational body.

12. **Jump Drive.** The Karposky Six may not live up to the Jump-2 performance of Terran and Vilani vessels far to coreward, but they were Neu Samara's first reliable jump drive, and gave the *Krolic* an operational lifespan well in excess of 60 years, long after other systems would have to be replaced or upgraded completely. Reliability was paramount with a ship that had to 'rabbit jump' consecutively so often to get where it was headed.

Ewan Quibell has provided High Guard (Classic Traveller Book 5) stats for this ship:

EX-1212231-000000-00002-0 MCr 63.394 100 Tons
Bat Bear 1 Crew: 2
Bat 1 TL: 9
Cargo: 2 Fuel: 32 EP: 2 Agility: 1
Craft: 1 x 3T
Fuel Treatment: Fuel Scoops and On Board Fuel Purification
1 ton Zero-G Gym
Architects Fee: MCr 0.634 Cost in Quantity:
MCr 50.715

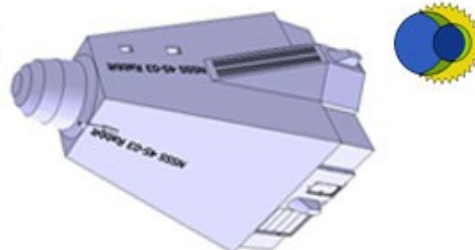
with 28 days duration and 3x Jump 1, and 4 state-rooms

The Zero-G Gymnasium can be added to other ships as follows:

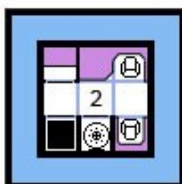
27kl/2tons disp, 4 tons mass, 0.015 MW, 0.2 MCr

Krolic Class Star Scout

TL 9, Neu Samaran Design, Circa 2193



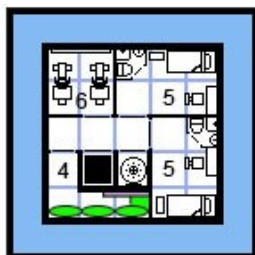
Gunnery Deck



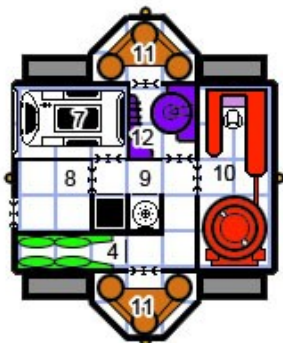
Bridge Deck



Living 2



Living 1



Engineering

Craft ID: Krolic (Rabbit) Class Star Scout, TL9, MCr 67.592

Hull: 90/225, Disp=100, Config 1SL, Armor 40D

Unloaded=1045 tons, Loaded=1112tons

Power: 5/10, Fusion=363 Mw, Duration 30/90

EMMask

Loco: 5/10, A-Grav Mdrive=-2; 2/4 Jump=1 (Fuel for Jump1x3)

NOE=130kph, Agility=0, 2G to 10 diameters, 1G interplanetary

Commo: Radio=Systemx3, Laser=Systemx3, Maser=Systemx3

Sensors: Radar=Far Orbitx1, Radio Direction Finder, Active IR, Passive IR,

LI, Adv Img Enh, Radiation Sensor, Radar Direction Finder,

Radio Jammer, Radio Jammer=Systemx1,

Radar Jammer=Far Orbitx1, Ladar=Far Orbitx1, Laser Sensor

ActObjScan=7+, ActObjPin7+,

PasEngScan=7+ (Only Ladar, Radio, or Radar Sources)

Off: Missiles xx2 (20 Batt Rnds - 60 HE Missiles)

Batt 1

Bear 1

20Mw Pulse Laser Fore

Def: DefDM=+4

Control: Computer=3x3, Panel=195 Computer Links, Special=HUDx2

Environ=Basic Env, Basic LS, Extend LS

(Note: NO Grav Plates, NO Inertial Compensators at TL)

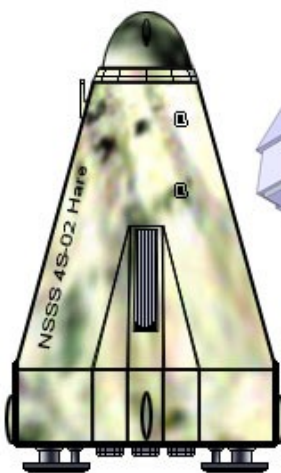
Accom: Crew=2 (1 Bridge, 1 Eng), 4 Std Staterooms, 1 Zero-G Gym,

Subcraft=Up to 3 Tons Disp.

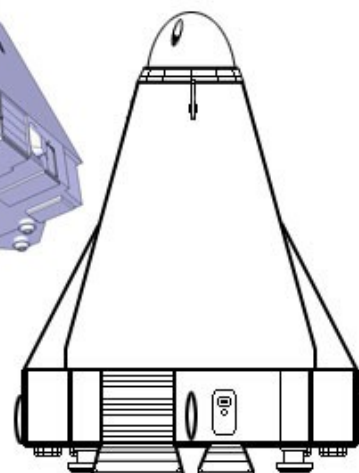
Other: Cargo=27kl (2 tons), Integral fuel scoops, Fuel=579.24kl,

Purification Plant=16 Hours. ObjSize=avg., EML=None.

(1x Jump 1=135kl)



'Starboard' Elevation

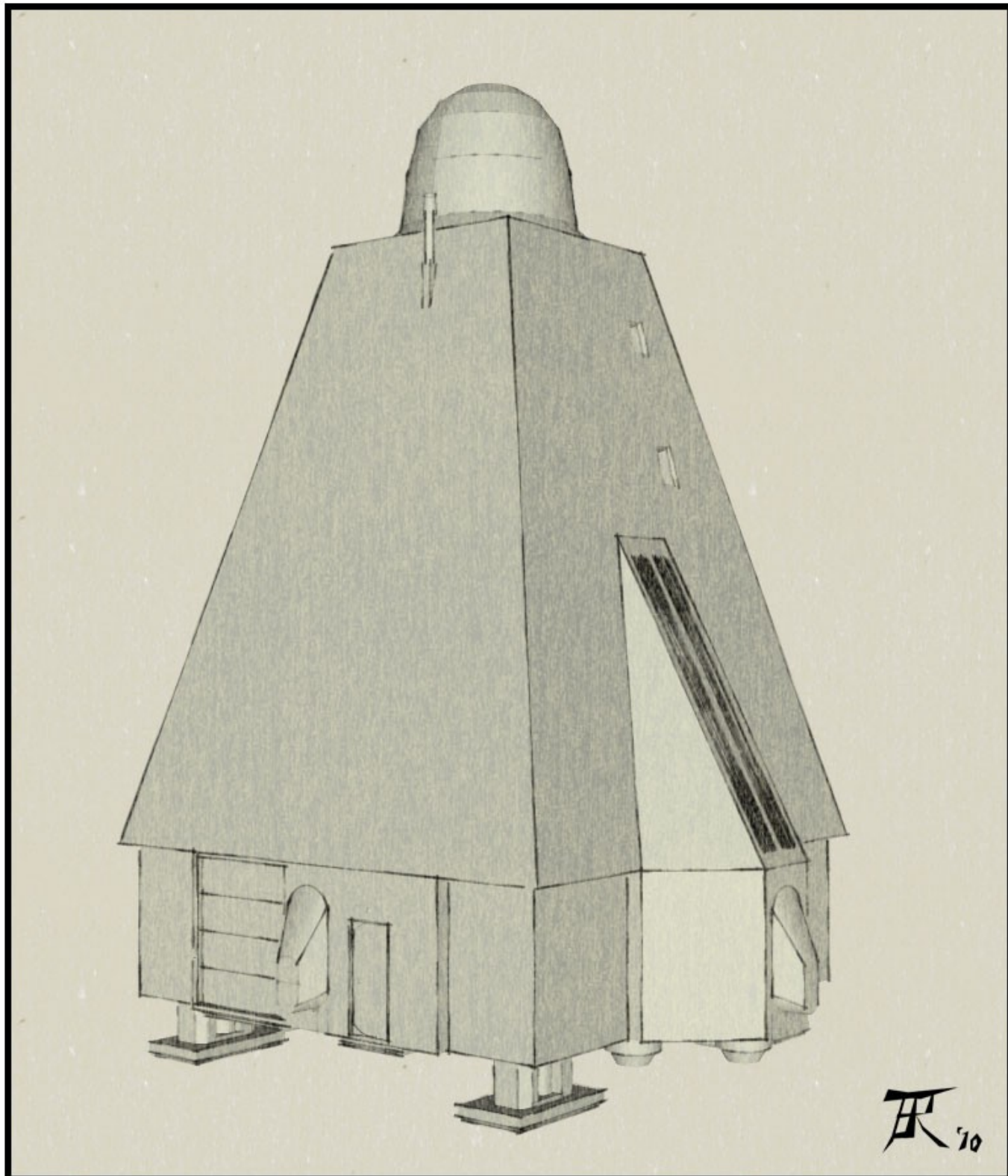


'Dorsal' Elevation

The Shipyard

Author's Note: The 3D images are from my first attempts using Google Sketchup for ship modeling. I'll make neater looking ships with it when I'm not working off a predesignated deckplan I think, but the Krolic was intended to be something of a 'classic

clunker' to begin with. The resemblance of a big flying house once modeled both surprised and amused me—I thought it was going to be a more significant taper initially.



Traveller for the 21st Century

by John Shead

Traveller is one of the oldest SF RPGs and many people now treat it as retro-SF modeled on the space opera novels of the 1960s and 1970s. While it can do this well, during the 1980s and early 1990s, the writers and developers at both GDW and DGP did their best to keep *Traveller* feeling like the sort of SF that was current at this time. However, these efforts (along with GDW) ended around 15 years ago. Since that time, personal electronics and the internet have changed many of our assumptions about technology, and SF has also changed.

With the publication of *The New Space Opera* (edited by Gardner Dozois and Jonathan Strahan) in 2008, we have seen a strong resurgence of space opera stories and novels that are the clear descendents of the works that spawned *Traveller*. My goal in this article is to provide some suggestions for helping to update *Traveller* to a modern understanding of technology and modern ideas about space opera, without transforming it into a different game. This article is in three parts: the first is about updating *Traveller* to better fit with our current understanding of various technologies, specifically electronics and biotechnology. The 2nd part is a list of common personal electronics used in the Imperium, and the third is a discussion of modern space opera and how to tweak *Traveller* so that it feels more like modern space opera, while still definitively remaining the same excellent RPG that we know and love. All three articles contain a few footnotes that are listed at the end of the third article. These footnotes are all references to various web pages detailing new technologies that are both changing our world and that would be available in the Imperium.

Part I: Traveller and Modern Technology

One of the most important points to keep in mind is that *Traveller* was created well before the advent of the sort of modern communication and data access that many of us now take for granted. When *Traveller* was new, there was no public internet, cell phones did not exist, and universal wireless data ac-

cess was barely imagined in SF. However, we now live in a very different world. Today, telling players that their PCs, who are carrying around TL 12 gear, cannot access whatever information they want when they are in range of their ship or a planetary data network is going to puzzle and annoy players who carry a smartphone or similar device and have grown to expect this sort of data access in the present day.

I've heard various older gamers say that cell phones and smart phones and similar devices ruin many standard RPG plots. I firmly believe that the existence of such devices and technologies changes these plots, but that they provide as many new opportunities as they eliminate. For modern day examples of how to use such technologies in adventure plots, take a look at TV shows like *Burn Notice* or *Leverage*. It's not difficult to mine these shows for examples of how instant and ubiquitous communications and data access can enhance RPG plots, including *Traveller* plots.

Here are a few suggestions for updating electronics, computers, and biotechnology in *Traveller*. These modifications will not significantly change the nature of the Imperium and will have little impact on play for players who are used to both using smartphones in their daily life and seeing similar electronics used in modern day crime and espionage movies and TV shows. However, these changes will both keep *Traveller* from feeling "retro" and also allow GMs and players with expectations of the future based upon their experiences in the modern day to more comfortably enjoy gaming in the Imperium.

We live in an era where augmented reality is starting to become mainstream¹, where electronics can give people new senses², or replace their existing ones³, and where robots are beginning to perform science on their own⁴, and robots have surpassed human dexterity⁵. There seems to me to be no excuse to not look to these technological wonders and let them inform *Traveller*.

Changing Modern Tech Levels

When *Traveller* was written, humanity was a TL 7 species; by the early 90s, we had achieved TL 8 in many areas, and while we have yet to discover anti-

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gravity, fusion power, or jump drive, we are now on the edge of TL 9, at least in computers, communications, medicine, and perhaps in a few other areas. As a result, we have far more of an idea what TL changes mean for electronics and some other areas of technology. We know that electronics improve vastly with TL changes. In the *Traveller* Imperium, tech levels advance quite slowly, but they do advance. Here are some suggestions for how they advance and how to incorporate the lessons of modern technology into *Traveller*.

Suggestions for Advanced Electronics

As TLs advance, I strongly recommend that computers and electronics improve in the following manner: electronic storage (which, in the Imperium consists of small chips like modern flash memory cards) can hold 1,000 times more with every advance in TL. So, a TL 9 memory card the size of a human fingernail can hold approximately 100 GB (gigabytes), while a TL 10 memory card of the same size can hold 100 TB (terabytes).

Also, computers are smaller than we expected 25 years ago and prices drop rapidly. My recommendation for both computers and robots (including the robot brains in CT Book 8: Robots) reduce all prices by a factor of 10 and size by a factor of 10 when the computer is introduced, to reduce size and price by an additional factor of 10 at the next TL and further reduce the size (but not the price) by a factor of 10 two TLs after the computer or robot brain is introduced. At this point there are no further reductions at higher TLs.

Other Consequences of Improved Electronics

Improved electronics also doesn't just mean better or smaller computers or cell phones. We live in an era of tiny robots, including tiny flying robots⁶, as well as tiny but powerful lab equipment⁷. To avoid drastic changes to *Traveller*, we will assume that the dreams of advanced robots the size of fleas are not realized, or at least not until TLs higher than those found in the Imperium, but by TL 10 or TL 11, we should assume that any device that consists largely

of advanced electronics can be made as small as is useful. As a result, almost any piece of portable electronics can be made so that it fits conveniently in the user's pocket.

Augmented Reality

With programs like Layar⁸ and Google Goggles¹, we are entering the first days of widespread augmented reality. Augmented reality means that you can either point the camera of your cell phone or similar device at a book, or (in a few years) look at a book while wearing your video display glasses, and you can, if you desire, instantly see book reviews and details for how to buy this book online. Similarly, you could look at a person and see their name and a link to their Facebook page that you could click, as well as any previous notes you may have made about this person. Alternately, you could look at a piece of fruit and see both nutritional information and a series of recipes for using it, or examine a fallen leaf, and also see pictures of and read a short informational article about the type of tree it fell from. Augmented reality means not just having information at your fingertips, but seeing it everywhere you look, and it is not a possible technology, it's available right now.

Technological Diffusion

One of the modern truths about cell phones and other easily portable electronics is that they spread swiftly and far. Today, more people in Sub-Saharan Africa have cell phones than have landlines, and cell phones can be found all across the modern third world, where they help provide people with little other contact with 21st century technology with opportunities that were previously unimaginable, allowing many to overcome poverty⁹.

In *Traveller*, a 200td merchant ship with a hold of various TL 11 personal electronics or communications satellites could go to a TL 7 world within the Imperium almost as easily as modern cell phone companies send representatives and sales agents to the poorest and most remote portions of the third world, and these merchants will often find eager buyers for these devices. While distances and expense will likely keep personal electronics from TL 11 or

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12 worlds out of the hands of the poorer inhabitants of TL 7 or 8 worlds, the wealthy and many members of the middle class will be able to afford these devices and there's no reason that Free Traders with holds full of such devices or spare parts for them could not regularly land on these lower tech worlds. As a result, as long as a low tech world is not a Red Zone or perhaps an Amber Zone or is not ruled by anti-technological fanatics, the well-off inhabitants of these worlds are very likely to have at least some devices from worlds with Average Stellar TLs. Also, such worlds are certain to have advanced satellite networks.

Satellite Networks

One of the truths of *Traveller* is that getting into orbit is cheap and easy, as a result, every world with a TL of 9 or higher is going to have many more satellites than we do, since even a good air-raft can reach orbit. Weather satellites, a full GPS satellite network, and enough communication satellites to handle all of the world's phone, data, and entertainment traffic anywhere on the planet are all going to be present on all such worlds in the Imperium. On some particularly repressive worlds, only the military or the ruling elite may be able to access data from these satellites, but the satellite networks will exist.

These same satellite networks will also be present on most worlds in the Imperium with TLs of 5+, simply because a Free Trader with a cargo hold full of such satellites could put them up around any planet with enough electronics to use them and make an excellent profit doing so. Some worlds with even lower TLs will have similar satellite networks, simply because the Imperial Navy or Scout service has a base on that world and finds the satellite network useful and very cheap to put up and maintain. As a result, almost anywhere in the Imperium, PCs who are on an inhabited planet (and on some uninhabited ones) will have full access to GPS, voice and data services to and from anywhere on the planet, and real-time satellite images of the world who resolution is mostly limited by local privacy laws.

Note on Satellite photos: Although in most

cases, satellite photos will not be able to clearly resolve individual faces, license plates, or similarly small details, due to atmospheric distortion, it's definitely possible to observe any person or vehicle that isn't underneath some object that blocks observation from above. As a result, PCs could use such imagery to tell the size and color of an air-raft and how many people were in it, but not exactly who was in it, or what the precise model of the air-raft was. Almost all worlds will also keep recordings of older satellite data, but may limit who can legally gain access to this data.

Different Approaches to Technology

The Imperium is a large and diverse place, and even if two worlds have the same TL, they will not approach the use of data networks and personal electronics in the same fashion. I can see at least three common approaches to dealing with these technologies, depending upon both culture and taste:

For cultures and individuals who prefer to minimize the obvious impact of technologies on their life: Everything except for visual enhancements (like display viewers, see p. XX) fit in a large, thin wrist watch or a credit card sized object with a small full color screen or holographic display on the front, a few buttons, and a microphone for vocal input. Characters on these worlds have easy access to both communication and data networks, but can also choose to ignore both when necessary. Also, devices will be primarily voice activated and will be able to draw upon data and preferences from the user's data store (see p. XX). Most interactions with technology will be utterly seamless – a character will look at a display screen on a wall or desk, say a few words, and the screen will display recordings from that character's data store.

For cultures that prefer to fully embrace technology but avoid implants: All devices carried by an inhabitant of this culture are linked in a personal area network¹⁰. There is a computer that is built into the wearer's clothing or jewelry, a pair of display glasses (p. XX) or display contacts (p. XX) that acts as a heads-up-display, a belt, necklace or similar device with an inertial compass and electrodes that provides

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the wearer with an innate sense of direction², tiny digital cameras (see camera jewelry, p. XX) with a wide range of frequencies, light intensifiers, and fairly good magnification on ear-rings or some other pieces of clothing or jewelry. Input is through a mixture of sub-vocalization and electrodes mounted on jewelry or simply tiny sensors stuck to the user's scalp¹¹. A character wearing this sort of device would be living in a significantly augmented world, with computerized facial recognition (linked with biographical info), as well as an almost instinctive awareness where every object the character owns is (due to miniature RFID tags in all consumer goods).

For cultures that prefer to fully embrace technology and have no problems with implants: Everything from the version immediately above, except that it's all implanted. Interestingly, the difference between the implanted and the worn version would largely be irrelevant to both the character and the player, since both provide full augmented reality and constant access to sensory and informational enhancements.

It's worth noting that early versions of the first option are already available, examples being the latest iPhone and some of the new, high-end Android OS smartphones, both of which now have augmented reality options.

Biotechnology

When we look at modern biotechnology, with stem cell therapy curing diseases¹² and gene therapy soon to be used to enhance athletes¹³, we see wonders that are clearly going to become even more amazing. We are on the verge of cures for many diseases and the basis of aging is currently being tracked down. As a result, it looks certain that in the future biotechnology will play a major role in many facets of human life. Obviously, *Traveller* isn't a universe where everyone has extensive genetic engineering, but there are modified humans like the desert adapted Jonkereen that have been created by Imperial biotechnology, and so advanced biotechnology is clearly in use.

In fact, advanced biotechnology has been in use for many thousands of years, and I'm certain that the genome of Imperial Humaniti would reflect this fact. I assume that at least 90% of the humans have these hereditary modifications, either because they are from Stellar or High Stellar worlds, their ancestors were from such worlds, or medical relief workers have provided them or their ancestors with these modifications. The nature of these modifications I'm suggesting is quite conservative – fixes for most genetic problems and very minor enhancements in health and longevity.

I recommend giving these modifications to all PCs (and most other inhabitants of the Imperium) for free. These modifications should include various minor but significant enhancements like allowing characters to normally live to be over 100 or so with access to Industrial or Pre-Stellar Medicine, 140 with access to Stellar medicine and to 160+ with access to High Stellar medicine, as well as immunity to most diseases, the ability to slowly regrow limbs and most organs, and perhaps double normal human healing rate. None of this would render PCs inhuman, but they make sense as tweaks that could have occurred over the course of millennia of high tech civilization. I'd also put a lower bound on Intelligence and Constitution, since I can see gene-fixes on both to make certain characters had a minimum of each. Essentially, what I see is fixing almost all hereditary problems, boosting lifespan a bit and improving healing a bit.

In terms of increasing longevity, we already have rules for increased longevity in the DGP supplement *Vilani & Vargr*. Pure-blood Vilani gain a +4 to all Aging rolls. Obviously, hereditary longevity improvement is possible, and during the Rule of Man, the Solomani would almost certainly have examined Vilani DNA and figured this out. So, such bonuses would likely be Imperium-wide, with additional bonuses for growing up on a higher tech world. To further represent that affects of growing up with high tech medicine, I'd also slightly delay how rapidly aging starts.

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Suggested Aging Modifiers*		
Tech Level	DM on Aging Roll	Begin Aging in Term
Pre-Stellar or earlier	+2	5
Early Stellar	+2	6
Average Stellar	+3	7
High Stellar	+4	8

* Note: These bonuses are quite conservative and GMs who wish to have genetic engineering be slightly more impressive should at +1 to all these bonuses, with the +s ranging from +3 to +5 instead of +2 to +4.

I also recommend that Endurance and Intelligence should be rolled as 6+1d6 or better yet, if you still want a bell curve, characters should roll 4+2d4 rather than 2D6 to represent gene-fixing that removes obvious problems to endurance or intelligence (which are certain to be the first two modifications people make). I would also allow humaniti (and most other sophonts who have had access to advanced technology for millennia) to regenerate lost body parts, due to long ago heritable genetic therapies. I'd make this regeneration quite slow, 3 months for a hand and 2 years for a leg, meaning that any injured PC who doesn't want to be out of action for a very long time will avail themselves of high technology medicine.

Putting it all Together – Technology In Daily Life

To better understand how to use these various technologies, here are examples of daily life at various TLs in the Imperium.

Life at Pre-Stellar TLs (TLs 6-8)

Most of the population uses landline phones, listens to the radio, or watches TV. However, the wealthy and upper middle class have access to off-world hand computers. Few people have better than TL 11 technology, but even these devices provide many benefits. Overheard a full network of communication, weather, observation, and GPS satellites

were put in place by a passing merchant.

Local military forces, covert operatives, and the specialized, high-end police and security forces use the GPS data and wireless data networks to great advantage as well as using TL 10+ hand computers to keep in constant communication with their superiors. The wealthy often drive air rafts, but the middle class must use ground cars, and most of the poor rely upon bicycles or public transport. Military special forces wear combat armor and carry laser rifles, but ordinary soldiers are equipped with pre-stellar weapons and armor. Off-world medicine is available to the wealthy, or for the most serious illnesses, but only the wealthy and powerful can gain access to the various medicines that slow aging. A few of the wealthiest may even be taking anagathics.

Life at Early Stellar TLs (TLs 9-10)

Augmented reality begins to become commonplace, and everyone is expected to own a hand computer. Wearable interfaces (see p. XX) are still rare, and only a few of the wealthy and the upper middle class have interface implants (see p. XX), as do some covert operatives. Most augmented reality is fairly limited, but it provides instant information about many topics. People expect to be in constant contact with each other and to always have information at their fingertips. Many individuals are puzzled or even a bit distressed when they are out of contact with phone and data networks.

Life at Average Stellar TLs (TLs 11-13)

Augmented reality is ubiquitous on any world that has not specifically decided to avoid its use. On many worlds, anyone who is not at least carrying a hand computer will miss most of the social and cultural information around them. Sometimes most outdoor signage is replaced by augmented reality information. On these worlds, most residents use wearable or interface implants, and people who rely upon ordinary hand computers are regarded as eccentrics, while those who lack even a hand computer are considered to be either social cripples or beneath notice. Individuals who lack even a hand computer often

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have difficulty functioning in this society.

Robots become popular and widespread and most consumer goods are made in automated factories. While human-shaped robots remain a curiosity used by eccentrics or for highly specialized tasks, many Average Stellar kitchens are almost fully automated with robot arms and other automated tools that fold up into sleek compartments when not in use, but which can reach down to prepare food and clean up. Every room that is not specifically kept sensor free has a variety of sensors, and residents can usually control everything from light and heat to window opacity or locking or opening doors by voice command. Someone in this TL could either order their home computer to prepare them coffee and breakfast once they wake up, or they could ask the computer to prepare them their coffee and favorite breakfast as soon as the computer determines that they have woken up.

Almost every commonly used device contains a computer that can communicate, in a simple and limited fashion, both with the user and with other devices. Refrigerators know when food inside them has gone bad and if given permission can order more food to be delivered by automated delivery vehicles. Home and hand computers also learn their user's preferences and can recommend entertainment, food, or other things based upon their user's previous tastes.

On many worlds, ubiquitous surveillance is the norm when you are outside; on others this sort of surveillance is highly illegal; and on some not only is outdoor surveillance ubiquitous, the data is available to everyone on the world, making privacy and secrecy outdoors nothing more than either a polite fiction or a foolish delusion.

Life at High Stellar TLs (TLs 14-16)

Houses, starships, and even hand computers develop personalities based upon their user's tastes and preferences. While not in any way intelligent, many computers seem like they are, at least unless you ask them about abstract topics or complex issues. The

introduction of neural interfaces at TL 15 makes intimate computer access the norm, and on some worlds every inhabitant is expected to have such a rig and wear it almost constantly. High speed communications between wearers of these devices allows them to communicate both faster and using a mixture of thoughts and images that resembles telepathy, except that it is purely technological.

Part II: Personal Electronics

The following are the most common types of personal electronics found in the Imperium. Here, for convenience, are the changes I am making to traditional *Traveller* electronics (also discussed in Part I).
Suggestions for Advanced Electronics

As TL's advance, I strongly recommend that computers and electronics improve in the following manner – electronic storage (which consists of small chips like modern flash memory cards) can hold 1,000 times more with every advance in TL. So, a TL 9 memory card the size of a human thumbnail can hold approximately 100 GB (gigabytes), while a TL 10 memory card of the same size can hold 100 TB (terabytes).

Also, computers are both smaller and less expensive than we expected 25 years ago and both size and prices drop rapidly. My recommendation for both computers and robots (including the robot brains in CT Book 8: Robots) reduce all prices by a factor of 10 and size by a factor of 10 when the computer is introduced, and reduce size and price by an additional factor of 10 at the next TL and further reduce the size (but not the price) by a factor of 10 two TLs after the computer or robot brain is introduced. At this point there are no further reductions at higher TLs. These adjustments have been provided to the costs of all items listed here and they do not decrease in cost at higher TLs unless specifically stated.

Other Consequences of Improved Electronics

Improved electronics also doesn't just mean better or smaller computers or cell phones. We live in an era of tiny robots, including tiny flying robots⁶, as well as tiny but powerful lab equipment⁷. To avoid

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drastic changes to *Traveller*, we will assume that the dreams of advanced robots the size of fleas are not realized, or at least not until TLs higher than those found in the Imperium, but by TL 10 and higher, we should assume that any device that consists largely of advanced electronics can be made as small as is useful. So, almost any piece of portable electronics can be made so that it fits conveniently in the user's pocket.

TL 9 Equipment

(Editor's Note: It is inferred that the TL in the header refers to when the equipment first becomes available, as the progressive improvement by TL of each device is discussed.)

Hand Computer (TL 9+): At TL 9, this device is equivalent to a high end modern smart phone with touch screen, digital still and video camera, GPS, limited voice recognition and augmented reality, including limited image recognition. This device also contains transceivers capable of connecting to all Imperial phone and data networks. Hand computers designed for interstellar travelers also contain multi-band radios capable of sending and receiving from similar units with a range of 100 km and of communicating with the powerful radio found on a starship at a range of 500 km. This capability adds nothing to the unit's cost. Also, due to standardized computer protocols, every hand computer can access basic voice and data services across the Imperium. At typical TL 9 hand computer is 12 cm x 6 cm x 9 cm and is either carried in a pocket or worn on an arm.

At TL 10, the computer used in this device possesses the High Data command logic and Basic Command fundamental command program (CT *Book 8: Robots*, p. 35) and can understand simple spoken commands like "Display all data on Arla Kasten's political career" or "Show me a map of the fastest route home". This computer possesses limited learning capability and the augmented reality functions also greatly improve, allowing the unit to display information on any known object. If the unit's camera is aimed at an animal or plant, it can provide detailed information about the target and the device can also perform facial recognition from any clear visual im-

age. All TL 10 units can also function as language translators for both written and spoken language, as long as the language is found in Imperial data banks. At TL 10 and higher, the capacity of a hand computer's memory is also so large that it is unlikely to ever be completely filled.

At TL 13, all hand computers use holographic displays instead of flat video screen and their cameras become holovideo recorders. Advances in electronic memory mean that the additional storage requirements of holographic imagery still allow these devices to have effectively unlimited storage.

This device serves the purpose of a chronometer, media player, digital still and video camera, GPS and mapping unit, data network terminal, augmented reality display, telephone, entertainment device, and at TL 10+ a language translator.

Cost: Cr 1,000

At TL 13+ the computer in this device can be made using a limited amount of synaptic circuitry and possesses the Low Autonomous command logic and Full Command fundamental command program, allowing it to understand relatively complex ordinary speech and make basic inferences.

Cost: Cr 3,000

Rules: At TL 10 the High Data computer in a hand computer has INT 3 and EDU 2. At TL 13+, a Low Autonomous computer in a hand computer has INT 6 and EDU 4 (see CT *Book 8: Robots* for details).

TL 10 Equipment

Data Store (TL 10+): This popular device is designed to contain all of an individual's personal data in an encrypted and secured fashion. Most individuals keep this storage unit in their hand computer, interface implant or similar device. However, others who prefer to interact with their technology in a less obvious fashion install it in jewelry or have it implanted, typically between the bones of their forearm, just above the wrist. If not installed in a hand computer, a data store communicates with hand computers and other devices using short range radio similar to modern Bluetooth. This radio has a range of approximately 10 meters. Separate data stores are

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ovals approximately 1.5 cm x 1 cm x 3 mm.

Data stores carry information about all individuals the user interacts with, as well as security permissions that can automatically open doors and start vehicles that the user has a legal right to open. The data store also holds all personal records including financial data, as well as the user's entire library of text, music, video, and holo-recordings, as well as any other data the user feels the need to keep with them.

Data stores can communicate with devices other than hand computers, enabling the user to put on a pair of headphones that can then automatically access all music recorded in their data store, just as the user could give a multimedia presentation just by talking to a high-end holo-projector that communicates with the user's data store. Users need only verbally instruct devices to access specific contents from their data stores. Careful users require matching voice prints and passwords to access especially secure information. Data stores can be used for official verification purposes, storing voiceprints of known individuals and providing encrypted digital signatures for the user.

At TL 10, a data store holds 100 TB, which most sophonts regard as barely adequate. Most travelers who can gain access to them use TL 12 data stores, which contain 1 million times more data and are sufficiently large that even a long-lived sophont cannot usually fill it up with all data they accumulate in their lifetime. Almost all inhabitants of TL 10+ worlds have data stores, and on TL 11+ worlds, it's difficult to function without one.

Cost: Cr 100

Display Glasses (TL 10): Looking much like ordinary eye glasses, this device contains tiny projectors in the temple pieces that project images on the inside of the lenses, allowing the user to see displayed images as if they were viewed on a large screen at a comfortable viewing distance. The user can either render the lenses opaque for clear viewing of entertainment or they can make the lenses fully transparent to allow for either discrete data display or various augmented reality applications. All display

glasses also contain speakers in the ear pieces as well as a tiny front-facing camera and microphone for both augmented reality applications and for making discrete recordings. Display glasses also serve as variable tint sunglasses.

Cost: Cr 100

Wearable Interface (TL 10+): This device represents the typical "hand computer" for many TL10+ societies and possesses all the capabilities of a standard hand computer, including the same statistics for the unit's computer. The TL 10 version consists of a small computer that is an oval 6 cm x 4 cm x 1 cm. It is radio linked to a pair of display glasses (see above) and also includes a micro-projector that can project clear images on any surface. Input comes through spoken or subvocalized commands. Thin gloves that can be used to provide gestural inputs, and on some units, electrodes on the user's scalp provide all non-verbal input. These electrodes can be worn on lightweight and often decorative headgear, or occasionally implanted just beneath the user's scalp, between the scalp and the skull. Some units also include display viewers that provide the user with enhanced vision and a small belt or other wearable device that provides the user with an innate sense of direction.

Cost: Cr 1,500 (Cr 2,500 with implanted electrodes)

At TL 11+, wearable interfaces can instead use contact lens displays and camera jewelry (see below). Most of these advanced rigs use subvocalized vocal input and scalp electrodes that are either worn on a headset or implanted.

Cost: Cr 2,000 (Cr 3,000 with implanted electrodes)

At TL 13+ the computer in this device can be made using a limited amount of synaptic circuitry and possesses the Low Autonomous command logic and Full Command fundamental command program, allowing it to understand relatively complex ordinary speech and make basic inferences.

Cost: Cr 3,500 (Cr 4,000 for a contact lens display wearable interface, Cr 5,000 with implanted electrodes)

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Rules: The user can access data, communicate with other wearable interface users, and perform other purely electronic tasks twice as fast as users limited to ordinary computer interfaces, like hand computers.

TL 11 Equipment

Camera Jewelry (TL 11): Usually worn with contact lens display, camera jewelry consist of a pair of ear rings, a pendant, choker, or some other item of jewelry worn on or near the user's head that contains one or two miniature camera and microphones, as well as small speakers to provide sound for the user. The cost of this device is included in the price for a wearable interface using a contact lens display.

Cost: Cr 300

Contact Lens Display (TL 11): Using micro-circuitry embedded in extended wear contact lenses, this device provides all of the visual display capabilities of display glasses. However, an external speaker must be used and if augmented reality is desired, the user must also wear camera jewelry.

Cost: Cr 300

Display Viewers (TL 11): This device combines the function of display glasses and electronic image viewers. Using advanced cameras and enhanced data display, these viewers function as ordinary display glasses, while also working as electronic viewers that allow the user to see clearly in the IR, visible, and UV spectral bands, as well as using light intensification to provide night vision. Automatic dimming and image polarization eliminates glare and dims down overly bright lights. In addition, the camera on this unit also permits magnification of up to 10X, which can be used as both binoculars and a low power microscope. The unit also contains a laser range-finder with a 1 km range. This device duplicates the functions of Image Convertor Binoculars (*MegaTraveller World Builder's Handbook* (DGP), p. 21).

Cost: Cr 800

Improved Camera Jewelry (TL 11): This improved version of camera jewelry includes all of the capabilities of display viewers, including seeing in the IR – UV spectrum, light intensification, auto-

matic dimming, 10X magnification, and the laser range finder. Advanced camera jewelry is often used in combination with interface implants, neural interfaces or computer implants.

Cost: Cr 1,000

Microdrone (TL 11): This tiny robot is the size and shape of a small humming bird⁶ and flies in a very similar manner. It is 4 cm long, 1 cm in diameter, with a 5 cm wingspan. Far too small to use gravitics, this diminutive robot flies using wings and high density batteries. It contains a tiny High Data computer identical to the one used for a wearable interface, as well as cameras, microphones, and speakers identical to those on display viewers or advanced camera jewelry. This robot can be controlled via a radio link or it can be given simply orders to follow a single person or to scout a specific area. It is effectively silent and at the user's option, its color changing paint can transform from a bright color scheme that makes it highly visible to matching its color to its surroundings, rendering it difficult to see (increase the Difficulty Level to see this robot by 1).

Microdrones fly at a speeds of up to 50 kph and can operate for up to 12 hours without recharging. They can maintain encrypted radio contact via cellular data networks or via a two way radio with a range of 100 km. This robot can only fly in Thin, Standard, or Dense atmospheres. Versions designed to swim underwater, with top speeds of 20 kph are made for the same price. A microdrone can be controlled by a hand computer, wearable interface, or similar device.

Cost: Cr 1,000

Mini-Sensors (TL 11): These devices are powerful sensors in very small packages⁷. Although there are many varieties, two are most commonly used by interstellar travelers – gas sensors and chemical sensors. Both devices are designed to communicate with the user's hand computer or other portable computer (including interface implants and neural interfaces). Users obtain the information acquired by these sensors from their hand (or other) computers and can use these computers to request specific types of sensor scans. TL 10 versions of both types of sensors exist, but are twice as large in every dimension and

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cost 10 times as much.

Atmosphere sensors: This sensor is a lens-shaped device 5 cm in diameter and 1.5 cm thick. It contains sophisticated sensors designed to analyze all types of gases. Many space travelers set this device to notify them if there is any potentially dangerous change in atmospheric composition or pressure, such as if harmful gases are introduced into the atmosphere or carbon dioxide levels begin to rise too high. It can also be used to swiftly notify the user if the atmosphere of a planet is safe to breathe. All such warnings can be easily set and require no skill roll. In addition, this device can be used to determine the exact composition of a planet's atmosphere or if someone wearing a specific brand of perfume was recently in a particular area. Using the device in these ways requires skill rolls using Biology, Chemistry, or Forensics.

Chemical Sensors: This device is the size of a small early 21st century cell phone – 9 cm x 4 cm x 1 cm. It contains miniature sensors used to determine the precise composition of liquids and solids. The user must place a sample of the desired liquid or solid in a small port on one side of the device. The device can only analyze material that has been placed in physical contact with this sensor port. Within 3 minutes of beginning to analyze a sample, the device provides detailed information about the sample's chemical composition. In addition to providing chemical analysis, the user can also ask their hand computer if a given sample is safe to eat or drink and can even obtain detailed nutritional information. This device can also be used in medical or forensic applications. Determining simple questions like whether or not a sample of food is safe to eat or if a sample of blood reveals the presence of arsenic require no skill rolls. However, using this device to reveal the presence of a difficult to detect poison in a murder victim's blood, or to analyze the possible effects of an unknown drug requires Biology, Chemistry, Forensics, or Medical rolls.

Cost: Cr 600 (for each type of sensor)

Video Bug (TL 11): This lentil-sized surveil-

lance device is 5 mm in diameter and 1 mm thick. It has an adhesive backing and contains a digital still and video camera that can see in near total darkness as well as in the UV-IR bands. It is capable of resolving clear, crisp images within 15m as well as a sensitive microphone capable of picking up whispers within 5m and normal speech within 15m. These devices are normally programmed to only record when they detect speech or movement and have batteries that allow them to record for up to two weeks under normal conditions. This device can broadcast to a hand computer or other radio that is within 10 km and broadcasts a highly encrypted signal. To avoid detection, it also only broadcasts compressed bursts of data that last no more than 30 seconds and does so either once a day or in response to a special encrypted signal. Alternately, this bug can be set not to broadcast at all, and to record its surroundings until the user retrieves it. Used in this fashion, it is essentially impossible to detect.

Cost: Cr 800

TL 12 Equipment

Interface Implant (TL 12+): Using a variation of the same technology used to provide both nerve refusion and prosthetic eyes, this implant consists of a TL 12 High Data computer no larger than a lima bean. It is tied into the user's sensory nerves and motor nerves. This computer also contains transceivers capable of connecting to all Imperial phone and data networks and also of receiving GPS data. This device offers all the advantages and capabilities of a TL 10 hand computer, including the same statistics for the unit's robot brain. However, this device is implanted and powered by the user's body heat. Interface implants can use augmented reality programs, and do so by tapping into the user's senses, using the owner's eyes to see and ears to hear, while also broadcasting information directly to the owner's eyes and other senses. This device can identify or provide further information on anything the user is looking at or a song or animal cry the user is listening to. If desired, the user can also wear improved camera jewelry to effectively give themselves enhanced senses. Interface implants can also both send and receive

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both smell and touch, allowing user to experience virtual reality that is almost indistinguishable from actual physical experiences. To communicate with an interface implant, the user can either speak, subvocalize, gesture, or provide some similar input. This device cannot read the user's thoughts.

Cost: Cr 5,000

At TL 13+ the computer in this device can be made using a limited amount of synaptic circuitry and possesses the Low Autonomous command logic and Full Command fundamental command program, allowing it to understand relatively complex ordinary speech and make basic inferences.

Cost: Cr 7,000

Rules: The user can access data, communicate with other interface implant users, and perform other purely electronic tasks twice as fast as users limited to ordinary computer interfaces.

TL 14 Equipment

Computer Implant (TL 14): This device represents that ultimate fusion of human and computer. The heart of this device is a High Autonomous computer that is a more advanced and more expensive version of the one used in high end interface implants. This computer has an equivalent Int and Edu of 15 each and it is linked directly into many portions of the user's brain. Rather than just tying into the user's sensory and motor nerves like an interface implant, a computer implant ties directly into the most complex portions of the user's brain, where it augments the user's thoughts and memory.

In addition to using difficult to produce the circuits that are designed to meld a brain and a computer into one, the surgery to implant this device is also difficult and very expensive. However, the results are exceedingly impressive. This unit also contains transceivers capable of connecting to all Imperial phone and data networks and also of receiving GPS data. Because of the expense involved, computer implants are limited to the very wealthy and to individuals like important scientists and experienced covert operatives who have special need for this particular augmentation. This device provides all of the

capabilities of an interface implant as well as many other advantages.

Rules: Users are treated as if their Intelligence and Education were both 16. In addition, they gain +2 to all rolls when using skills like Computer, Navigation or Gunnery, that can be directly aided by specialized programs. However, this bonus only applies if the user's skill is 0 or higher. If the user does not possess a particular skill, then they are treated as if they possess 1 point in the skill.

For skills that do not make use of existing programs, but which could obviously benefit from instant access to data, such as any science or academic skill, as well as technical skills like Gravitics or Commo, the user gains +1 to this skill if they already possess this skill and a 0 in this skill if they do not already possess it. The user can also remember and replay all of their memories with perfect accuracy and display these memories on holovision screens for all to see. In addition, the user can access data, communicate with other computer implant users, and perform other purely electronic tasks 5 times faster than users limited to ordinary computer interfaces.

Cost: 2 MCr.

Note: This computer implant is a version of a device that originally appeared in JTAS #22 in an article by J. Andrew Keith. The cost of this unit is reduced to 200,000 Cr at TL 16.

TL 15 Equipment

Neural Interface (TL 15): This advanced computer interface relies on contact based neural interface technology derived from the same technology used to create neural activity sensors. This unit is approximately the size of a wrist watch, 4 cm in diameter and 1 cm thick. It consists of a computer linked to a device that links directly into the user's nervous system by touch, allowing it to project images directly into the user's visual cortex and speech directly into the verbal center's of the user's brain as well as receiving subvocalized commands and even mental images from the user. This linkage is far less direct and invasive than the linkage provided by a Computer Implant and is only slightly better than the interface provided by an interface implant. The com-

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puter used in this device possesses the Low Autonomous command logic and Full Command fundamental command program, and the device also possesses all of the capacities of a TL10 hand computer with a TL 13 robot brain.

Neural interfaces are typically built into jewelry, or occasionally clothing. Many are made to in the form of wrist jewelry that has a similar size and appearance to a large wrist watch. Neural interfaces can use augmented reality programs, and do so by tapping into the user's senses. If desired, the user can also wear camera improved jewelry to gain enhanced senses.

Rules: The user gains +1 to any skill that would obvious benefit from immediate and easy access to a computer or from programs that assist the user. The user gains a 0 in this skill if they do not already possess it. In addition, the user can access data, communicate with other computer implant users, and perform other purely electronic tasks twice as fast as users limited to ordinary computer interfaces.

Cost: Cr 2,500

Part III: *Traveller* & Modern Space Opera

Traveller is space opera. It's far more like hard SF than *Star Wars*, but it's a setting featuring FTL travel, vast and ancient interstellar empires, as well as wondrous artifacts and alien ruins that are millions of years old. All of these are common space opera tropes. However, modern space opera is not the same as space opera written in the 1970s. In general, modern space opera has fewer aliens that look more alien and less humanoid. Nanotechnology, exceptionally advanced electronics, and advanced biotechnology, including genetic engineering are all common, and most modern space opera deals in some ways with the idea of the Singularity¹⁴. The Singularity is the concept that eventually technology will advance to the point that humanity will either create hyper-intelligent artificial intelligences or we will be able to transform humans into hyper-intelligent beings. The central idea is that when this occurs, the future becomes impossible to predict, because the inhabi-

tants of this future are now vastly more intelligent than we are.

Traveller is specifically a future where humanity avoids any sort of Singularity – true artificial intelligence is very difficult to achieve and requires TL 17+, and the other wonders, like genetic engineering and nanotechnology also deliver well less than many people currently imagine they will. Instead, even on TL 15 worlds, humans remain fundamentally human. They have access to wondrous technologies, they can travel between the stars and have access to vastly improved medicine, but they are still roughly as intelligent as we are, they may live longer, but they still eventually die. The inhabitants of many Imperial worlds may live surrounded by robots, but none of these robots are sentient beings.

Including Elements of Modern Space Opera In

Traveller

Without drastically changing the Imperium or the basic precepts of the *Traveller* setting and Tech Levels, many elements of modern space opera are not appropriate, but others are. The first and easiest steps to making *Traveller* more like modern space opera are described above – including modern concepts of computers and biotechnology (see *Part I: Traveller for the 21st Century*). Beyond these changes, giving your *Traveller* campaign elements of modern space opera would involve including or at least addressing nanotechnology, while also reducing the number of humanoid aliens and dealing with the issue of the Singularity.

Nano-Technology

In both modern space opera and modern science writing, one of the hot topics is nanotechnology. It clearly shows promise, but it's equally clear that some of this promise cannot be fulfilled without causing drastic changes to *Traveller*. However, that doesn't mean that we should ignore nanotechnology.

Limited Nanotechnology

In this type of nanotechnology, self-replicating nanotechnology is impossible. Instead, nanotech requires special devices to create them. The prime example of this type of nanotechnology is the assem-

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bler vat. Inside, tiny nanites transform raw materials into finished items. You stick raw materials and electronic plans in and you can get out everything from your dinner, to a new car, to cold medicine out. Assembler vats come in all sizes and most members of the middle class have them in their homes. The smallest assemblers are 2-3 liters in volume and can produce a limited array of products, while a unit capable of producing almost anything small enough to fit inside the vat is the size of a small home computer and monitor (10 liters or so). Much medicine is performed using specialized healing vats. The nanites produced and used by all of these different devices can do many things, but they also require specially controlled conditions to exist, they cannot survive in the outside world and thus can only function within their vats.

Sticking your hand in a healing vat could help you heal or give you a temporarily enhanced immune system, but since nanotech (both in living bodies and in the outside world) is vulnerable to attacks by bacteria and also to random environmental variation, you would need to go back for a new dose every hour, and each use actually only lasts 10 minutes (during which time the nanites identifies and corrects most medical problems). As a result, utility fog, world-eating grey goo and other alleged miracles & terrors of nanotechnology are totally impossible, they would be destroyed within a few minutes by bacteria and environmental conditions.

In a setting using this type of nanotechnology, raw materials can be mined robotically (and possibly nanotechnologically extracted from ore) and then the refined raw materials are cheaply and swiftly made into various goods using assembly vats. In an economy where this type of nanotechnology was common, items of value would be new plans for items as well as luxury goods, like food, clothes, and art objects that were made by hand. Growing natural food might be a popular hobby in many places and so most natural food would be a minor luxury. The more intensive forms of medical treatment involve immersing someone in a special purpose assembler

vat that could alter and repair organs, set bones and even install implants. This sort of nanotechnology exists largely in the background - it is where you get your new car, microdrone, or implant (in your body), and where they stick you if you get shot, but otherwise it's not present in the setting except as an important background detail. Starships would contain assembler vats for producing spare parts or snacks, but they are rarely important for the plot - unless someone steals the assembler vat plans for some new and highly restricted piece of technology. The novel *Pushing Ice* by Alastair Reynolds features nanotech like this.

Moderate Nanotechnology

Nanotech of this sort cannot self assemble, but is resistant to bacterial attacks and other environmental problems. So in addition to assembler vats, there are nanotech generators designed to produce nanites that go out and interact with the outside world. The smallest single purpose nanite generators can be made as small as a ping pong ball or a walnut. You can have permanent artificial immune systems (using implanted a nanotech generator) that can heal almost any wound in less than a day (heat dissipation issues and speed would likely limit faster healing). This type of nanotechnology would also allow the existence of clouds of minute but precise sensors and nanites that can repair any single item, but all of these require nanite generators to create. To repair a device, all you would need to do is place the nanite generator and some raw materials next to the device, and the nanites would do the rest (assuming that the generator had both instructions to repair the device and a full set of plans for the device being repaired).

You can make grey goo and other attack nanotech using this type of nanotechnology, but they require generators, so you could have mortar shells (or possibly even shotgun shells) filled with grey goo or (more likely) a small generator and it would destroy an area around the impact site, but likely no more than a few cubic yards. Destroy the generator and the existing grey goo nanites will eventually run down or degrade and they can't make more. Also, grey goo would turn things into dust, rather than into

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more grey goo. As a result, this nanotechnology cannot render a planet, or even a city lifeless.

You could have items like a canteen-sized generator that could create a fancy tent or even a small cabin and all the furnishings as the ultimate in camping gear. Also, another device might create a nanotechnology-based space suit that could transform into either combat armor or fancy dress clothing in less than a minute and requires only a tangerine-sized generator to keep this suit working and repaired. The economy of a setting with this sort of technology would look much like the previous version, except that devices (and people) could be made self-repairing using implanted nanites generators, and nanotech weapons would be hideously deadly.

Advanced Nanotechnology

This type of highly advanced nanotech can both self-assemble and resist bacteria. So, not only could a variety of nanite build a house, it can also make more nanites like itself, eliminating the need for nanotech generators. Utility fog and grey goo are possible, as is carrying a nanotech seed in your pocket that you can plant in a supply of the appropriate raw material to grow a spaceship, a city, or a living adult horse. The only limitation is that a horse would take a day or two to produce and creating a city would take almost a year. Most people would have extensive nanotech living inside them, and a few people might effectively be living, walking clusters of nanotech. This is god-tech territory and IMHO is not suitable for gaming as anything other than strange alien artifacts and exotic worlds that the PCs visit briefly. Instant healing and growing skyscrapers in a hour are both still impossible, because physical laws dictate that they are (because of problems with processing speed and heat dissipation) but a single vial of nanotech could still kill an unprotected planetary biosphere in a few years.

Nanotechnology In The Imperium

I'd allow all three types of nanotechnology in *Traveller*, but would limit them greatly by TL. Limited Nanotechnology is developed at TL 12 and

Moderate Nanotechnology is developed at TL 16. Perhaps one of the reasons that Darrian TL 16 ships are so much in demand is that they are self-repairing because various nanotechnology generators are built into their ships. Advanced Nanotechnology is only developed at TL 20, and thus only exists as a few rare, poorly understood, and often exceptionally dangerous artifacts, most of which were made by the Ancients.

In this version of the Imperium, most goods on TL 12+ worlds are made in assembly vats. This fact need affect nothing about play in the Traveller Imperium, except that every starship is likely to have several assembly vats for making spare parts, snacks, and similar oddments. If you use this type of nanotech in your Traveller campaign, it's worth considering that the development of TL 12 nanotech may be one of the major advances that allowed the Solomani to defeat the Vilani First Imperium.

Aliens

Modern space opera stories take place in a universe where sophont species are relatively rare, but where both humans and aliens create modified versions of their own species using genetic engineering. Many or even most of the actual aliens that exist in these stories are not humanoid and have drastically alien cultures and physiologies. Introducing some of these touches in Traveller is relatively easy to do by introducing more obviously alien aliens, like Hivers or Vegans, while also increasing the number of aliens who are actually minor human races, or perhaps minor Vargr races or variants of other major races. For example, the Hlanssai could easily be a human (or perhaps even Vargr) minor race created by the Ancients, while the Za'tachk and the Gurvin could easily be genetically engineered Hiver variants created 5,000 or more years ago during the Hiver's earliest forays between the stars.

The Singularity

One of the common tropes found in both modern and older space opera stories is that the galaxy is very old and has been inhabited by intelligent star travelers for millions, or perhaps even billions of

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years. According to *Traveller* Tech Levels, nothing resembling the wonders of any sort of Technological Singularity occurs below TL 18. However, there have been a few species who achieved these lofty and amazing heights, the most notable of them being the Ancients. So, instead of Grandfather being a uniquely evolved Droyne, you could instead make him either the first hyper-intelligent Droyne AI, or better yet, a brilliant and daring Droyne who managed to use advanced technology to upgrade his intelligence to super-human (and super-Droyne) levels and thus learned to do wonders, advancing the Droyne species to TL 18 and beyond. During the ascendancy of the Ancients, there was self-replicating nanotechnology, hyper-intelligent AIs, as well as all of the existing wonders of that era.

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Footnotes

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² Using Technology to give humans a perfect direction sense: <http://www.wired.com/wired/archive/15.04/esp.html>

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⁴ Robots doing science: <http://www.newscientist.com/article/dn16890-robot-scientist-makes-discoveries-without-human-help.html>

⁵ Amazing robot hand: http://www.youtube.com/watch?v=KxjVlaLBmk&feature=player_embedded

⁶ Miniature robots: <http://www.physorg.com/news181208607.html>

⁷ Miniature scientific equipment: <http://en.wikipedia.org/wiki/Lab-on-a-chip>

⁸ Laya augmented reality: <http://www.techcrunch.com/2009/06/21/layers-augmented-reality-browser-literally-more-than-meets-the-eye/>

⁹ Cellphones and Third World Poverty: <http://www.nytimes.com/2008/04/13/magazine/13anthropology-t.html>

¹⁰ Personal Area Networks: http://en.wikipedia.org/wiki/Personal_area_network

¹¹ Controlling electronics by brainwaves: <http://singularityhub.com/2009/05/22/the-emo-tiv-headset-gaming-with-thoughts-alone/>

¹² Stem cells curing sickle cell anemia: <http://www.usnews.com/health/family-health/articles/2009/12/09/bone-marrow-transplants-may-cure-sickle-cell-in.html>

¹³ Gene therapy to enhance athletes: <http://www.washingtonpost.com/wp-dyn/articles/A42270-2005Mar16.html> & <http://www.guardian.co.uk/uk/2004/jul/11/sport.health>

¹⁴ Vernor Vinge's Essay on the Singularity: <http://mindstalk.net/vinge/vinge-sing.html>

Gwen 'Aunt Molly' Polaneczky

by Ken Murphy

Gwen "Aunt Molly" Polaneczky (8A9856)

Human Female Age 42

7 Terms 'Bookie'

Vacc Suit-0, Brawling-0, Computer-2, Handgun-1, Gambling-4, Bribery-2, Streetwise-3, Carousing-2, Small Watercraft-2, Stealth-1, Bake Cookies-4, Bowling-2

Gwen's parents were killed in a shuttle mishap at Waterston Station (in orbit around gloomy Hargrave). For several years following, the girl was raised by a succession of even-more-distant and uninterested relatives until left to fend for herself on the busy, crowded streets of windy, storm-battered Port Royale.

There was a craggy-faced, limping old lady with long grey hair in the neighborhood, whom everyone called The Babba Yagga. On many occasions, she would stop to have a conversation with young Gwen. Such conversations would usually end with the green-coated hag giving Gwen a few Credits to get by. Other times The Babba Yagga would pay her for running errands—most notably the crossing of busy Radinson Avenue to the Bodega and back to bring the old lady a bottle of her favorite Rye, Old News-hound.

This time, however, instead of the usual 5 or 10Cr note, the fierce-looking, crone offered Gwen a place to stay—as long as the kid didn't upset her plethora of cats.

With so many different people with so many different names raising her, Gwen used whatever last name came to her as needed, but honestly, she'd confided with old Marishka (The Babba Yagga to you!), she wasn't really sure just *what* her last name was. The two discussed it off and on over time, until one day Marishka decided. "I'm raising you now, child. My last name, Polaneczky. It's a good name, girl. I give to you —Gwen Polaneczky" the cat lady bowed slightly and took Gwen's hand as if they'd just met. "I am The Babba Yagga. That is *my* name." The old lady smiled.

While bets could easily be taken via computer or

her communications setup, the Babba Yagga still liked to serve the locals personally; see the faces, have a shot, pass along some sagely advice, what have you. However, time had been silently working its magic, and getting around was becoming harder and harder. So at 14, Gwen began going around the neighborhood, and became the face of The Babba Yagga.

Gwen had always liked baking cookies (Snickerdoodles mostly, but also Chocolate Chip, and sometimes Chess Squares—Marishka's favorites), and started bringing some around on her face-to-face visits with the locals. One of the first locals to receive Gwen's cookies enthusiastically consumed them, saying how much they reminded him of his Aunt Molly's. Several others heard the comment and that was it. Gwen started being called "Aunt Molly".

Mama Marishka would bring Molly along on the annual trip to see the old crone's brother at the Hazelton Undersea Arcology, some 500km as the crow flies (and nothing short of the occasional visiting starship flies in Hargrave's roiling, grey-black, lightning filled blender of a sky). Molly soon learned to pilot the little submersible along its circuitous route, avoiding Hargrave's tricky, unpredictable tides, fierce surface storms, submerged mountains, giant reefs and shoals by following deeply-dredged pathways.

Molly is a small, pale, slip of a woman, with large, blue-gray eyes and blond hair kept in a ponytail. While The Babba Yagga was known as much for her grizzled appearance as her worn, green housecoat, Molly can usually be seen wearing a heavy leather duster made from authentic Earth cowhide to ward off the dreadful weather. Molly has never been offworld, or even into orbit (not that she can remember, anyways, as she was only 3 when her parents were killed) and has no interest to do so.

While she has acquired an encyclopedic knowledge of most sports over the years, Molly herself enjoys watching the Dog Races, and she loves to bowl—though her skills are really nothing to write home about.

Sometimes customers welch. When a stranger did it, it was handled efficiently by various means.

Up Close and Personal

(Continued from page 30)

But when a local did it, The Babba Yagga had always told Gwen it was like someone taking your trust in them and spitting on it. Now when the old lady came around to collect, her disheartening appearance would often be enough. If not, there were any number of nephews that made it their business to relentlessly grind whatever they could from the mark; sometimes doing a little body and fender work as needed.

Molly on the other hand—pretty, fine-boned, petite—lacking any intimidation value whatsoever, always tries to be nice and polite. Conversation is friendly, but business is business after all. If a local

thinks he can welch on her and get away with it, Molly may well be pushed to the point where she'll ask “Do we *really* need to take this to The Babba Yagga?” (Who is in fact, retired. But no one needs to know that). At which point the joker will usually see the light. If not, well, Molly has several nephews of her own. Occasionally things have degenerated to the point that Molly has been forced to draw her big, lethal-looking snub pistol, and say “Don't *make* me kill you!” (Molly has never killed anyone—though that shouldn't be confused with getting *shot*.)

Molly may be encountered anywhere around Port Royale, one of the undersea arcologies, or what could generously be called the Starport at Hendrix.

In A Store Near You

Missing Miscellany

by William Ringland

Here are some things missing from various versions of *Traveller* in my experience. Forgive me if they've already been covered somewhere else, just thought I'd share.

Multitool - Pen Knife, TL5: A small folding steel knife with a variety of cutting, gouging, sawing tools included. Also includes at least two kinds of screwdrivers, a magnifying glass, tweezers and sometimes (often the first thing lost) a toothpick.

Variations exist throughout known space, though the Solomani pride themselves on the quality, ingenuity, and sometimes downright ridiculous number of gizmos in their pen knives.

A basic pen knife multitool costs around 15Cr and weighs 0.2kg. Fancier ones can be had had from higher tech materials, cost upwards of 150Cr and can weigh around 1kg.

Multitool - Medium TL6, TL10: A heavier duty version of the multitool above, but more tools, and a casing that forms handles for better leverage when unfolded and inversed to the tool being used. Often includes snippers and pliers that rely on the improved leverage the design offers. When used correctly, a well made multitool will last for decades,

but users have a tendency to improvise with them, shortening the tool's lifespan, and sometimes the user's (i.e., using the handle as a hammer in a pinch, creating a circuit with them while not grounded, etc.). At TL10, some wear and tear is mitigated with the use of crystal-iron in the construction, and the inclusion of a gimbaled, lockable hammerhead.

The TL6 version costs 35Cr and weighs 0.7kg. The TL10 version costs 50Cr and weighs 0.5kg.

Special Rules: Multitools allow certain skill rolls to be attempted that would otherwise require a full tool-kit, but at a penalty, depending on the situation. Certain Simple repair tasks can be attempted without penalty, making the multitool a time-saver.

You'd figure multitools would make it into the 57th century? But I guess they weren't quite common household items when Traveller came out (I didn't even see my first Leatherman until the late '90s), but Swiss Army knives were common then. I'd imagine the Vilani thought they were both ingenious and somehow wrong at the same time - unless that's taking their hidebound specialization a bit too far? Human minor races flock to Terran ships to get their Swiss Army Knives and real Leathermans - the Imperium's days are numbered!

(Continued on page 32)

Up Close and Personal

(Continued from page 31)

Emergency Combination Radio/Flashlight, TL7, TL8: A small handheld case containing an LED flashlight, red flashing LEDs, a radio receiver (AM/FM/Shortwave), mono speaker, headphone jack, digital clock and alarm setting. Power is provided by a handcrank dynamo, rechargeable batteries, and a solar panel in the handle, making its power supply very versatile. The TL 8 version also includes a Distant (5km) communicator at no additional weight, and the construction is a bit more durable.

The TL7 Combo Radio/Flashlight weighs 2kg and costs 35Cr, while the TL8 version costs 100Cr.

I own an American Red Cross TL7 version of this - its pretty cool.

Aquaponics Subsistence Unit, TL9: A nearly closed system (when connected to the habitat sewage/treatment system) that provides rapidly growing fresh vegetables and cultured seafood for a single human or human analog. Includes a computer for monitoring its automated system as well as for keeping record of food harvested and seed/egg/frozen embryo stock available. Audio instruction systems can teach unskilled beings how to operate, repair, and monitor it provided they speak the same language. With proper care and management and stable power supply, a stocked unit can last for 5 years. A 5 year resupply or stock-spares (not including water) costs 15,000 Cr, displaces 3kl, and weighs 2 tons.

Each unit displaces 4 tons (54kl), weighs 30 tons, costs 0.3 MCr, and requires .07 MW to run. The subsistence unit, if integrated into a starship, counts as part of the Environmental Controls section. Although the unit doesn't include artificial gravity, it does need a stable gravity field in which to operate.

Making the equivalent unit for Hiver, K'Kree or Aslan requires 50% more resources than above for the increase in the fish/protein production (for Alsan), an 'aging bin' (used by the Hiver, aka 'Composter' by humans), or more hydroponics units (for the K'Kree, who only use the fish for aesthetics and ammonia to nitrate fixing.). Vargr and Droyne, with some minor modifications, can subsist on a unit designed for humans.

Variations are known throughout known space, including higher tech versions with more failsafes, higher yield foodstuffs for smaller amounts of space taken used, or catering to exotic diets. A visually aesthetic TL13 version designed for Micro to Zero-G environs, with lifeforms appropriate to it also exists, and has been a mainstay of Glisten startup communities for centuries.

Some of the numbers pulled out of the air, others were interpolated from MT environment components - Can correct it if that's too little space, but I am going by TL9+ (future) unknown techniques and handwavium nutrient/fertilizer management techniques. Just wanted to have the option for the players finding a 'derelict' covered in solar panels with an old coot/geezer of indeterminate vintage surviving in a void somewhere for years, or the frontier family on a rockball somewhere, still digging the grand garden-cave beneath their habitat while they use these in the meantime, or a scientist on biology cataloging sabbatical for a University, gone for close to a decade and thought deceased, living in an advanced base and one of these.

Likewise, simplistic gypsy ships can be crafted with these units, scooping and purifying fuel and making planetfall only when something interests them or they need to get 'out' and stretch their legs, eat something besides 'strawberries and fish', or need other kinds of resupply.

Feedback

We'd like to hear what you think of Freelance Traveller, both the magazine and the website!

We want to know what you think of the basic idea of Freelance Traveller as a magazine, not just a website; what you think of the articles we publish, and how we can make our magazine better and how we can make our website better.

We want to know what kind of articles you want to see, and what you *don't* want to see.

We want to know what you think of our look, and how we can make it better.

Please, give us your opinion! We've provided several ways you can do so:

You can send e-mail to us at feedback@freelancetraveller.com.

You can use the feedback form on our website, at

<http://www.freelancetraveller.com/infocenter/feedback/ftfbf.html>.

If you're a member of the SFRPG Forums, we monitor them, so you can post comments in the **Traveller Fanzines** section, at <http://www.sfrpg.org.uk/phpBB3/viewforum.php?f=36>. Please tag any commentary about Freelance Traveller with the string "[Freelance Traveller]", or reply to our message announcing the issue.

If you're a member of the Citizens of the Imperium forums, we monitor them as well, so you can post comments in the **Lone Star** section, at <http://www.travellerrpg.com/CotI/Discuss/forumdisplay.php?f=13>. As with the SFRPG forums, please tag any commentary about Freelance Traveller with the string "[Freelance Traveller]", or reply to our message announcing the issue.

Traveller on the Internet

Freelance Traveller sponsors a channel for Traveller fans on the Undernet IRC network, and RPGRealms sponsors one on the Otherworlders IRC network—and the two channels are “bridged” so that if you're visiting either, you can see what's going on in the other, and talk to people there. For more information about both channels, see our informational

IRC: The #Traveller and #LoneStar channels

pages at <http://www.freelancetraveller.com/infocenter/travnet.html#IRC> and <http://www.freelancetraveller.com/infocenter/travchat/index.html>. Come talk “live” with other Traveller fans about anything at all, Traveller or not. It's generally quiet in both channels—but you can change that, and make both channels “jumping” places to hang out!

Traveller on the Internet

Effective November 1, the Freelance Traveller Forums will be taken off-line, with the intent of returning, completely revamped, at the beginning of 2011. Although the revamped forums will have areas for general Traveller discussion, and for general off-topic discussion, the new forums will be more focused on the magazine (and website), with areas specifically for feedback and discussion of published articles, and for ‘slushing’ (and discussing) possible future submissions. We will be using new software to support them, so expect a different experience when we return.

The Freelance Traveller Forums

Because of the changes, we will not be able to reload the old system's message or user databases. However, we expect to be more feature-rich in the new version, and hope that you'll be willing to join us anew and make the Freelance Traveller reader community as vibrant and active as the Traveller community as a whole.

Thanks for your patience!

