Theme Issue:

Vargr

A Note About Production

Freelance Traveller is prepared using Microsoft Office Publisher 2010 running on a Windows 7 Ultimate x64 system. The program is reasonably easy to use, and produces good results with moderate effort; it also supports advanced typographic features such as typographic quotes and apostrophes, small caps, ligatures, swashes, and stylistic alternatives (if the advanced features are implemented in the font). Generation of the PDF files is built in to this version of Microsoft Office; no additional products are needed.

The title and heading typeface is ZapfHumanist BT, a Bitstream adaptation of Hermann Zapf's digital redesign of his 'hot lead' typeface Optima, chosen as a 'tie-back' to the title typeface of the original edition of *Traveller*. The black-and-orange of the section headings is also a tie-back to *Traveller*'s origins, though we felt that the 'correct' red was too dark. The heading sizes vary from 12 to 16 points. Body text is set in Palatino Linotype, also designed by Hermann Zapf, and is set at 11 points for most body text, giving approximately the same text spacing as Times New Roman at 12 point (which was the original *Freelance Traveller* body text), but a lighter 'color'. Palatino Linotype also 'balances' better as a body text typeface to Optima as a titling typeface.

Contents

From the Editor

There's one problem with living on a planet that has a rotational cycle of only 24 hours: You can't squeeze 30 hours per day of work, errands, helping mom clean up and set up from house renovation, helping mom shop, *and* putting together the magazine when you only get those 24 hours. It happens. But the issue is here, the last before TravellerCON/USA, and we're hoping to see as many of you in Morgantown as can get there. Come play with us, and thank you for all of the material you've produced that has appeared in our pages!

Mongoose Traveller 2nd Edition
Element Cruisers Boxed Set

reviewed by Jeff Zeitlin

Mongoose Traveller 2nd Edition Element *Cruisers Boxed Set*.
Matthew Sprange *et al*.
Mongoose Publishing http://www.mongoosepublishing.com
Boxed set, 3 softcover books plus
Price TBD (see note)

Note: The author received this as part of the deliverables from the product Kickstarter. It is unknown at the present time how this material will be offered to the public or at what price.

A nice heavy (for its size) package showed up one day, and sat waiting for me to open it. When I finally did (*I need 72-hour days!*), I found the box you see in the picture to the right. So, I opened the box, and found some deckplan sheets and three books.

The Books

The three books in the set are *Element Cruisers*, the core of this set, describing the focal ship class of the set; *Naval Campaign Sourcebook*, a set of guidelines for using Naval ships (and player-characters as crew thereof) in a campaign; and *Naval Adventure 1: Shakedown Cruise*, a mini-campaign designed to be used with the *Naval Campaign Sourcebook* that puts the rules and guidelines of the latter to good use.

Element Cruisers

While by no means the only important part of the boxed set, this book has to be considered the core. The titular ships and their crews and missions are described, along with operational aspects relevant to play.

Chapter One, "Cruisers of the Imperial Navy", provides an overview of the role of the cruiser in Imperial naval forces, including summaries of missions and unit organization. While cruisers aren't ideal for everything, they are quite versatile.

"Cruiser" doesn't designate a single design; Chapter Two, "Types and Classes", gives an overview of how various kinds of ships, all designated as "cruisers", can differ based on intended use. Often, a specialized design will be identified by its specialized mission or distinguishing characteristics, such

as Armored Cruisers, Escort Cruisers, Bombardment Cruisers, etc. – the number of design specializations may surprise those who aren't 'naval geeks'. An overview of procurement and disposal, as pertains to cruisers, is also included, as are a few paragraphs on how the cruiser is often used as a proof-of-concept testbed.

Chapter Three, "Officers and Crew", discusses the organization of Imperial Navy crews. The various branches and departments are described, along with their role in ship functions and how they relate to each other. The various career development tracks are touched upon, as is accommodating extremes of humanity (e.g., Geonee), humanesque aliens (e.g., (genetic) Luriani, Vegans, Aslan, and Vargr), and Imperial alien extremes (e.g., Virushi, Llellewyloly) as members of Imperial Navy crews.

The design history of the *Element* cruisers is outlined in Chapter Four, "The *Element* Cruiser Fami-

ly". Originally, the plan was for a single modular design, but other considerations led to two additional designs, one uprated and one downrated from the original. Each of the three resulting designs has a two-page spread for specifications.

"Modular" doesn't always mean "reconfigurable on the fly", like in the Modular Cutter. In the case of the *Element* cruisers, it means that there are a number of non-detachable "pods", each of which can be customized at build or refit time for specific missions. Chapter Five, "Pod Configurations", provides specifications for each of the most common pod configurations. There are enough to illustrate just how versatile the *Element* design can be.

Chapter Six, "Hull Construction and Layout" isn't quite a walk-through, but it does give you an orientation tour of the ship. If you have the space to lay out a blueprint sheet, this chapter plus locating each area on the plans will serve well as a familiarization tour of the main ship (excluding the pods). The overview includes specifically-tasked areas, like engineering and the bridge; basically, it's what any crewmember should know about a ship they've been assigned to. This section is nonspecific enough to apply to all three of the main designs in the family; the next three chapters each focus on one of those designs and describes its capabilities, common variations, and crew TO&E.

Chapter Ten, "History" is just that – a history of the *Element* class in Imperial service. Specific missions in which the class served with distinction are summarized; the ship has been used and proven itself across the Imperium, from the Fourth Frontier War against the Zhodani to antipiracy operations in Ley Sector.

Most Imperial Navy ships have Marine contingents aboard, and the *Element*s are no exception. Chapter Eleven, "Marine Contingents", gives an overview of the organization and functions of a ship's Marine contingent, and illustrates that Marine
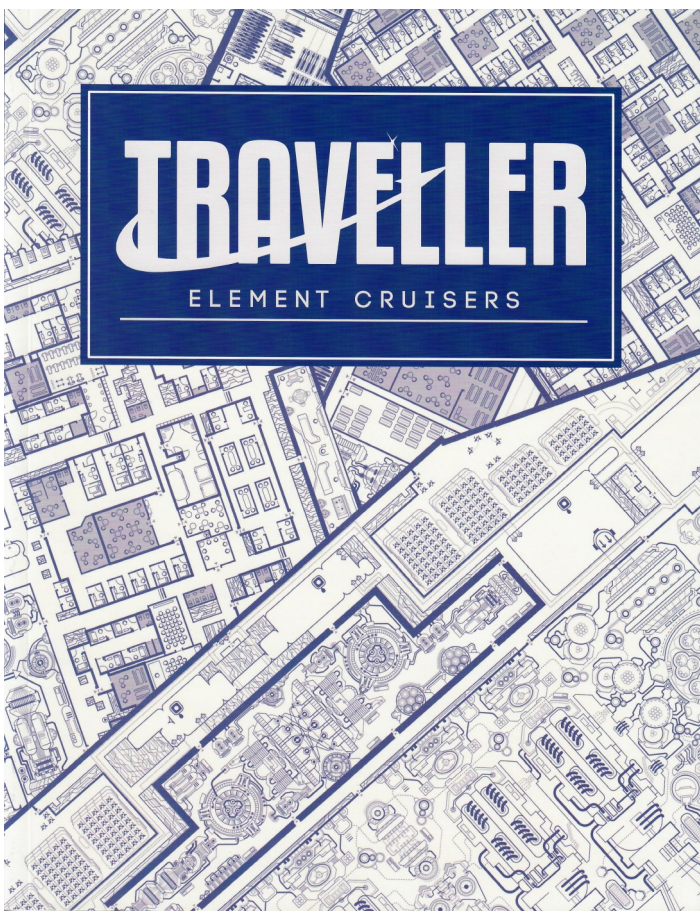
personnel serving aboard ships are Marines first, but must be versatile, as they can also be called upon to serve in purely ship-bound roles.

If one is not familiar with naval operations, it might be reasonable to think that Imperial Navy crews are all vetted, and that therefore "Internal Security" aboard a Navy starship wouldn't be all that important. Chapter Twelve, "Crew Dispositions and Internal Security" discusses the role of Internal Security both in ordinary operations and when the ship is at "action stations", and also discusses when and how shipboard personnel may be armed.

Chapter Twelve, "Hardware and Ordnance" is a catalogue of weapons and other equipment relevant to securing a navy starship. Personal weapons, armor and "space suits", and robots are included; this section acts as a supplement to the *Central Supply Catalogue* for items available to the Navy only.

Chapter Thirteen, "High Guard", is a supplement to the eponymous book, outlining new options for weapons, tactics, and support systems intended for use in constructing fighting ships. Some of these may be of interest to those who want to build mercenary ships as decommissioned naval assets, but for the most part, these should probably not be within the reach of independent player-character groups.

Overall, this book is a good look at cruiser operations and the Navy's philosophy pertinent thereto, and at the *Element* family of cruisers in particular (as intended).

Naval Campaign Sourcebook

Traveller has classically and consistently been focused on player-characters having "prior service" or "prior careers" operating independently, rather than being at the present orders of one of the Imperial services. The *Naval Campaign Sourcebook* offers the referee a way to use active-duty Navy and Marine characters in an adventure or campaign.
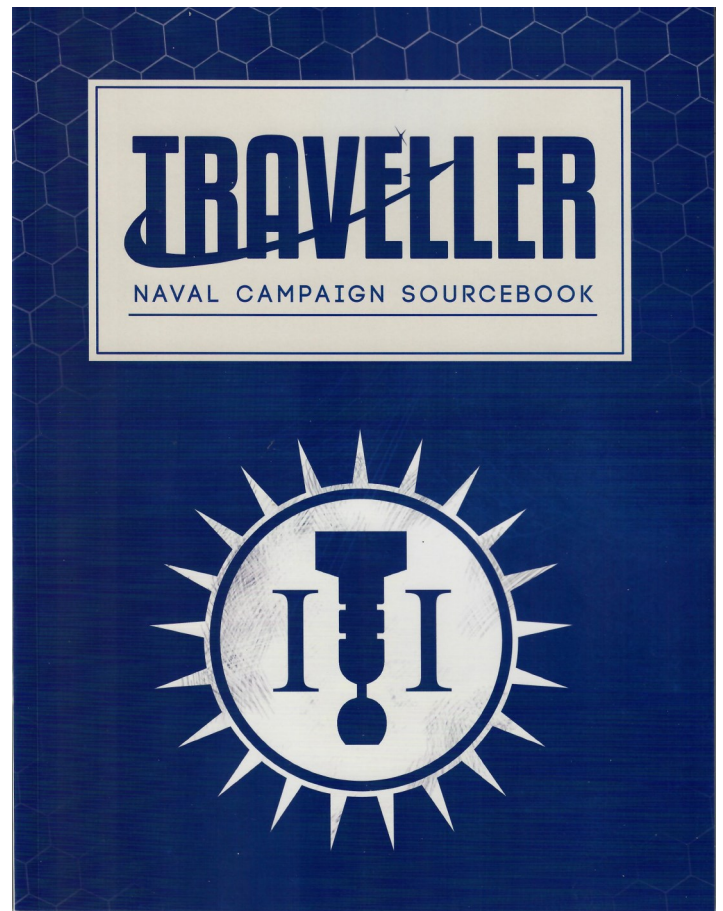
It is important to realize that the "standard" motivations don't apply to Naval campaigns; the player-characters aren't doing this for the benefits that might accrue (credits or otherwise), they're doing it because the Navy said "go forth and do…".

Because of this, the standard *ad-hoc* character generation process won't do. Chapter One, "Travellers in a Naval Camaign", and Chapter Two, "Creating Travellers" present a streamlined process for putting together a party of Navy characters and determining character skills.

Chapter Three, "Running a Naval Campaign", gives an overview of the kinds of campaigns that Navy missions would allow for, and how the player-characters can be rewarded, and/or "kept hungry". There are similarities with some "classical" adventures, but there are also significant differences, and a nod is given to the portrayal of similar tropes in SF shows like *Star Trek*.

Chapter Four, "The Ship and Crew as Characters", discusses how the ship itself and the crew other than the player-characters can be "characters" in an adventure. Previous versions of *Traveller* have used "ship quirks" and morale, but Mr Dougherty pulls it all together and ties in crew efficiency, to give us an entire package that can play a role in an adventure even before the player-characters are fully briefed.

Sometimes, you want members of a ship's crew to be more than 'spear chuckers' or 'redshirts', but they don't need to be as fully developed as player-characters, or even "major NPCs". Chapter Five, "Crewing the Ship", offers a quick and easy way to define a supporting character, with enough information that the referee can quickly (with a few rolls for relevant additional skills, personality traits, or events) convert the character into a major NPC. The chapter goes on to discuss "recruiting" (sometimes a captain or a prospective crew member can 'play' the Admiralty's system for assigning personnel to ships), rewards and punishment, courts-martial, and medals (with some nice illustrations – a minor surprise was that the Purple Heart (the 'Wound Badge' in other versions of *Traveller*), although it no longer bears George Washington's profile, still bears the Washington coat of arms where the medal itself depends from the ribbon. Deliberate, or an oversight?).

Chapter Six, "The Campaign", discusses activities that can affect the adventures, before an adventure starts, after one finishes, or between them. Although these activities are discussed as being outside of missions, they nevertheless do serve as hooks that you can hang an adventure on, or use to keep an adventure from being either too much of a cakewalk or too much of a headache. Or not, depending on how you as a referee want to run the campaign…. The three areas discussed in this chapter are Intelligence, Supplies/Stores, and Repairs, and a clever

referee can easily use the material in Chapter Four right alongside this material.

Chapter Seven, "The Mission", discusses the actual assignment of the ship that will serve as the framework for one or (hopefully) more adventures. The mission has an overall structure with several components, any of which can provide the opportunity for adventure, from a reception at the Admiralty where the ship's officers will interact with staff officers (and possibly increase the ship's chances of getting a good – or bad – mission), through briefing (where the intelligence may or may not be accurate), to mission preparation (do you have everything you'll need in the way of supplies, crew, stores, etc.? Can you get them before you have to get under way?), to launch, to the various tasks that are part of the mission (anything from routine patrol that doesn't turn out to be routine, to interdiction of hostile shipping, to showing the flag, to…), to return and debrief, lather, rinse, repeat. Each segment or task can succeed or fail, and 'success' or 'failure' in individual adventures may or may not affect overall segment/task success, or even mission success/failure. There are plenty of options for individual missions, tasks, and segments, and tables to assist in determining events and success. This is a very rich chapter, and worth reading through at least twice (or more; the well-prepared referee has probably gone through this entire volume twice, and this chapter in particular at least three times, before even starting prep to run a naval campaign).

Chapter Eight, "Resolving Combat", provides rules and tools for resolving 'abstracted' combat – for example, if the mission focusses on diplomatic negotiations and the ship's marine contingent is providing security for the Imperial negotiator, a space battle may be abstracted, so that its progress isn't entirely off-screen, but its progress can affect the progress of the negotiation without overshadowing it for the adventure. Even some actions that

might seem reasonable to game out might be worth abstracting, so that you can get to the critical part of the adventure – you don't necessarily need to game out a boarding action in detail if the critical part of the adventure is to find where the hostage is being kept and rescue him; you can abstract the boarding action to determine how much resistance or interference there might be while searching and extracting, and get right to the search. Of course, if you want (and have the time), there's nothing stopping you from using already-published rules to game out such abstractable actions in detail.

Chapter Nine, "Appendix: Alternatives and Options" is exactly what it says – most of this book assumes that you'll do things as outlined in the rest of the book – but if you find that it doesn't quite suit your group, or you want to try something a little different, this chapter discusses some of the more likely variations and their ramifications.

Overall, a thorough treatment of the naval campaign. Even though it assumes a ship like the *Element* cruisers, it's a definite buy with or without the rest of this set.

Naval Adventure 1: Shakedown Cruise

So, we have a good ship, and we have the tools to build a campaign with. And we even have plans for that ship (see the next section of this review). What else could we possibly want?

How about one of Mr Dougherty's well-written adventures to tie it all together and show how it's done?

Naval Adventure 1: Shakedown Cruise isn't quite an "adventure", even though it calls itself that. Rather, it's more what should be called a "mini-campaign" with multiple opportunities for adventures. To quote the first paragraph under "How To Use This Book":

This book presents the framework of a naval mission, with guidance on how to use the rules presented in the

Naval Campaign Guide*. It differs from a conventional* Traveller *adventure in that the mission can spawn a multitude of adventures, some of which could be quite lengthy. Most will, however, be quite short.*

The rest of the Introduction is a referee's overview of the structure of the mission, with some of the highlights. It is definitely not a section that can or should be skipped, as introductions so often are.

Chapter One, "INS *Sharshana*", introduces the *Element* cruiser at the center of this adventure, covering a bit of its history and the politics involved in its most recent refit (that led to this shakedown cruise) and assignment. Specifications are provided, as are a list and explanation of the quirks and traits that the ship has picked up in its history; there is a reminder that the ship can be a character in this adventure (as described in the *Naval Campaign Guide*).

The astrographic and astropolitical "landscape" is set out in Chapter Two, "Referee's Information",

along with some basic guidance for the referee. It is likely that some of the information here will need to be presented to the player-characters, as part of the mission briefing, in spite of the chapter title.

Chapter Three, "Shakedown", presents the mission. The introductory paragraph calls out the fact that this adventure may not be linear, even though the information about it is so presented. You get the "printed" orders for the Captain, an explanation of what they mean, and success criteria for the various aspects of the mission outlined in the orders.

As a freshly-refit ship going out on its shakedown cruise, the *Sharshana* must undergo some trials, and the resulting performance appraised. This is the focus of Chapter Four, "Appraisal and Space Trials". The discussion assumes that this phase of the mission will be somewhat abstracted, but there is a note that if the players enjoy this sort of thing, the trials can be resolved more actively and in detail.

Chapter Five, "The Mission: General Considerations", covers some aspects of a naval mission that are often overlooked in the typical *Traveller* adventure – for example, tracking (and replenishing) supplies and stores. It also covers general information from a naval mission viewpoint concerning ship encounters (and whether the ship would be running its transponder), intelligence gathering, and 'showing the flag'.

Chapter Six, "En Route", covers getting to the assigned patrol area for the mission. It involves visiting two backwater worlds, showing the flag and refueling at a gas giant, and an underway replenishment. This part of the mission is a good opportunity to see how well the ship and crew work, and if the refueling and replenishment exercise go well, it can mean that the crew is pulling together and becoming more efficient; this can contribute to success in later parts of the mission.

Once at the assigned patrol area and replenished, the player-characters (presumably the command crew of the ship) have some discretion as to what systems they visit in what order, within the limits of their orders. Chapters seven and eight outline incidents that should take place over the course of the mission; while chapter eight's incident must take place at a specific world, chapter seven's can happen anywhere, and the order that the two incidents occur is at the referee's discretion. Both incidents are of types that aren't unknown to the typical *Traveller* campaign, but the players may be in the novel position of being on the "other side", and even if not, they will certainly find that their options are different, and their hands may be tied – or not – in different ways from "normal".

Chapter Seven, "On Station", outlines an incident that can take place anywhere (and anytime) during the mission; how successful they are in achieving the aims of the incident (*no, you don't get any spoilers!*) can have a significant effect on their future actions and mission success.

Chapter Eight, "Aid to Civil Power", is another incident that will impact the eventual success or failure of the mission. The player-characters must realize that they are operating at an entirely different strategic and political level than usual, and the rules aren't quite the same.

Both of the above incidents should occur before the *Sharshana* arrives at the world specified in Chapter Nine, "Strike Mission", as the starting point for a sudden change in orders. The player-characters will have some important decisions to make in this part of the adventure, and how they conduct themselves and perform the mission objectives will strongly influence the overall mission success.

The change in orders represented by Chapter Nine doesn't cancel their original orders, and the ship should now return to its original patrol. It should be noted that the mission orders include certain activities beyond those of the incidents outlined in this volume; the referee should generate (and ab-

stract) these 'normal' activities, and play out one or two; it's not even out of the question to generate other events like the two presented in chapters seven and eight – but remember that the more that happens in an area, the more attention the Admiralty will pay to the ships that it assigns there, the more intensely the crew and command will be debriefed at the end of the mission, and the more critical their evaluations will be. That sort of mission assessment is summarized in Chapter Ten, "Return to Base". The player-characters are expected to submit a complete and accurate report; if the Admiralty believes they are being 'snowed' (beyond the usual attempt by the commanders to cast their activities in the best possible light), the outcome won't be good for the player-characters – and the referee is specifically cautioned not to be too lenient on the player-characters; a big part of naval missions involves ship and crew discipline under adverse conditions, and a ship and crew that acts in ways that embarrass the Navy and the Imperium will not find themselves looked on with favor.

I'd recommend purchasing this volume, but you really do want the *Naval Campaign Guide* with it, and having *Element Cruisers* would be helpful. Buy this plus the ones you don't have as a set.

The Plans

This is a collection of poster-sized glossy blueprints, white-on-blue, each sheet printed on both sides. The ostensible scale is given as 1:300 (or, if you'll forgive mixing measurement systems, approximately 1mm of plan to 1ft of "reality"); these ships are large enough that forward and aft sections of a deck don't appear together, and the plans aren't usable as playmats for miniatures. You get plans for all three main variants of the *Element* Cruiser Project, plus pods and subordinate craft. There's lots of detail, and if they were marked out for the standard 1.5m squares, you could enlarge sections on a copier for miniatures playmats, but as they are, they're in-

teresting to look at, but not extremely useful for play – 40"×28" (102cm×71cm) is a fairly awkward size for laying out anywhere other than the floor, and they're not suitable for framing and hanging on the wall (if your taste in decoration runs that way) because they're double-sided. I can't say that a separate purchase of these would be useful, but as a supplement to this boxed set, they're definitely nice.

Overall, this set is an excellent resource for a campaign type previously overlooked, and even if you're not into active-duty naval campaigns, it can give you good insights into the mindset and training of ex-Navy characters. Recommended purchase when it becomes available, unless you have zero interest in this aspect of Traveller and its universe. ✪

Deep Space Rescue Corps:

A Career for Classic and MegaTraveller

by Greg Alan Caires

Part One – The History of the Sappers

Shortly after the end of the first millennium of the Third Imperium, during the reign of the Emperor Gavin and following the Imperial victory of the Solomani Rim War (990-1002), the *Journal of the Traveller's Aid Society* (JTAS) published a small classified advertisement that asked a deceptively simple question:

"What one change might make the Third Imperium a more perfect union?"

The ad's author was not identified, and only an Xmail address accompanied the query.

Upon learning of the ad, the Moot was outraged – clearly this was some subversive scheme concocted by the recently defeated Solomani, using an arcane phrase from an ancient Terran political treatise to ignite widespread moral panic. A Ministry of Justice (MOJ) investigation could not determine who was responsible for the ad, and the Imperial Secret Service (ISS) determined the xmail address was fake.

After several months the virality of the hoax burned out and was on the verge of being forgotten until a disgruntled journalist from JTAS asked the Emperor of his answer to the question. Gavin was less bothered by the incident than the Moot, but no more amused than they were by the controversy:

"I couldn't care less. Isn't yours the same fringe publication that once published an ad from someone seeking a companion for time travel, warning them that their safety was not guaranteed? Only those damnable Travellers read the damn thing."

And with that Imperial dismissal, the question reentered public discourse; now, rather than trying to answer who asked the question, sophonts across the 11,000 worlds tried to answer it. What would make the Imperium "more perfect?"

Very quickly the traditional bromides of universal healthcare and basic income were proffered and then withdrawn after withering criticism. Then slowly, and the usually conservative pace of the Megacorporations, the answer began to form, partially inspired by Emperor Gavin's response – the Imperium would be better off without Travellers. Specifically, the "murder hobos" who under the guise of compliance with the Imperial Navigation Act respond to Signal GKs and Mayday requests yet somehow, almost invariably and without fail, make the situation worse for spacers in distress, their crews, their ships and the owners and masters of said ships. What was needed, a growing wave of "grass root" industrials advocated, was the establishment of a professional rescue service that would obviate the need for help from less than helpful and less than good Samaritans like the Travellers.

Drifting aboard 6G Response Boats in Cold Sleep until needed, DSRC personnel would wait patiently near 100 diameter limits along major axis leading to main worlds. Automated systems would revive them and plot intercept courses to ships needing assistance. Highly trained, skilled and conditioned to perform insanely dangerous rescue and recovery operations, they were envisioned to simultaneously improve the safety of space operations and deter troublesome Travellers from intervening.

Within the year the Emperor Gavin chartered the Deep Space Rescue Corps (DSRC). Initially envisioned as a charity, the overwhelming financial support from worlds and systems hoping to benefit from an expansion of the DSCR prompted the Moot to organize and fund it as a major service within the Imperial Government, akin to the Imperial Interstellar Scout Service (IISS). With a hat tip to the Solomani, who may or may not have set the affair motion, the DSRC appropriated an ancient term associated with lifesavers who once used explosives to contain

conflagrations – *sapeur-pompier* – to identify individual DSRC servicemembers: The Sappers

By 1100, every Imperial system with a Class A, B or C starport hosted a DSCR detachment. Along the way, the DSRC became one of the most respected Imperial Institutions, in some polls second only to the Imperial Family itself. In large part the DSCR's success is due to the bravery, fidelity, honor and heroism of the Sappers themselves.

Physically fit, preternaturally attractive and supported by a galaxy-class Public Affairs operation feeding an insatiable demand for pro-DSCR content by an adoring citizenry, juvenile sophonts want to be them, and mature sophonts want to mate with them. In more than 100 years of service, the Sappers have consistently been seen as heroic servants of the Imperium. Even when they fail, their clear devotion to duty and the tragic circumstances of their loss only enhances the aura bravura of the DSRC.

Every Sapper knows two things about their service are unfailingly true:

You must respond; you may not always return.

and

These things we do, so others may live.

And so it was for more than a century: unashamed heroes doing heroic deeds to widespread praise. That continued until the Flying Dutchman incident of 1105.

Some worlds of the Bowman Arm had been seeking to improve their status as Imperial clients. One system, Bowman (Spinward Marches 1132), had petitioned for and received a Sapper detachment. On 141-1105 an R-class, 600-ton subsidized liner *Duchess Selene* jumped into the Bowman system. The ship was dark, running without navigation lights, was not broadcasting and failed to respond to hails – a hazard to navigation condition called

"Flying Dutchman." She was also headed sunward on a path that would take her dangerously into the plane of the Bowman Belt where she would surely be pulverized and destroyed. The Sappers were revived and launched into action.

What transpired next has been the subject of controversy, conjecture and conspiracy theory during the past several years. What little facts can be determined are these: *Duchess Selene* crash landed on a planetoid within the Bowman Belt; that planetoid and a spherical exclusion zone several thousand kilometers in volume have been declared off limits, enforced by the Imperial Navy. The fate crew and passengers of the *Duchess Selene* is not accurately known; many – perhaps all – died, but it is unclear whether they were dead due to, or perhaps prior to, the ship's crash landing. The fate of the Sappers involved is also unclear – many, perhaps all, survived, but have never again been seen in public. Unfortunately, the most widely accepted theory is that at least some of the Sappers survived because they abandoned the crippled liner prior to crashdown. If true, this is the first reported instance of the Sappers "jumping like rats" rather than "going down with the ship."

A Moot investigation attempting to clear the Sappers was inconclusive, in large part due to MoJ and ISS decisions to classify all information about the incident at the Ultimate and Penultimate levels. In the wake of the tragedy and ensuing public relations disaster, the DSRC is soul-searching and seeking Imperial forgiveness as the demoralized Sappers attempt to regain the trust of the citizenry. Meanwhile, annual fundraising sales of the pheromone impregnated Imperial Calendar, "Sophonts of the Sappers," have declined precipitously. Only time will tell if the Sappers will ever again achieve the vertiginous heights of trust and popularity they once enjoyed.

(Continued from page 10)

Part Two – Sapper Character Generation

1. Roll 2D6 seven times, note the results, remove the lowest number, and assign results to UPP at player's discretion.

2. Roll 1D6 to determine number of terms served by the PC with the DSRC:

a. If the result is 3+, then the PC has at least three terms of service; skip to Section 3 below.

b. If the result is 2-, then the PC has two or fewer terms of DSRC service. Player should then roll 1D6-3 to determine the number of Prior Service terms the PC has experienced (any roll modified to less than one equals one), and then proceed to the following Section 2c.

c. Roll 1D6 to determine the PC's Prior Service career

1 = Scouts (Auto skill: Pilot-1)

2-4 = Navy (Auto skill: Zero G-1)

5-6 = Marines (Auto skill: Cutlass-1)

d. Determine Prior Service Skills, do not bother with Survival, Commission/Promotion or Re-Enlistment rolls.

It is assumed that the PC survived and re-enlisted for the pre-determined number of terms. It is also assumed the PC did not achieve Commission or Promotion; had they, they likely would have not left their Prior Service for the Sappers.

The circumstances of their PCs' departures from Prior Service is left to the players' imaginations.

SCOUTS receive 2 skill rolls per term:

1D6	Personal Development	Service Skills	Advanced Training	Advanced Education
1	+1 STR	Air/Raft	Vehicle	Medical
2	+1 DEX	Vacc Suit	Mechanical	Navigation
3	+1 END	Mechanical	Electronic	Engineering
4	+1 INT	Navigation	Jack-o-Trades	Computer
5	+1 EDU	Electronics	Gunnery	Pilot
6	Gambling	Jack-o-Trades	Medical	Pistol

NAVY receive 2 skill rolls during their 1st term, then 1 skill roll per term thereafter:

1D6	Personal Development	Service Skills	Advanced Training	Advanced Education
1	+1 STR	Ship's Boat	Vacc Suit	Medical
2	+1 DEX	Vacc Suit	Mechanical	Navigation
3	+1 END	Zero G	Electronic	Engineering
4	+1 INT	Gunnery	Engineering	Computer
5	+1 EDU	Blade Combat	Gunnery	Pilot
6	+1 SOC	Gun Combat	Jack-o-Trades	Admin

MARINES receive 2 skill rolls during their 1st term, then 1 skill roll per term thereafter:

1D6	Personal Development	Service Skills	Advanced Training	Advanced Education
1	+1 STR	ATV	Vehicle	Medical
2	+1 DEX	Vacc Suit	Mechanical	Gunnery
3	+1 END	Blade Combat	Electronic	Demolitions
4	Gambling	Gun Combat	Gunnery	Computer
5	Brawling	Gunnery	Blade Combat	Leader
6	Blade Combat	Zero G	Gun Combat	Admin

e. Prior Service Mustering-out benefits – PC earns 1D6 roll per term served in Prior Service:

1D6	Navy Benefits	Cash	Marines Benefits	Cash	Scouts Benefits	Cash
1	Low Psg	1000	Low Psg	2500	Low Psg	10000
2	+1 INT	2500	+2 INT	5000	+2 INT	20000
3	+2 EDU	5000	+1 EDU	7500	+2 EDU	30000
4	Blade	10000	Blade	10000	Blade	40000
5	Mid Psg	25000	Mid Psg	20000	Gun	50000
6	Hi Psg	50000	Hi Psg	30000	Mid Psg	60000
7	+1 SOC	70000	+1 SOC	40000	Hi Psg	70000

DM +1 on Cash Columns if PC has Gambling skill.

3. Determine DSRC rank

a. Characters are automatically awarded Rank 0 (Sapper Apprentice) and accompanying Auto Skills during their first term of service in the DSRC.

b. Roll 2D6 for each term of DSRC service (including 1st term) to determine if promoted during that term of service.

c. Promotion achieved on 2D6 roll of 8+, modified by +1 if INT is 8+.

d. Skill levels are cumulative so a PC with rank Lead Sapper who elects Medic-1 and who then rolls Medic on the Service Skills table below results in Medic-2.

Level	Rank	Auto Skill(s)
0	Sapper Apprentice	Vacc Suit-1 & Zero G-1
1	Sapper	Blade[1] & Damage Control[2]-1
2	Lead Sapper	Medic-1 or Demolitions-1
3	Sapper First Class	Leader-1 & Liaison-1
4	Chief Sapper	Demolitions-1 or Ship's Boat-1
5	Senior Chief Sapper	Instruction-1
6	Master Chief Sapper	Admin-1

4. Determine DSRC skills

a. Roll 1D6 against the table below twice per term starting with the 2nd term of DSRC service (note: total # of skill levels cannot exceed INT+END).

b. Player may choose which column they are rolling against but can only choose Advanced Education if their PC has an EDU of 8+

c. At least one roll per term *must* be on either Personal Development or Service Skills. The other roll may be on any qualified column.

1D6	Personal Development	Service Skills	Advanced Training	Advanced Education (EDU 8+)
1	+1 STR	Blade	Ship's Boat	Naval Arch
2	+1 DEX	Vacc Suit	Medic	Legal
3	+1 END	Zero G	Demolitions	Gravitics
4	+1 EDU	Dmge Ctrl	Computer	Engineer'g
5	Blade Cbt	Liaison	Survival	Navigat'n
6	Gambling	Air/Raft	Revolver	Pilot

1—Sappers are equipped with a custom "Sapper's Axe" that includes an electromagnetically attached blade head (front), pike (top) and hammer (rear), and a telescopic shaft, that allows this tool to also be used also as a crowbar (cudgel) or a hatchet. To master the Sapper's Axe, PCs acquire the Blade skill.

2—Damage Control (DC) is a new skill allowing characters to mitigate the effects of ship combat; it can be considered a mix of firefighting, mechanical, electronic, computers and engineering. Characters present in shipboard spaces (bridge, drive room, etc.) when damage occurs use their DC skill level to favorably modify damage rolls. If a PC is not present when the damage occurs, their DC skill can also be used to perform rudimentary repairs on shipboard systems after they are damaged to make them operable, but with limited functionality. Greater functionality may be achieved by more skilled personnel using skills other than DC (e.g., engineering, mechanical, computer, etc.).

5. Sappers do not roll for Reenlistment. After their 10th term (age 58), Sappers must retire.

6. At the *end* of each term, Sappers roll to determine their Survival. On a 2D6 roll of 12 the Sapper has been injured and must retire; on a roll of 2 the Sapper has been grounded and must retire; Flight Surgeons have determined that further low-berthing has become too risky, leaving the Sapper vulnerable to traditional low-berth survival rates. All other rolls (3 to 11) have no effect and the Sapper is assumed to have survived.

7. Determine Aging Effects

a. Roll 2D6 to determine effects of aging during 6th through 10th term of service. Note that due to extended periods in Frozen Watch, Sappers suffer the effects of aging at slower than other PCs.

b. Adjust UPP accordingly. The effect on the indicated characteristic is applied if the indicated roll is *failed*.

Term	6	7	8	9	10
Age	42	46	50	54	58
STR	-1 (11+)	-1 (11+)	-1 (10+)	-1 (10+)	-1 (9+)
DEX	-1 (11+)	-1 (10+)	-1 (9+)	-1 (8+)	-2 (8+)
END	-1 (12+)	-1 (11+)	-1 (10+)	-1 (9+)	-1 (8+)

8. Mustering-out benefits – PC earns 1D6 roll per term served in the Sappers:

1D6	Material Benefits	Cash
1	Gold multifunctional personal timepiece	10000
2	+1 INT	20000
3	+1 EDU	30000
4	Sapper's Axe	40000
5	Middle Passage	50000
6	High Passage	60000
7	+1 SOC	70000

Optional DM +1 on Material Benefits Column if Rank 5 or 6

DM +1 on Cash Columns if PC has Gambling skill.

Doing It My Way

9. Determine Pension

Sappers who successfully complete five or more terms with DSRC (not including Prior Service terms) receive an annual pension per the table:

DSRC Terms	Annual Pension
5	Cr2000
6	Cr4000
7	Cr6000
8	Cr8000

10. Conclude character generation by confirming character's current age, number of terms of current and prior service, and total number of skills and skill levels.

Final Thoughts

Sappers are hardened, hearty, almost foolhardy spacers sworn (and devoted) to save sophonts from near certain death amidst the hard vacuum of deep space. They approach this duty serenely, without gallows humor, secure in the knowledge that they will either survive, or die a hero's death. They rush into starship spaces intelligence sophonts are trying to escape. They do not give up their lives cheaply or easily, only when doing so means other will live. They are the perfect people to have beside you in a crisis, and they should be played accordingly. ✪

Author's note: The Sappers will return during TravellerCON/USA in October 2019 with "So Others May Live – Redux," a semi-sequel to last year's infamous *Duchess Selene* "Flying Dutchman" incident. This game will be run by the author Friday night, Saturday night and Sunday morning. Players wishing to create Sapper characters for use at these games are encouraged to do so. Please remember to keep your PCs as active members of the DSRC by ending character generation prior to their forced retirement and mustering out.

Raconteurs' Rest

Smoke Test: Once In A Blue Moon

by Michael Capriola and C. A. Pella

Chapter Three

Vishnu Lubbock gave up trying to raise the Seeker ship via radio and maser. He swiveled his chair about as Hayao Farb entered the Control Room. The thin, balding, stoop-shouldered tech team leader scowled at the Captain. "What's wrong? I just know something is wrong."

"I'm afraid so. There's a *Seeker*-class vessel out there trailing behind the probe by about ten thousand kilometers. Not on top of the thing, and maybe they don't even realize it's there."

"A Seeker? This won't do at all! Captain, you must find out who is on board and what their intentions are."

"If I must, but they aren't answering our hails."

"Then pull alongside and board the damn thing. Really, Captain!"

Farb reminds me of my sister-in-law, whose nagging drove my brother into the Imperial Marines. "Not as easy as all that. We'll have to match velocities."

"Coming up on orbit insertion," the First Mate announced.

Lubbock punched up the diagrams and figures of the *Grendelsbane*'s approach to the moon and tried out a couple of projections.

"Captain! We—"

"Quiet, Farb! I'm trying to run some calculations here…. Okay, Moe, here's what we'll do. We'll insert ourselves just behind the Seeker. About five or so klicks, if possible. I'm sending the figures to you

now. Got 'em? Good. But I want us facing ass-backwards once we're in orbit; that way we can use the engines to brake and drop into a lower and faster orbit if we need to."

"And overtake them," the First Mate interjected. "Got it, Captain."

"Okay, here we go. I'm aligning the ship now using the attitude jets. Hua, keep your sensors trained on that Seeker."

"Aye, sir."

"Say, Farb? If you're going to fidget, get the hell off my bridge."

The tech leader scowled but departed without another word. The three bridge officers focused on the job at hand.

————————

Three hours later the *Grendelsbane* circled Blue Moon just 7.565 Km behind the Seeker. Farb had monitored the ship's progress and was now back on the bridge.

Lubbock keyed on the ship-to-ship radio. "Merchant *Grendelsbane* to unidentified vessel: can you read me? What is your ID and status?"

Static issued from the speaker, but a voice came with it. "*Grendelsbane*, this is" *** "*Pygmalion* out of Port Citadel at" *** "—itin's Star. We have problems with" *** "—lectronics and power distribution net." *** "gyroscope and CPU diagnostics" *** "—ceding."

"*Grendelsbane* to *Pygmalion*: you're breaking up. Confirm that you have an onboard emergency. Over."

"Pygmalion here." Some of the static was gone. "Is that better? We have some systems failures, and we could sure use some extra help getting this rust-bucket back on track. As is, we're struck in orbit around this stupid moon. Over."

"*Pygmalion*, do you have life-support problems?"

"Negative, *Grendelsbane*. Environment is stable. We're not in any immediate danger, but we're not going anywhere either. Power supply and distribution is erratic. Nav-comp is down. We're still running diagnostics. Over."

"Okay, *Pygmalion*. We'll get back to you. *Grendelsbane*, over and out."

Lubbock swiveled his seat around. "Well, gang—what do you make of that?"

"Could be a trap," Cheng suggested. "They didn't give any explanation as to the cause of their engineering problems."

"Could just be bad or incomplete maintenance," First Mate Smith countered. "And there's no reason to suspect any ship that happens to be here at this time. Blue Moon is the largest satellite of this gas giant. Larsen's Star has twice the heavy metal abundance as Sol-standard normal, and prospectors are constantly searching this star system for the next mother lode."

"Still… we best approach with caution."

Farb butted in. "We need to find out if they've taken information from the probe. We should leave a team here to search the Seeker ship while the rest of us go and collect the probe and check its records."

"You contacted the probe by maser when we got within range, didn't you? Any sign of trouble or that the probe had been tampered with?"

"Does the probe have a security system?" Smith asked.

"'No,' to your question Captain. And 'yes' to yours, Mister Smith. The probe is quite capable of using its active sensor systems as a weapon against any manufactured object that gets too close without broadcasting a security code."

"Like, 'Halt—who goes there?'" said Cheng. "And the approaching vessel has to answer with a password?"

"Pretty much so. But the Seeker isn't close enough to trigger the probe's defense mechanism. And if they're dead in place…" Farb ran a hand through his thinning hair. "If they got between the probe and the moon, and then were attacked… and if they had enough power to push themselves into a higher orbit…"

Lubbock drummed his dark fingers on his armrest while he thought over his options. Imperial regulations required *Grendelsbane* to provide assistance to any ship in distress. But there was no way to know if the *Pygmalion*'s crew had tampered with the probe without checking out the probe. If *Grendelsbane* helped the Seeker-ship get on its way, and then found out the others had stolen the probe's data, there would be hell to pay. "Farb, how long will it take to retrieve the probe, download its data and redeploy it?"

"Forty-eight hours, Captain, as you should remember from briefings."

Petulant bastard. Lubbock turned on the ship-to-ship-radio.

"*Grendelsbane* to *Pygmalion*."

"We read you, *Grendelsbane*."

"We are prepared to render assistance, but we have an urgent matter to attend to. Can you wait forty-eight hours while we see to it? Over."

"Please stand by, *Grendelsbane*." The comm went dead, though the status light showed the line to be open. Lubbock figured that the *Pygmalion* crew were discussing the situation.

"*Pygmalion* to *Grendelsbane*. We understand your situation and will wait two days if necessary. However, I will have to file a complaint with Whipsnade authorities about the delay. Over."

Lubbock ignored the attempt at intimidation. "Understand, *Pygmalion*. See you in two days. *Grendelsbane* out." He cut the connection.

"Okay, gang. Let's head over to the probe."

————————————

The tech team used their communications equipment to contact the probe as *Grendelsbane* approached. Lubbock monitored their progress with a comm link tucked into his ear. It was pretty boring stuff to listen to. The techs had to shut down the probe's on-going operations one at a time. Sensor booms had to be retracted, and the small fusion power plant ramped down and secured. To make matters even more tedious, each procedural step had to be re-checked and certified before proceeding to the next. Bureaucratic red-tape required by the Vaughn-Payne R&D's grant from the Duke. Lubbock picked up a notepad and jotted down a new slogan to hang on the bulkhead. "Bureaucracy: Working Hard to Make the Galaxy More Tedious for Everyone!" And, "Today The Galaxy, Tomorrow The Universe: Strangling Us All With Red Tape One Star At A Time." He thought it over and decided the first idea was best. He tapped his stylus on the pad, then wrote, "Bureaucracy: Slowly Grinding Gears To A Dead Stop." No, the first one really was the best.

"Farb to Bridge."

Lubbock activated the intercom. "Bridge here."

"Captain. We're read to initiate Close Approach."

"Copy that." He checked the duty roster. "Second Mate Cheng, report to the Bridge."

"She's got a mouth full of food," Nguyen answered. "But she's on her way."

"Tell her to chew carefully." He cut the connection and checked the updates on the navcomp while he waited.

Cheng arrived a couple of minutes later and slid into the number two seat.

"Give me a distance reading, Hua."

"Five hundred twenty klicks and closing."

"Cutting speed slowly… Distance reading."

"Four hundred sixty-five klicks and closing."

"Let's see if we can get within spitting distance." Lubbock put more power into the braking jets.

"Farb to Bridge. Are we there yet?"

"I need to concentrate here, Farb! Stay off the intercom!" *Godsdamn fool.*

The last kilometer of the approach was the most dangerous. Lubbock cut the ship's speed to virtually nothing, tapping the attitude jet controls for short bursts as he maneuvered to within 50 meters of the probe. He paused to wipe the sweat from his face.

"Okay, Hua. Let's pivot this beast so that the starboard cargo bay door is facing the probe, then we'll move closer."

"Roger that."

Ten agonizing minutes passed.

"Bridge to tech team. We're ten meters from the probe and holding steady. That should be adequate for you guys to go and fetch the probe."

"Very good, Captain. We're suiting up now."

Lubbock activated a starboard camera so that he could monitor the progress of the tech team in bringing the probe on board. Fifteen minutes later he watched the two docking arms carefully extend towards the probe. The left-hand one stopped halfway to the probe.

"Goddammit!" someone swore.

"Shut down the docking arm motors," Farb ordered. "Davout and Fenton: go out and check the arm joint. Rayne: take a look at the motor."

It took the better part of an hour to locate the trouble—the motor had seized up—and fix it. Engineer Sprey had to lend a hand before the system was operating properly again. The docking arms inched their way towards the probe once again.

The grapples eventually took hold, and the two vacc-suited techs outside the ship jetted over to the probe for verification.

"Probe is secure," one of them announced. "You can bring it on home, April."

"Copy. Retracting the docking arms."

The probe edged towards the cargo bay door. Mohammed Smith entered the bridge during the procedure and stood quietly behind Cheng, watching the event on her monitor.

"The probe is aboard. We're setting it into the cradle. Get back inside, guys."

"Roger."

Lubbock looked up as the First Mate laid a hand on his shoulder. "You look beat, Captain. It's time for change-of-watch anyway."

"Already?" Lubbock unbuckled his seat belt. Cheng did likewise. Lubbock stood and stretched. "I'm going to take a nap. We'll go back to shifts of four hours on and eight off. Wake me at the end of your shift."

"Let me take the second shift, Captain," Cheng said. "I'm more rested." Smith nodded in agreement.

Lubbock studied the determined faces of his two subordinates and decided not to argue the point. "Alright. I could use eight hours in the sack."

Smith touched two fingers to his right eyebrow in salute, and then took Cheng's seat.

In the dream the goddess kali loomed over Vishnu Lubbock and waved her four arms in the air. They were not of flesh, though, but metal and cables like docking arms. He retreated, but the goddess grinned and chased after him.

An alarm woke him. An alarm and a shouting voice.

"Emergency! Emergency!"   ✸

2300AD: French Arm Adventures

reviewed by Megan Robertson

This review originally appeared on rpg-resource.org.uk in March 2016.

This book contains three adventures and ancillary material about the worlds on which they are set. The adventures are based on ones originally released by Game Designer's Workshop for their *2300AD* game—*Beanstalk*, *Kafer Dawn*, and *Energy Curve*—which have been retooled for the Mongoose *Traveller* ruleset. It is recommended that the introductory adventure *Tricolore's Shadow* be played first, but as I don't have a copy I cannot comment on that.

There's a nice map of the French Arm, then it's on to the first adventure, *Beanstalk*. There is a lot of supporting material explaining the nature of the Beanstalk itself and the planet of Beta Canum where it is to be found—plenty of history and background that makes the place come to life and suggests further ideas for adventure even after this one is done. Beta Canum has four continents—the French Continent, the British Continent, the German Continent, and the Southern Continent, and there is also an alien embassy, the Pentapod Enclave. All of these are described in considerable detail.

Scene set, we move on to sections entitled The Actors and The Drama. The Actors provides details of leading NPCs and The Drama consists of three separate but linked scenarios concerning the Beanstalk. These are followed by further materials: suggestions for follow-up adventures, technical data about beanstalk operation and other matters.

The adventures themselves involve the party working as troubleshooters for Rebco sampling air around the Beanstalk, getting involved in a dispute over foodstuffs produced by British and French companies and trying to survive when the Beanstalk
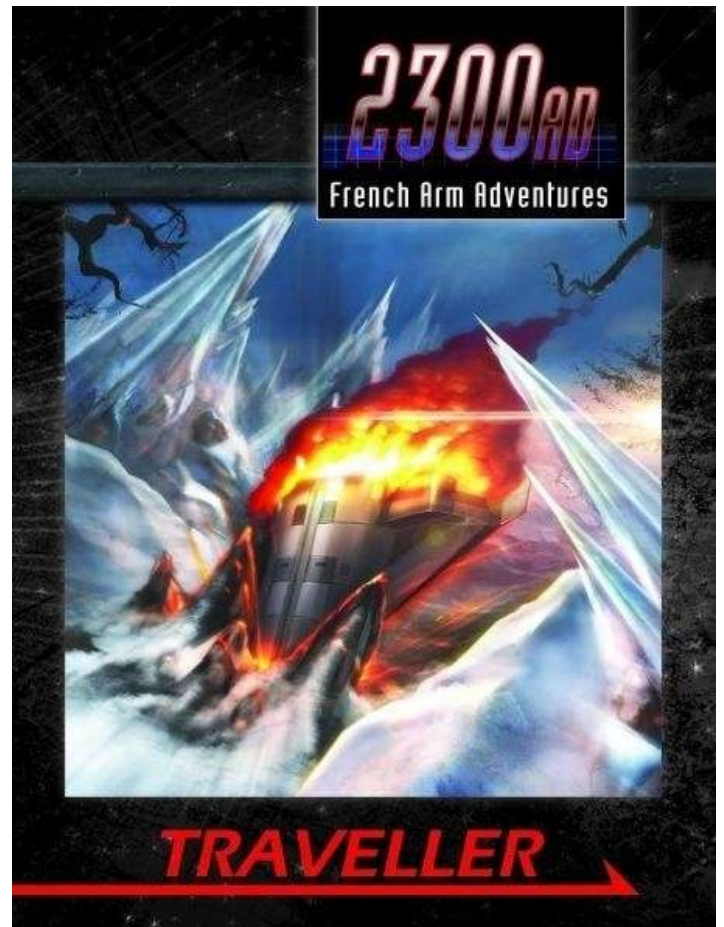
gets sabotaged… Each can be run as a standalone adventure or they can be run in sequence.

Next comes *Kafer Dawn* (which for some reason suddenly becomes *Kaefer Dawn*…). In this, the party are mercenaries on the planet Aurore and get embroiled in the growing war with the Kafer (or Kaefer), an alien race that is not inclined to share space with any other colonists. There is background on Aurore, its capital Tanstaafl and the Kafer themselves, ideas for adventuring on Aurore and three scenarios to get you going. There's a lot to keep characters who enjoy the mercenary life busy.

The third adventure is *Energy Curve*. This is not as well introduced as the others, everything's a bit muddled and a thorough read-through is recommended to understand precisely what is going on as—unlike the others in this book—you cannot get an overview at a glance. It involves a downed exploration vessel and the fight for survival on an unknown planet that ensues. There is masses of oppor-

Critics' Corner

tunity for exploration and interaction in this one, a fascinating and challenging adventure that lasts the better part of a year (game time).

Finally, there are a couple of appendices, one on the Pentapods and one about technology. Overall, there is a wealth of resources here over and above the adventures themselves, although there is a rather jumbled air to the whole thing with disparate

adventures suited to at least three different parties (if not groups of players—people who like exploring may find less fun exploring new worlds or trouble-shooting in a fairly civilised environment where gunplay is frowned upon, and vice versa). But there's plenty of material here and well worth reading as you build your knowledge of the French Arm and mine it for opportunities to adventure. ✲

Less Dangerous Game

Leilax

by Benedikt Schwarz

ANIMAL	HITS	SPEED
Leilax	15	3m
SKILLS	Climbing-1	
ATTACKS	Flee 8-; no attack*; Nettle fronds (1-2)	
TRAITS	Slow metabolism (-2 initiative); Small (-1); Poisonous (V. DIFF., incapacitation and pain/2D min.)	
BEHAVIOUR	Herbivore/Grazer	

ANIMAL	HITS	SPEED
Leilax *(pregnant)*	15	3m*
SKILLS	Athletics/Dexterity (leap)-1; Climbing-1; Melee/grappling-1; Melee/ovipositor-2	
ATTACKS	Flee 2-; attack 6+; Nettle fronds (1-2); Ovipostor (2D)	
TRAITS	Fast metabolism (+2 initiative); Small (-1) Poisonous (V. DIFF., incapacitation and pain/2D min.); Camouflage (-2 spot); Bright Coloration (+2 spot)	
BEHAVIOUR	Carnivore/Killer	

Morphology	Bilateral symmetry, octodecapod (eighteen short stub-limbs used for clinging and locomotion), many frond-like quills extending from back
Biochemistry	C/H/O/N/P/S, broadly human-compatible
Respiration	Oxygen-nitrogen inhalant, Carbon dioxide exhalant, tolerant of a wide range of tainted atmospheres
Ecology	Circadian (active day and night)
Habitat	Forested areas, from subtropical to the cold end of the temperate range
Diet and Trophics	Herbivore / grazer, ectothermic (cold-blooded)
Reproduction	Two genders, very little sexual dimorphism, conjugal intercourse, viviparous birth (laying twenty to thirty nymphs into a host's organs), semelparous (reproducing only once a lifetime). Progeny are not cared for.
Lifecycle and ontogeny	Five weeks as nymph gestating in a host body, several moultings, up to ten years as an adult. Dies about a week after laying nymphs.

Startlingly beautiful creatures, Leliax have been used in a few terraforming attempts during the Ramshackle Empire era, mainly to curb the growth of trees or tree-like plants in areas that should remain sparsely forested for meteorological reasons. They have long since spread to the habitable zones, where they have proven to be a dangerous nuisance. Zoological gardens are very fond of them for their beautiful displays of colour, keeping them hormone-

suppressed and confined to plastoglass-domed habitats for the safety of visitors. But when wild Leliax are encountered in parks or the outskirts of a city, they are usually caught or exterminated, both because of the damage they do to the tree population and because of the danger they pose to humans and other sophonts, especially in the mating season.
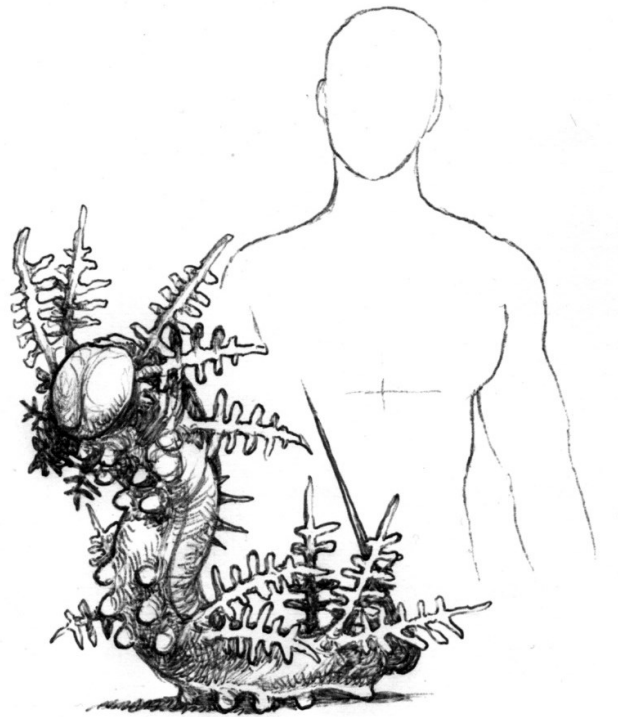
Less Dangerous Game

Their native planet is surmised to be one of the original Solomani colonies, but other sources suggest that the Leliax were a "present" from the Daryen (who aimed to help the Humans' terraforming attempts) that turned out to be a bane rather than a boon. The Solomani expression "a Darrian gift" means something that looks like a good opportunity but backfires horribly, and may have been coined for this or a similar instance of Daryen help.

Interestingly, many Aslan worlds have deliberately imported Leliax and introduced them to their ecosystems. Aslan, it seems, are more inclined to accept danger as a part of their everyday lives for the sake of beauty. They also value the Leliax as a "special prey" – and as an admonition to never let down one's guard, even in one's own garden. In *Trokh*, the creatures are called *realeakh*, which is simply 'Leliax' using *Trokh* pronunciation rules.

Leliax look much like a one-meter-long caterpillar, with a long, pointed stinger at the end of its abdomen (folded over the back to point upwards at a sharp angle, like a scorpion's stinger) and many tufted fronds jutting out from dorsal joints. The fronds are clustered above the groups of short leg-stumps that are used to anchor the Leliax to a tree. The entire facial dome is optically sensitive, with surprisingly accurate depth perception for a composite visual organ. Leliax have no sense of hearing.

Leliax attach themselves to trees and slowly nibble off the bark, along with the mosses and fungi that grow on it. The constant feeding weakens the tree, cuts off its circulation and makes it susceptible to rot; such trees usually lose their leaves or needles over the course of several years and finally develop severe phytopathogenic fungal infestations. Gnawing patterns are long, winding lines and spirals, like an ambrosia beetle's, that will slowly cover the entire tree during a Leliax's lifespan.

Leliax are not particular about which trees or tree-like plants they feed on; they will attack the gi-

ant spiral ferns of Gelenn with the same abandon as they do the wire dendrites of Zirkon or the bioluminescent glass-bark trees of their supposed home planet Elenvine. (A few species of alien trees are poisonous for them; Leliax who feed on those kinds of trees usually sicken and die within a few months.) Since Leliax are territorial and mark their own tree with a pheromone that keeps fellow species members away, the infested trees are evenly spaced several meters apart, leading to a natural lightening of the forest's density.

The pheromone's odour is undetectable by human noses; Aslan and Vargr may notice it as a faint, not unpleasant, whiff. Droyne (and, interestingly, psionically gifted humans) detest the pheromone's smell and will develop a strong headache if they remain too long in the vicinity of Leliax (-1 to all actions after 1 hour of exposure). The pheromone fades in the mating season, to be replaced by the female's sexual attractant odour.

Both the Leliax's skin and its fronds are very brightly coloured, with swirling patterns in many hues of green, white, blue, turquoise and lavender,

sometimes interspersed with garish stripes of emerald green, red or yellow. No two Leliax have identical patterns. The intense colouration serves as a warning to would-be predators: the fronds are covered with stinging cells (nematocytes) connected to nettle-glands that secrete a potent neurotoxin. While not actually deadly to sophonts of human size, the venom causes intense spasms and pain. (Droyne react more heavily to the toxin, suffering the equivalent of cardiac arrest in extreme cases).

If attacking a Leliax with a weapon shorter than a sword or cutlass, every attack must be followed by a VERY DIFFICULT; appropriate Weapon or Melee skill or Athletics/dexterity; DEX check (AVERAGE if using a sword-length weapon, -2 if the weapon has a basket hilt or similar protection). Failure means the attacker has touched the nematocyte fronds and been stung. A sting delivers 1-2 points of damage and injects the toxin if it causes at least one point of damage. Armour applies only if it covers the arms and hands entirely.

A person affected by the nematocytes' poison often (6+) develops striated reddish marks around the stung area, which last a lifetime unless removed by plastic surgery. Some victims (roll 9+) also report recurring periods of mild fever (-1 to all actions) about once per standard year. Such a spell of "Leliax fever" lasts from two to three days. On the positive side, once a victim has recovered from the first bout of fever—which, if it occurs, will be about 2D months after being stung—xe will develop a complete immunity against Leliax poison.

When attacked, the Leliax's usual reaction is to climb into the tree's top to evade its attacker. This strategy, together with the poisonous secretion, is usually enough to discourage predators. The Leliax will not attack by itself, relying on its nematocytes for protection.

Leliax meat is near-translucent white, turning milky when cooked or fried, and is considered a rare delicacy by humans who appreciate its subtle flavour. It takes skill, though, to prepare the meat without the neurotoxin from the nematocyte glands seeping into the fibres and spoiling the dish (ROUTINE; Steward ; INT for a specialist, but VERY DIFFICULT; Steward; INT for someone not extensively schooled in the fine art of Leliax cooking). Skilled chefs who are able to prepare Leliax are much sought after, and in some places are as famous and eccentric as media stars.

Aslan tend to dismiss the meat's taste as "weak", but since killing a writhing Leliax with a knife or dewclaw without touching the fronds is a rare feat of huntsmanship, the creature has found its way to many noble Aslan's tables (invariably heavily spiced) as a "trophy dish" that demonstrates the host's prowess – and challenges his guests' trust in him. On planets with a Leliax population, a claw-killed Leliax carcass is also a common gift of a subject to his liege – demonstrating the warrior's willingness to enter dangerous situations and endure pain on the liege's behalf. Many *ihatei* try to reinforce their plea to be taken into a lord's service with such an offering.

During the mating season, which strikes on average once every ten years, male Leliax are drawn to the scent that the female produces (which has been described as a mixture of lavender and liquorice with a sharp hint of lemon, and which can be smelled throughout the forest). Shortly after mating, the male perishes. Triggered by the hormones injected with the spermatophore, the female changes colour to blend in with its surroundings, and attaches itself to the underside of an overhanging branch. In its abdomen, about twenty to thirty tiny embryos are gestating.

Once a creature of sufficient size (dog- to horse-sized) comes into its striking range of about five meters (in game terms: if the Leliax achieves surprise at close range), the female launches itself at its victim

with a powerful spasm. It will grapple the victim in a frenzy and writhe around, trying to paralyze it with its fronds. Armour will protect only if it covers the entire body, otherwise it takes a successful VERY DIFFICULT; Melee/grappling; DEX roll each round of combat to keep the Leliax away from the vulnerable parts.

If the victim has been successfully grappled or paralysed, the Leliax will try to inject it with the stinger—which is actually an ovipositor for the centimeter-long larvae. Every successful stinger attack that gets through the victim's armour (which applies in this case!) and causes damage also injects 1D larvae into the victim's body. A pregnant Leliax will ignore all other threats and keep attacking its designated victim until it is killed or until it has injected all its young, at which point it dies.

Larvae burrow deeply into the host's internal organs and start feeding on its tissue, causing one point of damage for every larva per interval (2D×10 minutes). Organ damage is irreversible and cannot be healed naturally; only transplantation of regrown or artificial organs can restore damage caused by the larvae. The pain to the victim from the feeding larvae is excruciating and will incapacitate xir completely.

Placing a larva-infested person in cold berth is not recommended—the larvae will burst when frozen, and the probability of the perforated organs being ruptured is high. Medicinal Fast drug affects the larvae to some extent, slowing the interval to 2D hours. After half a day, the larvae develop an immunity against the drug, though, and the interval will slowly pick up speed again.

Larvae can be dug out with successful surgery, but only at a facility equipped with surgical scanners to locate them; a successful Medic check will take 1D×10 minutes and remove 1D larvae, with the difficulty being (2×the number of hours that have passed since implantation). Each attempt at surgery,

whether successful or not, also causes 1D damage, which can be regenerated through rest or regular medical treatment.

As a last ditch measure, a victim can also be dosed with tiny amounts of ricin to kill off the larvae in xir system. Ricin can be extracted from the Terrestrial castor bean or certain alien plants, such as the berries of Gelennian shreekith bushes. Dustspice in its unprocessed form also contains traces of ricin.

This is a very unreliable treatment, because ricin is a potent toxin—the dosage must be very closely matched to the patient's body weight, general health and liver activity (DIFFICULT, Medic, Int, at -2 if attempted without a medical scanner) or the patient will either die or the dosage will be too small to take effect. Even if properly administered, the dosage of ricin that makes sure the larvae are killed is very close to a human's own lethality threshold, and the patient needs to make an AVERAGE END check with xir current END modifier to survive. Primitive conditions, such as an insanitary cave in the woods, impose a -2 penalty to the test, while a well-stocked medical facility and proper care may grant a bonus of up to +2.

Common symptoms of ricin poisoning are severe inflammation of the gastrointestinal tract and damage to liver and kidneys. Note that an antidote for ricin is discovered around TL 14, making this kind of treatment much less risky if it is available.

If the larvae have been killed off, they will still have to be removed surgically, but they cease feeding (and stop causing further damage), which takes some of the urgency out of the patient's rescue.

If left untreated, the larvae eventually kill their host and devour its soft tissue; afterwards (now about the length of a finger) they migrate to individual trees, where they moult several times until they emerge as their final form (imago). Each larva will mark its tree with its own scent to keep other larvae away.

Adventure seeds

1. In a rural area far from the large population centers, a child has been attacked by a pregnant Leliax and injected with several larvae. The travellers need to get her to a hospital quickly before her inner organs are irrevocably damaged. Unfortunately, their air/raft (or other civilian transport) is simply not fast enough. They will have to override flight safety regulations (and argue with furious traffic controllers threatening to have them shot down), flying their ship into a city bustling with air traffic, and then abseil the child on a stretcher from the airlock to the hospital's roof while balancing the ship on its auxiliary thrusters. Not a mean feat for any pilot, but if they pull it off, they'll have something to brag about in every bar from here to Central. (Not to mention the parents' eternal gratitude).

2. The travellers move through a forested area and are greeted by an eerie silence. Several carcasses of dead animals and perished Leliax are lying around. A few moments later, they pass a tree with a camouflaged pregnant Leliax and are attacked.

3. Through an attendant's carelessness, several Leliax have escaped from the city's zoo. As soon as the hormone suppressants wore off, they entered a premature mating phase, and now there are several pregnant Leliax at large in the mall abutting the zoo. Citizens have been warned to keep to their homes. The police are busy channeling the frightened masses into safe zones, and now the emergency board is looking for a few experienced spacers able to catch the dangerous critters and rescue the few people still holed up in the mall. Collateral damage is supposed to be kept to a minimum, and further panic should be avoided at all costs.

4. The travellers are hired to go out into the infested woods to hunt Leliax for a high-class restaurant. It's not the mating season, but still, Leliax are dangerous game. A wounded animal may "play possum" and suddenly become very lively when it is collected.

5. An ambitious Aslan *ihatei* hires the travellers as wilderness guides for a trip to a rural area, where he intends to find a magnificent specimen of Leliax and kill it in single combat with his dewclaws. He hopes to be able to present it to a certain lord, and be taken into the noble's service. Unfortunately, his rivals show up just as he has spotted his prey. The travellers need to employ either their combat or their persuasion skills to keep them at bay so their employer can concentrate on the kill.

6. A man with heavy striated burn marks on his face and arms approaches the travellers in a spaceport bar. He is a former pirate on the run from his old mates, and he wants to retrieve a cache of valuables he hid away in a tree in one of the planet's nature reserves. The area is densely infested with Leliax, and he got his "Leliax marks" when he hid the stuff. The former pirate wants the travellers to find the exact tree (at the coordinates he provides) and get the valuables inside to a rented locker in the city, while he distracts his former colleagues who might be watching him.
   Unfortunately, the pirates have noticed the travellers talking to the renegade, and will stealthily follow them into the forest, ambushing them once they have found the goods.

7. The travellers are on a diplomatic courier mission. The Aslan ambassador invites them to go hunting with him in his "garden" (a densely forested hunting ground several square miles large). A treecat-like animal is released, and the first to touch it with hand or paw wins the hunt.

The hunters are supposed to leap from tree to tree (touching the ground means forfeiting the hunt), and unfortunately some of the trees are infested with Leliax. They are brightly coloured and easy to spot—but taking detours around their trees means losing ground to the other hunters, and sometimes it's worth the risk in order to get ahead in the chase. Success in the hunt may win the travellers the ambassador's favour and greatly help their mission.

8. A famous chef's booking agent approaches the travellers. After eating one of his master's Leliax dishes at a banquet, the agent explains, a noble connoisseur nearly died of poisoning. He is now in hospital, with his life hanging by a thread. The chef is in police custody and may be tried for manslaughter—or possibly even attempted premeditated murder: the noble and the chef have had a long-standing feud (concerning certain unfavourable remarks the noble made within earshot of the editor of an influential gastronomical magazine). The agent is convinced that someone tried to murder the noble, and that his master is being framed for the crime. He wants the travellers to investigate.

9. A cargo crate holding several Leliax specimens in frozen berth is damaged in flight, and several Leliax escape. They are now abroad in the ship's air ducts, maintenance crawlspaces and cable shafts, and while they don't do any damage, it's difficult to get them out of their hiding places without touching their fronds and getting a fist full of nematocytes. The ducts are much too narrow to be entered with any sort of protective clothing. And the port authorities are adamant that they will refuse permission to dock until all of the critters are accounted for. If the Referee is feeling especially nasty, there is also the possibility of a premature mating season triggered by the rapid "thawing out".

10. A local crime lord has captured the travellers. They are stripped naked and placed in single cells together with a Leliax each—and there is very little room to avoid touching the fronds. Falling asleep or moving a limb in the wrong way means instant excruciating pain, and the prisoners have to be very alert for every little move the Leliax make. The lord's torturer is also rumoured to have found several other, very creative, uses for the creatures and their larvae.

11. The Zhodani ambassador's residence has been the target of an attack: the culprits threw plastic bags of a clear liquid over the barrier, which burst when striking the ground. No damage was done, but the ambassador and his staff of nobles now complain about sudden bouts of blinding headaches. The substance is later discovered to be refined Leliax pheromone in an oily suspension. While an armed Zhodani courier fleet is ready to evacuate the ambassador, by force if necessary, Imperial system defense boats are drawn from the outskirts of the system to blockade the couriers, biologists and doctors try to find out the nature of the staff's headaches, and all sides are frantically striving to avoid a diplomatic disaster, an Ine Givar agent infiltrates the embassy disguised as a prole officer. The pheromone was used to numb the staff's psionic abilities so the agent could enter the residence without giving her intentions away to telepathic questioning.

The travellers may either be the agent's accomplices, hired to provide a quick getaway; they may be suspects; they may be investigators; they may be called upon for (xeno)medical expertise on the mysterious headaches; they may be involved in the fleet blockade; they may be called upon to block the agent's escape vessel. Also, the incident provides a great opportunity for enterprising smugglers, with the Naval assets' attention focussed on the Zhodani courier fleet.

Less Dangerous Game

12. The travellers were hired to release thousands of Leliax into the wilderness—supposedly to help curb a forest's expansion in the planet's uninhabited zone. They were successful, but on the way back, they spot several well-camouflaged primitive human settlements in the zone! Investigating, they find that the settlers are refugees from the planet's oppressive government who founded their ramshackle villages out here where they could hope to be left in peace. The next mating season (which will be in about a month, due to deliberate artificial hormonal boosts in the specimens to ensure a quick spread of the creatures) will be a dire threat to the peaceful refugees. The travelers have to persuade the settlers to relocate—and they should ask themselves whether the release of the Leliax was not in reality intended by the government to flush those settlers from hiding? ✪

Doing It My Way

Navigation in Traveller

by Dan Corrin

This series will explore a number of concepts with navigation in *Traveller*. The rules are often unclear and the science and/or reasoning behind them not ideal. In your own *Traveller* universe you can (of course) ignore or alter these as you see fit. Future planned topics are running *vs* standing jumps, Jump masking and courses, jumping without a survey, and exploratory navigation.

Part 1: The 100-Diameter Limit

"Canon" (i.e., the extant body of official rules in the 'default' setting) specifies that Jump drives work far less reliably within 100 Diameters of a body more massive than themselves than in "open space". There is an increased chance of misjump if the drive is activated in this region and a moving ship will precipitate out of jump space if it tries to move inside this region. However, there are some strange implications and no basis in science, even weird science, for this rule. Consider: you are in a starship some 13,982,000 km from a Jupiter-sized large Gas Giant. Somehow the drive or jump-space itself know that the ship is just within 100 diameters and if you were to move 200 km further away a jump would work. That is a variation of 2km in the diameter of the gas giant. How does the drive know this? It isn't really measurable. It also isn't because of gravity. At this point the ship is experiencing a 6.5×10^{-4} (0.00065) m/s^2 acceleration towards the planet. At a safe jump distance from a star of 1 Solar Mass/Size a ship would experience a force from gravity of 6.8×10^{-3} (0.0068) m/s^2 – count those zeros (or compare the exponents) carefully; the force is 10 times as much in a safe jump point away from the star. The weak force can't act at that distance and electromagnetism is at best inconsistent, and absent in some cases.

Why is 100D an issue? Let's take a look at some other factors that come from a phenomenon that can measure diameter at a distance and even measure it from within jump-space (theoretically a different dimension) to an object in normal space:

Consider an extreme example, a neutron star of 1.6 solar masses has a diameter of about 21 km, and therefore a 100 D limit of 2100 km. So, a starship could jump in to 2100km of the surface without issue (it can't jump out as we will see). Calculating the force at 101D (2121 km), we get 4.8 *million* G. Everyone will die, however, before the ship crashes into the star at 5% of light-speed, as the tidal forces will

shred everything "long" before impact (which is only in 0.3 seconds) – but *theoretically* the ship could have jumped away.

Let's look at a different example. Saturn is a very gaseous gas giant. It has a very high oblateness. The equatorial diameter is 120,536 km while the polar diameter is 108.728 km – a 10% difference. So a starship in a very large polar orbit at 11,000,000 km (still inside the orbit of Phoebe) will be able to jump when it is near the poles, but not while it passes over the equator as the 100D limit is 12,0000,0000 km there. While the average diameter could be used, what mechanism could be in place to measure that?

Let's look at smaller effects. A 500,000 dton battleship, the *Tigress* class is essentially a 500 ft. sphere with a 250 ft box on the back. As a *Tigress* is likely more massive than most ships, it can be expected to have a jump limit of its own. If we assume the same 100D limit as for planets or stars, it will affect jumping out to 15 km of a ship to either side (or above or below). If, however, the *Tigress* is facing directly toward or directly away from the jumping ship, jumps within 22.8 km are prohibited.

The *Kokirrak* 200,000 dton dreadnought is 1484×371×185 ft. The 100D limit goes from 5.6km above/below to 11.3 km at the sides to 45 km to the front/back. One could imagine creating a ship 20-30m in diameter and 20 km long. That would prohibit jumping within 2000 km of anything it is pointing towards – not a huge distance in space terms. But that brings up another point in the calculation of diameter at a distance. What happens if you bring two ships together? Let's say you have 2 *Tigress*es 10m apart. Your ship is 25 km in front of the first ship and 25.2 km in front of the one behind that. So, OK to jump. What if they touch? Is the jump interference now 45.6 km? What if they docked and were now physically essentially one ship?

Finally, 14 AWG wire is fairly stiff (used in-wall house wiring for 15 A circuits). A ring of this around the Sun just past the orbit of Neptune would have a diameter of 10,000,000,000 km. At 18.4 kg/km a circle of this would weigh 552 million tons – a lot but not impossible amount of resources – about the equivalent of 75 *Tigress* battleships. Would two of these rings perpendicular to each other constitute a structure for jump interference? If so, it could prohibit jumps within 1/10 of a light year. That would be a 233 day trip for a 2G ship.

I think I have presented enough points to question the validity of the 100 Diameter jump limit as any actual physical limit; perhaps it should be treated more like a general guideline to an underlying gravitic physical constraint. The problem with this is (as mentioned previously) the difference in force experienced at valid jump points from different types of bodies (G at a safe jump point from a star is 10× that from a gas giant, and 25× that from a rocky planet (Earth is $2.46×10^{-4}$ m/s^2)).

How can this be addressed (besides ignoring it completely)? We can say that the jump distance is based on mass and gravity experienced by the ship. So as long as the referee doesn't actually provide a number for that force and says that the 100D is an easy approximation and the players don't try the math themselves then one can ignore the issue. But unfortunately the force exerted on a ship by gravity at 100D is wildly different between an iron planet, a silicate planet, a gas giant, and a stellar mass.

We could pick one of the values as correct and recalculate the jump distances, throwing away the 100D rule. However, calculating based on the stellar gravity at 100 stellar diameters would make planetary travel to the jump point quite a bit shorter (10 minutes *vs* 4 hours at 2G), but this wouldn't be a huge issue. The opposite is not true. Using the planetary force at 100 planet diameters the stellar jump zone would be 25× larger, the majority of planets would be masked by their star, and it would make

(Continued from page 25)

all journeys extremely long (237 hour flight time in and again back out at 2G).

The proposed solution: Jump space (or the jump 'bubble') is supposed to be a different dimension, which allows light-speed in 'real space' to be circumvented. Why can we not change other physical factors? Gravity in 'real space' follows the inverse-square law ($f=Gm/r^2$; if you double the distance the force is ¼ as strong ($2^2 = 4$). If we tweaked this a bit, and decided that jump space interacts slightly differently with 'real space' masses, it should not be noticeable to a ship that is alone in its jump bubble with no masses around. In fact, if we used an inverse power 2.7 law ($f=Gm/r^{2.7}$), and decided that the safe jump distance is where $f \leq 10^{-10}$ m/s², we could almost replicate the 100D guideline for jump distances with a real math-based formula. (In the formulae, G is the gravitational constant 6.67408×10^{-11} m³/kg-s², m is the mass of the body in kg, and r is the distance in meters.)

Why go to the effort? Even this method lets us approximate by using 100 diameters in many cases. However, using this new rule most of the exceptions listed above go away. Jumping to a neutron star will precipitate out at a safe distance (black holes, too). Oblate planets will have one distance as it is purely mass based. Two objects near-touching/touching will act like their combined mass, regardless of how much contact they do or do not have (planets can be treated as point masses, irregular bodies – such as a pair of ships, would be the sum of the effects of multiple point masses). Huge low mass structures will

not affect jumping any more than a large asteroid. The new formula, being optimized for both stellar and Iron planets, does noticeably differ for silicate planets (Asteroids) and smaller gas giants. Ships, too, have 25% of the former 100D jump interference, so it is not without some effects. In the end however, there is a reasonable science-based formula underlying the 100D "rule", previous references can be maintained (with a reasonable margin of error), and special cases (e.g., neutron stars) are calculated as needed.

The table at the bottom of the page shows the old and new safe jump limits (in km) for some examples and the travel time to the limit assuming mid-point turn-around. (remember the formula gives distance in meters) To calculate the values for other bodies, use the following formulae and tables:

World Mass (M) in kg (S=Size Code, d=density): **M=(2 145×10¹⁸)×d×S³**

Select a density (g/cm³[=tonnes/m³]) from the table below.

World Type	Low Density	Medium Density	High Density
Gas Giant	0.825	1.100	1.375
Icy body (e.g., Pluto)	1.100	1.925	2.750
Rocky body (e.g., Ceres)	2.750	3.575	4.400
Molten Core (e.g., Earth)	4.400	5.500	6.600
Heavy-metal Core	6.050	8.250	11.000

The above table represents common ranges of densities; you may choose other values within the indicated ranges.

100 Diameters in km: **D=S×160 000**

Safe Jump Distance (km where $g=10^{-10}$ m/s²) (M=world mass in kg; uses modified relationship): **D=(3.369×10⁻¹¹)×M¹ᐟ²·⁷**

Travel time (hours) to safe jump (D=safe jump (km); M=drive maneuver rating): **T=(D/M)¹ᐟ²/360**

The above formulae are simplified; constants and scale factors have been combined and reduced where possible. ✪

Body	Type	Mass	Safe Jump Limit (km) Old (100D)	New (g-10⁻¹⁰)	%	M1	Time (hrs:min) turn-around M2	M3	M4	M5	M6
Sol	Stellar	1.99E+030	139268400	143348474	103.0	67:00	47:00	39:00	34:00	30:00	27:00
Earth	Med Iron	5.97E+024	1274200	1292143	105.0	6:24	4:30	3:42	3:12	2:54	2:36
Mars	Low Iron	6.42E+023	677900	565578	83.4	4:12	3:00	2:24	2:06	1:54	1:42
Jupiter	LGG	1.90E+027	13982200	10915645	78.1	18:30	13:06	10:42	9:18	8:18	7:36
Saturn	LGG	5.68E+026	11646400	6983513	60.0	14:48	10:30	8:36	7:24	6:36	6:06
Neptune	SGG	1.02E+026	4924400	3701725	75.2	10:48	7:36	6:12	5:24	4:48	4:24
Ceres	Silicate	9.39E+020	94600	50427	53.3	1:18	0:54	0:42	0:36	0:36	0:30
Tigress	Ship	7.38E+009	15 or 22.8	3.89	25.9	40s					
Neutron Star	Special	3.20E+030	2100	185804434	88478.0	76:00	54:00	44:00	38:00	34:00	31:00

Sex and the Single Vargr

by Joe Webb

This adventure originally appeared in response to an informal adventure contest on the Journal of the Travellers' Aid Society (JTAS) at SJGames, (now defunct), and was made available on the pre-magazine Freelance Traveller website in 2002 with the permission of SJGames and the author. It may not be distributed elsewhere without the express permission of SJGames and the author.

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Contest criteria: The adventure should feature a virgin and "unusual stellar phenomena".

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The PC group cannot include Vargr. They must have a starship with room for passengers (probably anything bigger than a Scout).

Play starts on any backwater world that has little or no permanent Vargr population. There should be little traffic and no (or rare) regular passenger liners.

The destination world can be any world, Imperial or not, that has a significant Vargr population. This world should be about one month travel time from the starting point and should not be difficult to reach. It is a double star system, the companion a distant red dwarf that *normally* is not important.

Personalities

Dzourraeks: The virgin.

Guuvagh: The wimpy father.

Zugfo: The grouchy business magistrate.

Knularrg: The lovable old maidservant.

Zaedz: The mystery male.

The Adventure

Guuvagh, a member of a Vargr merchant group that is investigating investments on this world, approaches the PCs. He, his daughter and two others, need transport back to their homeworld. He will be evasive and somewhat embarrassed if pressed on why, he only insists they must arrive no later than 35 standard days after launch. He will pay a bonus of Cr10,000 if the PCs can deliver. There should be no problem doing this. Guuvagh will also request

bodyguard services, Cr7000 for each PC that acts as a body guard during any and all port calls. The only stipulation is that they must never let his daughter, Dzourraeks, out of their sight, and never allow her contact with other Vargr, especially males.

Any research will reveal nothing significant about Guuvagh; he is a minor official in the company, rich but not particularly charismatic. His daughter, Dzourraeks, has some scandals associated with her, but apparently nothing more serious than any feisty female Vargr just entering adulthood would have. The only problem is that Guuvagh's company is made up of Vargr with somewhat puritanical beliefs, a culture common on that world. However, this does not appear to be the reason for their journey.

Dzourrakes is very personable, and in fact is developing a high level of charisma. By Vargr standards she is quite beautiful. She is intelligent and very spiritual, but reluctant to discuss details of her beliefs, especially when the other Vargr are present. It is obvious that her maidservant, an elderly female named Knularrg, has raised her and until recently exercised a lot of control over her. Dzourrakes loves to push her boundaries with Knularrg, and with any PCs acting as bodyguards.

Knularrg, for her part, is charismatic, but nervous. She will not want to speak around any sort of official, even fearing the ship's captain. When away from officials she is very spiritual, apparently a follower of some form of *Senghik Outoun*, a common Vargr form of spirit worship. Unless she is very comfortable with a person, she will not reveal the exact nature of her religion.

The other member of the Vargr group is Zugfo, an elderly male. He is some sort of official, come to accompany Guuvagh and his daughter back. Foul tempered, he is very critical of Dzourrakes and will watch her every move. This is difficult, as he is old and easily distracted, especially by discussions of

Active Measures

interest rates, family lineages and 'the good old days'. Guuvagh will do anything to keep Zugfo happy, and this will occupy much of his time.

The day of launch a single male Vargr approaches the PCs, asking for passage. By Guuvagh's terms, the group should probably reject him. Guuvagh will be very upset if this person, Zaedz, is allowed onboard, but it was not part of the original deal not to allow other Vargr aboard the ship.

During jump, Dzourrakes will delight in getting into mischief. She is very interested in jump mechanics, in fact making a study of this (much to her father's disapproval). She will pester anyone in engineering, but is very friendly about it. At one point she will attempt an EVA, stealing a vacc suit, just to see jump space 'first hand'. While not particularly dangerous, this should be an unnerving event for the PCs.

If Zaedz is onboard, Guuvagh will insist that he be kept as far from his daughter as possible. Zugfo, too, will be very insistent on this. For her part, Dzourrakes will be only show mild interest in him, but apparently will use the chance to vex her elders and her bodyguards. Zaedz, on the other hand, will be very interested in Dzourrakes.

If Zaedz was not allowed on the ship, he will arrive at their next port of call less than a day after they arrive. This is very unusual, since there were no other ships scheduled to leave so soon after the PCs' ship. He will be very evasive if questioned. A difficult search of starport records (the SPA will be reluctant to reveal them) will show that Zaedz came in his own Scout.

Other adventures at the layover ports are possible, with Dzourrakes leading the PCs on a merry chase or otherwise getting them into trouble with Guuvagh, Zugfo, and even Knularrg. She will find the only bars with possible Vargr clientele, and that will more often then not have the PCs come to blows with young Vargr males who wish Dzour-

rakes 'attentions'. This should not lead to deadly violence, only bar room brawls or duels to first blood. Dzourrakes will also sneak away with female Vargr, and the PCs may find her speaking intently to them about religious matters. Her growing charisma will be very evident in these cases.

On the final leg of the journey the ship will suffer an apparent misjump. The system's companion star, a red dwarf, turns out to be a Shaamarkudun Variable, and has suddenly expanded to triple its former size. The new diameter precipitated the PCs' ship out of jump and far from help. The misjump is so damaging the maneuver drives are knocked out as well. It will take weeks for help to arrive and tow the ship into port.

Fortunately, a Vargr passenger liner is precipitated near the PCs ship, only a few hours after they arrive. This ship, the *Pride of Anggahks*, with hundreds of passengers, mostly Vargr, will have working maneuver drives and will offer to give anyone aboard a lift to the mainworld. Guuvagh will insist on going. The PCs can be assured that the SPA will take care of the their ship (if not pay for the towing and repairs, at least it will arrive in port safely), so they may join Guuvagh and company. If they did not hire on as bodyguards, Guuvagh will repeat the offer, at triple the rate.

While on the *Pride of Anggahks*, the captain of that ship, in order to distract his otherwise upset passengers, will order parties every night. This will become a frantic chase for the PC bodyguards, as Dzourrakes will do everything in her power to escape them. Further, she will attempt to 'rendezvous' with any male she meets, especially Zaedz if he is present. This is an apparent turn around, as she was not especially interested in sex prior to this. Knularrg will suddenly be running interference for Dzourrakes, another turn around, and be annoyingly vocal in her beliefs.

Active Measures

Apparently this misjump was some sort of sign. Guuvagh will be desperate to keep his daughter a virgin and will offer the PCs thousands of credits if they can help.

What Is Going On?

Guuvagh, *et al*, come from a Vargr culture that practices *Kaegorz*. Inheritance follows the females of the family, only passed to virgins. The actual money, properties, etc., are controlled by the males, in this case Guuvagh, but he has to have a virginal daughter to receive the money.

Zugfo is a *Dhohkskfu*, essentially a virginity checker, heraldry master and banker, all in one, associated with *Kaegorz*. He came to Guuvagh to inform him of an inheritance, one worth millions of credits, and to check and keep an eye on Dzourrakes. If Dzourrakes arrives a virgin, within the allotted timespan, the entire inheritance goes to Guuvagh. Otherwise he will get little or none of it.

Knularrg, Dzourrakes's faithful maidservant, is secretly a priestess of the *Tsuelloung Zhatuga Kfaeghr* sect, a cult of *Senghik Outoun* officially forbidden in the Imperium due to the psionic powers of its members. She has been teaching Dzourrakes the ways of the sect, but with no real hope to make her a priestess. Dzourrakes had no interest in becoming a mother anytime soon, and it is a requirement that she do so before her 19th year. With Dzourrakes's growing charisma, and her interest in jump space, Knularrg has lately been pressing Dzourrakes to consider becoming a priestess. Dzourrakes refused, especially after the arrival of Zugfo and the news of the inheritance.

This changed with the misjump. Knularrg had been predicting something would happen to change her mind, and this sudden dramatic turn of events has convinced Dzourrakes that she should become a priestess. Therefore she will try to get pregnant as soon as possible. A passenger liner full of partying Vargr would make this pretty easy to do, unless the PCs intervene.

The mysterious Zaedz, on the other hand, appears to be in love with Dzourrakes. She was friendly to him in the past, but it was never too serious. If he is available, Dzourrakes will prefer to have him become the father of her child (if only because she knows him).

Any and all of this may become apparent during the weeks the PCs are with the Vargr. Discussion of his daughter's virginity will not be easy with Guuvagh, but Zugfo will probably break the ice sometime during the voyage. If the PCs can keep Dzourrakes a virgin, Guuvagh will pay them a bonus of Cr7,000 each. If they do not, he will declare bankruptcy or otherwise attempt not to pay them for anything. Remember they have a huge repair bill to pay for their ship…

Possible Alternatives

1. Knularrg is very psionic, and will use these powers to help Dzourrakes during her 'quest'.

2. Zaedz is actually an agent of the Ministry of Justice. The *Tsuelloung Zhatuga Kfaeghr* sect is illegal and he has been on the trail of Knularrg for a long time. Dzourrakes is incidental to him, but she may end up seducing him anyway. If he is *not* a MoJ agent, he is somewhat rich and bribed the SPA officials to reveal the PCs' flight plans and hid his ship (in case of retaliation by Guuvagh).

3. Dzourrakes is psionic, and uses her powers to aid her mischief. She is otherwise a good person, but is intelligent enough to know not to reveal too much about her powers.

   If she can become a priestess, she will become very powerful, commanding quite a following (although she will probably have to move into the Extents permanently thanks to anti-psi prejudice in the Imperium). Depending on the PCs'

actions, she can be a good friend, or dangerous enemy.

Library Data

Kaegorz: Vargr cultural meme present in many lower tech worlds of the Gvurrdon Sector. In general it states that males of household control/determine sexual activity of females. In practice this usually means the most ideal female mates are virginal and conversely, the least desirable have mated outside of legal or religious marriage. This is often coupled with dowry or inheritance laws.

Tsuelloung Zhatuga Kfaeghr: Cult form of *Senghik Outoun*, Vargr spirit worship. Officials in this cult must all be female, have given birth by the age of 19 and be psionically trained. Due to the danger-

ous psionic powers high level members possess, this cult is banned on all Imperial worlds. (this is a more radical form of *Zhatuga Kfaeghr*; see *GURPS Traveller Alien Races 1*, p. 85)

Shaamarkudun Variable: An extremely long term variable star. Such stars, typically M5 to M9 suns, will remain in a steady state for hundreds to thousands of years, during which their cores gradually heat up. During a few critical weeks, they will expand to several times their normal diameter as the core reaches a critical state. Those outer layers are eventually expelled as the core expands and cools. The star collapses again and resumes its slow heating. (recall that in standard *Traveller* rules, diameter is the important figure in jump limitations—"take it as an article of faith.")   ✸

The Ziranii: A Vilani Psionics Society

by Jason Kemp

This article was originally posted to the pre-magazine Freelance Traveller website in 2002.

The Ziranii, or "Caste of the Soul", is a secret society made up of members of various psionic and quasi-psionic races (including a few minor human races) that have officially been eradicated or converted by the Vilani during the Consolidation Wars of the Ziru Sirka. Psionics have always been persecuted by the Vilani culture, even before their expansion into space, as psionics have traditionally been associated with the "warrior gods" (Ancient warbots) that fought one another on Vland until 20,000 years ago.

While some Ziranii members speculate that a secret society similar to the "Caste of the Soul" may have existed to unite and protect those few Vilani psionicists that may have existed in Vilani prestellar history, no evidence has ever been brought forward to support this theory. In actuality, the

Ziranii started as an underground movement during the Consolidation Wars of the First Imperium, when several psionic races (including a minor human race) sought to avoid death and persecution during the "Vilanification" of their cultures. Massive near-genocidal attacks by the Vilani greatly reduced the numbers of these races, and the survivors made extreme efforts to integrate into Vilani society. Originating within the coreward reaches of Diaspora sector, all but forgotten by history, the Ziranii movement slowly maneuvered to positions of power in the rimward sectors controlled by Sharurshid.

By the point of the Ziru Sirka's first contact with Terrans at Barnard's Star (2096AD), the Ziranii secret society had spread its membership of a few thousand over three sectors, occupying positions of importance in preparation for a daring move. The

Ziranii had begun a plan to move beyond the rimward borders of the First Imperium, and establish a safe haven many parsecs beyond the reach of the Vilani oppressors. A staging area had been selected on the rimward border, and operations had begun under the guise of the research and development outpost of Ikugi (Solomani Rim 1926, known to the 3I as Barnard's Star.) The plan took a major shift when, less than a decade into preparations, the Vilani were encountered by another major race, humans from the nearby Terra system (Solomani Rim 1827.)

The meeting was held in secret in the year 2094AD (Terran reckoning), with first contact made by a telepathic member of UNSC Advanced Intelligence division, a Terran governmental agency secretly conducting psionic research for "intelligence purposes". The United Nations Security Council, having detected radio emissions from the new colony, utilized the recently developed Waven Hyperspace Shunt drive (jump drive) to engage in a clandestine mission of First Contact. The AdvInt agent, detecting the presence of a talented Ziranii telepath, engaged in negotiations with the local Ziranii Council leaders, and both sides left the table with the beginnings of a new plan. After conferring at the Provincial Council at Dingir, the Ziranii determined to utilize the Terrans to cover their own actions, developing an unsteady allegiance with the United Nations Security Council Advanced Intelligence division. Carefully orchestrating the initial interactions between Terrans and the Ziru Sirka, starting with an official First Contact in 2096AD, the Ziranii played the two cultures against one another as they continued to prepare for their colonization rimward of both the Terrans and the Vilani. The increased trade and diplomatic missions proved a successful smoke screen for the movement of Ziranii provisions and people to Ikugi. In exchange for technical information, the Ziranii's AdvInt allies kept Terran intervention to a minimum, although a few individual pockets of resistance grew against the machinations of the Ziranii and AdvInt.

The Barnard Incident of 2110 (also referred to as the Canberra Massacre) escalated a state of war between the Terrans and the Ziru Sirka, throwing the Ziranii's carefully laid plans into disarray. An all-out surprise assault by their AdvInt "allies" on the gathered Ziranii members at Ikugi in 2117 reduced the numbers of the secret society by almost two orders of magnitude, and the few remaining members scattered to the stars.

Over the decades and centuries that followed, the Ziranii slowly grew in strength, and worked against the Terran invaders. Members of AdvInt waged a secret war against their once-allies, the Ziranii, and both organizations strove to wipe the other out. The success of the Terrans in forming the Rule of Man drove the Ziranii deep into hiding. Most Ziranii Councils were eventually discovered and destroyed during this troublesome period, but a small membership did survive. Using centuries-old techniques of hiding amongst an anti-psionic society, the Ziranii blended into the background, and bided their time, content to control from behind the scenes.

Various Councils survived the Long Night, and reestablished contact through their concentration on centers of political power. Although some dispute has arisen between a few of the Councils as to the direction and leadership of the Ziranii, the general consensus granted a majority of intergroup authority to the Capitol Council, as the seat of greatest political power resided there for the Third Imperium, and for the future goals of the Ziranii.

During the early years of the 3I, the Ziranii subtly supported and promoted the presence of official Psionic Institutes, trying to build a pro-psionic stance within Imperial society. The actions of other secret organizations, anti-psionic in nature, has hindered the Ziranii progress significantly. Great

strides in changing public opinion were made during the 700s, until public opinion went radically anti-psionic with the Psionic Suppressions. Over the last few centuries, the Ziranii have retreated into hiding once again, again driven nearly to destruction.

Time has healed the old wounds, the membership has grown once again, and the newer members are looking for new directions, new goals, new frontiers. Perhaps the Ziranii Dream might be better pursued on the Imperial frontier. Perhaps the Domain of Deneb, with its proximity to the Zhodani Consulate, might prove to be an area worthy of develop-

ment. Perhaps the Solomani Rim, once home to the traitorous AdvInt, might prove of benefit in the goals of the Ziranii. Perhaps… but that is a story yet to be told.

(Additional note: The Psionic Suppressions could also have been directed against the Ziranii, who might have secretly been working with the Zhodani to bring about a pro-psionic shift in Imperial society. However, since the Ziranii tend to keep to the conspiratorial shadows, nothing has ever been mentioned of them in history texts, and they are all but unknown to the general public.) ✪

Critics' Corner

Mongoose Traveller 2nd Edition:
Reach Adventure 2:
Theories of Everything

reviewed by "the Guvnor"

Reach Adventure 2: Theories of Everything. Martin J. Dougherty. Mongoose Publishing http://www.mongoosepublishing.com
33pp., PDF
US$8.99/UK£6.90

The author notes that he received this as a complimentary copy from Mongoose for review purposes.

Overview

In Reach Adventure 2: Theories of Everything *the Travellers are hired as crew and research assistants aboard the laboratory vessel* Insight III. *The ship is owned by a cooperative of scientists working in a cross-discipline environment to solve problems and discover knowledge as they journey across the vast reaches of space… or so they claim. In fact,* Insight III *is basically a jump-capable shouting match as its owners bicker, squabble and argue their erratic way across a dangerous subsector. The Travellers' mission is thus more than merely running the ship and helping collect data. They will need to be advisors, diplomats and bodyguards too, injecting a little common sense into the heady mix of ego and brilliance aboard In-*
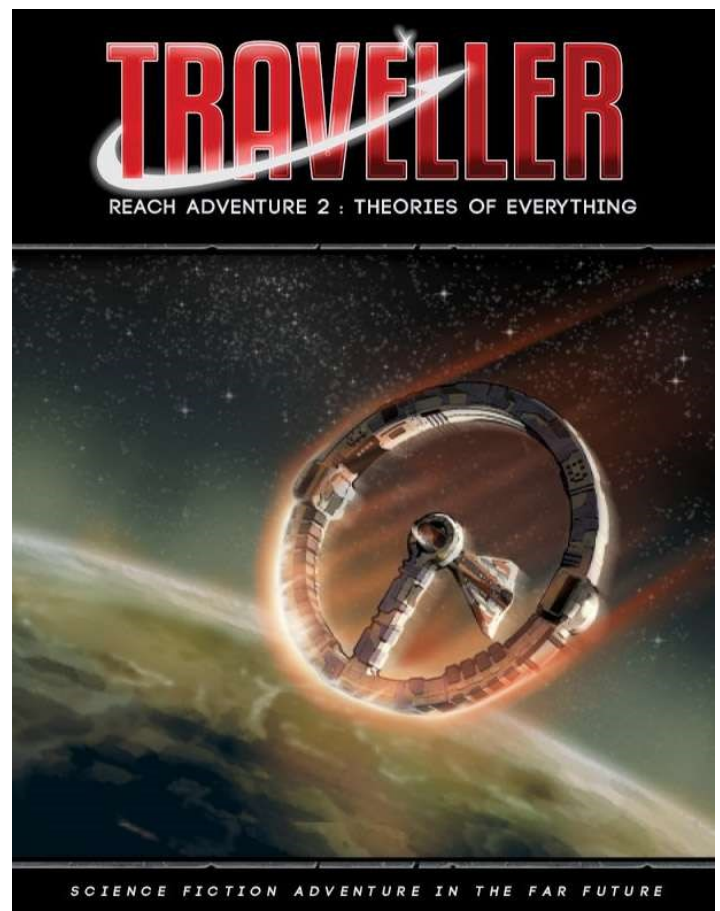
sight III. *The storyline of the adventure is as much about the interactions of the scientists and crew as the situations they find themselves in, and it may be that the Travellers' greatest challenge will be keeping the scientists from murdering one another…*

This an adventure book that utilises the Type L research vessel that has seen deployment in many a *Traveller* adventure since the early days. It does this with a well-detailed, well-mapped, and interesting mixture of vessel, scientist crew, a clearly defined set of research tasks that begin on the planet of Marduk, move to Borite and end in an exciting and potentially emotionally fraught rescue off a gas giant.

This scenario is not novel, but the author, Martin J Dougherty, expands and delivers it well, and in doing so reveals a little more about the wider setting in which Marduk and Borite lies. This is a non-linear adventure book with lots of opportunity for dynamic and freeform roleplaying, and using a limited set of components, the book delivers an excellent series of play sessions, probably 3-4 in total. There is some overlap and re-use of the Marduk material from *Reach Adventure 1*, but in a way that could enrichen the ability of the PCs to save the bacon of a rather foolish research academic. It is well illustrated with recognisably '*Traveller*-like' 3D image, Type L ship plans, pinnace and vehicle stats, and competent character illustrations. It follows the high quality of *Traveller* 2.0 layout and graphics, and has no apparent typos or grammatical problems.

It is comprised of the following chapters:

Introduction: Short, sweet and yet purposeful. Key here is that the adventure starts on the planet of Marduk, in the Oghma Cluster, in the Sindal subsector of Trojan Reach, before proceeding into the Borite system. The adventure is suitable for any group of Travellers, but they need to either not have starship or a plot device is provided here to relieve them of it with a hook to engage them in "Theories of Everything" for a month or so. Again, so nice phrasing from the author "Using the jump drive in its present state would fall into the 'might not die' category of risks" raised a smile from me. The players do really need a pilot, and an engineer.

Referee's Introduction: As noted, this a Sindal subsector, Oghma cluster adventure in the Trojan Reach sector. This is a very well detailed part of the Original *Traveller* Universe (OTU), and well developed by Mongoose over many years in books about the Aslan and the foundational *Pirates of Drinax* campaign. There is a small amount of necessary duplication from *Reach Adventure 1* and other sources, but this is utterly necessary and makes this adventure accessible to a referee or group of players who know nothing of the Reach, or even the OTU.

The *Insight III*: This chapter details the Type L research lab ship, a ring design familar to experienced *Traveller* gamers, and the complement of quixotic, irascible, heads-in-the-clouds research scientists who own and work on it. These are the academics that the players will need to look after as they embark on a series of field work missions across three systems: Marduk, Borite and Noricum. The ships and pinnace are attractively mapped out, detailed for Mongoose *Traveller* 2.0, and the four scientists statted up and their idiosyncratic personalities and interpersonal relationships explained. There are also two other non scientist NPCs, which could be easily swapped out for suitable player characters, so as to avoid the possibility of the players simply watching the referee 'acting out' a cast of NPCs in front of them. With little work a group could also adopt the roster of NPCs and simply play them as pregenerated characters, which would be my personal preference for a 3-4 session extended microcampaign.

Theories of Everything: This is technically chapter 3, but is in fact three paragraphs stating that this a freeform open ended adventure. Superfluous, but has a lovely scene setting picture of a snarky note left by one NPC to another that's well worth printing and showing to the players!

Critics' Corner

Hiring On: Here the research project is detailed, in and of itself straightforward but notably it gives the whole group clearly defined tasks, opportunities for roleplaying, and [and this is rare] actual tasks to fulfil when in jumpspace between systems..

Marduk: This could be subtitled "Amongst the Ruins by the Seaside, something Lurks". So as not to spoil it, any player who has played *Reach Adventure 1* is going to be able to handle this spike of danger very well, but the duplication of moving pieces is well handled and should delight the group. If the first adventure was not played, then it will be potentially a little dangerous, as it should be.

Borite: The culture of Borite is one of carefully nurtured idiocy, a front to ensure that no-one is a potential target for Oghma raiders who target the capture of anyone who can read/write or has numeracy. The interaction of a group of very well educated and in one case very extroverted scientists as such a culture is a potential source of great roleplaying. [I was also minded that an Oghma quisling might even be on planet and taking names..] The Borite field work is very similar to that on Marduk, but is interrupted by a Signal GK distress call from space!

Rescue: This is a very exciting, well designed, rescue attempt to save the crew of the far trader *Jolly Joel* before it tumbles into a gas giant. Slingshots, parallel routing of the *Insight III* and the pinnace, the number of hour left before disaster, all are carefully explained by the author, and even if you don't know your 2G acceleration from your 4G mobile phone, a referee has all they need to run a space rescue mission worthy of *Thunderbirds*. Again, not all is as it seems, and the crew of far trader are flawed people, the scientists have little common sense, and it might all go completely Pete Tong [*Google it*], and a very linear mission has been interweaved with open ended possibilities, some tragic, some triumphant. At the end it is likely that those that live will eventually make their way to Noricum. As the blasted remains of the Sindal Empire a key place in the *Pirates of Drinax* campaign, this a good choice for Mongoose and Dougherty to leave the players, probably with a new network of contacts, friends or enemies on board a rambling excuse for a scientist adventure in games to come.

Summary

Well crafted, well illustrated, well laid out, well written, high potential for 3-4 evenings of engagement in non combat SF adventure, complements *Reach Adventure 1* well. 4.5/5   ✦

Information Center   Computer Connection

Traveller By the Byte: Vilani Speech Synthesis with SSML

(Author's Note: In this article, "Windows PowerShell" refers to the version of PowerShell distributed with/as part of Windows 7 or later, or which is included with the Windows Management Framework updated for those versions. "PowerShell Core" refers to those versions of PowerShell other than Windows PowerShell. "PowerShell", not otherwise specified, refers to both Windows PowerShell and PowerShell Core.)

All code from this article can be downloaded from `https://www.freelancetraveller.com/infocenter/software/ssml.zip`

If you've got a Windows computer (Windows 7 or later), your computer can talk pretty easily:

Start up a Windows PowerShell session—it doesn't matter whether you use the ISE or the console version of Windows PowerShell—and type the code in listing 1at the prompt.

(Continued from page 34)

The voice quality is pretty good, although the intonation is somewhat mechanical—the result actually sounds better than the voice from Stephen Hawking's voder, though the rhythm and intonation is similar.

Other systems (e.g., Macintosh or Linux) have their own speech synthesis (sometimes called TTS—text-to-speech) systems, which may or may not be accessible from PowerShell Core on those systems. You will need to consult the documentation for your operating system and TTS software.

But even in Windows, it's really only this simple if the text you use in the **$voice.Speak(…)** statement is in the language that your Windows system uses as the default user interface language—for me, US English. If you try to use text from a language whose orthographic conventions (that is, the way sounds are written) are significantly different from your system default language, you'll get something that will sound badly wrong, and in fact you may even end up having part or all of your text spelled out. On my system, for example, trying to get the standard voice (for US English) to speak French has pretty horrible results. Trying to use the English TTS engine with a language that doesn't even use the Latin alphabet (e.g., Russian, Hebrew, or Chinese) throws an error.

You can, of course, install additional voices for different languages, and in some languages, for different dialects or accents (for example, Windows has English voices for US, Canada, England, Ireland, Australia, and India) or both genders. If you're will-ing to pay for third-party voices, you can even get children's voices or elderly voices. I've installed other Microsoft (free, built-in to Windows) voices on my system, so if I wanted my computer to say something in French, I could enter the code in Listing 2.

Naturally, you can incorporate these statements into a script, and have complex "canned" dialogues, or you can write a script that reads your input and then speaks it.

What happens, though, if you want to use a language that isn't available (for example, obscure languages like Xhosa, or fictional languages like Klingon), either as a free Microsoft voice or as a third-party voice? Or if you want to insert a single word or short phrase in one language into the middle of a text in another? For both situations, the World Wide Web Consortium (W3C) has defined **Speech Synthesis Markup Language** (SSML), based on XML and allowing the user to specify exact pronunciation using the International Phonetic Alphabet (IPA).

A full treatment of SSML is beyond the scope of this article; we will only be discussing how to generate an IPA pronunciation and insert it into an SSML framework.

Most TTS systems, not just those for Windows, will support SSML. Power-Shell Core is available for Windows, Macintosh, and Linux systems, so the PowerShell code in the rest of this article is applicable to any system, unless otherwise noted.

A minimum SSML string for the Windows text-to-speech (TTS) subsystem is given in Listing 3a;

Listing 1: Basic Speech Commands (Windows PowerShell)

```
Add-Type -AssemblyName System.Speech
$voice = New-Object -TypeName System.Speech.Synthesis.SpeechSynthesizer
$voice.Speak("Good day, ladies and gentlemen")
```

Listing 2: Windows PowerShell Speaks French

```
$voice.SelectVoice("Microsoft Hortense Desktop")
$voice.Speak("Bonjour mesdames et messieurs")
```

Listing 3b includes the XML preamble and DOC-TYPE preambles that TTS systems other than Windows may require.

To tell Windows PowerShell to use SSML for speech generation, use `$voice.SpeakSSML(…)` instead of `$voice.Speak(…)` (*See listing 4*).

Doing this doesn't get you anything beyond what we've already seen with `$voice.Speak(…)`, however; we need to insert another SSML tag to use IPA: the `<phoneme>` tag.

Suppose we want our default US English voice to say "The French for 'Hello' is 'Bonjour'.". If we simply pass that string to the TTS engine, it will completely mangle the French word. We use the `<phoneme>` tag to tell the (English) TTS engine how to pronounce the French word (*see listing 5*).

If we then feed this to the TTS engine, we will get what sounds like an American who knows French, but still has an American accent.

In the `<phoneme>` tag, we provide the '`alphabet`' attribute to tell the TTS engine what phonetic transcription system we will be using to represent the pronunciation. All SSML processors that support the `<phoneme>` tag are required to support IPA; other phonetic representation systems may be supported at the TTS engine author's discretion. The '`ph`' attribute provides the pronunciation of the word or phrase, as represented in the phonetic transcription system named in the '`alphabet`' attribute.

We now have enough information on SSML to be able to have our computer insert individual Vilani words into phrases in our computer's primary TTS language. What we don't have is a way of transcribing Vilani into IPA. I went through extant information on the Vilani language, came up with the IPA equivalents for the "standard" Latin-alphabet orthography for Vilani, and wrote it out into a file that will be used by code in this article. That file, VILANI.IPA, is included in SSML ZIP. See the sidebar for how to create a language IPA definition file.

The PowerShell Advanced Function (also called a 'script cmdlet') in Listing 6 will take as parameters a language identifier and a string containing a word

Listing 3a: Minimal SSML for Windows TTS (PowerShell `$voice.SpeakSSML(…)`)

```
<speak version="1.0" xmlns="https://www.w3.org/2001/10/synthesis" xml:lang="en-US">Good Day, Ladies and Gentlemen</speak>
```

Listing 3b: SSML with preambles for non-Windows TTS (check your TTS system documentation)

```
<?xml version="1.0"?>
<!DOCTYPE speak PUBLIC "-//W3C/DTD SYNTHESIS 1.0//EN" "http://www.w3.org/TR/speech-synthesis/synthesis.dtd">
<speak version="1.0" xmlns="https://www.w3.org/2001/10/synthesis" xml:lang="en-US">Good Day, Ladies and Gentlemen</speak>
```

Listing 4: Using `$voice.SpeakSSML(…)` in Windows PowerShell

```
$ssml = '<speak version="1.0" xmlns="https://www.w3.org/2001/10/synthesis" xml:lang="en-US">Good day, ladies and gentlemen.</speak>'
$voice.SpeakSSML($ssml)
```

Listing 5: Using the <phoneme> tag to insert one language into another

```
$ssml = '<speak version="1.0" xmlns="https://www.w3.org/2001/10/synthesis" xml:lang="en-US">'
$ssml += 'The French for "Hello" is '
$ssml += '<phoneme alphabet="ipa" ph="bɔNˈʒшʁ">"Bonjour"</phoneme>.</speak>'
```

Raconteurs' Rest

Building a Language IPA Definition File

The structure of the language IPA definition file is fairly simple, but must be followed carefully; there is essentially no tolerance for variation. Create an ordinary text file with the name «language».ipa (e.g., `vilani.ipa`); the contents are as follows:

The first line of the file must *always* be the string

`ortho=ipa`.

Each subsequent line is of the form `«text»=«ipa»` where

`«text»` is the way the sound is written in the language. Any Unicode character sequence may appear here.

`«ipa»` is the IPA representation of the sound.

For example, in English, the character sequence "sh" normally represent the sound that maps to the IPA symbol /ʃ/. To represent this, you would include

`sh=ʃ`

in your language IPA definition file.

Sometimes, the IPA symbol for one sound will match the way a different sound is written in the language. If this happens, you will need to be careful about the order of the lines in the language IPA definition file. For example, suppose that in your language, the character "o" represents the sound notated in IPA by the symbol /**a**/, and the character "a" represents the sound notated in IPA by the symbol /**æ**/. If your language IPA definition file contains the two lines

`o=a`

`a=æ`

in that order, you will end up changing all occurrences of both "o" and "a" to /**æ**/, because the generator will first change "o" to /**a**/, and then it will change "a" to /**æ**/. To achieve the intended substitutions, you need to have these two lines in the opposite order, so that "a" gets changed to /**æ**/, and then "o" gets changed to /**a**/.

In rare cases, you might not be able to come up with a workable order. In that case, you may have to use a secondary substitution character. For example, in Vilani, the characters "ii" represent the sound written in IPA as [i], and the character "i" represents the sound written in IPA as [ɪ]. If you do the i-to-ɪ substitution first, then "ii", a completely different sound, gets replaced with "ɪɪ" - not what you want. If, on the other hand, you do the ii-to-i substitution first, you end up with all occurrences of both "i" and "ii" being changed to "ɪ", like the o-a substitution problem example above. The solution here is to use a temporary substitute for "ii", and then, after you've completed the i->ɪ substitution, replace the temporary substitute with "i":

`ii=#`

`i=ɪ`

`#=i`

Be careful about the substitution that you use; the PowerShell code that implements the substitution uses regular expressions by default, and you may get unexpected results if you use characters with special meanings in regular expressions. For example, if **$** is used instead of **#** in the above example, the result will have the character "**i**" at the end of every IPA string; this is because **$** is the regular expression symbol for "end of string".

This technique is essentially guaranteed to work; it should be noted that, at least in the specific case of Vilani, one can in fact do the **i->ɪ** substitution first, and then convert any occurrences of **ɪɪ** back to **i**.

(Continued from page 36)

ostensibly in that language, and will use the rules defined for Vilani in a file such as described in the sidebar to emit a string that contains the IPA for the correct pronunciation of the input word. Note that the rules file must be named **«language».ipa**, where **«language»** is the language with which you are working.

Now, we need to insert this IPA string into a `<phoneme>` tag. The PowerShell Advanced Function/script cmdlet in Listing 7 will take as parameters a language identifier and a string containing a word ostensibly in that language, and will use the function from Listing 6 to generate an IPA string, and then emit the `<phoneme>` tag that will allow our TTS system to pronounce the word.

As this returns the string to be inserted into the SSML, you can call it as part of your effort to build the SSML string (*see listing 8*)

NOTE: The pronunciation generated by these functions does not take into account any rules for stress or tone that may differ from those of the default TTS engine language. You may want to output the generated SSML

(or, later on in this article, the PLS lexicon) to a file and hand-edit it to reflect those additional rules.

The `<phoneme>` tag isn't really the right solution for entire phrases or paragraphs in an unsupported language, however. The ideal solution would be to create or obtain a TTS engine for the language; however, we are assuming that that's not an option. You can, however, add vocabulary to an existing TTS engine using a *pronunciation lexicon*. The W3C has a specification for this, the **Pronunciation Lexicon Specification** (PLS). This is an XML-based file format that pairs orthography with pronunciation, much like the `<phoneme>` tag in an SSML document does. However, when a pronunciation lexicon is active, one may pass strings in the lexicon's language to the TTS engine, either directly or as part of a SSML document (depending on the TTS engine's limitations), without individual `<phoneme>` tags, and have it pronounce the words correctly (*see listing 9*).

(The Windows .NET SpeechSynthesizer class also has a method `.AddLexicon(…)` to load a PLS

Listing 6: Convert Text to IPA according to language rules—This function is part of `ssml.ps1` in the zip file

```
function ConvertTo-IPA {
    [CmdletBinding()]

    Param(
        [Parameter(Mandatory=$true)]
        [string]$language,

        [Parameter(Mandatory=$true)]
        [string]$word
    )

    $langfile = $language + ".ipa"
    $phonemetable = (Import-CSV -Path $langfile -Delimiter '=')
    ForEach($phoneme in $phonemetable) {
        $word = $word -replace $phoneme.ortho,$phoneme.ipa
    }
    return $word
}
```

(Continued from page 38)

file. There is a known bug with the "Microsoft Zira Desktop" voice; this voice ignores loaded lexicons.)

According to the W3C specification for PLS, a minimal PLS header would consist of the XML prolog, followed by the `<lexicon>` element defining the namespace, alphabet, and language (*see listing 10*).

Note that some TTS systems require the `xml:lang` attribute to match the 'native' language of the TTS voice (Windows is one such). In those cases, you will need separate copies of the lexicon for each language you wish to apply the lexicon to. As with the `<phoneme>` tag in SSML, support for IPA is mandated; support for other pronunciation representations is at the TTS engine author's discretion.

The `<lexicon>` element encloses multiple `<lexeme>` elements, each representing a single "word" and its pronunciation. Each `<lexeme>` element encloses one or more `<grapheme>` elements, representing the way the word is written, and one or more `<phoneme>` elements, representing the pronunciation. For the purposes of this article, we will as-

Listing 7: Generate a `<phoneme>` tag with IPA pronunciation—This function is part of `ssml.ps1`

```
function New-SSMLPhonemeTag {
    [CmdletBinding()]

    Param(
        [Parameter(Mandatory=$true)]
        [string]$language,

        [Parameter(Mandatory=$true)]
        [string]$word
    )

    $phonemetag = '<phoneme alphabet="ipa" ph="'
    $phonemetag += (ConvertTo-IPA -word $word -language $language)
    $phonemetag += '">' + $word + '</phoneme>'

    return $phonemetag
}
```

Listing 8: Generating SSML with `<phoneme>` tags

```
$ssml = '<speak version="1.0" xmlns="https://www.w3.org/2001/10/synthesis" xml:lang="en-US">'
$ssml += 'The Vilani word that means "a change in lighting that reveals new detail" is
"' + (New-SSMLPhonemeTag -word kurishdam -language vilani) + '".'
$ssml += '</speak>'
```

Listing 9: SSML to load a pronunciation lexicon, then use it

```
<speak version="1.0" xmlns="https://www.w3.org/2001/10/synthesis" xml:lang="en-US">
    <lexicon uri="file:///usr/traveller/vilani/lexicon.pls"/>
    Dishimkhirni lekane baasa ka amaargi in disaninu ka iirbar in sisadikud. Dirgekii ka
darkaamku in midu in dinekhinumninu ka khurer khinumash.
</speak>
```

Information Center

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sume that a lexeme encloses exactly one grapheme and one phoneme. (*see listing 11*)

Given the lexicon from listing 11, once loaded into an English voice, we could use the word "bonjour" without having to include pronunciation data "on the fly".

The PowerShell Advanced Function/script cmdlet in listing 12 takes a text file and a language IPA definition file, and uses the `ConvertTo-IPA` function from Listing 6 to generate a PLS lexicon for the language including all the words in the text file. It is assumed that the text file will contain one word per line. The only required parameter is the language name; if the vocabulary text file or output file names are omitted, they will default to the language

name followed by `.txt` and `.pls` respectively (i.e., if the language is vilani, the language data will be read from `vilani.ipa`, the vocabulary from `vilani.txt`, and the output lexicon will be `vilani.pls`)

References

SSML 1.0: https://www.w3.org/TR/2004/REC-speech-synthesis-20040907/

SSML 1.1: https://www.w3.org/TR/speech-synthesis11/

IPA: https://en.wikipedia.org/wiki/International_Phonetic_Alphabet

PLS: https://www.w3.org/TR/pronunciation-lexicon/ ✪

Listing 10: A Minimal PLS Header

```
<?xml version="1.0">
<lexicon version="1.0" xmlns="http://www.w3.org/2005/01/pronunciation-lexicon" alpha-
bet="ipa" xml:lang="en-US">
</lexicon>
```

Listing 11: A Lexicon with a <lexeme> element

```
<?xml version="1.0">
<lexicon version="1.0" xmlns="http://www.w3.org/2005/01/pronunciation-lexicon" alpha-
bet="ipa" xml:lang="en-US">
    <lexeme>
        <grapheme>bonjour</grapheme>
        <phoneme>boɴˈʒuʀ</phoneme>
    </lexeme>
</lexicon>
```

Minimizing or Avoiding Lexicons

Using your computer's default language is not always the best place to start—if your computer's "native" language doesn't use spelling and pronunciation rules that are similar to those of the language you want to synthesize, you will need to provide pronunciation information for almost every word in your synthesized language. On the other hand, if

your synthesized language has rules that are similar to some other installed (or installable) language, starting from that similar language means that you will only have to provide pronunciation data for words which contain phonemes that either do not exist in or are different from the installed language—for example, if you hold that Old High

Listing 12: A PLS Lexicon Generator—This function is part of `ssml.ps1` *in the zip file*

```
function New-PLSLexicon {
    [CmdletBinding()]

    param(
        [Parameter(Mandatory=$true)]
        [string]$language,

        [string]$wordfile,

        [string]$outfile
    )

    $lexicon = @()
    if ($wordfile -eq "") { $wordfile = $language + '.txt' }
    if ($outfile  -eq "") { $outfile  = $language + '.pls' }
    $wordlist = Get-Content $wordfile
    $lexicon += '<?xml version="1.0">'
    $lexicon += '<lexicon version="1.0" xmlns="http://www.w3.org/2005/01/pronunciation-
lexicon" alphabet="ipa" xml:lang="en-US">'
    ForEach ($word in $wordlist) {
        $lexicon += '  <lexeme>'
        $lexicon += '    <grapheme>' + $word + '</grapheme>'
        $lexicon += '    <phoneme>' + (ConvertTo-IPA -word $word -language $language) +
'</phoneme>'
        $lexicon += '  </lexeme>'
    }
    $lexicon += '</lexicon>'
    Set-Content -Encoding Unicode -Path $outfile -Value $lexicon
}
```

Geonee (OHG) sounds most like Italian, and that Italian spelling rules are valid for OHG, except that OHG "ss" is pronounced like English "sh" instead of "s", as in Italian, you would only need to provide pronunciation data for OHG words that contain "ss"—all other words could be supplied without pronunciation data, and would be pronounced properly by an Italian voice in a TTS system.

The advantage to this is that any PLS lexicon that you create need only contain words with the differing phonemes, rather than a complete vocabulary for the language, making the lexicon significantly smaller. It should be noted that the Windows TTS system has significant problems with large lexicons.

#40: My Babies

In a first I mentioned in my After-Action report (*Freelance Traveller*, May/June 2019, p.32), TravCon19 contained an excitement for me that I've not experienced before. Although I've sold hundreds of copies of my adventures via Mongoose and via DriveThru, I've not been aware, until now, that anyone aside me has ever run one of my adventures.

So it was a delight to have work colleague Jane ask if she could run *A Troubled Case* at this year's convention. This is an adventure that she and two others had experienced across a number of lunchtimes. The idea had been to 'make it up as we went' although that was made easier by running it in 45 minute segments with, usually, a couple of weeks in between. I had plenty of time to create the next few details that were required. In the end I wrote it up as an adventure that Jane felt she could use as her debut refereeing experience. Indeed, she ended up running it twice there was such demand.

I decided early on that it wouldn't be very kind to Jane to sit in on the sessions and either be an intimidation or a distraction; back seat driving is never pleasant. It also seemed silly to deprive conventioneers of a seat at the table – particularly as Jane was replicating her experience of just three players instead of the usual six.

Since TravCon19, another conventioneer, who'd kindly bought all three parts of my *Ashfall* trilogy of adventures, has asked to run the entire thing in three sessions at UK Games Expo which I under-

stand is the largest "hobby games event" in the UK. Richard is a talented and experienced referee and it's been my privilege to see in action several times. Naturally I was delighted. As I said to him: I wouldn't write (and sell) them if I didn't want people to play them.

It's wonderful to see others taking an interest and giving yet more people the chance to experience the stories I've tried to tell.

But it's odd too. As I was busy running other games at TravCon I could only dip into Jane's version of *A Troubled Case* very very briefly. It would be difficult for me to get to Birmingham at the right time to see Richard running *Ashfall*. In other words, although it's great to know that it's happening, I've not yet *seen* my adventures being played. They're like children growing up and being released into the world with the hope they might check in occasionally. I can no longer know exactly what's happening with them.

I'd like to publicly thank Jane and Richard for taking these on – particularly Jane undergoing her first trial by refereeing – always something of a baptism of fire. Naturally, I'd be thrilled if others wanted to do the same and sent reports of how it went or even (especially?) criticism of how the adventures could be improved.

But be warned, one day you might just find me creeping in the back to see just how they're doing!✪

Getting Around in Traveller

by Frank Miskevich

Engines and power plants are the life blood of every spacecraft. The most common systems used are M-Drives for in-system travel, fusion-based power plants to provide the vast energies needed to travel through space, and Jump engines, the mag-

nificent engines which inflate a private pocket universe and make interstellar travel possible. In my preferred versions (*Cepheus Engine* and Mongoose first edition), however, there are several issues with engines and power plants. Some were corrected in

second edition Mongoose *Traveller* (although introducing other problems that keep me from switching), and one that seems to be common to all *Traveller* versions. Here I offer a few minor changes to improve game balance and make several theoretically possible ships more practical.

Jump Engine Fuel

Jump engines provide the only means available to travel from one system to another in most standard forms of *Traveller*. Typically a ship needs 10% of its volume in refined hydrogen fuel per parsec Jumped. As technology progresses, longer and longer jumps become technically possible, but since the amount of hydrogen required stays constant there is a practical upper limit to the distance a ship can Jump. External drop tanks can extend that limit, and in well-established worlds that works reasonably well. For unexplored or undeveloped systems, however, drop tanks simply are not practical.

A second problem with the large fuel tanks required on high-jump ships is the reduced cargo capacity available aboard those ships. For Jumps using the full capabilities of the engines this is not a problem and those cargoes move fairly efficiently. For shorter jumps, though, the extra fuel storage is basically wasted space and the same tonnage ship carries less cargo and makes less profit per trip. The only way to carry cargo efficiently is to always travel at maximum Jump.

To help reduce this penalty, I allow larger, higher tech jump engines to be more efficient than smaller engines. In particular, ships capable of Jump-3 and Jump-4 need only 9% of their volume in refined hydrogen per parsec while those capable of Jump-5 and Jump-6 need only 8% of their volume per parsec jumped. This allows high-tech, high-Jump ships to have smaller fuel tanks than they would otherwise require. The ships become more efficient, increasing their profitability while maintaining the flexibility of their high jump capacity.

So how would this work out in practice? A standard 400-ton merchant freighter at Jump-3 would require 120 tons of fuel under the standard rules. The modified rules would only require 108 tons, a savings of 12 tons that could be dedicated to cargo or any other use desired. If the ship only needed to make a Jump-2 to reach its destination, only 72 tons of fuel would be needed.

For a 400-ton Jump-5 express freighter, a massive 200 tons of fuel would be required for a single jump, or 50% of the total tonnage of the ship. Using the modified rules, however, it would only need 5×8% or 40% of the ship's volume. While the ship still requires 160 tons of fuel, those extra 40 tons of available space make a significant difference. Furthermore, when the Jump-5 vessel only has to make a Jump-2, it only uses 64 tons of fuel. Saving 24 tons of refined hydrogen would cost Cr12,000 less (at Cr500/ton) and allow more marginal trips to still be profitable.

While useful, this fuel efficiency change will never allow a high-jump ship to be as efficient as a lower-jump freighter for short jumps. It does, however, open up far more design possibilities for high-jump ships that simply aren't available to smaller vessels under the standard rules. They can carry more cargo per trip, and refueling even on the shorter trips is less expensive because of the more efficient engines.

For example, trying to construct a 100 ton Jump-6 express courier using standard *Cepheus Engine* rules is an exercise in futility. 66 tons of fuel, 20 tons of Type C Jump engine, 10 tons Type C power plant, 10 ton bridge… oops, over size already. Granted, 12 tons isn't a lot of fuel space saved using the modified rules (48 tons needed for the Jump-6 + 6 for the power plant for 2 weeks), but a stateroom and a Type A maneuver drive does barely fit. Add a hefty computer and standard sensors… sounds pretty much like an X-boat to me. There would even be 2 tons of cargo room if they are willing to sacrifice in-

dependent acceleration in-system. It may not be a ship that any player would want, but at least it makes the small Jump-6 courier possible.

Finally, a high jump transport for priority cargo is something many militaries might really appreciate. In Mongoose *Traveller* a Heavy Freighter carries 500 tons of cargo, 216 tons of fuel, has a Type H Jump drive and a Type H Power plant (70 tons), and a total range of Jump-2. Bumping that up to a Jump-5 requires a Type S Jump drive and power plant (142 tons total) plus 534 tons (!!) of fuel. Without any other changes, the extra fuel and power systems take up 400 tons of space, leaving 100 tons for cargo. Note that Jump-6 (Type X Jump engine and power plant and increased fuel consumption of the power plant) would require removing all cargo *and* 50 tons other systems to even fit within a 1000 ton hull. With the modified Jump rule, the power systems still have to be Type S but the fuel requirement drops to 434 tons (8×10×5, +34 for 2 weeks of powering a Type S power plant). Cargo capacity doubles to 200 tons compared with the standard rules. Granted, this is still a modest cargo capacity compared to the 500 tons carried by the normal heavy freighter, but it might very well be a worthwhile tradeoff for priority military cargo.

Large Engine Sizes

A second change I have implemented has to do with the limited size of engines in standard *Cepheus Engine* or first edition Mongoose *Traveller* rules. (This was corrected in Mongoose *High Guard* and Second edition.) I like the size limitation of 5000 tons on Jump-capable ships, but main ship engines only go up to size Z. For a 5000-ton battleship, this only allows a low Jump-2 capability. Even a small 2000-ton cruiser can only reach Jump-4 or 4G acceleration. A second limitation is that hull sizes under the standard rules only go up by 1000 tons at a time. For a 2000-ton to a 3000-ton ship, that is a 50% size increase. Finer gradations would be useful.

To correct this, I developed tables 1 and 2, which includes ship hulls that are 500 tons apart as well as larger engines and power plants. Size increases for both engines and power plants are larger in these heavy ranges because ship size increases by 500 tons per column rather than by 200 tons in the medium size ranges. Fuel use is calculated based on power plants size using ⅓ of volume in fuel per week, rounded down as per p.124 of *Cepheus Engine* SRD.

Table 1: Oversize Power Systems							
Rating	J-Drive		M-Drive		P-Plant		
	Vol.	MCr	Vol.	MCr	Vol.	MCr	Fuel
AA	135	260	51	104	79	206	52
BB	145	280	55	112	85	222	57
CC	155	300	59	120	91	238	61
DD	165	320	63	128	97	254	65
EE	175	340	67	136	103	280	69
FF	185	360	71	144	109	296	73
GG	200	390	77	156	118	320	79
HH	215	420	83	168	127	344	85
JJ	230	450	89	180	136	368	91
KK	245	480	95	192	145	392	97
Vol. = Volume in displacement tons; Fuel=displacement tons per two weeks							

These tables provide expanded high-acceleration options for larger ships such as warships and priority transports. In addition, jump tugs designed to ferry non-jump spaceships can now be built to move more tonnage while still staying within the 5000-ton limit in *Cepheus Engine*. Combined with changes to the fuel efficiency of high-jump starships, more ships can actually approach maximum jump range where the limit becomes the technology level of the ship rather than the maximum size of the engine.

Consider the case of a 4000 ton system monitor whose job is to protect assets within a single star system. Using a maximum maneuver engine of size Z, it could only accelerate at 2G which would severely limit how quickly this vessel could reach a pirate incursion. The new modification would give an acceleration of 3G with Type AA engines (costing 18 additional tons for increased engine, power plant,

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Table 2: Drive Performance by Hull Volume

Drive Type	100	200	300	400	500	600	700	800	900	1000	1200	1400	1600	1800	2000	2500	3000	3500	4000	4500	5000
A	2	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
B	4	2	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
C	6	3	2	1	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
D		4	2	2	1	1	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—
E		5	3	2	2	1	1	1	1	1	—	—	—	—	—	—	—	—	—	—	—
F		6	4	3	2	2	1	1	1	1	1	—	—	—	—	—	—	—	—	—	—
G			4	3	2	2	2	2	1	1	1	1	—	—	—	—	—	—	—	—	—
H			5	4	3	2	2	2	2	2	1	1	1	—	—	—	—	—	—	—	—
J			6	4	3	3	2	2	2	2	2	1	1	1	—	—	—	—	—	—	—
K				5	4	3	3	3	2	2	2	2	1	1	1	—	—	—	—	—	—
L				5	4	3	3	3	3	3	2	2	2	1	1	—	—	—	—	—	—
M				6	4	4	3	3	3	3	2	2	2	2	1	1	—	—	—	—	—
N					5	4	4	4	3	3	3	3	2	2	2	1	—	—	—	—	—
P					5	4	4	4	4	4	3	3	3	2	2	1	—	—	—	—	—
Q						6	5	4	4	4	4	4	3	3	3	2	2	1	—	—	—
R						5	5	5	4	4	4	4	3	3	3	2	1	—	—	—	—
S						5	5	5	5	5	4	4	4	3	3	2	1	—	—	—	—
T							6	5	5	5	5	5	4	4	4	3	3	2	1	—	—
U								6	5	5	5	5	4	4	4	4	3	2	1	—	—
V									6	5	5	5	5	4	4	4	3	2	1	1	—
W										6	5	5	5	4	4	4	4	3	2	1	1
X										6	5	5	5	4	4	4	3	2	1	1	1
Y											6	5	5	4	4	4	3	3	2	1	1
Z												6	5	5	4	4	4	3	2	2	1
AA													5	5	5	4	4	3	3	2	2
BB													6	5	5	5	4	4	3	3	2
CC														6	5	5	5	4	4	3	3
DD															6	5	5	5	4	4	3
EE																6	5	5	4	4	3
FF																	6	5	5	4	4
GG																		6	5	5	4
HH																			6	5	5
JJ																				6	5
KK																					6

— = Drive insufficient for use in this hull

Blank Cell = Drive offers no improvement in performance over smaller drives

and 4 weeks of fuel compared to Type Z), 4G with Type CC engines (56 additional tons), 5G with Type FF engines (110 additional tons), and a whopping 6G with Type HH engines (164 additional tons). Because Jump engines are not present, these monitors can accelerate much more quickly for only a modest increase in power plant size and fuel usage. It only seems to make sense that shipyards would want to provide the maximum flexibility for their clients travel needs whether moving quickly within a system or having extended jump ranges for larger ships.

Small Craft Engines and Power Plants

Small craft are an important part of most space fantasy settings. Who can't imagine a small fighter whizzing around a giant space station while big guns fire uselessly around them? More practically, any ship (or space station) not designed to enter an atmosphere needs a reasonable way to get cargo and people from the surface into orbit and vice versa. Small craft are perfectly suited for this role.

In *Cepheus Engine* and the Mongoose *Traveller* SRD, though, there are a number of situations where using the engines and power plants of the small ship design rules simply make no sense. For example, take a 50-ton small craft with 4G acceleration. This is very reasonable performance; it gives decent acceleration, doesn't take forever to get off the surface, and isn't pushing any rules limits. According to both *Cepheus Engine* and Mongoose *Traveller*, this would require an sK engine (5 tons, 11 MCr) and an sK power plant (3.9 tons, 7.5 MCr), and the power plant would use 2.6 tons of fuel per 2 weeks in *Cepheus Engine*, 2 tons in Mongoose *Traveller*. It would also be able to power only a single energy weapon.

That same 50-ton craft, however, could achieve the same 4G acceleration using a *ship* type A Maneuver Drive (2 tons, 4 MCr) and type A power plant (4 tons, 8 MCr) and 2 tons of fuel per 2 weeks. So, for exactly the same size ship and same acceleration, the ship type A power setup is 1) smaller by nearly 50%, 2) cheaper by better than 50%, 3) uses the same fuel *at most* (depending on your rules), and 4) could fully power a triple laser turret. The overall cost of the ship would *drop* by about 25%. There are no disadvantages. *None.* As small craft can use the same components as larger craft there is no reason to use the small systems.

The same logic applies in many situations. 40-ton craft with 5G acceleration (such as the *Cepheus Engine* Pinnace) have identical numbers as the situa-

tion described above. 90-ton craft with 2G acceleration need type sH engines and power plants at 7.3 tons and 15.5 MCr under SRD rules, or type sJ systems under *Cepheus Engine* at 8.1 tons and 17 MCr. Compared to type A ship engines and power plants (treating 90 tons as 100 tons) this is again heavier and more expensive. Table 3 breaks down the trade off points for the combined engine and power plant ratings compared to their small craft equivalents, where the ship system is the combined power plant and maneuver drive.

Table 3: Ship vs. Small Craft System Break-Even Points				
	Ship System		**Small Craft Systems to Break Even**	
Type	**Cost**	**Volume**	**Cost**	**Volume**
type A	12 MCr	6 tons	sF - sG	sF-sG
type B	24 MCr	10 tons	sQ	sK-sL
type C	36 MCr	15 tons	sU	sP

A second issue regarding small craft engines and power plant systems is their relative sizes. For regular ships, power plants are larger than M-drives and continually get larger as their size increases. The ratio of M-drive to P-plant gets closer together as sizes increases. The engine:power plant ratio for type A engines is 0.5, the ratio for type E is 0.563, for type K is 0.613, or for type P is 0.628. For small craft, though, power plants increase in size much much faster than M-drive engines do. For example, the ratio of M-drive to P-plant for sA engines is 0.417, for type D the ratio is 0.952, for type K the ratio is 1.282, type P is 1.429, and type T is 1.494. The huge change in ratio makes it hard to justify ever using a mid-size or larger small craft engine because of the relative size increase.

It is quite easy to use normal ship engines and power plants in mid-size or larger small craft. Performance and power are improved, while costs are reduced. Rounding acceleration down is somewhat

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inefficient, but those losses are more than acceptable given the dramatic difference in size and cost ratios for everything but the smallest small craft. Table 4 lists the ship performance in various size small craft, keeping in mind that under standard Cepheus Engine and First edition Mongoose Traveller rules the maximum acceleration is 6G. Note that type C engines in any small craft are usually overkill and provide little if any advantage over Type B engines.

Table 4: Small-Craft Performance with Ship Systems									
System	Small-Craft Hull Displacement (tons)								
	10	20	30	40	50	60	70	80	90
type A	-	10	6	5	4	3	2	2	2
type B	-	-	-	10	8	6	5	5	4
type C	-	-	-	-	-	10	8	7	6
- = Ship System of this type cannot fit into this hull									

It is still better to use small craft engines compared to their ship type equivalents in a few situations, particularly when looking at low performance/price options. For a slow 40-ton pinnace with a thrust of 1G, type sB small craft engines and powerplants only take up 2.5 tons and cost 5 MCr. For a 30-ton launch with 3G thrust, small craft systems sE weigh 4.9 tons and cost 9 MCr. The value equation changes in mid-size small craft, though. For a 60 ton ship with a thrust of 2G, small craft systems sF cost 5.7 tons and 11.5 MCr; type A ship engines give 3G for a measly 0.3 tons and 0.5 MCr more. For a 90-ton shuttle at 2G, a small craft power system H costs 7.3 tons and 15.5 MCr which is about 20% more than ship type A systems for the same performance.

As an alternative, I revised the small craft engine/power plant table to make the smaller engines more similar to the larger ship types. Small craft power plants were left virtually unchanged. Maneuver drives were shrunk substantially and reduced in price to make them more competitive. (*see Table 5*)

So how does the revised table compare to the standard *Cepheus Engine* system? For a 50-ton cutter

Table 4: Revised Small-Craft Engines and Power Plants					
	Maneuver Drives			Power Plants	
drive type	size(tons)	price(MCr)	size(tons)	price(MCr)	tons fuel per 2 weeks
sA	0.5	1	1.2	3	.8
sB	0.7	1.5	1.5	3.5	1
sC	0.9	2	1.8	4	1.2
sD	1.2	2.5	2.1	4.5	1.4
sE	1.5	3	2.4	5	1.6
sF	1.8	3.5	2.7	5.5	1.8
sG	2.1	4	3	6	2.0
sH	2.4	4.5	3.3	6.5	2.2
sJ	2.7	5	3.6	7	2.4
sK	3	5.5	3.9	7.5	2.6
sL	3.3	6	4.5	8	3.0
sM	3.6	7	5.1	9	3.4
sN	3.9	8	5.7	10	3.8
sP	4.2	9	6.3	12	4.2
sQ	4.5	10	6.9	14	4.6
sR	4.8	11	7.5	16	5.0
sS	5.1	12	8.1	18	5.4
sT	5.5	13	8.7	20	5.8
sU	5.7	14	9.3	22	6.2
sV	6	15	9.9	24	6.6

with 4G acceleration, type sK drop from 5 tons to 3 tons and 11 MCr to 5.5 MCr. This would give a cutter 2 extra tons to add cargo, a larger cabin, better sensors, or whatever seems most appropriate. Compared to using ship type A engines and powerplant it would still be slightly larger overall (6.9 tons vs 6), more expensive (13 MCr vs 12) and less fuel efficient (2.6 tons vs 2) but at least it is a lot closer. A 90-ton shuttle aiming for 2G thrust needs either sJ or ship type A equipment. Combined, the sJ engines and power plant are 6.3 tons and 12 MCr, again nearly equal to the size and cost of the type A ship system. Bumping the shuttle up to 4G acceleration requires sP or type B engines. Here the combined values favor type B systems by size (10.5 vs 10 tons) and the small craft systems by cost (21 MCr vs 24). The small craft equipment would also burn slightly more fuel in the same time.

The new table provides the largest advantage for smaller and midsize small craft in the 2G-4G ranges.

(Continued from page 47)

The extra tonnage available means a lot for this size ship and allows a very different vessel to be constructed. For example, a 10 ton fighter thrusting at 6G needs a Type sC power system. The new table reduces the size of the maneuver drive by 0.6 tons, or 6% of the fighter's total displacement. That's equivalent to 4 points (nearly 5) of crystaliron armor.

A slow modular cutter designed with an accelleration of 2G using the new rules requires Type sE maneuver drives and power systems. Together they total 3.9 tons and 8 MCr, which saves 1 ton and 1 MCr compared to *Cepheus Engine* values. An extra ton for a small craft is a big deal.

Overall, these changes make getting around the systems and subsectors of the *Traveller* Universe more balanced and opens up several new ship designs. The revised small craft tables basically improve the effectiveness and affordability of the small craft engines without substantially changing the nature of the ships. For my campaigns, I tend to have a fair amount of in-system travel between bases, moons, and habitable worlds. Small craft become the semi trucks of the solar system, ferrying around modular cargo containers and passengers to various outposts and scattered habitats. Similarly, large engines and power plants gives larger ships the opportunity to get to their destination much more quickly than before. High tech Jump capable starships also become more affordable and efficient for shorter jumps. High-jump ships still have smaller cargo holds because of the amount of fuel they must be able to carry, but at least they are more efficient at using their fuel which partially compensates for the decreased tonnage available. The change is modest enough that low-jump ships still have many uses. I hope other referees find these alternative rules as balancing as I do.   ✪

Reach Adventure 4: Last Flight of the *Amuar*

reviewed by Megan Robertson

Reach Adventure 4: Last Flight of the Amuar. Martin J. Dougherty. Mongoose Publishing https://www.mongoosepublishing.com
57pp., PDF
US$11.99/UK£9.86

This review originally appeared on rpg-resource.org.uk in Jan. 2018.

This adventure sends the party into little-known space (at least as far as the Imperium is concerned) in search of a lost commercial vessel. It's designed to take several months of game time, and there's scope for adding in side adventures of your own on the way if you wish. Even their fact-finding inquiries on the places they visit in the course of this adventure may grow into something more should the mood take you and the opportunity arise. This book, though, just covers the core mission of locating the *Amuar* and finding out what happened. Alongside this main theme, the party will have to figure out whether or not their patron is to be trusted…

The adventure begins on Pax Rulin, subsector capital of the Pax Rulin subsector of the Trojan Reach sector, and takes the party through this subsector and neighbouring Egryn. This voyage will need a ship capable of Jump-3. If the party has one, fine, but if not their patron can supply one (and will even pay for berthing the party ship while they are away). The Referee's Information chapter provides information on the stellar cartography of the whole region and explains what is to be found there… and perhaps more importantly, who is in charge. There's also a fair bit about their target, the *Amuar*, which is a *Leviathan*-class ship designed for the sort of exploratory commerce in which she was engaged when
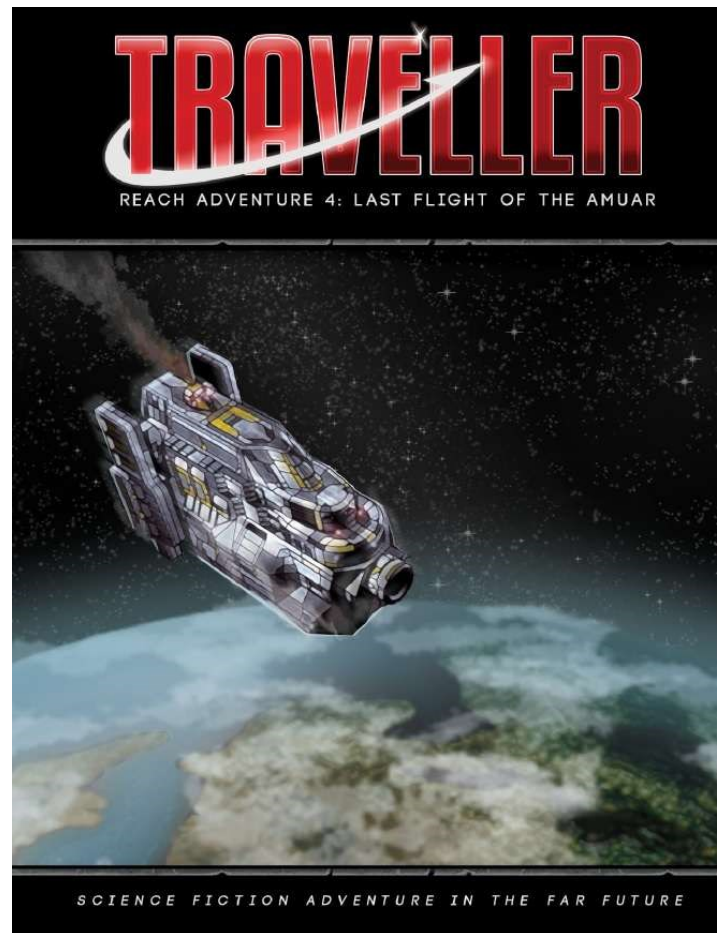
she disappeared. The facts about her last voyage—which of course the party need to discover—are also laid out. A real chapter of disasters!

Next we meet the vessel that will most likely be used, a Far Trader called the *Voidskipper*. It has its own little foibles, which can be annoying or endearing depending on how you view them. One thing to note is that it's quite cramped, so crews are likely to want to make the most of each planetfall. Encourage the almost claustrophobic feeling and let the freedom of each new world beckon… and there's a neat system to model 'crew fatigue' if you want to make this part of your game mechanics. This affects their performance of their duties as well as making them short-tempered and difficult to live with. This can be reduced by shore leave or even a good dinner, but of course those not able to join in due to their duties actually get worse through resentment! It's a nice idea for when an adventure involves a lot of time in the black.

Background done, the adventure begins. A relative of one of the crew of the *Amuar* has got hold of a ship and one crewman, but he needs a few more to go in pursuit, so seeks the party's help. He feels that someone must know what happened to her and wants a diversely-skilled bunch to help find out. He offers a wage plus the possibility of big payouts for salvage or information. Apart from that, a few other reasons for wanting to go along are provided should you wish to use them.

The next part provides descriptions of the places they call at, and events that might take place there including a brief collection of suggestions for further adventures if you wish to prolong the stay. There are also opportunites to gather information about the *Amuar* and by the fifth system visited the party should be building up quite a good picture of the ship and have an idea where she ended up… if they don't find all the clues they need, they may end up visiting even more worlds, and a good assortment

TRAVELLER

REACH ADVENTURE 4: LAST FLIGHT OF THE AMUAR

SCIENCE FICTION ADVENTURE IN THE FAR FUTURE

are given brief descriptions should they stop there—although you will have to flesh these out considerably more than the first five planets.

Finally (hopefully) the party will arrive in the system where the *Amuar* is, and can then investigate what took place aboard. The locals are unfriendly and insular, but it should not prove too difficult to find the *Amuar*… and then the party will have to explore her to discover what happened. That's where the adventure ends. You'll have to attend to getting them back home yourself. As well as main NPCs, some new weapons and equipment and yet another ship (encountered on the way) are detailed at the back.

It makes for an interesting yet rather bland adventure which leaves quite a lot to the referee, although inventive ones can make it come alive. A lot of the time it reads more like an adventure outline rather than a full-blown adventure: expect that and you'll find it quite well resourced. ✪

The Church of the Creator

by Richard Honeycutt

*This article was originally postd to the pre-magazine Freelance Travel-
ler website in 2004*

The Church of the Creator is a Vargr faith based on a simple premise, that imitation is the most sincere form of flattery and worship is just flattery of the divine. From that idea, a simple and utopian form of religion was begun. The best and most sincere way to worship is to imitate the Creator by creating, or at least caring for the Creator's finished work.

Creation can be thought of as building ideas and things. The fine craftsmanship of a woodworker is just as worthy as the writing of a fine novel. The finished product becomes less important than the careful act of making something new. The love that one instills in the finished work is evidence that one wishes to be like the Creator. Does not a child imitate his father in order to be like him? Once every sentient being attains that end, paradise will come.

As a workman's tools allow him to create, they are treated as holy relics. The finest care is given to them and it is not unusual to hear prayers uttered over them. As tools allow us to create, so we, as the Creator's tools allow him to create. We must hone our bodies and minds, ready for his use. No tool is less important than any other and all tools have their own purpose and use.

The goal of any follower is to continuously improve any and all things made by sentient beings. Once perfection is attained in an object, we may humbly offer it up to the Creator for judgement. Of course we can never come close to his works but the main thing is to try with humbleness and a willingness to always try to achieve better.

The Church of the Creator believes that The Church of the Chosen Ones are heretical as they claim that they are chosen for greatness because they were purposefully made by the Ancients. How foolish! All sentient beings were purposefully made by the Creator as his tools for shaping the universe as he sees fit. No tool is more important than any other. All are used, though perhaps not as we expect. Even the Ancients were purposefully made by the Creator. By putting the Ancients on a pedestal, they worship the candle while ignoring the candlemaker. The Church of the Chosen Ones represent broken tools that must either be mended or thrown back into the furnace to be recast anew. ✺

The Lab Ship

Tidally-Locked Planets

by Mark S. McCabe

As many of us know, we always see the same side of the moon as it circles the Earth. The term used for this phenomena is "tidal lock". By definition, this means the moon is in synchronous rotation around our planet, where the gravity pull between both bodies affects the moon to the degree where its rotation matches the amount of time it takes to complete a single orbit around Earth. The gravitational effect on the moon also causes it to be stretched so that the moon's diameter measured along a line connecting the center of the moon with the center of Earth is slightly larger than any other measurement.

As we look further into our solar system, many of the moons of the other planets are tidally locked with their host planet. In one such case, the dwarf planet Pluto is mutually tidally locked with its moon Charon where both bodies face each other in the

same way all the time. Mars, Jupiter, Saturn, Uranus and Neptune all have multiple moons that are tidally locked to them. So if this is a natural and commonly seen astronomical phenomena, why wouldn't a planet in a habitable zone be tidal locked to their host star? What would this planet look like?

There have been several artist's renderings that address this very question (*unfortunately, none have sufficiently permissive availability to use with this article—ed*). The native flora and fauna would be concentrated in and around the twilight/dawn threshold. The back side of the planet, locked in a permanent winter of darkness, would likely be covered in ice and snow. Wherever there would be geothermal activity on this back side of the planet there would be geysers and immense mounts of fog, clouds and snow, much of the water would shoot high into the atmosphere and be carried aloft to condense and fall back to the planet miles away. An example of this phenomena would be Saturn's moon Enceladus, whose ice geysers supply the ice materials for Saturn's E-ring (and which is tidal locked to Saturn).

The front side of the planet, baked in intense daylight, would be too hot to support life as the constant bombardment of solar energy would vaporize any water. Heat and radiation both would make this land sterile in the extreme. Near the dead center of the uninhabitable zone one would expect more elevated land masses as the gravitational pull would cause a bulge in the area closest to the sun. I would envision barren land with an abundance of geothermal and volcanic activity. If the technology is sufficient, this land should be loaded with all kinds of minerals and valuable raw materials for the ambitious belter to harvest.

Along the twilight/dawn periphery, the land would be just warm enough to support liquid water. Much of this water would be runoff from the glaciers melting on the darker side of the planet. The interaction between the hot and cold zones of the

planet would cause the water to flow in currents between the islands that lie off shore of the main continent of sand and heat. Even though there are no winds being caused by the planet's rotation, the temperature difference would also generate a constant "trade wind." This permanent sirocco would also be a means to melt the edges of the glaciers, perpetually churning the water vapor cycle.

So if we go with the assumption that there is a fully operational water evaporation/condensation cycle, we can see where, with a little help through terraforming, life could be sustained here. Rain would be possible, but moisture will likely come from the glacial melting creating fog or mists. It would, however, have to compete with the dry winds from the deserts to hold moisture. Where there is abundant and constant moisture, plants would grow – and quite well due to the constant sunlight. I would expect huge flora sizes and excellent crop yields where arable land could be found and worked.

Now again, we have been working under the assumption that this planet is located in the habitable zone of a solar system. What if that planet was located further away, let's say by another whole AU (Astronomical Unit). Then the heat would only melt an ice planet in one area (assuming that there is moisture there). Where most of the planet would be encased in hard ice, there would be a small sea or ocean that should contain enough gravity pull from the host stellar body to create land masses. This land of perpetual sunlight would be bathed, I would think, in near-constant fog or clouds with the moisture cycle on constant overdrive. Again, with a little terraforming, this planet could also produce large amounts of foods and agricultural products in a smaller amount of space.

Now there have been arguments made that a tidal locked planet would be rendered inhospitable due to a runaway greenhouse effect. I believe that

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any planet can be rendered inhospitable by a runaway greenhouse effect; tidal locking isn't necessary—for example, the Earth was dangerously close to undergoing a runaway greenhouse change during the Permian-Triassic Extinction Event some 252 million years ago. This event was likely triggered by extreme volcanic events in the Siberian Traps area where massive amounts of volcanic gases started to create this condition. This being the case, I can see where a sufficiently advanced technological society, could do well with planets such as these with just a little effort.

So for those of us who enjoy a planet with unique and different features from our own, I humbly submit these thoughts for your consideration. In your mind, how would the plant life be different? Would they lean one way towards the sunlight or be bent another way due to the constant winds? What animals would thrive in such an environment? Would they have moisture retaining features to allow them to live in the hotter regions, or thicker fur with larger eyes for the colder regions? What would the weather be like? With all the added gravitation stress, how would your planet's tectonics be impacted? I see a lot of possibilities for many different types of adventures under challenging conditions.

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Doing It My Way

Multi-Skills, *or* 'Skills' as Certifications

by Brian Jones

There is always a temptation on my part to add dozens of more skills to *Traveller*. The acquisition of skills is for me at least a fundamentally important aspect to the pleasure of the *Traveller* experience. Now I have communicated with various players who mentioned how satisfying it was to take a character with very few skill levels and make him successful. I can appreciate their perspective. And others have been concerned with the issue of skill bloat—having so many different skills to choose from that they cannot be kept up with. That is also a valid concern. Some rule-sets have taken the path of over-simplification. They lump all vaguely related skills together under a single heading (e.g., all of the sciences into one skill called Science).

I believe this robs the system of its charm. You might as well have one skill called Starship which combined piloting, engineering, and electronics. Or one skill called Combat which includes all weapons, whether handheld, mounted, or shipboard. The system is highly technology-oriented and that is reflected in the technical skill sets. The interpersonal element is also not neglected in the skills as they play a major role in interaction with NPCs.

Traveller is supposed to be based on "Hard SciFi". If it is science fiction based – where is the *science*? There is plenty of evidence of *technology* in the ships and weapons and other gear. A space fantasy like *Star Wars* also provides technology. But where is the Zoology? Where is the Geology? What about

Botany or even Paleontology? It would not be so difficult to construct scenarios that make a scientific discipline integral to the plot. Rather than assuming that technology is the "god" that magically comes to the rescue, let's have characters with scientific training who have to investigate for answers.

Is a mapping expedition reacting badly to something in a forest that is making people sick? Let a Botanist figure it out. Is a native species of animal inexplicably attacking a newly established colony? Bring a zoologist on board. Does the engineer need some germanium to repair the power system? Someone with geology can acquire and refine it for him. A museum on Porozlo is offering a finder's fee for an intact fossil of an extinct five legged specimen of a bear-like creature. Some paleontology would certainly help.

When you start tacking on advanced skills like astrophysics and biochemistry the threat of skill bloat looms large. But there is another way to address this without adding skills: Reinterpret existing skills in such a way as to enhance the character. I call these 'multi-skills', or multi-disciplinary skills. They do not have levels; instead, they act more as a certification. Here are some examples.

To get this certification...	...the character should have these skills	
Biochemistry	Biology 2+	Chemistry 2+
Biophysics	Biology 2+	Physics 2+
Geochemistry	Geology 2+	Chemistry 2+
Geophysics	Geology 2+	Physics 2+
Astrophysics	Astronomy 2+	Physics 2+
Quantum Chemistry	Chemistry 2+	Physics 2+
Veterinary Medicine	Animals 2+	Medic 3+

Combining skills in meaningful ways to produce certifications can give the character more dignity. But the combination needs to be meaningful. Combining two levels chef with two levels of gun combat to use a broccoli bazooka – well … it just doesn't quite "cut the mustard" for meaningful.

I *do* have issue with the Engineering skills. They are used to *operate and maintain* the drives on the starship as well as certain various other systems. The term engineer has been used for at least 150 years now to describe some who originally operated and maintained steam engines on trains. That went on to include all forms of engines and power plants on trains, ships, and others. A modern engineer, however, is more likely to design and modify all manner of systems, devices, and structures depending on his specialty. It is the *technicians* and *operators* who operate, maintain, and repair said devices or *assist* engineers in the design process through testing and such. (For example, in the New York City subways, the person who makes the train go from one station to the next is a *train operator*, not an *engineer*.)

So a Starship *Technician* would operate, repair, and maintain jump and maneuver drives and power systems. A Fleet *Engineer* would design the Jump and Maneuver Drives and modify them for specific hull configurations. If a Captain were fortunate enough to have an actual engineer aboard, he could even adapt an engine from a different class of ship, even an alien one, to his ship at need. The Engineer Skill slot could be opened for Civil Engineers (surface structures), Chemical Engineers (polymers and ordinance), Electrical Engineers (power systems), Mechanical Engineers (naval and starship hulls and engines) , Avionics Engineers (control systems, sensors, and communications), Photonics Engineers (energy weapons) and Computer Engineers.

Getting back on topic, having a multi-skill system in place could help motivate a character to try to get that one last level of a skill he needed to qualify for a certification and achieve the satisfaction that comes with it. Perhaps Biology 2+ & Chemical Engineering 2+ to get Biochemical Engineering …   ✵

Arorrbar-Harroga

profiled by Paul Sanders

This article was originally posted to the pre-magazine Freelance Traveller website in 1997.

Arorrbar-Harroga is a member of a minority Vargr subspecies, the Kokasha (*Vilani & Vargr*, p.63). He is typical of his subspecies in most regards; physically weak, but possessing enhanced mental abilities. Arorrbar is witty, bright, and well educated. He was born towards the end of the Long Night on an average world near the edge of the Vargr Extents on the frontier with the Vilani. His parents were killed during a Corsair raid against his world conducted by Vilani Slavers. He managed to escape the death and destruction of this raid, and vowed revenge.

Arorrbars' physical statistics are abysmal; a fall down a short flight of stairs even in his youth would have been enough to send him to the hospital. From an early age he has lived on the wrong side of the law, usually Vilani law. His career has been that of a pilot, crewing on several pirate cruisers that have preyed upon merchant and military starships of the surviving worlds of the old Ziru Sirka. He has retired far into Vargr middle age with only a shotgun, body armor, a vacc. suit, a handful of cash, and a desperate need to run. Old enemies, bounty hunters, law-enforcement officers, and the military forces of more than one Pocket Empire have hunted him across a dozen worlds. At the end of many years, he finds himself deep within unfriendly human space, wasting away from the effects of disease and old age.

His years with the space raiders have given Arorrbar an incredible level of starship-piloting skills (Pilot-7). He can fly almost any spacecraft in existence, and knows stunts that would make average pilots turn white with terror. His missions as a pilot aboard numerous pirate starships were always aimed against the Vilani forces and their interests. He now rests easy knowing that his parents have been avenged.

Arorrbar has style. He knows how to drive the humans around him crazy, and he also knows how to make those humans laugh. Children of any race find him to be a warm ally full of stories, and female Vargr find him irresistible. He enjoys excitement too much to care about death.

At present, we find Arorrbar older and much weaker; a bad fall would now be likely to kill him, and he is racked with chills. His job, money, and all his friends have just vanished in the holocaust of an alien revolt. Arorrbar was fortunate enough to have made it to the spaceport, and after hijacking a small vessel, escape off-planet. Arorrbar managed to escape with nothing but a filthy spacesuit, an assortment of battered and mismatched body-armor, a dagger, and a shotgun and ammunition. After marooning the hijacked starship's small crew on a suitable planet in a neighboring system, and purchasing supplies with credits taken from the ship's safe, he has decided to head for an uncharted area far from Vilani space. As his pirated ship shifts into jump-space, Arorrbar coughs frantically, itching his greying muzzle. He ponders the future and wonders what dangers await him ahead in the emerging manrealm calling itself the Third Imperium.

Arorrbar-Harroga 2B3C99 Age 54 Cr 7,000
9 terms Corsair Pilot

Pilot-7, Navigation-3, Ship Tactics-1, Grav Vehicle-2, Vacc Suit-0, Shotgun-2, Sensor Op-1, Instruction-1, Persuasion-1.

Pocket Scout (Hijacked), Shotgun & Ammo., Battered Body-Armor, Vacc. Suit, Dagger.

Homeworld: Starport A, Medium, Standard, Wet World, Mod. Pop., Mod. Law, Avg. Stellar.

Note: This character was inspired by and draws heavily from an article entitled "Flawed Gems Shine The Brightest" written by Roger E. Moore in Polyhedron #63.

Temporal Tonic Wine

by Alan Hume

[This was the winning entry from Freelance Traveller Contest 2008-01, which asked that entrants create a consumer good. -Ed.]

Temporal Tonic Wine is a "Tonic Wine" produced exclusively by the Vargr monks at the monastery of Ghoerrughz (Canine Time Worshippers on the island of Four Winds on Emerald in the Spinward Marches).

Temporal Tonic Wine is deep brown, almost black, in colour, it is sold in a very distinctive large 750ml dark green screwcap bottle. The label itself is a notoriously bright yellow in colour and features (alongside the large black lettering of the name itself and requisite alcohol content details) the profile of a large black Vargr head, it is grinning (possibly as if drunk) has large staring eyes and a slobbering tongue hanging out of its greying muzzle (hence the name "Old Dog")

The high strength (30° proof (15% ABV)) of this drink is legendary.

The wine was originally sold in tiny quantities by the monastery itself, claiming many medicinal and health benefits with the slogan "Four small glasses a day, for great health and lively blood" (no one ever dared add "a glossy coat" to this motto!) Eventually, the recipe was changed in order for the wine to appeal to a wider customer base, resulting in increased sales.

Recently, "Old Dog" has attained a surprising level of popularity within bohemian and working class communities in certain parts of the Spinward Marches.

Amongst the student community on Regina a fanzine called *Old Dog Supernova* ran for nearly a decade in the years immediately following the Fourth Frontier War.

In several areas of the Marches it is known as "Startown Table Wine" (A reference to the ubiquity of the drink throughout the various slums of the Marches' Startowns where the drink is so common that it can even be found "on tap" in some of the worst bars and gambling dens).

Its iconic stature within the rough, criminal underclass is impossible to over-emphasise and groups of lowlifes can frequently be seen drinking it out of the bottle at all times of the day and night in starports, parks and other public places.

"Old Dog" and its surrounding culture is so notorious that it is even referred to in popular culture and song (see "Got my dog" by Terran rock band "Deadhead", and the jazz fusion bongo epic of "Dogtime" by experimental Aramisian quartet "Imperial Air".)

Aside from "Old Dog", other nicknames include "Hair of the Dog", "Barker Ale", "Clawvine" and "Rocket Fuel" (taken from the notorious incident when Captain Brett Klaag (RIP), a swashbuckling free trader and notorious drunk attempted to fuel his ship (the *Beowulf*-class *Nelson's Pride*) with a salvaged crate of Temporal Tonic Wine resulting in the predictably disastrous deaths of himself, his crew and over a dozen starport workers as the ship crashed immediately following takeoff).

There have been many calls over the years for the drink to be restricted or withheld from general sale from both local law enforcement agencies, community welfare groups and even the local Imperial nobility. Many highlight Temporal Tonic Wine as being particularly responsible for disorderly behaviour, crime and general social deprivation.

Magnus Berkstrom, former chairman of local Regina Startown community group "Neighbourhood Action" even called for the drink to be banned outright; he faced an immediate and virulent demonstration by armed locals chanting "Save our Dog". A violent confrontation was only avoided when the a local unit of the Imperial Army Reserve was divert-

ed to the scene with full riot gear. As a direct result of this affair, Mr Berkstrom received correspondence from legal teams acting on behalf of the monks of Ghoerrughz; he was subsequently ruined and is rumoured to have fallen into alcoholism himself. A further consequence of Mr Berkstrom's activities was that sales of "Old Dog" increased substantially as a direct result of his comments.

A further attack was made by Jonas Du'Pree, the Regina Medical School's spokeperson. In a public announcement he described Temporal Tonic Wine as "… a completely irresponsible drink in its own right and a huge influence on anti-social and reprehensible behaviour.". The monks of Ghoerrughz returned fire by accusing Du'Pree of exhibiting "despicable manners" and an "utter and complete lack of good judgement".

Ultimately the Emperor Strephon himself entered the debate stating that "… while, clearly Temporal Tonic Wine, this 'Old Dog' as it is referred to amongst the lower orders, is particularly attractive to the worst elements of our fine society and has, in fact, become somewhat of a badge of pride amongst them, we cannot allow ourselves to deny the availability of this drink to those upstanding members of our Imperium who do desire to enjoy this drink responsibly and those who seek to generate income from its distribution and sale."

Ultimately all efforts to ban or restrict Temporal Tonic Wine has been completely ineffectual as the revenue gained from the importation of the drink is such that the Imperium is loath to restrict its trade.

The Vargr of Ghoerrughz and their distribution partners continue to strenuously deny that their product is in any way harmful, stating that it is both legally and responsibly enjoyed by the vast majority of purchasers.

Additionally, they also hasten to point out that such areas identified with its acute misuse have been both socially and economically deprived for many, many years, and that Temporal Tonic Wine represents less than three percent of the total alcohol sales in these areas. ✪

Battle Dress User Interface at Higher Tech Levels

by Jeff Schwartz

One of the issues plaguing TL 7 and 8 vehicles and complex machinery has been information overload. The user of the machine is presented with a plethora of information, and has to determine a choice of action based on it. This problem is manageable in industrial processes which are less time sensitive, but in operation of vehicles, and especially combat vehicles, it is a deadly threat.

The *OODA Loop* (*O*bserve, *O*rient, *D*ecide, *A*ct) has a tendency to bog down in the first two steps as more and more Observables are offered. A TL5 pilot has only their eyes and ears, plus a couple rudimentary instruments that are of more use in pre- and post-combat navigation than in the actual fight. TL7 combat aircraft have radar, threat sensors, optical enhancement, flight position sensors, bomb and stores reporting, and other inputs that can easily overwhelm the pilot. This tech level attempt to use Heads-Up Displays (HUDs) to integrate sensors and help increase the bandwidth of the pilot's interface to the plane. By TL8, there are expert systems that attempt to limit less-needed information and en-

hance the readability and noticeability of the more-needed (at this moment) information. There is still a bottleneck, though, of the only real inputs to the operator being sight and sound, and both of those suffer in high stress situations. Auditory exclusion and vision tunnelling are genetically programmed into humans as part of our hunting ancestry, and there is not much that can be done to change that. Even those expert systems don't keep up, and the processing ends up distributed to either a REO (Radio and Electronics Operator) aboard the aircraft, or to a support aircraft (such as AWACS, the *A*irborne *W*arning *A*nd *C*ontrol *S*ystem) that does nothing but C3I (*C*ommand, *C*ontrol, *C*ommunications, *I*ntelligence/*I*nformation).

The OODA issue is especially sharp once power armor is developed. This is a situation akin to the early days of fighter aircraft, in that the pilot is often operating alone in the decision making process. There is no AWACS telling you that in 10 minutes you'll be in weapons range of the other guy. There is a fall back to the days of the best sensors being those onboard, and little time to communicate. This situation slowly improves as newer generations of IVIS (In-Vivo Imaging Systems) are merged into battle dress design, but that has a point of diminishing returns. Eventually all the little dots, icons, symbols, sounds, alerts and alarms begin to overwhelm the operator, and they're slowed rather than aided by the information provided.

By approximately TL14, the techniques of transcranial magnetic stimulation (TMS) are applied to the problem. This is aided by the availability of fine-manufacture room-temperature superconductors and a new generation of small computers.

When the armor is being fitted to the planned user, in addition to adjusting the physical sensors for using the strength enhancers, a functional MRI is run (by the armor) as the operator is presented sundry visual, auditory and tactile stimuli. The tactile

stimulation is provided by the computer twitching the armor's "muscles" or tweaking the internal temperature controls.

Once the armor "maps" the operator, it uses that as a comparison against pre-programmed baselines and figures out how to present other stimuli… this allows additional I/O bandwidth to the operator's brain. Once they're used to the interaction, it lets them orient on incoming information more quickly, thus breaking up a bottleneck in the OODA loop.

For example, in TL11 battle dress, a message from a teammate is generally sent by voice. The person hearing it must process what they hear, decide what other information they need to decide what to do, run their eyes over the relevant displays, then integrate it and decide on a course of action. If your buddy yells, "I'm taking fire!" you have to recognize the voice, look on your IFF scope to see where he is, determine from IFF telemetry if he's hit (and if so, how badly), and then figure out where the enemy is.

TL 14 synesthesia systems piggyback much of that into the voice message. The TMS forces a false color sensation into the audio, ranging from 'blue' (a routine friendly message) to 'orange' (a serious situation). A false 'tickle' is added to the skin, giving a direction cue for where he is, and a false 'distance' vibe is pushed for how far away they are. A false scent is generated for how many of the enemy are present—"how stinky the situation is." Other than color-coding the audio, the sensory information coming in is working in conjunction with the way our nervous systems evolved.

Many of the hazards and tools of the modern battlespace are not directly sensible by the soldiers. Active EMS, for example, shows on sensors, but adding an icon to the screen that a hostile radar emitter is shown is something that has to be looked at, then mentally converted to "Oh! there's a badguy over there about a klick away." Synesthesia UIs push these 'invisibles' as multimode sensory input.

The hostile radar sweep feels like a wire brush running over the skin. The closer and more solid the lock-up, the more intense the sensation. Obviously, the expert system has to be smart enough not to distract the user so severely they can't react appropriately… but a good operator can react to the first sensation of the brush against their arm more quickly than they can see a little flashing icon, decide which way to jump, and then move to cover.

That 'brush sensation' is generally mixed with coloration ('red', with the intensity of the color indicating the severity of the threat) and scent or taste (which enemy unit is associated with that radar, for example). Better systems try to create a variation of OLP (Ordinal Linguistic Personification) to provide an immediate 'feel' for the target sensed. These systems actually induce the type of target into the operator's mind. ("I'm being brushed by the sensors of a Zho Mark 7 suit whose operator is using them in a tentative manner.") This is akin to the situation most people have experienced where when having a dream, they 'just know' things about the background of the dream.

Like most UIs above TL8, the system is user configurable, with the operator being able to adjust "to taste" (pun intended) what tastes, scents, touches, and other sensations are associated with which incoming event.

Generally, the armor 'nulls itself out'—the armor will remove the sensation of wearing it, giving the operator the feeling of being naked, and feeling every breeze across their skin. This is very disconcerting in hostile environments. Most Imperial Marines do basic training in vacc suits, and get used to the feel of one around them before undertaking EVA. To stand in an airlock and have your skin tell you you're naked, and deliberately issue the 'open outer door' command is something that is a big step in training for those troops converting to Battle Dress. There are those who compare this step to the one early paratroopers had to take in deliberately jumping out of a functional aircraft.

Most ships carrying Battle Dress units implemented bridge control of airlocks used by the troops—this requires the trooper to use the armor radio to send a 'request airlock open' message to the Bridge, where the lock is remotely undogged. The idea here is to prevent a Marine who isn't thinking from opening the lock while unarmored.

The synesthesia systems are intended to produce a somewhat dreamlike, unreal cast to combat. This tends to make combat memories less real, and help with long term PTSD issues. The veteran has fewer events where a stimulus triggers an old, bad memory when the stimuli in question are ones that cannot occur naturally. Also, the memory being less real allows the soldier to better dissociate themselves from it. Instead of blaming herself for the stray RPG round that hit a school bus full of children, she can just view it as something that happened in a bad dream she had. "Yeah, it happened, but … it didn't really happen to *me*" is a comment occasionally heard, and in the vast majority of cases it is enough to let the soldier put it out of their memory within a few months. While this mitigates traditional PTSD issues by pushing them to the side, there are some cases where that merely submerges them more deeply in the subconscious so that when they do resurface, they're harder to deal with.

There are issues of "Synth Addiction", where one becomes more comfortable in the Synth than out of it. This problem is worse in early-generation battle dress, where the user has direct control over the amount of Synth provided. This generally led to the operator leaving the suit set for 'full synth' from the moment they were feet-wet in the combat area. They then became used to the feeling of all-knowingness that the armor's sensors and communications gave. There was little point in talking to teammates, be-

cause they already knew what you saw and were experiencing.

Symptoms of Synth Addiction when outside battle dress include the 'million-klick stare' , which is akin to the thousand-mile stare of PTSD troops. They stare off into the distance, waiting to see what the armor wants to show them. In particularly severe cases, they forget to dress—they're used to the sensation of the nulled-out armor, and thus 'feel dressed' when leaving the shower.

There are occasional incidents of Synth Addicts mistaking sensations—some mild cases will flinch when caught in a rain shower, thinking it is orbit-to-ground radar. Sometimes a trooper who takes an afternoon nap will wake suddenly when the sunlight shifts enough that the warmth beats on their skin, making them think they're caught by targeting systems.

They tend to be confused, a bit dazed, and out of touch with what's going on around them. They tend not to speak, but expect those around them to 'just know' what's on their minds. At times, they become frustrated and occasionally violent when people don't understand. In one case, a Marine private sitting in camp was approached by Gen. Nattop. When the General came within arms reach, the private stood, slapped the General, and then sat back down as if nothing happened. During the court martial, the private explained that he was trying to get the General's attention that there was the possibility of nearby snipers, and that the jaunty dress uniform the General was wearing was a threat to the General's life.

Later suits (TL15) implemented variable-Synth, where the suit ramps up the amount of Synth depending on the situation. The idea was that when in lower-risk situations, the user would be forced to speak and interact with team mates in a more normal, human fashion. Most well-disciplined units found this effective. Some of the more 'old-school', 'hard-core' NCOs who could bully new second LTs into it would disable this feature, forcing their unit into the older continuous full-Synth modes.

In the end, the method for dealing with Synth Addiction was to implement very strict rules on the number of hours one could be in-suit without a break. In some ways, this was a good thing - the restriction on suit endurance meant that designers could add more armor, or sensors, or weapons, and increase survivability during the time the soldier was on the sharp end.

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TravellerCON/USA 2019

TravellerCON/USA 2019 will be happening the weekend of 11-13 Oct 2019 at a new location, the Holiday Inn Morgantown. The theme is *Vargr*. The kickstarter has been fully funded, and registration via the TravellerCON/USA website is open at `https://www.travellercon-usa.com/registration.html`—give a click and join the fun!

Come play with us!

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Traveller on the Internet   IRC: The #Traveller and #LoneStar channels

Freelance Traveller sponsors channels for *Traveller* fans on the Undernet and Otherworlders IRC networks, 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 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, and make both channels "jumping" places to hang out!

You can also run "play-by-IRC" game sessions in either channel; please stop in and ask the channel operators (FreeTrav) to schedule it, so we can ensure that the 'bridge' and the 'bartender' are set into a nondisruptive mode.

Please watch the Traveller Mailing List, the Mongoose Traveller forum, and the Lone Star section of the Citizens of the Imperium forum for announcements of Topical Talks!

News About Traveller

Recent *Traveller* (and *Traveller*-compatible) Releases

July/August 2019

- **Antherwyck House Games** has released *Planetary Display Logbook* (in print).
- **FSpace Publications** has released *Far Encounters Micrond Staryards Ship Compendium 1*.
- **Gypsy Knights Games** has released *Outlaw: Crime in Clement Sector* (PDF and print).
- **Michael Brown** has released *The Marrying Kind*, *Quick Robots*, *.CAREER: Salvor*, *CAREER: Star Marshal*, *LOCALE: Strtowns*, *The Sounding* (PDF and print), *Instrument of Our Devotion*, *Alternative Vector: The Guns of Hispañiola*, *DOSSIER: Tristan and Trixane Halvern*, (under the TAS imprint) *Vlezhdiets*.
- **Mike Henry Publishing** has released *Ironmongery: Modern Swedish Vehicles* (database).
- **Okumarts Games** has released *Retro Space Set Ten: Space Station Set*, *Extrastellan Set Seven: Bug Hunt Crew*, *Extrastellar Set Eight: Bug Hunt Colonial Troopers*.
- **Old School Role Playing** has released *Repo!*.
- **Pyromancer Publishing** has released *Baille Class Racing Yacht*.
- **Sharp Mountain Games** has released *Alien : RPG STOCK ART*.
- **Studio Cat** has released *Data Trafficking*.
- **Zozer Gmes** has released *Outworld Authority*, *Crew Expendable*, *Kosmos 68*. ⚙

Submission Guidelines

Content

Freelance Traveller supports *Traveller* in all of its incarnations, rulesets and settings, both. However, there are some limitations on the combination of ruleset and setting that we will enforce:

We refer to the rules defined in Classic *Traveller*, *MegaTraveller*, *Marc Miller's Traveller* (T4), *Traveller[5]*, and both editions of Mongoose *Traveller* as "Classic Compatible" or "2D6". This includes Sceaptune Games' *Hyperlite*, and Samardan Press' *Cepheus Engine*. For these rulesets, any setting, whether official, commercially-published-but-unofficial, or house setting, will be supported. A partial list of published settings supported under 2D6 *Traveller* includes the Third Imperium setting (including polities other than the Third Imperium proper), Reign of Discordia, Clement Sector, Hyperlite, Twilight Sector, Orbital, 2300AD, Foreven Sector, Mindjammer, and I'm sure I've missed others.

Other rulesets, such as **GURPS** *Traveller*, *Traveller[20]/SF20*, *FATE*, *Hero System*, and so on are different enough from 2D6 *Traveller* to make conversion more difficult, and will only be supported for the Third Imperium setting (including polities other than the Third Imperium proper)—we feel that combining these rulesets with a non-Third Imperium setting makes the game something other than *Traveller*. The Third Imperium setting includes *all* eras and polities of the Third Imperium, however, so mixing (for example) the "Milieu Zero" Third Imperium with *FATE* rules would be fair game, as would be playing out some of the Zhodani core expeditions using *SF20*.

Send us any type of article—house rules and rulemixes; animals you've created for encounters; adventures (both long form and short); after-action writeups of conventions or your gaming night; equipment; vehicles; starships; other consumer goods; character profiles (NPC or PC); reviews of *Traveller* products, of products for other games that you feel can be "mined" for use in *Traveller*, of fiction (or non-game nonfiction) that "feels" like *Traveller*, or presents ideas that would be of interest to *Traveller* players or referees; new races or organizations or societies; artwork; or pretty much anything else you can think of. Articles on real-world science are of interest, when accompanied by rules for applying that science to *Traveller*. Tools and techniques you use for preparing for a session or a game are also welcome. We're also compiling a "*Freelance Traveller* Cookbook"; quick and interesting recipes for snacking before, during, or after sessions go here.

Published *Traveller* has generally been kept to a rating approximating the MPAA "PG-13" rating, or the ESRB "T" rating, and *Freelance Traveller* respects that, but does not draw a hard line. Mature themes may be addressed, but explicit or excessively violent/bloody material will not be accepted for publication.

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