

The Path of Cunning



Issue #3

November 2020

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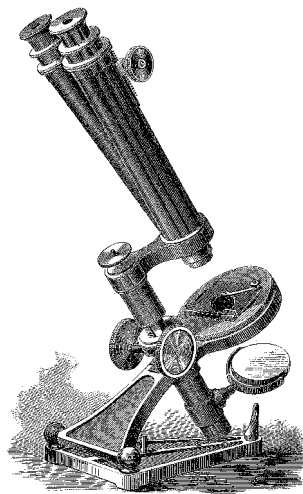
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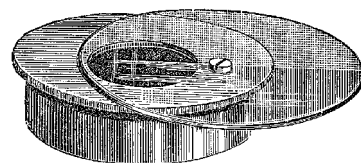
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... An Otherwise Bald and Unconvincing Narrative

John Dallman

Not the *worst* thing that could happen, but ...

We started work on this issue in February, and then the COVID-19 pandemic happened. As everyone has noticed, daily life has changed a bit, and we both had to concentrate on higher-priority things.

One of those was cataract surgery for me, on the eye that works well enough for my brain to be willing to use. It's quite strange to pick a book to read while waiting for surgery, knowing that if things went *really* badly, it would be the last one ever. In fact, things went pretty well, but recovery has been slow for me.

So we're late, but we have not given up. Enjoy this issue, and write to us about it!

Immediacy

Immersion is a concept that gets talked about quite a bit in RPGs. What I'm going to call "Immediacy" is less often discussed, still less distinguished from "Realism."

I've been led to this concept by the discovery that lots of modern role-players wholly disown the **GURPS** concept of the reality check. They don't worry if the events in their games that are governed by the "physical reality" of their setting make any sense in terms of the real world. If you suggest they might, they prefer to fall back on legalistic analysis of their game's rules. Naturally, this hits problems when the rules aren't consistent, but creatively contorted analysis can overcome many difficulties. So they seem to play using *just* the abstractions of the game rules.

This led me to wonder precisely how their enjoyment of their games works, and the first step is to try to define how my own enjoyment works. I very much enjoy the feeling of being someone else, doing difficult things and succeeding, after overcoming problems. What does this imply about what I like in a game?

I don't want to be *visibly* guided by familiar narrative structures. That strains my disbelief-suspenders, because it makes the story form visible to the characters. Terry Pratchett managed to make this into an important feature of the Discworld, known to anyone there who thought about it or asked the right questions¹. It is pretty much definitional for Discworld gaming that goes into any depth about the place. However, using it in settings that aren't designed that way seems to me like lazy and clumsy GMing, which doesn't let the players take their full share of control of the game.

I don't want to play characters that someone else has created. I don't identify to the necessary degree with them, even if they're from fiction that I really like. I want the characters to be *mine*.

I've never been very motivated by "genre tropes" because they imply a serious lack of self-awareness by the characters within the setting. I want to be able to play the character's full awareness of the setting, as far as I can, and to be able to be ingenious and creative within the limits of their mind and resources. If the game is about high-stakes adventure, as most are, unconventional solutions, within the character's

¹ Pratchett did not realise that was how the Discworld worked until he was half-way through writing *Witches Abroad*. Source: his convention guest of honour speech a few weeks later.

ethical limits, should definitely be available. Spotting the hole in the opponents' tactics and diving through it is a special pleasure.

A party of semi-equal characters emerges naturally from a group of players who are friends and not overtly competing in the game. That pretty much defines RPG-style narratives, as opposed to other forms. Sticking to this form makes the social, as opposed to story-telling, activity of gaming easy.

I've tried experimenting with the form a bit, with an *Amber Diceless Role-playing* campaign with a single character, being run as a team effort by three players². I've also played a *GURPS Reign of Steel* campaign that was structured like a TV series. The two good-looking characters were the stars, and the others were supporting cast, but this was decided by the players, and the GM was not aware of it.

So what is "immediacy" in this context? The concept I'm trying to nail down is the *connection* between character and setting, so that the character is as capable of relating to the setting and making changes in it as a real person in the real world.

This doesn't imply that characters can do whatever they like without consequences, which tends to destroy any sense of difficulty or struggle. It means that the setting has its own qualities and resistance to change, analogous to the physical, social, political and/or economic challenges of the real world, but not necessarily replicating them.

I've called this "fictional transparency" in the past, but I think "immediacy" is a better term, because it's about how immediately accessible the fictional world is to me *through* the

character, as opposed to my degree of identification with the character, which is the core of my idea of "immersion." I'll write about that in the future.



Achieving this isn't something that either the players or the GM can do by themselves. It's an important part of the collaborative element of the game. Experienced gamers generally understand this, vaguely, but it's taken me some while to untangle it from the many other things that make up the experience of role-playing and write it down, albeit poorly.

A concept like this is more useful if we can make use of it to improve the game, and that's going to have some variation between people and groups. Here are a few aspects of doing that.

2 Lesson #1: This does not work with one of the players absent. That's far more disruptive than having a player missing from a more normal game.

Understanding what's going on

I'm amazed by the way some gamers don't listen during play. Assuming you know what's going on is a trap in an RPG; presenting a situation that looks simple but has a hidden twist is basic GMing technique, as in any other kind of storytelling.

Being clear about what you're doing, and asking and answering questions about things that can be observed is basic gaming etiquette, for players and the GM. Being clear about one's motivations is a different matter, of course. As a GM, I usually don't contradict players who make wrong deductions, provided they aren't obviously invalidated by their characters' observations.

Some combinations of people have trouble understanding each other. This isn't usually anyone's fault in itself, but ignoring the problem makes it worse.

Doing stuff

The mechanics of an RPG are rarely fun in themselves, once you have a bit of experience with the game. Some games radically abstract their mechanics to save time, but that tends to push me away from immersion in the character and setting. I prefer to be able to imagine things at the level of step-by-step physical actions, if they're important; obviously, I can't do this for every second of the game.

The approach that I prefer is for players to demonstrate that their characters "know what they're doing," that they can put their skills, equipment and other stuff together effectively to accomplish things, cope with setbacks, and achieve goals. Once the GM has accepted this, the mechanics of play can be compressed to the crucial die rolls, or even skipped entirely to save time for more interesting things.

The easiest way to do this is to play through a few challenges in detail, showing that the character can handle them. Once you've done this, the GM may be willing to accept your expertise, at least implicitly. Yes, this rewards player knowledge. I'm perfectly happy with players reading about historical background, or otherwise doing research into the things their characters know. Doing that, and thinking about possible events in the game, enriches my experience of a game, and my players are welcome to do it. It's also a partial answer to the high-IQ generalist PC. Few of them have good technique for all of their skills.

Of course, there are things you can't research. In an AD&D game about 25 years ago, the characters found a magician's library, but could not understand its organisation. They called in a bard character of mine with practical experience of such libraries. Since the DM *probably* didn't have details of the library's organisation, I reckoned all I had to do was sound as if I knew what I was talking about, and that worked.

A step beyond this is playing a specialist, someone who can do more than usual on a specific subject, not because of special abilities or rules, but because they understand the subject well. This is more useful in games less detailed than *GURPS*, which does give you ways to describe most kinds of expertise.

If you're designing a scenario for a known set of PCs, then their expertise or specialisation can be useful, in allowing you to set important challenges and give them a sense of accomplishment without burning up lots of playing time. This also gives you a natural way to move the spotlight among the PCs. Doing this works better if the characters have a lot of choice in how and when they tackle a problem, because they'll naturally use approaches they can execute well.

“Making sense”

This is a concept that floats around in *GURPS* conversations. Everyone seems to know what it means, but I struggle to define it to people who aren't used to the *GURPS Weltanschauung* (look it up). *GURPS* has claimed to “make sense,” in the introduction to the Basic Set, since First Edition, but it never says what that means.

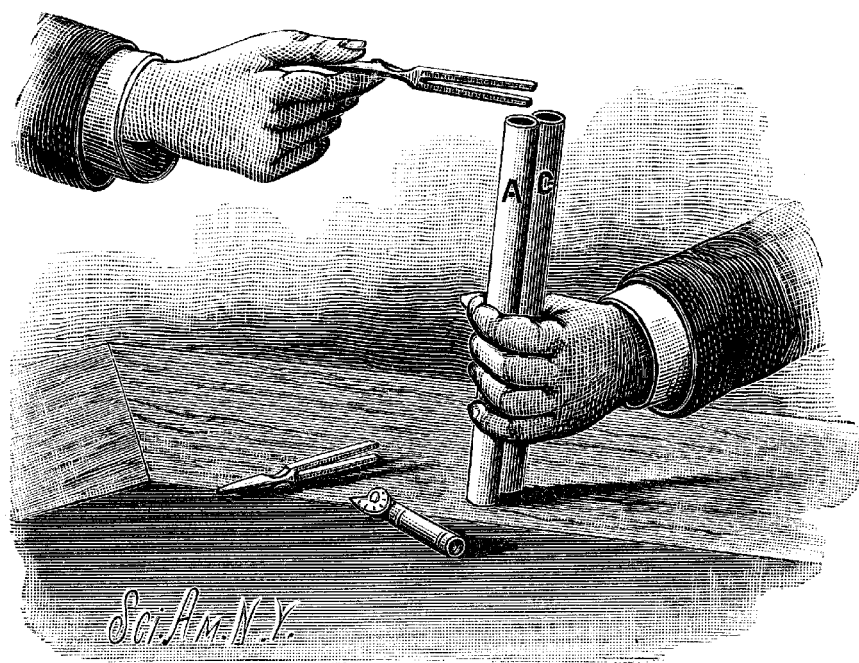
There seem to be several parts to it, including:

- The setting is reasonably internally consistent. Perfection is not demanded, but things hang together. The setting's legal system doesn't have to be consistent — few real ones are — but departures from the basic laws of economics need justification. Physics often gets messed around with, but that needs to be done consistently, and “technobabble of the week” that gets forgotten in the next episode won't do for most players.
- People's motivations and behaviour in the setting need to be reasonably plausible. They don't have to be the same

as the real world, since active gods, magic or ultra-technology can change things a lot, but they need to be believable without strain, and it needs to be possible to anticipate and extrapolate them.

- The numbers that the game produces match up to reality reasonably well, at least on a personal level. There's no need for vague and artificial units for things like time and movement speed.
- We don't mistake the game rules for the laws of nature in the setting. They are playable simplifications and abstractions, no more. We remain aware that the underlying fictional reality is far more complicated. Rules-lawyering is not a useful activity. This means that “fluff” is at least as important as “crunch,” because fluff tells us about the underlying reality and crunch does not.

Having the setting make sense is the GM's responsibility. The players can help, with ideas, and with research (for settings where that works), but the GM usually needs to keep control. Or at least, present an illusion of it.



Amanda Svartvinge

Anders Starmark

Age 25, blond hair, blue eyes, very pale, 5'2", 80 lbs., 92 points.

Attributes: ST 9 [-10]; DX 12 [40]; IQ 11 [20]; HT 10 [0].

Secondary Characteristics: Dmg 1d-2/1d-1; BL 16 lbs.; HP 9 [0]; Per 12 [0]; Will 12 [0]; FP 10 [0]; Basic Speed 6.00 [10]; Basic Move 7 [5].

Advantages: Ally: Ravn (25%; almost all the time) [3]; Animal Empathy [5]; Animal Friend 2 [10]; Flexibility [5]; High Manual Dexterity 2 [10]; Luck [15]; Resistant: Disease (+3) [3]; Single-Minded [5].

Disadvantages: Cowardice (12) [-10]; Dependent: Ravn (0 or fewer points; 6 or less; loved one) [-15]; Pacifism (Self-Defense Only) [-15]; Skinny [-5]; Social Stigma (Female) [-5]; Status -2 [-10]; Wealth (Poor)[-15].

Quirks: Dislikes people who mistreat animals [-1]; Doesn't snitch [-1]; Intolerance (Upper-class people) [-1]; Looks down on street girls [-1]; Very thick accent [-1].

Skills: Acting-12 [4]; Animal Handling (Corvids)-13* [2]; Area Knowledge (Gothenburg)-12 [2]; Climbing-14† [1]; Connoisseur (Jewelry)-10 [1]; Current Affairs (Gothenburg)-11 [1]; Detect Lies-10 [1]; Escape-13† [1]; Fast-Talk-12 [4]; Filch-14‡ [2]; Gambling-11 [2]; Holdout-12 [4]; Housekeeping-11 [1]; Knife-12 [1]; Lockpicking-11 [2]; Observation-11 [2]; Panhandling-11 [1]; Pickpocket-12‡ [1]; Running-12 [8]; Search-11 [2]; Shadowing-12 [4]; Sleight of Hand-10 [1]; Stealth-12 [2]; Streetwise-12 [4]; Veterinary (Birds)-13† [2].

* Includes +2 for Animal Friend

† Includes +3 for Flexibility

‡ Includes +2 for High Manual Dexterity

Amanda Svartvinge ("Blackwing") was born to a poor working family in Gothenburg, Sweden in 1843. She had to share everything with her seven siblings and quickly learned to look out for herself. When she was 12 she ran away from home to escape from a father who drank too much and a mother who didn't protect her children from him. She ended up on a farm outside of Skara and spent three years there learning to cook, clean and keep house. Ever since she was a child, she had always loved being around animals, and when she found a raven chick in a nearby forest she decided to keep it and raise it. When the farm was sold to a local gentleman farmer she ran away again, finding her way back to Gothenburg.

Ever since then she has lived on the streets of Gothenburg. She has nimble fingers and has taught herself to be an accomplished pickpocket. Amanda has managed to stay independent of the larger gangs of the city, playing them off of each other. One day, perhaps, she will no longer be able to do so and she will have to join one of them, but for now she enjoys her independence.

Adapting Amanda to other settings: There is very little that is setting-dependent for Amanda. As long as there are pickpockets and ravens she would be easy to slot into another setting with very little work. Just change her Area Knowledge and Current Affairs skill to whatever is appropriate. In a high-tech setting she should probably have 2 or 4 points in Electronics

Operation (Security), but she would be too poor to afford cybernetic enhancements for her or Ravn. She would work fine in a fantasy setting as is, but you may want to add Magic Resistance. There's no need to make her a mage – the character works fine as a completely mundane person.

Ravn

Ravn is an unusually intelligent raven. She is a good flyer and an excellent thief, having learned that bringing jewelry back to Amanda will result in treats. She can also speak and knows about 20 to 30 words. She's still a bit unclear on how to use them, however.

ST 3 DX 14; IQ 5; HT 10

Will 10; Per 12; Speed 6; Dodge 9; Move 2
(ground)

SM -4; 3 lbs.

Traits: Domestic Animal; Flight (Winged; Air Move 12); Mimicry; Foot Manipulators 2; Sharp Beak.

Skills: Filch-14.



Inserting Amanda into a Campaign

Amanda can be inserted into a campaign many different ways. She is a 92-point character and can easily be an Ally, Contact, Dependent, or Enemy. As written, she is a competent thief, but not extremely so – her professional abilities hover around 12-15. This is easy to improve – just add +3 to all relevant skills (your decision depending on what role you want her to play, but if you go for a straight thief I would recommend Filch, Pickpocket, Stealth and Streetwise) and adjust her point value accordingly.

Amanda Adventure Seeds

Here are two easy ways to center an adventure around Amanda:

I need help! Amanda plays the big boys against each other, allowing her to keep her independence. That works fine – for a while – and then it doesn't work at all. Alternatively, she could have stolen something worth more than she was ready for, and powerful people are after her. Either way, she can seek help from the adventurers and pay them in petty goods or money. She doesn't have a lot, but she will do just about anything to save her skin.

You need help! The opposite of above. Amanda has something the characters want and for some reason they can't just straight up kill her. Maybe she has a crucial piece of information, or the expertise needed to break into a place. Either way, finding her can be an adventure in itself; she's not connected to the major gangs in the city, and she is good at keeping her head down.

Amanda Upgrades

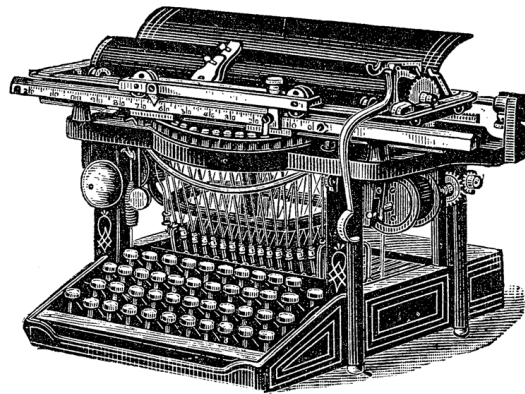
Here are a few options if you want her to be more than she seems:

Amanda the Alien: Maybe she's not from around here. Maybe she's from... someplace else? In a **Space** campaign she could be a shapeshifter from another world, although that raises questions about why she has an affinity with Earthly animals. Maybe Ravn is also shapeshifted, or maybe it's an example of convergent evolution. In a Fantasy campaign she could be an Elf or Faerie; the latter, especially, pack a lot of punch and would drastically increase the power of the character.

Amanda the Beastmaster: The character as written already has a strong affinity for animals. What if it was supernatural? Psi or magic are the easiest way to go here. **Magic** has a lot of animal spells,

and **Powers** has the Animal Control power. In a **Supers** campaign, she could be a low-level metahuman with the ability to summon and control animals and maybe raven-themed powers as well – Flight, Mimicry, Terror... let your imagination run free!

Amanda the Operative: Give her high skills in unarmed combat and/or knife, as well as Guns (Pistol). Increase her Acting and Holdout skills. In a high-tech campaign, you can add cybernetic or bionic enhancements as well, but be careful – these things can often be detected and blow her cover. Sometimes unenhanced is the stealthier option.



GURPS Community Contacts

SJ Games GURPS page: <http://www.sjgames.com/gurps/>

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GURPSDay blog index: <https://gamingballistic.com/gurpsday/>

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RPG.NET GURPS: <https://forum.rpg.net/index.php?tags/gurps/>

Stack Exchange GURPS: <https://rpg.stackexchange.com/questions/tagged/gurps>

Infinite Cabal Part 3

Missions, NPCs and significant events

John Dallman

The campaign has now finished, which allows me to explain a few things that the players only found out at the end, and some motivations of NPCs that were not clear to the players.

These sections are not in strict chronological order, but are grouped for ease of telling. Many other things happened, described in the [campaign log](#); I'm relating things that turned out to have long-term importance for the campaign.

Missions

The characters were always, in theory, a group working for the Royal Society on whatever cross-world missions were required.

Their first mission was to investigate a theory about the worlds. Given that there are many worlds, at different dates and with time running at different speeds, does extrapolating backwards suggest one event when they were all split off from a single world? Or indeed, a reasonably small number of such splits? The answer soon proved to be “no,” although there were substantial complications along the way. This mission occupied about the first ten sessions of the campaign.

Their second mission was far broader. “Find out why the universe is like this, and how that happened.” Newton felt the worlds seemed too complex to be a purely natural phenomenon, although he did not mention that at the time, since he had no evidence. This mission occupied most of the campaign, about 190 sessions, ending with practical experiments.

An issue that the players noticed early on was “Why don't we spread diseases from world to world?” That was a puzzle for Infinity and Centrum too, and had to be considered in the campaign's resolution.

Robert Smythe of Centrum

The first cross-world traveller from outside the Cabal that the party met was from Centrum, the resident agent on a world (“Sans-Newton”) where Newton had died in the plague of 1666. He'd spotted them when Commander Hodgson's disadvantages of Dependent, Mistaken Identity, and Weirdness Magnet all came up together, and he was recognised by this world's version of his sister.

Smythe happened to be in the same bookshop at the time, and his suspicions were raised by the unusual conversation. A bit of shadowing and high-tech spying confirmed they were out-worlders. He made an attempt to kidnap them for interrogation, but failed, and bought his freedom with information about Centrum, Infinity and their conflict.

Nomenclature

The Royal Society never adopted Infinity or Centrum nomenclature wholesale. They named worlds themselves, sometimes adopting an Infinity or Centrum name if they were introduced to the world by those agencies. This wasn't a problem in play, because many of the worlds that were used weren't from *Infinite Worlds*.

Aldebaran

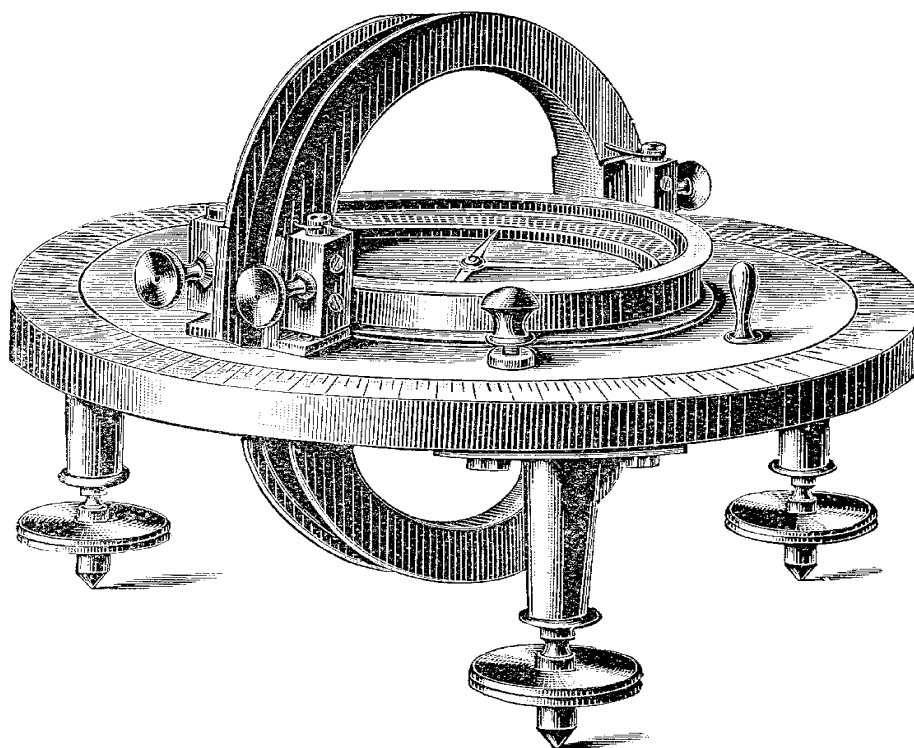
Sans-Newton had an effective, if complicated, system of astrology, which was the only kind of magic in use there. Some months and several worlds after the first encounter with Smythe, the party learned it also had Centrum trying to alter its history, by assisting the Jacobite Rebellion of 1745 with supplies and logistics.

The characters were generally opposed to a Jacobite success and Commander Hodgson's ability to sense quantum flows allowed him to tell which actions were likely to alter history.

Owing to overconfidence, half the party fell into Centrum's hands, and Nell and the Commander found themselves on the Near Astral, watching a large and well-equipped Jacobite army preparing to move out of camp and engage the defenders of London. Since they had no idea what to do, an astral encounter seemed indicated, and a random page in the *Encyclopedia of Fantasy* came up with the star Aldebaran.

"Well," I thought, "that's a zodiacal star, and doubtless significant in Sans-Newton astrology." Its spirit showed up on the astral, looking like a red star about 6' in diameter, and at the same time, like a red giant star viewed from close up, completely filling the sky. It was concerned that the voices it heard from this world were becoming faint and incomprehensible; when the situation was explained a bit, it offered to help, and gave Nell a flame. When this was thrown through a small gate into the camp, just about everything caught fire. This was a pivotal moment in Nell's development: megalomania started here.

The captured party members found themselves negotiating with Smythe, and were able to buy their freedom by taking a Centran special-ops team to Shikaku-Mon, enabling them to learn its coordinates. A dead-drop for messages was also set up, since both sides felt further contact might be necessary.



Cabal Rome

Fairly early on, the characters found that they needed to learn better technique for blending into unfamiliar worlds. They asked the ambassador from the larger Cabal to the Royal Society, Rigos Sapienza, about this, and were directed to “Cabal Rome,” a Rome in 248CE where the Cabal had significant influence, and training was available.

They travelled to Rome on Newton-X, mostly by ship, crossed to Cabal Rome, got some training, discovered a chronobahn in the foothills of the Apennines, and used it to visit a number of Rome-related worlds. They rescued an Australian expert in porcelain, who’d been exploited by swagmen, from the dungeons of an Ur-Rome on the astral plane; he was able to tell them rather more about the Infinity-Centrum war, and its minor players, and they hired him.

The most significant of the Rome-related worlds for the campaign was “New Renaissance” a world in its early 1960s, where WWII had fizzled out early on. An exodus of Jewish musicians, artists and scientists from Germany had sparked cultural and scientific innovation in the rest of Europe and North America during the 1950s, without any major wars. It was a world where long-distance air travel was readily available, without the tedious security checks that cause such difficulties for people with swords and guns in the real world.

They eventually returned to England via a steam-car race from Rome to London on Rome-7 (*IW*, p. 145), and set up a base on New Renaissance, by buying a house in London that also existed on Newton-X, and installing a portal between the two cellars. Their Australian became the base manager, pending their figuring out *which* Australia he came from (he’s still waiting).

Hilary Gretton of Infinity

The characters met Hilary when she was a street-level Infinity operative in London on New Renaissance. She spotted Daniel Book, a PC who was with the party for a year or so, and decided to approach him with a view to friendly contact with the group. She was reasonably sure they were Cabalists, but they also seemed not to be seizing power, abusing the population, meddling with Things Man Was Not Meant to Know, or generally acting like Infinity’s image of the Cabal. She was exceeding her authority a bit, but got away with it, because it worked.

Newton, Halley and Sapienza were surprised by this approach, but willing to go along with it.

Over time, a considerable degree of trust was built up between Hilary and the party, although formal alliances were always avoided. She proved to have no magical talent whatsoever, much to her relief. Once Hilary had been shown the Astral Plane, Infinity naturally became keen to know how it related to their parachronic theories. See “Quantum Levels” in part 2 of this series.



Daniel Book

Daniel was based on a character from Neal Stephenson’s *Baroque Cycle*. He was mathematically talented and a protégé of Newton. He’d acquired world-jumping ability via one of Newton’s alchemical experiments, but its targeting was somewhat unreliable. He was somewhat naive and lacking in confidence, but interesting things happened around him. *Played by Ceri Harrison.*

Shikaku-Mon

An early event with Hilary, while she was being introduced to the Astral Plane and was gathering information on the coordinates of worlds, was a mis-jump that landed them on Shikaku-Mon's Hampstead Heath. She realised where they were, got the coordinates, and they left quickly. That helped demonstrate the value of the relationship to Infinity's management, who had been dubious about the whole idea.

Solving Enigma

Rather later, Infinity asked the characters if they could figure out what had transpired with Enigma (*IW*, p. 140), and where its population had gone. This turned out to be fairly straightforward, if weird: the Enigma that Infinity had access to wasn't the B_0 world, as would be expected, but the B_1 . See part 2 for the B-levels.

The expedition promptly went to the B_0 , but since they'd decided to do this in an unpopulated area of Scotland to avoid encountering people unexpectedly, they didn't meet anyone for a few hours. When they did, it was two men, who looked quite similar, except that one was distinctly older. The first words from them to Janos, "Whur's your other?" were very suggestive, and some questioning made it clear that the whole population of the B_1 had appeared in the B_0 on the date where Enigma's population vanished. The duplicate identity problem had been handled by the social mechanism of having the pair share a life.

Naturally, the world was rather poorer, and there had been significant starvation at first, but things were now fairly stable. There were no clues as to the *cause* of this event, but the obvious hypotheses for Hilary and the characters were "natural phenomenon" and "Cabalist meddling."

Infinity were quite pleased to have an entire 1982 to loot; they left the UK to the characters, who opened the vaults in the Bank of England, and acquired a very substantial supply of gold. They later took the Crown Jewels, on the grounds they'd probably be useful.

The Unity

By ascending to the Astral Sea from Infinity Homeline, the characters discovered that there were three worlds whose astral pools were adjacent to Homeline's, and two of them were Centrum and Shikaku-Mon. Of course, they investigated the fourth immediately.

This was a world at the leading edge of history, populated by humans who formed a single world-wide mental gestalt, the Unity. It is, in fact, the prototype, as glimpsed in the dreams of SF writers, of those far-future worlds where people live in pastel-coloured domes set amid parkland, and are occupied with ideas rather than things. The characters didn't know any of this, but they did learn some things:

This world's history diverged during the Egyptian Old Kingdom, when Imhotep developed the first psionic arts. Their ancestors had explored the worlds millennia ago, and understood them well, but had found the life of their group-mind more interesting and now did little else. The individual who talked to them seemed normal enough moment-to-moment, but appeared to be remembering things asynchronously.

The party declined an offer to join the gestalt and left politely. They had described the outlines of current world-travel, and picked up the detail that the two-quantum limit on projector-conveyor travel was a mistake in the theory.

The Astral Sea location where Homeline, Centrum, Shikaku-Mon and Unity are found

became a significant location in subsequent events, although it was never formally named.

Albert Einstein

Newton had been reading a lot of mathematics and physics from worlds later in history than Newton-X, and had become quite impressed with Einstein's work. The solution of General Relativity's equations that describes one universe splitting into two¹ was obviously interesting. He also wanted to know why there seemed to be so many more worlds with history related to Infinity Homeline than to Centrum, Shikaku-Mon or the Unity.

"Fetch me an Albert Einstein! One young enough to be creative, but old enough that his genius is established!"

After some research, they chose 1920 as an appropriate date, which matched New Renaissance B₄. As a recruiting tool, they obtained a collection of scientific papers published for the 50th anniversary of his publication of General Relativity in 1915. It was then a question of getting an interview (they were getting quite good at Diplomacy by this time), showing him the book, letting him check some of the reasoning, and telling him the truth: that there were many worlds, and one had an active Newton, who wanted him as a collaborator on a Theory of Everything.

After some demonstrations that they were telling the truth², he accepted.

Blowing up Blip

The characters had been told about Blip (*IW*, p. 140) by Hilary, on behalf of Infinity. They'd

1 "Trouser Worlds," first discovered by Anderson and DeWitt.

2 Einstein, looking around on the Near Astral: "So, the Theosophists are not wrong about *everything*."

visited it briefly, and found that while it seemed normal on the material plane, its Near Astral was constantly shaking, and its tunnel from B₀ towards B₁ was in constant peristaltic motion as new B-levels calved from it. They left it alone, pending a bright idea.

When Carnot and the Commander went to fetch Einstein for his first summer of research with Newton, they travelled across the Astral Sea, and encountered a volcano spirit. It was quite an inquisitive one and followed them, claiming that it sought inspiration, and to inspire others.

They split up, the Commander getting Einstein to their destination, while Carnot distracted the volcano. After failing to bore it with tales of the French Revolution, he eventually led it to Blip's Near Astral, which it found interesting enough to let him get away.

A few hours later, that worldline disintegrated. At its previous location on the Astral Sea, there were several small pools in place of one large one, and divination revealed that they were dangerous to enter. A Planar Summons spell produced a ghost who told of the world ending in fire after a spectacular sunset.

Carnot's hardly-concealed glee at having destroyed an entire Earth earned him a very frosty interview with Newton, at which he apologised and promised not to do it again. He did have the sense not to claim it was an "experiment," which would have been fatal.

Flamefang

A few weeks later, the characters were passing through the Homeline/Centrum location of the Astral Sea when a dragon of considerable size stepped out of nowhere and asked them about a world of his that had exploded. Fortunately, he

was a Cabalist who kept to the rules, and nobody got eaten.

He had been responsible for Blip, and was not pleased about its destruction, but found the characters interesting on conversing with them. He proved to be an entire faction of the Cabal in his own right, a dragon who regarded the worlds of the Astral Sea as his hoard. After learning about them and the Royal Society, he asked to be visited by Newton, and they became friends, insofar as Grand Masters can.

As Antoine correctly guessed, Flamefang was a strictly astral being, incapable of visiting the material plane. He was, in fact, the original platonic ideal of dragons, who'd become ambitious and decided to do more than the role he was set. This may have something to do with the ways the ideas and images of dragons have varied so much over recent decades.

Emmy Noether

After a lot of hard work, Newton and Einstein began to see the outlines of a decanic generalisation of general relativity.



Unfortunately, it was in 36 dimensions, and the mathematics was *horrible*. It gradually became clear to them that they needed a better, more creative, mathematician to help them. And when those two need a better mathematician, they're in pretty deep.

The characters did some research, and decided on [Emmy Noether](#), other candidates having included John von Neumann, Srinivasa Ramanujan and Paul Erdős. Since most of the players live in Cambridge, and know a fair amount *about* mathematics even if none of them are professional mathematicians, the choice was more informed and interesting than it would have been for many groups.

Noether is not famous, but she did a great deal of the creative work towards modern number theory, and proved an important theorem in theoretical physics. The characters concluded they might as well recruit her from the same world as Einstein, although he refused to be connected with the approach. As a new member of the Cabal, he did not want to be associated with anything out of place in his homeworld.

The bait was a part of the 36-dimensional problem, and Noether found the deliberate mistake, and an accidental one. She was unsure about taking a non-academic post, having fought so hard to achieve academic recognition, but was advised by David Hilbert³, her professor at Göttingen, to take the job.

Mara, the Huntress

She comes from a fairly obscure and very unconventional fantasy series, *Rhapsody of Blood*, by Roz Kaveney. Around 4000 BCE, she and her sisters kept an inn somewhere in northern Mesopotamia, where her role was hunting for the pot. She met one of the new gods that were

3 If any real person had the **GURPS** Intuition advantage, it was Hilbert.

commonplace at the time, and he showed her the secret of immortality. The same day, her sisters were killed by wandering marauders. Ever since, she has taken it upon herself to defend the weak against the strong.

She is not a goddess. She's quite clear about that, although she has killed hundreds of gods, and taken a measure of their power. She seems to be part of the universe's immune system, killing things that threaten it. Among Cabalists, she's a horrible rumour of an implacable and ingenious killer.

The characters met her on Nostradamus (*IW*, p. 138), where they were studying the Chronobahn, with the help of vehicles taken from the Reich-5 Nazis. She concluded that while they were Cabalists, they weren't the exploitative kind that are so sadly common, and enlisted their help against Reich-5. So as to reach the gate to *Reichsprotektorat* Mesopotamia without being spotted, she showed them how to travel quickly through the not-so-near Astral, a method that became known as "Astral Speed" and allows crossing continents in tens of minutes, although getting lost is remarkably easy.

When you can move on and off the Near Astral at will, infiltrating secure buildings is trivial and killing their guards is easy. When the gate opened, Mara slipped through it to Reich-5, which she had no other way to find. The characters destroyed the gate, the shipment that had come through, the base's ammunition dump and fuel stores, and killed most of the officers, not stopping until the elite troops of the SS Raven Division fled.

They never knowingly saw Mara again, but since Reich-5 cross-world operations halted rather abruptly, they presumed she had killed off the relevant people in Mesopotamia and Burgundy.

Echoes of Homeline

One of the mysteries of the setting was the large number of echoes of Homeline. No other world seemed to have them. Investigation made it clear that echoes weren't B-stack worlds, because many of them were on different quanta from Homeline, and they had B-stacks of their own, with B-worlds at different dates from Homeline's B-worlds.

That raised the possibility that echoes were related to Infinity's methods of inter-world travel, which immediately pointed to projectors, since they are used rather less often than conveyors.

Then the characters decided to ask Flamefang about the rate of disappearance and appearance of worlds from his hoard. It had been increasing, since Infinity started using projectors, a date of which he had not been aware. And that was enough evidence to get Infinity to run an experiment, operating a projector as rapidly as possible for a few hours.

Worlds started appearing, at the Homeline/Centrum location on the Astral Sea, and proved to be echoes. This seemed to be happening when projectors glitched or otherwise misbehaved. At this point, the possibility that worlds were being destroyed at the same time had to be considered.

The characters used the dead-drop to arrange a meeting with Centrum and tell Smythe about this. He naturally wanted evidence, but did say that Centrum didn't know why echoes existed, and they didn't have them.

All the parties to this information had realised that *if* Infinity's incomplete parachronic theory allowed building projectors that created and destroyed worlds when they malfunctioned, then a device that could destroy worlds was a possibility, and probably only a matter of R&D.

The Savoy Conference

This got a lot of attention, in the upper reaches of Infinity and Interworld. Theoretical investigations by both organisations couldn't rule it out, and made it seem plausible. Senior Interworld and Infinity people were taken to the Astral to meet Flamefang (who is quite convincing), see a new world appear and confirm that the Astral Sea allowed access to Homeline, Centrum and Shikaku-Mon. They were prepared to take the characters' word for Unity.

The Royal Society saw a chance to become recognised as a power in the universe, and backed the characters in staging a diplomatic conference to discuss peace between Infinity and

Interworld. Since Centrum has been a world government for over a century, they had to re-learn formal intergovernmental diplomacy.

An agreement was reached, dividing the universe into spheres of influence, and with Centrum providing a better parachronic theory to Infinity to enable safe travel. The Royal Society acquired formal diplomatic recognition and representation with both societies, in recognition of their contributions.

At this point, I considered ending the campaign, since it had resolved the primary conflict of the setting. However, I had more ideas to explore, and the players were happy to continue. See Part 4 of this series, in the next issue, for the conclusion.



GURPS Cold Shard Mountains: Designer's Notes

Matt Riggsby

There's a tension hidden inside the premise of the *GURPS Dungeon Fantasy* line. The very first paragraph of *GURPS Dungeon Fantasy 1* has this to say about the genre it's *not* trying to represent:

Fantasy is an engaging genre, bursting with wonder and mystery. It offers worlds full of fascinating lands, dotted with great cities and populated by exotic cultures. All of this has a powerful resonance with any gamer familiar with myth, fairy-tales, and the fantasy epics of literature and film. For that, get *GURPS Fantasy*.

The next paragraph goes on to describe what it *is*: superheroes in Medieval drag going to dangerous places, killing things, and taking their stuff. No complex social interaction, complex plots, and so on. The disdain for attention to history, society, culture, and so on continues, describing “two-dimensional ‘heroes’ from a non-culture, and pillages history and fantasy novels at random for powerful equipment and mythology.”

But, I've always thought, that's not really what's going on. With my gamer hat on, I can observe that there are, in fact, elements of social structure underlying the *DF* genre. There are explicit mentions through the *DF* line of kings and agents of kings, a Frozen North which produces barbarians, a Mysterious East which produces martial artists and ninja, relatively safe towns where adventurers can rest and resupply, and relatively dangerous wildernesses which are full of monsters and treasure. Already, before any GM gets their hands on things, there's culture, geography, and politics, however rudimentary.

And with my social scientist hat on I can observe that there are *always* social and cultural factors in play in anything people do, even if they don't think about or aren't aware of those factors. The game itself makes some assumptions about society and culture, and GMs flesh out that picture in more or less detail when the game hits the table. Any actual playable setting has social, cultural, and historical features, from the extensively Scandinavian-flavored background of Douglas Cole's Nordlands publications to the names and legends behind a variety of items in Peter Dell'Orto's Felltower megadungeon, to say nothing of the social circulation of information in the form of rumors. *DF* doesn't escape society, culture, and history. It just tries not to think about them very hard.

That said, it doesn't think very hard about those things for good reason. It's not really about them. *DF* is about characters with a narrow job description: travel through a dangerous wilderness to even more dangerous locations, kill things there, and take their stuff. There's little scope for the elaborate social interactions or complex plots it purports to disdain. But there is scope for culture and history, the fascinating lands and exotic cultures it claims not to be about. It's just a narrow use.

That use is one I summed up in a single word in my proposal to SJ Games for *Cold Shard Mountains*: branding. One of the things dungeon delving heroes remember is the magnitude of what they struggle against and what they win: how much damage they had to do, what the DR of the boss monsters was, how many \$ of loot they got. But they also remember *who*, *what*, and *where*. A good adventure of any kind doesn't just provide numbers to compare with other numbers, but a sense of place and

time and personality. Heroes don't impress people by saying they fought a monster with such-and-such a list of characteristics including Flight with limitations, high DR, and a flame-based Innate Attack. They impress people by saying they fought a dragon. Heroes like Zorro and the Three Musketeers are memorable not just because of their competencies, but because of their style. Excalibur is a good sword, but everybody remembers it for its symbolism. And, of course, players find all manner of other games memorable for their settings: Glorantha, the Forgotten Realms, and so on. When things hit the table, all of those trappings of society and history are important, even in games which claim not to care about it.

So, then, the point of *Cold Shard Mountains* was to construct histories, societies, personalities, and material culture useful for the ends of dungeon-delving adventure, providing stylistic hooks on which to hang the mechanical challenges of dungeon delving. It started with dungeons. There are plenty of good *DF*-themed adventures to be had above ground, but underneath is the heart of the game. That

suggested a relatively small area, large enough to require a bit of travel between dungeon and town but not so much to make long hauls the theme. Moreover, there had to be a lot of potential underground spaces. For that, it was worth throwing in everything that might leave a void under the surface: geology conducive to cave formation, creatures who dug extensive tunnels, long habitation by two canonically underground-dwelling species, and invasions from the underworld. Each had to come on the scene in its own time and eventually give way to the next batch of influences on the region.

Then there was treasure. Each culture which came through the region would naturally have its own styles, and its own preferred ways of doing things and making things. This in turn would result in some distinctive bits of material culture. Each major culture got its own distinctive "look" for its artifacts, which turns up in play as a way for delvers to get a sense of what kinds of treasures they're finding. For example, even if they don't have someone around to cast *Analyze Magic*, they can guess that the skeleton-motif item they just found is likely demon-made and therefore probably cursed with *Lifebane*.

With this basis in place, there were other modes of play and ways of motivating adventure to consider. The living, breathing people of the region would have their own reasons for doing stuff. Bandits, revolutionaries, ambitious rulers (Tennen the Short is loosely based on one of my dogs, fussy and spoiled but capable of remarkable ferocity if roused), and religious conflict are all there to serve as both a source of obstacles and a source for backgrounds and missions for adventurers. All of these might have received more attention had this been a more conventional fantasy setting, but as it is, their function in the book is limited.



For the Unifier/Polyphysite split, I wanted to have something reminiscent of the character of early Christological disputes without reproducing any of their actual content. The conflict covers real temporal power with the control of holy sites and artifacts at stake as well as bafflingly dense and subtle arguments. It's the kind of conflict where the choice of a preposition in a theological document can break a faction apart. This means that the GM can summon up a new faction any time it's necessary without worrying too much about requiring them to be right or wrong in the eyes of players or their characters.

There are a few items meant to encourage a broad range of player choices by breaking up the monocultures we sometimes saddle ourselves with. While members of different races tend to live in separate communities, there are hybrid communities as well¹, and the Unifier/Polyphysite conflict knows no boundaries. Had this been a more conventional fantasy work, I would have punched up those cultural and species overlaps more. Even the Wise Raptors don't limit their society to their own species, but are entirely willing to include dragons among their number. Something I considered but didn't actually write, was the occasional Wise Raptor contrarian take on history. They've got their own viewpoint, after all, which sometimes contradicts that of various other peoples. However, I scrapped that idea because it's more of an *explicitly* than *covertly* general fantasy idea that didn't lend itself well to enabling further dungeon crawling.

Much of the rest is window dressing, local color, and interesting landscapes for individual quests and adventures: a still river with the banks flowing around it, levitating stones, burning swamps, pocket dimensions, and so on. The mountains complicate movement, making for

more arduous journeys in a relatively small region (which keeps delvers from running back to town to resupply the moment things get a little hairy) and also provide a wide range of microclimates and balkanized pseudo-polities for the GM to use as desired; need to set something in a swamp, on a farming plateau, a lake, or some other kind of territory, or a new king or other aristocrat to hire some wandering PCs? You can put a new one down somewhere without interfering with other bits of terrain that have already been used. The hex-shaped map was purely for old-school sentimentality.



The sum total, then, is (one hopes) a place which feels like a place. Since it's riddled with tunnels and monsters and treasures, it's got the physical infrastructure for dungeon delving. But all of those places and things *also* have associations with different peoples, eras, and the grand flow of history. It all matters to the delvers if only because those traces of history create the conditions of delving, and it's all there for a GM to expand if they're so inclined. But if not, I thought about it so you don't have to.

¹ And historically, Kerenk's dwarven empire included coleopterans and surface-dwellers.

GURPS Reign of Steel: Read the Sky: Designer's Notes

Roger Bell_West

Introduction

In February I was asked to contribute something for what became the **GURPS** PDF Challenge. My original idea turned out to be rather too close to one that someone else was working on (not yet announced), so I decided to exploit the access to art from the excellent Tithi Luadthong to add some further material to the world of **Reign of Steel**, for which I'd previously written the 4th edition conversion.

The adventure was originally run in 2009 in my *Debugging* campaign, the same one that was used to test much of the 4th edition conversion that eventually became **Will to Live**. This campaign was run under **GURPS Action**, which meant that the team had a medic competent enough to deal with the (spoiler), though this still involved several days in hospital. The (other spoiler) met the unfriendly end of an anti-tank weapon.

I've only had one adventure published before, though I've written several for repeated use; it's a very different process, since my own running notes are mostly reminders to myself, while something for someone else to run needs to transfer the entire plot into the GM's head as well as the fiddly details. After all, even if I'd had a much larger word count available, I couldn't hope to cover *everything* players might come up with; whoever runs this needs a good picture of the situation so as to be able to improvise around their actions.

Traditionally adventures for **GURPS** don't do well because everyone's running a different campaign – and generating a **GURPS** character for a one-shot may take more time than playing the game. If I'd had more space, I'd have included some pre-generated characters, at least in short form. However, the basic plot structure could be easily enough amended to fit any setting that has powerful enemies that can become deranged, and bandits. Which is an awful lot of settings, really.



GURPS Disasters: Hurricane: Designer's Notes

James P. Howard, II

Introduction

In December of 2019, Steve Jackson Games published *GURPS Disasters: Hurricane*. This was the first, and so far only, bit of role-playing material I have ever written. Below are some thoughts and comments on how it came to be and why it has the form it does.

The Inspiration

In early 2018, Chase, my then eight-year-old, and I were at a *Pokémon* TCG prerelease event at Alternate Worlds in Cockeysville, Maryland. We were wandering the store in between rounds, and Chase had seen a shelf of books for *Star Wars: The Roleplaying Game* from Fantasy Flight Games. The only thing Chase loves more than *Pokémon* is *Star Wars*, so he asked me about it. And I had no idea what to say, because I did not know anything about role-playing games.

Growing up, I always heard that role-playing games, i.e., *Dungeons and Dragons*, were, well, you know what it is like in the Midwest. Something about Satan. Obviously, I got better, but I never played anyway. So this was not my bag. The only other thing I knew about role-playing games is the story of Steve Jackson Games and the United States Secret Service, as relayed by Bruce Sterling in the *The Hacker Crackdown*. Obviously I did not have a good foundation here on role-playing games.

I found myself, after a few days, at the website for Steve Jackson Games and clicked on the link for their submissions wish list. Steven Weinberg says in his preface to *To Explain the World*, “as an academic, when I want to learn about something, I volunteer to teach a course on the subject.” Writing is teaching’s more formal

friend and the perfect opportunity was here. They wanted a proposal on hurricanes for their *Disasters* series. My doctoral research was on flooding. I felt like this was a natural match.

I wrote my proposal and explained my lack of experience in the role-playing arena, but that I had the hurricane part down. After some back and forth, Steven Marsh gave me the go-ahead. From proposal to publication was probably 18 months, longer than I expected, but well worth the effort.

Commentary on Development

There is nothing like diving into the deep end to get things going. One of the hardest parts to learning the *GURPS* system is its intense crunch. That is, it is highly reliant on the dice for determining outcomes. There is nothing wrong with that, but the complexity of the rules is daunting at first. It is also complicated because rules are not always where you expect them to be. For instance, *Hurricane* includes a copy of the Beaufort Wind Force Scale with associated rules. The Beaufort Scale is used by weather bureaus and disaster management agencies for understanding how intense the wind is. This is distinct from the hurricane category levels, which are completely different.

It was important to make sure I did not change any of the existing rules. So I searched for rules for wind in the *GURPS Basic Set*. Without anything that provided rules for wind, I checked a few other volumes that seemed like obvious places, and there were no wind rules. So I adapted the Beaufort Wind Force Scale to provide rules for wind. It was only during editorial review, I found out that the Beaufort Scale was, of all places, in *GURPS Magic*. This

resulted in a reworking to make sure the rules aligned.

One of the harder aspects of the manuscript was developing campaign ideas. For instance, adventure ideas for an existing campaign almost write themselves. We have all been through a hurricane, or snow storm, or something else that might disrupt life for a few days, before things start returning to normal. This could be a hurricane in the middle of a war, striking a city of superheroes, or just a group of adventurers doing their thing, in addition to the adventure seeds given in the book. Campaign ideas are much more interesting in this case, because it means grounding the entire set of adventures in a short-term event.

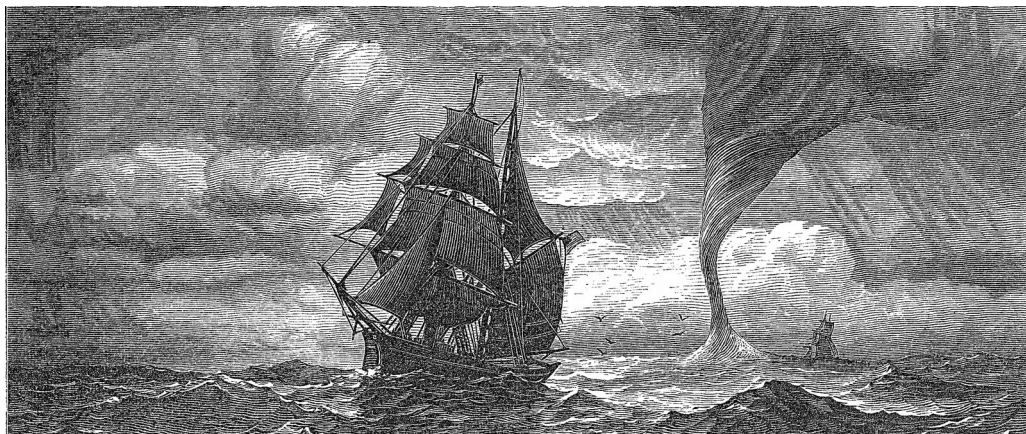
A place I am happy to have gone further than expected is with Search and Rescue/TL. Hurricanes includes specialties for Cave, Combat, K9, Maritime, Mountain, and Urban. At least Mountain makes little sense in the Hurricane context, but since I was developing the Search and Rescue/TL skill, I wanted to make sure I “finished the job,” covering all of the real world search and rescue specialties. So, a mountaineering team could use these rules for search and rescue, without even touching the hurricane stuff. Though, for *Transhuman Space*, you still have to come up with your own.

A huge part of the supplement just explains what hurricanes are, in practical terms. We know what a hurricane is, we think. But many of us are not familiar with the ins and outs. For instance, FEMA has for years used the “Waffle House Index,” a three-tier system that shows the level of destruction in an area: red when the restaurant is closed and cannot be reopened, yellow when it is open with a limited menu, and green when it is operating normally. If the Waffle House Index is red, the people there need serious help. If yellow, those people need help, but it might be able to wait. If the index is green, first responders are not necessary. It is this kind of inside baseball that makes hurricane response gameable!

Final Comments

The final product is, itself, beautifully put together. Nikola Vrtis edited the supplement and did a magnificent job keeping me on task, ensuring things were as simple as possible, and generally making sure I did not break anything in the process. The volume would not exist without her editorial guidance.

With dozens of publications on editorial pages, journals, and books, I thought this would be easier. It was an incredible challenge, and I learned a lot about the fundamentals of role-playing, which helps my games with Chase now. It is an experience I will try again, some day.





Eric Bryden

I read your intro essay in *Path of Cunning* #2 and felt compelled to write. Probably like a lot of other **GURPS** fans, I've often wondered about how we can attract more people to it as a gaming system. I understand the SJG position that a) we the players should be doing a lot of the work ourselves, and b) that marketing **GURPS** isn't going to be worth the money, but I still find it intensely frustrating. I think your idea about having an actual-play show has merit. It would probably have to include some of the currently visible live play folks (like some of the folks from Penny Arcade) and would definitely need a GM who knew their **GURPS** and was a good GM to boot. Why not Sean Punch himself? The question of genre, etc. also comes up. I'd suggest something like a post-apoc or action game; something distinctive that would catch some notice and could showcase rules on melee combat, firearms, and magic/powers/etc. Maybe a follow-up game could focus on a dungeon crawl. I don't know how much something like that would cost, but I suspect that the same kind of production values as some of the more popular live play series would be

necessary (no just recording a bunch of folks around a kitchen table.)

Another possibility is for SJG to work with some of the D&D YouTube channels, even if it was just to sponsor an episode or two in order to get advertising. I've noticed several channels recently ("WASD20" and "Taking20") that have voiced frustrations with some of the assumptions and mechanics of current D&D (e.g. the "bag of hit points" effect), as they point out issues that I think **GURPS** solves. Maybe someone from SJG should reach out to such channels? I especially think that SJG – even if just Sean – should get in contact with the YouTubers behind the "Webdm" channel. They're based out of Austin (to the best of my knowledge), one of them (Jim Davis) mentioned **GURPS** powers mechanics in a positive way in a video (and so is familiar with the system,) and they regularly get tens of thousands of views on the videos they post. They might be amenable to interviewing Sean (when he's at FnordCon) about **GURPS**. One way to regain some public exposure for my favorite rpg system without SJG having to spend a huge amount of money. Your thoughts? Do you think that Sean might be at all open to these ideas?

Anyhow, my apologies for e-mailing you out of the proverbial blue and for prattling on so much. I'm enjoying the 'zine you've helped put together and hope you're all able to keep it going.

Roger: *Don't apologise – we welcome letters!*

*I have no inside information about what Sean and the powers at SJGames would want to do – on the one hand they have far more idea of the business realities than I do, and we can reasonably speculate that **GURPS** isn't a major generator of profit for the company. On the other one wonders how much it would take to get professional-level video producers interested. The only games that seem to get any attention at all are dungeon bashes, and very occasionally **Call of Cthulhu**; you can do both of those in **GURPS** of course, but neither leaps out as an ideal showcase (there are many other dungeon bashing games; CoC has its own system which people tend to use as the benchmark for such stories, and some copyright considerations).*

Perhaps such a show would be more viable now that people are being forced to play remotely if they want to play at all.

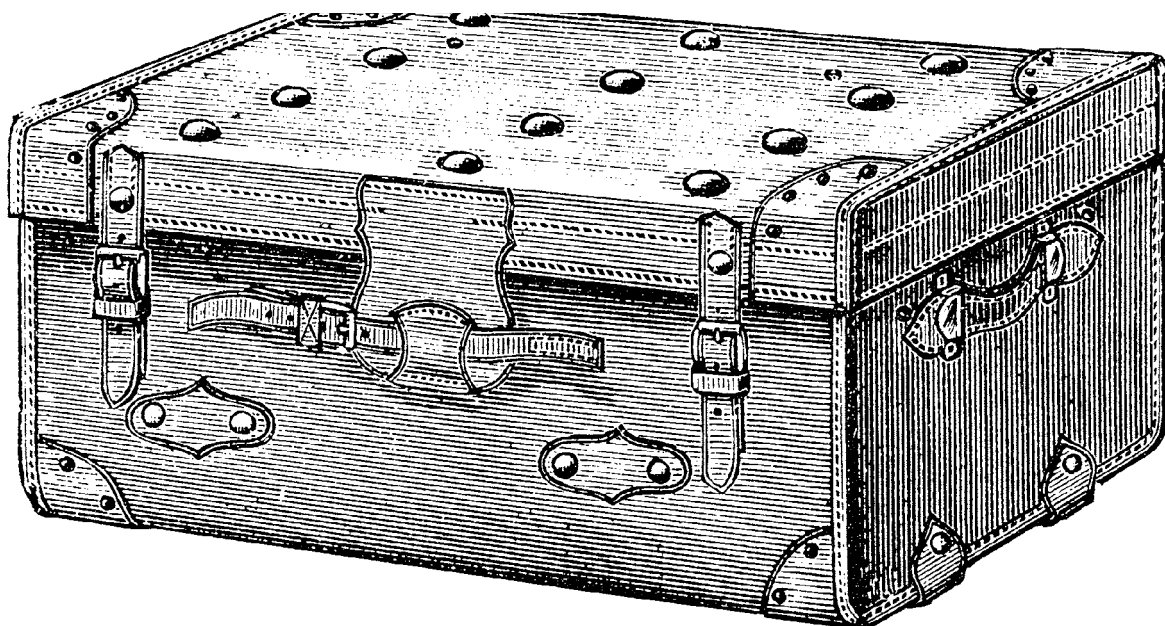
Michael Abbott

I apologise for not having written back to you about **The Path of Cunning**. I was reading it at lunch hours till the lockdown started, and then lost track. On the one hand, details of how to build **GURPS** vehicles kind of go past me; but on the other hand, I am distinctly jealous of your astral exploration and parallel worlds campaign, which sounds smashing fun! Thanks: please keep sending it.

We Also Heard From

David L. Pulver, Dan Smith, Owen Smith, and the commenters on the Steve Jackson Games forums.

Thanks to Bill Burns, Michael Cule, and Amanda "Dr Bob" Kear; and to the staff of Warehouse 23, for help with distribution and publicity.



Starting a Monster Hunters Campaign

Roger Bell_West

I've recently set up and started to run a **GURPS Monster Hunters** campaign. There are some interesting choices to be made, and this article attempts to cover them.

Rules Density

The first consideration is, as with the **GURPS Action** series that I've used before, whether one should stick with the cut-down version of the **GURPS** rules that are strictly necessary for the **Monster Hunters** setting or allow more complexity. My players are all experienced **GURPS** hands, so this isn't a hard choice: if they want to make a case for something that isn't in the approved trait list for a particular template, they're welcome to do so, while being aware that it may not be worth the points.

In particular, by request of the player to whom this applies, we're using the full **Ritual Path Magic** sourcebook rather than the simpler and earlier version introduced in **Monster Hunters**; with more room for rules and examples, the whole thing can be a bit clearer.

Campaign Parameters

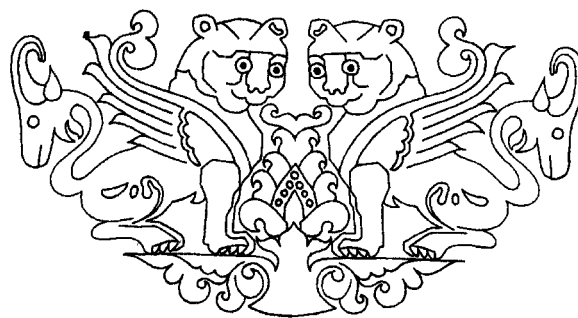
There are lots of ways in which high-powered humans can be set up to hunt monsters. Most of them, including all the examples in the book, involve being part of an organisation, but I want my players to feel that they're out on their own, that there's nobody they can easily turn to if they're feeling outclassed, so that they have to fall back on their own resources.

Since some previous games with this group have led to them allying themselves with an existing organisation and I wanted something of a change of emphasis, it feels more reasonable if those alliances are explicitly placed out of reach.

It's not clear just *how* the government and police of this world are corrupt, but corrupt they certainly are; the most likely outcome of someone turning up and saying "I have weird powers and I'd like to work for you" would be that they vanished into the dissection and/or breeding labs.

This doesn't mean that they can't have allies, of course; it simply means that I don't want this to turn into an "agency" campaign where the patron takes care of mundane law enforcement while the heroes charge off causing trouble.

Another consideration is how easily the knowledge of monsters can spread. I take the approach that most people have no idea they're real. To maintain this, most monsters decay to dust quickly when killed so as to avoid leaving inexplicable corpses lying around. (Which does deal with some of the problem of law enforcement too.) As far as almost everyone is concerned, monsters are just the result of too much imagination.



Mechanics

The PCs and enemies are built on the standard 400-point templates; this is rather higher than the starting power level of any **GURPS** game I've run before, though some long-running campaigns have exceeded it.

On the other hand, these are already highly capable characters, so rather than my standard award of three character points per session, I've reduced it to three per adventure (or "episode," see below).

Nobody's gone for a sidekick, but I'm having fun coming up with ephemeral NPCs anyway.

The characters ended up being:

- An Experiment, who woke up amnesiac with good combat skills and heightened senses. Was he even originally human? It's not clear, but there seems to be at least a bit of something else.
- A Techie, a street-level tinkerer who can whip up something useful out of the junk in the back of his car.
- A Sleuth, a former FBI agent who knew her bosses had been keeping the lid on something, but not how far it stretched. (This player has left the campaign.)
- A Witch, a high school biology teacher with a neat line in improvised magic. She also makes charms to keep the rest of the party safe.
- An Inhuman, a weretiger with rather more control than is common for therianthropes. When the moon isn't full, she sings with a local band.

The Techie and the Sleuth might show up in a game without strange powers (though they're both quite cinematic), but the others are certainly engaged with the setting's weirdness even before the game starts.

I haven't read the *Monster Hunters International* book series that I'm told is a major part of the inspiration for this setting, but I get the impression that there's rather less firepower here than in a typical party: two hand cannon, some more normal pistols, and teeth and claws.

Equipment

I'm not generally a fan of traditional resource-management gameplay, so I have a flexible approach to equipment: things that the character would reasonably have on them don't have to be listed, and much of the time "pop into a hardware store and buy something" is an entirely reasonable approach to take.

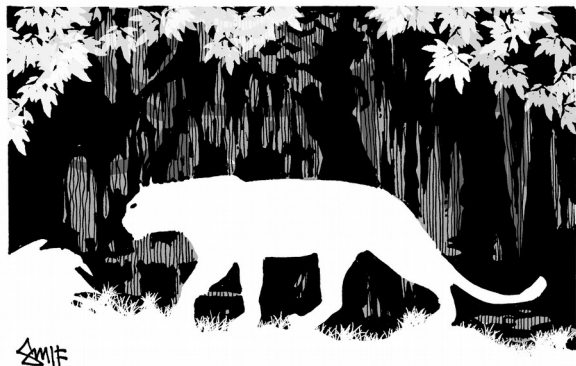
One exception is firearms: given the mechanical intricacies of the system, it's moderately amusing to be able to say "I have *this* specific overpowered handgun". (And in this setting, .50 AE and .454 Casull actually have some practical use.)

Location

For this I have to give credit to John Dallman: I was hawing between the UK (more familiar to me) and the USA (readier access to firearms), and he suggested the weird Florida of Carl Hiaasen, Tim Dorsey and other writers. Their books aren't supernatural fiction; but they do feature many people with criminal intentions and poor impulse control, which makes for an amusing kind of opposition for the PCs; and reality can be somewhat loosely defined, at least in that some of the daft criminal schemes people come up with after too much marijuana and/or cocaine might actually *work*. In short, this is Florida! (thanks to Phil Masters for the term), which relates to real Florida much as The Sword! relates to sword skill.

I also borrowed Jacksonville as described in *The Good Place*: "Once, this guy in a bow tie came up to me at the gun range in a Jacksonville bus station and said he'd give me \$600 if I put these weird turtles in my duffle bag and brought them to Daytona Beach. So I hotwired a swamp boat to Daytona and the guy paid me the \$600. My point is, you always trust dudes in bow ties."

It certainly helps that all the players are of broadly similar political persuasions, so some subjects (such as the extreme ease of access to firearms) can be regarded as broad parody by all of us.



The Nature of the Enemy

The *Monster Hunters* books allow for a hotchpotch of cryptids, undead, therianthropes, angels, demons, and indeed aliens, as well as rogue magically-empowered humans. I feel that aliens don't fit particularly well, so while I'm not ruling them out of the game they certainly aren't on the first tier of enemies; similarly, angels and demons in the canonical sense are too tied to a specific world-view to work well in my head. (Which isn't to say that there isn't some kind of extradimensional realm where malevolent entities come from... nor indeed a realm from which troublemakers come and fight them. But the angels in particular, if they show up at all, aren't going to look as overtly Judaeo-Christian as the books imply.)

One thing that sits poorly with me in much paranormal fiction is *organised* monsters: the way vampires are numerous enough to sort themselves out into a vampire society, with rulers of cities and so on (the books call this "Monster Underworlds"). In a campaign that's about fighting monsters-as-a-class, rather than about being a particular sort of monster, they should be rare enough that this kind of thing

doesn't happen. Instead, a vampire may ally itself with a group of humans who either aren't aware of its nature or don't care; but when you kill that vampire, you don't get a note from the Prince of Poughkeepsie calling you to account.

In Play

The *Monster Hunters* books have an investigation system and a standard plot template: the party learns of the problem, does some bookwork and legwork to try to find out what's going on and what its vulnerabilities are, then confronts it. And that's fine with me. But the books also have a Deduction system in which PCs explicitly amass Clues until they have enough to beat a big penalty on the "work out what's going on" roll. Fine as far as it goes, but for me and I think for these players quite a bit of the fun of an investigation is putting things together oneself to work out what might, or must, be happening; so we're not explicitly using this deduction mechanic, though it's still very useful for suggesting relevant avenues of investigation and the skill rolls that determine the quality of information found by following them.

One point of slight concern: a Witch with broad competence is extremely versatile, and runs the risk of being better at any X than the specialist in X. But the limited rate of gathering magical energy means that they'll be less overpowering in any fight which can't be won quickly; and the relatively loose investigative structure means that one way of making them *more* effective, by loading up on the right charms in the interval between finding out what the monster is and going to confront it, is mostly unavailable.

Structure

I'm trying out a televisual sensibility in story structure: most episodes (adventures) should stand more or less alone, though they may also

have some links to the Season Big Bad. We started with a pilot episode, after which (as is my practice with any system as complicated as *GURPS*) players were invited to modify or replace their characters if they wanted to. (The Big Bad was introduced then, though not with plot immunity; if the PCs had confronted her and finished her off, which they had a small chance of achieving, I had a backup ready.) So far an episode seems to be lasting about three or four short (2-2½ hour) sessions of play. Each adventure is getting an episode title, though this is only revealed at the end.

I'm also trying to follow the genre in that when an investigation bogs down there's at least something else to fight, which will in turn dispense more clues.

The Real World

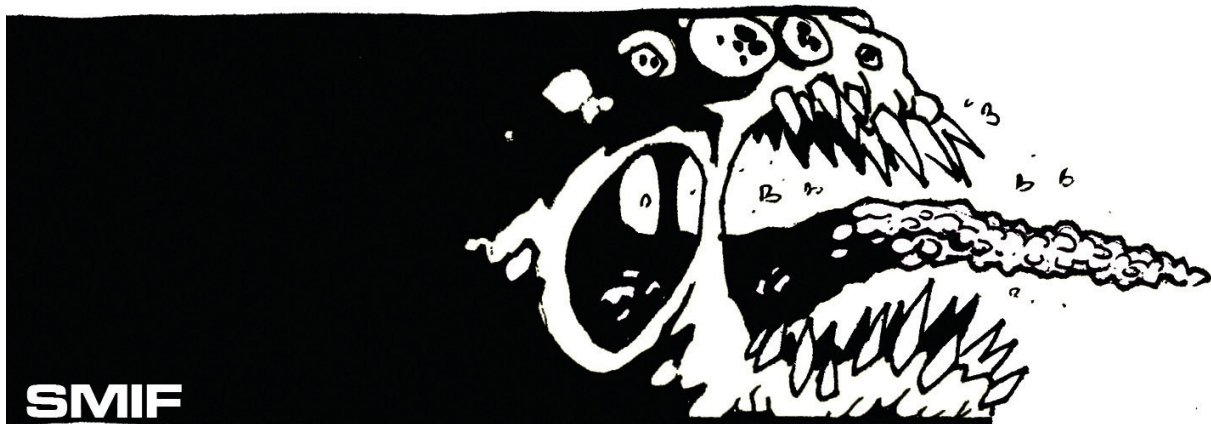
Since the group has stopped meeting face to face, I've been running with one laptop dedicated to the videoconference and another for the game writeup, notes, and so on. One thing I've been trying out on that second machine is the Viking GIS software, on which I've been logging all the locations that come up

in the game (the PCs' homes as well as significant spots during the adventures). I started doing this just to get a sense of distance between places; but because this works in WGS84 latitude and longitude, it's easy to convert it to other formats. I've ended up automatically generating a [Leaflet map](#) with links to Google Streetview so that the players can see what the actual locations look like.

Conclusions to date

Apparently I don't run games "as written." The books imply rather more focus on combat, with abstracted investigation; I'm more interested in the clue-following and in the people. Even so, there's more combat here than is usual in my games, because these characters are highly capable combatants (though the range of combat ability between the weretiger and the techie does put some restrictions on the sorts of threat that will work) and because it can be an enjoyable activity in a system complex enough to let it be a new optimisation puzzle to solve rather than an endless parade of "roll to attack, roll damage."

Five episodes in (plus pilot) and things seem to be starting to make sense.

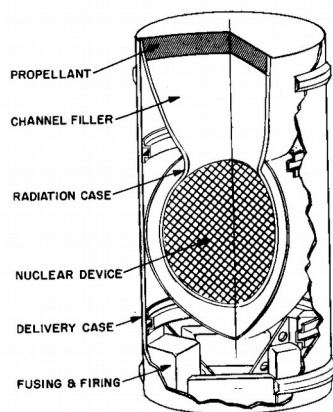


Casaba-Howitzer: Directed Nuclear Weapons for GURPS Spaceships

Roger Bell_West

The Casaba-Howitzer proposal was an offshoot of [Project Orion](#): if the US Air Force was going to have huge space battleships, it needed something to arm them with.

The design starts with the bomb used to propel the craft: a nuclear weapon detonates, producing X-rays. A beryllium oxide channel filler, mounted in just one direction from the bomb, converts the X-rays in that direction to infra-red (while being vaporised). Finally, the infra-red radiation hits a tungsten propellant disc, which is converted to high-speed plasma which impinges on the ship's pusher plate and provides momentum.



The configuration of the channel filler and propellant disc determines the angle of spread of the tungsten plasma. For propellant bombs, this should be wide enough that the entire pusher plate is in the cone, so that the energy density at each individual part of the plate is as low as possible. But it can be made much, much narrower, and pointed at something less resilient than hundreds of tons of steel pusher plate.

No prototype was ever built, so these numbers must necessarily be theoretical, but we can make

reasonable calculations based on nuclear weapon efficiency, beam angle, and target distance.

Casaba-Howitzer devices are available at TL7 and are built as bombs, as noted in **GURPS Spaceships 4**: they are fired from missile tubes, but weigh one-third as much as the equivalent missile (so three times as many can be loaded).

They cost \$100K per ton, plus the cost of the nuclear warhead (see the *Unconventional Warhead Table* on p. 47 of **GURPS Spaceships**). Antimatter warheads may not be used. They are fired just as bombs (or missiles) are.

Each unit immediately aligns itself to the target, and detonates when it's a safe distance from the launching ship. This uses the missile gunner's Gunner (Beams) skill.

Warhead	dDam	Range
25 kiloton	3d×100	C/S
100 kiloton	4d×100	C/S
2.5 megaton	6d×200	S
10 megaton	2d×1,000	S/L

Casaba-Howitzer units do burn rad sur (3) damage. If using the tactical space combat system from **GURPS Spaceships 4**, use the plasma beam range table for 300 MJ, 1 GJ, 30 GJ and 1 TJ respectively, keeping these damage figures.

A Casaba-Howitzer warhead can also be fitted to a standard missile. In this case, if the missile survives point defence, it makes a single attack with the missile gunner's Gunner (Beams) skill. Similarly, it may be built into a sufficiently large gun shell.

Weather At Sea and In Flight

John Dallman

GURPS has rules for the effects of weather on land travel, on p. B351, but those don't address sea or air travel. For both of these environments, wind speed is the most important factor.

GURPS Disasters: Hurricane gives wind-force penalties for people in the open; this table applies to people in enclosed boats and in all aircraft. It is based on the Basic Set penalties for the various vehicle-operation skills.

Ships and boats

Sail-powered vessels must reduce ("reef") the amount of sail they are using in high winds, and that is assumed in the table. If they don't, double the penalties. Roll vs Boating+4, or Shiphhandling +4 and crew's average Seamanship +4, to reef sail at the right time; this may be needed more than once as a storm builds.

A submarine on the surface uses Shiphhandling penalties if their hull is ship-shaped, as was normal until after WWII, or Boating penalties with modern "tear-drop" hull forms.

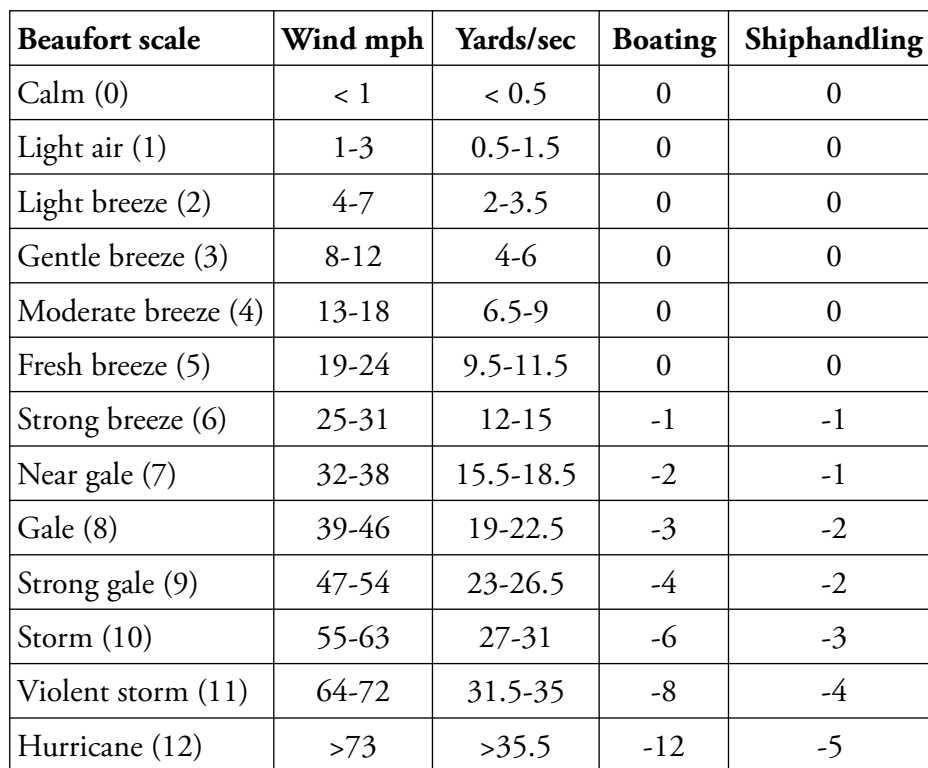
Optionally, apply half the weather penalty to Seasickness rolls, as per p. B436.

Aircraft

Aerospace, heavy airplanes, and high-performance airplanes use Shiphhandling penalties.

Autogyros, gliders, helicopters, light airplanes and TL9+ vertol craft use Boating penalties.

Contragravity, flightpack, lighter-than-air, ornithopter, ultralight and TL6-8 vertol craft use doubled Boating penalties.



Beaufort scale	Wind mph	Yards/sec	Boating	Shiphhandling
Calm (0)	< 1	< 0.5	0	0
Light air (1)	1-3	0.5-1.5	0	0
Light breeze (2)	4-7	2-3.5	0	0
Gentle breeze (3)	8-12	4-6	0	0
Moderate breeze (4)	13-18	6.5-9	0	0
Fresh breeze (5)	19-24	9.5-11.5	0	0
Strong breeze (6)	25-31	12-15	-1	-1
Near gale (7)	32-38	15.5-18.5	-2	-1
Gale (8)	39-46	19-22.5	-3	-2
Strong gale (9)	47-54	23-26.5	-4	-2
Storm (10)	55-63	27-31	-6	-3
Violent storm (11)	64-72	31.5-35	-8	-4
Hurricane (12)	>73	>35.5	-12	-5

Naval Dogfighting

John Dallman and Roger Bell_West

This is an extension to the *Dogfighting* article published in issue 2. *Weather At Sea and In Flight*, in this issue, provides wind speeds in yards/second and penalties for bad weather.

Errata: Enhanced Dodge (Piloting) costs [5], as per *Template Toolkit 3: Starship Crew*, rather than [10] as in *Dogfighting*. The statistics for RP-3 rockets on p. 65 of issue 2 are incorrect, and better ones are in *WWII Naval Aircraft*, after this article.

Carrier Operations

Operating from an aircraft carrier imposes some strict requirements, most of which involve *Wind over Deck* (“WoD”). This is the speed of the air flowing over a carrier’s flight deck. If at all possible, a carrier will steam directly into the wind when launching or landing aircraft, so WoD is the sum of the wind speed (measured with respect to the sea) and the carrier’s speed through the water.

On a good flying day at sea, the wind might be 20 mph (a fresh breeze, force 5 on the Beaufort scale) and the carrier might be steaming at 34 mph (30 knots). WoD is 54 mph, Move 27.

A Shiphandling roll, at any penalties for bad weather, is required to adjust the carrier’s speed and heading to the conditions, before aircraft can take off or land. If this is failed, the weather penalty for the relevant Piloting rolls is doubled.

If WoD exceeds an aircraft’s Stall, it will be blown away, unless secured to the deck. Attempting to fly in such conditions is foolish. In extreme conditions it may be necessary to steam *downwind* in order to make flying possible.

Carrier layout and elevators

A WWII-period carrier had a long straight flight deck, with a hangar deck (sometimes two) underneath it. Aircraft were moved between the hangar deck(s) and the flight deck by elevators, which formed part of the flight deck when they were up, and part of the hangar deck when they were down. They were usually in the middle of the flight deck, to avoid weakening the ship.

Most aircraft that served on carriers had folding wings, so they took up less space in the hangar, and the elevators could be smaller.

Organising aircraft on the deck

Folding an aircraft and taking it below by elevator was quite slow work. In the absence of details for an aircraft and elevator, assume about a minute each for: folding; movement to the elevator; elevator descent; movement off the elevator; and finally elevator ascent. Bringing an aircraft up was the reverse process, and took the same time. WWII elevators only carried one aircraft at a time.

Aircraft small enough to dispense with folding were helpful. Piston-engined aircraft needed to have their engines warmed up, requiring running them for fifteen minutes, before they could take off.

To launch a group of aircraft, it was necessary to bring them all up on deck first, warm them up, and then have them take off, across the raised elevator platform(s). They did so one at a time, but this could be done at 10-second intervals.

An annoying detail was that since elevators couldn’t be right at the end of a ship without

weakening it badly, aircraft were brought up in the reverse of their take-off order. That made it advantageous to be able to warm up aircraft in the hangar (the engines were stopped while they were being moved). Doing that *required* the sides of the hangar to be able to open up for ventilation. Without that, running high-powered piston engines would rapidly suffocate the hangar crew. During WWII, American carriers could do this, but British and Japanese ones could not. Those navies preferred armoured hangars, and accepted slower operations as their price.

Taking off

To take off, an aircraft needs to accelerate to above its Stall speed. This is easy enough on land, with a long runway, but aircraft carriers are *much* smaller than runways. However, WoD makes the job easier. Before it starts, an aircraft at rest on the carrier deck is already moving, with respect to the air, at the WoD speed. It only needs to add the difference between the WoD and its Stall speed to take off.

To take off safely, a WWII carrier aircraft needed a fairly low Stall speed, and good acceleration. Safety was an important issue, even in combat operations, because safety failures tended to block the flight deck as well as killing people and destroying aircraft.

On land in still air, an aircraft's take-off distance is the square of Stall divided by twice Acceleration. When there is a wind over the deck (or runway), subtract this from the Stall speed before doing the calculation.

Taking off requires a Piloting roll, adjusted by the aircraft's Hnd rating, and is never routine (p. B171). An additional Shiphandling roll for the carrier acts as a complementary skill for a deck-load of aircraft. Carrier operations are a specific familiarity of Piloting skill, usually

(Light Airplane) or (High-Performance Airplane), and of Shiphandling.

Take-off rolls failed by 1 or 2 usually involve not having quite enough speed, falling off the carrier and managing to achieve flying speed before hitting the sea. This is worth a Fright Check. Worse failures put the plane in the sea, at risk of being run over by the carrier. Critically failed rolls are engine failures or collisions on deck.

Landing

To land on a carrier, it was necessary to approach at above Stall speed, touch down, and then stop, without going over the side or running into anything. WoD helps, by reducing the amount of speed to be lost.

To help the pilot fly the correct approach path, there was a *Landing Signal Officer*, (aka "LSO," "paddles" or "batsman") whose job was to provide directions. On WWII American and British carriers, they were pilots themselves, who provided directions via visual signals, with hand-held flags or paddles, or signal lights at night.

Once the aircraft had touched down, it was meant to catch a steel cable running across the deck with a sturdy *tail-hook* attached to the airframe. There were several of these *arresting cables*, attached to below-deck winches with brakes to slow the aircraft to a stop within a safe distance. The brake settings needed to be correct



for the weight of the aircraft and the WoD. The cables were held several inches above the deck by springs, to improve the odds of the tail-hook catching them.

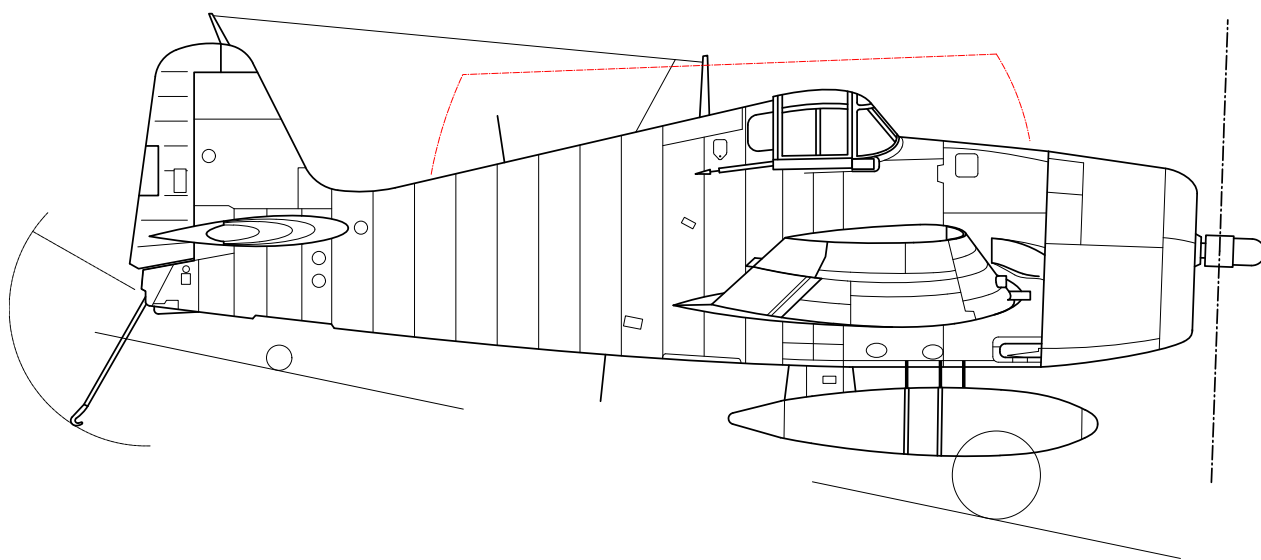
If the pilot didn't catch an arresting cable, the best move was to try to take off again, with maximum engine power. It was normal to throttle up at the moment the pilot expected to catch the cable, which was quite strong enough to withstand this treatment. If the take-off failed, the aircraft would hit a crash barrier further down the deck. That existed to protect aircraft that had already landed, but hadn't yet been taken below, and moving them beyond it was an urgent task after each landing. Damaging an aircraft when it hit the crash barrier was preferable to having it smash through several parked aircraft.

On WWII Japanese carriers, the LSO was not a pilot and had far less responsibility, limited to signals to go round again, or that the tail-hook was not deployed. Instead of directions from the LSO, there was a system of light beams that let the pilot see if he was on the right approach path, as regards altitude. American and British carriers relied on the LSO.

Landing requires a Piloting roll, adjusted by Hnd and darkness penalties, and is never routine (p. B171). The Piloting skill of the Landing Signal Officer can be used as a complementary skill; penalties to Piloting for bad weather are definitely applicable, but an additional Shiphandling roll for the carrier can reduce them by 1.

On a successful arrested landing, which verges on a controlled crash at the best of times, roll vs. the aircraft's HT+4 to avoid damaging¹ it. The undercarriage or arresting hook are the usual damage sites: roll on the vehicle hit location table (p. B554) but read Body as Wheel (or hook) and vice-versa.

Unsuccessful landings tend to be painful. Critical failures are crashes onto the deck, going over the side and into the water, and similar accidents. For ordinary failure, try to take off again, which requires a piloting roll with a margin of success greater than the earlier margin of failure. Failing that roll puts the plane in the crash barrier, seriously damaged. The crew take 4d-8 damage each, or more if they weren't properly strapped in. The danger of carrier operations is why carrier pilots are carefully



1 Aircraft not originally designed for carrier landings may have penalties to this HT roll, if their undercarriages weren't strengthened enough.

selected, thoroughly trained, and proud of it. They usually have Piloting-14, and some experienced ones are better.

Aircraft design constraints

During the WWII period, carrier aircraft were always single-engined, since building a twin-propeller aircraft to fold is quite hard, and making it capable of landing on only one engine is worse. Jet engines made twin-engined aircraft preferable on safety grounds.

Other requirements add undesirable weight:

- A strong structure in general and, especially, strong landing gear. Aircraft with low HT tend to be damaged on landing too frequently.
- The tail-hook, its mounting points and the raising/lowering mechanism.
- The wing folding mechanism and the locks required to keep it from folding at the wrong time.
- A low Stall speed implies larger and heavier wings, or lightweight construction, which tends to reduce HT.
- High acceleration implies a powerful engine, or lightweight construction.

- Resistance to salt corrosion was vital, and required heavy coats of paint, carefully maintained between flights.

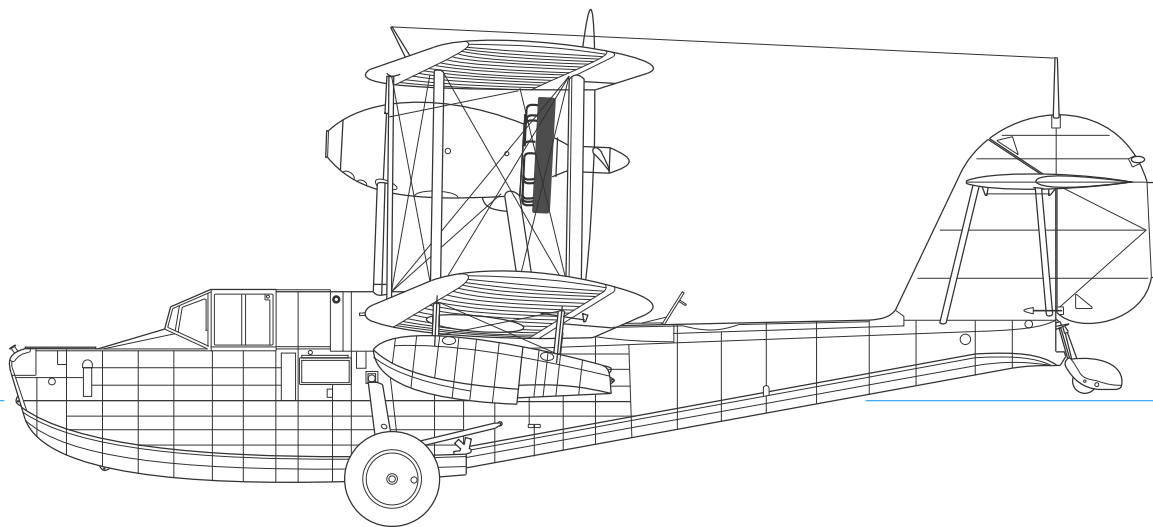
Seaplanes

Aeroplanes that can take off from and land on water are called “seaplanes,” and come in two major styles.

Flying boats have a fuselage whose lower part is watertight and shaped like a boat. They usually have small floats mounted on their wings to keep them upright on water, but a few have *spoonsons*: sideways extensions from their hull that do the same job. The largest seaplanes are all flying boats.

Floatplanes have large floats that are separate from the fuselage. Some have a single large central float to support their weight, and small wing floats for stability. Others have two large floats under the fuselage, which do the same job.

Many utility aircraft, and a few other types, can have their wheels replaced by floats. Some floatplane fighters were built during WWII, but had very little success. A few flying boats are *amphibians*, with retractable wheels and a boat hull, capable of landing on land or water.



All seaplanes suffer weight and streamlining penalties and are slower than landplanes of similar size and power. Their hulls or floats always have a [planing design](#), which greatly reduces water drag as they approach take-off speed.

During the early part of WWII, many large warships carried one or two floatplanes for scouting and gunnery spotting, which were launched by catapult, landed on the sea, and were hoisted back aboard.

Flying seaplanes is a familiarity of Piloting (Light Airplane), (Heavy Airplane) or (High-Performance Airplane) skill.

Catapult take-offs require a Piloting+2 roll. Failures are as per carrier take-offs.

Take-offs from water can be tricky.² They require a relevant Piloting roll, subject to weather penalties. Acceleration is reduced by 1 until the aircraft reaches half its Stall speed, at which point it will start to plane at full acceleration. Rough water reduces the achievable take-off speed, and thus the Load. Reduce the Load by 50% per point of weather penalty: this can result in a negative Load, which reduces the amount of fuel that can be carried. Failures are some kind of accident, not necessarily serious, but a seaplane with damage to its hull or floats can sink quite quickly.



2 Thanks to Cullen McHael for the detailed PBY Catalina statistics that inspired these rules.

Landings also require a Piloting roll, subject to weather penalties. Failures damage the aircraft to some degree.

Ships

In naval aviation, other ships can be nearly as important as one's own carriers.

Identifying a ship

Spotting a ship uses the same rules as spotting an aircraft, with a bonus of +1 to +3 if the ship is making smoke. Identifying a ship can use:

- Hobby Skill (Ship Spotting).
- Soldier, improvable as an Average technique to a maximum of Soldier +4, but with a penalty of -4 for ships not normally used or opposed by the service that taught the Soldier skill.
- Other skills such as Seamanship, Shiphandling or Mechanic, with appropriate specialisations and familiarities.

If a ship is making smoke, apply twice the bonus to spot it as a penalty to identifying it.

Rolls to identify ships are normally Per-based and can be made against a single spotted target, giving the general type (destroyer, cruiser, etc.), and national flag if one is flying.

Errors in ship identification are remarkably common among air forces that don't usually operate over the sea. The usual errors are mistaking ships for more threatening ones of similar appearance: seeing destroyers as cruisers, cruisers as battleships, and tankers as aircraft carriers. This may be due to difficulty in judging size without references or a precisely known distance.

Bombing ships

Dropping bombs from high altitude on moving ships is futile if the ship is aware of the attacker, because they can dodge quite easily. Look up the Size Modifier of the ship on the *Size and Speed/Range* table (p. B550), and add 3. Bombs dropped from that altitude may be Dodged at no penalty. Each -1 or +1 step in Range modifier from higher or lower altitude also gives +1 or -1 to the ship's Dodge respectively. For example, bombs dropped from 7,000 yards (-21) altitude on a ship 100 yards long (+10+3) give +8 to the ship's dodge.

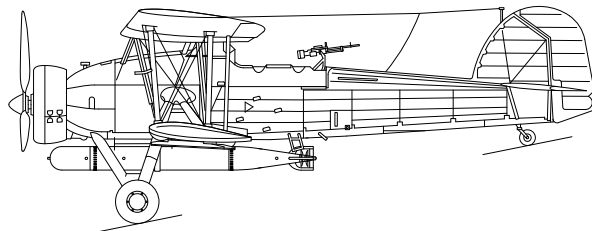
Air forces that understood this did not attempt to use high-level bombing against ships under way during WWII. Notable exceptions included the USAAF B-17 force, the Italian *Regia Aeronautica*, and the many Luftwaffe groups which weren't trained in anti-shipping action. Those air forces, encouraged by the spectacular splashes that bombs detonating in the sea make, continued high-altitude bombing for years.

The advantage of dive-bombing, as naval air forces understood, is that it lets an aircraft close the range *quickly*, to the point where dodging becomes hard. Because long-range AA fire of the period uses time-fused high-explosive shells, making correct timing for range vital, a dive-bomber's full speed is applied to Speed/Range modifiers to defending fire. Sophisticated AA fire-control systems and proximity-fused ("VT") shells give bonuses.

Optionally, a large ship's vehicular dodge uses the Shiphandling skill of the conning officer rather than the Seamanship of the steersman.

Dropping bombs on a moving ship is a familiarity of Artillery (Bombs), which takes modifiers for target speed and size. "Dumb"

bombs have Acc 0³. Multiple attacks in the same turn can count as Rapid Fire for dodge purposes, even if they're from different aircraft, since ships do not actually manoeuvre very fast; this requires an appropriate Tactics roll by the attack leader. A successful dodge avoids one hit, plus additional hits equal to the margin of success (pp. B374-5). The aircraft do not get a rapid fire bonus on their attack roll unless they drop enough bombs individually to qualify.



Torpedo attacks

All WWII anti-ship aerial torpedoes were straight-running, stabilised in direction by a gyroscope system and in depth by a hydrostatic valve and pendulum. Hitting a ship with them wasn't as hard as it looks, since the problem is strictly two-dimensional. The difficult part of attacking a defended ship was that it was necessary to fly straight and level while the guidance stabilised, and if the aircraft dodged during that time, the attack was spoiled.

A torpedo attack occupies a 20-second turn, which also allows a +2 bonus for extra aiming time, although that requires a Will roll for the pilot if he's being shot at. The attack is rolled against Artillery (Torpedo), modified by weather penalties for the aircraft, range and target size. The only modifiers for target speed are for *changes* of speed after the attacker starts their attack.

If a torpedo is launched within a 20-second turn's run of the target, the only defence is to

3 Thanks to David Pulver for help with rules on weapon statistics.

dodge⁴, which requires the ship to be moving already. If the run time is longer, and the target can change speed and/or course to move entirely out of the way, the torpedo misses automatically.

Several simultaneous coordinated attacks can be treated as Rapid Fire, as above.

Rocket attacks

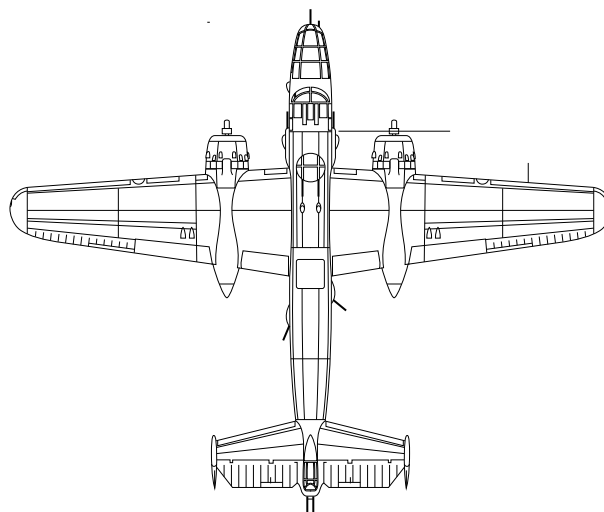
These are normal ranged attacks. The number of shots available depends on the launcher system: batteries of 8 or 12 rockets were common on aircraft, usually fired in groups of 2, 4 or all. Rapid fire bonuses are available if enough rockets are fired.

Carrier-incompatible planes

Trying to land or launch aircraft that aren't meant for the job on a carrier is the kind of thing that PCs do. There were also some historical cases, such as the B-25 Mitchell aircraft launched from USS *Hornet* for the Doolittle Raid, and the landing of ordinary Hawker Hurricanes aboard HMS *Glorious* in June 1940 while British forces were evacuating from Norway.

The take-off case is easy to calculate, using the formula above. The B-25s have an Acceleration of 3 and a Stall speed of 45; *Hornet* would have been using her maximum speed of 18, so the required take-off run with no wind would have been $27^2/(2 \times 3) = 122$ yards. *Hornet's* flight deck is 274 yards long, but the 16 B-25s are 18 yards long each and take up about 12 yards when staggered, for a total of 192 yards, leaving only 82 yards for the first aircraft. The carrier needs to find some wind: with a fresh breeze, 10 yards/sec, the necessary take-off run is only $17^2/(2 \times 3) = 49$ yards. The danger in this mission wasn't so much lack of take-off run, but the aircrews' lack

of experience of carrier operations, and the impracticality of operating any other aircraft with the flight deck full of bombers, while deep within enemy-controlled waters.



Landing an aircraft uses the same formula, but replaces the aircraft's normal Acceleration with its deceleration due to braking. However, this isn't part of a **GURPS** vehicle statistics line, nor is it usually part of an aircraft's description. Powered ground vehicles can normally decelerate by 5 yards/second per turn (p. B468), but that seems a bit high for propeller-driven aircraft with "taildragger" undercarriages, which can be badly damaged and/or lose control if the nose dips and the propeller strikes the ground. Arresting gear solves this problem by holding the aircraft's tail down.

Assume by default that aircraft can brake on the ground by half their usual acceleration (round up), although this may be worse, especially for wood-and-canvas aircraft, which didn't usually have power-operated brakes. Using "Pushing the Envelope" from p. B395 for extra deceleration and failing the control roll will put the propeller into the deck, effectively a collision with an immovable object (p. B431) at the aircraft's stall speed minus WoD.

⁴ A targeted submarine which can dive before the torpedo hits dodges automatically.

The procedure for a carrier trying to land an aircraft without a tail-hook would be to stow all aircraft below, since there's a high risk of accidents, and steam into the wind at high speed. For the Norwegian campaign example, the Hurricane has a Stall of 32 and Acceleration of 4, while *Glorious* has a top speed of 17, and should be able to find a 7 yard/sec breeze easily enough. The landing distance is $8^2/(2 \times 2)$, only 16 yards; there's no need for the carrier to go at top speed. The difficult part for the pilots is getting their approaches correct, given familiarity penalties to Piloting, and not knowing the LSO's signal code and thus not getting the benefit of his skill. Failures are as for arrested landings. Fortunately, the Hurricane, 32' long and 40' wingspan, will easily fit on *Glorious*' 46x48' lifts.

If a carrier is *unwilling* to have an aircraft land, things will get very difficult for the pilot. The carrier would sail cross-wind, and swerve once the aircraft was committed to a landing, requiring the aircraft to follow it with very little reserve speed above the stall. A Piloting roll at -10 to make a safe landing seems about right, with modifiers for Hnd, weather, and so on.

Post-WWII carrier developments

Three important additions were made to aircraft carriers after WWII, which made it practical to operate jet aircraft.

The *steam catapult* provides take-off acceleration, using the carrier's powerful boilers to generate the steam. It usually provides an Acceleration of about 35 for two seconds, and has to be set correctly for the aircraft's weight. WWII-era catapults were driven by flywheels, gunpowder or hydraulics, which took more time to set up for each launch, were less powerful, and less safe. They weren't used much on carriers, though they

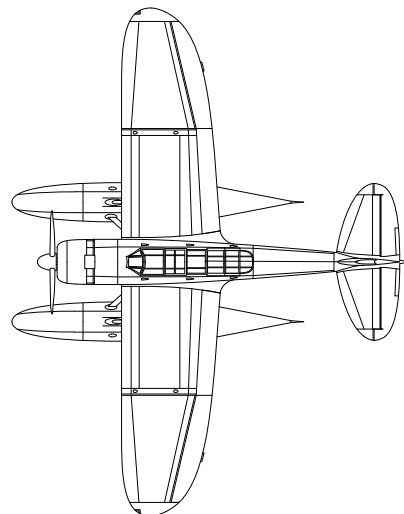
were useful for launching floatplanes from other ships.

The *mirror landing sight* allows a pilot to fly the correct approach using their own sight and reflexes, rather than having the reflexes of the LSO in the loop. This made it practical to land aircraft with higher approach (and thus Stall) speeds. The LSO provides directions by radio, rather than visual signals.

The *angled flight deck* allowed an aircraft that missed the arresting gear to zoom harmlessly over the side of the carrier, rather than hitting the (now obsolete) crash barrier. This made landing much safer: any success on Piloting after a failed landing allows a safe take-off.

A further addition came in the *deck-edge elevator*, first used during WWII, which saved internal space in a carrier, by mounting the elevators on the outside of the ship's hull. This allowed more and larger aircraft to be carried. Combined with the other improvements, it allowed simultaneous take-offs and landings.

Aircraft which can land vertically (e.g., helicopters, Harriers, Yak-38s, V-22s and F-35Bs) are *much* easier to operate from carriers, provided everything works. If it doesn't, the accidents tend to be messy. Take-off and landing can be routine tasks, in reasonable weather.



Example: 9th April 1942

The Imperial Japanese Navy's 1st Air Fleet, also known as the *Kidō Butai*, staged a raid with five aircraft carriers into the Indian Ocean between 31st March and 10th April 1942, causing serious losses to the Royal Navy's Indian Ocean fleet and forcing it to withdraw to East Africa. On 9th April, a scout seaplane found the aircraft carrier HMS *Hermes*, which had left port the previous day to avoid an air raid, but had no aircraft on board, and her sole escort, the Australian destroyer HMAS *Vampire*. A subsequent air strike sank both ships. Here's an imagined version of the combat using these rules.

The seaplane was almost certainly an E13A "Jake" floatplane, and was launched from the battleship IJNS *Haruna* by catapult. The whole action takes place in good weather.

Spotting *Hermes* is not difficult (SM+12, +10 for in plain sight). This will probably happen at a range penalty of -25 (15 miles) or so. A well-trained early-war Japanese observer will have training in Soldier and quite possibly the Ship Identification technique, and we assume he recognises *Hermes* and *Vampire* as warships, and thus priority targets. Sending a sighting report is a routine task for Electronics Operation (Communications).

The floatplane crew would have expected the carrier to launch fighters to shoot them down or chase them off, and must have been relieved that this didn't happen, even after they'd drawn attention to themselves by transmitting. The lack of aircraft taking off or landing would have suggested that the carrier didn't have any.

The British intercepted and decoded the spotting report and radioed *Hermes* and *Vampire* to return to port, where they could be protected

by fighters and anti-aircraft guns. However, they never got there.

The five Japanese carriers launched a strike of 85 D3A "Val" dive-bombers, escorted by 9 AM6 "Zeke" fighters. Let's look at a squadron of 18 Vals, plus 3 Zekes to escort them, taking off from the carrier IJNS *Akagi*, flagship of the 1st Air Fleet. *Akagi* has a top speed of 31.5 knots, Move 18, and a flight deck that's 270 yards long. The Zeke has a Stall of 37, the Val of 34. Both aircraft have good Acceleration, of 4.

To launch all the aircraft quickly, and thus avoid some of them having much more fuel than others, they must all be brought up together, "spotted" on the flight deck, and have their engines warmed up. To work out how much space this takes up, look up more dimensions in Wikipedia: the flight deck is 33 yards wide, Vals have 16 yard wingspan and Zekes 10 yards. Fitting two Vals side-by-side is a bit tight, but they can be staggered to take up two-thirds their length (8 yards) each. That's 8×18, 144 yards.

Since the Zekes have a higher stall speed, it would technically be better to put them at the back, but fighter pilots always want to be up front. We can put two Zekes side-by-side, and put the other one into the staggered pattern of Vals. That's about 1.75 Zeke-lengths of flight deck, 18 yards, making a total of 162 yards of planes. The front Zeke has 108 yards of deck for take-off.

With Stall 37 and Acceleration 4, it needs $37^2/(2 \times 4) = 171$ yards of run to take off with no WoD, and there isn't that much space available. With 10 yards/sec of WoD, it needs $27^2/(2 \times 4) = 91$ yards, which is practical. Since all the aircraft behind it have equal acceleration and equal or lower Stall, they will have enough room.

The pilots have skill 14, +1 for a successful Shiphandling roll. 21 rolls against 15 produce

20 successes and one failure by 1; the pilot makes his Fright Check. They form up and head towards the position given by the seaplane.

Finding *Hermes* and *Vampire* involves two Navigation rolls. The first was by the seaplane, to know and report its position; the second is by the raid leader to get there. The ships will have moved, but the raid leader has enough aircraft to form a good search pattern, and finds them easily enough.

With no opposing fighters on the scene, the only defence against the dive-bombers is anti-aircraft guns. Sadly, both the British ships are of WWI design, and lack modern AA fire-control systems. *Hermes* has 3×4" AA guns, and *Vampire* has 4×4" AA guns, two twin Lewis guns in .303 and a quad-barrel Vickers gun, also in .303.

The Japanese aircraft circle at 7,000 yards altitude, (range -21), at Move 100, which doesn't make them harder to hit. They are SM +7, so the range penalty to hit them is -14, not really worth shooting. One by one, they start their dives, which are at maximum speed, about Move 135, or 2,700 yards in a 20-second turn. They take two turns diving, reducing their altitude to 1,600 yards, and in the third turn, they decide on their release altitude, drop their bombs, and pull out of their dives.

Hermes is 200 yards long, SM +12, and gets an unmodified dodge at a drop altitude of -15 (700 yards). If the dive-bombers release at an altitude of 300 yards (-13), their attack rolls are Artillery (Bombs) -1 (-13 for range, 12 for target size), and *Hermes*' dodge is at -2. Since she has Hnd/SR of -3/6, the total dodge penalty is -5. Five aircraft attack in each 20-second turn, dropping three bombs each. *Hermes* clearly can't dodge all of them, since she'd have to make a dodge roll by 19.

The AA fire in the three turns is at Speed/Range modifiers of 4,300+135 (-20), 1,600+135 (-18) and 300+135 (-14) yards, with +7 for the SM of the Vals, giving penalties of -11 and -7 for the two closer turns. *Hermes*' historical AA gunners seem to have lacked outstanding skill or luck, because they did not down any of the attacking aircraft.

Attacks on *Vampire* are quite similar, although that ship is SM +10, requiring getting closer, or allowing an easier dodge. The defending machine guns will do their best, but it takes quite a few .303 hits to shoot down an aircraft.

Historically, twelve Fairey Fulmar II fighters arrived once *Hermes* and *Vampire* were already sinking. Their performance was worse than that of the Zeke, and their crews were not as experienced. Two were shot down without inflicting any losses on the Japanese aircraft.

The seaplane started to return to *Haruna* when the attack force arrived. It needs another Navigation roll to find *Haruna* without requiring the ship to transmit radio signals, which could allow the British to locate the raiding force. Its crew will have known the planned movements of the force to allow for finding it. Once it finds any ship of the force, it can ask directions by blinker light.

On finding its home battleship, the pilot needs to make a successful Piloting roll to land safely, and the ship's crew need a Seamanship roll to crane the seaplane aboard.

The returning Vals and Zekes likewise need a Navigation roll to find the force, and can then find *Akagi*. Each aircraft needs a Piloting roll to land. They have skill 14, +1 for Hnd for both the Zeke and the Val, and a potential +1 from the LSO, and all succeed. They need to make HT+4 rolls on landing, and two fail, requiring some repair.

WWII Naval Aircraft

John Dallman and Roger Bell_West

These figures were calculated with formulae from David Pulver's article "Eidetic Memory: Describing Vehicles" in *Pyramid #3/120 "Alternate GURPS V"* with amendments by Roger and John.

The Sea Hurricane, Supermarine Seafire, Bf 109T and Ju 87C are equivalent, to this degree of accuracy, to the land-based versions of aircraft listed in "WWII Aircraft" in *The Path of Cunning*, issue 2, but have tail-hooks, making them carrier-compatible. The Seafire has -2 to the HT roll required for an arrested landing, because of its weak undercarriage. The Bf 109T might well have had a similar problem, but historically never made a carrier landing. The Sea Hurricane seems to have been strong enough, and the Ju 87C's fixed undercarriage was presumably quite adequate.

DR values are averaged across the aircraft for simplicity's sake. Historically, these aircraft have thin skins with engines, crew compartments and/or fuel tanks individually armoured.

PILOTING/TL (LIGHT AIRPLANE)

<i>TL</i>	<i>Vehicle</i>	<i>ST/HP</i>	<i>Hnd/SR</i>	<i>HT</i>	<i>Move</i>	<i>LWt.</i>	<i>Load</i>	<i>SM</i>	<i>Occ.</i>	<i>DR</i>	<i>Range</i>	<i>Cost</i>	<i>Loc.</i>	<i>Stall</i>	<i>Notes</i>
6	F2A-3 Buffalo	67/224	+0/2	10f	4/157	3.58	1.21	+6	1	6	968	\$186,000	g3WrWi	43	
6	SOC-1 Seagull	62/192	+0/3	10f	3/81	2.72	0.82	+6	2	3	675	\$77,000	OS2R2Wi	31	[1][2]
6	SB2C-4 Helldiver	88/387	-1/3	11f	3/144	8.31	3.03	+7	2	5	1,165	\$380,000	2g3WrWi	46	
6	SBD-5 Dauntless	74/273	+1/3	11f	4/125	4.68	1.48	+6	2	5	1,115	\$200,000	G3WrWi	40	
6	TBD-1 Devastator	71/252	+0/3	11f	4/101	4.64	1.84	+7	3	5	435	\$141,000	G3WrWi	34	
6	F4F-3 Wildcat	68/231	+1/3	11f	4/162	3.71	1.26	+5	1	5	845	\$199,000	g3WrWi	43	
6	F6F-5 Hellcat	84/352	+1/3	11f	4/191	6.3	1.68	+6	1	6	945	\$441,000	g3WrWi	45	
6	TBF-1 Avenger	86/369	+0/3	11f	3/132	7.95	2.91	+7	3	5	1,215	\$333,000	Gt3WrWi	41	
6	F4U-4 Corsair	84/352	+1/3	11f	3/218	7.27	2.66	+6	1	5	1,005	\$502,000	g3WrWi	50	
6	OS2U-3 Kingfisher	60/180	+0/3	11f	3/84	2.49	0.82	+6	2	4	908	\$70,000	2gS2RWi	33	[1][2]

<i>TL</i>	<i>Vehicle</i>	<i>ST/HP</i>	<i>Hnd/SR</i>	<i>HT</i>	<i>Move</i>	<i>LWt.</i>	<i>Load</i>	<i>SM</i>	<i>Occ.</i>	<i>DR</i>	<i>Range</i>	<i>Cost</i>	<i>Loc.</i>	<i>Stall</i>	<i>Notes</i>
6	SB2U-3 Vindicator	71/252	+0/3	11f	4/119	3.74	0.92	+6	2	5	1,120	\$168,000	2g3WrWi	36	
6	Blackburn Skua II	71/252	+0/3	10f	4/110	4.1	1.37	+7	2	5	760	\$151,000	G3WrTWi	37	
6	Gloster Gladiator I	59/174	+0/3	10f	4/124	2.3	0.69	+6	1	3	444	\$100,000	g3W2Wi	30	
6	Fairey Albacore Ia	77/296	+0/3	10f	3/79	5.23	1.63	+7	2 or 3	4	710	\$142,000	G3W2Wi	32	
6	Fairey Barracuda II	84/352	+0/3	11f	4/117	6.6	1.93	+7	3	5	686	\$273,000	G3WrWi	42	
6	Fairey Firefly FR1a	85/361	+1/3	11f	3/181	6.36	1.53	+6	2	5	760	\$438,000	G3WrWi	46	
6	Fairey Fulmar II	77/296	+0/3	11f	4/133	4.84	1.33	+7	2	5	780	\$233,000	G3WrWi	39	
6	Fairey Seafox I	62/192	+0/3	10f	3/61	2.71	0.81	+6	2	4	440	\$58,000	O2S2Wi	28	[3][4s]
6	Fairey Swordfish	65/211	+2/3	10f	4/70	3.79	1.69	+7	3	4	522	\$73,000	O3W2Wi	28	[5]
6	Supermarine Walrus	68/231	+0/3	10f	4/66	3.6	1.15	+7	4	4	600	\$81,000	g3Wr2R2Wi	27	[6][4h]
6	Fieseler Fi 167	73/266	+1/3	10f	3/99	4.97	1.88	+6	2	4	810	\$153,000	g3W2Wi	35	
6	D3A1 “Val”	70/245	+1/3	10f	4/132	4.03	1.37	+7	2	4	915	\$175,000	G3WWi	34	
6	E13A1 “Jake”	72/259	+0/3	10f	4/114	4.01	1.1	+7	3	4	1,298	\$166,000	G2SWi	33	[3][4s]
6	E16A1 “Paul”	75/281	+0/3	10f	4/133	4.3	1.05	+6	2	4	731	\$216,000	G2SWi	39	[3][4s]
6	E7K2 “Alf”	67/224	+0/3	10f	4/84	3.64	1.32	+7	3	3	1,290	\$97,000	G2S2Wi	35	[3][4s]
6	N1K-J “George”	74/273	+2/2	11f	5/199	4.3	1.11	+6	1	5	670	\$318,000	g3WrWi	42	[4h]
6	A6M2 Zero “Zeke”	62/192	+1/3	10f	4/162	3.08	1.23	+6	1	3	1,160	\$150,000	g3WrWi	37	
6	F1M2 “Pete”	65/211	+0/3	10f	3/112	2.81	0.69	+6	2	3	460	\$119,000	OS2R2Wi	32	[4s]

<i>TL</i>	<i>Vehicle</i>	<i>ST/HP</i>	<i>Hnd/SR</i>	<i>HT</i>	<i>Move</i>	<i>LWt.</i>	<i>Load</i>	<i>SM</i>	<i>Occ.</i>	<i>DR</i>	<i>Range</i>	<i>Cost</i>	<i>Loc.</i>	<i>Stall</i>	<i>Notes</i>
6	G3M2 “Nell”	89/369	-1/4	10f	4/114	8.82	3.35	+8	7	5	2,700	\$312,000	g2WrWi	33	[4l]
6	J2M3 “Jack”	74/273	+1/3	11f	6/178	3.54	0.41	+6	1	5	1,179	\$279,000	g3WrWi	42	[4h]
6	B5N2 “Kate”	69/238	+0/3	10f	4/115	4.19	1.68	+7	3	4	608	\$144,000	G3WrWi	33	
6	B6N2 “Jill”	75/281	+0/3	11f	4/147	5.73	2.41	+7	3	5	1,085	\$244,000	G3WrWi	39	
6	J1N1 “Irving”	86/369	+0/3	11f	4/154	7.73	2.79	+7	2 or 3	5	1,581	\$380,000	G3WrWi	43	[4l]
6	D4Y2 “Judy”	70/245	+0/3	10f	3/166	4.69	2	+6	2	4	910	\$223,000	G3WrWi	45	
7	MXV-7 “Baka”	40/80	+1/2	10f	4/281	2.36	1.87	+4	1	3	23	\$68,000	gWi	65	[7]

[1] The S hit location represents the main float, the two R locations the small stabilising floats. This gives them a reasonably appropriate size and chance of being hit.

[2] Normally used as a seaplane, but can have its floats replaced by fixed wheeled undercarriage and is then carrier-compatible.

[3] The 2S hit location represents the floats.

[4] Carrier-incompatible aircraft: **h** indicates no tail-hook, **s** indicates a seaplane that isn’t amphibious (and will also lack a tail-hook), **l** indicates a plane that’s too large.

[5] The (carrier-incompatible) floatplane configuration replaces the 3W hit locations with 2S to represent the floats, and reduces Acceleration by 1.

[6] Amphibian aircraft.

[7] Air-launched manned missile.

[Buffalo] armed with 2 forward body and 2 forward wing .50 M2 Brownings.

[Seagull] armed with 1 forward body and 1 rear body .30 M2 Browning (*High-Tech* p. 132), up to 650lb of bombs.

[Helldiver] armed with 2 forward body AN/M2 20mm cannon (use stats for Hispano Mk II), optionally 2 forward wing gunpods each with 2 .50 M2 Brownings, 2 rear body .30 M2 Browning, bomb bay for 2 1,000lb bombs or 1 Mark 13 torpedo, 2 underwing hardpoints for 1 500lb bomb each.

[Dauntless] armed with 2 forward body .50 M2 Browning, 2 rear body .30 M2 Browning, up to 2,250lb of bombs.

[Devastator] armed with 1 forward body .30 M2 Browning or .50 M2 Browning, 1 rear body .30 M2 Browning, 1 Mark 13 torpedo, or 1 1,000lb or 2 500lb or 12 100lb bombs.

[Wildcat] armed with 4 forward wing .50 M2 Brownings.

[Hellcat] armed with 6 forward wing .50 M2 Brownings, or 2 forward wing AN/M2 20mm cannon and 4 forward wing .50 M2 Brownings. Optionally, 6 5" HVAR rockets, or 2 11.75" Tiny Tim rockets, or 1 Mark 13 torpedo or up to 2,000lb of bombs.

[Avenger] armed with 2 forward wing .50 M2 Brownings, 1 rear turret .50 M2 Browning and 1 rear ventral .30 M2 Browning. Up to 8 rockets, 3.5" FFAR, 5" FFAR or 5" HVAR, 1 Mark 13 torpedo, or up to 2,000lb of bombs.

[Corsair] armed with 6 forward wing .50 M2 Brownings, or 2 forward wing AN/M2 20mm cannon and 4 forward wing .50 M2 Brownings. Optionally 8 5" HVAR rockets or up to 4,000lb of bombs. Landing a Corsair on a carrier requires a specific and unusual method. Until this was discovered, carrier landings were at -2 to Piloting skill, and the aircraft was mostly used from land.

[Vindicator] armed with 1 forward wing and 1 rear body .50 M2 Brownings. 1 1,000lb or 500lb main bomb, plus 2 100lb and 8 30lb bombs.

[Skua] armed with 4 Browning Mk II* in forward wing, 1 Vickers "K" gun in rear body, and optionally 1 500lb SAP bomb.

[Gladiator] armed with 4 Browning Mk II*, 2 in forward body, 2 in forward lower wing. A few had 2 more Brownings in forward upper wing.

[Albacore] armed with 1 Browning Mk II* in forward wing, 1 or 2 Vickers "K" guns in rear body, 1 18" torpedo, or up to 4 500lb SAP bombs.

[Barracuda] armed with 2 Vickers "K" guns in rear body, 1 18" torpedo, or 1 1,600lb AP bomb, or up to 6 250lb SAP bombs, or 4 450 lb depth charges.

[Firefly] armed with 4 forward wing Hispano Mk II (gyro gunsight) and 2,000lb of bombs or 8 RP-3 unguided rockets (fired in pairs or all together).

[Fulmar] armed with 8 forward wing Browning Mk II* or 4 forward wing .50 M2 Browning, occasionally 1 Vickers "K" gun in rear body, optionally 2 110lb or 1 250lb bombs.

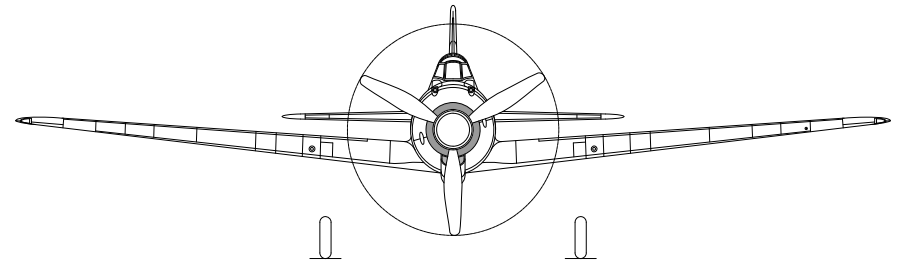
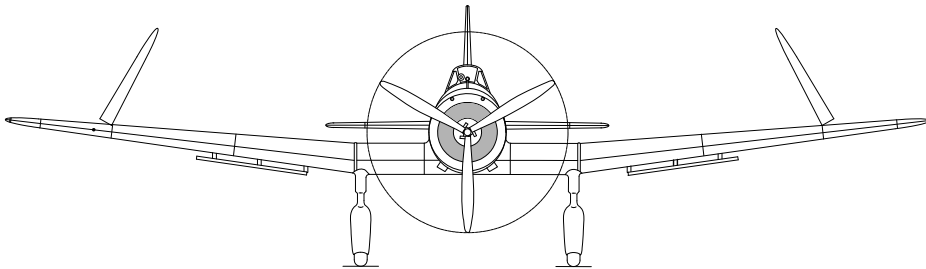
[Swordfish] armed with 1 forward body Vickers Mk II .303 (*High-Tech* p. 131), 1 rear body Lewis Mk II .303 (ditto) or Vickers "K" gun, and 1 underslung 18" torpedo, or 1 1,500lb mine or up to 1,500lb of bombs. The "Stringbag" was so named because it could carry almost anything within its weight limit. The second crew member was sometimes replaced by a fuel tank, increasing range to 1,030 miles. Can dive-bomb (slowly) and was operated as a floatplane from cruisers and battleships.

[Walrus] armed with 2 Vickers "K" guns (front body, rear body), and up to 600lb of bombs or depth charges.

[Fi 167] armed with 1 forward body MG 17 and 1 rear body MG 15, 1 2,200lb bomb, or 1 F5w or F5b torpedo, or 1 1,100lb bomb and 4 110lb bombs.

[Val] armed with 2 forward body Vickers Mk II .303, 1 rear body Lewis Mk II .303, 1 550lb bomb under body, plus 2 130lb bombs under wings.

[Jake] armed with 1 rear body Lewis Mk II .303, occasionally 2 downward-firing body 20mm Type 99-2 cannon, up to 550lb of bombs.



[Paul] armed with 2 forward wing 20mm Type 99-2 cannon, 1 rear body MG 131, up to 550lb of bombs.

[Alf] Armed with 1 forward body Vickers Mk II .303, 2 rear body Lewis Mk II .303 (1 dorsal, 1 ventral), up to 165lb of bombs.

[George] armed with 4 front wing 20mm Type 99-1 cannon, optionally 2 550lb bombs.

[Zeke] armed with 2 forward body Vickers Mk II .303, and 2 forward wing 20mm Type 99-1 cannon, optionally 2 130lb bombs, or 1 non-droppable 550lb bomb for Kamikaze attacks.

[Nell] armed with 4 Lewis Mk II .303 (1 each side of cockpit, 2 in forward dorsal turret), 1 20mm Type 99-1 cannon in rear dorsal turret, one Type 91 torpedo or 1,800lb of bombs.

[Jack] armed with 2 forward wing 20mm Type 99-1 cannon and 2 forward wing 20mm Type 99-2 cannon, optionally 2 135lb bombs. Cannot operate from a carrier, despite being a navy aircraft.

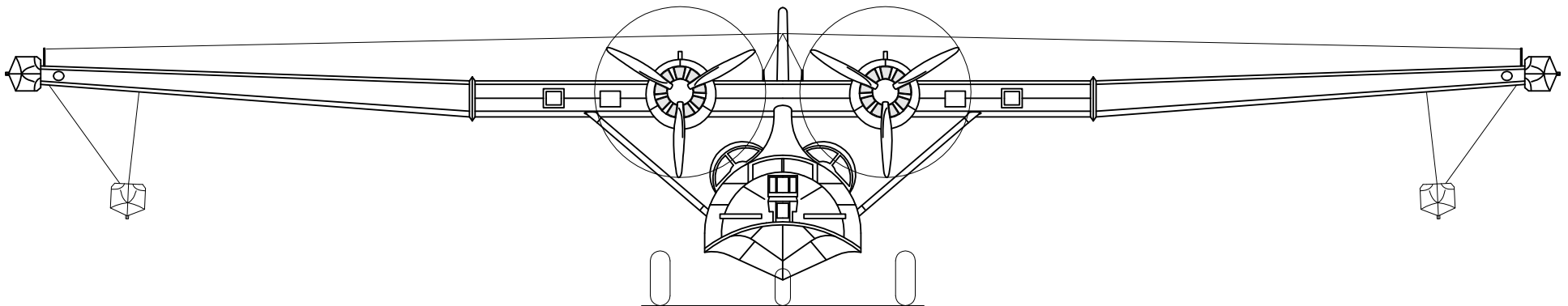
[Kate] armed with 1 Lewis Mk II .303 in rear body, some have 2 forward wing Vickers Mk II .303, 1 Type 91 torpedo, or 1 1,750lb bomb or 2 550lb bombs or 6 135lb bombs.

[Jill] armed with 2 Lewis Mk II .303 in rear body (one dorsal, one ventral), 1 type 91 torpedo, or 1 1,750lb bomb or 1 1,100lb bomb, or 2 550lb bombs.

[Irving] has two armament fits: J1N1-C is a 3-seat long-range reconnaissance aircraft with 3 crew, 1 rear body MG 131. J1N1-S is a 2-seat night-fighter with 4 20mm Type 99-2 cannon, 2 firing upwards and 2 downwards.

[Judy] armed with 2 forward wing Vickers Mk II .303, 1 rear body Lewis Mk II .303, up to 1,100lb of bombs.

[Baka] Suicide plane, armed with 2,600lb warhead, 6d×97 damage.



PILOTING/TL (HEAVY AIRPLANE)

<i>TL</i>	<i>Vehicle</i>	<i>ST/HP</i>	<i>Hnd/SR</i>	<i>HT</i>	<i>Move</i>	<i>LWt.</i>	<i>Load</i>	<i>SM</i>	<i>Occ.</i>	<i>DR</i>	<i>Range</i>	<i>Cost</i>	<i>Loc.</i>	<i>Stall</i>	<i>Notes</i>
6	PBY-5A Catalina	110/605	-2/4	11f	3/96	17.7	7.26	+9	10A	5	2,520	\$502,000	g3t3Wr2RrWi	36	[1]
6	PBM-1 Mariner	129/832	-2/4	11f	2/100	28	11.41	+9	7A	5	3,000	\$829,000	g5t2RWi	44	[2]
6	Short Sunderland III	130/845	-2/4	11f	3/103	29	11.75	+9	10A	5	1,780	\$888,000	g3t2RWi	44	[2]
6	BV 138C-1	118/696	-2/4	11f	3/87	15.98	3.01	+8	6A	5	760	\$564,000	g3t2RWi	37	[2]
6	Dornier Do 24T-1	110/605	-2/4	11f	4/103	15.1	4.74	+8	4 or 6	5	1,800	\$534,000	g3t2RWi	39	[2]
6	H6K4 “Mavis”	118/696	-2/5	10f	4/103	18.74	5.83	+9	9A	4	2,981	\$665,000	g2t2RWi	32	[2]
6	H8K2 “Emily”	137/938	-2/5	11f	3/142	27.01	6.75	+9	10A	4	4,440	\$1,438,000	G5t2RWi	39	[2]
6	G4M1 “Betty”	98/480	-1/4	11f	3/130	14.18	6.75	+8	7	5	1,772	\$483,000	2g3t3WrWi	41	
6	P1Y1a “Frances”	101/510	-1/4	11f	4/166	11.57	3.57	+8	3	5	3,340	\$665,000	G3WrWi	45	

All of these aircraft are too large for carriers and lack tail-hooks.

[1] Amphibian version. The Rr locations are the retractable wing-tip floats.

[2] Flying boat.

[Catalina] armed with 2 side “turret” .50 M2 Brownings and 3 .30 M2 Brownings (2 in front turret, 1 in ventral hatch) and up to 4,000lb of bombs, depth charges or torpedoes.

[Mariner] armed with 8 .50 M2 Brownings (2 each in nose, dorsal and tail turrets, 1 in blisters each side), up to 4,000lb of bombs or depth charges or two Mark 13 torpedoes.

[Sunderland] armed with 12 Browning Mk II* (4 front body, 2 nose turret, 2 dorsal turret, 4 tail turret), sometimes 2 .50 M2 Brownings in side hatches, up to 5000lb of bombs or depth charges.

[BV 138] armed with 2 MG 151/20 (nose turret, rear turret) 1 MG 131 (top body), up to 1,500lb of bombs or depth charges.

[Do 24] armed with 1 MG 151/20 or Hispano Mk II in dorsal turret, 1 MG 15 in nose and tail turrets.

[Mavis] armed with 4 Lewis Mk II .303 (forward body, upper body, two side blister “turrets”) and 1 20mm Type 99-1 cannon in tail turret, 2 Type 91 torpedoes or 2,200lb of bombs.

[Emily] armed with 5 20mm Type 99-1 cannon (nose, dorsal and tail turrets, two side blister “turrets”), 5 Lewis Mk II .303 (2 in body side hatches, 2 in sides of cockpit, 1 in a ventral hatch), 2 Type 91 torpedoes or 4,400lb of bombs or depth charges.

[Betty] armed with 1 20mm Type 99-1 cannon in the tail turret, 4 Lewis Mk II .303 (2 in body side hatches, 1 nose turret 1 dorsal turret), 1 Type 91 torpedo or 1 1750lb bomb or 4 550lb bombs.

[Frances] armed with 1 front body 20mm Type 99-1 cannon, 1 rear body MG 131, 1 Type 91 torpedo or up to 2,200lb of bombs.

ARTILLERY/TL (TORPEDO)

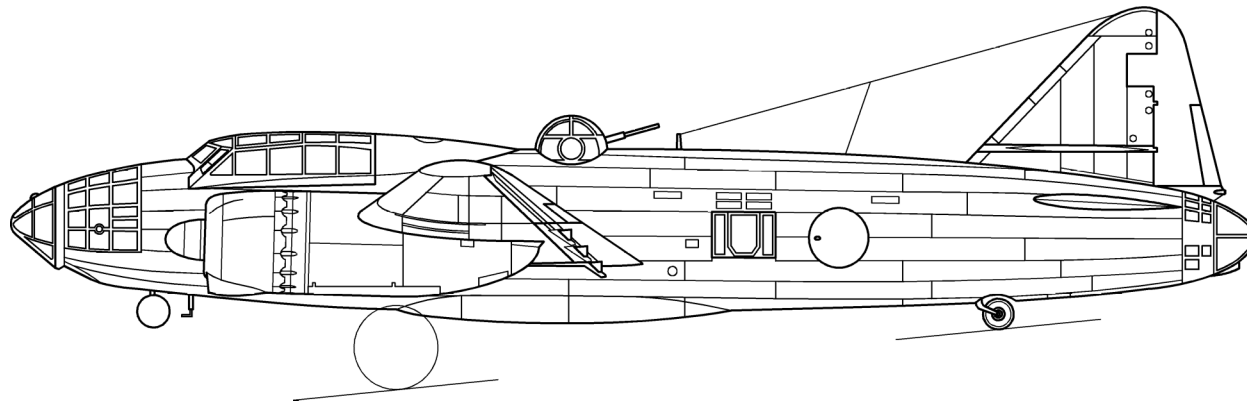
First range figure is speed in yards/second.

TL	Weapon	Damage	Acc	Range	Weight	RoF	Shots	ST	Bulk	Rcl	Cost	Notes
6	US Mark 13	6d×56 cr ex	0	19/6,300	2,216	1	1	n/a	n/a	n/a		
6	British 18" Mk XII	6d×39 cr ex	0	23/1,500	1,548	1	1	n/a	n/a	n/a		[1]
6	British 18" Mk XV	6d×53 cr ex	0	23/2,500	1,801	1	1	n/a	n/a	n/a		[1]
6	German F5w	6d×42 cr ex	0	23/3,300	2,000	1	1	n/a	n/a	n/a		[2]
6	German F5b	6d×48 cr ex	0	23/2,200	1,700	1	1	n/a	n/a	n/a		
6	Japanese Type 91	6d×37 cr ex	0	24/2,200	1,800	1	1	n/a	n/a	n/a		[3]

[1] The Mk XII was standard during the first half of WWII, and used to a limited extent after replacement by Mk XV. These torpedoes also had a slower speed/longer range setting, but that made hitting much harder, and it was little-used.

[2] German designation for the Italian Fiume W torpedo, used by them before F5b entered service in late 1941.

[3] Damage was increased several times during WWII, to a maximum of 6d×62.



GUNNER/TL (MACHINE GUN)

TL	Gun	Damage	Acc	Range	EWt.	RoF	Shots	ST	Bulk	Rcl	Notes
6	Vickers "K" gun, .303	7d pi	5	1,000/3,800	31.5	20!	96 drum	17M	-6	2	
6	Type 99-1 20×72mmRB	7d×2pi++	5	1,100/6,300	51	8!	Belt-fed	24M		2	
	<i>Follow-up</i>	2d [1d] cr ex									
6	Type 99-2 20×101mmRB	6d×3pi++	5	2,000/7,000	77	9!	Belt-fed	30M		2	
	<i>Follow-up</i>	2d [1d] cr ex									

GUNNER/TL (ROCKETS)

First range figure is speed in yards/second.

TL	Rocket	Damage	Acc	Range	EWt.	RoF	Shots	ST	Bulk	Rcl	Notes
6	US 3.5" FFAR (ASW)	6d×6 (2) pi++	4	511/1,200	55	8	8	n/a	n/a	2	[1]
6	US 5" FFAR	6d×5 pi ++	3	292/800	90	8	8	n/a	n/a	2	
	<i>Follow-Up</i>	6d×6 cr ex									
6	US 5" HVAR	6d×6 pi ++	4	576/1,500	140	8	8	n/a	n/a	2	[2]
	<i>Follow-Up</i>	6d×6 cr ex									
6	US 11.75" "Tiny Tim"	6d×7 pi ++	3	269/1,600	1,255	1	1	n/a	n/a	2	
	<i>Follow-Up</i>	6d×24 cr ex									
6	British RP-3, 25lb shot	6d×5 (2) pi++	4	533/1,500	25	8	8	n/a	n/a	2	[1]
6	British RP-3, 60lb shell	6d×4 pi++	3	400/2,000	60	12	12	n/a	n/a	2	
	<i>Follow-Up</i>	6d×7 cr ex									

High-Tech, p. 150, has the M10 launcher and M8 4.5" rocket. That was used by the US Army, rather than the Navy, and is a much lighter rocket.

[1] No explosive warhead. Intended for punching holes in submarine hulls, which they did reliably if they hit.