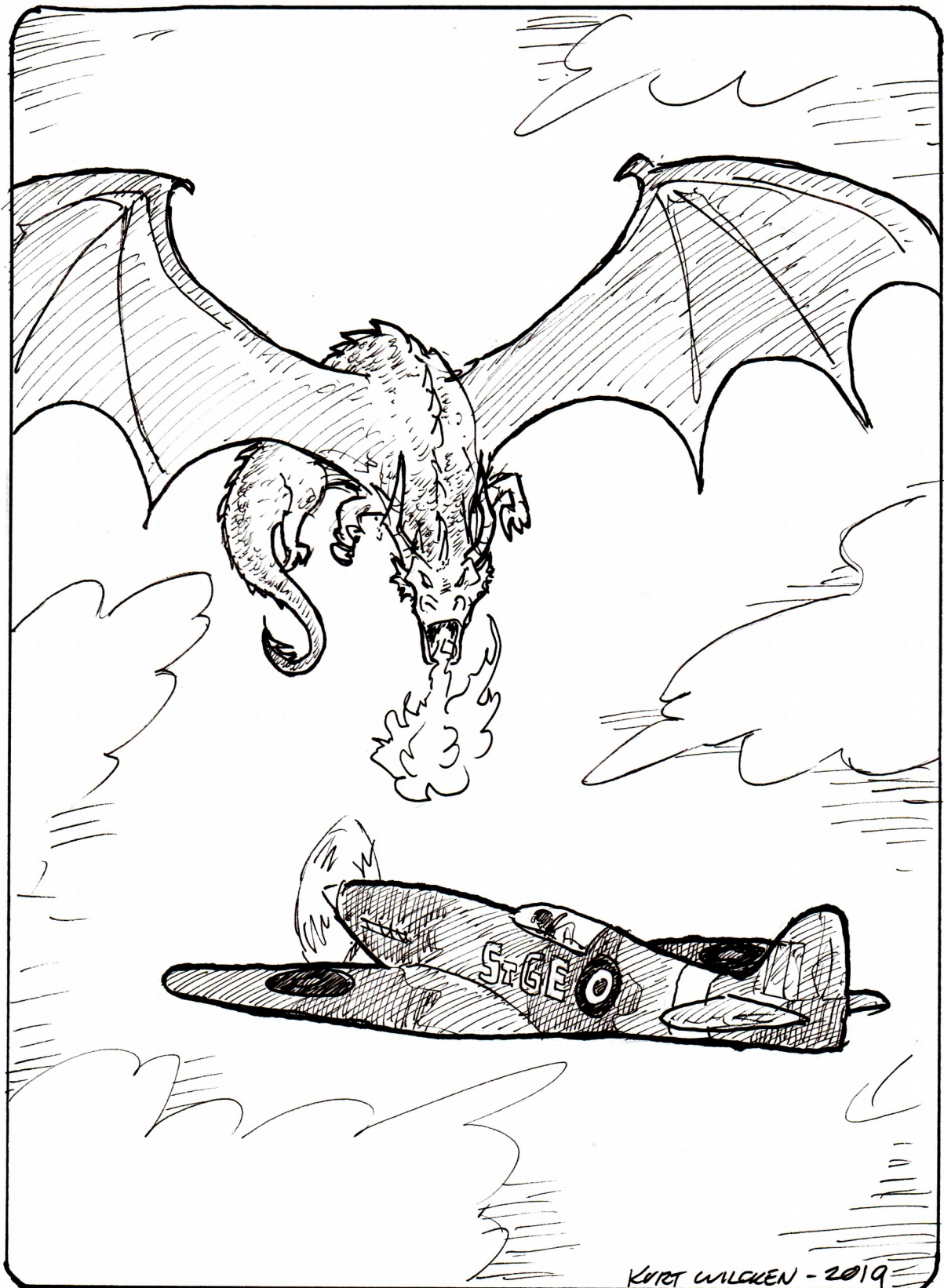


The Path of Cunning



The Path of Cunning

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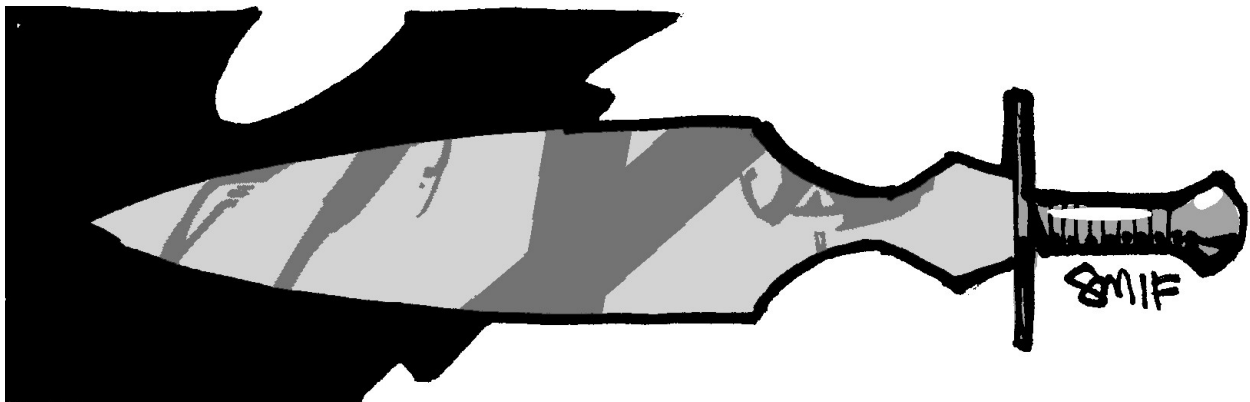
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A GURPS By Any Other Name

Roger Bell_West

For some years I've been running short **GURPS** demonstration scenarios at various conventions: no knowledge of the rules is needed. With pre-generated characters, I can teach enough of the system in a few minutes ("3d6, roll low") that players can engage in the adventure and get some idea of how the system could be applied to the games they like to run. Sometimes the games fill up, sometimes (more of late) they don't.

Before the latest yog-sothoth.com Games Day I asked on their forums how much difference a system made – specifically, whether people would be more or less willing to play a Lovecraftian horror adventure depending on what system it would be run under – and was surprised to learn that to many of them it would make a big difference. Similarly, last Stabcon I ran something like my standard format of investigative adventure under the *Cthulhu Hack* rules rather than **GURPS**, and got a full house of players rather than the usual two or three.

This makes sense to some extent: if a game's being run under *D&D* or *Pathfinder* it's a fair bet that fighting will be a major focus, whereas in *Cthulhu Dark* the rules for combat against a monster are "you lose". But to me an investigation is an investigation, and whether the game mechanics are *Call of Cthulhu*, *Trail of Cthulhu*, any of the other official and unofficial Lovecraftian games, or my own Lovecraftian **GURPS**, really shouldn't make any difference. Do I have a way of knowing what sort of investigation my character is good at? Well, that's pretty much enough.

But I think that **GURPS** in particular has something of an image problem: people think of it as complicated. Which, of course, it *can* be if

you want it to be; if you're building a power to match some piece of fiction, it's likely to end up with lots of fiddly modifiers. Many people remember, or have heard dark rumours about, **GURPS Vehicles** for Third Edition, which certainly had a lot of arithmetic in it; what they don't remember, or didn't know in the first place, is that most of that arithmetic was never intended for use in a game session, but rather by someone designing vehicles for use in a campaign. (That kind of involved design process was much commoner in games of the 1980s – see *Battletech* or the original *Car Wars* – when it served as a way of getting game-like fun on one's own, in the times between actually playing the game. Now we have the Internet.)

It's unfortunate too that much of the complexity of **GURPS** is front-loaded: you need to generate a character before you can play the game, and before you can make decisions about how high your stats or skills should be, you need to understand how they work, and unless you have some guidance it's very easy to spend all your points on building a character who won't actually be effective in the story. As a generic system, the core book lists more or less everything that could be useful to characters from many different genres, and a couple of hundred pages of options can be overwhelming. Contrast a single-genre system like *Call of Cthulhu* where you can generate some random stats, pick a profession, and have a list of ten skills you're supposed to be good at.

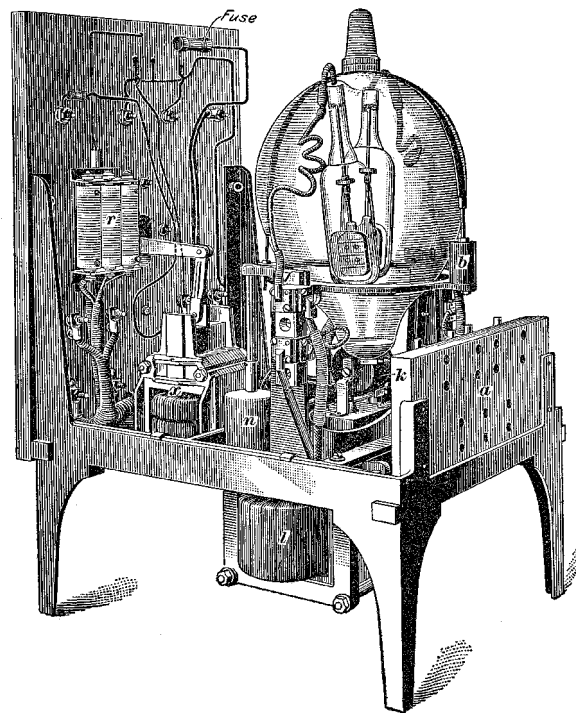
There are ways round this, but they're not obvious. Perhaps because many old hands like to build their own worlds, there's no standard setting or genre for a **GURPS** campaign the way there is for a *D&D* or *Call of Cthulhu* one. One extreme case is the **Dungeon Fantasy RPG**, or

slightly less extreme *GURPS Dungeon Fantasy* and other lines such as *Action* and *Monster Hunters*, which both pare away traits that are irrelevant to their particular classes of game and give strict occupational templates: if you're joining an Action game and want to play a driver or a martial artist, you can go from scratch to a playable character with about ten decisions.

A further step back towards the full complexity of *GURPS*, while retaining significant assistance for the player, is the series of setting books such as *Tales of the Solar Patrol*, *Britannica-6* and my own *Reign of Steel: Will to Live*. Here all *GURPS* traits are potentially available, though as always the GM is encouraged to make a list of just the things they plan to allow, but there are plenty of templates and lenses to be added to them; this doesn't give you an instant ready-to-play character, but it does at least make it clear which traits will be necessary for your character to have a useful role in the party.

But all of this, while it does indeed make *GURPS* easier for the newcomer, doesn't help if a player sees the name and thinks "oh, that's that complicated system, I'll play something else". When I evangelise for *GURPS* I tend to emphasise the potential for simplicity: yes, *if* you want to design a family of spaceships with common technological assumptions and consistent behaviour you can have that, but there's nothing to stop you running a game where the spaceship is a magic carpet that gets the party to where the adventure is going to happen. I can have baroque interlocking magic systems... or I can offer simple spellcasting magic, or even single-purpose powers. I don't believe there is any such thing as a *GURPS* campaign which uses all the rules in the Basic Set, never mind in the various supplements.

I suspect that the answer to this would be to get a popular actual-play video show to run an adventure in *GURPS*; it's certainly done impressive things for sales of the current edition of *Call of Cthulhu*. But I don't know how to make that happen.



Infinite Cabal part 2

The Astral Plane, and some places it leads to

John Dallman

Addendum to part 1

The campaign has been running fortnightly since late 2010, with one gap of a few months, and the experience award is normally three points per session. So there have been about 190 sessions so far, each two to three hours of play.

Perceptions of the Astral

GURPS has several descriptions of the Astral plane, spirit realm, and related concepts. I wanted to unify them. A very valuable tool for this is “variations of perception” — the idea that different styles or schools of magic regard the Astral in different ways, and perceive it accordingly. Since the Cabal knows a large number of magical secrets, it seemed entirely plausible that they’d understand this, and be able to teach their members about it.

It is something of a theme in campaigns I’ve run that different views of reality make a vast difference to one’s behaviour and ambitions. The connection between this and my terrible vision, uncorrected until I was three, is too obvious to spend time on.

Some of the most valuable abilities in the campaign have been visual. Commander Hodgson had See Invisible (Quantum Flows) from the *Infinite Worlds* world-walker template from the beginning, and enhanced versions of the *Mage Sight* spell have been developed to allow reliable perception of things discovered during play.

Moving between planes

While the Infinite Cabal characters are capable of finding natural world-gates, and casting planar travel spells, they’ve done almost all their travelling using Jumper (World) abilities. At the start of the campaign, the only character capable of this was Janos Balaban, whose sword can do that, with the Tunnel enhancement, allowing the rest of the party to follow him. It’s a gadget, a great work of enchantment which he cannot improve, and only operates four times per day, which was a significant constraint in the early stages of the campaign. Direct world-to-world jumps are known in the campaign as “cuts” because of it, although it hasn’t been the only way of doing them for some years.



With time, more characters acquired Jumper abilities. Commander Hodgson can do it with psionics, and M.Carnot, who has not yet been introduced, has a gadget of his own design for the purpose.

Spells

Since I expected the campaign to deal with a large number of worlds, I simplified the rules of the Gate college a bit, although they have not seen much use.

Plane Shift Other and other spells with *Plane Shift* as a prerequisite do not need to be learned in plane-specific versions. Knowledge of *Plane Shift* (implying *Planar Summons*) for the target plane suffices.

Plane Shift to the Astral plane is a single spell for all worlds (so far discovered, it seems possible in principle that some could be different) and only costs 10 fatigue. *Create Gate* to the Astral plane only costs 40. Getting off the Astral plane to a material plane can be done either with a plane-specific version of *Plane Shift*, or by casting *Plane Shift (Astral)* or *Create Gate* at -10. Note that the Astral Plane is a normal mana plane, decanic modifiers are available, and failing the shift means you just don't go anywhere. Fumbling it can cause astral hazards, of course. Items symbolic of the target plane can give useful bonuses. Even with the reduced fatigue costs, the characters only use these spells in emergencies.



The Near Astral

However you reach the Astral plane, its immediate appearance is the same. It's a grey environment, lacking landmarks of its own, but with the material world fuzzily visible. The human mind copes with four dimensions here fairly naturally, in that the three-dimensional material world is "below," and there's an additional dimension, which separates you from it. This generally requires a Fright Check from people who haven't been briefed about it in advance and some of those who have, as the world suddenly seems stranger and more complex to them. This is quite hard on normal people and makes taking animals through the Astral a major problem. The Astral adjacent to the material world is sometimes called the "Ghost Zone" and *Psionic Powers* calls it the "Outer Astral."

The Astral is a realm of ideas and thought, and doesn't obey normal physics terribly precisely. Moving through the near Astral lets you cover distance in the material world at about twice the speed you would make in that world. You can't walk through some material things: trees, people or large animals, or solid walls that have been in existence for long enough to affect material people's ideas and memories. You can read large writing that's on the material plane, down to English letters about 3" high, but no smaller.

Objects left behind on the Near Astral have a tendency to vanish if left unobserved for a few hours. They sometimes show up back in the material realm, but not reliably.

Advanced technology doesn't work on the Astral: up to TL4 is usually OK, although clocks run randomly faster or slower. Electrical or electronic equipment takes to it very poorly, usually involving escaping smoke. Switch it off completely before taking it to the Astral: batteries usually survive if they have no current

flowing through them. Nobody has been brave enough to take anything nuclear-powered to the Astral during the campaign so far (the characters don't have any such equipment).

Going “Up”

It's not obvious how one goes anywhere, except in the three dimensions of the material realm, while in the Near Astral. However, once you're shown the trick of it, movement in the fourth dimension is quite straightforward, and one can move “away” from the material, in a direction generally called “up.” At this point, neophytes are warned not to move “sideways” once out of sight of the material, because it's *easy* to become *comprehensively* lost. At least, that was what was assumed to be the case when people didn't come back, which was what normally happened.

This is the “Middle Astral,” which is the point where it's necessary to start learning and using Navigation (Astral). Given that astral distances are mostly a matter of perception, and the physical dimensions of maps vary unhelpfully, this skill is largely a matter of mental dead reckoning, and awareness of the environment. Absolute Direction does not boost it, but 3D Spatial Sense does. The idea is to go as straight “up” as possible.

The Cabal actually knows more about sideways movement nowadays (see below), but it's still a great way for the inexperienced to get into trouble. New travellers are thus taught the straightforward techniques first.

The Astral Sea and its Pools

After going “up” for a while, one emerges into the “Astral Sea.” The ground here is still grey and ill-defined, but one can see for long distances horizontally. The land is not quite level, but has slow undulations, with hills and valleys. There's what looks like uniform grey cloud a long way

overhead, with light filtering through it. This is called the “Astral Sea” because it extends a very long way, and is uniform, with little about it that indicates where you are. The analogy is weak, because the terrain is permanent enough to navigate by, via Navigation (Astral), but the name has stuck.

Objects left unattended here also vanish. They are occasionally found in the material world, but not often.

There are small depressions in the ground, usually looking as if they're about fifty yards long and ten wide. The new traveller emerges from one of them, which looks rather like a pool, with a surface covered in varying colours. Walking around it, you soon discover that the shape is a matter of perception; you always seem to be at the middle of one of the long sides, suggesting that it's really circular, and appears distorted, or perhaps that three-dimensional perceptions aren't fully effective in this environment.

Each pool leads to a world.

The colours of the pool and their patterns vary from pool to pool, and can be used to learn something about the conditions in the corresponding world, using Divination (Astral Pool), an IQ/VH skill with no default that can only be learned in this environment. There are definite limits on the precision of the information you can get from this skill, but it's easy to learn if a world is uninhabitable from it. The colours and patterns tell you most easily about life and civilisation on the world.

When you enter a pool, you find yourself in the Middle Astral of a world and can readily descend to the Near Astral. From there, you can look at the world, and decide if you want to enter it, via some means of moving to the material plane.

If you haven't moved around on the Near Astral of either world, you arrive at the same geographical position on the new world as you had on the old one, to within a few yards. Movement in the Astral Sea doesn't change your location in the material realm. All the worlds where this has been checked seemed to have similar geography, at least in the area examined. There are some changes for different points in history: rivers silt up, earthquakes change the land levels, and so on, but all the worlds visited seem to have the same geophysical history. The PCs haven't visited any outright myth parallels, as far as they know.

No-mana worlds are a special case. They're obvious from the Near Astral, because the barrier between them is weak. It feels like being precariously balanced, and it is possible to "fall off" the Near Astral and arrive on the material plane. This hurts — 1d damage to a random location, avoidable with an Acrobatics roll — but that's the limit of the harm it does. Of course, it's harder to get *back* to the Near Astral from a no-mana world.

With these tools, the PCs could embark on exploration of the Infinite Worlds.

Quantum levels

The quantum levels that limit Infinity and Centrum's conveyors and projectors do not appear to correspond to anything about the Astral Sea¹. After some time, the PCs made friendly contact with Infinity². They were asked to measure the quantum levels of a sample of worlds that they had reached via the Astral Sea, in exchange for information that they needed. Infinity provided them with a simple device for this, which could be switched *off*.

¹ This is a deliberate change for plot purposes from *Infinite Worlds* canon. The Jumper (Worlds) abilities that the characters use are not limited by quanta.

² See Part 3 of this series, planned for issue #3.



Infinity found that they could construct mathematical models that connected relative positions in the Astral Sea to their quantum-based theories, but they needed an independent variable for each world involved. This isn't so bad when you're dealing with three or four worlds, but when the number has passed thirty, it becomes clear you're on the wrong track.

q, r and ϕ

After two and a half years of play, the PCs encountered a ship sailing across the Astral Sea. This was something of a surprise, but after they'd dealt with its overly-aggressive commander and befriended the crew by supplying them with drink, they found out how it behaved.

The crew had been on board for a century or so, seemingly not ageing, nor needing to eat or drink, though that had not relieved them of the desire. From the ship, the Astral Sea appeared to be a normal sea of blue-green water, with the pools being patches of weed or surf that the crew tried to avoid.

The ship had been a merchantman in the Caribbean, hired to transport a strange fellow and his luggage to Haiti. A strange storm had blown up, and the passenger taken by tentacles from the sea. Since then, they had been wandering this strange sea. Since the PCs had come to the Astral Sea from England, the ship seemed to have travelled geographically, while on the Astral.

After enlisting ship and crew into the Newton-X Royal Navy, they experimented more with it, and learned how to move in q and r , which correspond, approximately, to latitude and longitude in the material realm. The vertical dimension in the Astral Sea was named ϕ . It may well correspond to “up” in the Middle Astral, but the characters were getting wary of assumptions by this time.

Going Sideways: the B-axis

Six months or so later, a new player joined the group. He plays extroverts by habit, and wanted to investigate what actually happens if you go sideways in the Middle Astral. His character is a historical scientist:

Nicolas Léonard Sadi Carnot

This is the same Carnot who [founded thermodynamics](#), in our history. This version, born later in a France infiltrated by the Cabal, has applied thermodynamic reasoning to magic. He is also a magical engineer, having built himself a device that does Jumper (World) with Tunnel. He is aggressively French, proclaiming cultural superiority over the English on all occasions. *Played by Bob Dowling.*

Daniel Bernoulli

Newton-X’s version of this [illustrious scholar](#) arrived in London during the campaign, because of all the new mathematics and physics being

published there. He did not cope well with learning that he’s one of many historical versions of the same person, who have achieved and published many things that he’s barely thought about. The Royal Society lodge tries to break this to members gently, but there was a mistake.

Bernoulli decided that he wanted to study something different, and needing funds to pay for this, was willing to participate in a dangerous experiment. Essentially, Carnot wanted him to go sideways in the mid-Astral, on the end of a long rope, and report on what he found when he was retrieved. Carnot needed a lodge member for Astral experiments, but none of them (and none of the PCs at first) was willing. Bernoulli’s willingness, due to the way he felt he’d lost purpose in his life, was vital to the experiment.



Past versions of worlds

After a fair bit of getting lost, mysteriously growing and vanishing ropes, breaking ropes and existential terror, it was discovered that if you know how, going sideways in the Middle Astral allows access to past versions of the world whose Middle Astral you're exploring. This was entirely new information to the Cabal, and the party's first major discovery in the exploration of the universe.

If you go sideways in the Mid-Astral and can maintain your sense of direction (a customised version of *Mage Sight* makes this easy) you find walls gradually appearing, narrowing to form a tunnel. Following this, for a distance that takes long enough to notice, but little more, leads you to another Mid-Astral space, where one can go up to the Astral Sea, sideways to another tunnel, or down to the material realm. That material realm is in the past of the world you started from, by a decade or so. Every one of these worlds that has been checked is no-mana.

Carnot named this new dimension the "B-axis", after Bernoulli, with the readily accessible world being B_0 , the first one found down the tunnel B_1 , the next one B_2 , and so on. Going up in any B-world's Mid-Astral brings you out to the same pool in the Astral sea, going into the pool always takes you into the B_0 Mid-Astral. Or at least, nobody has found a way of doing otherwise.

It was postulated that the Echoes of Infinity's Homeline might be its B-axis worlds, but that was fairly readily disproved: see part 3 for an account of the PCs' interactions with Infinity.

If there is a pattern in the time differences between worlds in a B-stack, apart from them generally getting bigger as B_n increases, it hasn't been found yet. The furthest the characters have been down a B-stack was a B_{513} , at about 64,000 BCE from astronomical dating.

Very occasionally, a new B-axis world will "calve" from the B_0 . The new world becomes the B_1 , the previous world the B_2 , and so on. Conditions in the tunnels while this is happening are quite exciting, but nothing obvious happens in the material realm.

Limitations

Although travel via the Astral is quite flexible, there are some things that have not been figured out yet. There is no known way to use Jumper (World) to go to a *specific* place in the Astral or material. You can only stay "where you are" relative to the Earth, and switch worlds.

You can use it to go to the Astral from the material, and you arrive on the Near Astral close to your location in the material realm.

You also can use it to go to a specific material realm, from another material realm, or anywhere in the Astral, but you end up at the physical location corresponding to where you last left the material, plus any changes in q and r you've made by moving on the Astral.

This restriction corresponds to the similar restriction on parachronic conveyors (p. B.530), and exists for the same game reason, so that the familiar concepts of position and distance remain useful. It's re-phrased in terms of position relative to Earth because I prefer to start with minimally sound science before breaking its rules.

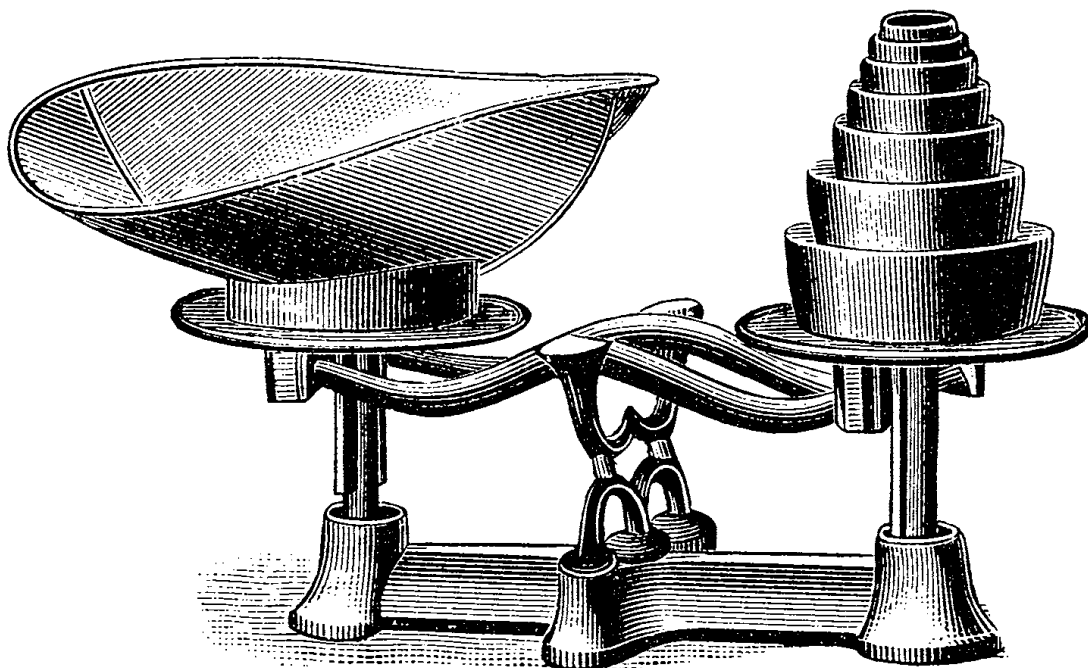
Astral encounters

As a realm of thought and concepts, influenced by all of the worlds, random encounters actually seem justifiable on the Astral. They are quite rare: I usually roll 3d, and count ones and sixes. With none of either, there is no encounter. Three ones are an implacably hostile encounter,

three sixes an extremely friendly one, and mixtures are less committed.

To decide what has been encountered, I use the Encyclopedia of Fantasy as a random encounter table: roll dice for a random page, look at the

things on that, and make an encounter out of it. If nothing leaps to mind, I either re-roll, or create a platonic ideal of whatever I've rolled. Those may well look harmless — the platonic ideal rabbit was an example — but are best left alone, if possible.



The Decan of Cheese

Roger Bell_West

The [Cheese College](#) is one of the more neglected schools of magic in **GURPS**, with a substantial spell list that is nonetheless rarely played. Why should its influence stop there? Clearly the Way of Coagulated Dairy Products should be included in other **GURPS** magic systems.

In particular, the system of decanic influences (originally from **GURPS Cabal**), describing as it does every imaginable thing, must have a place in it for cheese. Where might it fit?

It probably does not share a decan with an existing college, or Atrax, the decan of nourishment, would be the obvious answer.

Belbel, the decan of pain, torment, shock and loss, should probably be reserved for casu marzu. Buldumêch, wealth and worldly treasure, is too obvious. Tepsisem perhaps, beauty and its loss, for nothing cheese can stay.

But the principal contenders are Nefthada, pleasure and delight, and Alath, satiety and comfort. *Ars longa, caseus brevis*; the pleasure passes, but the satiety remains. Alath it shall be. Among its signifiers are select gentlemen's clubs (only the *most* select, clearly), and *square and cubic shapes* (!) which prove that we're on the right track.

Fine-Tuning Defaults

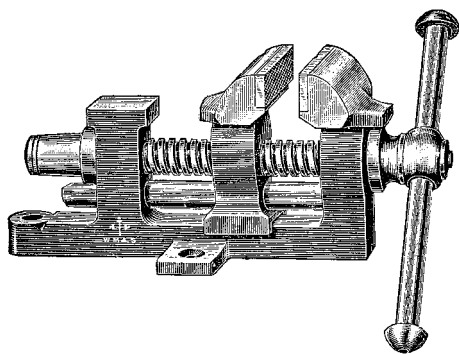
Paul Blackwell

Introduction

Default skills levels can be life-savers, and fine-tuning them can be an inexpensive way to add colour and detail to a character, or even form the basis of a character who is a “specialised generalist.” Some existing traits cover most of what is necessary: the Dabbler perk (*GURPS Power-Ups 2: Perks*, p. 16 or *GURPS Action 4: Specialists*, p. 33) allows improved defaults on a skill-by-skill basis, the Background Knowledge perk (*GURPS Power-Ups 2: Perks*, p. 16) explicitly allows a character access to those defaults that exist for some people but not all, and Jack of All Trades (*GURPS Power-Ups 3: Talents*, p. 11 or *GURPS Action 4: Specialists*, p. 32) allows improved defaults for all skills that have them.

Two new generic perks presented here, Amateur and Dilettante, fill in some gaps, primarily addressing skills that normally do not have defaults for any characters. Access to Background Knowledge, Dabbler and Jack of All Trades is not needed to use them, although they do work together well. At the end are some example power-ups making use of these perks.

The author is grateful to Jason “PK” Levine for comments on an earlier version of some of this material.



New perks

Amateur 1 point

This perk gives a way of creating or increasing attribute-based defaults for skills that take into account the existing skill-based defaults for closely related skills or specialties.

The idea is that we can improve defaults by considering the effect of spending actual points on one skill, then reducing the level of that particular skill but retaining the given defaults, reducing the cost at the same time. Specifically, we can:

- Start with a set of two or more skills/specialties with good mutual defaults.
- Spend two points on one of them.
- Keep the defaults which that gives for all other skills/specialties.
- Then reduce the level of the original skill/specialty to the default that it would have had if the points had been spent on a different one from the original set.

If the mutual defaults, difficulties and base attributes are the same, as is most common, that means that the linked skills or specialties end up with the same default levels.

We also reduce the cost from [2] to [1], which can be thought of as adding a quirk (“Doesn’t get primary benefit”), or taking a kind of optional specialty (“General principles”) or applying a -50% limitation to the skill (“For defaults only”). All these costing schemes are rather vaguely defined, but all lead to the same obvious result of a net cost of 1 point.

We can think of the whole thing as a new class of perks, Amateur, which gives improved defaults for a linked set of skills/specialties, based on the levels that would be obtained by spending two points. The cases in which this gives any benefit over just Dabbler, Dilettante or actually spending the points directly are limited. In particular, for characters with the maximum 3 levels of Jack of All Trades, Dilettante is generally the cheaper way to get defaults for all possible skills. The key exception is that Amateur (Engineer) often remains worthwhile, because of the long list of specialties covered.

The principal examples are those where some of the skills involved lack an attribute-based default completely. For the cases listed, the relatedness of the skills leads to higher defaults than Dilettante would give.

Example Amateur Perks

Amateur (Anthropology): Gives defaults of IQ-3 in Anthropology (Humans), to specialties for closely related species, and to Paleontology/TL (Paleoanthropology), and IQ-4 to Sociology. Note that Amateur (Paleontology/TL) may be better value, depending on the setting.

Amateur (Bioengineering/TL): Gives defaults of IQ-5 for all specialties of Bioengineering at a particular tech level.

Amateur (Engineer/TL): Gives defaults of IQ-5 for all mundane specialties of Engineer at a particular tech level (plus any exotic ones the GM specifies). Note: at TL5+, where Mathematics (Applied) is a pre-requisite for actually buying the Engineer skill, it would not be unreasonable to make the same requirement here.

Amateur (Navigation/TL): Gives defaults of IQ-2 in Navigation (Air, Land, Sea) at a particular

TL. Note: gives no benefit to Navigation (Space or Hyperspace).

Amateur (Paleontology/TL): Gives defaults of IQ-3 in all specialties of Paleontology at a particular TL, and in Anthropology (Human).

Amateur (Physician): Gives defaults of IQ-6 for Physician, Surgery and Veterinary, IQ-5 for Diagnosis, IQ-4 for Poisons, and IQ-1 for First Aid.

There are some possibilities where all skills have attribute-based defaults already. This list is far from complete. Also, for some skills there are different possible choices of specialty on which to base the perk. The most likely ones are listed, but certainly others are possible. In some cases the benefit compared with Dabbler, or with simply spending a point on one skill/specialty, is rather minor.

Amateur (Animal Handling (Carnivora)): Gives defaults of IQ-2 in Animal Handling (Dogs, Big Cats) (p. B175) and also for cats, bears, raccoons, seals etc.

Amateur (Artist): Gives defaults of IQ-3 for Artist (Calligraphy, Drawing, Illumination, Painting), and IQ-5 for Artist (Body art).

Amateur (Boating/TL): Gives defaults of DX-2 for Boating/TL (Large Powerboat and Motorboat) and DX-3 for Boating/TL (Sailboat and Unpowered).

Amateur (Demolition/TL)¹: Gives defaults of IQ-2 for Explosives (Demolition, Underwater Demolition)/TL at a particular tech level, and IQ-4 for other specialties of Explosives.

Amateur (Diving Suit/TL): Gives defaults of DX-2 for Diving Suit/TL and Scuba/TL and DX-4 for Battlesuit/TL, NBC Suit/TL, Vacc

1 Amateurs tend to terrify people with proper training.

Suit/TL. Note: see also Amateur (Environment Suit).

Amateur (Driving, Auto/TL): Gives defaults of DX-2 for Driving/TL (Automobile, Heavy Wheeled) and DX-4 for Driving/TL (Half-Track, Tracked) at a particular TL.

Amateur (Electronics Operation/TL): Gives defaults of IQ-4 for all mundane specialties of Electronics Operation at a particular tech level (plus any exotic ones the GM specifies).

Amateur (Electronics Repair/TL): Gives defaults of IQ-4 for all mundane specialties of Electronics Repair at a particular tech level (plus any exotic ones the GM specifies).

Amateur (Environment Suit/TL): Gives defaults of DX-2 for Battlesuit/TL, NBC Suit/TL, Vacc Suit/TL and DX-4 for Diving Suit/TL at a particular tech level. Note: see also Amateur (Diving Suit/TL).

Amateur (Guns/TL): Gives defaults of DX-1 for Guns/TL (LMG, Musket, Pistol, Rifle, Shotgun, SMG) and DX-3 for Guns/TL (GL, Gyroc, LAW) at a particular TL.

Amateur (Performance): Gives defaults of IQ-2 for Acting, Performance and Public Speaking, and IQ-3 for Stage Combat.

Amateur (Piloting, Light Airplane/TL): Gives defaults of DX-2 for Piloting (Glider, Heavy Airplane, High-Performance Airplane, Light Airplane, Ultralight) at a particular TL, plus defaults for other specialties as detailed on p. B214.

Amateur (Survival): Gives defaults of Per-3 for all land specialties of Survival, and Per-2 for Camouflage. Note: depending on the character's relative Per and IQ, it may be more efficient to invest in Naturalist.

Dilettante 1 point

This perk gives defaults for a specified set of skills that have no standard defaults for anyone. It represents a small amount of knowledge specifically in those skills, but they still count as defaults, not as studied skills, just as with the Dabbler perk. These defaults can be improved by Dabbler or Jack of All Trades as normal, within the same limits that apply to other skills.

The default given is Attribute-4 for Easy skills, Attribute-5 for Average skills, Attribute-6 for Hard skills, or Attribute-7 for Very Hard skills. Each Dilettante perk covers four such skills; for a skill that requires specialization, each specialty to be included counts separately. Multiple Dilettante perks can be taken by a character, and for convenience they can be listed as a single trait, costing 1 point for every 4 skills or specialties included; see examples below.

The skills and combinations permitted depend on the GM. Typically any skill on which an ordinary PC could spend a full point as normal is potentially available, so restricted skills e.g. Hidden Lore, may be excluded, as may any skills with Trained by a Master, Unusual Background etc as a pre-requisite. Skills whose main functions can be replaced by a roll against DX (Jumping and all six unarmed combat skills) are not available; defaults give no benefit because the skills' secondary benefits (e.g. special defenses) are specifically excluded (p. B173). Musical Composition is also excluded, as its use requires other skills at levels that will provide a useful default anyway. The skills with existing defaults that are worse than normal, Lip Reading (Per/A) and Physician (IQ/H), can be included, improving their defaults from Per-10 to Per-5 and from IQ-7 to IQ-6, respectively. Also, any specialty of Piloting or Submarine



(both DX/A) can be taken, giving a default of DX-5 in addition to the standard default of IQ-6, since ordinarily there is no DX-based default for these skills.

Example: A character who has grown up around circus performers may take Dilettante (Fire Eating, Sleight of Hand, Stage Combat, Ventriloquism), or Dilettante (Circus) for short, for 1 point to give defaults that most characters would not have: Fire Eating DX-5, Sleight of Hand DX-6, Stage Combat DX-5, Ventriloquism IQ-6. If she later spends an additional 3 points, she can “trade in” Dilettante (Circus) so that she has 1 point in each skill and default levels are no longer relevant; she then has Fire Eating DX-1, Sleight of Hand DX-2, Stage Combat DX-1, Ventriloquism IQ-2, for a total cost of 4 points, just as if she had bought them normally. If Dabbler is available, this progression can take place gradually, 1 point at a time, with all the perks being traded in when the fourth point is spent.

Example Dilettante Traits

Dilettante (Action) [5]: Fast Draw (Ammo, Knife, Long Arm, Pistol, Sword) and Forced Entry, all at DX-4; Sleight of Hand at DX-6; Navigation (Air, Sea) and Speed-Reading, all at IQ-5; Brainwashing, Computer Programming, Cryptography, Engineer (Combat), Physician and Ventriloquism, all at IQ-6; Surgery at IQ-7; Lifting at HT-5; Body Language and Lip Reading, both at Per-5.

Dilettante (Action Expert) [1]: Expert Skill (Computer Security, Epidemiology, and Military Science) at IQ-6. Note: these are separated from Dilettante (Action) because they are redundant for characters with high levels of Jack of All Trades.

Dilettante (After the End) [7]: Fast Draw (Ammo, Arrow, Knife, Long Arm, Pistol,

Sword, Two-Handed Sword) and Forced Entry, all at DX-4; Bolas and Lasso, both at DX-5; Net and Sleight of Hand, both at DX-6; Navigation (Air, Sea) at IQ-5; Brainwashing, Computer Programming, Hypnotism, Physician, and Veterinary, all at IQ-6; Surgery at IQ-7; Lifting at HT-5; Breath Control at HT-6; Autohypnosis at Will-6; Body Language and Lip Reading, both at Per-5; plus a further three specialties chosen from Engineering (Any) at IQ-6; Expert Skill (Mutants or Robotics) at IQ-6; Survival (Radioactive Wasteland) at Per-5 as appropriate to the particular setting.

Dilettante (Low Tech Fast Draw) [1]: Fast Draw (Knife, Sword, Two-handed Sword, and Arrow) at DX-4.

Dilettante (Navigation) [1]: Navigation (Air, Hyperspace, Sea, Space) at IQ-5.

Dilettante (Polymath) [5]: Navigation/TL8 (Air, Sea, Space) and Speed-Reading, all at IQ-5; Bioengineering/TL8 (All), Brainwashing/TL8, Computer Programming/TL8, Cryptography/TL8, Finance, Hypnotism, Linguistics, Metallurgy/TL8, Musical Instrument (Any one) and Ventriloquism, all at IQ-6; Autohypnosis and Dreaming, both at Will-6; Body Language and Lip Reading, both at Per-5.

Upgrades

As with Dabbler, a character should be allowed to convert points in Amateur and/or Dilettante into points in some of the skills, once they have spent enough points that making this conversion would completely replace the trait. Obviously this is most likely when small numbers of skills are involved.

Action Power-Ups

Generalist 1 25 points

Advantages: Dilettante (Action) [5]; Jack of All Trades 2 [20].

Generalist 2 50 points

Advantages: Dilettante (Action) [5]; Jack of All Trades 3 [30]. A further 15 points chosen from among lens advantages, Ambidexterity [5], Charisma [5/level], Combat Reflexes [15], Cultural Adaptability [10], Danger Sense [15], Eidetic Memory [5] or Photographic Memory [10], Fit [5], Gizmos 1-3 [5/gizmo], Intuition [15], Rapid Healing [5], Sensitive [5], Serendipity [15], or replace Luck [15] with Extraordinary Luck [30] for 15 points.

After The End Lens

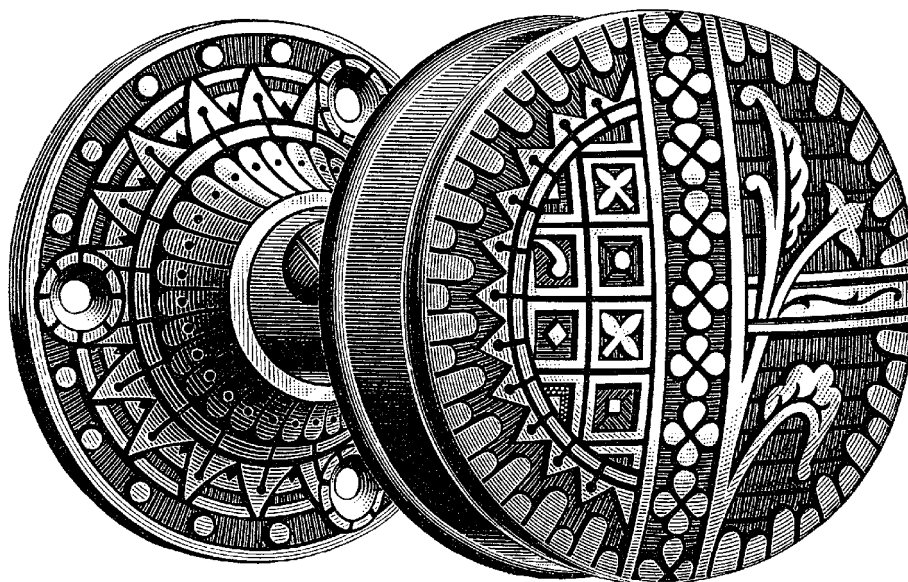
Generalist (+50 points) • Dilettante (After the End) [7] and Jack of All Trades 3 [30]. • 10 points chosen from among Ambidexterity [5], Charisma [5/level], Common Sense [10], Cultural Adaptability [10], Eidetic Memory [5] or Photographic Memory [10], Fit [5], Gizmos [5/gizmo], Rapid Healing [5], Sensitive [5],

Single-Minded [5], or Versatile [5]. • 1 point on each of two primary or secondary skills from different templates from your own. • Either Amateur (Engineer) or 1 point on another skill from a different template.

Meta-trait

Polymath: IQ +1 (Only for defaults, -80%) [4]; Amateur (Engineer) [1]; Amateur (Paleontology) [1]; Amateur (Physician) [1]; Dilettante (Polymath) [5]. *12 points.*

You have defaults of IQ-3 in almost all Easy IQ-based skills, IQ-4 in Average skills, IQ-5 in Hard skills, and IQ-6 in Very Hard skills (based on your IQ without the limited +1) and similarly for Per- and Will-based skills; see Dilettante for exceptions. You have higher defaults in the skills covered by the Amateur perks, which do benefit from your limited +1 to IQ. No specialties of Religious Ritual are included, as they are so culturally specific, and only one Musical Instrument is included; these can be covered by one or more additional Dilettante perks if required. The GM should be cautious about allowing this trait in high-powered games: with IQ 20, almost every skill is at a professional level.





Onno Meyer

While detailed vehicle design systems can be entertaining, the truth is that no game can build 'realistic' vehicle stats with three or more significant figures, no matter how scientific the system pretends to be. So taking a few basic vehicle write-ups like those in the Basic Set or High Tech and varying them with rules like yours is a quick way to keep the dice rolling and the adventure going forward.

But there is one thought. You have balanced the modifiers with a matched set of ads and disads, and sometimes with a maximum number of levels. But shouldn't the GM assume that many sample vehicles *already* have modifiers, and that they cannot be taken again? For instance, the 'deuce-and-a-half' truck from p. B464 might already have one level of Rugged, and taking two more levels would be excessive. If the Sports car already has one or two levels of Fast, another level would not reduce SR because it wouldn't be the first Fast.

If you ever expand your rules, how about more hints and tips to determine what the starting modifiers on a published vehicle are?

Roger: It's a reasonable thought, but I fear it would just come down to "the GM should determine". Does the TL7 Pickup Truck on that same page represent a generic pickup, or is it the Toyota Hilux that's famed among rough-country truckers (and tribal warlords) for its ability to keep going whatever you throw at it? I think that it has to be up to the GM to determine what should be allowed; this certainly isn't a system that you can toss to the players to let them design their own vehicles without GM supervision and approval.

David L. Pulver

An impressive zine, and definitely fills a gap. I am glad that you have a SMIF art piece, which means that Dan has been represented in both the GURPS fanzines I have read so far.

What GURPS Needs/Problem with Pyramid

I agree! But to stir the pot a bit more ...

John Dallman mentioned semi-historical as a preferred genre. Allied to that, I'd really like to see an alternate edition of the Basic Set offered at a lower price point that is split into two books: Book 1 should be the Basic Set: Human Characters minus all magic, psi, exotic, and paranormal traits; then Basic Set: Exotic

Characters then contains the text removed from Book 1 for those who want it without having to buy the original Basic Set again. The advantage of this set is to make it easier to learn GURPS by not throwing you in off the deep end when you're trying to build characters.

I do think Pyramid should have used a few articles to establish some baseline open-ended settings that set up fundamental universal rules and low-res expandable backgrounds, then encouraged authors and readers to create things in those broad backgrounds, so as to create a larger community base playing in the same garden.

What I mean by this sort of thing is typified by the early version of GDW's Third Imperium: "There's a galactic empire so vast there can be any number of worlds. The empire's highest TL is 15. Here is how human starships work. Most of the empire is human, but there are countless aliens in and around it. There's a low-power psionics system, but psi is suppressed. There are several major star-spanning institutions, but each sector, sub-sector, and world is also its own thing. The imperial government sends in the marines and navy to stop major wars or nukes, but anything else goes. There are rival megacorporations, corporate wars, and ruins from ancient alien races." Note that this has no set templates, exotic rules, etc. A lot of GURPS problems stem from player base fragmentation in the major genres. Original, clever worlds are great if you're going to support them, but if you're not, make something that's easy for everyone to live in. Infinite Worlds comes close to this, but the Centrum-based conflict and the travel mechanics are a bit too centralized and non-generic for me.

Dungeon Fantasy also almost does this, and if it presented a paragraph-length open world as an option, it would be perfect for me. But as is, it focusing on the dungeon element almost to the

point of self-parody, and it follows a SJ Games tradition found in both Yrth and TFT that I find annoying, which is an unwillingness to set up a level of "higher evil" like D&D's demons/devils that can provide useful metaplot.

Also, I have mixed feelings about Dungeon Fantasy's implementations. A lot of it is very good – the monsters and the action rules, for instance; the rules that simplify common tasks are inspired. But it is also so heavily focused on complex character builds intended to emulate the superhero tropes of D&D games of the 3rd edition and later era and thus enforce a particular style of play, and that part is not for me. The trouble is that for me, there was absolutely nothing wrong with standard GURPS character creation for medieval heroes and the gameplay element circa 150 points. For me, boosting things so that everyone gets to start out with a ST 18 dude with a ton of "cool" abilities just means it's much harder to write adventures for them.



I mean, basically just stuff “hundreds of petty kingdoms, independent city-states, and empires, most of them TL1-3; the standard magic system is in play, numerous gods and religions exist, culture is roughly medieval with magic, there are dungeons, and zillions of monsters exist and fantasy races, including (long list) XYZ.” Then plop, anyone can create their own kingdom or whatever but it’s all the same world. (TFT sort of does this, but TFT also has its own oddities.)

I read the Infinite Cabal article and especially enjoyed the more personable approach to discussing how things went in your own game (which we didn’t usually get in Pyramid). The setting looks quite atmospheric, but what I most appreciated here was the *Jazz and the Art of Campaign Maintenance* and *Play Style* sections. It’s neat to see how other GMs are doing things in practice. I appreciate the conceit mentioned (“everyone in the game is a player character, but some players aren’t participating”) -- it’s refreshingly old school realist in some ways, but in service of story. (My one unanswered question was how many sessions it took to go from 300 to c.800 points, which I think would have been an interesting detail.)

Vehicle Modification (Roger Bell_West): I very much like the modifiers, especially Thirsty, Forgiving, and Economical. They sound realistic rather than the other-the-top cute names some people might use. I think I’d like to see Fast as providing a smaller increment (5%?) after speed exceeds sound, as 10% can a bit much when applied to fast aircraft.

GURPS Powers: Totem and Nature Spirits (Rory Fansler): Unfortunately I haven’t read the original book, but the totem examples look well-done. I particularly like Honeybee’s emblematic traits. This reminds me of an anime I watched some years ago, where each character (in a modern-day setting) was a human embodying the spirit of a Chinese zodiac animal.

The other articles also looked solid (and crunchy in three cases), but being a week away from a deadline I may take a bit before I read them ...

Are you planning on being roughly quarterly?

Steve Jackson on Fanzines, long ago:

<http://www.sjgames.com/gurps/Roleplayer/Roleplayer28/FanzinesForever.html>



John: *I suspect the Human Characters/Exotic Characters form of the Basic Set would put potential players off. Most people coming to GURPS have some idea of how D&D works, where lots of things that would be exotic traits are available to low-level characters, especially in the modern editions. Presentations like the **DFRPG** seem like a sounder way to make GURPS easy to learn.*

We're expecting to produce 3-4 issues of PoC per year. This depends on how many contributions we get. For Infinite Cabal statistics, see Part 2 in this issue.

Roger: *While it seems odd to old-timers like me, most people meeting RPGs now are already familiar with dungeon tropes from video games, and that's what they want their system to handle first (though it's fine if it does other stuff too).*

The giant universe of shared assumptions does seem to have gone out of favour, possibly because companies have realised that they can sell books about the minutiae of their backgrounds – or at least that GMs have less time than they used to, and a world which is frozen (like classic Traveller's Imperium, or Transhuman Space) relies entirely on the GM rather than being open to new supplements.

You'd know the design process for 4th edition better than I would! But the impression I get is that, in the wake of the Compendia, the intention was to have one core book with every single advantage, skill, etc., even if some of them got extended and more specialised in supplements. Otherwise something like Telekinesis would end up being defined in both the Psionics book and the Superheroes book, or they'd depend on each other...

Dave Waring

Am I going to be expected to run Avalon under GURPS now? Points for an Avalonian dragon or giant – hmmmm

John: *You ran the first GURPS I ever played, in Avalon, and it showed me something important. The character of a game is strongly affected by the system, and trying to change system in a setting (Avalon is a rationalised D&D world) is going to change the feel. I'd only want to change the game system if the setting was struggling with the system, and Avalon doesn't.*

Vicky Molokh

I found 'The organisation and regulation of magic in the post-war world' the most interesting read, but also one that poked the most at my pet peeve: yet another setting which makes magic look more like psi in Babylon 5's Psi-Corps than *magic* in magical settings. Some hallmarks of this:

- Huge involvement of secretive government organisations in the topic of magic.
- Witch-hunt apologia.
- The suggestion of a register which is suspiciously similar to the psi-corps register: on paper you're not forced to join, but in practice the coercion is implied to be huge.
- Plans for wide-scale governmental recruitment and implicitly the accompanying propaganda.
- Hints of the governmental magical organisation lacking transparency and public accountability.



These are some of the things that are big differences between how magical settings tend to treat magic and how B5 treated psi (though lately I've seen some fantasy settings that imitate B5 in its treatment of magic, such as Dragon Age).

John: *Well, this is a GURPS campaign set during WWII, where the PCs and their opponents have been in intelligence services, special operations units and the like. There was no public awareness of magic being real at the start of the war and Appendix A really was the first public statement acknowledging it by any government. The secretive government organisations are the only ones with any practical expertise. Since most of their members will be leaving at the end of the war, civilian organisations can then be set up,*

Is it possible that the parallel you're seeing is between societies where significant individual powers have recently appeared? In I&R, magic seems to have started to work, a little, about thirty years before the campaign date, but was unknown to the public, and most governments, until much more recently. Magical settings in my experience rarely have magic as a new thing to the public; it's either still secret, or has been known for long enough that society takes account of it.

Several scenarios have been about amateur occultists who'd made up their own systems of ritual magic and got themselves killed or otherwise created major trouble using them. The paper isn't talking about magical training exclusively for government service, but training as part of the general education system, so as to allow magic to become part of society without lots of accidents. It isn't "witch-hunt apologia" but trying to avoid people getting killed by their neighbours' unwise experiments.

Are you seeing euphemisms in the paper for repressive government measures? If so, I think you're miss-reading the tone. This is a civil service

paper, which is trying hard to be honest and is somewhat blunt. The politicians have not got at it yet.

There's no deliberate parallel to the B5 psi-corps, because I didn't know of that (Babylon 5 didn't air until after I'd given up watching television). I don't see where you get large-scale governmental recruitment, though this may be a terminology issue: the British police of 1945 weren't under the control of central government, but were funded locally, as is still the case.

There isn't a governmental magical organisation described: the implication is that the various branches of government will recruit their own magicians if they can, but nobody knows how many magicians there will be, so making plans isn't practical yet.

Dalton Spence

As for Issue #2, one thing I would like to see is a general description of your *Irresponsible and Right* Weird War II setting similar to that of Newton-X in *Infinite Cabal* part 1. The reference files on your site are useful but I would like to see more about the magic systems you chose and the backgrounds of your PCs (the descriptions in your campaign log are a bit sparse).

Since this campaign seems to be ongoing you probably don't want to publish any secrets your players don't know yet but a general timeline of the war to date could be very interesting. The log itself is pretty dense and seems to assume the reader is a player with inside knowledge so some extra details wouldn't go amiss.

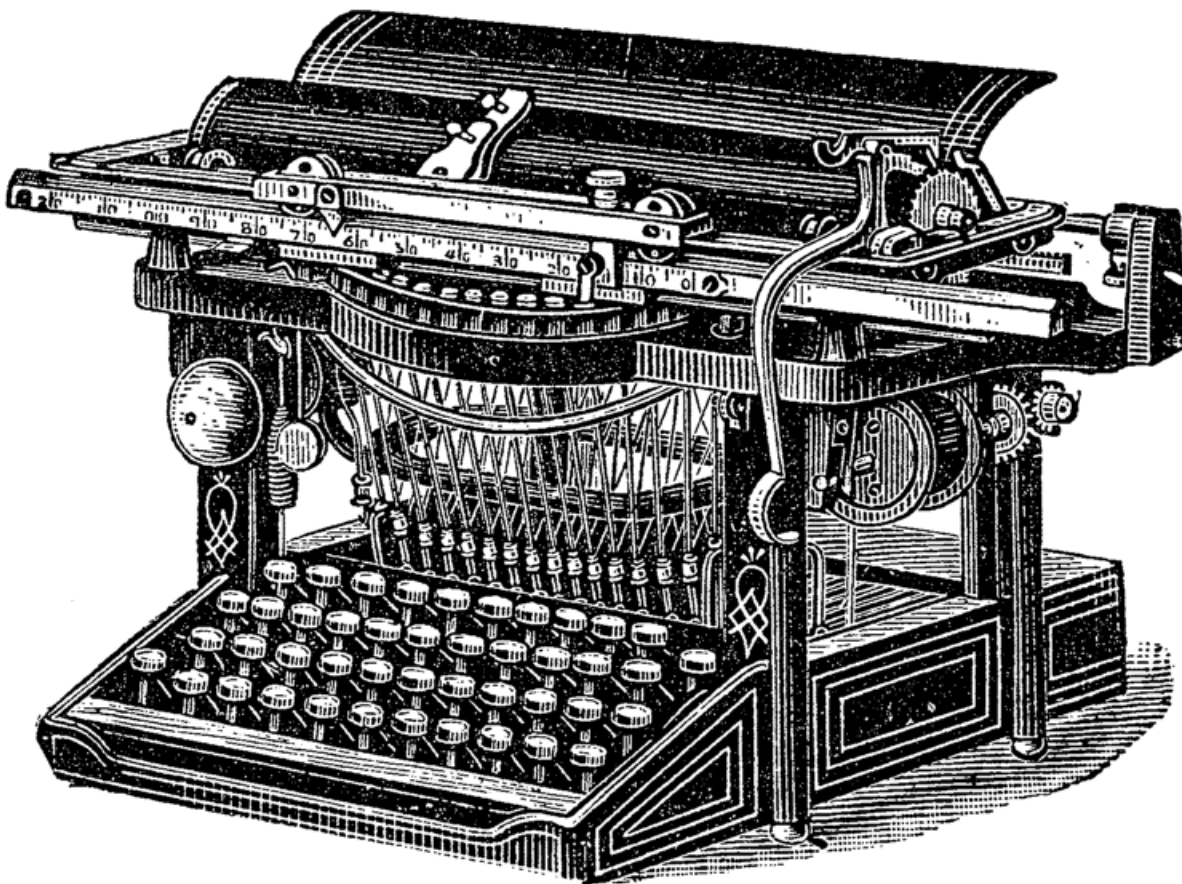
Neither would an IW style world profile but you might not want to go there.

John: *The campaign is indeed ongoing. I've written an overview, which Roger has supplemented and edited.*

We Also Heard From

Michael Abbott, David Cantrell, Peter Knutsen, Damon Howarth, Chris Potter, Christopher R. Rice, Bridget Wilkinson, and the commenters on the SJG forums.

Thanks to Bill Burns, Michael Cule, and Amanda "Dr Bob" Kear for help with distribution and publicity.



GURPS Community Contacts

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

SJ Games GURPS forum: <http://forums.sjgames.com/forumdisplay.php?f=13>

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

GURPSNet-L mailing list: <mailto:gurpsnet-l%2Bsubscribe@sjgames.com>

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

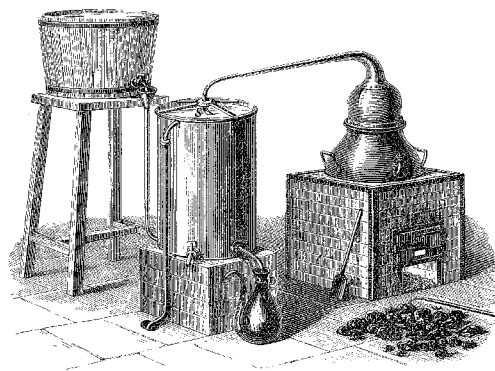
Stack Exchange GURPS: <https://rpg.stackexchange.com/questions/tagged/gurps>

GURPS Power-Ups 9: Alternate Attributes: Designer's Notes

Sean Punch

The **GURPS Power-Ups** series is a home for thoughts about character capabilities. It covers both “new subsystems” (**Power-Ups 1: Imbuements** and **Power-Ups 5: Impulse Buys**) and “trait catalogues,” with the latter further broken down into true compilations (**Power-Ups 2: Perks**, **Power-Ups 4: Enhancements**, **Power-Ups 6: Quirks**, and **Power-Ups 8: Limitations**) and collections that *also* expand rules for specific categories of traits (**Power-Ups 3: Talents** and **Power-Ups 7: Wildcard Skills**). Collectively, the series to date touches upon subjects that could fairly be deemed advantages (perks, Talents, and *modifiers* for advantages), disadvantages (quirks), and skills (Imbuement and wildcard skills) – matters topical for Chapters 2, 3, and 4 of the **Basic Set**, respectively.

What inspired me to write **Power-Ups 9: Alternate Attributes** was the observation that the **Basic Set** features another elementary character building block alongside the previous three: attributes (shorthand for “basic attributes and secondary characteristics,” in both the supplement and this article). These appear early in Chapter 1 because they’re *fundamental*. That means many gamers would see any change to them, however minor, as slaying a sacred cow. I figured that if anybody could get away with that, it would be the system’s cowherd!



What inspired the *content* of **Alternate Attributes** was years of discussion – mostly on the Internet, mainly on the SJ Games forums (forums.sjgames.com) – regarding how **GURPS**’ attributes aren’t *quite* right. They cost too much... or not enough. They don’t split things up fairly. There aren’t enough of them. And so on.

In particular, I wanted to collect in one place – and organize, and *refine* – 15 years of answers I’d given to questions on the forums. Those that leapt to mind when I started writing were making ST cheaper at higher TLs; solving the “problems” of players raising DX and IQ rather than skills, and of HT granting near-immortality for cheap; explaining what “going first” is worth when the price of +1 to Basic Move and a level of Enhanced Dodge already add up to the cost of +1 to Basic Speed; working out HP from weight for characters, just as for objects; debating whether Will and Per starting equal to IQ makes sense; and sharing my thoughts on the attributes I’d use were I redesigning **GURPS** from scratch.

As well, although I stand by the changes Fourth Edition made to **GURPS**, I liked the idea of noting non-uniform cost progressions, pricing all basic attributes in the same way, HT-based HP, ST-based FP, Basic Speed as running speed, and other concepts from previous editions – and in some cases from *Man to Man* or even *The Fantasy Trip* – in a Fourth Edition supplement, for the benefit of gamers who hadn’t followed Steve Jackson (or even been alive) for 40+ years.

Putting that stuff in writing caused a lot of new questions to pop into my head: If ST costs too much in some settings, are there backgrounds where it’s too *cheap*? While DX, IQ, and HT are

usually underpriced, are they sometimes *overpriced*? Do standard advantage and disadvantage costs still make sense once we start repricing attributes – and what happens to advantages and disadvantages that rely on attributes that go away? If we're fine with moving Will and Per away from IQ, why not do something similar with all secondary characteristics – and if we do, what are the formulas? If we decide on different attributes, what should they cost, be called, and control? What do these many changes do to the value of character points?

Alternate Attributes tries to answer these and many other “Okay, but...” questions.

Doing so led to even wilder ideas keeping me awake at night: While we're examining relationships between attributes and advantages, what about *replacing* advantages with attributes, like turning Charisma into a score that controls social skills? If social skills can have their own attribute, why not social *position*, like Status and Wealth? Why do attributes start at 10? Why do skills depend on attributes? Heck, why does everybody have the same set of attributes?

My answers to *those* kinds of questions are sketchier – more like thinking aloud – but they give adventurous gamers a starting place. To be completely honest, that remark applies to the entire work to some extent! This *isn't* an exercise in spoon-feeding. A great many ideas are presented without development. For instance, complete rules for external social attributes, rolls for purchasing goods (and their modifiers), Resource Points expended to do so (and recovered via monthly job rolls), etc. could fill a *GURPS Social Engineering* volume. Here are two ideas that didn't make the cut.



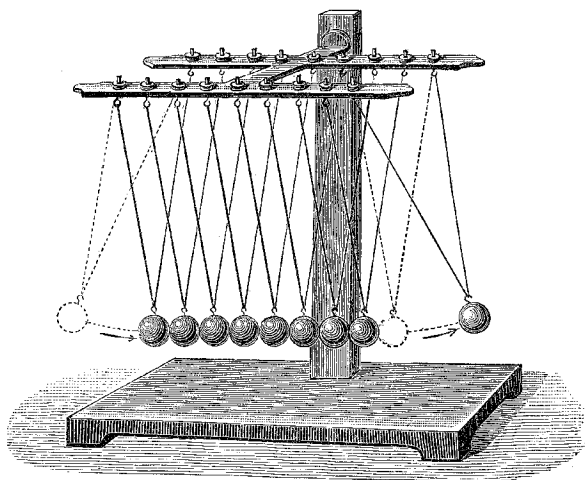
Crisis Response

Or Combat Reflexes, if you prefer. Either way, this attribute is abbreviated “CR” and retires the Combat Reflexes *advantage*. It also supplants the Combat Paralysis disadvantage. Enhanced Time Sense remains, granting accelerated perceptions and thinking, and the ability to act before those without ETS; it has no effect on the CR attribute and, with the retirement of Combat Reflexes, costs only 30 points.

The CR attribute replaces other attributes for three kinds of rolls:

- IQ for rolls to recover from mental stun – or, where applicable, to resist it in the first place.
- Will for Fright Checks, resisting Intimidation (not Influence skills in general!), and resisting supernatural fear and stun effects. Unlike Will, CR is neither “free” with IQ nor cheap, meaning *The Rule of 14* (p. B360) goes away. So does the Unfazeable advantage, which is now just “really high CR.” Fearlessness and Fearfulness remain, for those who want to adjust CR for this one specific purpose.
- Perception for rolls the GM requires for situational awareness, like registering an enemy's weapon, maneuver, or injuries. This *doesn't* replace most Sense rolls, even those made in combat for things like spotting snipers or hearing invisible foes. It *does* replace those for *Target Discrimination* (p. B390). It also replaces Per when it's read as distance for *Un sighted Shooting* (*GURPS Tactical Shooting*, p. 13), *Cool Under Fire* (*Tactical Shooting*, p. 38), *Close-Quarters Battle* (*Tactical Shooting*, p. 43), and similar rules.

The Soldier and Tactics skills *always* depend on CR instead of IQ. Combat and vehicle skills remain DX-based, but Block, Parry, and *vehicular* Dodge (p. B375) are found by floating the relevant skill from DX to CR and then doing the calculation. For instance, with DX 11, CR 13, and Broadsword (A) DX+1 [4]-12, your skill for hitting people is 12, but your Parry is figured from CR+1 = 14, so it's 10. By the same token, the GM can float any skill roll they feel is a defensive response – a reaction rather than an action – to CR. For example, Hazardous Materials remains IQ-based, but a roll to spot and not step in toxic waste might be CR-based where formerly the GM would have used Per.



Two situations that didn't formerly rely directly on attributes *or* skills use CR rolls:

1. Binary tests that depend on having or not having Combat Reflexes or Combat Paralysis becomes CR rolls. Success means you count as having Combat Reflexes or *not* having Combat Paralysis. For instance, if you have Light Sleeper (p. B142), roll vs. CR upon awakening to avoid stun. When assessing your mental state using *Threat Recognition* (**Tactical Shooting**, p. 33), a successful CR roll means you're in Condition Yellow, while failure means Condition White.
2. In a partial surprise situation (p. B393), the leaders roll a Quick Contest of CR – or Tactics,

if better – to determine initiative. Ignore modifiers for Combat Reflexes, IQ, etc., but leaderless groups *still* roll at -2.

Optionally – though it's *highly* recommended – Basic Speed shifts from $(DX + HT)/4$ to $(DX + CR)/4$. That way, CR influences Dodge (meaning it affects *all* active defenses) and who acts first in combat (which seems logical). When doing do, it's best to either use Basic Move = $(DX + HT)/4$ or make Basic Move independent.

What's a fair price? In any campaign where surprise, fear, situational awareness, and (most important) active defenses are a big enough deal to merit their own attribute, 10-15 points/level is reasonable. If CR also influences Basic Speed, go with 15-20 points/level. Before setting the price *too* high, remember that in the standard rules, warriors buy DX for attack rolls and active defenses, and now they'll need DX *and* CR.

Wildcards as Attributes

Doing Away with Attributes (**Alternate Attributes**, pp. 37-40) can be combined with *Separating Skills from Attributes* (**Alternate Attributes**, p. 44) and taken to an extreme in campaigns where character sheets are meant to fit into the space of a game card or even a cardboard miniature, especially in cases where **GURPS** is stripped down for use as a roleplaying “minigame” within a tactical boardgame or wargame. In that case, keep only a couple of key extrinsic attributes – say, ST and Basic Move – and give every character a small number of wildcard skills, perhaps just one, that function as attributes.

Consider a game that simulates one of the countless military computer games where every soldier belongs to a class. Warriors might have ST (used only to assess carrying capacity and HP, or “Life”), Speed (used mainly to rate *movement* speed, but in a tabletop rendition,

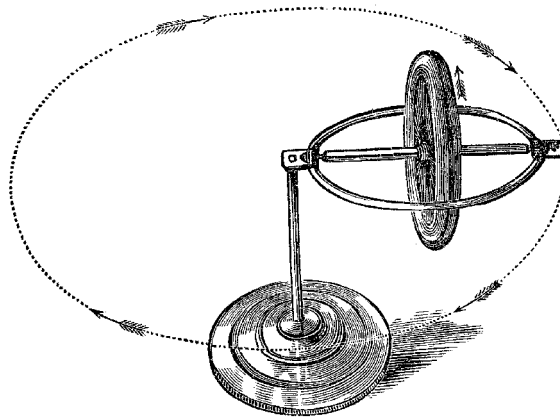
initiative as well), a Shooting skill for hitting targets with small arms (the *gamer's* reflexes and coordination would provide this in a computer game!), and their class skill. A possible breakdown for the latter would be Engineer (for setting and defusing explosives, including mines, and completing “build” and “repair” objectives), Intel (for picking locks, donning disguises, *spotting* mines and disguises, and completing “gather intelligence” objectives), Medic (for reviving and healing others), Ops (for calling in fire support and supply drops, and also reinforcements in the form of “capturing spawn points”), and Weapons (permitting use of antitank weapons, mortars, and other things heavier than pistols and rifles). Each hero's card or counter would have just four numbers on it; those in the upper left and right corners might be understood as ST and Speed, while bottom left is Shooting and bottom right gets a letter as well (e.g., M15 means “Medic-15”). Gear variations complicate matters, but then again, gear might have its own cards, with the total value in a player's “hand” limited by ST in its role as carrying capacity.

There might not be much choice in levels! Perhaps Light, Medium, and Heavy body types determine fixed ST/Speed combinations. The skills might all be priced “behind the scenes” as wildcard skills governed by an arbitrary, larger-than-life attribute of 13, with each hero having effectively 60 points in this for attribute+3, or

16 – the level where No Nuisance Rolls (*Perks*, p. 16) would be available, explaining why in video games, class-specific tasks simply take time but never fail. Although wildcard skills normally have no default, the pricing assumes Very Hard difficulty, so attribute-7 would be a fair default, giving everybody a flat 6 for out-of-class tasks. The GM might permit a little horse-trading between Shooting and class skill so that players can have, say, Shooting-17 and Intel-15 instead of a 16 in each if they really want.

Everything else that could possibly arise would be subject to *Filling the Gaps* (*Alternate Attributes*, p. 39). The GM decides what flat numbers work best in each case. A 12 or even 15 is fine if everybody is truly larger than life. On the other hand, if people automatically fall down once their Life score reaches 0, *HT* rolls might be against 9 or worse. These scores probably shouldn't be variable, but the GM may permit each character to have *one* “perk” (in the video-game sense, not the *GURPS* one) that improves the odds of *one* roll.

As a parting shot, note that this illustrates *Different Strokes?* (*Alternate Attributes*, p. 47), too. In the military video game example, only engineers have the Engineer attribute, only medics have Medic, and so forth. The flat default of 6 in out-of-class skills is nothing more than a special case of *Filling the Gaps*.



GURPS High-Tech: Electricity and Electronics: Designer's Notes

William H. Stoddard

A curiosity such as mine is the most agreeable of all vices — Friedrich Nietzsche

I started doing the research that went into ***GURPS High-Tech: Electricity and Electronics*** long before I thought of writing it, simply because I was curious. In a sense, it went back to my childhood in the 1950s, when I became interested in electronics, just as the transition from vacuum tubes to transistors was picking up speed — and at the same time, I started reading books about great inventors, including figures such as Morse, Bell, Edison, Marconi, and De Forest. Much later, I discovered that university libraries had histories of such fields as radio and computers, and became fascinated with their early development.

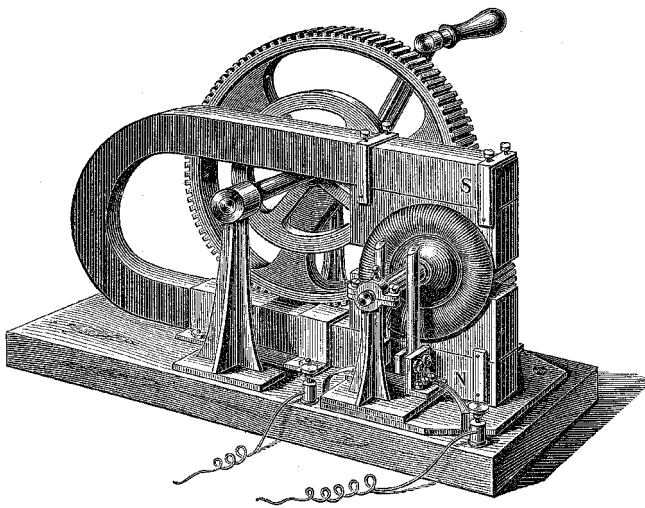
As well as this background, I took courses in college-level physics as part of completing a major in mathematics, during which I learned about things like Maxwell's equations and Kirchhoff's laws. So when I looked at ***GURPS*** rules for subjects such as electricity and radio, I asked myself about the actual physical processes the game mechanics represented.

My first ***GURPS*** book, ***GURPS Steampunk***, partly reflected these interests. I saw steampunk, back in 2000 AD, primarily as an alternate technological history: a “what if” about the progress of invention and its social impact. My biggest inspirations were novels about Charles Babbage's “analytical engine,” but I also asked myself what would have happened had nineteenth-century physics, with its theory of the luminiferous ether, turned out to be correct — and that led me back to electrical technology. The same interest went into my

compiling ***GURPS Steam-Tech***, not much later. So when I started thinking about a supplement to the current version of ***GURPS High-Tech***, I had already surveyed the ground. Now I had a direction for a lot of additional research (which was a bonus for writing this book, as far as I was concerned!).

In fact, my biggest original goal for ***GURPS High-Tech: Electricity and Electronics*** was to make its readers aware of the history of electricity, and to make them aware of how electrical devices worked in past decades or centuries, just as the primary ***GURPS High-Tech*** did for firearms. I started out familiar with many of the major names, from Franklin and Volta to Edison and Tesla and to Turing and Shockley; my reading added others I had scarcely heard of, such as John Frederick Daniell (inventor of a type of battery widely used in telegraph stations from 1836 until well into the twentieth century), Jagadish Chandra Bose (a pioneer in radio, inventor of the “coherer” used in Marconi's radio receivers), and Ernst Alexandersson (who developed radio transmitters based on ultra-high-speed alternating current generators). I also became aware of limitations of earlier technologies that are scarcely remembered today: batteries with electrodes immersed in a pool of acid, which couldn't be carried about; carbon filament light bulbs, which emitted a dim orange glow; radio transmitters with spark gaps, whose signals sprawled over a bandwidth of 100 kilohertz or more, internationally outlawed after 1920 to make room for more precisely tuned vacuum tube transmitters; or early computers that were “programmed” by physically rewiring their circuits.

After working on this for a while, I decided that some players might want their characters to invent various devices a few years early, or to construct devices someone else had invented. To help this, I provided both the dates when various inventions came onto the market, and the earlier dates when the first experimental versions were created. The **GURPS** rules for inventing require that a price be specified for any particular device, as a basis for making it Simple, Average, Complex, or Amazing. With devices that actually came into widespread use, I was often able to look up their original prices and convert them to 2004 dollars. But what if an inventor wanted to build something that was never more than an experimental design? For that purpose, I didn't try to figure out a market price; rather, I set a complexity level (which was basically an informed guess) and invited GMs to assign any price that fell into that range.



This approach also gave me a way to deal with the cutting edge of technology: devices that are currently being experimented with but aren't market-ready, from control of computers by EEG readings to microwave area denial weapons intended to produce intolerable pain without inflicting bodily injury. Sometimes I was able to find estimated costs for prototypes; when this wasn't possible, I assigned a complexity level that seemed appropriate.

I also took advantage of this project to address a concern that has been raised on the Steve Jackson Games forums: the assignment of Complexity ratings to computers at different TLs. The published material in **GURPS High-Tech** and **GURPS Ultra-Tech** had computers advancing in Complexity by one or two steps per TL. Consistent with this, to allow uploading of human minds onto computers in the not incredibly distant future (say, at TL10), the Complexity of a brain emulation was set at approximately half of its IQ score, plus or minus a small number. But at the same time, Complexity was tied to such measurable factors as the number of bits in a computer's memory and the speed of its internal processes. A computer at a given Complexity level was considered ten times as powerful as one of the next lower Complexity level. But the actual history of computers has shown roughly a tenfold boost *per decade* over the past half century! Reconciling these assumptions was a problem. One option was to say that Complexity had no real connection with any measurable feature of computers, but was just an arbitrary game mechanic. Another was to say that while present-day computers have many times more memory and are many times faster than computers at the start of TL8 (ca. 1980), those advances have made relatively little difference to their actual Complexity, because the software they're called on to run doesn't do much more now than forty years ago.

But I preferred a third approach: To retain the linkage between Complexity and actual measurable traits, which seemed more **GURPS**-like, and to assign Complexity scores to different tasks based on when computers of different sizes started performing them. So, for example, an early animated short film, *André & Wally B.*, was made in 1984 on a Cray supercomputer, but by the mid-1990s, computer animation was done on much smaller workstations. This approach let actual historical computer software be used as

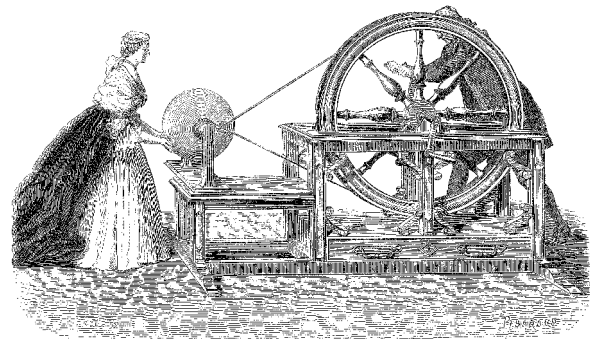
benchmarks for what could be done at different Complexities. In particular, in the recent past, an IBM supercomputer in Switzerland was used to simulate a single cortical column in a rat brain; since this came out to Complexity 9, and a human brain is far more complicated, the Complexity of a brain emulation would have to be greatly increased. Obviously all of this had to be treated as an alternative set of rules, for the use of GMs who wanted a more realistic, “hard SF” approach to computer technology — one that I didn’t try to extend past TL8, as doing so would necessarily be speculative rather than simply extrapolative.

As well as describing all these alternative, experimental, and innovative possible devices, I was able to find information on a lot of real devices that hadn’t been included in *GURPS High-Tech*. In particular, I focused on devices that had become available since that book was published. I mainly emphasized relatively small devices that could be carried on an adventure, in a backpack or in the trunk of a car, to give the book as much player utility as possible.

One particular focus for such devices was the technology of electronic warfare, especially the conflict between communications security and signal detection. *GURPS High-Tech* provided basic rules for this subject, but I wanted a more detailed treatment, and one that took account of the whole evolution of electronic intelligence, from the first use of loop antennas for direction finding to the latest software-defined radio systems. At the same time, I didn’t want to propose an alternative set of rules, but to provide additional devices and game mechanics for their capabilities. This part of the project came together when it occurred to me that the most sophisticated signal interception systems could be viewed as Discriminatory Radio, comparable to Discriminatory Hearing or Smell; I used this idea as a guideline for assigning modifiers to various tasks.

This and other parts of the project called for a careful look at the underlying physics of electricity, magnetism, and radio. As I noted, this was a subject I had studied more than once, but I still learned some additional things about it while researching this supplement and working out the game mechanics!

One major focus was expanding the rules for electric shock. The underlying physics for this seemed to depend on total energy delivered rather than on voltage: a static charge might be at very high voltage, but there was only a brief flow of current before it was discharged, so relatively little energy was delivered, producing nonlethal shock, whereas touching a power line delivered continuing damage and could be lethal even at low voltage, because the energy delivered added up over the course of a second. On the other hand, though lightning is a static discharge, it involves such a high voltage and charge that it can destroy tissue and is thus best treated as lethal shock that inflicts burning damage. For both lethal and nonlethal shock, I looked at the effects of higher and lower energy, and concluded that the best way to deal with them was to use the logarithmic progression built into the Size and Speed/Range table.



In the course of reviewing electric shock rules, I also looked at the effects of frequency. I was able to find results on the biological effects of DC, low-frequency AC, and high-frequency AC such as a Tesla coil puts out, and to adjust the ratio of burning damage to the risk of stopping the heart.

Energy also became relevant when I looked at radio communication, because the chance of detecting a signal depended not just on energy, but on how much energy was being delivered in a certain frequency range. Early spark gap radios delivered a poorly tuned signal whose energy was spread across a very wide band of frequencies, requiring a high power input to produce a signal. The tuned circuits that have been standard since shortly after World War I put the same energy into a narrow range of frequencies. More recently, spread spectrum radio (growing out of a proposal made by Hedy Lamarr during World War II) deliberately distributes a signal across a wider range of frequencies without boosting its energy, effectively hiding it in background noise — but letting a listener who knows what to listen for pick it out.

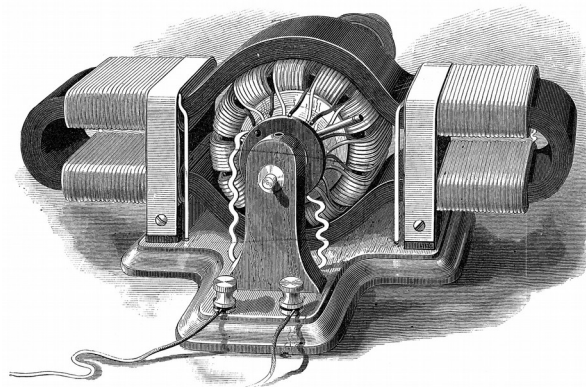
Another topic I took up in relation to radio signals was triangulation: the use of multiple receivers to spot the location of a transmitter by aiming their antennas to maximize the signal strength, and working out where the lines of aim come together. I spent a lot of time drawing diagrams of triangles and working out how to use the Size and Speed/Range table for tradeoffs between the separation of the receivers, the distance to the transmitter, and the accuracy with which it was located.

I had worked on illumination levels previously, for *GURPS Powers: Enhanced Senses*. But for

GURPS High-Tech: Electricity and Electronics, I extended this work, coming up with a system for figuring out how much light various light sources and lamp designs provided, and how light levels changed with range.

The big trick in all of this was to come up with gamable simplifications. I could do the geometry and physics — but to make this book useful to GMs, it needed not to make them do the same analysis. So after I worked out what was really going on (or a tolerable simplification of it), I had to turn it into simple tables where things could be looked up. Whenever possible, I reduced the necessary calculations to adding and subtracting.

In all of this, though, I was trying to maintain what I think is one of the great strengths of *GURPS* as a system: its use of real-world physical measurements to describe game worlds and define game mechanics. Sean Punch, the *GURPS* line editor, was a huge help in this, both because of his more advanced knowledge of physics, and because of his sense for what met the needs of GMs and players; and Nikki Vrtis, who did the final edit, helped clarify a lot of small issues and make sure my phrasing was understandable. I hope that the product is both useful in game play and thought-provoking for its review of the long history of electrical technologies.



GURPS Vehicles: Transports of Fantasy: Designer's Notes

Phil Masters

The idea of ***GURPS Vehicles: Transports of Fantasy*** arose because a previous project, ***GURPS Vehicles: Steampunk Conveyances*** had proved interesting and reasonably straightforward to write and acceptably successful in terms of sales. I never set out to be the founder of the long-mooted ***Vehicles*** line, but somebody had to go first. Anyhow, an obvious option with the second book was to follow the first in depicting a set of vehicles for a particular genre, and “fantasy” is generally a safe bet in such matters.

Which is not to say that vehicles suitable for fantasy games of one sort or another hadn't already been detailed in ***4th edition*** terms, mostly of course in the magnificent ***GURPS Low-Tech*** or one of its add-ons. I ended up borrowing a few game-mechanical details from there (with acknowledgement), but expanded them with a bit of research and a bit of imagination. In the process, I think that I took a slightly different approach to that adopted by the ***Low-Tech*** authors, even where I was covering overlapping subject matter. What I think I have ended up doing with both my ***Vehicles*** books is not writing tech books but writing books about *genres*. I hope that I gave as accurate a description as possible of those real-world vehicles that I mentioned, including the game numbers, but the point of the exercise was what they could do in game terms. How fast a chariot can go is sometimes an important question, but it only matters at all because there's a reason for a chariot to appear in play – in this case, in a fantasy game.

(Which said, it's not all about the fantasy; the narrative function of a vehicle may be its most

important feature in even the grittiest and most grounded of games. The technical research can throw up interesting details there, too. For example, very few people today who haven't done the reading or had direct experience perhaps realise just how damn *uncomfortable* an old-fashioned carriage could be, especially but not only on old-fashioned roads. You know that fabulous gilded state coach that the Queen rides to the opening of Parliament? Several members of the British royal family have been quite forceful on just how much they hate riding in it.)

And of course I got to invent some very fantastical vehicles. Flying ships are fun... Though finding excuses for their existence and guessing at game numbers for them is an art in itself. There's a predictable high elf sky ship, but I also referenced pre-existing ***GURPS*** settings such as “Azoth-7” and “Marchen-1”, which have their own distinctive flying technologies. I'm quite fond of the gnomish sea-going vessel with the fantasy nuclear Stirling engine, too. Those are both significant vehicles in their settings and distinctively *fantasy* artefacts.

But looking at vehicles' narrative function also led me to add some other material, which may be useful beyond genre fantasy games. This book has rules for uncomfortable bumpy coach rides as previously mentioned, and also for chariot collisions and harnessing times, a system for ship ramming damage that explains the huge shift in galley tactics between Classical and Byzantine periods, and more besides. And I still managed to sneak in St. Brendan's leather ship and a one-wheeled chariot. Hopefully, people will find a lot of uses for this thing.

Introducing Irresponsible and Right

John Dallman and Roger Bell_West

Roger's *Weird War II* [campaign](#) has been running since 2006. As of January 2020, the campaign date is in January 1945, and real-world history is no longer a reliable guide to its future. A fair amount of the divergence is the doing of the player characters, but not all of it. Because the campaign is ongoing, not all of its secrets will be revealed here.

Mechanics

The campaign is *GURPS* fourth edition, using *GURPS: World War II* in the "Gritty Heroes" style. The key difference from the historical war is that magic has emerged from the shadows and become important, so chapter 3 of *GURPS: WWII: Weird War II* has been a primary source.

The campaign is based in the UK, and is definitely Anglo-centric. The characters work for [Maxwell Knight](#) in MI5 section B5 (b). They were initially generated on 150 points, with up to 75 points of disadvantages, plus an additional pool of 75 points of "weird stuff" constituting their magical abilities. They could move points from the normal pool to "weird," but not vice-versa. Templates were not required, although *GURPS WWII* templates were used as guidelines for some of the characters.

The campaign has run monthly, with some gaps, for about 128 sessions, averaging 3-4 hours of play each. The usual award was three character points per session, and training was often available in intelligence-agent skills, so the highest-value characters are now around 630 points, depending on player attendance.

There is a [campaign log](#), kept by the GM, but it's mostly intended to aid the players' and GM's memories, and isn't easy reading for anyone else.

Play style

Gritty, but not harshly realistic. There are no impulse buys or wildcard skills, and planning and logistics are important. As counter-intelligence agents and troubleshooters, combat is not the characters' primary job. It's also quite dangerous, given the availability of powerful firearms and lack of armour, and is avoided where possible; the characters have usually had magical healing available, but know its limits.

There has never been any truck with the idea (which some role-players get from fantasy games) that melee combat should be a valid alternative to firearms.

Most of the characters don't attempt to use magic for direct combat: firearms, explosives and aircraft outperform it. Magic is marvellous for information-gathering, avoiding combat or gaining unfair advantages, and that's how it usually gets used.

The most-used *GURPS* books have been the *Basic Set*, *Thaumatology*, *High-Tech*, and the *GURPS WWII* line. *Lots* of history books have also been consulted.

The transition from TL6 to TL7 (with occasional ventures into TL6⁺) has been taking place during the campaign. *GURPS* rules-as-written don't fully support living through a TL transition and adapting to it. Roger wrote some [house rules](#) for that, which seem to work fine.

Campaign phases

In retrospect, the campaign falls into four periods, although the boundaries between them aren't sharply defined.

Finding our feet ran from the start of the war to the Dunkirk evacuation. We saw *HMS Royal Oak* [sink](#), took a brief part in the [Winter War](#) suppressing a Soviet magical operation, and were involved with ancient magical defences in Belgium, which *may* have caused the German panzers to pause before attacking Dunkirk.

Defending the UK ran until the end of 1941, and mostly involved dealing with magically-based espionage and sabotage operations, plus an attempt by German magicians to get perfect weather for an invasion. Operations like this continued to happen during the following phases. The Germans realised that the UK had people defending against magical operations, and tried to attack us in various ways, but we were able to thwart them, and they seem to have given up.

World Travel started with the discovery that magical conditions in the US and Canada were very different from Europe. A fair amount of time was spent there, and we incidentally prevented a magical project of Aleister Crowley's from setting off the San Andreas fault. The next major trip was to Stalingrad, where we sabotaged an unwise NKVD magical project that looked likely to destroy most of the cities of Europe. We went to Japan, to kill off the "Foo

Fighters," wooden swept-wing aircraft, apparently rocket-propelled, and extremely fast, which had allowed the Japanese to win at Midway. Finally, we returned to the USA, and found that its magical conditions were now much more like Europe.

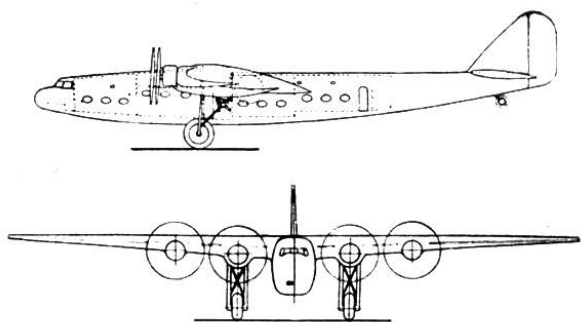
The current phase is *Strategic Influence*, which has been about supporting the invasions of Italy and France against magical interference. It's also included our organisation turning against us, as should happen in every long secret-service campaign. The matter was all sorted out, and Kim Philby is now safely dead. This phase will presumably last until the end of the war. Roger intends that to be the end of the campaign, possibly with an epilogue or two.

The phases match up fairly well with the phases of the war from the British high command viewpoint: the Anglo-French alliance, war alone, the formation of the alliance with the USA, and the movement towards victory. Roger didn't deliberately create the campaign phases, and they do seem to have arisen naturally from the war situation and the characters' priorities.

Campaign time

For much of the campaign, there was about one scenario, lasting a few days of game time, and about one session of play, per game month. This worked very well in the *Defending the UK* period, when it produced a plausible-feeling rate of events requiring the attentions of magical trouble-shooters. During *World Travel*, many of the scenarios required several sessions of play, and that continued into *Strategic Influence*, where the current scenario has taken thirteen sessions so far, and is not complete. That's taken seven weeks of game time.

Roger did consider having a month of game time pass per real-time month, but it wasn't practical. There's just been too much to fit into



single sessions at many times, and especially since the D-Day landings. Since then, we've had an average of five sessions per game-time month.

Campaign themes

The basic theme is of magic re-appearing in the world after a long absence. It's not clear how much of this is due to reality quakes altering history — which have definitely happened — and how much is a single world going through changes. If, indeed, it's possible to distinguish between these ideas when reality quakes are happening.

It appears that magic first began to work in about 1910, and has been steadily becoming easier. Casting spells and doing rituals was at -5, as if in low mana, at the start of the war, but the penalty has been decreasing and is now -1.

The characters' main activity has been countering attempts by the Axis powers, mostly Germany, to use magic to gain advantages in the war. This fitted well with MI5's basic wartime job of catching spies, and with the Allied grand strategy of using their economic and population advantages to win the war.

We've done this by catching and imprisoning enemy agents, trying to hamper Axis invasions and aid Allied ones, restraining people on the Allied side who have discovered magic and tried to put it to use unwisely, and generally trying to keep the advent of magic from wrecking things. In 74 separate scenarios, with many ongoing plot threads and NPCs, a great deal has happened.

Personalities

Roger: A significant corollary to the theme of reappearance of magic is that historical personalities have largely *not* changed: when Churchill or Himmler or Zhukov learns that

magic exists, this is melded into the way they already tend to think, and this affects the way they choose to employ magic and magicians in the conduct of the war.

John: This meant that, just as in other fields of Nazi endeavour, there were several factions of Nazi magicians, who helpfully spent their time competing for political influence rather than getting on with the war.

Human Evil

Roger: This is less a theme than a piece of guidance for the GM to keep in mind; Roger feels strongly that systems like Nazism arise largely from ordinary people doing things that seem reasonable to them at the time, not from some conscious desire to do evil, and has tried to echo this in the magical war... even as it's become clear that some Nazi uses of magic have been quite profoundly immoral, this is because they're people who have made bad moral choices, not because demons have been whispering to them¹.

Campaign development

John: The directions in which the campaign has developed have been strongly influenced by the players' and characters' interests. I'm distinguishing those because these characters have definitely developed ideas of their own.

Playing in the recent past, in our own culture, and in events which are at the edge of the older players' personal cultural backgrounds makes for deep immersion in one's character and the setting. None of us are old enough to remember the war — we were all born between 1950 and

¹ John: This has worked as intended. The characters have several times been seriously annoyed by the choices made by Nazi magicians, and have come up with ways to stop them that have, so far, deterred or prevented repetition.

1970 — but several of us had parents who took part.

The characters have a strong sense of their obligations towards their country and its allies. This sometimes conflicts with the GM's preference for a player-directed campaign; the characters know that their abilities are rare, and should be used in the Allies' best interests, as far as possible. Going to Greece to do some magical archaeology would be fascinating for the players, but there are magical air defences in Germany that need to be defeated to end the war.

Trying to write up the setting for publication would be challenging, simply because of the way it has developed, often in direct response to the actions of the PCs. Writing up all the German magical organisations in the detail that Roger has for the ones we've interacted with the most would be possible, but a lot of work.

John doesn't think Roger knows very much about the Japanese organisations: we've only been there once. We made a *beautiful* mess of the system they were using to broadcast magical power all across the Pacific for the "Foo Fighters", and left. The US Navy then managed to recover from having taken heavy losses at Midway, and the invasion of Hawaii, and as far as we know, their war is back on the historical track.

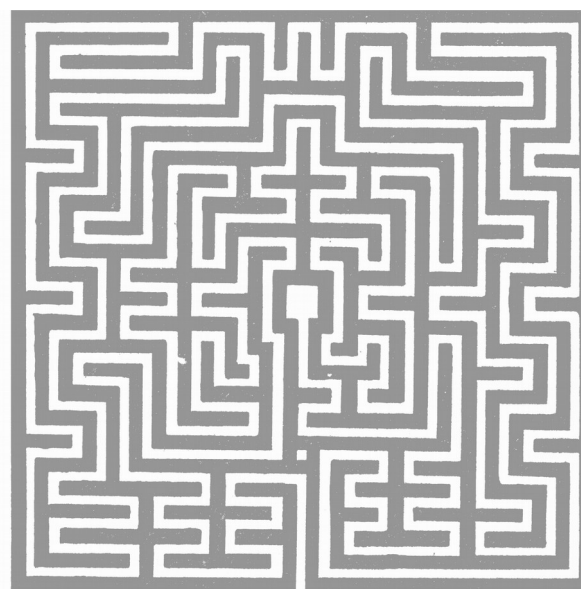
Roger: The first stage of scenario development has always been to look at what was going on historically at the campaign date (including things that hadn't yet happened, but for which the preparations were in train) and see whether there was something that could make for interesting play, either in its original form or in a magical equivalent (thus October 1940 saw a "Battle of the Charms" paralleling the Battle of the Beams). The idea is not to have just "a WWII adventure" but "a January 1942 WWII adventure". Which is an incentive for me to

keep things at least somewhat on the historical track, which led to:

The Knight-Fuller document

John: As part of the reality quakes (probably) the party acquired a document that includes a short history of *a* Second World War, with much the same information as Chapter 1 of **GURPS: WWII**. This showed up during time spent in Egypt and Palestine in autumn 1940.

Comparing this history to that of the setting, it's become clear that when our WWII diverges from that course, and the cause of the divergence is removed, our war tends to return to that course. This goes beyond historical inertia, to "historical bounce-back."



This is very convenient for the GM, because it means he can carry on using historical information. For the characters, it would raise serious questions about the nature of reality if they had time to think about them.

The document appears from internal evidence to have been sent back in time from a point after the end of WWII, aimed at 1910 or so, as a warning to the UK not to get involved in WWI.

It has a lot more information about WWI, which seems to match history.

It seems possible that the appearance of this document, sent by future versions of Maxwell Knight² and [J F C Fuller](#) is what started the re-emergence of magic, or caused reality quakes that changed history so that there had been magic in the past. We don't know, and we don't really expect to find out until the session after the end of the campaign when we ask Roger to explain a few things.

The effect of this document on the campaign has been excellent. It makes it far easier for the players to firewall their own knowledge of WWII if the characters know the outlines. It has helped the characters stay alive, and given them a big shared secret, which tends to bind a group together.

Secrecy

The characters have the impression that there are more British magical operatives, apart from the ones they've recruited out of scenarios. The characters know they don't have need-to-know about those, and haven't tried to find out about them. Since they're at risk of capture they also don't get to know about Ultra, or any other major secrets outside their portfolio. They do know quite a lot about magical operations, but this is unavoidable.

The idea of reality quakes is a secret held by the characters, Maxwell Knight, and whoever he's told. As far as we know, the Allied political leaders and the Combined Chiefs of Staff don't know about them.

The characters have one huge secret, their greatest mistake, which indirectly caused the

2 Yes, our boss. He didn't know about it until we told him. We've talked to Fuller a bit, but we have not told him about the document. He is not *entirely* trusted.

destruction of Chicago when the first nuclear reactor was started up in December 1942. They have never written it down, and never intend to do so, or tell anybody about it. The Manhattan Project was abandoned, so it is not clear how the war with Japan will conclude.

Science and Magic

The Knight-Fuller document warned against nuclear power, because in that timeline, when the first nuclear reactor was started up, and again when the first atomic bombs went off, magically talented people all over the world went mad or died.

When the PCs started looking into radioactivity and nuclear energy, it rapidly became clear that magic interferes with it, and vice-versa, in ways that aren't yet entirely understood by them.

Uranium bullets are effective against magical defences, and salamanders can "let the fire out of" uranium with much higher yields than fission, but risking reality popping like a soap bubble.

There were also technological ways to handle magic, used by the NKVD and some of the Germans. They required minerals from Tunguska but those stopped working after some strange events at the start of the Battle of Stalingrad.

A lot more is understood by [Niels Bohr](#), who the characters were able to recruit into their scientific support team after his escape from Denmark. They mostly follow his suggestions, but not always.

There have been some American magical technology projects. One was Einstein's, about time travel, and will have given rise to the legends of the Philadelphia Experiment. It was shut down by Einstein after an explanation from

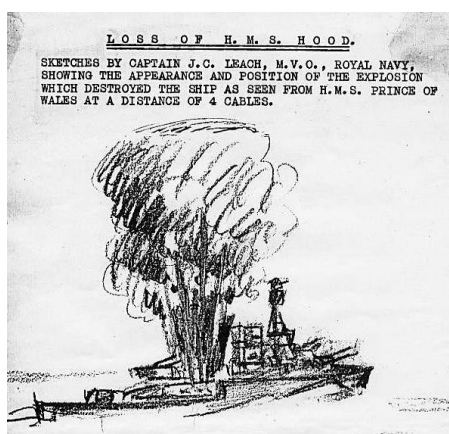
Bohr about how dangerous it was for reality. The other re-created the [Warlock's Wheel](#) from *The Magic Goes Away* to burn out magic in an area, and also turned out to be dangerous for reality. The agency running that one was rather fanatical, and we hope they've been shut down, but we aren't sure.

Changing history

On the surface, the campaign looked like the historical WWII for a long time. The sides, issues, leaders, organisations, resources, and equipment were the same, until you looked at quite small details, and the atmosphere has been as close as players and GM could manage.

There were scenarios that provided explanations for puzzling bits of WWII history, such as the [Panzers being held back](#) from Dunkirk, and the failure of the Italian Army to [advance into Egypt](#) after crossing the border from Libya; meanwhile, the [Tizard Mission](#) had been slightly less open-handed, having learned that some of its technology had existed deep in the past (since a reality quake happened) in ancient Egypt.

The first deliberate attempt to change history by the characters was sinking the *Bismarck* before she could [sink](#) *HMS Hood*. That worked, but was mostly cancelled out by the Imperial Japanese Navy. A wargaming exercise, some coincidence, and some speculation led to greater consequences:



Roger: The next assignment for *Hood* would have been as part of [Force Z](#), the naval force centred on *HMS Prince of Wales* and *HMS Repulse* that was historically destroyed by Japanese air attack off Malaya. This world's Force Z was thus stronger. This seemed as though it might make for an interesting wargame, so Roger and a friend played it out (using the *Victory at Sea* rules by Matthew Sprange, which are fun and fast-playing but not very detailed). Because of spotting rolls, the Japanese naval force encountered and engaged Force Z, sinking *Repulse* and the escort ships and crippling *Prince of Wales* and *Hood* while taking heavy losses themselves; when the Japanese aircraft arrived, they finished off *Hood* at great cost, but *Prince of Wales* was just about able to limp home (though she'd be out of action for the rest of the war).

Roger: The lesson learned by British commanders, and passed on to the rest of the Allies, was thus not the historical “air cover is *absolutely vital* for a naval force”, but instead “strike aircraft are fine for finishing off damaged ships but still take casualties, and haven't been tested against ships in fighting trim” — in other words the doctrine that already existed. That in turn meant that the Americans were more complacent than historically when *they* first went up against the Japanese... and the effect of that error was compounded by the next obvious change to history being the “Foo Fighters.”

John: In summer 1944, the characters started risking bigger changes, when they seemed likely to end the war sooner and thus reduce the overall death toll³. Arranging for General Mark Clark to have [specific](#) orders about intercepting and destroying the German retreat from Monte Cassino, rather than seizing Rome and letting the Germans escape worked well: it started a

3 When you can't ask for orders because what you do is too secret, it's best to go for morally sound choices.

chain of events resulting in all of Italy being liberated by mid-October 1944.

Arranging for the estuary of the [River Scheldt](#) to be the primary target of the British and Canadian armies after the breakout from Normandy was also effective. It meant that Antwerp was in service as a supply port from September 1944 instead of the end of November, and as a bonus, Operation Market Garden didn't happen, *then*.

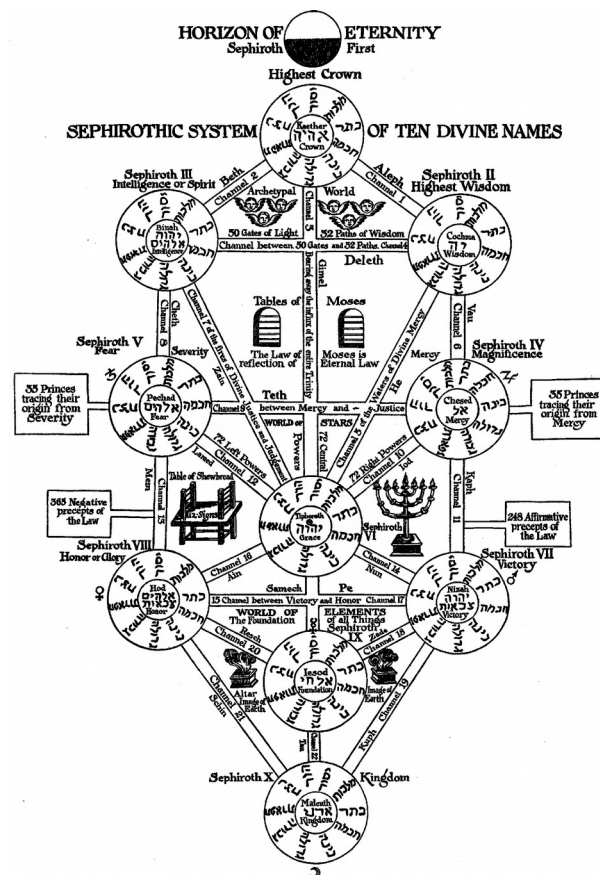
We have not had history all our own way. The German counter-offensive of late 1944 was in the Netherlands rather than the Ardennes, for a shorter route to Antwerp, had better weather (thanks to magic) and nearly succeeded. Its cost to the Germans was about the same, though.

There's also been a huge change to history in the USSR. The characters got a warning, based on the Knight-Fuller document, sent to the Polish Home Army that the Red Army probably would not help with the [Warsaw Uprising](#) of early August 1944. It started anyway, and the Red Army *did* help.

Stalin recalled Rokossovsky, the general in question, who refused the summons with "I have a battle to fight." In the background of a photograph was one of his staff officers, one Alexei Morozov, whom we first heard of in August 1942, when he was one of Beria's staff officers in Moscow, feeding information to MI6, and seeking British support for his bid for power as the "rightful Romanov heir."

Stalin "stepped down" in September 1944, "taking responsibility" for the Katyn Massacre and "ended his life" two weeks later. Morozov is now General Secretary of the Communist Party with no publicity about his Romanov claims, Molotov is terrified of him, and Beria is on trial. Morozov is being much more reasonable than Stalin was in summit conferences, and is

continuing with the war. The players have no idea how all this will turn out. They have some guesses about how he might be doing all this, but no evidence.



Magic Systems

A majority of the characters use magic-as-powers, all with the Mana-Sensitive (-10%) limitation. There haven't been any other power sources used in the campaign, as far as I know. There has been magic that looks like psionics, magic accessed via technology of various kinds, lots of ghosts and spirits, and just a few physical undead. But it's all the same at the lowest level.

Actual spell-casters or ritual-performers have used a variety of systems. There has been one user of the standard **GURPS** magic system, but he didn't stay around. The most-used magic system after individual powers has been Effect Shaping Path/Book magic, as per *Thaumatology*.

Some opponents have used Armanic Rune Magic, as per *Weird War II*. One PC has a custom syntactic magic system (see below) and another uses a magic-as-powers tradition that is shared with NPCs.

Roger: There is some evidence internal to the world that magic is shaped largely by belief; several NPCs appear to have developed magic systems consistent with their prior beliefs, with varying degrees of success.

Player Characters

The characters weren't designed as a team. They were created independently by the players, including the stories of how they acquired their abilities, and had to learn how to work together. This kind of improvisation was normal in the UK at the start of WWII, and often worked surprisingly well.

There have been personal animosities, but the characters now have so much shared experience that they have more in common with each other than anyone else.

In order of rank, at the time of writing:

Kingsthorpe

Lieutenant-Colonel Brian Kingsthorpe, Royal Engineers, is a veteran of WWI, which he spent building ports in France, never getting near the front lines. He's also a veteran of the Hermetic Order of the Golden Dawn, practising Path/Book magic with hermetic modifiers (the decanic system that originated in *GURPS Cabal*).

A Major at the start of the war, he has been the party's commanding officer throughout the campaign. His personality is rather unusual for a ritual magician, being quiet and unassertive, and

he Does Not Get On with Aleister Crowley⁴. If Crowley is an important magician in the setting, he's keeping an uncharacteristically low profile.

The colonel has developed some excellent contacts in the Imperial General Staff, thanks to his team's record of solving weird problems quietly. *Played by Phil Masters.*

Alexander

Wing Commander Vincent Alexander, RAF, is a veteran of [Tallulah Bankhead](#)'s visits to Eton College, and the Berlin and Hollywood film industries, which gave him some personal acquaintance with senior Nazis, and with Howard Hughes. Returning to the UK just before the start of the war, he was commissioned as a Pilot Officer since he already had extensive [flying experience](#), and has juggled the demands of MI5 and RAF service since then, gaining a distinguished record in the Battle of Britain.

His magical abilities include stunning good looks, charisma, mind control, telepathy and telekinesis. He has considerable mundane skills in leadership, piloting and gunnery, which account for his impressive row of medals. He's also engaged to Princess Charlotte, the youngest sister of King George VI. (She was created by a German magical operation, which caused a small reality quake, at the cost of all the operators' lives.)

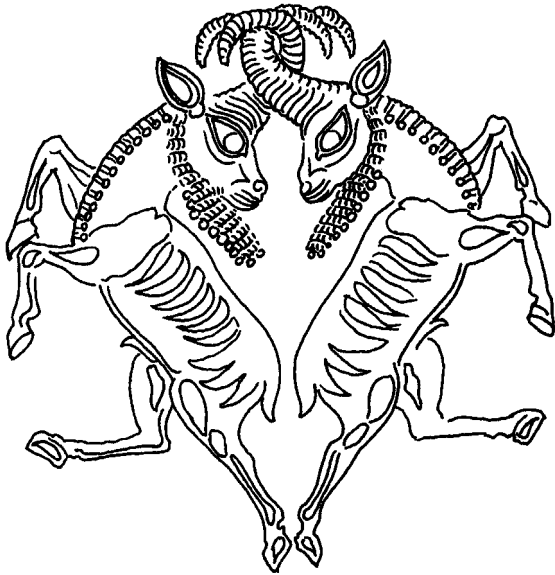
His personality is very different from the Colonel's and there was real friction between them in the early days, but they get on reasonably well now. He was swift to seize command when the Colonel was possessed by a German spirit, but normally the Colonel commands on the ground, and Alexander in the air. *Played by David Devereux.*

⁴ Crowley once accurately described Kingsthorpe as "A moderately talented dabbler with the soul of a suburban bank manager."

Highfield

Captain Bernard Highfield, Intelligence Corps, SAS, and SBS, served in the Mediterranean until mid-1944. He came with a recommendation from [Paddy Mayne](#) when he joined the team after Vane's departure (see below).

Some documents found in Damascus gave him insight into Zoroastrianism, and he's developed a form of [Syntactic Magic](#) based on that. It has a complete set of verbs, but only three nouns, Fire, Light and Truth. This requires ingenuity, which he's developing. *Played by Zygmunt Lozinski.*



Argas

Captain Peter "Pete" Argas, Intelligence Corps, served late in WWI as a young private. He discovered his power of invisibility during [Operation Michael](#), when his battalion of the Royal Fusiliers was overwhelmed. He's never commented on how a young working-class man with invisibility came to learn stealth and lock-picking between the wars. His other abilities include night vision, magic detection, mediumship, and trying hard to be undetectable.

His basic job is infiltration, stabbings, thefts, and explosions, plus sniping. He's branched out into detective work, intelligence analysis and keeping track of our lists of problems and things we might be able to do about them. He's also learned most of the aircrew jobs apart from piloting, and is Alexander's preferred aerial navigator.

He's the only PC with a wife and children, who add background colour, and have been involved with a few scenarios. *Played by John Dallman.*

Matthews

Captain Reginald Matthews, Indian Army, spent WWI in the Middle East. A long-time civil servant in India, he learned the ideas of the Mysterious East, manifested in his ability to speak with and control plants and animals. He's also become a medium, with Nordmann (below) as his spirit guide.

He's a surprisingly carefree personality for the oldest of the team, and has nearly been killed several times, and actually killed once, surviving thanks to an Extra Life and assistance from Nordmann.

Kirilov

Lieutenant Vladimir Igorovich Kirilov, Red Army (Main Intelligence Directorate, "GRU") was assigned as a liaison officer to the team in Stalingrad, tagged along when they left for Moscow, stayed with them on the trip back to London, and defected to the British. He did not actually believe in Communism, which is why his knowledge of its doctrines is so comprehensive.

He practices [White Russian Elementalism](#), a school of magic dating back to Tsarist times, which is well-established in the modern GRU. Fire and tunnelling are his main specialities,

along with sniping. He's definitely the best team member for large-scale destruction with personal abilities. *Played by Ingvar Mattsson.*



Vane (departed)

Private Barbara Vane, [Auxiliary Territorial Service](#), discovered her abilities as a medium pre-war when she visited a WWI cemetery and met her relative buried there. He became her spirit guide, known as "Sarge" and they were invaluable members of the team until shortly after D-Day.

As well as mediumship, she learned piloting from Alexander, Path/Book magic from Kingsthorpe and acquired healing powers. However, her greatest value may have been as the voice of sense and reason.

Her player's increasing health difficulties, and the unwillingness of the other characters to allow a young woman to risk major danger (I think these were connected in the players' subconscious) resulted in Vane leaving the team

with a small army of French ghosts to assist in the clearance of France. *Played by Karen Gilham.*

Nordmann (deceased, still serving)

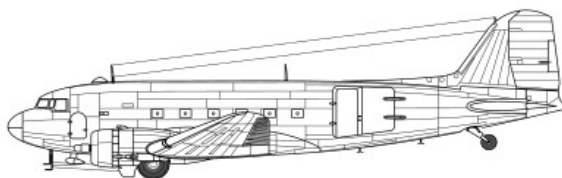
Ola Nordmann was a [Sámi](#) shaman, with Norwegian citizenship, who crossed the North Sea by canoe in December 1939 to volunteer for MI5 service. His magical abilities included weather control and healing, and he was also an expert at reindeer herding, boating, demolitions and sniping.

He died outside Stalingrad, in combat against a "Golden Boy," a Waffen-SS trooper empowered by technomagic, when he couldn't resist the impulse to put his head up and take another shot after being wounded. He now acts as Matthews' spirit guide, and often operates with Argas, but is still Impulsive. *Played by Ingvar Mattsson until his death. Since then, an NPC guided by David Cantrell.*

Carnegie (believed in Hell)

Robert John Carnegie was a civilian volunteer from the USA. He seemed to be an accomplished magician, using the standard system, but was worryingly familiar with demon-summoning.

He was lost on the first scenario, the sinking of *HMS Royal Oak* by U-47 in Scapa Flow, when he was attacked by suddenly-living ropes and then dragged underwater by an unknown force. Scrying for him produced a terrifying vision. *Played by Ingvar Mattsson, who deliberately produced a character who'd die in the first session to establish campaign atmosphere.*



Dogfighting

Roger Bell_West and John Dallman

GURPS has good basic rules for vehicular actions, but running a game set in WWII Roger has found a need for more detailed rules for aerial combat – while not going to the extreme of a hex-grid map (there are already good tactical boardgames that do this, but they tend to be too complex and slow for use in a role-playing session). The more these rules are pushed away from that setting, the more likely they are to break.

Like **GURPS Mass Combat**, it's not intended as a stand-alone wargame, but rather as a way of resolving air battles and working out what happens to the participants with a little more detail than a quick contest of Piloting.

These rules are derived loosely from **GURPS Action 2: Exploits** and **GURPS Spaceships**.

The standard dogfighting turn lasts 20 seconds. All crew on a single aircraft act at the same time; normally aircraft (and other combatants, such as flak sites) act in descending order of the pilot's or commander's Speed, breaking ties with the lower SM aircraft going first. A missile with more than one turn of flight time counts as an aircraft in its own right; if it is command-guided, its controller is regarded as its pilot even though they are not on board.

Each character on board an aircraft may perform a single task, or may attempt multiple tasks at a penalty: -4 per extra task after the first, applied to *all* that character's tasks. (This is quite usual for a single-seat fighter.)

An attacker may be Engaged with a single aircraft (flying closely and responding to its manoeuvres), and may in addition be Advantaged (behind it and facing it); but any

aircraft may only be Engaged with one other. (This isn't a two-way constraint: several fighters can all be Engaged with, and potentially Advantaged, over a single bomber.)

Statistics

You will need a standard vehicle statistics line for each aircraft involved.

For the purposes of these rules, Move is split into Acceleration and Top Speed.

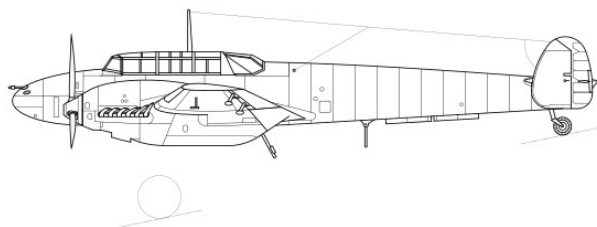
For each aircraft involved in the fight, you will need to keep track of its range bands to other aircraft.

Altitude is abstracted into Engaged and Advantaged status.

Extra Hit Points

While the GURPS system of hit points works well for immediate injury, it makes large vehicles excessively vulnerable to accumulated damage. We recommend modifying the HP of large vehicles: if ST is higher than 20, $HP = ST \times ST \div 20$. This is used only for general damage accumulation; other uses of HP, for example to determine whether an attack is severe enough to cause major damage, continue to use the ST value.

(Thanks to David Pulver for this suggestion.)



Ranges

Dogfighting combat uses abstracted range bands.

Range band	Distance	Penalty
Close	20 yards	-6
Short	100 yards	-10
Medium	500 yards	-14
Long	2,000 yards	-18
Extreme	10,000 yards	-22

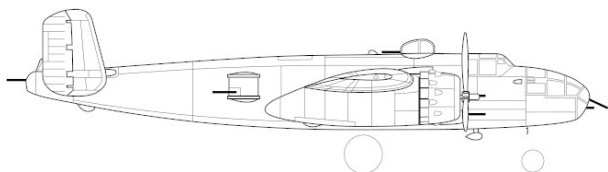
Opposed Piloting rolls

Several tasks need Piloting rolls; make either a simple Piloting roll, if no opposed aircraft are nearby, or a Quick Contest of Piloting skill against your primary opponent (if you haven't yet chosen one, or indeed if you haven't detected one, the GM assigns it). Each pilot adds to their skill:

- Their aircraft's Hnd rating.
- +1 if their aircraft has a higher Acceleration than that of their primary opponent.
- -6 if it's a Quick Contest but they have not detected their opponent.
- Any applicable penalty for darkness or obscured vision.

The sum of Hnd and Acceleration modifiers is referred to below as the "manoeuvre bonus".

If an aircraft has Advantage over another, it may not be fired on by that other aircraft's forward-facing guns.



Dodge

Your vehicular Dodge equals half your Piloting skill, rounded down, plus the aircraft's Hnd rating. Combat Reflexes adds +1, as always.

Camouflage

Camouflage for aircraft was popular at TL6, but became much less important as radar became the dominant way of detecting them during TL7.

There are two types: ground camouflage, mostly intended to hide the aircraft when it is stationary on the ground, and air camouflage, intended to make it harder to see in flight.

At the start of WWII, many aircraft had ground camouflage on their upper surfaces and air camouflage on lower surfaces. A ground camouflage system can give -1 to -2 to spot an aircraft on the ground, if the colours match the terrain, and up to +2 to spot it if they don't. Aircraft in flight below an observer are usually spotted via their moving shadows, which camouflage can't help with.

Aircraft against the daytime sky are normally darker than the sky, which camouflage can't disguise. Painting them a light colour overall can give +0 to spot them; ground camouflage can give +1 or +2 to spot them, depending on conditions.

At night, black aircraft are darker than the sky and more visible than necessary (+1 to spotting) and a matt finish increases drag (-5 to -10 to Top Speed). Dark green or grey camouflage can give -1 to spotting rolls and a semi-gloss finish avoids speed loss.

Formations

Aircraft on the same side have three possible formation states:

- **Tight:** they all move according to the formation leader's actions and rolls. They are close enough together that they are spotted, or not, as a single target. Pilots other than the leader are fully occupied in keeping formation and cannot make spotting rolls, or fire other than when the leader does.
- **Loose:** They operate and are spotted independently, but they get +1 to piloting to stay with the formation leader.
- **None:** They operate entirely independently.

Formation may be changed freely on any Piloting action.

Blind Spots

Some aircraft have blind spots, most commonly from behind and below, which is universal for single-seat fighters. Scanning the sky from such aircraft requires turning and banking, and this is the vital job of the "wingman" in organised fighter tactics. Make a Tactics roll as the commander of an aircraft or a formation to ensure that your sky scanning covers the full sphere; aircraft approaching from blind spots may Ambush (see below) freely.

Spotting a camouflaged aircraft approaching from below at night is difficult (-1 in camouflage penalties and up to -9 in darkness penalties) and for reasons that are unclear, the British night bombers of WWII did not normally keep a methodical downward lookout. An approach from below is a deliberate tactic, and must be declared when the target is unaware of the attacker; it is resolved as a Stealthy Close, below.

Attacking from below with forward-firing guns is difficult, requiring a successful Piloting roll, and risks collision (on a critical failure of the Piloting roll) if done at Close range. "Schräge Musik" upward-firing guns with appropriate sights solved that problem, and are highly effective, although they're too bulky and heavy for most single-seat fighters.

Tasks

Leadership

The Leadership skill (p. B204) may be used by the commander (in this era, the pilot) of an aircraft to their crew, or by the leader of a formation to all crew in all aircraft, to boost their morale.

Motivate Crewman

The commander of a single aircraft may use Leadership to encourage a single subordinate; if successful, they get +1 to any tasks they perform during this turn. On a failure, you distract them; -1 to any tasks. Double bonuses or penalties on critical success or failure.

Boost the engine(s)

Make a roll against the appropriate repair skill (a Mechanic specialisation for the aircraft) to double acceleration for this round – which will use extra fuel, of course. Anything short of a critical success stresses the engines, giving -4 to further attempts for the next hour. Failure disables the engines at the start of your next turn; critical failure disables them immediately.

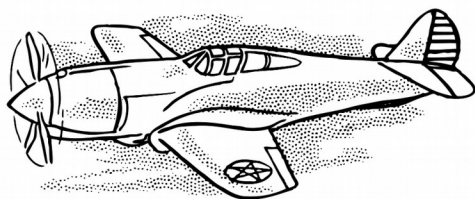
Scan the sky

Make a Vision roll to spot as many targets as you can; for convenience, a single roll is applied against all targets, but range, camouflage and environmental conditions may vary with each. If

you know the general location of your target and have aids to vision, you may add your Telescopic Vision bonus but may only attempt to spot a single target. Add modifiers for:

- Range
- Darkness
- Obscured vision (in cloud)
- Target SM
- Target camouflage modifier
- Target uses a TL7 jet engine (bright and smoking): +4 and ignore darkness penalty
- Target uses a rocket engine (very bright): +5 and ignore darkness penalty
- Target in plain sight (in the air, or in the open on the ground): +10

This spotting gives the general class of aircraft (e.g. “multi-engined propeller”). Passing the Vision roll by 10 or more allows the reading of markings, as well as an Identify attempt (below) that does not require a further action. You can continue to track a single target, your primary opponent, without needing to spend further actions.



Identify an aircraft

There are several skills that can be used for this:

- Hobby Skill (Aircraft Identification).
- Soldier, improvable as an Average technique to a maximum of Soldier +4, but with a familiarity penalty of -4 for vehicles not normally used or opposed by the service that taught the Soldier skill. For example, pilots fighting in

Europe may not be taught Japanese aircraft shapes.

- Other skills that may be regarded as giving knowledge of aircraft types and classifications (e.g. Mechanic and Piloting with appropriate specialisations and familiarities for the target).

A roll, normally Per-based, may be attempted against one spotted target, and will give the type (if it's a regularly encountered one) and national markings.

Radar Search

WWII is the age of practical radar, and it starts to be used in aircraft as well as in ground stations. It is used similarly to visual spotting, with a roll against Electronics Operation (Sensors), modified for:

- Radar quality
- Range
- Target SM
- Target in plain sight (in the air, but not on the ground): +10

Radar spotting tells you that a target is there, but no more details. Radar spotting lets you close with the target as if you had spotted it visually, but does not allow identification or gunfire; you still need to find it visually for that.

Use of window (chaff) imposes a -4 penalty: if you fail that roll by 0-4, you are aware that *something* is out there, but can't tell whether it is window or an aircraft. Half of this penalty may be bought off as an Average Technique to Electronics Operation (Sensors).

Use of electronic warfare transmitters is resolved as a Quick Contest between the EW operator's Electronics Operation (Electronic Warfare) and the searcher's Electronics Operation (Sensors).

Piloting: Close

You must normally have a manoeuvre bonus of +1 or higher to Close, though see Ambush, below.

Make a Quick Contest of Piloting Skill against your primary target; if its last manoeuvre was Evade, it doubles its manoeuvre bonus. If it is unaware of you, treat this as a simple skill roll. If you win, you can:

- close by one range band; or
- go from Unengaged to Engaged status against that target; or
- (if you were already Engaged) gain an Advantaged state against it; or
- (if you were already Engaged) set up a Collision for your next turn.

Success by 10+ or a critical success lets you do two of these things, or (if you were already Engaged) to collide *immediately*. (This is what command-guided missiles will be trying to do.)

You may make a *Dedicated Close*, giving you +3 to your Piloting skill but preventing you from making any Dodges until your next turn.

You may make a *Stealthy Close*, if you have not been detected. Select a penalty to your piloting skill, which is also applied to your target's attempts to spot you until your next turn. The GM may set limits on this option, especially in full daylight. Possible modifiers to this, at the GM's discretion, include the sun being in an (in)convenient position and penalties for a target that is an unfamiliar type of aircraft.

If your target performed a Close or Hold Course, and you have not been detected or the GM rules that your aircraft has advantageous terrain (such as a cloud bank), you may make an *Ambush*; you do not need a positive manoeuvre bonus, you and your opponent may separately

choose whether to use Piloting or Tactics, and both sides' manoeuvre bonuses are halved (round towards zero).

Piloting: Feint

You must have a positive manoeuvre bonus, and you must have been spotted.

You are flying deceptively to set up a Close, Evade or Fast Pass. Make a Quick Contest of Piloting skill against your primary target; if you succeed, select one of these benefits:

- Your margin of success (rounded down) is added to a Quick Contest of Piloting skill against that target in your next turn.
- Your margin of success is subtracted from the target's next spotting roll against another aircraft of your choice.

Piloting: Open Range

You must be flying faster than the aircraft you're trying to get away from.

You increase your separation from it by one range band.

Piloting: Evade

Make just one Piloting roll with standard modifiers. If any aircraft is Engaged with or Advantaged over you, and you beat it in a contest of Piloting:

- If it was Advantaged, it no longer is.
- Its pilot must make a Scan the Sky roll (as a free action); a failure means that it is no longer Engaged with you.

Whether or not this contest succeeds, if the roll on its own is a success, until your next turn you double your manoeuvre bonus (or gain +2,

whichever is higher) when rolling against aircraft attempting to Close with you; you also get +1 to Dodge.

Piloting: Hide

This is an attempt to make an opponent lose sight of you. It requires some favourable condition, such as clouds, the sun at a useful angle, or darkness; the GM must rule on the possibility of doing this, and bonuses or penalties for the situation.

As a guideline, 5/10 cloud cover is +0 to piloting, no cloud is -5, and 10/10 cloud is +5.

Roll a Quick Contest between your piloting and your opponent's Vision roll in the current conditions. You must win to have them lose you.

This manoeuvre is not effective against radar spotting, unless the favourable condition affects radar too (mountains, large clouds of window).

Piloting: Hold Course

This is the default activity for a pilot who's keeping the aircraft steady but is not engaged in combat manoeuvres.

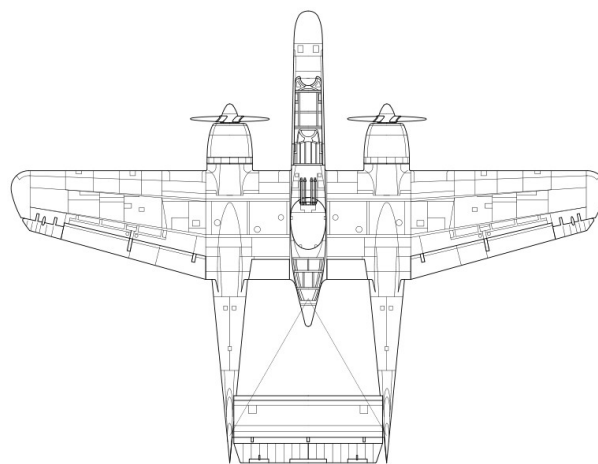
Piloting: Fast Pass

The attacker is flying in and out of range of the target within a single turn. You may select this option if the total of your Speed and that of your primary opponent is 100 or more (making a head-on attack). If the *difference* in Speed is 100 or more, it is the *only* way in which you can attack with guns.

Make a Quick Contest of Piloting; if the attacker beats the target, the gunner may add +2 to their attack roll. This Quick Contest is compulsory: a single-seat fighter pilot will have

to take the multiple action penalty for piloting and shooting in the same turn. If both pilots critically fail, the aircraft collide. Unless the attacker critically succeeds in Piloting, any Advantaged status they have is lost at the end of the turn.

Attack with current range modifiers (typically Long or Extreme) to represent the high relative speed. Aware defenders may fire back, using the action that would normally be available on their next turn.



Gunnery: Attack

You must be Engaged with a target to attack it with fixed forward guns without penalty; if it is Engaged with you but not vice versa, you may attack it with fixed forward guns at -5 and other guns at no penalty. If neither you nor your target is Engaged with each other, all your attacks on it are at -5. If it is Advantaged over you, you may attack only with tail guns and turrets that can bear to the rear. Whatever the state of Advantage, one aircraft may attack a single opponent only through a single facing in a single turn – if the waist gunners are shooting at that Bf109, you may not also fire at it with non-turret nose or tail guns, though you may fire with turrets that can bear to the side.

An attack with guns does not represent 20 seconds of continuous fire, but rather a series of

bursts as the target crosses the sights. For a single set of guns fired from a single mount, multiply the RoF by the number of guns to generate a RoF bonus using the table on p. B373. (Divide rounds-per-gun by the RoF to determine the number of times the gun can fire before it needs to be reloaded.)

If Advantaged, you may try to target a specific location (see the Vehicle Hit Location Table on p. B554).

You may fire multiple dissimilar guns at once, but you may only apply a weapon Acc bonus to one type.

Add to relevant skill, which will usually be Gunner (Machine Gun):

- +2 fixed gun mount
- +1 gyro gunsight
- + weapon's Acc if Advantaged; or
- + ½ weapon's Acc (round down) if target is Advantaged with you
- + Rate of Fire bonus for burst size, per p. B373.
- -4 to gunners other than the pilot if the firing aircraft has dodged since its previous turn; turret gunners are exempt from this
- + target's SM
- Range
- Darkness
- Obscured vision

The total bonus for fixed gun mount and Acc cannot exceed the vehicle's SR.

Aircraft with wing-mounted forward-firing guns (this isn't listed in their stats, but can be gleaned from a bit of research) may have a convergence distance (range band) set before takeoff, usually Medium. Shots at more than this distance cannot hit at all; shots at exactly this distance gain a +2 bonus to hit; shots at closer range

suffer a -2 penalty. If no convergence distance is set, roll normally.

The pilot of the target aircraft may Dodge if someone on board has sight of the attacker.

Any crew on an aircraft that is attacked with guns who were keeping a lookout (i.e. did "Scan the Sky" as their last action), other than the pilot, must make a Willpower roll or start tracking the attacker, which prevents them from doing Scan the Sky as their next action. A bonus from Leadership applies to this roll.

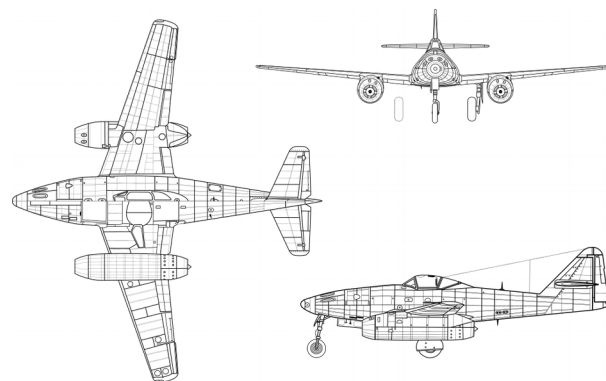
Other Weapons

Weapons which don't have command guidance are fired/launched/dropped using Artillery (Bombs), Gunner (Cannon or Rockets), etc.

Command-guided missiles such as the Ruhrstal X-4 make an Artillery (Guided Missile) roll to avoid launching errors, but then rely on the operator's Pilot (Light Airplane or High-Performance Airplane) to close with the target.

Bail Out

Up to two crew members per turn may use a single exit; roll Acrobatics or DX-based Soldier to get out of the aircraft safely, at -2 if it is out of control or disabled. Some aircraft impose significant modifiers to this roll. Failure inflicts 3d cr from impact with the aircraft. Then roll Parachuting (see p. B212) to land safely.



Messerschmitt Me 262 Schwalbe

Fuel

Usually fuel will not be a consideration in a single dogfight, but it may be important when an aircraft has a particularly short range, or when it needs to go some distance after the fight.

Each vehicle has a number of fuel points which are used for flight and acceleration. Each 2 points represents the fuel used in 20 seconds of normal flight.

To calculate fuel points, divide Range (miles) by Top Speed (yards/s), and multiply by 220.

Example: The TL7 Light Monoplane on p. B465 has Range 500 and Top Speed 70. It has 1,571 fuel points.

A turn of flight at up to 80% of Top Speed (normally the most efficient cruising speed) costs 2 fuel points.

A turn of flight at up to Top Speed costs 3 fuel points.

Acceleration by more than $\frac{1}{2}$ of the Acceleration figure costs 1 fuel point.

A turn spent with engines at idle costs no fuel points, but requires a deceleration of at least 100 yards/s.

To convert remaining fuel points back to miles of Range in normal flight, divide by 220 and multiply by Top Speed.

Takeoff

Aircraft ready to “scramble” can take off quite quickly: divide their stall speed by $(20 \times \text{Acceleration})$ to get the number of turns required. This is usually only one turn, and a catapult or rocket-assisted launch ensures that.

Damage

Gun damage is usually piercing and aircraft are unliving. A reminder of the modifiers, from p. B380:

Type	Multiplier
imp, pi++	$\times 1$
pi+	$\times \frac{1}{2}$
pi	$\times \frac{1}{3}$

Aircraft are affected by damage as per pp. B483-4, but note that when an aircraft is at 0 HP or less, it only rolls to avoid being disabled each turn, not each second.

Most aircraft are Flammable, so when they take Major Damage (half their ST from a single attack) they must roll HT to avoid catching fire. Once on fire, they take 1d-1 further damage per turn unless they are able to extinguish the fire, and any critically-failed HT roll results in an immediate explosion.

Multi-engined aircraft intended for combat or carrying passengers usually have fire extinguishers mounted in each engine nacelle (GM's discretion, or research). These extinguish a fire if a roll against HT+2 is successful; on a critical success, the engine still works afterwards. Single-engined aircraft don't usually have extinguishers.

An aircraft with between 0 and $\frac{1}{3}$ of its HP remaining is badly damaged; approximately, -1 to Hnd and probably also SR, and halve Acceleration and Top Speed.

As an optional rule, the pilot of an aircraft that is at 0 HP or less, but above $-1 \times \text{HP}$, can keep it from becoming disabled for a turn with a Piloting roll, at -1 on the second turn, -2 on the third, and so on.

Tracer

Historically, tracer ammunition was used early in WWII, but fell out of favour once better gunsights became available. If the darkness level is -2 (twilight) or lower, on the turn after you have fired with tracer on a target within $\frac{1}{2}D$ range, you gain +1 to attacks on that same target, not cumulative with any gunsight bonus; but when you fire, other aircraft that haven't already spotted you get a free attempt to do so, taking the darkness penalty as -2.

Tracer is an incendiary attack but not a *burning* attack, and is not significantly more damaging to aircraft than normal gunfire.

Critical Hits

3 – The attack does triple damage.

4 – The target's DR protects at half value (round down) after applying any armor divisors.

5 – The attack does double damage.

6 – The attack does maximum normal damage.

7 – If *any* damage penetrates DR, the vehicle must make an HT check or suffer -2 to Hnd on its next turn.

8 – If *any* damage penetrates DR, the vehicle's crew must roll vs HT to avoid Stun, or lose their next action.

9, 10, 11 – Normal damage only.

12 – Normal damage, and any external stores are knocked loose and lost.

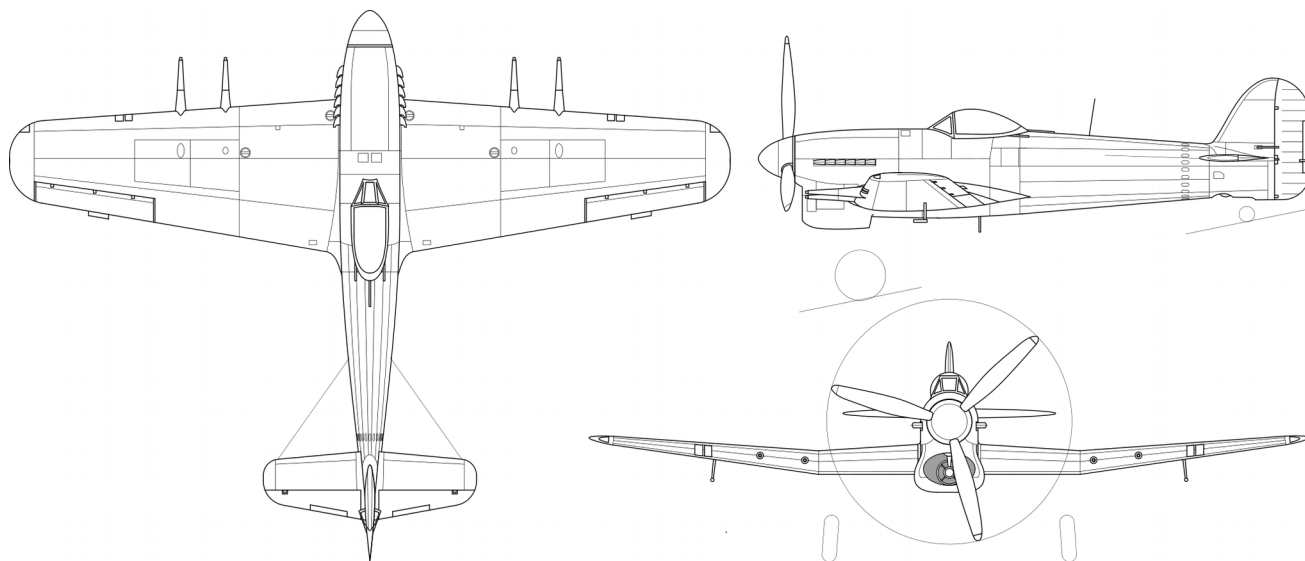
13, 14 – If *any* damage penetrates DR, the vehicle must make an HT check or suffer -2 to Hnd on its next turn.

15 – The attack does maximum normal damage.

16 – The attack does double damage.

17 – The target's DR protects at half value (round down) after applying any armor divisors.

18 – The attack does triple damage.



Example 1: Battle of the Atlantic

A Hawker Hurricane I has been launched from a Catapult Aircraft Merchantman ship (*WWII: AtKM*, p. 20) in response to the sighting of a Focke-Wulf 200 Condor. The CAM ship commander waited until the Condor was within Extreme range; the Hurricane pilot has sighted the Condor before take-off.

This scenario is artificial, as an example, and uses naive tactics. For simplicity, the action is taking place in full daylight with no clouds, all relevant skills on both sides are 12, all success rolls will roll 10, and the Hurricane acts first on each turn as the smaller aircraft.

The Hurricane's manoeuvre bonus is +1 for Handling, plus +1 for higher Acceleration; the Condor's is -1, from Handling.

Turn 1: The Hurricane takes off with rocket assistance and gains some initial altitude, during which the Condor gets a spotting attempt at -22 for range, +5 for the rocket, +6 for the SM of the fighter, and +10 for "in plain sight," for a total of -1. It would succeed, but artificially fails, so as to demonstrate some more rules in the next turn, and holds its course towards the convoy.

Turn 2: The Hurricane attempts to close, which is a contest of piloting skill. The Condor is unaware of the fighter, is at -6, and loses. The Hurricane closes to Long range (-18). The Condor now gets a spotting attempt at -2, and succeeds. The Condor Crew attempt to Open Range, and find that the Hurricane is faster.

In the third turn, the Hurricane pilot uses Dedicated Close. His manoeuvre bonus is +2; the Condor's is -1. The Contest of Piloting sees the Hurricane at +5 (base +2, +3 for the Dedicated Close), and the Condor at -1. The Hurricane wins, and closes to Medium range (-14).

Turn 4: The Hurricane attempts to become Engaged, rolling at +2 against the Condor's -1, and succeeds.

The Condor fires with its MG 131 rear turret, at -14 for range, +6 for target size, +3 for RoF 15, totalling -5 with Rcl 3, and misses by 3.

Turn 5: The Hurricane pilot fires on the Condor, at -14 for range, +8 for target size, +7 for RoF 152 (This early Hurricane has 8 Browning MkII* at RoF 19, as per p. B373), +2 for fixed guns, and +2 for wing-mounted guns converging at Medium range, totalling +5 with Rcl 2, and hits with 4 rounds. Medium range is well within the ½D range for all the guns in this fight.

The Condor attempts to dodge (Skill 12÷2, -1 for handling), fails the roll against 5, and takes 4×6d+2 pi against an unliving target with DR 3, which averages 24 hit points. The Condor still has 874 hit points, and is not affected. Chipping away the Condor at this rate is not going to be effective.

The Condor's tail turret gunner fires again, at the same odds, and misses again. The Condor's rear MG15 gunner joins in, but at -4 to the previous odds of the tail turret, because his aircraft attempted to dodge, he isn't operating it, and he isn't in a turret, for a total of -9 and misses. It's clear to him that dodging on a 5 is not worthwhile.

Turn 6: The Hurricane attempts to become Advantaged, which will allow some of the Acc bonus of its guns to apply. It rolls against skill 12 plus manoeuvre bonus of +2 and succeeds by 4; the Condor pilot rolls against skill 12 plus manoeuvre bonus of -1 and succeeds by 1. The Hurricane gains Advantage.

The Condor fires with its MG 131 rear turret, at the same odds as Turn 4, +2 for half of Acc 5, and misses by 1. The MG15 rear gunner also shoots, with the same odds as the turret and also misses.

Turn 7: The Hurricane shoots for a Vitals area at -3. The other modifiers are -14 for range, +8 for target size, +7 for RoF, +3 (the Hurricane's SR) as a limit on the bonus for Acc and fixed guns) for Acc and +2 for converging guns. The total is +3 with Rcl 2, and 3 rounds hit.

The Condor does not attempt to dodge, in the interests of trying to shoot down the fighter, and the x3 damage multiplier for vitals cancels out the division by 3 for pi damage to an unliving target. The Condor takes 60 points of damage, reducing it to 814 HP.

The two rear gunners of the Condor miss, again.

Turn 8: The Hurricane shoots for the Vitals again, at the same odds, doing the same damage and reducing the Condor to 754 HP.

The two rear gunners of the Condor miss, again.

From here, the Hurricane can continue to damage the Condor. The artificiality of the scenario is obvious, so we restart it, with less artificial rules.

Example 1A: Battle of the Atlantic, in more detail

We run the same scenario, rolling the dice for success rolls, but still taking average damage, and improving the tactics.

Turn 1: The Hurricane takes off with rocket assistance and gains some initial altitude, during which the Condor gets a spotting attempt at -22 for range, +5 for the rocket, +6 for the SM of the fighter, and +10 for "in plain sight," for a total of -1. It rolls 12 against (12-1) and does not see the Hurricane.

Turn 2: The Hurricane attempts to close, which is a contest of piloting skill. It rolls 14 against (12+2) and succeeds exactly; the Condor is unaware of the

fighter, rolls 6 against (12-6-1), and loses. The Hurricane closes to Long range (-18).

The Condor now gets a spotting attempt, rolls 14 against (12-2), and fails. The Condor continues towards the convoy.

Turn 3: The Hurricane pilot uses Dedicated Close. The Contest of Piloting sees the Hurricane at +5 (base +2, +3 for the Dedicated Close), and the Condor at -7. The Hurricane wins, and closes to Medium range (-14).

The Condor crew's spotting attempt is now at +2, and finally succeeds. They attempt to Open Range and find that the Hurricane is faster.

Turn 4: The Hurricane attempts to become Engaged, rolling at +2 against the Condor's -1, and succeeds.

The Condor fires with its MG 131 rear turret, at -14 for range, +6 for target size, +3 for RoF 15, totalling -5 with Rcl 3. The gunner rolls a 10, and misses by 3. The Condor's rear MG15 gunner joins in, at the same odds since he has RoF 16, but with Rcl 2. He rolls a 14 and misses by 7.

Turn 5: The Hurricane attempts to become Advantaged, which will allow some of the Acc bonus of its guns to apply. It rolls against skill 12 plus manoeuvre bonus of +2 and succeeds by 5; the Condor pilot rolls against skill 12 plus manoeuvre bonus of -1 and fails by 2. The Hurricane gains Advantage.

The Condor rear gunners fire again, at +2 because they can now use half their Acc, so they're at -3. The MG 131 rolls 9 against (12-3) and hits with one round, the MG 81 rolls 10 against (12-3) and misses. The Hurricane takes 9d pi+ against its DR 5 and loses 13 hit points.

Turn 6: The Hurricane pilot fires on the Condor's vitals, at -14 for range, +8 for target size, +7 for

RoF 152 (This early Hurricane has 8 Browning MkII* at RoF 19), as per p. B373, +3 for SR (which limits its Acc and fixed-gun bonus), +2 for wing-mounted guns converging at Medium range, and -3 for the Vitals location, totalling +3 with Rcl 2. It rolls 9, hitting by 6, with 4 rounds. Medium range is well within the ½D range for all the guns in this fight.

The Condor attempts to dodge (Skill 12÷2, -1 for handling), fails the roll against 5, and takes 4×6d+2 pi against its DR 3 vitals. The x3 damage multiplier for vitals cancels out the division by 3 for pi damage to an unliving target. The Condor takes an average of 80 points of damage, which is Major damage, and leaves it on 818 HP. Since the Condor's HT attribute of 10f has the "f" signifier for "Flammable", it needs to roll against HT-3 to avoid igniting. It rolls 10, and catches fire.

The Condor gunners have another shot. The turret gunner rolls 8 against (12-3) and hits with one round, the MG 81 rolls 10 against (12-3-4) and misses. The Hurricane loses another 13 HP, leaving it on 233 HP.

Turn 7: The Hurricane shoots for the vitals again, and rolls a 6 against (12+3). Five rounds hit, doing an average of 100 points of damage. The Condor does not attempt to dodge, since the rear gunners are hitting. 100 HP is another set of Major damage, and it's already on fire.

The Condor crew are getting rather busy. The pilots attempt to extinguish the fire, using the engine's built-in extinguisher, but fail with a roll of 13 against (10+2). The rear gunners shoot again, and roll 12 and 8, both against (12-3). One round from the MG 81 hits, doing 7d+1 pi, which only does 7 HP to the Hurricane, leaving it on 221 HP.

Turn 8: The Hurricane shoots for the vitals again, and rolls 13 against (12+3), hitting with two rounds and doing 40 HP. The Condor tries to dodge, and fails on a roll of 11.

The Condor gunners have another shot, but both miss. The Condor aircraft commander now needs to consider what to do. His aircraft is on fire, hundreds of miles from home. Bailing Out near the convoy gives his crew a better chance of survival than in a random patch of ocean. He tries to Evade, to get time to think, and rolls 10 against (12-1), while the Hurricane pilot rolls 11 against (12+2), staying on his tail.

Turn 9: The Hurricane shoots for the vitals again, and rolls 10 against (12+3), hitting with three rounds and doing 60 HP. The Condor tries to dodge, and fails on a roll of 7.

The Condor crew start to Bail Out.

The Hurricane will withdraw when the pilot realises what's happening, but stay in the area just in case the Condor crew are playing a trick. Once the Condor is in the sea, he'll consider if he has the fuel to reach land, and if not, bail out.

As the Hurricane was expendable, shooting down the Condor is a victory even if the Hurricane is lost.

Analysis

With the right assumptions, a single fighter, against a well-defended bomber with naive tactics and luck on the bomber's side, could well lose the fight. That is the kind of scenario that convinced many air forces in the 1930s that bombers could defend themselves against fighters, and escort fighters were not necessary.

For *GURPS*, having better skills than your opponents, plus advantages like Combat Reflexes and Enhanced Dodge, or Enhanced Dodge (Piloting) [10] will pay off handsomely, which is in keeping with the game.

Example 2: Air Superiority

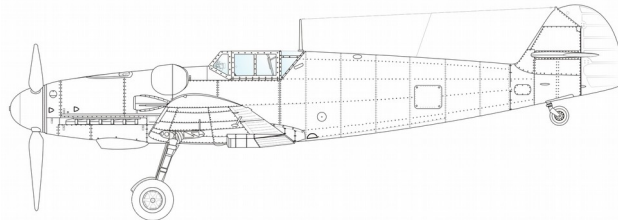
In 1940 over France, a Spitfire (8 Browning Mk II*, no gyro gunsight this early in the war) has been sent to intercept a Bf109 E (2 MG 17 in the nose, 2 MG FF on the wings) going against a bombing raid.

The action is taking place on a clear full moon night (-4 darkness penalty); all relevant skills are 12, but the Spitfire pilot has a fractionally higher Basic Speed.

Turn 1: the Spitfire pilot searches for the Bf109: -22 extreme range, -4 darkness, +6 SM, +10 plain sight, -10 total. He doesn't find it, so asks for radar vectors, which allows him to close to Long range.

Turn 2: the Spitfire pilot searches for the Bf109: -18 Long range, -4 darkness, +6 SM, +10 plain sight, -6 total. A roll of 10 fails; so does the Bf109 pilot's roll of 9.

Turn 3: this time they both roll 7 and each spots the other.



Turn 4: The Spitfire pilot elects to Close. Both aircraft have +1 handling and -4 for darkness for net -3, but the Spitfire has +1 for higher acceleration. The Spitfire pilot rolls 14 for a failure by 4; for the Bf109, a roll of 9 gives a success by 0.

The Bf109 pilot tries the same thing: rolling 10 is a failure by 1, against the Spitfire's rolled 11 which is also a failure by 1.

Turn 5: The Spitfire pilot elects to Close. Both aircraft have +1 handling and -4 for darkness for net -3, but the Spitfire has +1 for higher acceleration. The Spitfire pilot rolls 5 for a success by 5; for the Bf109, a roll of 7 gives a success by 2. The Spitfire chooses to become Engaged with the Bf109.

The Bf109 pilot tries to Evade. A roll of 15 is a failure by 6, which doesn't beat the Spitfire pilot's rolled 12 (failure by 2).

Turn 6: If the Spitfire pilot tries to Close again, the Bf109 will be rolling against an 11 (+2 for Evading) to prevent it, but since he can't hit beyond Medium range with converging guns, that's his best option. Spitfire at -2 rolls 11 for a failure by 1; Bf109 at -1 rolls 8 for a success by 3.

The Spitfire pilot tries to keep eyes on the Bf109: -6, as in turn 2. A roll of 10 fails, and the Engaged status is lost.

The Bf109 pilot tries to Close in turn: a roll of 13 fails by 4, versus the Spitfire's 7 passing by 3.

Turn 7: The Spitfire attempts to Close again. 8 passes by 2; the Bf109's 9 passes by 0. This time the pilot elects to close range to Medium.

The Bf109 also attempts to close, but a 13 (fail by 4) vs the Spitfire's 6 (pass by 4) gives it no advantage.

Turn 8: The Spitfire attempts to Close again. 4 passes by 6 (and is a critical); 9 passes by 0. The Spitfire becomes both Engaged and Advantaged over the Bf109.

The Bf109 attempts to evade: it rolls 10 to fail by 1, while the Spitfire rolls 8 to pass by 4. The Spitfire remains Engaged and Advantaged.

Turn 9: The Spitfire opens fire with 8 Brownings. +2 fixed gun mount, +2 Acc capped by SR, +7 RoF, +6 target SM, +2 converging guns at set range, -14 Medium range, -4 darkness, total +1. A roll of 6 is success, and at Rcl 2 hits with 4 rounds.

The Bf109 attempts to dodge: $12 \div 2 = 6$ +1 Hnd +1 Evasive = 8. 13 fails.

The Brownings only do pi damage; 93 less DR 5 per shot is 73, which becomes 24 hit points, so the Bf109 still has 207 HP remaining. With an ST of 85, the Bf109's threshold for major damage is 42.

The Bf109 tries to evade, rolling a 6 vs 9. The Spitfire pilot rolls 14 vs 10. The aircraft are still at Medium range, but no longer engaged. The Spitfire pilot attempts to maintain sight: -14 Medium range, -4 darkness, +6 SM, +10 plain sight, -2 total; a 7 succeeds.

Turn 10: The Spitfire pilot tries to close. 11 fails by 1; 11 fails by 2. The Spitfire opts to be Engaged again.

The Bf109 tries to evade again: 9 vs 9 passes by 0, but the Spitfire's 6 vs 10 passes by 4.

Turn 11: the Spitfire fires. +2 fixed gun mount, +7 RoF, +6 target SM, +2 converging guns at set range, -14 Medium range, -4 darkness, total -1. A roll of 11 gives exactly one hit.

The Bf109 tries to dodge: $12 \div 2 = 6 + 1$ Hnd +1 Evasive = 8. 10 is a failure.

20 damage rolled, -5 for DR, $\times \frac{1}{3}$ for pi vs unliving target, is still 5, but while the Bf109 is now down to 202 HP that's nothing like major damage.

The Bf109 tries to evade, rolling 7 vs 8. The Spitfire pilot rolls 11 vs 10. The aircraft are still at Medium range, but no longer engaged. The Spitfire pilot attempts to maintain sight: -14 Medium range, -4 darkness, +6 SM, +10 plain sight, -2 total; a 16 fails.

Turn 12: The Spitfire pilot tries to find the Bf109 again. -14 Medium range, -4 darkness, +6 SM, +10 plain sight, -2 total. An 8 succeeds.

The Bf109 pilot also tries to close. 6 passes by 3; 9 passes by 1. The Bf109 becomes Engaged with the Spitfire.

Turn 13: The Spitfire tries to evade: 10 vs 10 passes by 0, but the Bf109's 8 vs 9 passes by 1.

The Bf109 fires 2 MG 17 and 2 MG FF. For the MG FF: +2 fixed gun mount, +3 RoF, +6 target SM, +2 converging guns at set range, -14 Medium range, -4 darkness, total -5, target 7. 9 is a miss.

For the MG 17: +2 fixed gun mount, +5 RoF, +6 target SM, -14 Medium range, -4 darkness, total -5, target 7. 13 is a miss.

Turn 14: The Spitfire pilot tries to evade: 12 vs 10 fails by 2, as does the Bf109's 11 vs 9.

The Bf109 fires 2 MG 17 and 2 MG FF. 8 and 16 miss again.

Turn 15: The Spitfire pilot tries to evade: 10 vs 10 passes by 0, and the Bf109's 11 vs 9 fails by 2. The Bf109 pilot attempts to maintain sight: -14 Medium range, -4 darkness, +6 SM, +10 plain sight, -2 total; a 12 fails.

The Bf109 pilot tries to regain sight of the Spitfire: -14 Medium range, -4 darkness, +6 SM, +10 plain sight, -2 total; a 16 fails.

Turn 16: The Spitfire pilot tries to Close. 8 passes by 2. The Spitfire is Engaged.

The Bf109 pilot tries to regain sight of the Spitfire: -14 Medium range, -4 darkness, +6 SM, +10 plain sight, -2 total; a 17 fails.

Turn 17: The Spitfire fires. +2 fixed gun mount, +7 RoF, +6 target SM, +2 converging guns at set range, -14 Medium range, -4 darkness, total -1. A roll of 7 gives three hits.

The Bf109 still has no sight of the Spitfire and cannot dodge.

70 rolled damage becomes 18, not major damage; 184 HP left.

The Bf109 tries to evade, rolling a 12 vs 9. The Spitfire pilot rolls 8 vs 10. No change.

Turn 18: The Spitfire closes again; 6 passes by 4, and he is now Advantaged.

The Bf109 tries to evade, rolling 11 vs 9. The Spitfire pilot rolls 11 vs 10. No change.

Turn 19: the Spitfire opens fire. +2 fixed gun mount, +2 Acc capped by SR, +7 RoF, +6 target

SM, +2 converging guns at set range, -14 Medium range, -4 darkness, total +1 – and since the Spitfire pilot believes he won't be attacked before his next action, he makes an All-Out Attack (Determined) for +1. A roll of 5 is success, and at Rcl 2 hits with five rounds. 155 rolled damage less 5x5 DR becomes 43; 134 HP left.

But that's just enough to count as major damage, and the Bf109 has to make a HT roll not to catch fire. 14 is a failure, and the pilot elects to bail out.

Example 3: Battle over Holland

March 1944. A lone B-17 is making its way back to England and has reached Holland, having dodged fighters through clouds since leaving Cologne. However, it has been detected by German radar, and two Bf109s have been sent to identify it. They advance carefully in tight formation under ground control, and the scenario starts when they sight the B-17 at Extreme range (-22).

The leading Bf109's pilot has Piloting 12 and Gunner 13; his wingman has Piloting 13 and Gunner 11. They intend that the wingman will distract the B-17 while the leader closes for a surprise attack. All applicable skills on board the B-17 are 12.

The manoeuvre bonus of the Bf109s is +1 for Handling, plus +1 for having higher Acceleration. The manoeuvre bonus of the B-17 is -1.

There is 8/10 cloud, and the sun is beginning to set in the west, imposing -1 to all vision rolls.

Turn 1: Still in tight formation, the Bf-109s attempt to Hide in the clouds, in case they have been spotted. They roll 12, with +3 from the cloud cover, but the B-17 had not spotted them, so there is no effect.

The B-17 Holds Course, and the crewman scanning in the relevant direction attempts a spotting roll. The modifiers are -22 for range, +16 for fighter-size aircraft in plain sight, and -1 for darkness, for a total of -7. The B-17 rolls 8 against (12-7) and does not see them.

Turn 2: Still in tight formation, the Bf109s attempt a Stealthy Close, taking -2 to Piloting, and relying on the B-17 not having spotted them for success. They roll 13 against (12+2-2), failing by 1, and the B-17 rolls 14 against (12-6-1), failing by 9. They advance to Long range (-18).

The B-17 Holds Course, and the crewman scanning in the relevant direction attempts a spotting roll. The modifiers are -18 for range, +16 for fighter-size aircraft in plain sight, -2 for the stealthy close, and -1 for darkness, for a total of -5. The B-17 rolls 8, again, against (12-5) and does not see them.

Turn 3: The Bf109s split up. The wingman attempts to close to Medium range, rolling 16 against (13+2) to fail by 1. The B-17 is not aware of him, and rolls 15 against (12-6-1), failing by 10. The wingman succeeds in reaching Medium range (-14), but is not Engaged. The leader Holds Course while the distraction is set up.

The B-17 attempts to spot the obvious Bf109, with modifiers of -14 for range, +16 for +16 for fighter-size aircraft in plain sight, and -1 for darkness. It rolls 12 against (12+1) and succeeds. It knows it has spotted a single-engined aircraft, but does not yet know what it is.

Turn 4: The wingman attempts to identify the B-17, and rolls 10 against a skill of 12, -1 for darkness. He recognises it as an B-17 in American markings. The leader Holds Course, in case of a call that it's friendly: unlikely, but possible.

The B-17 crew attempts to identify the Bf109, and rolls 11 against a skill of 12, -1 for darkness. They know it's a Bf109, in German markings.

Turn 5: The wingman makes a Feint, of moving to an Engaged position. He rolls 8 against his Piloting 13+2; the B-17 rolls 8 against its Piloting 12-1; the wingman's margin of victory is 3.

The lead Bf109 attempts a Stealthy Close, taking -4 to his Piloting, and rolls 14 against (12+2-4), failing by 4. The B-17 rolls 9 against (12-6-1), failing by 4. The Bf109 does not succeed in closing.

The B-17 is looking out for more fighters, but has a penalty of -4 for the Stealthy Close, -3 for the Feint and -1 for darkness. The relevant crewman rolls 11 against (12-8) and does not spot the lead Bf109.

Turn 6: The wingman makes another Feint and rolls 9 against his Piloting 13+2; the B-17 rolls 12 against its Piloting 12-1; the wingman's margin of victory is 7.

The lead Bf109 attempts another Stealthy Close, taking -2 to his Piloting, and rolls 12 against (12+2-2), an exact success. The B-17 rolls 10 against (12-6-1), failing by 5, and the Bf109 moves to Short range (-10).

The B-17 is looking out for more fighters, but has a penalty of -2 for the Stealthy Close, -7 for the Feint and -1 for darkness. The relevant crewman has a target number of 2 (12-10) and cannot roll.

Turn 7: The wingman makes another Feint and rolls 11 against his Piloting 13+2; the B-17 rolls 10 against its Piloting 12-1; the wingman's margin of victory is 3.

The lead Bf109 attempts another Stealthy Close, taking -2 to his Piloting, and rolls 9 against (12+2-2), success by 3. The B-17 rolls 11 against (12-6-1), failing by 6, and the lead Bf109 is Engaged.

The B-17 is still looking out for more fighters, but has a penalty of -2 for the Stealthy Close, -3 for the Feint and -1 for darkness. The relevant crewman has a target number of 6 (12-6) and fails the roll.

Turn 8: The wingman makes another Feint and rolls 5 against his Piloting 13+2; the B-17 rolls 11 against its Piloting 12-1; the wingman's margin of victory is 10.

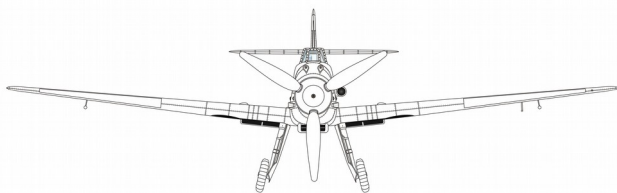
The lead Bf109 attempts another Stealthy Close, taking -2 to his Piloting, and rolls 15 against (12+2-2), failing by 3. The B-17 rolls 7 against (12-6-1), failing by 2, and the lead Bf109 fails to gain Advantage.

The B-17's spotting roll has a penalty of -2 for the Stealthy Close, -10 for the Feint and -1 for darkness. The relevant crewman has a target number of -1 (12-13) and cannot roll. The B-17 commander has become suspicious that the wingman Bf109 is trying to distract him from something, and tries an Evade. He rolls 15 against (12-1), failing by 3; the wingman and the unseen leader both succeed in their rolls against (13+2) and (12+2) and stay with him. He also orders an extra lookout downwards.

Turn 9: The wingman Feints again, rolls 7 against (13+2) and succeeds by 8. The B-17 commander ignores him, and nothing happens.

The lead Bf109 tries to become Advantaged, rolls 7 against (12+2), and the B-17 rolls 10 against (12-1). The lead Bf109 gains the Advantage, which will allow it to attack a specific hit location on the B-17.

The two downward lookouts both roll against (12-1) and one spots the lead Bf109; the pilot attempts an Evade, rolling 8 against (12-1), but that Bf109 rolls 5 against (12+2) and stays with him.



Turn 10: The wingman attempts to become Engaged, since his leader has been spotted, and rolls 8 against (13+2). The B-17 pilot has a critical failure of that piloting roll, on an 18, and the Wingman becomes both Engaged and Advantaged.

The lead Bf109 shoots for the B-17's Vitals, with two MG 131, total RoF 30 (+5) and Rcl 3, and an MG 151/20, RoF 12 (+2), Rcl 2. The modifiers apart from RoF are -10 for range, +8 for the size of the B-17, and 3 for Vitals. All the weapons have Acc 5, and are fixed mounts, but the Bf109 has an SR of only 2, which caps bonuses from Acc and fixed mounts at +2. This saves worrying about which weapon the Acc bonus should apply to.

The MG 131 shot rolls 7 against (13-5+5+2) and gets 3 hits for 9d pi+ each. Taking average damage and DR12, that's 10 per hit, tripled for vitals. The B-17 takes 90 HP from that attack, having failed to dodge.

The MG 151/20 shot rolls 12 against (13-5+2+2), and gets 1 hit. That does 7d×2 pi++ each, and taking average damage and DR12, that's 37 HP, tripled for vitals. The B-17 takes a further 111 HP, totalling 201 HP. Since the two attacks are simultaneous, the GM rules that the same Dodge roll applies to both.

A B-17 has 132/831 HP. It has taken Major damage, but makes the roll against catching fire. The GM rules that an engine is out of action, but a B-17 with no bomb-load can still fly happily on three engines.

The B-17 upper and rear gunners shoot at the wingman, They each have two M2 Brownings, with a RoF per turret of 26, for a +5 bonus with Rcl 2. As the wingman is Advantaged over the B-17, they get half their Acc, for +2, which is not restricted by the B-17's SR of 4. The other modifiers are -12 for range, +6 for target size, and -1 for darkness, totalling +0. The gunners are rolling against 12, and roll 12 and 11, for one hit each. Those do 6d×2pi+ each, for an average of 42 damage, and each inflict 18 points of injury against a DR 5 unliving target. That Bf109 failed to dodge, on a roll of 11, but is not seriously affected.

The B-17 ball gunner shoots at the lead Bf109, with similar guns to the other turrets, but closer range, for a net +2. He rolls a 6, making 5 hits, and the dodge fails.

The Bf109 takes 90 HP, which exceeds the Bf109's ST (it has 68/231 HP). It needs to roll vs. its HT of 10f to avoid catching fire. It fails that roll and ignites.

Turn 11: The leader decides if he's got this far, he might as well have another shot while he can, and shoots at another engine at the same odds. He rolls 12 for the MG 131s and gets one hit, the B-17 fails to dodge and takes another 30 HP. The roll for the MG 151/20 is 10 for two hits, doing 222

HP, which leaves the B-17 on 447 HP. Again, this is Major damage, and this time the B-17 ignites.

The wingman also shoots, but does not try for the vitals, since he's a worse shot at longer range. He rolls 7 vs. a net 11 with his MG 131s, for two hits, and misses with his MG 151/20. The B-17 takes 20 HP, reducing it to 427.

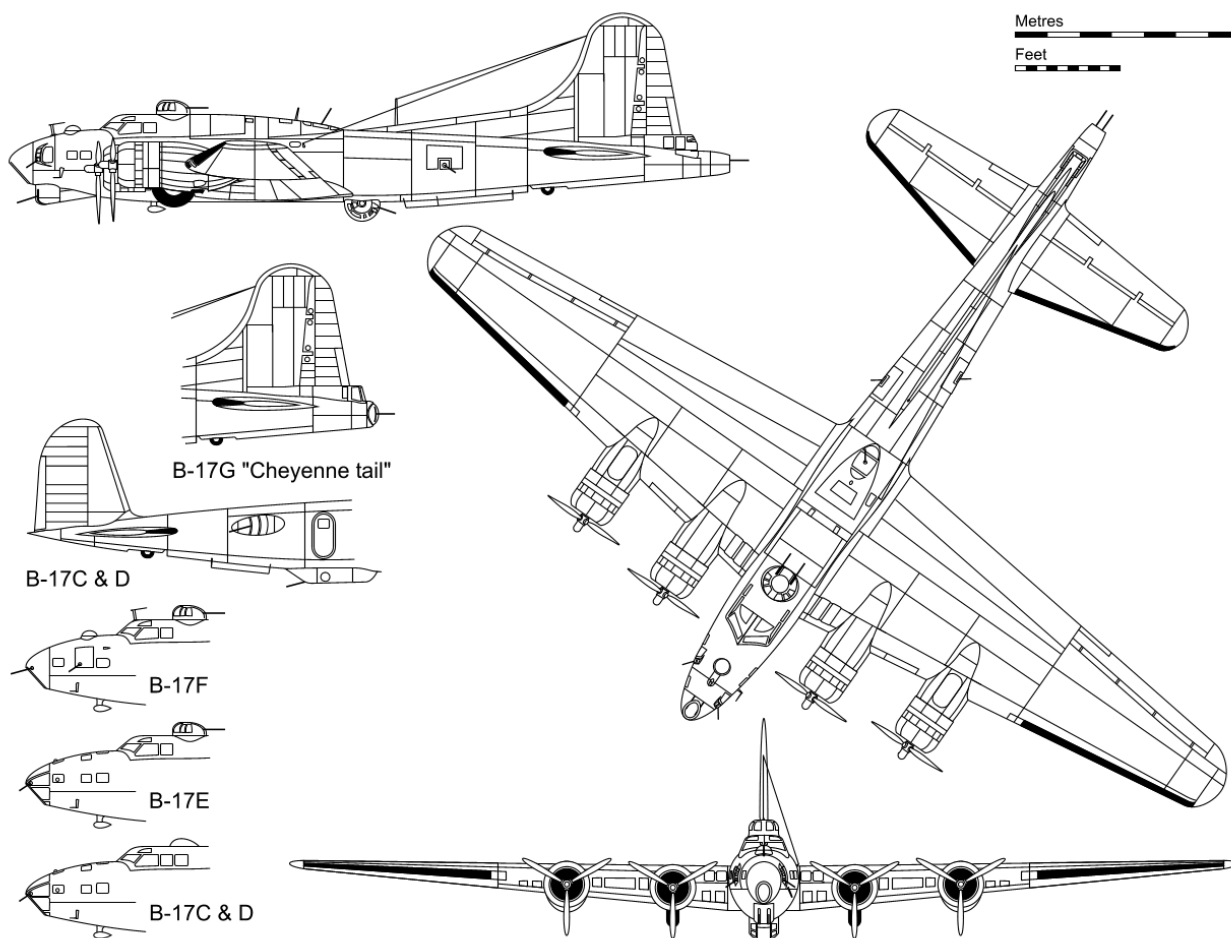
The B-17 pilots attempt to extinguish the fire and roll 12 vs HT11+2, so they succeed. The B-17 gunners shoot at the same Bf109s.

The wingman takes two hits from one gunner, and 36 HP is Major damage for a Bf109, but it avoids catching fire. The other gunner gets one hit, and that Bf109 has taken a total of 90 HP, leaving it on 141. The ball gunner gets two hits on the

lead Bf109, for 36 HP, but it still has 105 HP left, and is already on fire.

Turn 12: The leader tries for one more shot, at a third engine. He rolls 6 for the MG 131s and gets three hits, the B-17 fails to dodge and takes another 90 HP. The roll for the MG 151/20 is another 6 for four hits, doing 444 HP, which leaves the B-17 on -87 HP, which would disable it. The GM invokes the optional rule to allow the pilot to keep it from being disabled on a Piloting roll, and he succeeds. However, the B-17 is on less than $\frac{1}{3}$ HP, which halves its top speed to 70. This is *just* less than its stall speed, forcing it to go into a dive to retain control

The GM rationalises the damage as three engines out of action. It's time to Bail Out.



Example 4: Slash and Burn

January 1945. A group of Me163 fighters is attacking an USAAF air raid. We focus on a particular B-17 and the Me163 that attacks it.

The Me163 has Move 4/273, as compared with the B-17's 2/140. With a difference of 133 in the Moves, a fast pass is the only option for the Me163. Its manoeuvre bonus is +2, and the B-17's is -1, so we assume that the Me163 has sighted its target, Engaged and become Advantaged at Long (-18) range.

Turn 1: The Me163 attempts a fast pass, closing from the B-17's rear. The German pilot has to attempt two tasks, piloting and shooting, each at -4. He rolls vs 13 (skill), -4 (two tasks), +2 (manoeuvre bonus) and succeeds by 3. The B-17 pilot rolls vs 12 (skill) -1 (manoeuvre bonus) and succeeds by more than that, avoiding the attack.

The B-17's gunners miss, because they're at -18; and the gunners on other B-17s in the box formation are at an additional -5 because the Me163 is not Engaged with them, and also miss.

Turn 2: The Me 163 lost its Advantaged state on the fast pass, and has to win a new contest of piloting to regain it. We assume it does that.

Turn 3: The Me163 tries another fast pass, and gets an exact success. The B-17 pilot may have been unnerved by the rapid head-on approach, since he fails, and the Me163 can fire. The attack is against 12 (skill), -18 for range, -4 for doing two things at once, +3 for the Me 163's SR (capping +2 for a fixed gun mount and +5 Acc), +4 for RoF 20 (2xMK 108 with RoF 10 each), and +8 for the B-17's SM, for an effective skill of 5.

With a roll of 5, he has a very lucky hit, and the B-17 fails to dodge. A random hit location seems appropriate. A roll of 14 is a wing, and the hit

does $7d \times 2$ pi++, for an average of 49, less the B-17's DR 12, making 37 HP.

The follow-up damage is also significant: $5d$ [2d]. The $5d$ is tripled for an internal explosion, for another 52 HP on average. Fragments attack like an automatic weapon with Rcl 3 and skill 15. While it's not clear from p. B415 how to handle fragments from an internal explosion, a plausible ruling is to treat it as having rolled a 3, but without a critical hit roll. That makes 5 fragments doing damage, for an average of another 35 HP, totalling 130 HP of damage to that wing.

At just under the B-17's ST, this is definitely Major damage, and the explosion means it's a burning attack. The HT-3 roll to avoid catching fire is a failure, and the wing ignites, presumably due to a ruptured fuel tank. Since there are no fire extinguishers in the wings, there's no way to put the fire out, and it will eventually doom the aircraft. The MK108 is quite deadly, *if* one can actually hit with it.

Meanwhile, another Me163 is attacking another B-17. This has the experimental Jagdfaust installation, which fires automatically when its carrier aircraft passes low underneath another aircraft. This is much easier for the Me163 pilot, since he doesn't have to do two things at once, so a less-skilled pilot has been given the job. He can't use his forward-firing guns simultaneously with his upward-firing rockets, because they require him to fly different paths.

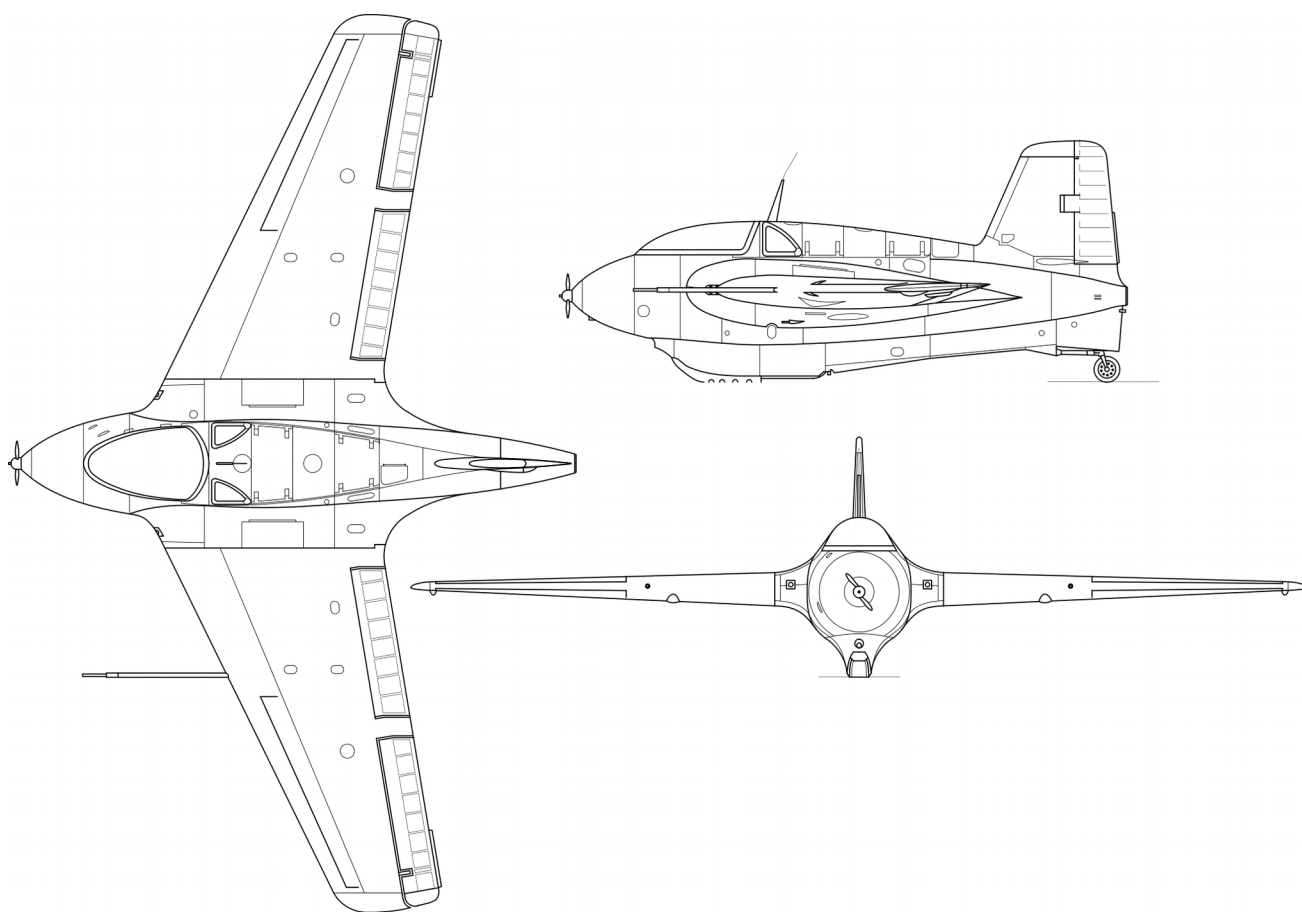
Having become Engaged and Advantaged at Extreme (-22) range and armed his weapon, he tries a Fast Pass. He rolls vs 11 (skill), +2 (manoeuvre bonus) and succeeds by 7. The B-17 pilot rolls vs 12 (skill) -1 (manoeuvre bonus), and fails by 1, and the attack goes in.

The Jagdfaust triggers, rolling against 18 (skill), -22 (range), +3 for the Me163's SR (capping Acc), +1 for RoF 8, and +8 for the B-17's SM, for an

effective skill of 8. On an exact success, one rocket hits, and the B-17 fails to dodge. The damage is 6d cr ex, for an average of 9 after the B-17's DR 12, plus [1d] fragmentation, which can't penetrate the B-17's DR. The hit location is 10, for the Body, which is occupied by the crew. The table on p. B555 tells us that with 10 crew in an SM+8 vehicle, someone is hit on a roll of 6 or less, but

nobody is. The B-17 has a hole in the floor of its fuselage and a lot of superficial damage, but nothing else of significance has happened.

The Jagdfaust would seem to need more development, or pilots willing to start their passes from closer range.



WWII Aircraft and Weapons

Roger Bell_West

Prices for combat aircraft and even more for guns are not well-defined; though money changed hands between user and manufacturer, the details are not always readily available or differ between sources, exchange rates were subject to manipulation or evasion, and many of these aircraft were never offered on the open market. This is particularly applicable to German aircraft.

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>
6	Hurricane	72/259	+1/3	10f	4/166	3.8	0.96	+6	1	5	600		g3WrWi	32
6	Bf 109 G	68/231	+1/2	10f	4/170	3.47	1.09	+6	1	5	528	\$710,000	g3WrWi	45
6	Bf 110	85/361	0/4	10f	4/144	6.6	1.77	+6	3	5	530	\$1,570,000	g3WrWi	40
6	Spitfire	69/238	+1/2	11f	5/180	3.3	0.78	+6	1	5	1,135	\$1,100,000	g3WrWi	36
6	Mosquito NF	95/451	+1/3	10f	4/179	8.85	2.17	+7	2	5	1,500		g3WrWi	48
6	Mosquito B	97/470	+1/3	10f	4/203	9.05	1.9	+7	2	5	1,300		g3WrWi	54
6	Typhoon	83/344	+1/3	11f	4/201	5.7	1.28	+6	1	5	510		g3WrWi	37
6	P-38	94/442	+1/4	11f	4/202	8.75	2.35	+7	1	6	3,300	\$1,430,000	g3WrWi	44
6	P-47	86/370	+1/3	10f	4/212	6.37	1.37	+6	1	6	1,800	\$1,250,000	g3WrWi	49
6	Ju 87	73/266	+1/3	11f	4/116	4.78	1.79	+7	2	8	490	\$761,000	g3WWi	24
6+1	Me 163	77/296	+1/3	8x	4/273	4.75	2.65	+5	1	4	55		gRWi	51
7	Me 262	81/328	+1/2	9f	3/273	7.14	2.95	+6	1	6	650		g3WrWi	53

The Fw 190 and P-51 have stat lines in ***GURPS High-Tech*** (pp. 237-238); their modified HP values are 289 and 353 respectively.

[Hurricane] armed with 8 forward wing Browning Mk II* or 4 forward wing Hispano Mk II (gyro gunsight), and 500lb of bombs.

[Bf 109 G] armed with 2 forward body MG 131 (300 rpg), 1 forward body MG 151/20 (200 rpg) or MK 108 (65 rpg), optional 2 forward wing MG 151/20 (135 rpg), or 500lb of bombs/rockets, or drop tank for +90 miles range.

[Bf 110] armed with 2 forward body FF/M (180 rpg in 3 60-round drums) or MG 151/20, 4 forward body MG 17 (1,000 rpg) or MK 108, 1 or 2 rear MG 15. Some are also fitted with *Schräge Musik* off-bore guns, nominally 2 (upward body) FF/M, but MG 151/20 and MK 108 are also used

[Spitfire] armed with (all guns forward wing) 8 Browning Mk II*, 4 Browning Mk II and 2 Hispano Mk II, 2 Hispano Mk II, or 2 Hispano Mk II and 2 M2 Browning. All models with Hispano guns also have gyro gunsight.

[Mosquito NF] armed with 4 forward body Browning Mk II and 4 forward body Hispano Mk II (gyro gunsight for both).

[Mosquito B] no gun armament.

[Typhoon] 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).

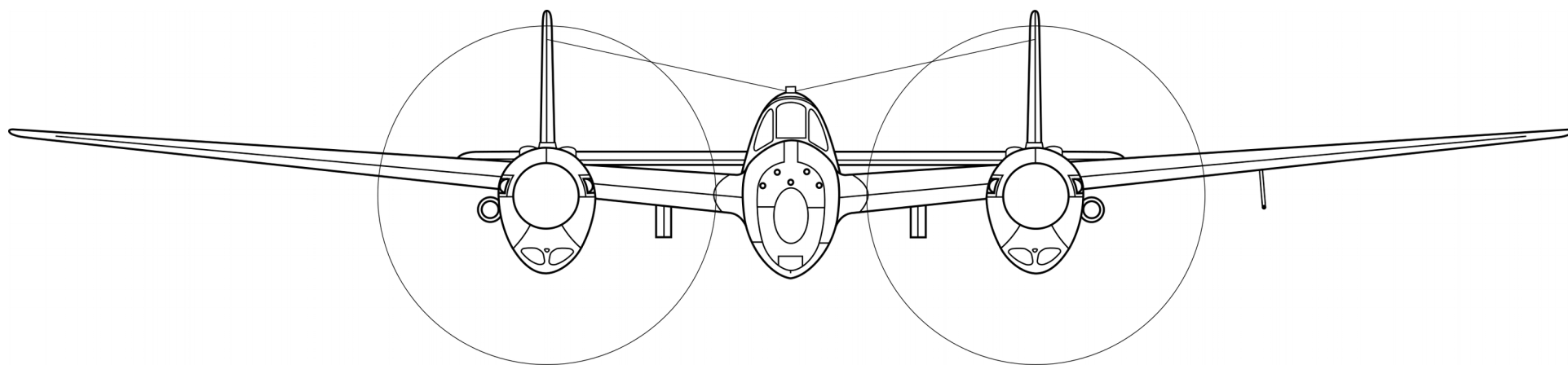
[P-38] armed with 1 forward body Hispano Mk II (150 rpg), 4 forward body M2 Browning (500 rpg), and up to 5,000lb of bombs and rockets. Gyro gunsight for all guns.

[P-47] armed with 8 forward wing M2 Brownings (425 rpg, gyro gunsight) and up to 2,500lb of bombs or rockets.

[Ju 87] armed with 2 forward wing MG 17, 1 rear MG 17, and up to 990lb of bombs.

[Me 163] Rocket. Armed (forward body) with two MK 108 with 60 rpg, or (in pre-production aircraft) two MG151/20 with 100 rpg. Two aircraft are each fitted with two banks of 4 *Sondergerät 500 Jagdfaust* vertically-fired single-shot guns.

[Me 262] Jet. Armed with 4 forward body MK 108, and 1,100lb of bombs.



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>
6	Mosquito FB	97/470	0/3	10f	2/186	11.15	4	+7	2	10	1,300		g3WrWi	50
6	He 111	107/572	0/4	10f	3/132	13.3	3.7	+8	5	10	1,400	\$1,790,000	g3WrWi	43
6	B-17	132/871	-1/4	11f	2/140	27	8.93	+8	10	12	2,000	\$3,000,000	g3t3WrWi	72
6	Condor	134/898	-1/4	10f	2/115	25	6.29	+8	5	3	2,210		g2t3WrWi	29
6	Lancaster	133/884	-1/4	11f	3/138	27.5	9.1	+8	7	12	2,530	\$2,740,000	g3t3WrWi	36
6	P-61	114/650	0/4	10f	3/179	14.85	3.13	+8	3	10	1,900	\$2,920,000	gt3WrWi	34
6	B-24	133/884	-2/3	10f	2/145	27.5	9.25	+9	11	10	1,540	\$3,620,000	g4t3WrWi	49
6	B-25	108/583	-1/4	10f	3/133	17.5	7.76	+8	5	10	1,350	\$1,820,000	gt3WrWi	45
6	B-26	115/661	-1/4	10f	3/140	18.5	6.5	+8	7	10	2,850	\$2,850,000	Gt3WrWi	50
6	A-26	113/638	0/3	10f	3/176	13.8	2.6	+8	3	10	3,000	\$2,930,000	g2t3WrWi	30
6	Ju 88	112/627	-1/4	10f	3/142	13.34	2.47	+8	4	12	1,696	\$1,658,000	g3WrWi	30
6	He 177	133/884	-1/4	9f	2/172	35.27	16.76	+9	6	9	3,500	\$5,000,000	g2t3WrWi	41
7	B-29	168/1,411	-1/4	10f	2/175	60	22.75	+9	11	12	5,600	\$10,500,000	g4t3WrWi	51

The Twin-Prop Transport on p. B465 is pretty much a DC-3 (in airliner configuration, but a C-47 is similar).

[Mosquito FB] armed with 4 forward body Browning Mk II and 4 forward body Hispano Mk II (all with gyro gunsight), and up to 1,000lb of bombs.

[He 111] armed with up to 7 MG 15 or MG 81 (2 nose, 1 dorsal, 2 side, 2 ventral); nose or ventral position may instead mount an MG FF; dorsal and ventral positions may instead mount an MG 131; 4,400lb of internal bombs, *or* 7,900lb externally.

[B-17] armed with 13 M2 Browning: 2 chin turret, 2 forward body, 2 side, 2 upper turret, 2 lower turret, 2 rear, 1 up. Turrets have gyro gunsight.

[Condor] armed with 1 MG 15 front turret (1,125 rpg), 1 MG 15 rear (750 rpg), 2 MG 15 sides (1,500 rpg), 1 MG 131 rear turret (1,000 rpg), 1 MG 151 forward body (800 rpg); and 2,200lb of internal bombs or 11,900lb of external bombs.

[Lancaster] armed with eight Browning Mk II (2 nose turret, 2 upper turret, 4 rear turret) and 14,000lb of bombs.

[P-61] armed with 4 forward body Hispano Mk II (as M2 Hispano; gyro gunsight) (200 rpg), 4 M2 Browning (upper turret; gyro gunsight) (560 rpg), and up to 6,400lb of bombs.

[B-24] armed with 10 M2 Browning: 4 double turrets (nose, dorsal, ventral, tail; gyro gunsight on all) and 2 single side mounts, and up to 8,000lb of bombs.

[B-25] armed with T13E1 cannon and 12-18 M2 Browning including 8 forward body, 2 dorsal turret (gyro gunsight), 2 side, 2 tail (gyro gunsight), and up to 3,000lb of bombs.

[B-26] armed with 12 M2 Browning including 1 forward body, 2 dorsal turret (gyro gunsight), 1 tail, and 4,000lb of bombs.

[A-26] armed with 6 or 8 forward body M2 Brownings; "C" variant has 2 and changes g to G. Up to four pairs of M2 Brownings in underwing pods, or three M2 Brownings in each outer wing panel. Two each M2 Brownings in dorsal and ventral turrets (gyro gunsight). Up to five 5" HVAR rockets on pylons under each outer wing panel. Up to 6,000lb of bombs in bay, plus 2,000lb on wing hardpoints.

[Ju 88] armed with 2 forward body and 4 rear body MG 81s, and up to 9,700lb of bombs.

[He 177] armed with forward body MG 81 (1,000 rpg) and MG 151 (300 rpg), MG 131 rear body (1,000 rpg), 2 MG 131 in forward dorsal turret (500 rpg), MG 131 in rear dorsal turret (1,000 rpg), MG 151/20 rear (800 rounds); up to 20,500lb of bombs.

[B-29] armed with 8 or 10 M2 Brownings in 4 twin turrets (forward upper and lower, rear upper and lower; gyro gunsights; forward upper turret sometimes upgraded to 4 guns), 2 M2 Brownings and 1 Hispano Mk II (as M2 Hispano) in tail; up to 20,000lb of bombs, more typically 12,000lb. *Silverplate* variant omits all turrets for a higher bomb load.

GUNNER/TL (CANNON)

TL	Gun	Damage	Acc	Range	EWt.	RoF	Shots	ST	Bulk	Rcl	Cost
6	T13E1 cannon, 75mm	7d×10 pi++	5	3,000/9,000	405	1				6	

GUNNER/TL (ROCKETS)

TL	Weapon	Damage	Acc	Range	EWt.	RoF	Shots	ST	Bulk	Rcl	Cost
6	RP-3, 76mm	6d×7	2	400/1,700	82	1	1			1	
	<i>follow-up</i>	2d [1d] cr ex									
6+1	Jagdfaust, 50mm	6d [1d] cr ex	5	150/300		1	1			2	

The Jagdfaust is triggered by photocells; during a high-speed pass an entire bank fires, using its own gunnery skill of 18.

GUNNER/TL (MACHINE GUN)

TL	Gun	Damage	Acc	Range	EWt.	RoF	Shots	ST	Bulk	Rcl	Cost
6	MG 131, 13mm	9d pi+	5	900/4,000	50.5/25	15!	100(5)	15B†	-6	3	\$425
6	MG 151, 15mm	10d pi++	5	1,100/5,400	93	12!			-7	2	
6	MG 151/20, 20mm	7d×2 pi++	5	1,200/6,900	92.4/48.2	12!	100(5)	22M	-9	2	\$14,700
	<i>follow-up</i>	2d [1d] cr ex									
6	MK 108, 30mm	7d×2 pi++	5	600/3,000	128	10!		33M	-10	2	\$16,000
	<i>follow-up</i>	5d [2d] cr ex									
6	MG FF, 20mm	7d×2 pi++	5	1,100/6,300	58	8!	80			2	
6	FF/M, 20mm	7d×2 pi++	5	900/5,200		9!	80			2	
	<i>follow-up</i>	2d [1d] cr ex									
6	MG 15, 7.92mm	7d+1 pi	5	1,100/1,400	18	16!	150	12B†	-7	2	\$4,200
6	MG 17, 7.92mm	7d+1 pi	5	1,100/1,400	27.7	20!	75	12B†	-7	2	\$4,200
6	MG 81, 7.92mm	7d pi	5	1,100/4,400	13.9	27!		12B†	-6	2	
6	Hispano Mk II, 20mm	6d×3 pi++	6	2,000/7,000	110	10!		30M	-10	2	\$20,000
	<i>follow-up</i>	2d [1d] cr ex									
6	Browning Mk II, .303	7d pi	5	1,100/4,500	25.3	19!		17M	-6	2	
6	M2 Browning, .50	6d×2 pi+	5	1,700/7,100	64	13!	100(5)	21M	-8	2	\$15,000

