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VEHICLES EXPANSION 1

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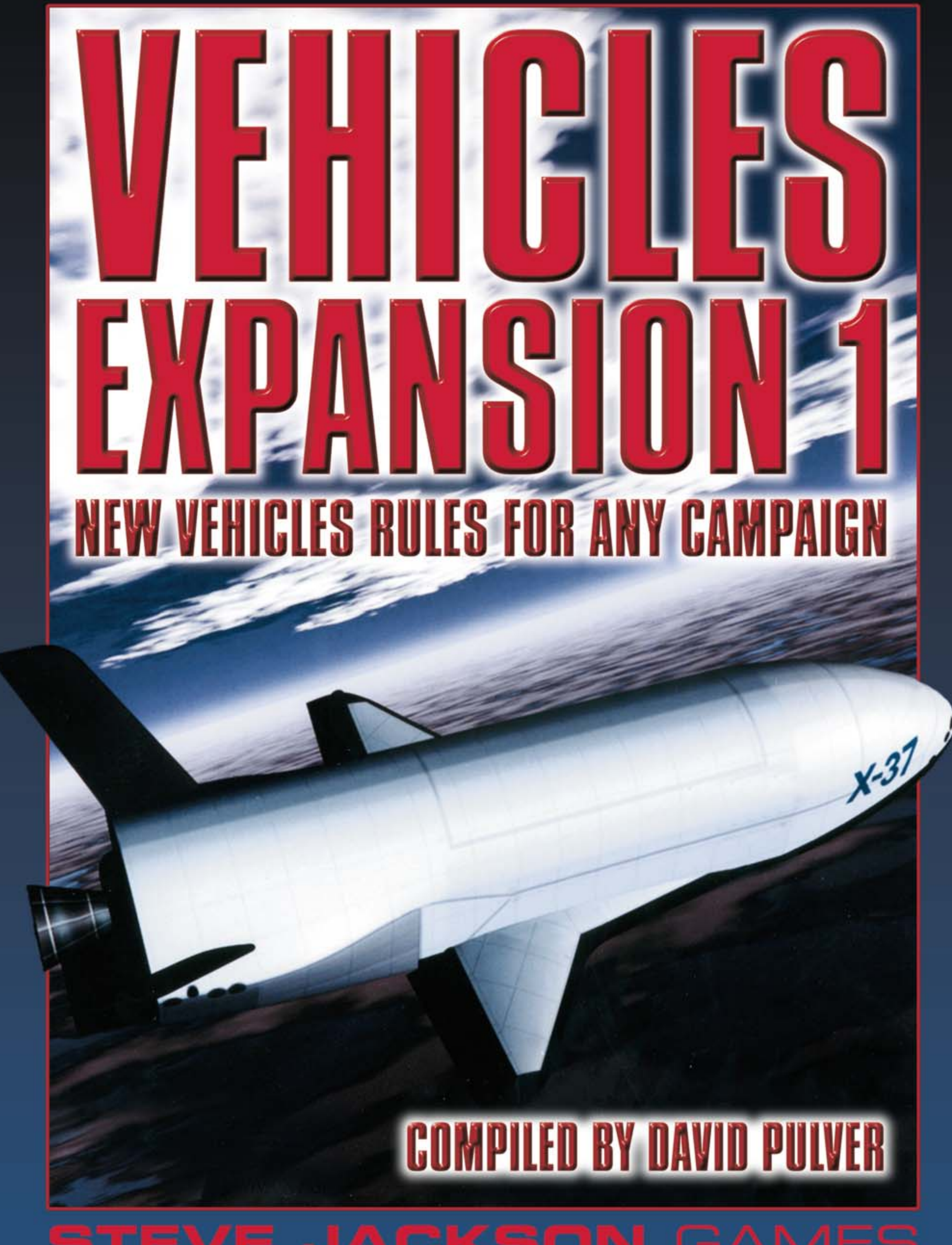

COMPILED BY DAVID PULVER

STEVE JACKSON GAMES

Time for a Tune-up!

David Pulver's long-awaited supplement for ***GURPS Vehicles*** has dozens of vehicular design options and components – some have appeared in other ***GURPS*** books, and some are brand new! Now you can build:

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- Monstrous cybertanks invulnerable to anything short of a nuclear weapon.
- Elegant spacecraft that ride the solar winds on magnetic sails.

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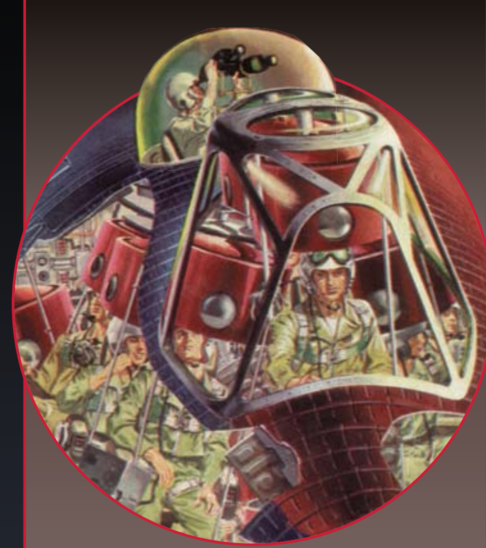

GURPS Basic Set, *Third Edition, Revised* and ***GURPS Vehicles,*** *Second Edition,* are *required* to use this supplement in a ***GURPS*** campaign. The ideas in ***GURPS Vehicles Expansion 1*** can be used with *any* roleplaying system.

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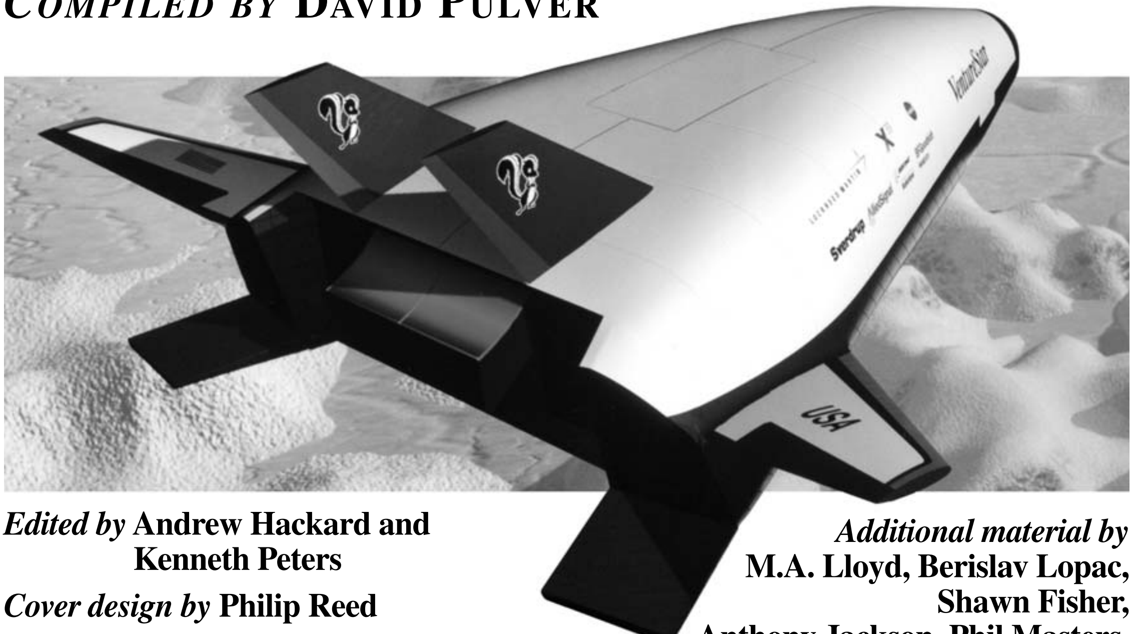

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STEVE JACKSON GAMES

INTRODUCTION

About *GURPS*

Steve Jackson Games is committed to full support of the ***GURPS*** system. Our address is SJ Games, Box 18957, Austin, TX 78760. Please include a self-addressed, stamped envelope (SASE) any time you write us! Resources include:

Pyramid (**www.sjgames.com/pyramid/**). Our online magazine includes new ***GURPS*** rules and articles. It also covers ***Dungeons and Dragons, Traveller, World of Darkness, Call of Cthulhu,*** and many more top games – and other Steve Jackson Games releases like ***In Nomine, INWO, Car Wars, Toon, Ogre Miniatures,*** and more. *Pyramid* subscribers also have access to playtest files online!

New supplements and adventures. ***GURPS*** continues to grow, and we'll be happy to let you know what's new. A current catalog is available for an SASE. Or check out our website (below).

Errata. Everyone makes mistakes, including us – but we do our best to fix our errors. Up-to-date errata sheets for all ***GURPS*** releases, including this book, are available from SJ Games; be sure to include an SASE. Or download them from the Web – see below.

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Internet. Visit us on the World Wide Web at **www.sjgames.com** for an online catalog, errata, updates, Q&A, and much more. ***GURPS*** has its own Usenet group, too: rec.games.frp.gurps.

GURPSnet. This e-mail list hosts much of the online discussion of ***GURPS.*** To join, e-mail majordomo@io.com with "subscribe GURPSnet-L" in the body, or point your web browser to **gurpsnet.sjgames.com**.

The ***GURPS Vehicles Expansion 1*** web page is at **www.sjgames.com/gurps/books/vehiclesx1/**.

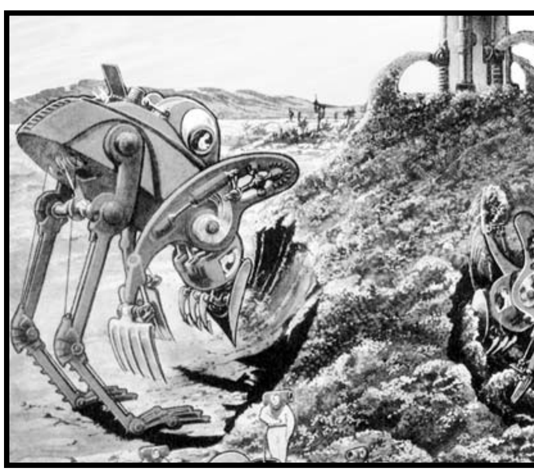
Page References

Rules and statistics in this book are specifically for the ***GURPS Basic Set,*** *Third Edition.* Any page reference that begins with a B refers to the ***GURPS Basic Set*** – e.g., p. B102 means p. 102 of the ***GURPS Basic Set,*** *Third Edition.* Page references that begin with CI indicate ***GURPS Compendium I.*** Other references are CW for ***GURPS Cyberworld,*** HT for ***GURPS High-Tech,*** and VE for ***GURPS Vehicles,*** *Second Edition.* For a full list of abbreviations, see p. CI181 or the web list at **www.sjgames.com/gurps/abbrevs.html**.

This supplement to ***GURPS Vehicles,*** *Second Edition* provides additional design options, components, and performance rules for creating and operating vehicles.

GURPS Vehicles Expansion 1 focuses on new features, subassemblies, and components that can be used to create more specialized vehicle designs, or offer alternative byways to existing technology paths. A second purpose of this book is to enhance ***GURPS Vehicles'*** ability to pass a reality check. To this end, some rules are marked as "extra detail." These optional expansions of existing ***GURPS Vehicles*** rules provide added realism at the expense of greater complexity or more detailed calculation.

GURPS Vehicles Expansion 1 would not have been possible without the substantial contributions of M.A. Lloyd. A vociferous playtester and tireless advocate of system realism, M.A. Lloyd created a vast array of supplementary material for ***GURPS Vehicles***, a good chunk of which appears in this book. Additional contributions came from Berislav Lopac (expanded sailing rules), Shawn Fisher, Anthony Jackson, Phil Masters, Kenneth Peters, William H. Stoddard, and others too numerous to mention.



About the Compiler

David L. Pulver is a writer, game designer, and editor who lives in Victoria, British Columbia. He is the author of numerous roleplaying games and supplements, including ***GURPS Vehicles*** and ***Transhuman Space.***

Design Options 1

This chapter describes alternative approaches to vehicle technology and design, including options for creating subassemblies, body features, structures, and armor that expand on the rules in Chapter 1 of ***GURPS Vehicles.***

Superscience

GURPS Space and ***GURPS Ultra-Tech 2*** divided technological developments into those that seemed reasonably plausible ("hard science") and those that postulate changes in the physical laws as we know them today (called "superscience").

Superscience devices are assigned TLs, but these should be considered arbitrary, and the GM should feel free to change them if it suits the campaign. For example, it can be interesting to add a single newly discovered superscience technology. such as hyperdrive or cosmic power, to a modern society (TL6-8) and explore the ramifications.

Subassemblies

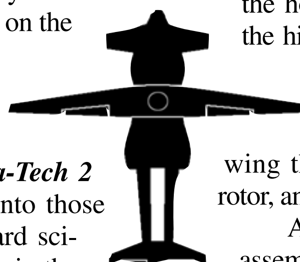
These are additional vehicular subassemblies (see p. VE7).

Superscience in *GURPS Vehicles*

The following technologies from ***GURPS Vehicles*** are examples of superscience: reactionless thrusters, stardrives, parachronic conveyers, contragravity generators, gravity communicators, FTL communicators, multiscanners and gravscanners, psionic technology, teleport projectors, screen generators, artificial gravity units, gravity webs, grav compensators, cosmic power plant, force field grids, gravitic guns, paralysis beams, fusion beam, gravity beam, disintegrator, and displacer.

These technologies have sound operating principles, but their amazing performance qualifies them as superscience: TL9 and TL10 fusion rocket, all power cells, radiation shielding, neutrino communicators, MHD tunnels, neutrino-homing guidance, X-ray laser, and graser. More realistic alternatives to some of these technologies are described in this book.

Canard Rotor Wing (CRW, TL8)



This wing subassembly design combines the hover efficiency of a helicopter with the high-subsonic cruise speed of a fixed-wing aircraft. It consists of a small forward wing (canard), a large but narrow top-mounted wing that can also spin like a helicopter rotor, and a rear twin-boom tail unit.

A CRW is treated as a wing subassembly (p. VE8), except that the combination of wings (both wings, tail, and canard) is treated as a single subassembly, rather than a pair of wings. No components can be built into its wings. The vehicle may have up to Very Good streamlining.

Structures: The total wing volume (p. VE17) should not exceed 0.15 × body volume, and will be nothing but empty space; as usual for standard wings, multiply area by 1.5. On the *Vehicle Structure Table* (p. VE19) use the *Wings or Rotors* row for weight and cost multipliers. Treat as a wing for calculation of hit points.

Propulsion Systems: A vehicle with a CRW must be given a reaction rotor drivetrain (p. 12) and a reaction engine (p. VE35 or p. 11), usually a turbojet or turbofan. The engine must be mounted in the body; the combination allows aerial vehicle propulsion.

Performance: A vehicle with a CRW has both helicopter-mode and airplane-mode performance characteristics. Use the figures for the reaction rotor drivetrain (p. 12) to determine helicopter-mode statistics and the performance of the jet engine and wing to determine airplane-mode statistics.

The vehicle can change into helicopter mode at any speed below 300 mph, or into airplane mode at any speed over the aircraft's stall speed. This takes one second, during which time it is treated as being in the previous mode. It may not accelerate, decelerate, or maneuver during this time. In helicopter mode, the vehicle may not exceed 300 mph, regardless of streamlining.

Other Components 3

This chapter describes other equipment that can be installed in a vehicle. It expands upon the components detailed in chapters 4 through 8 of ***GURPS Vehicles.***

Instruments and Electronics

This section covers a wide variety of gadgets and options for communication, navigation, jamming, and other purposes. Items so classed can be located in the body, or superstructures, pods, turrets, arms, wings, open mounts, legs, or masts unless otherwise noted.

Communications

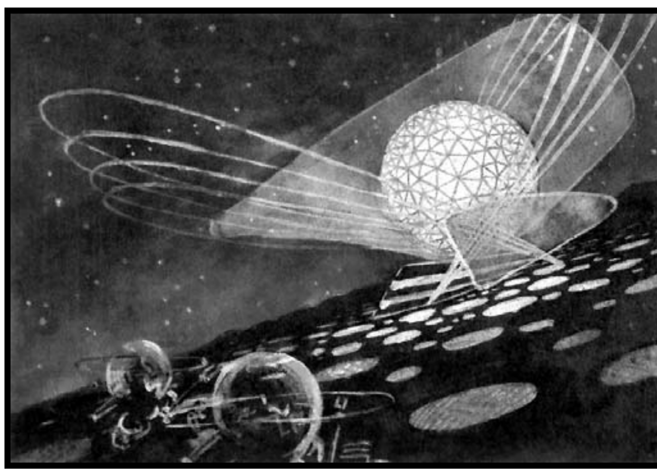
If one communicator is transmitting to another communicator with a *different* range, the actual maximum range is the square root of (transmitting communicator range × receiving communicator range). A communicator's transmitting and receiving range are normally identical, unless the communicator has the options Sensitive or Very Sensitive (increases receive range only) or Receive Only (no transmit range).

Underwater Communications

Ordinary radio waves cannot penetrate water to any useful depth. Submarines can be equipped to receive VLF radio signals, but they cannot transmit radio in these wavelengths; only fixed stations and specially equipped large aircraft can transmit VLF. Likewise, subs can only be equipped to receive ELF signals, and extending or retracting the antenna for this purpose actually takes around 30 minutes (not 30 seconds) on contemporary subs. However, several additional specialized systems are available:

Sonar Communicator (TL6): This is an option for communicators (p. VE46). A sonar communicator uses sonar pulses fort underwater communication between two vessels with compatible equipment. It can only be combined with the Sensitive, Very Sensitive, Receive-Only, and Tight Beam options, and may not be Long, Very Long, or Extreme range. Multiply weight, cost, and power by 10; divide range by 10. Messages can be voice, text, or datalink, and may use scramblers.

Communications Buoy/Trailing Wire Antenna (late TL6): This is a buoy or wire several hundred yards in length, trailed behind a submerged submarine, which floats to the surface and acts as an antenna, allowing the sub to receive – and, optionally, transmit – regular (not VLF/ELF) radio messages. The system weighs 5,000 lbs., occupies 100 cf., and costs $250,000.



Message Buoy (TL6+): These should be designed as small vehicles with a floatation hull, radio, and battery with enough armor to survive at their launch depth. Many are launched from decoy dischargers, and should range in size from 0.5 to 5 cf. A typical TL7 example has a spherical 0.5 cf medium, expensive frame with a sealed floatation hull coated with DR 6 expensive metal and equipped with a medium-range scrambled radio powered by a 72 kWs lead-acid battery. It is 31 lbs. and costs $2,019. It has a crush depth of 384 yards.

Blue-Green Lasers (TL8+): This option (p. VE123) can also be applied to laser communicators, laser rangefinders, ladars, and AESAs for the standard +20% cost and one-half range. (More realistically, blue-green lasers should have one-tenth their range underwater while other lasers have only 1/100th their normal range.)

Performance and Operations 4

This chapter expands on chapters 10 and 12 of ***GURPS Vehicles***, providing additional rules for sailing, submersible, and supercavitating vessels.

Water Performance – Wind and Sails

GURPS Vehicles discusses wind speed and its effects on sailing vessels in two places: under *Sails* (p. VE30), where the wind force according to the Beaufort scale determines the ship's speed, and then again in the sidebar *Sails and Wind* (see p. VE159), which describes the effect of gales and stronger winds.

In fact, the Beaufort scale includes all winds possible on Earth, and is based less on wind speed than the general effect of wind on the sea surface (which is of greater importance to sailors). The scale goes further than the force 7 wind listed on p. VE30, encompassing everything from complete calm (0 Beaufort) to a violent hurricane (12 Beaufort).

These rules are for use with the expanded sail options (pp. 8-10). They add additional flavor at the cost of extra complexity. The table below summarizes how wind conditions measured on the complete Beaufort scale affect sailing:

Expanded Wind and Sails Table

Scale	*Wind Speed*	*Sea*	*Hazard*	*HRM*	*MTF*	*Sailing*
0: Calm	0-1	calm water	–	0	0	None
1: Light air	2-3	calm water	–	0	1	Slow
2: Light breeze	4-7	calm water	–	0	2	Slow
3: Gentle breeze	8-12	choppy seas	1 day	0	3	Slow
4: Moderate breeze	13-18	choppy seas	4 hrs	0	4	Good
5: Fresh breeze	19-24	choppy seas	2 hrs	-1	5	Fast
6: Strong breeze	25-31	rough seas	1 hr	-1	5	Rough; furl 1/4 sails
7: Near gale	32-38	rough seas	30 min	-1	4	Rough: furl half sails
8: Gale	39-46	rough seas	15 min	-2	3	Very rough: furl 3/4 sails
9: Strong gale	47-54	stormy seas	5 min	-2	0.25	Very rough: furl all sails
10: Storm	55-63	stormy seas	1 min	-3	0	All hands to the pumps!
11: Violent storm	64-73	major storm	1 min	-3	0	Man the lifeboats!
12: Hurricane	74+	major storm	1 min	-4	0	Davy Jones's locker!

Scale: The wind force levels according to the Beaufort scale, with a usual name for each level.

Wind Speed: Measured in miles per hour.

Sea: The prevailing sea conditions typical at that wind force, which affect Control Rolls according to the sidebar on p. VE152.

Hazard: The time interval at which a Hazard roll must be made as long as the ship is in the area affected by the wind of the listed force. This interval is modified according to the vessel's Size Modifier. A positive modifier shifts the interval upwards one row per +1 (e.g. a ship with Size Modifier +3 in a Gale makes a Hazard roll each 2 hours instead of every 15 minutes), while the penalty shifts it downward. *Exception:* A ship in a Calm area, no matter how small, never makes Hazard rolls due to wind conditions. Treat all Size Modifiers above +6 as +6, and those below -3 as -3.

HRM (Hazard Roll Modifier): This is a modifier to all the Hazard rolls made when the ship is affected by the wind of listed force, in addition to the modifiers from the sea conditions. Do not apply this modifier to ordinary Control Rolls.

MTF (Motive Thrust Factor): Since the only way for a sailing vessel to survive under a strong wind is to furl part or all of her sails, the aquatic motive thrust of her sails is multiplied by this number instead of the wind force. Furling the sails will also prevent the HT loss described in the sidebar on p. VE159.

Sailing: This column gives a short description of what the sailing conditions look like from the perspective of the vessel's crew.

Compute the lifting body or wing aerial maneuver rating normally. (For even more realism, if hyperspace acts like a real fluid, divide by its apparent density.)

sSR: Calculate it exactly like aSR (see p. VE136). Failed control rolls that give an Energy Loss result instead cause speed loss equal to 2 × sDecel. Tailspins still result in spin and wing stress, but no loss of altitude.

Hyperdynamic Top Speed: Calculate this exactly like aerial top speed (p. VE134), except that thrust is limited to that produced by engines that function in vacuum. Then multiply by the hyper-factor.

If a hyperdynamic field is activated while the spacecraft is traveling faster than its hyperdynamic top speed it decelerates and cannot maneuver until its speed has dropped below hyperdynamic top speed. The GM may decide on the rate of this deceleration: sDecel = sAccel × [(current speed/top hyperdynamic speed) squared] or the aerobraking rules (p. VE164) are reasonable; a constant 1 mph/s (or similar value) otherwise.

Gravity Stabilization: At the GM's option, a vehicle in a hyperdynamic field divides felt acceleration (from maneuvers) by its hyper-factor for purposes of determining GLOC (p. VE154) and any structural stress on the vehicle.

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