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INTRODUCTION

About GURPS

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

Pyramid. Our online magazine includes new rules and articles for ***GURPS***. It also covers all the hobby's top games – ***AD&D, Traveller, World of Darkness, Call of Cthulhu, Shadowrun*** and many more – and other SJ Games releases like ***In Nomine, INWO, Car Wars, Toon, Ogre Miniatures*** and more. And *Pyramid* subscribers also have access to playtest files online, to see (and comment on) new books before they're released.

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 Web site (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 always available from SJ Games; be sure to include an SASE with your request. Or download them from the Web – see below.

Q&A. We do our best to answer any game question accompanied by an SASE.

Gamer input. We value your comments. We will consider them, not only for new products, but also when we update this book on later printings!

Internet. Visit us on the World Wide Web at www.sjgames.com for an online catalog, errata and updates, and hundreds of pages of information. We also have conferences on Compuserve and America Online. ***GURPS*** has its own Usenet group, too: rec.games.frp.gurps.

GURPSnet. Much of the online discussion of ***GURPS*** happens on this e-mail list. To join, send mail to majordomo@io.com with "subscribe GURPSnet-L" in the body, or point your World Wide Web browser to www.io.com/~ftp/GURPSnet/www/.

Page References

References to the ***GURPS Basic Set,*** *Third Edition Revised* begin with a B – e.g., p. B121 is page 121 of that edition.

Similarly, CI refers to ***GURPS Compendium I: Character Creation;*** HT means ***GURPS High-Tech,*** *Second Ed.;* S means ***GURPS Space,*** *Second Ed.;* SU means ***GURPS Supers,*** *Second Ed.;* UT means ***GURPS Ultra-Tech,*** *Second Ed.;* M refers to ***GURPS Magic,*** *Second Ed.;* RO points to ***GURPS Robots;*** P signals ***GURPS Psionics*** and TT to ***GURPS Time Travel.***

GURPS Vehicles is a generic construction kit for designing almost any type of conveyance, from rowboats to antimatter-powered grav tanks. This second edition of ***GURPS Vehicles*** offers an easier-to-use design sequence and many new options, including detailed rules for building spacecraft and locomotives, as well as a comprehensive weapon design system.

GURPS Vehicles is designed to build a vehicle from the ground up, allowing maximum versatility by not restricting designers to specific hull or vehicle types. While ***GURPS Vehicles*** will let you design cars and airplanes, it will also let you create very exotic craft: Want a combination submarine-helicopter? You can build it . . .

Conventions

The following conventions are used throughout this book:

Abbreviations for Units

The following abbreviations are not standard, but are used to save space:

"cf" (instead of "cu. ft.") for "cubic foot"
"cy" (instead of "cu. yd. ") for "cubic yard"
"sf" (instead of "sq. ft.") for "square foot"

Metric and Other Conversions

1 cubic yard = 27 cubic feet
1 cubic foot = 7.481 US gallons = 28.317 liters
1 litre = 0.264 US gallons
1 displacement ton = 35 cubic feet
1 ton = 2,000 pounds
1 pound = 0.4536 kilograms
1 Astronomical Unit (AU) = 93 million miles
2 mph = (approx.) Speed or Move of 1
1 kph = 0.621 mph
1 knot = 1.15 mph
1 gravity (g) = 10.7 yd/s/s = 21.9 mph/s
1 horsepower = 0.746 kilowatts (kW)
1 kilowatt-hour = 3,600 kilowatt-seconds (kWs) (kilojoules)

Constants and Equivalents

The following equalities are assumed:
Speed of light in vacuum = 328,000,000 yd/s
1 inch of unsloped hard steel armor = DR 70
An "E" power cell holds 360,000 kilowatt-seconds at TL8

Calculations

There are lot of calculations in the vehicle design rules; a calculator is recommended! Two points of order:

Fractions and Rounding: Fractional hit points, DR, PD, DF, SR and crew requirements are rounded up to the next whole number (e.g., DR 7.5 becomes DR 8); values less than 0.5 are dropped to 0. In all other cases, retain fractions – but you can round them off to two decimal places (e.g., 20.1234 becomes 20.12) if desired. Any exceptions to these rounding conventions are noted in the text.

Cube Roots: A few of the formulas used for watercraft performance require cube roots to be calculated. In the event your calculator or spreadsheet lacks a cube root function, we've included a simplified cube root table in the appendix to the *Performance* chapter (p. 138).

About the Author

David L. Pulver is a writer and game designer based in Kingston, Ontario. He is the author of ***GURPS Ultra-Tech, Psionics*** and ***Robots,*** and the "Phoenix Sector" in ***Space Atlas 4,*** as well as many ***GURPS*** adventures. He has also written game supplements for other companies, including ***Glory of Rome*** and ***The Complete Druid*** (TSR) and ***Indiana Jones and the Rising Sun*** (West End Games). Besides gaming, David's interests include science fiction, military history and Japanese animation.

This book provides a comprehensive metasystem for creating nearly any type of vehicle. A vehicle is designed by choosing the major *subassemblies* (like wheels or wings or turrets) it will have, along with any *body features* like streamlining. Next, components that go into it such as propulsion systems, weapons, seats and power systems are selected and placed within the body or subassemblies. Then the volume of the body and each subassembly is determined, and the size, weight and cost of the structure needed to contain and support these components is calculated. Surface features like armor are layered over the vehicle. Last of all, the vehicle's statistics are determined.

Create vehicles by following the steps outlined in this chapter, and referring to other chapters as directed, recording all the design features as they are chosen.

EXAMPLE

To demonstrate how the system works, we'll build Captain Morgan's Kitty Hawk, an "omnimobile" intended for a modern-day super agent campaign.

Tech Level

First, decide what tech level the vehicle will be built at – this may be anything from TL 0 (Stone Age) to TL16 (super science).

The various components and technologies that can be used in a vehicle are rated for the TL at which they first appear.

Occasionally, a historical tech level may be prefixed with "early," referring to the first half of the period covered in the tech level, or "late" indicating that availability limited to the latter half of that tech level. If no tech level is listed for a component, it is assumed to be available at any TL. A vehicle can normally only be built with technologies and components from its own or a lower TL, unless some source of higher-TL parts is available, or the designer has the Gadgeteer advantage.

The Kitty Hawk is built at late TL7, but has a few TL13 components salvaged from a wrecked UFO.

EXAMPLE

Concept

Next, come up with a general concept of the vehicle. What's it for? What should it look like? The most basic concepts are:

Ground Vehicle (TL0): A vehicle designed to move in contact with the ground or another solid surface, such as a car, locomotive or tank.

Water Vehicle (TL0): A watercraft; a vehicle designed to float on water or another liquid, such as a boat or ship.

Underwater Vehicle (TL5): A watercraft that can swim while totally submerged in liquid – a submarine.

Air Vehicle (TL5): An aircraft; a vehicle designed to fly in an atmosphere, such as a balloon or airplane.

Space Vehicle (TL7): A spacecraft; a vehicle designed to fly beyond an atmosphere.

Hovercraft (TL7): A vehicle that uses hover fans to maintain an air cushion and achieve lift, and as such is capable of skimming over ground or water at altitudes of a few feet. Also called an air cushion vehicle (ACV) or ground-effect vehicle (GEV).

A vehicle can combine one or more of these concepts. For instance, most airplanes are a combination of aircraft and ground vehicles (taxiing on a runway), and seaplanes are combination watercraft and air vehicles.

The Kitty Hawk is a combination aircraft, water vehicle, ground vehicle and submarine: an "omnimobile." It's supposed to resemble an ordinary automobile, but with special features that enable it to fly and swim in or under water.

EXAMPLE

Part I: Subassemblies

Every vehicle has a main *body*. But many vehicles have subassemblies attached to their bodies, such as wheels, wings or turrets. At this stage, choose which subassemblies, if any, the vehicle has.

Subassemblies are broken down into three broad categories: motive subassemblies (like wheels or legs), flight subassemblies (like wings or rotors) and structures (like turrets or arms).

A. Motive Subassemblies

If the vehicle will have skids, wheels, tracks, halftracks, skitracks or legs for moving on the ground, pick one or more of these subassemblies and refer to the appropriate section below; otherwise skip ahead to *B. Flight Subassemblies*, on p. 7. A ground vehicle will normally have a motive subassembly; the only way a vehicle can travel in contact with the ground without one is to install a flexibody drivetrain (covered later, in the *Propulsion and Lift Systems* chapter) and slither like a snake.

If a motive subassembly is desired, refer to each one's description below for its available TLs, capabilities and any other design decisions that need to be made (e.g., if a wheeled subassembly is chosen, there are several subtypes available).

The Kitty Hawk will have wheels.

EXAMPLE

VEHICLES IN THE CAMPAIGN 15

A battered Kitty Hawk landed beside Cassidy's hanger. Morgan jumped out. She seemed tired but unhurt, and inordinately pleased with herself. They hugged quickly, then pulled apart.

"Armageddon postponed, Captain?" Cassidy asked.

"The cause of light triumphs again," Morgan sighed, leaning back against the hood. "She of the Seven Eyes is in the trunk."

"But you got tagged," Cassidy observed. He pointed to a huge dent near the front fender. "What did that, a 25mm cannon round?"

"You should see the other guys." Morgan grinned evilly. "Harriers zip, Kitty Hawk two. But speaking of repairs . . ."

This chapter covers the role of vehicles in the campaign. It deals both with issues that concern PCs (such as obtaining and legally operating vehicles, designing new ones and personal vehicular equipment), and those that concern GMs (such as tech paradigms and alternative vehicular technologies).

Using GURPS Vehicles

What can you do with ***GURPS Vehicles?*** That depends on the worldbook you use it with. Obviously, it can be used as a source for vehicles and vehicle combat for historical, fantasy, modern-day or futuristic adventures. In addition:

GURPS Time Travel

When characters are adventuring in the past, the GM can use this book to create period transportation. Furthermore, using the ***Basic Set*** rules for building up tech levels, characters stranded in an earlier time can try to construct their own non-historical vehicles. As well, the rules for "parachronic conveyers" (p. 40) are suitable for use in ***GURPS Time Travel's*** *Infinite Worlds* background.

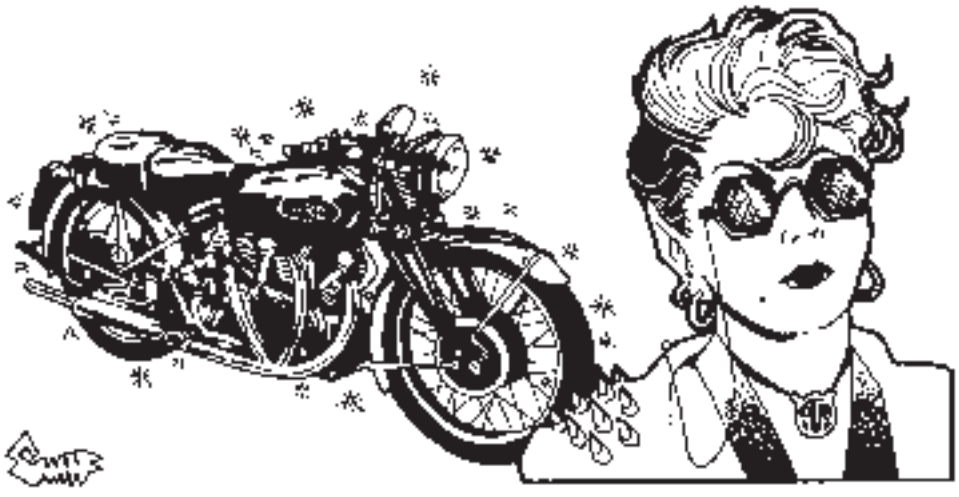
GURPS Magic

The GM can use ***Vehicles*** to create exotic enchanted craft such as demonic war machines powered by soulburners, flying ships drawn by gryphons or boats rowed by zombie oarsmen.

In a modern-day "mana-punk" campaign, or a weird science one like ***GURPS IOU,*** spell-powered motorbikes and autos can be easily created using these rules.

GURPS Espionage

What's an espionage game without car chases and exotic vehicles? These rules allow the design of "spymobiles" with everything from mutable license plates to oil jets.



Sensitive and Secret Technology

When PCs wish to build vehicles, GMs should feel free to classify as "sensitive technology" any item whose manufacturing process is classified and unavailable to ordinary citizens. Examples at TL6 would be most kinds of radar, advanced bomb sights and proximity fuses. At TL7, examples of sensitive technology include most ECM and stealth systems, fission power plants, advanced sensors, laminate armor and some guided missiles.

Characters will usually be unable to purchase sensitive equipment commercially, and stealing it, or the plans or machines used to build it, may be the focus of an adventure.

The actual manufacturing blueprints of many military (and some civilian) *vehicles* are also classified, even if the vehicle itself is for sale. Even though none of its components may be classified in and of themselves, designing the vehicle is still a long and expensive process. However, possession of the engineering drawings enables the vehicle to be easily "reverse engineered." After France embargoed sales of advanced jets to Israel, Israeli agents stole the blueprints of the French Mirage 5 fighter. Later, Israel produced its own Mirage 5 clone, the Nesher.

Making Lemons

If a vehicle is poorly maintained (or very used) it may have various bugs. Also, some vehicles are just designed badly. Some sample flaws are given below. Pick a few that can apply to the vehicle, or make some up.

Minor Bugs

Hangar Queen: Reduce the time the vehicle can run between maintenance checkups (p. 146) by 10-60%.

Low Mileage: Add 10%-30% to the fuel consumption of the vehicle's power plant.

Complex Controls: The vehicle's controls are very complex. Anyone new to the vehicle will be at an extra -1 to skill beyond the usual -2 for unfamiliarity with the vehicle type. Default use is at an *extra* -2 penalty. This is common on military jets.

Continued on next page . . .