CAR WARS

COMPENDIUM

The Complete Rules In One Volume

Second Edition

STEVE JACKSON GAMES

CAR WARS®
COMPENDIUM

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Introduction

The *Car Wars Compendium* is an attempt to compile all the rules that have been published for *Car Wars* since its release nearly 10 years ago. This book includes all the rules and equipment from *Deluxe Car Wars*, the first four *Uncle Albert's Catalogs*, and *Dueltrack*, as well as vehicle and character information from *Boat Wars* and *Midville*. This is intended to be the definitive *Car Wars* rulebook.

This book is *not* a complete game; you will still need a map and counters to play. The *Compendium* is intended for the dedicated player, who already has these things and doesn't need to buy them again. If you are new to *Car Wars*, you should put this book down and buy *Deluxe Car Wars* instead . . . or else supplement this book with an expansion set, such as *Midville* or *Muskogee Mayhem*, which has game maps and vehicle counters.

Chronology

Car Wars is set 50 years in the future. The "now" of the *Car Wars* world moves ahead as the real world does. It was 2031 when the game was first published. As these words are written, it is early 2040. It's a rough world . . . and "Drive Offensively" is its motto.

2000: Federal government moves to nationalize dwindling supplies of oil and natural gas production. Legislatures in Texas, Oklahoma and Louisiana react by seceding, and move to nationalize these resources themselves. Pitched battles with federal forces follow, resulting in the destruction of several oilfield sites on both sides of the newly-established border.

2003: U.S. forces stopped in the hills of central Texas, ending bloody "Gulf or Bust" campaign. Rebel forces begin to retake lost territory.

2004: Texarkana Accords are signed, ending the Second Civil War. Oklahoma, Texas and Louisiana become three separate sovereign nations, referred to as the Free Oil States.

2012: Grain blight breaks out in Nebraska, spreading rapidly to neighboring areas. A simultaneous blight takes root in the Ukraine. Accusations fly, charging deliberate biological war, followed by nuclear warheads. To everyone's surprise, satellite defenses stop most of the missiles. Meanwhile, the world's stock of grains, excluding barley and sesame, has been devastated. Severe food shortages spring up across the globe. The U.S. is in better short-term shape than most, since the blight apparently has no effect on foods with preservatives in them.

2016: The Food Riots. "Fortress" towns develop. National government fails to keep order throughout much of the U.S.

2018: Gangs rule most of the U.S. outside of the fortress towns. Country real estate becomes worthless; algae farms make up lost food production.

2020: Many large cities totally abandoned. National government regains authority but enforcement decentralized. Economy weak but stable, with food rationed and unemployment at 37%.

2022: Supreme Court decision decriminalizes manslaughter in arena games. "Death sports" become popular. Television becomes nation's number-two industry, just after food production.

2023: "Crazy Joe" Harshman wins Fresno destruction derby by mounting a surplus .50-caliber machine gun in his Chevy. Term "autoduelling" first used by sportswriters.

2024: Armadillo Autoduel Arena opens on site of former shopping mall in Austin, Texas.

2025: Autoduelling becomes most popular TV sport, edging out combat football and private wars. Eight more autoduel arenas open in North America. The American Autoduel Association (AADA) is formed.

2026: Utah autoduellists form vigilante group to counter Badlands cycle gangs. AADA holds first sanctioned "National Championship" in Austin, Texas. AADA also begins issuing area advisories and helping duellists organize against cycle gangs and other hazards, upsetting local police forces.

2027: Police admit inability to deal with duellist-armed vehicles in highway use. Informal duels increase in numbers.

2028: Many localities legalize vehicular weaponry of a "defensive nature" — very loosely defined. Duelling outside city limits now legal in 14 states and tolerated in most others.

2029: A variety of weapons becomes available as "factory options" on all U.S. makes of cars and several imports.

2030: Statistics show "smash-and-grab" cycle and car gangs much reduced. Rural real estate begins to rise in value. Law-enforcement officials credit vehicular weaponry of private citizens, but most point out that "The gangs that are left are now better armed than we are . . ." Autoduelling now legal in 39 states, as well as the Free Oil States.

2033: *Autoduel Quarterly*, "The Journal of the American Autoduel Association," is first published. Autoduelling now legal in all 47 states in the U.S., as well as Texas, Oklahoma, Louisiana, most Canadian provinces, the Republic of Quebec, Australia and Mexico.

2036: Gas-powered racing and duelling events begin to grow in popularity.

2037: People living on the coasts begin to arm and armor their boats. Piracy rises dramatically but drops again by the end of the year as more and more boats have "defensive" modifications added.

2038: AADA recognizes boats and other watercraft events.

System Support

With over 200,000 copies of *Car Wars* sold since its 1981 release, the game has a huge base of players. Steve Jackson Games provides several different kinds of support for the world of *Car Wars*, and we are always interested in your suggestions.

Nearly 50 different *Car Wars* supplements have been published, including both "straight" rules material and the *American Road Atlas and Survival Guide* roleplaying series. While some supplements are out of print; many are still available. Check at your local hobby store.

Autoduel Quarterly is the *Car Wars* magazine. It appears four times a year. If you can't get it at your hobby store, write Steve Jackson Games for subscription information.

Errata for *Car Wars* products are available free from Steve Jackson Games; please enclose a stamped self-addressed envelope with your request. If you locate new errata, please let us know!

For computer users, SJ Games runs a bulletin board with an active *Car Wars* discussion area. The number is 512-447-4449; you can log in at 300, 1200, or 2400 baud.

The American Autoduel Association is an international network of official *Car Wars* clubs. Check *Autoduel Quarterly* for a list of existing chapters you can join, and information on starting one of your own. The AADA has two yearly World Championship events: duelling, with the finals at Origins, and racing, with the finals at GenCon. Any AADA member can enter.

1. Getting Started

In order to play *Car Wars*, you will need a rules set (such as this book); game maps and counters (from *Deluxe Car Wars*, or any of a number of expansion sets); several 6-sided dice; pencil and paper; and a table big enough to play on.

The game can be played solo, but is more fun with an opponent. It is probably best with 4 to 6 players. A game with over 8 players can take a very long time.

Dice

Car Wars uses 6-sided dice only. These rules use abbreviations to indicate what dice are to be rolled. For instance, "2d" means "2 dice." "2d-1" means "roll 2 dice and subtract 1 from the result." "3d+2" means "roll 3 dice and add 2." And so on.

Some weapons do "½d" of damage, or a "half-die." This means to roll one die and divide the result by 2, *rounding up*.

Beginning the Game

To start playing *Car Wars*:

(a) Lay out your road sections, spread out one of the maps, or draw up a map of your own.

(b) Select your vehicles. Make a record sheet for each car and pick a counter to represent it.

(c) Roll for each driver's reflexes (see *Handling Class*, p. 8). Reflexes of characters other than drivers do not count in this game.

(d) Place all vehicles in starting position — and go!

Laying Out the Game Board

For highway scenarios, place two or three road sections end to end. When the cars leave one end of the map, pick up the section on the other end and put it in front of them so they don't run out of road.

For city battles, many different *Car Wars* maps are available. For other fixed-area scenarios (like arenas, parking lots or obstacle courses), draw the whole layout on ¼" graph paper and tape it to the table. Such a layout should show roads, curbs, debris, etc., and the nature of off-road terrain (shoulders, sidewalks, buildings, etc.). This will be important when cars leave the road (see *Off-Road Duelling*, pp. 8-9).

Vehicle Selection

The "stock car shopping list" (see Chapter 15, *Sample Vehicles*) gives specifications and prices for a number of standard vehicles. Several "options" (tradeoffs, with or without differences in cost) are listed for each vehicle. All vehicles have been worked out according to the vehicle construction rules (see Chapter 5, *Car Design*). Vehicle design is complex. You will want to use "stock" cars the first few times you play.

Sample Specifications

Hotshot: Luxury, x-hvy. chassis, hvy. suspension, super power plant, 4 puncture-resistant tires, driver, 2 MGs linked front, 2 FTs linked back, 1 FT right, 1 FT left, Armor F20, R10, L10, B20, T10, U10. Fire ext. Accel. 5, top speed 100, HC 3; 6,600, $14,600.

Options: Remove any or all flamethrowers and replace with MGs. Each FT replaced by an MG saves enough weight to allow an extra 30 points of armor. For each FT replaced by an MG and 30 points of armor, the cost goes up by $1,350. One rear FT may be replaced by a minedropper and 30 points of armor, at an extra cost of $850.

Explanation: Car size is given first; then chassis, suspension, power plant and tires. Next, the number of people the car can hold is specified. Then weapons are listed, with the position in which each is mounted. Next is the number of armor points on each of the vehicle's six sides: Front, Right, Left, Back, Top and Underbody. Accessories are listed last. Acceleration is explained in Chapter 2; handling class affects maneuverability, and is also explained in Chapter 2. Weight is a vehicle's total weight with all seats filled and a full load of ammunition. The price is the vehicle's "sticker cost," and includes a full load of ammunition. Options are changes a player can make in a car without special reference to the Car Design section; they've already been checked. If no price differential is given, an option does not change a car's cost. Note that some changes (e.g., targeting computers, different suspensions) affect only a car's price — not its weight or available space — and may be added to any vehicle by paying the cost shown on the Accessories sheet, without other calculations.

After a car is selected, make up a record sheet for it as shown below. The record sheet will show any modifications, options, ammunition remaining, damage taken, etc., in a pictorial fashion.

The sample record sheet below shows a Hotshot (stock, no options) after a brief combat. All the armor on the right side has been destroyed, and the right FT has taken 1 hit of damage. The right front tire has taken 3 hits, and the front armor has taken 4 hits. There is no other damage. The front MGs have fired three times each, and the right FT has fired twice (shown by tally marks). The driver has no body armor, so he can take only 3 hits — therefore he is shown with only three damage boxes.
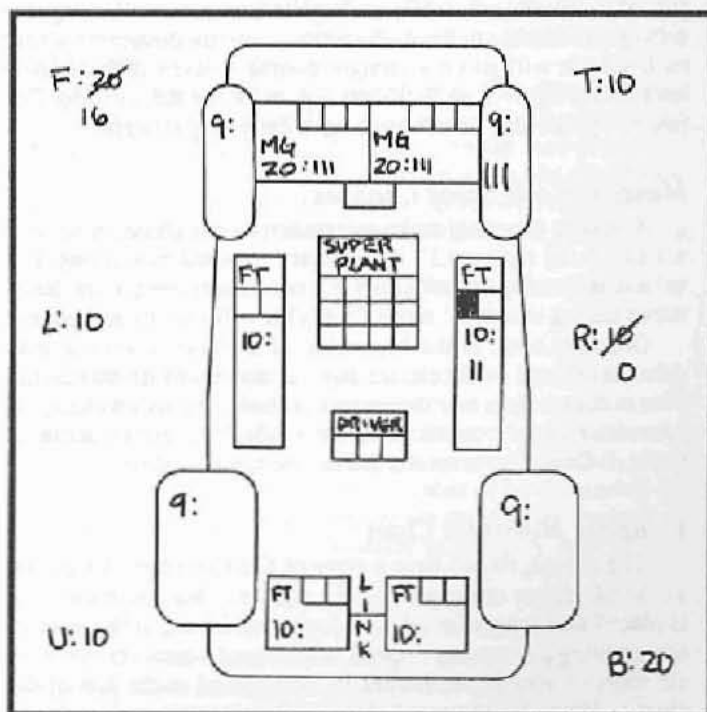
2. Movement

The Movement Chart

The road sections and maps used in *Car Wars* are marked with a square grid to control movement. The scale is 1/180; one inch equals 15 feet. The heavy lines are 1" (15 feet) apart. The light lines are 1/4" (3.75 feet) apart. Each turn represents one second. Each turn is divided into five "phases" of 1/5 second each.

A vehicle's speed determines both how many times it will move each turn and when it will move, as shown on the Movement Chart to the right. There are five "phases" during each turn. During each phase, vehicles of certain speeds may move. For instance, vehicles going 30 mph will move 1" during phases 1, 3 and 5, as shown by the "1"s on the chart.

If a car is moving at an "even" speed (10, 20, 30 mph, etc.) below 60 mph, then all its moves will be "ordinary" 1" moves during which it may maneuver. These are shown by a "1" on the chart.

If a vehicle is moving at an "odd" speed (5, 15, 25 mph, etc.), then one of its moves each turn will be a "half-move." The vehicle must move straight ahead 1/2", and cannot maneuver. (*Exception:* See *Pivot*, p. 8.) Trucks moving at uneven speeds will make "quarter-moves" at some speeds; see below.

Vehicles traveling in excess of 50 mph will move more than 1" inch in some phases. In the phases marked by a "2" on the Movement Chart, a vehicle must move 2". A vehicle traveling at an "odd" speed greater than 50 (55, 65, 75 mph, etc.) must make a half-move during the phase indicated by a "1/2," in addition to its other movement during that phase.

Straight-Line Movement

The basic move in *Car Wars* is a straight line — usually 1". Since the maps are gridded, it is easiest to figure movement when the cars travel in straight N-S or E-W lines. However, a vehicle's straight-line movement can be calculated precisely, even if it is moving at an angle to the grid lines. This is because each car counter is exactly 1" long (the distance normally moved in one phase), while each cycle counter is 1/2" long. By setting one counter in front of another, you can determine where each vehicle will go on a straight course — even if the vehicle isn't following N-S or E-W lines. A ruler, or the Turning Key (see p. 7), can also be used to keep a car going straight.

Maneuvers and Speed Changes

A vehicle may only make one maneuver per phase. A maneuver (see p. 6) replaces 1" of ordinary forward movement. If a vehicle is moving at more than 1" per phase, the owner determines during which 1" move (if any) it will take its maneuver.

Once per turn, at the beginning of a phase, a vehicle may either accelerate or decelerate any amount up to its maximum. This is done before any movement is made; the speed change is immediate. Any control rolls are made before movement as well; all Crash Table results are handled in this phase.

Using the Movement Chart

The referee should have a copy of the Movement Chart and a control marker representing each vehicle. This control marker is placed along the edge of the Movement Chart, at the number representing the vehicle's speed, and moved whenever the vehicle changes speeds. A marker is then placed at the top of the chart at Phase 1 and moved along. When a mark appears in the

Speed	1	2	3	4	5	Ram
0						0
5	½					1d-4
10	1					1d-2
15	1		½			1d-1
20	1		1			1d
25	1		1		½	1d
30	1		1		1	1d
35	1	½	1		1	2d
40	1	1	1		1	3d
45	1	1	1	½	1	4d
50	1	1	1	1	1	5d
55	1½	1	1	1	1	6d
60	2	1	1	1	1	7d
65	2	1	1½	1	1	8d
70	2	1	2	1	1	9d
75	2	1	2	1	1½	10d
80	2	1	2	1	2	11d
85	2	1½	2	1	2	12d
90	2	2	2	1	2	13d
95	2	2	2	1½	2	14d
100	2	2	2	2	2	15d
105	2½	2	2	2	2	16d
110	3	2	2	2	2	17d
115	3	2	2½	2	2	18d
120	3	2	3	2	2	19d
125	3	2	3	2	2½	20d
130	3	2	3	2	3	21d
135	3	2½	3	2	3	22d
140	3	3	3	2	3	23d
145	3	3	3	2½	3	24d
150	3	3	3	3	3	25d
155	3½	3	3	3	3	26d
160	4	3	3	3	3	27d
165	4	3	3½	3	3	28d
170	4	3	4	3	3	29d
175	4	3	4	3	3½	30d
180	4	3	4	3	4	31d
185	4	3½	4	3	4	32d
190	4	4	4	3	4	33d
195	4	4	4	3½	4	34d
200	4	4	4	4	4	35d
205	4½	4	4	4	4	36d
210	5	4	4	4	4	37d
215	5	4	4½	4	4	38d
220	5	4	5	4	4	39d
225	5	4	5	4	4½	40d
230	5	4	5	4	5	41d
235	5	4½	5	4	5	42d
240	5	5	5	4	5	43d
245	5	5	5	4½	5	44d
250	5	5	5	5	5	45d
255	5½	5	5	5	5	46d
260	6	5	5	5	5	47d
265	6	5	5½	5	5	48d
270	6	5	6	5	5	49d
275	6	5	6	5	5½	50d
280	6	5	6	5	6	51d
285	6	5½	6	5	6	52d
290	6	6	6	5	6	53d
295	6	6	6	5½	6	54d
300	6	6	6	6	6	55d

row for a vehicle's speed, that vehicle moves in that phase. The referee keeps track of this, calling out the moves; i.e., "Phase 3. Car 12 moves, then 6, then 10."

If a vehicle is moving at an uneven speed (e.g., 12.5 mph), its control marker is put between the bracketing speeds. It moves on the line below it, but goes only ¼" in the half-move phase.

Often, vehicles of different speeds will move during the same phase. For instance, all cars traveling 45 mph or faster will move in Phase 4. When vehicles move during the same phase, the faster one moves first. For vehicles traveling the same speed, the one whose driver has the faster reflexes (see *Handling Class*, p. 5) may choose when he wants to move.

When vehicles are moving at high speeds in close quarters, it may be desirable to move the cars in alternating 1" increments during each phase, until that phase's movement is done. Keep in mind that each vehicle is still limited to one maneuver per phase.

A vehicle must move when the Movement Chart tells it to, and may never move at any other time.

Acceleration and Deceleration

At the beginning of each phase, any vehicle that has not accelerated or decelerated during previous phases of the turn may change speeds. A vehicle may only change speeds once per turn.

Acceleration: A vehicle's maximum acceleration is determined when it is built; see p. 55. Acceleration is not a hazard unless Rocket Boosters (p. 91) are used.

Deceleration: Any vehicle can decelerate up to 10 mph each turn without danger. Greater deceleration is possible, but risky (Heavy Duty Brakes help). If control of a vehicle is lost due to rapid deceleration, roll on Crash Table 1 to determine effects.

Deceleration of 15 mph: Difficulty 1 (D1) maneuver (see *Maneuvers*, p. 6).

Deceleration of 20 mph: D2 maneuver.

Deceleration of 25 mph: D3 maneuver.

Deceleration of 30 mph: D5 maneuver.

Deceleration of 35 mph: D7 maneuver, and each tire takes 2 hits of damage (see *Recording Damage*, p. 30).

Deceleration of 40 mph: D9 maneuver, and each tire takes 1d damage.

Deceleration of 45 mph: D11 maneuver, and each tire takes 1d+3 damage.

Deceleration of more than 45 mph in one turn is impossible without special devices. Continue the pattern for progression of difficulty ratings.

Handling Class

Each vehicle has a *handling class* which determines how maneuverable it is. The higher the handling class, the easier it is for the driver to keep control. A vehicle's basic handling class is determined by its suspension (see p. 51).

Handling class is modified as follows:

Reflexes: Any vehicle driven by a character with very good reflexes will have an improved handling class. At the beginning of each combat, every driver of a vehicle rolls 1 die. This is called a *reflex roll*. A 5 or a 6 indicates exceptional reflexes. On a 5, the HC of the vehicle is raised by 1 for the duration of the combat; on a 6 (or higher), the HC goes up by 2.

Skill: The reflex roll can be modified by the skill of the character driving the vehicle (see *Driver*, p. 40). A Driver +2, for example, would get to add 2 to the die roll. The Cyclist skill is used when driving a motorcycle. The Trucker skill is used for
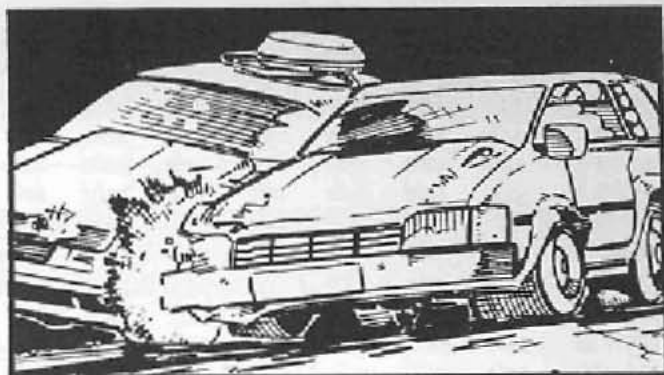
driving a ten-wheel truck, big rig or bus. Helicopter Pilot skill is used for flying a helicopter. Boat Pilot is used when piloting a boat. Hover Pilot is used to fly a hovercraft. Attempting to drive a vehicle without the proper skill results in a *penalty* to the handling class (see specific skill descriptions). A helicopter cannot be flown at all without Helicopter Pilot skill.

Lost tires or wheels: Not only is losing a tire a hazard (see below), but it affects the vehicle's handling *class* permanently. All damage done to tires by maneuvers, debris, obstacles, spikes, mines, enemy gunfire, etc., is assessed against the damage points of the tire. If the final damage that destroys the tire comes from mines, grenades or enemy gunfire, then the entire *wheel* is considered lost.

Any vehicle that loses all its *wheels* in one position (usually just one wheel, but oversized vehicles can have two or four) has its HC reduced by 3 permanently, starting on the next turn. If only the *tire(s)* are lost, HC drops by only 2. This loss *will* affect the number of points recovered each turn on the Handling Track.

Any vehicle that loses wheels on *two* corners (or any trike or cycle that loses one wheel) goes to Crash Table 1. It can no longer steer, accelerate or brake. It must decelerate by 30 mph each turn.

The Handling Track

Each vehicle record sheet includes a Handling Track. A counter is placed on the Handling Track to show the vehicle's current *handling status*. This is a measure of how "in control" the vehicle is at that moment.

At the beginning of the game, each "handling" counter starts at that vehicle's handling class, as modified by the driver's reflexes. Each maneuver or hazard causes the marker to move down. And *each time* the marker moves down, the player must roll on the Control Table (see below) to see if he loses control. If he loses control, he will have to roll on one of the Crash Tables (see p. 10).

Thus, *frequent* maneuvers, as much as *extreme* ones, lead to danger.

Regaining Handling Status

Each vehicle's handling status is adjusted upward at the end of each turn — that is, once per second. This simulates the driver's ability to regain control of a vehicle over time. Move the handling counter upward by a number of boxes equal to the modified Handling Class of the vehicle (as given by suspension type — see p. 51) plus the bonuses or penalties listed above. Thus, a vehicle with Handling Class 2 and a Driver +1 would regain 3 points of handling status at the end of each turn.

Each vehicle will always recover at least 1 point on the Handling Track at the end of each turn. However, a vehicle's handling status can never be adjusted above its starting handling class, as modified for the driver's skill and reflexes.

Movement

Control Table

	7	6	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6	Modifier
5-10	safe	safe	safe	safe	safe	safe	safe	safe	safe	safe	safe	safe	safe	2	-3
15-20	safe	safe	safe	safe	safe	safe	safe	safe	safe	safe	safe	safe	2	3	-2
25-30	safe	safe	safe	safe	safe	safe	safe	safe	safe	safe	safe	safe	2	4	-1
35-40	safe	safe	safe	safe	safe	safe	safe	safe	safe	safe	safe	2	3	4	+0
45-50	safe	safe	safe	safe	safe	safe	safe	safe	ssafe	safe	2	3	4	5	+1
55-60	safe	safe	safe	safe	safe	safe	safe	safe	safe	2	3	4	4	5	+1
65-70	safe	safe	safe	safe	safe	safe	safe	safe	safe	2	3	4	5	6	+2
75-80	safe	safe	safe	safe	safe	safe	safe	safe	safe	3	4	5	5	6	+2
85-90	safe	safe	safe	safe	safe	safe	safe	safe	2	3	5	5	6	XX	+2
95-100	safe	safe	safe	safe	safe	safe	safe	safe	2	4	5	6	6	XX	+3
105-110	safe	safe	safe	safe	safe	safe	safe	safe	3	4	6	6	XX	XX	+3
115-120	safe	safe	safe	safe	safe	safe	safe	2	3	5	6	XX	XX	XX	+3
125-130	safe	safe	safe	safe	safe	safe	safe	2	4	5	6	XX	XX	XX	+4
135-140	safe	safe	safe	safe	safe	safe	safe	3	4	6	XX	XX	XX	XX	+4
145-150	safe	safe	safe	safe	safe	safe	2	3	5	6	XX	XX	XX	XX	+4
155-160	safe	safe	safe	safe	safe	safe	2	4	5	6	XX	XX	XX	XX	+5
165-170	safe	safe	safe	safe	safe	safe	3	4	6	XX	XX	XX	XX	XX	+5
175-180	safe	safe	safe	safe	safe	2	3	5	6	XX	XX	XX	XX	XX	+5
185-190	safe	safe	safe	safe	safe	2	4	5	6	XX	XX	XX	XX	XX	+6
195-200	safe	safe	safe	safe	safe	3	4	6	XX	XX	XX	XX	XX	XX	+6
205-210	safe	safe	safe	safe	2	3	5	6	XX	XX	XX	XX	XX	XX	+6
215-220	safe	safe	safe	safe	2	4	5	6	XX	XX	XX	XX	XX	XX	+7
225-230	safe	safe	safe	safe	3	4	6	XX	XX	XX	XX	XX	XX	XX	+7
235-240	safe	safe	safe	2	3	5	6	XX	XX	XX	XX	XX	XX	XX	+7
245-250	safe	safe	safe	2	4	5	6	XX	XX	XX	XX	XX	XX	XX	+8
255-260	safe	safe	2	3	4	6	XX	XX	XX	XX	XX	XX	XX	XX	+8
265-270	safe	safe	2	3	5	6	XX	XX	XX	XX	XX	XX	XX	XX	+8
275-280	safe	2	3	4	5	6	XX	XX	XX	XX	XX	XX	XX	XX	+9
285-290	safe	2	3	4	6	XX	XX	XX	XX	XX	XX	XX	XX	XX	+9
295-300	safe	3	4	5	6	XX	XX	XX	XX	XX	XX	XX	XX	XX	+9
	7	6	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6	

The Control Table

Whenever a vehicle makes a maneuver or undergoes a hazard that moves its handling marker downward, a *control roll* may be necessary. Refer to the Control Table (p. 6). Cross-index the handling status of your vehicle with its current speed. Handling status cannot get worse than -6, but a vehicle at -6 must still roll on the Control Table for each new maneuver or hazard.

The table will give one of three results: "Safe," "XX," or a number.

"*Safe*" means the vehicle is still safe; no roll is necessary.

"*XX*" means a loss of control is unavoidable. Go directly to the appropriate Crash Table. Crash Table 1 is used for maneuvers; Crash Table 2 is for hazards; Crash Tables 3 through 6 are for special types of vehicle.

If the table shows a *number*, it means that the driver *may* be able to keep control. Roll 1 die; this is called a *control roll*. If you roll the number shown or higher, you keep control of the car. If you roll lower, you lose control; go to the appropriate Crash Table.

Crash Modifier: The last column on the Control Table is the "modifier" column. If you lose control of a vehicle for *any* reason, and go to the Crash Table, refer to this column to get the Crash Modifier for your speed. The Crash Modifier will be *added* to your Crash Table roll. Low speeds have a negative Crash Modifier; high speeds are much more dangerous and have a positive Crash Modifier.

Example: During one turn, a car traveling 60 mph attempts three maneuvers. Its handling class is 2, so the marker starts at 2. The first maneuver is a "drift" (Difficulty 1, or D1). Subtract 1 from handling status, moving the marker to 1. Cross-indexing 60 mph and status 1, we see that no roll is required for control.

The second maneuver is a "steep drift," which is D3. Subtracting 3 from handling status moves it to -2. The table shows that a control roll is required; the player must roll a 2 or better.

The third maneuver is another drift — D1 again. Subtract one more from handling status and roll again; this time a roll of 3 or better is needed.

Maneuvers

Any change of vehicle direction is called a *maneuver*. Each maneuver has a *Difficulty Class*, expressed as D1 for Difficulty 1, and so on. The more difficult a maneuver, the more it will reduce the vehicle's handling status, and the more likely the vehicle will skid, flip, etc. Maneuvers at low speed are easy. As speed goes up, the danger increases.

Any time vehicle weapons are fired on the *same phase* as a maneuver, the D value of the maneuver is subtracted from the to-hit roll.

Figures 1 through 7 show basic maneuvers. Where no separate cycle diagram is shown, use the same diagrams, with the square cycle counter in place of the front half of the car.

Bend

The vehicle moves 1'' forward, and then angles to one side, keeping one rear corner in the same place. Figure 1 shows bends from 15° to 75°. A 90° bend, of course, is a right-angle turn.

Bends are a D1 maneuver for every 15° of the bend, as shown below. See Figures 2b and 2c for examples of bends performed with a Turning Key.

Up to 15° — D1
16 to 30° — D2

Figure 1 — Bends

Figure 1 — Bends
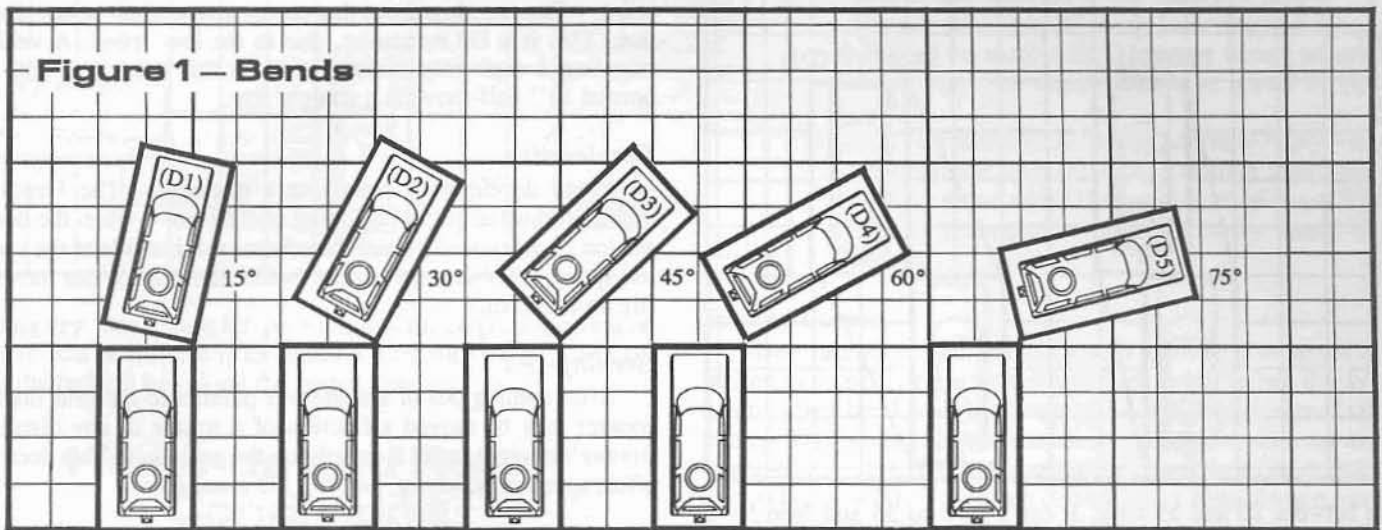
31 to 45° — D3
46 to 60° — D4
61 to 75° — D5
76 to 90° — D6

Drift

The vehicle moves 1" forward and 1/4" (or less) to either side, while facing the same direction. This is a D1 maneuver. A vehicle can also do a *Steep Drift*, moving 1" forward and between 1/4" and 1/2" to one side. This is a D3 maneuver. See Figure 3.

Figure 2a shows a drift performed with a Turning Key.

Swerve

The swerve is a 1/4" drift, followed by an angle turn as for a bend, all in the same phase. The bend must be in the *opposite* direction from the drift. A swerve has the difficulty of the equivalent bend, plus 1. The drift *must* be performed before the bend.

Figure 4 shows a swerve made up of a drift to the right followed by a 30° bend to the left.

Controlled Skid

To perform a controlled skid, make any bend or swerve in the regular manner, and then *immediately* declare how far you wish to skid. Assess the difficulty of the combined maneuver (see below) and make a control roll if necessary.

If control is maintained, perform the skid on your *next* move. Start by "skidding" for the chosen distance: without changing the direction in which the car is going, move it in the direction it was traveling *before* the original maneuver. If the skid was less than 1", move the rest of the inch straight ahead. For example, on a 3/4" skid, you would skid for 3/4", then move 1/4" straight ahead. See Figure 5.

Deliberate skids increase the difficulty of the bend or swerve that begins the skid. They also cause weapons-fire modifiers, slow down the vehicle and can damage its tires.

1/4" skid — Adds +D1 to the difficulty of the bend or swerve, -1 to aimed weapons fire, no deceleration, no tire damage.

1/2" skid — +D2 difficulty, -3 to aimed weapons fire, -5 mph deceleration, no tire damage.

3/4" skid — +D3 difficulty, -6 to aimed weapons fire, -5 mph deceleration, 1 point damage to each tire.

1" skid — +D4 difficulty, aimed weapons fire prohibited for the rest of the turn, -10 mph deceleration, 2 points damage to each tire.

The tire damage is applied immediately after the skid. Handling class is reduced and a control roll is made (if necessary)

after the maneuver but *before* the skid. Any deceleration is applied at the beginning of the next phase.

The weapons-fire modifiers are lower on this chart because this is a controlled (instead of uncontrolled) skid.

Bootlegger Reverse

This is a special maneuver — the old moonshiner's trick of using a controlled skid to reverse direction. Police departments call it the "J-turn." It works, but it's dangerous.

To attempt a bootlegger reverse, a vehicle must start the turn

Figure 2 — Turning Key

All maneuvers and Crash Table results can use the *turning key* shown here. To make a maneuver, place the key next to the counter at the point that corresponds to the desired maneuver. Then move the vehicle along the edge of the turning key. Pictorial examples of all maneuvers and Crash Table results are shown below.

The turning key makes it possible to play on a gridless map, allowing play in any scale (toy cars, 1/24 scale models, 100% scale). All you need is a properly scaled turning key.
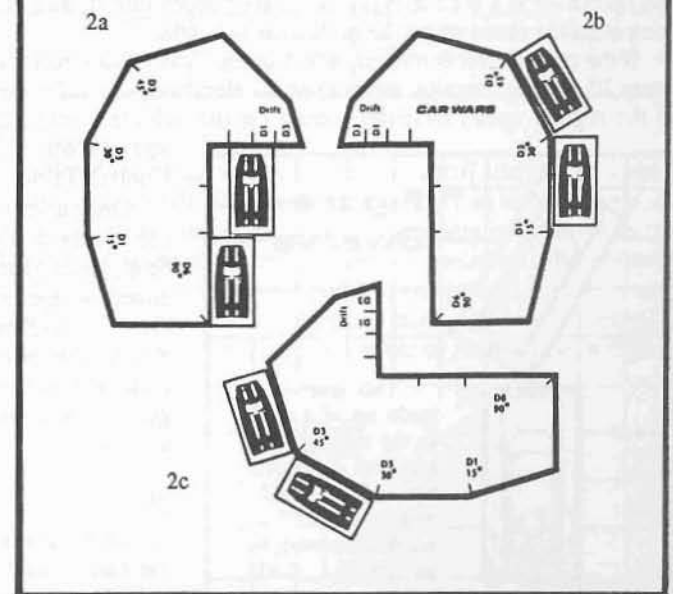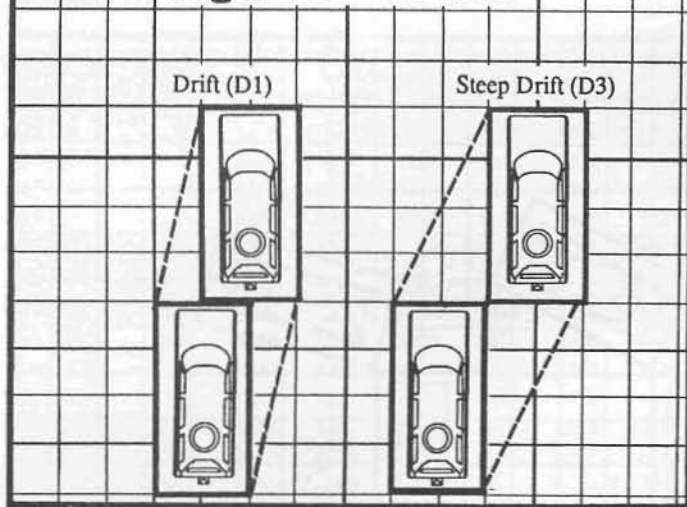
Figure 3 — Drifts

Drift (D1)   Steep Drift (D3)

at between 20 and 35 mph. It can't slow to 35 and then try a reverse, all in one turn.

Figure 6 shows the bootlegger reverse. On the phase that a vehicle starts the reverse, it skids from A to B. This is a D7 maneuver, and does 1 point of damage to each tire. If the vehicle makes its Control Roll, it will automatically go to C on its next movement phase, and stop (speed goes to 0), facing the way it came. Properly executed on a road, the J-turn leaves you in the correct lane for your new direction!

If it goes out of control and/or loses a tire, it will roll or skid sideways next phase, in the direction shown by the heavy arrow, and will lose speed only as dictated by the roll or skid result.

Once a vehicle begins a J-turn, it cannot fire aimed weapons until it stops moving (the occupants are too busy). Weapons on automatic (see *Automatic Fire*, p. 32) will still fire. Cycles and oversized vehicles cannot try this maneuver. No other maneuvers (skids, swerves, etc.) can be combined with a bootlegger.

T-Stop

This is an extreme maneuver used for emergency deceleration. It consists of rotating your car 90° to either side and moving forward one inch — identical to beginning a roll. See Figure 7. The car then continues skidding sideways until it slows to a halt.

The vehicle decelerates 20 mph per inch of movement. Each tire will take 1 point of damage for every full 20 mph of speed lost, immediately after each movement phase. The difficulty of this maneuver is a D1 for every 10 mph of deceleration, and the control roll is made when the maneuver is begun.

If the control roll is missed, add 1 to the Crash Table roll for every 20 mph (or fraction thereof) of deceleration — in *addition* to the regular speed modifier (based on the vehicle's original speed) on the Control Table.

Once a vehicle starts a T-Stop, it can't fire aimed weapons. Only vehicles which can perform a bootlegger can perform a T-Stop.

Pivot

This maneuver can be made only by a vehi-

Figure 4 — Swerve

This swerve is made up of a drift to the right (dotted outline) followed by a 30° bend, without further forward movement, to the left.

cle moving at 5 mph. To pivot, a vehicle (a) moves ¼" in a straight line, and (b) keeps one rear corner fixed at the same point, while pivoting about that corner any amount in any direction. This is a D0 maneuver, due to the low speed. A vehicle traveling 5 mph may choose between this maneuver and the normal ½" half-move in a straight line.

Deceleration

Rapid deceleration counts as a maneuver. The Handling Track is adjusted at the beginning of the turn — when the deceleration is announced — and the control roll is made at the *original* speed. All this must happen before the vehicle can move or fire on that turn.

Evening-Out

After coming out of a maneuver parallel to the grid lines, a counter may be moved a fraction of a square in any direction (owner's choice) to get it exactly on the grid lines. This does not affect speed or handling, and is a D0 maneuver.

Figure 5 — Bend and Controlled Skid
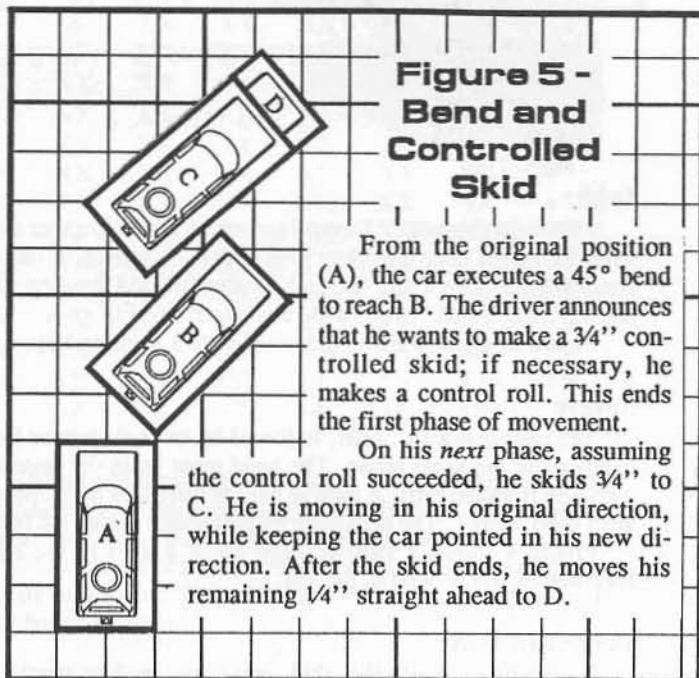
From the original position (A), the car executes a 45° bend to reach B. The driver announces that he wants to make a ¾" controlled skid; if necessary, he makes a control roll. This ends the first phase of movement.

On his *next* phase, assuming the control roll succeeded, he skids ¾" to C. He is moving in his original direction, while keeping the car pointed in his new direction. After the skid ends, he moves his remaining ¼" straight ahead to D.

Movement in Reverse

Any vehicle except a cycle may move in reverse at up to ⅕ of its top speed. A vehicle cannot go from forward to backward speed (or vice versa) without stopping for one turn. Acceleration rules are the same as for forward movement. Any maneuver may be made in reverse; the difficulty class is one higher.

A cycle may be pushed backwards by the cyclist at 2.5 mph.

Fishtail

A fishtail cannot be chosen as a *deliberate* maneuver, for two reasons. One is that a fishtail combined with a bend is very similar to a tighter bend, and is virtually identical to a swerve. The second is that a 90° bend combined with a major fishtail can result in a controlled 120° turn — not very reasonable. Thus, the only fishtails are Crash Table results.

To perform a fishtail on the square grid, hold one front corner still, and move the opposite rear corner ¼" or ½", as appropriate, on the opposite direction. See Figure 8a.

To perform a fishtail using the turning key, line the vehicle up with the 15° bend (for a ¼" fishtail) or the 30° bend (for a ½" fishtail). Keeping the front corner motionless next to the key, pivot the vehicle so it lines up with the next angle of the

Figure 6 — Bootlegger
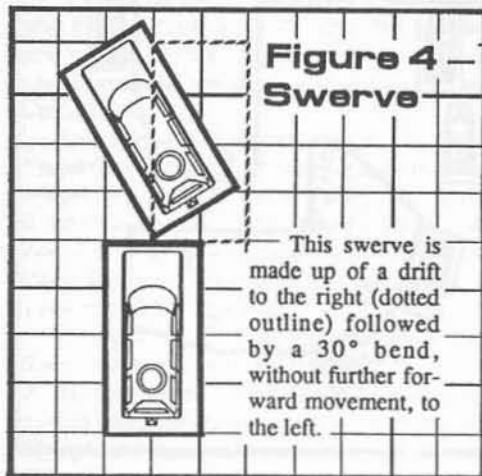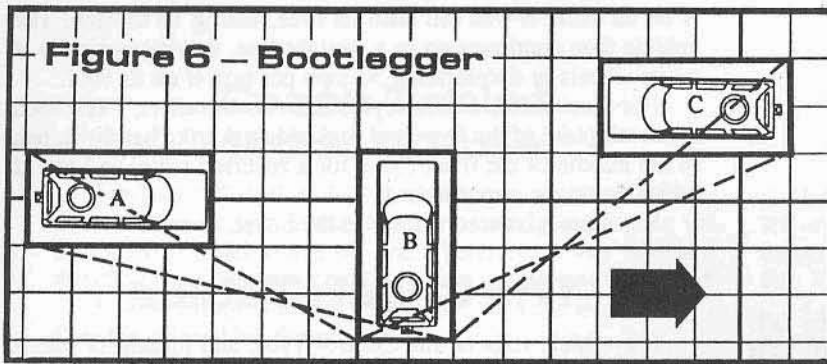
turning key. See Figure 8b; position A is the original location of the car, and position B is its location after the fishtail, lined up with the turning key along the dotted line.

Hazards and Road Conditions

Hazards are outside events (enemy fire, for instance) that can affect vehicles. They are treated like maneuvers — each one has a difficulty rating.

Each enemy attack produces a separate hazard. If a vehicle is struck by three weapons in one turn, each attack would move the handling marker down and require a separate die roll on the Control Table. Mines are "enemy fire." Spikes, debris, obstacles, etc., are not.

Road conditions (like oil, ice or rain) present no danger in themselves but add to the difficulty of any hazard or maneuver the vehicle undergoes. A few road conditions (such as banked curves) can *reduce* the difficulty of maneuvers.

Hazards

Hitting curb, obstacle or pedestrian: D3.
Hitting loose debris: D1.
Enemy fire does 1 to 5 hits of damage: D1.
Enemy fire does 6 to 9 hits of damage: D2.
Enemy fire does 10+ hits of damage: D3.
Driver injured or killed: D2.

Hazards to Oversized Vehicles

Striking an obstacle counter: D1
Enemy fire does 13 to 21 hits: D2
Enemy fire does 22+ hits: D3
Trailer released while tractor is in motion: D2
AT gun fired to side: D1
Tank gun fired: D2
Cycle steamrollered: D1

Tire Blowouts

Losing the first wheel or tire of a pair is a D2 hazard.

Losing the second and successive wheel or tire of a pair, as long as there are intact tires on that corner of the vehicle, is a D3 hazard.

Losing the last wheel or tire on a corner drops the vehicle's handling status to -6 immediately. Handling *class* drops by 2 if only the tire(s) are lost, or by 3 if the whole wheel was lost. If the vehicle has more than one wheel at that corner, *all* wheels must be intact, or handling class is reduced by 3.

Any vehicle that loses wheels on *two* corners (or any trike or cycle that loses one wheel) goes to Crash Table 1. It can no longer steer, accelerate or brake. It must decelerate by 30 mph each turn.

Road Conditions

Off-road: adds D1 to any maneuver.
Light rain: adds D1 to any hazard or maneuver.
Heavy rain: adds D2 to any hazard or maneuver.
Gravel on road: adds D1 to any hazard or maneuver. Note that many roads have gravel on the shoulder.
Oil on road: adds D2 to any hazard or maneuver.
Light snow: adds D2 to any hazard or maneuver.
Heavy snow: adds D3 to any hazard or maneuver.
Ice or packed snow: adds D4 to any hazard or maneuver.

Banked Curves

Many racetracks and arenas include turns that are specially banked to ease driving around them. Such slopes reduce the difficulty of any bend or swerve made towards the inside edge of the turn by -D1; bends or swerves made towards the outside edge are increased by +D1. Drifting outward is at a -D1, while drifting inward is at a +D1. Very steep curves reduce inward maneuvers by -D2, but increase outward maneuvers by +D2.

Jumping and Falling

With a good takeoff angle (20° to 40°), a vehicle will fly 15 feet for every 10 mph of takeoff speed over 20 (30 mph yields 15 feet of flight, 40 mph results in a 30-foot flight, etc.). A flatter or steeper angle (15° to 19° or 41° to 45°) will cut the distance traveled in half. Inclines flatter than 15°, or steeper than 45°, cannot be used to launch a jump.

Landing is a D1 hazard; +D1 for every full 30 feet of flight. Thus, a 15-foot jump is a D1 hazard, a 30- to 59-foot jump is a D2 hazard, a 60- to 89-foot jump is a D3 hazard, and so on. Subtract 1 from the hazard if you land on a downward slope (because all your wheels will hit at about the same time). Add 1 to the hazard if you land on an upward slope. On landing from a jump, roll 1 die for each tire except solids, off-road solids or plasticores. On a 1, 2 or 3, that tire takes 1 point of damage.

Figure 7 T-Stop
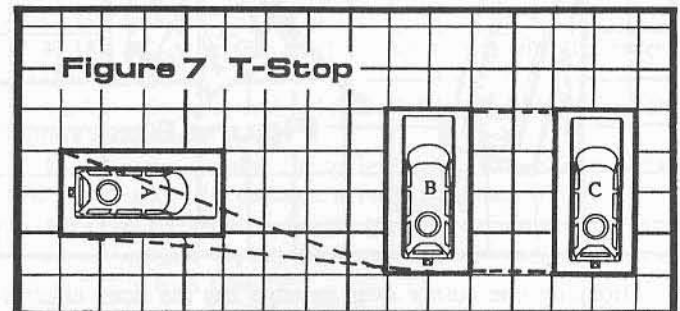
Falling

Whenever a land vehicle drives off a cliff, curb or crevasse, it will begin to fall. If the vehicle drove off an upward slope, it will jump, rather than fall, as per the jumping rules above; if, at the end of the jump, the vehicle has not contacted solid ground, it falls anyway. A falling vehicle hits the ground after a certain length of time, as per the following table. Obviously, vehicles cannot accelerate, decelerate, maneuver or jump while in flight.

Height	Time	Damage
¼"	2 phases	1d-2
½"	3 phases	1d-1
¾"	4 phases	1d-1
1"	1 turn	1d
1 ¼"	1 turn, 1 phase	1d
1 ½"	1 turn, 1 phase	1d

Movement

1 3/4"	1 turn, 2 phases	1d
2"	1 turn, 2 phases	1d
2 1/4"	1 turn, 2 phases	1d
2 1/2"	1 turn, 3 phases	1d
2 3/4"	1 turn, 3 phases	2d
3"	1 turn, 3 phases	2d
3 1/4"	1 turn, 4 phases	2d
3 1/2"	1 turn, 4 phases	3d
3 3/4"	1 turn, 4 phases	3d
4"	2 turns	3d

Height is the height from which the vehicle began the fall. *Time* is the elapsed time after which the vehicle will land. This time is counted beginning with the phase in which the last portion of the vehicle left the ground; the vehicle takes damage at the beginning of the first movement phase after it lands.

Example: A 1" fall takes 1 second. If a vehicle moving 20 mph ends Phase 3 at the edge of a 1" cliff, it will drive completely off the cliff on Phase 4. It will hit the ground below, after 2" of forward movement, at the beginning of its move in Phase 4 of the next turn. Finally, *Damage* is the collision damage assessed to the vehicle.

Fishtails

Figure 8a

Figure 8b
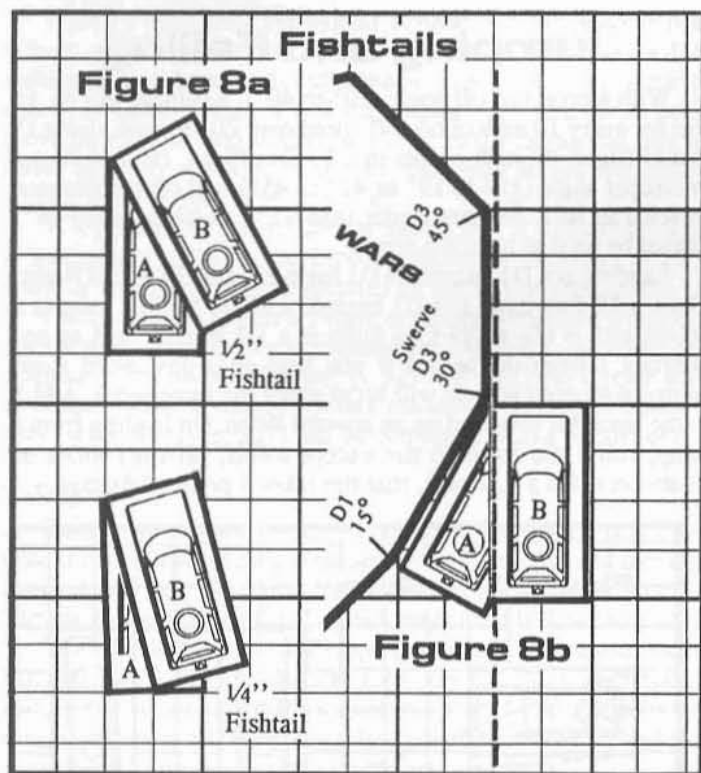
Dropping one corner over an edge has the same effect as losing all tires on that corner, except that all penalties are removed as soon as the corner is back on the ground.

If a vehicle skids, fishtails or drifts so that both corners of one side (not the front or back) are unsupported, it will roll over the edge. It continues at its original speed, rolling one side per movement phase. When it lands, assess the damage to that side (or to each tire if it lands on its wheels). Reduce handling status to -6, and make a control roll at the vehicle's original speed. If control is regained, the vehicle stops. If the vehicle stays out of control, it continues its roll normally. On a roll of 4 to 6 on 1 die, it also catches fire.

If a vehicle drops its two front or back corners off an edge, it continues at its original speed, flipping one facing per *turn* (it progresses from underbody to front to top to back to underbody). Once it lands, assess damage to the proper side. If the vehicle landed on its front, the very next phase it will fall forward, landing on its top (and taking 1d damage to that location).

If on its back, it will fall onto its tires, taking 1d to each. The vehicle then continues on in a straight line, driving normally if on its wheels or decelerating 30 mph per turn if on its roof.

For these rules, a motorcycle has two "corners," one each at the midpoint of the front and back sides. A trike has three, one in the middle of the front (back for a reversed trike) and one at each side on the opposite end.

For more advanced rules, see the insert.

The Crash Tables

If a vehicle rolls on the Control Table and misses its roll, it has gone out of control. The six Crash Tables show the different things (all bad) that can happen. A Crash Table roll is made on 2 dice. The higher the roll, the worse the result. Results may range from mild (a light skid) to disastrous (vehicle rolls and burns).

If a car or cycle loses control during a maneuver, it uses Crash Table 1. If it loses control because of a hazard, it uses Crash Table 2. Crash Tables 3 through 6 are used for oversized vehicles, helicopters, boats and hovercraft, respectively.

If during the course of resolving a Crash Table result a vehicle is again required to roll on the tables, he only suffers the *worst* result rolled.

Example: Wildman Al starts to spin out due to an encounter with a Flame Cloud, and is hit by enemy fire. He rolls for control and fails; he now rolls a Minor Skid on the Crash Table. All Al does is keep spinning.

Crash Table Modifiers

Skill bonus: The driver's Driver skill (or Cyclist, Pilot, or other appropriate skill) bonus is *subtracted* from all Crash Table rolls.

Difficulty of maneuver or hazard: The difficulty of the maneuver (or hazard) that caused the loss of control plays an important part in determining a crash result. Take the *modified* Difficulty rating of the hazard or maneuver, subtract 3, and add the result (negative or positive) to the Crash Table roll. Thus, a D4 maneuver gives a +1 to the roll, while a D1 maneuver gives a -2.

Speed: Loss of control at high speed is more dangerous. When you go to the Crash Tables for any reason, add or subtract the number in the Control Table "modifier" column from your speed — i.e., at 20 mph, you would subtract 2 from your roll on either Crash Table.

Crash Table Results

The result of a Crash Table roll is applied at the beginning of the next phase in which a vehicle moves. A vehicle that fishtails may move normally after it fishtails. A vehicle that skids must move straight ahead for the rest of that phase — i.e., if it skids 1/4", it must move 3/4" forward (the direction its nose is pointing) after the skid. If a vehicle is on its half-move, it cannot skid more than 1/2".

A vehicle that encounters a hazard while skidding or fishtailing must make another control roll, and may lose control again, affecting it on the next phase it moves. No vehicle may skid more than once per phase.

A vehicle that loses control will suffer a penalty on any aimed weapon fire for the rest of the turn, as shown by the asterisks on the Crash Table entries:

* Any further aimed weapon fire from this vehicle on this turn will be at a -3 to hit.

** Any further aimed weapon fire from this vehicle on this turn will be -6 to hit.

*** No further aimed weapon fire permitted from this vehicle this turn.

Crash Table 1
Skids & Rolls

2 or less — Trivial skid. The vehicle keeps the same orientation, but moves ¼'' in the direction it was going before the maneuver in which it lost control. Therefore, it may skid in a direction other than the one it is pointing — see Figure 5, p. 8. *

3, 4 — Minor skid. As above, but the vehicle skids ½''. Speed is reduced by -5 mph. **

5, 6 — Moderate skid. As above, but the vehicle skids ¾'', and each tire takes 1 point of damage. Speed is reduced by 10 mph. It then performs a trivial skid on its next move. **

7, 8 — Severe skid. As above, but car skids 1'' and each tire takes 2 points damage. Speed is reduced by 20 mph. On its next move, it performs a minor skid. ***

9, 10 — Spinout. Vehicle spins, rotating 90° and moving 1'' in the direction it was previously traveling (before the maneuver or hazard which caused the spinout) per phase of movement required. All rotations must be in the same direction. If the vehicle fishtailed into the spinout, the rotations are in the same direction the fishtail took; otherwise, roll randomly. Each tire takes 1d of damage at the start of the spinout. The vehicle decelerates 20 mph/turn, and the spin stops when the vehicle comes to a halt. A driver may try to recover from a spinout. To do so, roll for control at HC -6. If the roll is successful the spinout stops. If the roll is missed the spinout continues normally. If control is regained, and the vehicle is facing the direction it is moving, movement continues on as usual. If the car is facing sideways it must perform an immediate T-stop. It may discontinue a T-stop by turning "into" the direction of the skid and then continue the turn. If the vehicle is facing backwards and is traveling faster than its reverse top speed, it must slow down by at least 5 mph per turn until it is under its normal top speed for reverse.

11, 12 — Car turns sideways (as in a T-stop; see Figure 7, p. 9) and rolls. The driver is no longer in control. The car decelerates at 20 mph per turn. Each phase it moves, it goes 1'' in the direction it was traveling and rolls ¼ of a complete roll — i.e., in the first phase it moves 1'', turns sideways, and rolls onto its side; the next phase it moves, it goes 1'' and rolls onto its top, etc. It takes 1d damage to the side (top, etc.) rolled onto each phase. When the bottom hits, each tire takes 1d damage. After all tires are gone, the bottom takes damage when it hits. Occupants may jump out at any time, or stay inside and hope that no damage reaches the interior. The car may be driven after it stops rolling if it is right side up and has tires on at least three corners. A cycle won't be drivable after a roll. ***

13, 14 — As above, but vehicle is burning on a roll of 4, 5, or 6 on 1 die. (For more information on burning vehicles, see *Fire and Explosion*, pp. 31-32.)

15 or more — The vehicle vaults into the air by the side (or front) tires, the tires doing the vaulting taking 3d of damage. The vehicle will then fly through the air for 1 to 6 inches (roll 1 die) in the direction the vehicle was traveling before the crash result, revolving two sides for every inch traveled. When it lands, the side that hits takes collision damage at the vehicle's initial speed. If the attempted maneuver was a tight bend or a hard swerve, the vehicle will flip end over end. Upon landing, the vehicle will continue to roll as per result 11 on this table. All occupants take 1 point of damage automatically. Body armor does not protect against this damage.

Crash Table 2
Fishtails

1-4 — Minor fishtail. Roll randomly to see if fishtail will be left or right. If, for instance, it is left, keep vehicle's right front corner in the same square, and move the left rear corner 1 square left. Reverse for a right fishtail. *

5-8 — Major fishtail. As above, but rear corner moves 2 squares. **

9, 10 — Execute a minor fishtail and roll again on Crash Table 1. ***

11-14 — Execute a major fishtail and roll again on Crash Table 1. ***

15 or more — Execute a major and a minor fishtail (for a total of 3 squares movement in one direction) and roll again on Crash Table 1. ***

Crash Table 3
Car Trailers and Tractor-Trailer Rigs

-1 — Trivial skid. The tractor moves ¼'' in a "trivial skid" as per Crash Table 1. The trailer follows as per a normal maneuver.*

0, 1 — Minor fishtail. The tractor does not move; the trailer fishtails ¼''. Treat as a regular fishtail; roll randomly for right or left and move the rear of the trailer ¼'' in that direction, keeping the kingpin over the fifth wheel.*

2, 3 — Minor skid. The tractor skids ½''; the trailer follows normally.**

4 — Major fishtail. The tractor does not move; the trailer fishtails as for result 0 above, but moves ½''.**

5, 6 — Minor skid and fishtail. As for result 2, 3, above, followed by result 4.**

7, 8 — Major skid and fishtail. The tractor skids ¾'' and the trailer follows, then fishtails ¾''.***

9, 10 — Extreme fishtail. The tractor stays still, the trailer fishtails 1''.***

11, 12 — Extreme skid and fishtail. Tractor skids 1''; trailer follows and fishtails 1''.***

13 — Kingpin breaks. The trailer comes loose. The tractor's fifth wheel takes 1d-2 damage. A further D2 hazard!***

14, 15 — As result 13, but the trailer goes into a roll.

16 — As result 13, but the tractor rolls. It catches fire on a roll of 4, 5 or 6 on 1 die.***

17 — As result 16, but the trailer rolls, too (catching fire on a 4, 5 or 6).

18 — As result 16, but the tractor or towing vehicle flips as in result 15 on Crash Table 1.

19 or more — As result 18, but the trailer rolls too (catching fire on a 4, 5 or 6).

Crash Table 4
Helicopters

0-2 — Involuntary drift. The helicopter performs a drift maneuver in the direction it was maneuvering toward, and loses ¼'' altitude. (If it was flying straight, roll randomly for the direction of the drift — 1 to 3 left, 4 to 6 right).

3-5 — Involuntary veer. The helicopter executes a veer maneuver in the direction of its last maneuver (if flying straight, roll randomly as above) and loses ½'' altitude.

Movement

6-8 — Severe veer. The helicopter executes a veer maneuver in the direction of its last maneuver. It loses 1'' of altitude. *

9-11 — Diving veer. The helicopter executes a veer in the direction of its last maneuver. It loses 1½'' of altitude and is considered diving at 10 mph. In addition, on the *following* movement phase of the helicopter, it *must* perform a drift in the direction of the veer or it will automatically continue the veer. The handling difficulty due to that drift will not count against handling. Check for rotor failure, as described below. ***

12-18 — Spinout. The vehicle turns 90° to its flight-path at the end of the phase, in the direction of its last maneuver. Check for rotor failure. On its next phase, the helicopter will automatically go into a diving veer. ***

19 or more — Rotors fail automatically. Helicopter falls.

Rotor Failure — Roll 2 dice:

2-7 — No effect. Rotors are still in working order.

8-10 — Rotors damaged. Roll on this table every turn before Phase 1, and consider any result of "rotors damaged" to mean "rotors fail."

11, 12 — Rotors fail. Helicopter drops like a stone. Bon voyage.

Modifiers
Helicopter is moving 80-120 mph: +1
Helicopter is moving 121-160 mph: +2
Helicopter is moving 161-200 mph: +3
Helicopter is moving over 200 mph: +4
Engine damaged: +1
Rotor damaged by weapons fire: +4

Crash Table 5
Boats

0-2 — Fishtail. Executed just like the result on Crash Table 2; back corner of boat moves 2 squares.

3-5 — Minor Swamping. Boat takes on 1 space of water, and speed is immediately reduced 10 mph. In addition, the engine stops on a roll of 1 on 1 die; it takes 3 turns to restart. *

6, 7 — Minor Swamping and Fishtail, as above. *

8-10 — Major Swamping. Boat takes on 1d spaces of water, and speed is reduced 10 mph for every space of water taken on. In addition, the engine stops; it restarts on a roll of 1 on 1 die (this roll is made at the end of each turn). **

11, 12 — Fishtail and Major Swamping (as above). **

13-15 — Capsized. Boat turns and rolls like a car, but only taking ½d of damage each time it rolls on water. Boat decelerates at 20 mph/turn until it comes to a stop. Any material not tied

down and in the open is lost overboard. A capsized boat may be righted with the same equipment that gets one unstuck, at the same cost. ***

16 or more — Disaster. Boat breaks apart (and eventually sinks). Vehicular weapons are inoperable. All occupants and components take ½d of collision damage. Boat's component parts continue skipping across the waves, decelerating at 40 mph/turn. People below deck have 10 turns to get to an open part of the boat in order to jump out — otherwise, they automatically drown. ***

Crash Table 6
Hovercraft

0-2 — Minor fishtail. Executed as on Crash Table 2; back corner moves 1 square.

3 — Rotate. Hover rotates 45°. Roll randomly for direction. *

4, 5 — Major fishtail. Back corner moves 2 squares. *

6, 7 — Rotate. Hover rotates 90°. Roll randomly for direction. **

8-10 — Spinout. Hover rotates 90° each time it moves, decelerating 5 mph per turn until it stops. ***

11-14 — Plenum Blowout. Plenum chamber collapses. Hover rolls, as result 11, 12 on Crash Table 1. ***

15 or more — Plenum Blowout. Plenum chamber collapses. Hover executes a vault as result 15 or more on Crash Table 1. ***

Collisions

When a vehicle counter touches a fixed object or another counter, a collision has occurred. Even though all *Car Wars* vehicle counters are a minimum ½'' wide (7½ feet in game scale), the referee should use common sense when determining whether a collision has occurred. A motorcycle can squeeze into tighter spots than a truck, even though the counters are the same width. If a player wants to take his motorcycle down a four-foot-wide alley, let him. The driver of a bus can't do it.

Collision damage is based on the type of collision, the weight of the vehicles involved, and their relative speeds. To find the result of a collision, determine the type of collision (T-Bone, Head-On, Rear-End or Sideswipe) from the collision diagrams in Figure 9. Every collision can be classified as one of these four types. When a vehicle is driving in reverse, rolling over, etc., designations of "front," "side," etc., are sometimes inappropriate. A rolling car can have a "head-on" collision in which a side strikes first, for example. If a car is doing a bootlegger, consider the leading side as its "front," moving at 15 mph. In general, use common sense in determining the type of collision. Then follow the instructions for that type, and the steps below, to find damage, final speed, and final position for both vehicles.

1) From the *Collision Damage Table* (below), find the *Damage Modifier* (DM) corresponding to your vehicle's weight. A Shogun 100 (800 lbs.) has a DM of ⅓. A Killer Kart (2,300 lbs.) has a DM of ⅔. A Piranha (5,995 lbs.) has a DM of 1. A tractor-trailer rig weighing 62,000 lbs., has a DM of 15. (Figure weight at the beginning of a trip; don't bother recalculating every time you expend a shell.) A pedestrian has a DM of ⅕.

2) When a collision occurs, determine the collision speed according to the formula given under each type of collision. The number of dice of damage a collision of that speed will cause can be found in the far right column of the Movement Chart (see p. 4), under the heading "Ram." Multiply the "ram" damage rolled on the dice by your vehicle's DM. That is the damage you cause to your opponent. The damage you sustain is the product of his DM multiplied by the same base damage rolled.

Example: A Killer Kart (DM 1/3) collides with a Piranha (DM 1) at a net speed of 40 mph. A 40-mph collision results in 3d damage, and a 14 is rolled. The Kart gives the Piranha (14 × 1/3) = 9 points of damage (rounding down). The Piranha gives the Kart (14 × 1) = 14 points of damage.

Example: A Shogun 100 (DM 1/3) collides with the semi-trailer rig we mentioned above (DM 15), at a net speed of 10 mph. One die is rolled, and 2 points are subtracted, so that the result will be a 0, 1, 2, 3 or 4. In this case, the result is 3 points of damage. The Shogun gives the rig (3 × 1/3) = 1 point of damage. On the other hand, the rig impacts the cycle for (3 × 15) = 45 points of damage. Even at 10 mph, a big rig can smash a cycle.

Collision Damage Table

Vehicle Weight	Damage Modifier
0-2,000	1/3
2,001-4,000	2/3
4,001-8,000	1
8,001-12,000	2
12,001-16,000	3
16,001-20,000	4
20,001-24,000	5

DM increases by 1 for every additional 4,000 lbs.

Collision Types

A Head-On collision occurs any time one vehicle collides with another from within the 90° shaded arc of Figure 9a.

A Rear End collision (Figure 9b) is similar to a Head-On, except that the two vehicles are heading in roughly the same direction.

A T-Bone collision occurs when one vehicle collides with another from within the 90° shaded arc of Figure 9c.

There are two types of Sideswipe. In one case, the vehicles are traveling in the same direction, nearly parallel to each other (i.e., within the 45° shaded arc of Figure 9d). The second type is similar to the first, except that the vehicles are traveling in opposite directions, but still nearly parallel to one another (see Figure 9e). Fishtails are a major cause of both types of Sideswipe.
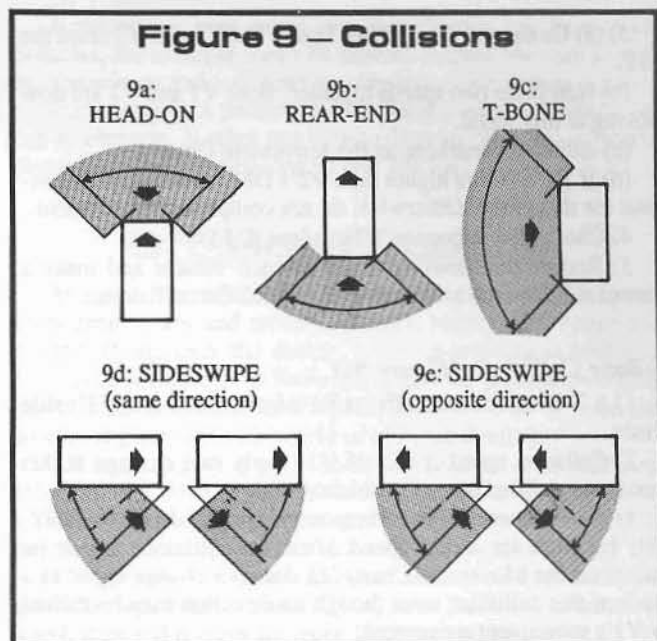
"Conforming" Movement

When one vehicle pushes another one out of the way, the second vehicle is "conforming" to the first. A vehicle conforms to another by pivoting on one corner until, through regular movement, the two vehicles are no longer in contact. The driver of the conforming vehicle selects an appropriate pivot corner from the choices shown in Figure 10. In each case, V2 is "conforming" to V1. During its own movement phase, V2 does not pivot; it moves normally as its driver maneuvers it (or as required by the Crash Table, if it is out of control).

If a collision occurs and it is on the border of two types of collisions, the defender decides what type of collision it is. For example, if Car A is hit by Car B on the line between a Rear-End and a T-Bone, Car A gets to decide which of the two it will be.

Note that subsequent phases in which the vehicles are still in contact are not new collisions. Do not assess additional damage or adjust speed again unless a vehicle hits something else. For example, a car might sideswipe a trailer, slide along its side (accumulating no new damage) and then collide with the tractor, which had turned into the car's path (a new collision). Or a car might sideswipe a building and then have a new collision with a projecting wing of that same building.

If one vehicle is shattered by the collision (see the optional

Figure 9 — Collisions

9a: HEAD-ON 9b: REAR-END 9c: T-BONE

9d: SIDESWIPE (same direction) 9e: SIDESWIPE (opposite direction)

Confetti rule, p. 36), the ram is treated as if the surviving car had hit a fixed object; it takes precisely as much damage as it took to confetti the other vehicle, and follows the fixed-object rules above to determine its future movement.

Collision Procedure

Head-On Collisions (Figure 9a)

1) A Head-On collision affects the front armor of both vehicles.

2) Collision speed is that of V1 plus V2; apply ram damage at this speed, as modified by each vehicle's DM.

3) (a) Compute the "Temporary Speed" for V1 and V2 from the *Temporary Speed Table* (TST) on p. 14.

(b) Subtract the speed of the slower vehicle from the speed of the faster vehicle. The faster vehicle is now moving at this new speed; the slower has speed 0.

(c) Adjust the markers on the Movement Chart.

(d) If the phasing vehicle is still moving, complete this movement phase.

(e) The slower vehicle (now at 0 mph) "conforms" itself to the faster one.

4) Check for concussion effects (see p. 14).

5) Reduce the handling status of each vehicle by 1 for every 10-mph change in speed (rounding up) and make a control roll for each one at its original speed. Apply at least a D1 hazard to each one, even if it lost no speed.

Rear-End Collisions (Figure 9b)

1) A Rear-End collision affects V1's front armor and V2's back armor.

2) Collision speed is that of V1 minus V2; apply ram damage at this speed, as modified by each vehicle's DM.

Figure 10 — Conforming Movement
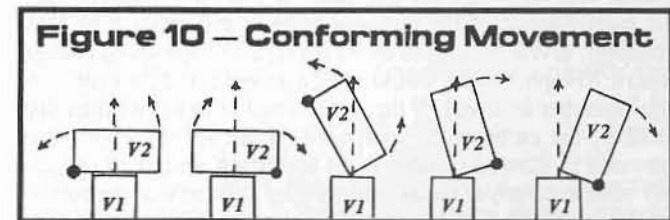
Movement

3) (a) Compute "Temporary Speed" of V1 and V2 from the TST.

(b) Add these two speeds together. Both V1 and V2 are now moving at this speed.

(c) Adjust the markers on the Movement Chart.

(d) If V1's DM is higher than V2's DM, complete its movement for this phase. Otherwise, do not complete its movement.

4) Check for concussion effects (see p. 14).

5) Reduce the handling status of each vehicle and make a control roll for each as described for Head-On collisions.

T-Bone Collisions (Figure 9c)

1) A T-Bone collision affects V1's front armor and V2's side armor.

2) Collision speed is that of V1; apply ram damage at this speed, as modified by each vehicle's DM.

3) (a) Compute V1's "Temporary Speed" from the TST. This becomes its actual speed after the collision; adjust its marker on the Movement Chart. V2 does not change speed as a result of this collision, even though its direction may be shifted by V1's subsequent movement.

(b) If V1's new speed is above 0, and it was making its move when the collision took place, it completes this phase's movement, and V2 "conforms" to V1's movement. If V2 was making its move when the collision took place, and if V2's DM is higher than V1's DM, complete V2's movement for this phase. Otherwise do not complete V2's movement.

4) Check for concussion effects (see below).

5) Reduce handling status for both vehicles and make a control roll for each vehicle as described for a Head-On collision.

Sideswipes (Figures 9d and 9e)

1) A Sideswipe affects the side armor of both vehicles.

2) (a) Determine the net speed of the collision. If both vehicles are going in the same direction (Figure 9d) subtract the lower speed from the higher. If they are going in opposite directions (Figure 9e), add the two speeds.

(b) Divide net speed by 4, rounding up to the nearest 5 mph. This is the collision's "Swipe-Speed."

3) Apply ram damage at the "Swipe-Speed," as modified by each vehicle's DM.

4) If the phasing vehicle's DM is lower than the other vehicle's DM, it finishes its movement by sliding along the other vehicle.

5) Reduce the handling status of each vehicle by 1 for each 10 mph of "Swipe-Speed," and make a control roll for each.

6) If either vehicle fishtails as a result of this control roll, the fishtail will be in the direction away from the collision which just occurred.

7) A Sideswipe does not affect the actual speed of either vehicle.

Concussion from Rams (Optional)

When any vehicle is involved in a collision, all occupants must roll for concussion effects from the ram. Take the speed change that resulted from that ram (in T-Bone collisions, take the speed change of the ramming vehicle and apply it to both vehicles), divide that speed by 10 (thus, a 35-mph speed change from a 70-mph T-Bone would yield a 4) and roll 2 dice for each crew member involved. If the roll is equal to or higher than that number, the crewman is unaffected. If the roll is lower, that crewman is stunned (unable to do any firing actions or operate any vehicle controls) for as many phases as he missed the roll by (at least to the end of the turn). Safety seats add +1 to the roll,

as do Impact Armor and Roll Cages. Stunning a driver adds a D2 to the total collision hazard.

Trailers in Collisions

When a car and trailer or a big rig is in a collision, there is a chance of the trailer hitch/kingpin or tongue being destroyed.

First, assess the collision normally, using the total weight of the tower-trailer combination to determine the DM. If the combination slowed down in the collision, then find the amount by which the pair decelerated. Apply ram damage at this speed to both the tongue and the hitch. Excess hitch damage goes to the towing vehicle's back armor; excess tongue damage goes to the front armor of the trailer. Hitch armor will not protect against this damage, though it will absorb the excess damage before other armor.

Fixed Objects

A fixed object will cause exactly as much damage as it takes, up to the point at which the fixed object breaks. All fixed objects have a DP rating, which is the number of Damage Points they can take before they are destroyed.

Example: A 20-point tree gets in the way of a luxury car going 40 mph. The "ram" damage at 40 mph is 3d, and a luxury car's DM is usually 1. A 12 is rolled on 3 dice, and multiplied by 1 for a result of 12. That's how much damage the car does to the tree, and it's also how much damage the tree does to the car.

Now, let's send the same car into the same tree at 80 mph. The "ram" damage at that speed is 11d, and this time the total

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Temporary Speed Table

Find your vehicle's *Damage Modifier* (DM) on the left and cross-index it with the opposing vehicle's (or obstacle's) DM across the top. The result (1, ¾, ½, ¼, 0) is a *preliminary* indication of how your speed was affected. Multiply your original speed by this number, rounding up to the nearest 5 mph. This is your "Temporary Speed."

Your DM	⅓	⅔	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
⅓	½	¼	¼	¼	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
⅔	¾	½	½	¼	¼	¼	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	¾	½	½	¼	¼	¼	¼	¼	¼	0	0	0	0	0	0	0	0	0	0	0	0	0
2	¾	¾	¾	½	¼	¼	¼	¼	¼	¼	¼	¼	¼	¼	¼	0	0	0	0	0	0	0
3	1	¾	¾	½	½	¼	¼	¼	¼	¼	¼	¼	¼	¼	¼	¼	¼	¼	¼	¼	¼	¼
4	1	¾	¾	¾	½	½	½	¼	¼	¼	¼	¼	¼	¼	¼	¼	¼	¼	¼	¼	¼	¼
5	1	1	¾	¾	¾	½	½	½	½	½	¼	¼	¼	¼	¼	¼	¼	¼	¼	¼	¼	¼
6	1	1	¾	¾	¾	½	½	½	½	½	½	½	¼	¼	¼	¼	¼	¼	¼	¼	¼	¼
7	1	1	¾	¾	¾	¾	½	½	½	½	½	½	½	½	¼	¼	¼	¼	¼	¼	¼	¼
8	1	1	1	¾	¾	¾	½	½	½	½	½	½	½	½	½	¼	¼	¼	¼	¼	¼	¼
9	1	1	1	¾	¾	¾	¾	½	½	½	½	½	½	½	½	½	½	¼	¼	¼	¼	¼
10	1	1	1	¾	¾	¾	¾	¾	½	½	½	½	½	½	½	½	½	½	¼	¼	¼	¼
11	1	1	1	¾	¾	¾	¾	¾	¾	½	½	½	½	½	½	½	½	½	½	¼	¼	¼
12	1	1	1	¾	¾	¾	¾	¾	¾	¾	½	½	½	½	½	½	½	½	½	½	½	¼
13	1	1	1	¾	¾	¾	¾	¾	¾	¾	½	½	½	½	½	½	½	½	½	½	½	½
14	1	1	1	1	¾	¾	¾	¾	¾	¾	¾	½	½	½	½	½	½	½	½	½	½	½
15	1	1	1	1	¾	¾	¾	¾	¾	¾	¾	¾	½	½	½	½	½	½	½	½	½	½
16	1	1	1	1	¾	¾	¾	¾	¾	¾	¾	¾	½	½	½	½	½	½	½	½	½	½
17	1	1	1	1	¾	¾	¾	¾	¾	¾	¾	¾	¾	½	½	½	½	½	½	½	½	½
18	1	1	1	1	¾	¾	¾	¾	¾	¾	¾	¾	¾	½	½	½	½	½	½	½	½	½
19	1	1	1	1	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	½	½	½	½	½	½	½	½
20	1	1	1	1	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	½	½	½	½	½	½	½	½

is 41. The tree only has 20 DP, so it is destroyed. But the car also only takes 20 points of damage.

For each collision, determine the collision type — Head-On or Sideswipe — and apply damage, speed change, concussions and hazards accordingly. Of course, in a Head-On, if the obstacle is not destroyed or breached, the vehicle stops. If the obstacle is destroyed, the vehicle's "Temporary Speed" becomes its new speed. If a Sideswipe does not destroy it, the vehicle finishes the phase by sliding along the obstacle.

Note: A building breach is generally 1/4" wide (see *Buildings,* p. 37). A vehicle ramming a building or wall must, in effect, create two such breaches in order to break through. Thus, when ramming a 6 DP building, a vehicle must do 12 points of collision damage to create a double breach and continue through. In addition, each 1/4" section of wall will return damage, up to its full DP value.

Debris and Obstacles

A "road debris" counter may represent any sort of junk on the road. Debris can be part of a scenario (appearing already drawn onto the road) or it can appear as a result of combat.

A debris counter is 1/2" × 1/4". It may show debris in two squares or in only one. Place it on the board so its squares align with those on the road, showing exactly which map squares contain debris.

Hitting Debris

A vehicle hits debris the first time any part of the vehicle counter touches a debris square. Debris can be hit only once per phase, regardless of how many debris squares are entered. If a vehicle starts the phase on top of debris, that debris does not affect it; it has already been hit.

Debris affects all of a vehicle's tires. Roll 1 die for each tire, and subtract 3 from the result, to find the damage to that tire. Thus, on a roll of 1 to 3, the tire is undamaged. Hitting debris is a D1 hazard.

Producing Debris

When a car takes 10 or more points of damage during one phase, pick one debris counter randomly. Place it next to the car, at the point hit. (A car is not affected by its own debris unless it drives back through it.) Debris for top/bottom damage goes behind the vehicle. If a car explodes, choose five random debris counters, and drop them onto the board from a height of one foot over the explosion site. (If one misses the board, or hits any other counter, drop it again.) Align counters with the road grid as closely as possible at the point where they fall. Debris and other obstacles (below) remain until the game ends.

Hitting Obstacles

An obstacle counter represents a pothole, loose wheel or other larger road hazard. Striking an obstacle is a D3 hazard. Determining whether or not an obstacle is struck is done in the same way as for debris. An obstacle does the same damage to each tire as debris does. A vehicle may hit more than one obstacle in a phase, and must roll for each.

Producing and Moving Obstacles

If a car loses a wheel (not just a tire) or takes 20 or more hits during one phase, or loses one or more points of metal armor, an obstacle is placed as described above for debris. In some scenarios, debris or obstacles may be thrown from buildings, vehicles, etc. Note that an obstacle is bulky, equivalent to one space in size, and no vehicle will be able to carry very many.

A pedestrian may move any obstacle that can be moved; potholes, for example, can't be moved. It takes one turn to pick an obstacle up and a pedestrian may move one square per turn while carrying it. A pedestrian cannot use a weapon while carrying an obstacle. It takes one turn to drop an obstacle. A typical obstacle will weigh between 50 and 100 lbs.

Off-Road Duelling

Many of the most demanding combat situations take place away from roads and arenas. A beach battle, with cycles and buggies flying over the dunes . . . a cat-and-mouse hunt in a Louisiana swamp . . . a Badlands raid, with pickups swooping down from the hills to intercept a convoy . . . all of these and more, are possible in the world of off-road duelling.

All maneuvers (but not hazards) off-road are at an additional D1 difficulty. All Crash Table rolls are at a -3, due to the vehicles' tendency to slide and skid while off-road. This applies to all vehicles except hovercraft.

The only significant advantage to driving off-road is that the ground is softer than cement. Thus, in a "bail-out" situation or a roll, cars and drivers are more likely to survive.

Off-Road Vehicles

Off-road suspension (see p. 51) is available for 4- and 6-wheeled vehicles, to lift the underbody off the ground and cushion it from shocks. Hovercraft, since they are not in contact with the ground, are natural off-road vehicles. They suffer *no* penalties for off-road travel.

Penalties for Unmodified Vehicles

Any vehicle can go off-road without modifications — but the handling class of an unmodified vehicle is reduced:

Motorcycle (with or without sidecar): -2 HC
Trike: -1 HC
Car (4 or 6 wheels): -3 HC
Oversized vehicle: -2 HC

The handling bonus for radial and racing slick tires does not apply while off-road. Special off-road (OR) tires are available (see p. 54).

In addition, most vehicles are subject to damage when going off-road. Every turn a standard car, van or oversized vehicle is off-road and traveling faster than 10 mph, roll 2 dice. On a 2 or 3, the underbody takes 1 point of damage. On a 4 or 5, one tire (roll randomly to see which one) takes 1 point of damage. If the vehicle is going over 30 mph, roll twice per turn; over 50 mph, roll 3 times; and so on. Once the underbody is gone, the internal components do not take further damage.

Exceptions: racing slicks take double damage from traveling off-road, and solid and off-road tires take no damage.

Vehicles with Off-Road suspensions, as well as all cycles and trikes, are built higher off the ground and do not take underbody damage.

Off-Road Terrain

Off-road should not be taken to mean the dirt on the edge of the road; the shoulder of the road is usually no great hazard. "Off-road" means open country — fields, desert or park.

Grass and open fields: This is the standard off-road terrain. No extra penalties apply — just the normal +D1 difficulty for off-road travel.

Trees: Small ones are a D2 or D3 hazard. Larger ones would be fixed barriers and could have 8 to 20 DP, or even more.

Boulders: Small ones (about a foot across) should be treated as obstacles. Those 1 to 2 feet across are fixed barriers with as

much as 25 DP. Boulders are usually knocked out of the way (rather than destroyed) if they take more than their DP value from a collision. Larger boulders would have even greater DP values — a four-foot boulder would be worth at least 50 DP.

Ditches and Gullies

Small ditches (less than 2 feet across) are a D3 hazard at 20 mph or less, but only a D1 hazard at greater speeds — vehicles fly right over them. Ditches between 2 and 4 feet across are impassable at less than 20 mph — if a vehicle tries to cross one, it will fall in and collide with the far wall at full speed, taking full damage for its speed. At 25 to 40 mph, such a ditch is a D3 hazard. At 45 mph or greater, it is a D1 hazard again; you fly right over. Wider ditches should not be jumped without a ramp (see above). Very wide gullies, unless they are full of water, can be crossed by driving down one side and up the other.

Water

Vehicles without off-road (OR) suspension cannot cross water deeper than 1½ feet. Vehicles with OR suspension can take on water up to 3 feet deep. Vehicles in deeper water drown out and stop working — the effect is the same as if the power plant had been destroyed. The plant takes no actual damage, though — once the vehicle is out of the water (how you get it out is your problem), it will dry out and be usable again in 1d hours.

Hitting standing water deeper than ½ foot is a D2 hazard. Traveling in water decelerates a vehicle by 5 mph per turn per ½ foot of water — you must accelerate by 5 mph just to stay at the same speed. Vehicles with OR suspensions decelerate 5 mph per turn per ½ foot of water *over* 1½ feet deep.

Radical maneuvers are impossible in water — no maneuver with an original, unmodified difficulty over D3 can be performed. There is no additional penalty for those maneuvers which *can* be performed.

Dropped weapons may be used in water, to mixed effect. Oil will not be effective; flaming oil will ignite, but it will also disperse and be ineffective; icedroppers will form a thin sheet of ice that acts as floating debris; spikes and mines will be hidden under the water. Every time a dropped weapon is used in water, roll 1 die. On a 1 or 2, water backs up into the system while the port is open, and the weapon takes 1d-3 points of damage.

Tires cannot be targeted in over a foot of water; they are at an additional -2 to hit when in over 6'' of water.

Jumping Out of Vehicles

Anyone jumping out of a vehicle, or off a cycle, when off-road will take reduced damage. Figure the damage as though the driver has been hit by a sideswipe from a car traveling 30 mph slower than the speed at which he actually hit the ground.

Rolling

When a vehicle rolls in an off-road situation, each side that hits the ground takes 1d-2 damage, instead of 1d of damage. Tires, likewise, take 1d-2 damage in an off-road roll. It is quite possible to roll a vehicle on soft ground and drive it away afterward — if you can get it upright.

Pedestrian Movement

Most pedestrians move at 12.5 mph; that is, they move ¼'' on every phase. Pedestrians with the Running skill (see *Running*, p. 42) can move faster.

Pedestrians may move into any adjacent square, including those which are diagonally adjacent, in their move. They can change direction any time without having to bother with control rolls or handling class (though things like oil and spikes can hamper movement). For details on pedestrians, see pp. 44-46.

Trailer Movement

Trailers are represented, like any vehicle, by rectangular counters. The counters vary in length, depending on the trailer length, and have an additional triangular area simulating the trailer tongue. All counters are ½'' wide. The tongue triangle has a base and height of ½''.

Trailer Type	Counter Length
Mini	¼''
6'	½''
10'	¾''
15'	1''
20'	1½''
25'	1¾''
30'	2''

Each trailer is attached to a vehicle by a hitch. The hitch point is marked by a dot in the center of the towing vehicle counter's back edge. See Figure 11.

Figure 11 — Trailer Counters
Motorcycle w/Mini trailer
Car w/20' trailer   Hitch Point   Long Axis
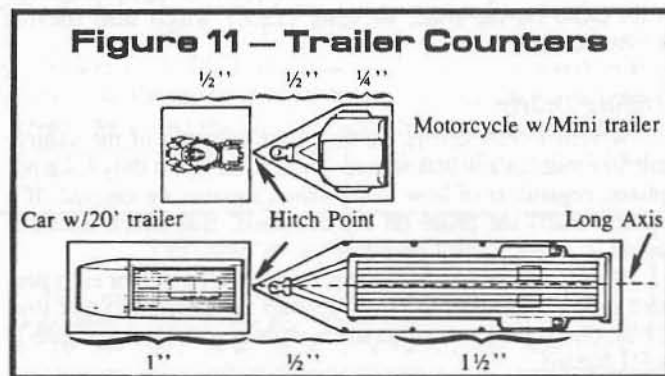
Acceleration and Deceleration

Acceleration for a trailer-towing vehicle is determined normally, but the trailer's weight must be included. A trailer's weight doesn't count against the vehicle's chassis-weight limit. Any trailer-towing vehicle that decelerates more than 30 mph in a turn goes immediately to Crash Table 3, and all the tires (including the trailer's) take 2d of damage.

Straight-Line Maneuvers

Vehicles pulling trailers are represented by two counters — one for the towing vehicle and one for the trailer. A trailer cannot accelerate by itself, and usually crashes if it comes loose during movement (see *Loose Trailers*, p. 18).

Place the trailer counter so that the point of the tongue touches the hitch point of the towing vehicle, as in Figure 11.

The combined counter moves forward 1'' or more during every phase in which the Movement Chart indicates it should move. This is the normal hauling configuration. Angling the trailer is a maneuver (see below).

Maneuvers

A vehicle towing a trailer maneuvers the same way a car does, except that it cannot attempt a bootlegger.

The trailer follows the towing vehicle in a very interesting way — it is separate, joined by a hitch. During a maneuver, the two counters are moved one after the other, and will be separated

Figure 12 — Trailer Movement
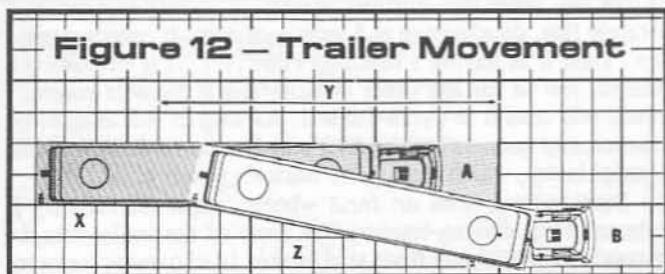
briefly. At the end of each maneuver, the end of the trailer's tongue must be directly over the hitch-point of the towing vehicle. The towing vehicle can never make more than a 90° angle with the trailer; if it does, the rig has jackknifed (see below).

To maneuver with a trailer, first move the *towing vehicle,* as per the maneuver chart or turning key. Next, move the *trailer* counter as follows:

First, move it in a straight line along its long axis (see Figure 12) the same distance the towing vehicle moved. If the towing vehicle moved an inch, the trailer moves forward an inch.

Second, hold one rear corner of the trailer counter in place, and pivot the trailer until its tongue is as close as possible to the hitch point of the towing vehicle.

Third, move the trailer (usually forward 1/8" to 1/4") until the tongue is exactly over the hitch point, once again.

If the trailer is now touching a wall or other counter, a collision has occurred. However, if the trailer happened to overlap something during the first two steps of its movement, no collision took place.

In Figure 12, the shaded positions are the original ones; the outlined positions are the final ones after execution of a steep drift. The double-ended arrow shows where the trailer was located at its intermediate position; it moved forward one inch, exactly covering the old position of the tractor. The tractor went from A to B. The trailer went from X to an "imaginary" position at Y, and then pivoted to reach its final position at Z.

Arrows also show the long axis of the trailer before and after it moved. If a rig is towing a *second* trailer, move the towing vehicle first, then resolve movement for the first trailer, then do the same for the second trailer as if the first trailer was the towing vehicle.

Backing Up

Reverse movement is handled just like regular movement. First, move the towing vehicle to its new position. Then move the trailer counter backwards in a straight line along its long axis. When the tongue is as close as possible to the hitch point, hold one corner of the trailer down and pivot it until the tongue is once again over the hitch point. As with forward movement,

a collision takes place only if the trailer ends its movement in contact with another object.

A vehicle towing a trailer may attempt to back up at up to 20 mph, but backing up can cause a trailer to jackknife. It is not wise to back up at more than 5 mph; 2.5 mph is safer yet.

Regardless of the *player's* skill in manipulating counters, the *character* must have the proper skill to back up safely with a trailer. The skill needed depends on the towing vehicle — Driver for cars, Cyclist for cycles, etc. If a non-skilled character tries to back up a vehicle/trailer combination in a straight line, he must roll 1 die on every phase of movement. On a 1, the rear of the trailer swerves 1 square (1/4") out of line (roll randomly for direction). If the vehicle/trailer is being backed in any way except a straight line, the trailer will swerve on a 1, 2 or 3. The swerve will always be in the direction that tends to jackknife the trailer, rather than to straighten it out.

Jackknifing

A trailer is in a jackknife position whenever the side of the tongue hits the towing vehicle's rear — that is, whenever the side of the tongue triangle makes parallel contact with the towing counter's back edge, the trailer has jackknifed.

When a trailer jackknifes due to a fishtail, roll 1 die. On a result of 1, 2 or 3, the tongue or hitch (whichever has fewer DP) breaks and the trailer is loose. If the jackknife occurred due to a maneuver, the roll is not made until this jackknifed position is held for two consecutive movement phases. See Figure 13.

Figure 13 — Jackknifing
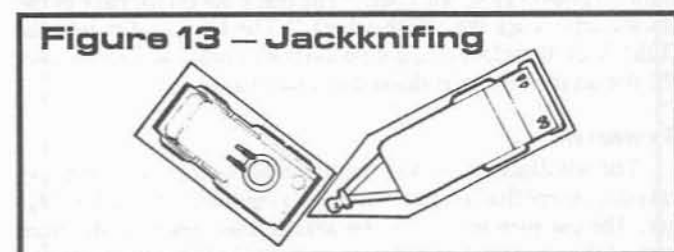
Loose Car Trailers

When a tongue or hitch is shot off or breaks, or a trailer is deliberately released, there will be a loose trailer on the road. There is no way to control a loose trailer. The tongue hits the ground, taking 1 die of damage per 10 mph the trailer is traveling. Excess damage passes to the trailer's underbody armor. The trailer then makes a control roll at HC -1, and goes to Crash Table 2 if it fails. If it does not lose control, it continues to move in a straight line, decelerating 15 mph per turn and taking damage at its new speed at the end of every turn. The trailer starts to roll automatically if it hits a hazard or obstacle while loose. There can be no further fire possible from any gunners inside a rolling trailer until it stops, and then only if it stops right side up.

Crashes and Collisions

Cars or cycles towing trailers must roll on Crash Table 3 when they lose control. Cars and cycles towing trailers are affected normally by debris, obstacles and other road hazards. Losing the first tire of a pair is a D2 hazard. When all tires on one side of a car trailer are lost, go to Crash Table 3. HC goes to -3 in this case.

When a vehicle/trailer combination is in a head-on or rear-end collision, use the combined weight of the towing vehicle and trailer when determining damage. If a vehicle/trailer combination is hit from the side, use the weight of the part (either vehicle or trailer) that was hit to determine collision damage.

Movement

Oversized Vehicles

Movement for oversized vehicles follows the principles of the basic vehicular movement rules, with certain changes.

Handling Class

Oversized vehicles don't handle easily. The handling class of a tractor without a trailer is 0. Addition of a trailer makes the whole rig HC 1. Buses and RVs are also HC 1. Further increases in handling class can come only from good reflexes, aided by the Trucker skill (see p. 42).

Acceleration and Deceleration

Big rigs and buses use the same acceleration rules as ten-wheeled trucks (see p. 60). Any big rig decelerating uses the same chart as cars, though if they lose control they roll on Crash Table 3. Ten-wheelers that lose control due to braking roll on Crash Table 2.

Straight-Line Movement

Buses are represented by single long counters. Counters for tractor-trailer rigs, though, have two components — the tractor and the trailer. These are combined to form a "rig." A trailer cannot accelerate by itself, and usually crashes if it comes loose during movement. A tractor can move by itself; its acceleration is better but its handling class is worse.

To use the tractor and trailer counters, place the trailer so it overlaps the back of the tractor. The black dot on the front of the trailer represents its "kingpin." The black dot on the back of the tractor represents the "fifth wheel." The kingpin fits into the fifth wheel; therefore, the dot on the trailer must be directly over the dot on the tractor at the end of each maneuver.

Maneuvers

Ten-wheelers, buses and tractors maneuver in the same way cars do, except that a tractor-trailer rig cannot attempt a bootlegger. The car pictures should be assumed to represent the front inch of the oversized vehicle.

Tractor-trailer rigs maneuver and back up in the same way as vehicles towing car trailers — see Figure 12. Substitute the big rig's "kingpin" for tongue, and "fifth wheel" for hitch. At the end of each maneuver, the black dot on the trailer (the kingpin) must be directly over the black dot on the tractor (the fifth wheel). The tractor can never make less than a 90° angle with the trailer; if it does, the rig has jackknifed. Roll 1 die. On a 1, 2 or 3, the kingpin breaks and the trailer comes loose.

Ultra-Slow Movement

A truck making a complicated maneuver in a tight space (e.g., parking or entering a fortified area) will move very slowly. In real life, it might move at only 1 mph. For game purposes, 2.5 mph is the slowest possible speed. This translates to one 1/4" square per turn, moving in Phase 1.

A rig moving at this speed should place its speed marker on the line between 0 and 5 mph on the record sheet. On each turn, the tractor may move as follows:

(a) 1/4" straight forward, or
(b) 1/4" straight forward and pivot, as per the regular vehicle pivot, or
(c) pivot without any forward movement at all.

The trailer will follow the tractor as per normal movement.

Loose Trailers

When a fifth wheel is shot off, a kingpin breaks, or a trailer is deliberately released, the trailer will come loose.

If the loose trailer is a true trailer, with wheels in front, treat it like any other uncontrolled vehicle. It moves forward in a straight line, decelerating at 5 mph each turn. It cannot maneuver. Treat it as having a handling class of 1. If it encounters a hazard, roll as for any other vehicle, and a "loss of control" result will send it to Crash Table 2. As long as it does not lose control, any gunners in the trailer may fire the trailer's weapons (except lasers, which require the tractor's power plant).

Semi-trailers, with no front wheels, crash immediately if released by a moving tractor. The front of the trailer hits the ground, the underbody front armor takes 1d of damage for every 10 mph it is going when it hits, and the semi goes to Crash Table 2. If by chance it does not "lose control" at that point, it moves in a straight line, decelerating by 15 mph at the beginning of every turn and doing more damage, as above, at the beginning of every turn until it stops. It has a handling class of -1. If there are gunners in the semi, they will not be able to fire their weapons until it stops, and then only if it is right-side-up.

When a semi hits the ground, the kingpin breaks, so it can't be reattached to a tractor until the kingpin has been replaced.

Debris and Obstacles

Buses and tractor-trailer rigs treat debris and obstacles the same way as ten-wheeled trucks. The road and combat hazards that affect buses and tractor-trailer rigs (such as losing tires, taking damage from enemy fire, etc.), are also the same as those that affect ten-wheeled trucks (see p. 9).

Crashes and Collisions

Buses and tractors without trailers use the same Crash Tables as cars if they lose control. When a tractor-trailer rig loses control for any reason, it goes directly to Crash Table 3.
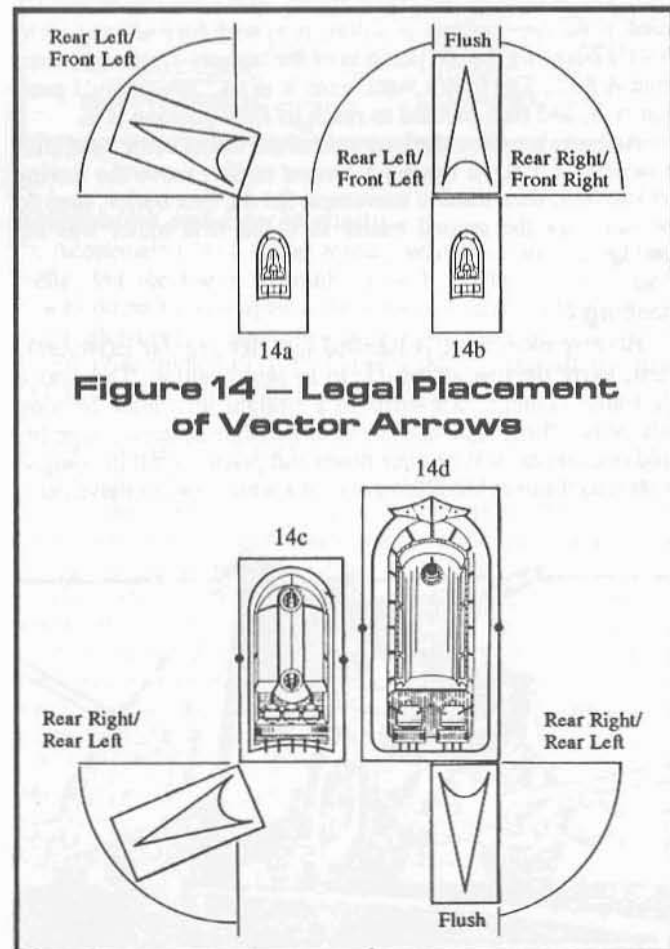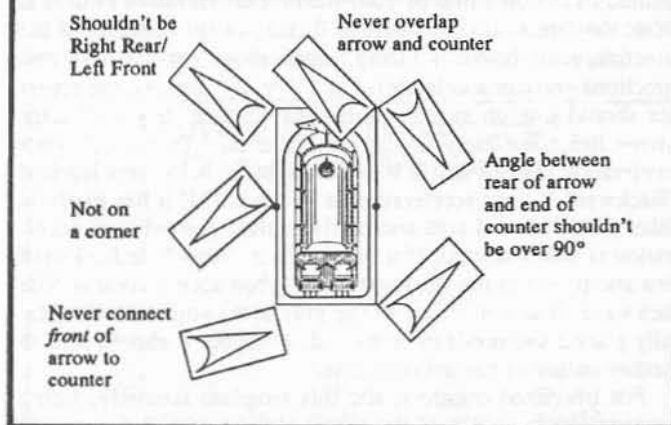

Figure 14 — Legal Placement of Vector Arrows

Figure 15 —Illegal Placement of Vector Arrows

Shouldn't be Right Rear/ Left Front

Never overlap arrow and counter

Angle between rear of arrow and end of counter shouldn't be over 90°

Not on a corner

Never connect *front* of arrow to counter

Use the collision system detailed for cars. Note how dangerous a fully loaded tractor-trailer rig can be, even at low speeds, due to its high Damage Modifier.

Steamrollering

When a ten-wheeler or larger vehicle hits a motorcycle in any way but a sideswipe, it may "steamroller" it — that is, run right over it — due to the difference in heights. Roll 1 die when such a collision takes place. On a 1 or 2, a normal collision occurred; on a 3-6, the cycle was steamrollered.

When this happens, reduce the speed of the cycle to zero. The large vehicle simply runs over its counter. This is an extra D1 hazard, in addition to the collision hazard. The vehicle being steamrollered takes *double* regular collision damage, evenly spread among all components. A cyclist who is about to be steamrollered had better jump — any chance is better than none!

Where the ten-wheelers can only steamroller cycles, the big rigs and buses can also steamroller compacts, subcompacts, and light and medium trikes. Steamrollering a car or trike is a D3 hazard; other vehicles are a D1.

Hovercraft Movement

Since a hover can rotate while traveling in a straight line, it will often be facing in one direction while moving in another. Therefore, a new counter is required to move hovercraft. This is a Vector Arrow (a 1'' × ½'' counter with an arrow on it), which indicates which way the hover is moving.

The hover counter and Vector Arrow are always connected to each other corner-to-corner: either the left-rear corner of the arrow with the left-front corner of the hover (Figure 14a), or the right-rear corner of the arrow with the right-front corner of the hover, or (if the hover and its Vector are pointed in exactly the same direction) *both* rear corners of the Vector Arrow to the corresponding front corners of the hover counter (Figure 14b).

If the hover is facing in the opposite direction of its movement (and thus in the opposite direction of its Vector Arrow), the possible connections are similar: either the left-rear corner of the arrow with the right-rear corner of the hover, or the right-rear corner of the arrow with the left-rear corner of the hover (Figure 14c), or, again, *both* rear corners of the arrow with the corresponding rear corners of the hover, (when it is pointing in exactly the opposite direction of the arrow — Figure 14d).

Note that the *right-rear* corner of the arrow is *never* connected to the *left-front* or *right-rear* corners of the hover, nor is the *left-rear* corner of the arrow ever connected to the *right-front*

or *left-rear* corners of the hover. The front corners of the arrow are never connected to any corner of the hover. See Figure 15.

The Vector Arrow moves very similarly to a car counter. It performs bends and drifts just as cars do. It cannot perform any other maneuvers. The hover counter follows the Vector Arrow, always maintaining corner contact, as described above. When performing a bend, move the Vector Arrow through the bend. Then, keeping the hover counter pointed in the direction in which it began the phase, move it until it is once more in contact with a rear corner of its arrow. (This looks very much like the *hover counter* is performing an unusual drift.) See Figure 16.

The maneuvers described so far never allow a hover to change the direction it is facing. There are two ways for it to do so. First, a hover may *rotate* up to 90° in a phase. It may perform no other maneuvers when doing so. To rotate, move the Vector Arrow out of the way, but keep it pointed in the same direction. Then, rotate the hover counter up to 90°. Next, move the arrow so that it is back in contact with the hover counter. (It will not move back to its previous location on the map, but it will still be pointing in the same direction, which is the important detail.)

Finally, move the arrow 1'' straight forward (i.e., in the direction in which it is pointing) and move the hover counter so that the two counters are once more in legal contact. This is a D2 maneuver; a vertical stabilizer reduces it to a D1. See Figure 17.

Figure 16 — D3 Bend with a Hovercraft

16a

16b

Note: that in this example, the legal corners changed from RR/RF to LR/LF
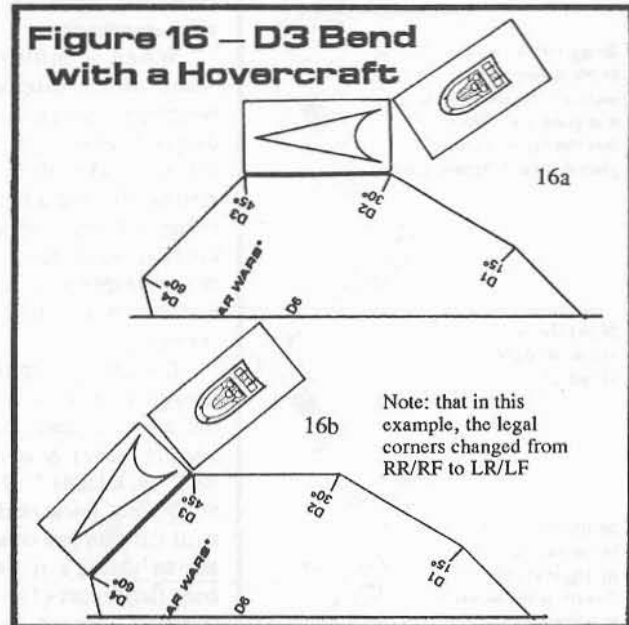
Note that a hover cannot rotate and perform any other maneuver at the same time.

The second way for a hover to change the direction it is facing is for it to begin the phase flush with the arrow (i.e., with the arrow's rear corners connected to the counter's front corners). Then, if you perform a bend, the hover counter may maintain its flush contact with the arrow at a penalty of +D1 to the maneuver. See Figure 18.
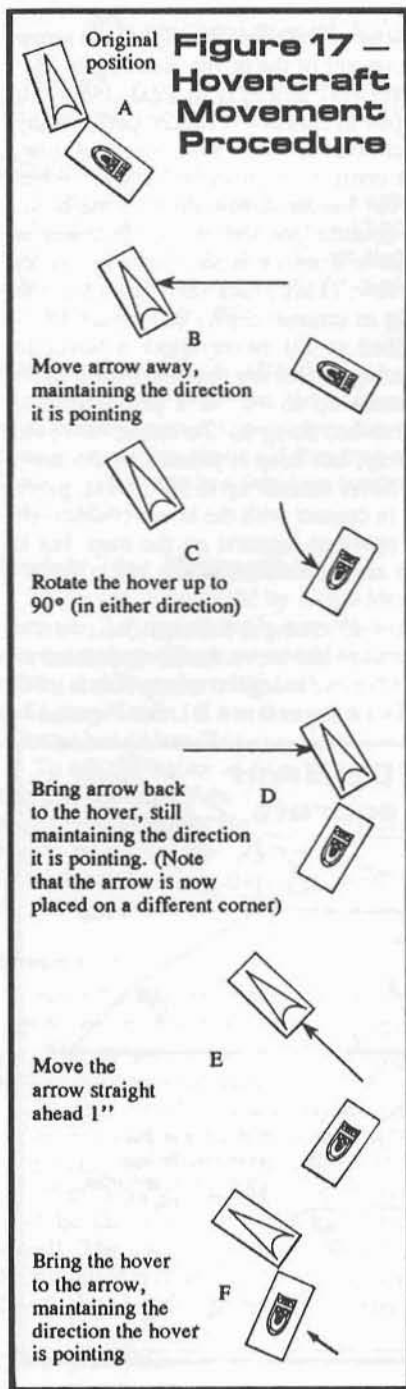
Other restrictions on hover maneuvers are as follows:

One-Man and *Small Hovers* may perform any allowed maneuver at no additional penalty.

Standard Hovers may perform D1 through D5 maneuvers normally; D6 or greater maneuvers are at +D1.

Large Hovers may perform D1 and D2 maneuvers normally; D3 maneuvers are at +D1, D4 and greater are at +D2.

Small Cargo Hovers may only perform D1 or D2 maneuvers normally; D3 maneuvers are at +D2, and more difficult maneuvers cannot be performed.

Movement

Original position Figure 17 —
Hovercraft Movement Procedure

A

B
Move arrow away, maintaining the direction it is pointing

C
Rotate the hover up to 90° (in either direction)

D
Bring arrow back to the hover, still maintaining the direction it is pointing. (Note that the arrow is now placed on a different corner)

E
Move the arrow straight ahead 1"

F
Bring the hover to the arrow, maintaining the direction the hover is pointing

Cargo Hovers may only perform D1 maneuvers normally; D2 maneuvers are at +D1, and more difficult maneuvers cannot be performed.

In all of these cases, a vertical stabilizer can decrease the difficulty of a maneuver. However, it doesn't allow a maneuver that is otherwise impossible, nor does it eliminate any penalty placed on the larger hovers. Thus, a Cargo Hover with a vertical stabilizer and traveling over 60 mph still can't perform D3 maneuvers, and normal D2 maneuvers are +D1 (because of its size) and -D1 (for the stabilizer), resulting in a D2 maneuver.

When a moving hover uses a dropped weapon, align the dropped counter parallel with the Vector Arrow, placing a front corner of the dropped counter so it touches the corresponding rear corner of the hover counter.

Do not overlap the dropped counter and the hover counter unless the hover is moving "backwards." If it is moving backwards, treat the dropped counter as though it had been fired from a front-mounted weapon. See Figure 19.

If not on a transparent sheet, cut out the center 1" × ½".

To determine what type of acceleration you're using, hold this template over your hover counter, with the Forward end pointed in the direction of your hover's *acceleration* (which is either the direction your hover is facing, or the opposite of the direction your hover is facing, since those are the only two directions you can accelerate). For 1" × ½" hovers, the center slot should line up exactly with your counter. If your Vector Arrow lies completely in the area labelled "Forward," your acceleration is Forward. If it lies completely in the area labelled "Backward," your acceleration is Backward. If it lies partly in either Side Forward area and partly in the Forward area, acceleration is Side Forward. If it lies partly in either Side Backward area and partly in the Backward area, your acceleration is Side Backward. If any of it lies in the gray area, your arrow is illegally placed and needs to be moved. Probably it should shift to another corner of the hover counter.

For oversized counters, use this template similarly, lining the appropriate corner of the center slot up with the corner of your hover which is in contact with the Vector Arrow.

Forward

If your acceleration is Forward, simply add your acceleration to your current speed. *Example:* your current speed is 25 mph, and you accelerate 10 mph Forward. Your new speed is 35 mph (25 + 10). Unless your acceleration is 5 times as large as your current speed, or your current speed is more than 5 times as large as your acceleration, rotate the arrow so that its angle with the direction of the hover's acceleration is cut in half (see Figure 22a). If the angle is 15° or less, just "even out" the arrow, placing it flush with the hover.
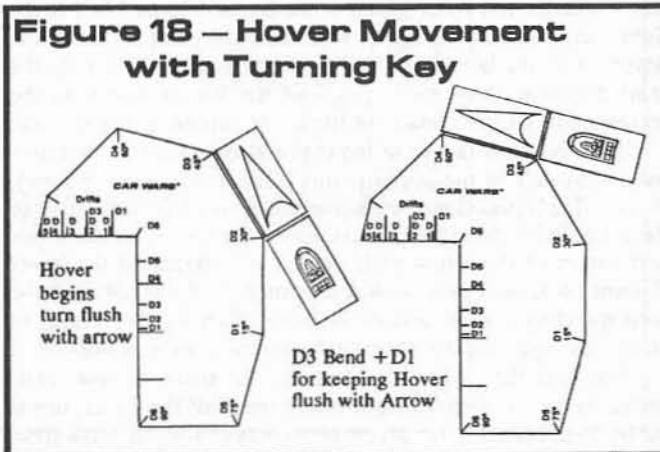
If acceleration is 5 times greater than current speed, rotate the arrow so it is points in the direction of the hover's acceleration (Figure 22b).

If current speed is more than 5 times greater than acceleration, don't change the direction of the arrow at all. *Example:* current speed is 60; acceleration is 10. Don't change the direction of the arrow. The exception is gradual acceleration; see below.
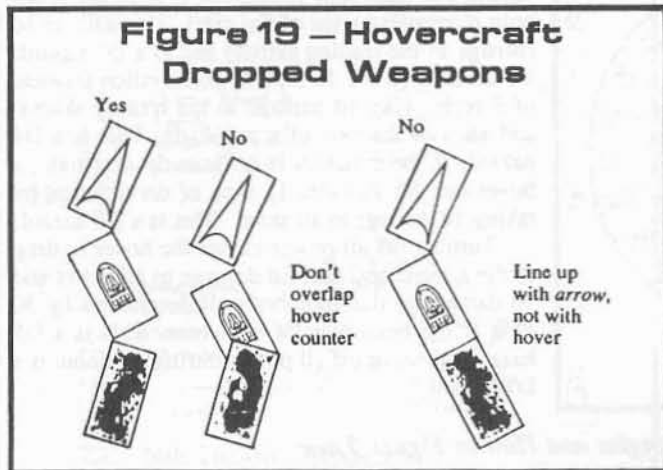
Gradual Continued Acceleration

When, over a period of several turns, neither the hover nor its arrow have changed direction, combined acceleration may add up to more than 1/5 of original speed even though the acceleration on each turn was much less. In such instances, rotate the arrow halfway toward the direction of the hover's acceleration, as in the second paragraph above.

Example: Current speed is 100; acceleration is 10. Don't change the direction of the arrow. At the beginning of the next second, current speed is 110 and acceleration is 5. Over the 2

Hovercraft Acceleration

When a hover is facing exactly the same direction its arrow is pointing, simply add your desired acceleration to your current speed. When it is facing exactly the opposite direction its arrow is pointing, find the difference between acceleration and speed (subtracting the smaller from the larger). When a hover *isn't* facing in either of these directions, acceleration can be tricky.

First, use Figure 20 to determine whether your acceleration will be Forward, Side Forward, Side Backward or Backward. Treat *deceleration* in any direction as acceleration in the opposite direction.

The rectangular template in Figure 21 is useful for hover acceleration. (It can be copied onto a transparent sheet.) It quickly indicates whether your acceleration is Forward, Side Forward, Side Backward or Backward.

Figure 18 — Hover Movement with Turning Key

Hover begins turn flush with arrow

D3 Bend +D1 for keeping Hover flush with Arrow

seconds, acceleration totals to 15 mph, still not 1/5 of the original 100 mph speed. At the beginning of the third second, current speed is 115 and acceleration is 10. Over all 3 seconds, total acceleration has been 25 mph — more than 1/5 of the original 100 mph. Rotate the arrow halfway toward the direction of the hover's acceleration. See Figure 22c for another example.

Figure 19 — Hovercraft Dropped Weapons

Yes

No

No

Don't overlap hover counter

Line up with *arrow*, not with hover

Side Forward

If your acceleration is Side Forward, again compare your acceleration to your current speed. Your new speed becomes the sum of the faster plus *half* of the slower. *Examples:* you are traveling 30 mph, and accelerate 10 mph sideways. Your new speed is 35 mph (30 plus half of 10). If you are traveling 20 mph, and accelerate 30 mph sideways, your new speed is 40 mph (half of 20, plus 30). Round up to the nearest multiple of 2.5 mph. If acceleration *equals* current speed, simply take half of one and add the other.

To determine your new direction of travel (i.e., in which direction your Vector Arrow is now pointing), find the ratio of acceleration to current speed and refer to the following table. Swing the Vector Arrow toward the direction of the hover's acceleration by the angle listed in the table (but never swing it *past* a flush facing). See Figure 22d.

Acceleration / Current Speed	Change in Vector Arrow
Less than 1/5	0°
At least 1/5, but less than 1/3	15°
At least 1/3, but less than 2/3	30°
At least 2/3, but less than 3/2	45°
At least 3/2, but less than 3	60°
At least 3, but less than 5	75°
At least 5	Place the arrow flush with the direction of the hover's acceleration.

If current speed is 5 times greater than acceleration, don't change the direction of the arrow at all unless continued acceleration over several turns exceeds 1/5 current speed.

Side Backward

If your acceleration is Side Backward, again compare your acceleration to your current speed. Your new speed becomes the *difference* of the faster minus *half* of the slower. *Examples:* You are traveling 30 mph, and accelerate 10 mph sideways. Your new speed is 25 mph (30 minus half of 10). If you are traveling 20 mph, and accelerate 30 mph sideways, your new speed is 20 mph (30 minus half of 20). Round up to the nearest multiple of 2.5 mph. If current speed and acceleration are equal to each other, halve either one and subtract it from the other (or, more simply, your new speed is half the previous speed).

To determine your new direction of travel (i.e., in which direction your Vector Arrow is now pointing), find the ratio of acceleration to current speed and refer to the following table. Swing the Vector Arrow towards the direction of the hover's acceleration by the angle listed in the table (but never swing it *past* a flush facing). See Figure 22e.

Acceleration / Current Speed	Change in Vector Arrow
Less than 1/5	0°
At least 1/5, but less than 1/3	30°
At least 1/3, but less than 2/3	60°
At least 2/3, but less than 3/2	90°
At least 3/2, but less than 3	120°
At least 3, but less than 5	150°
At least 5	Place the arrow flush with the direction of the hover's acceleration.

If current speed is 5 times greater than acceleration, don't change the direction of the arrow at all unless continued acceleration over several turns exceeds 1/5 current speed.

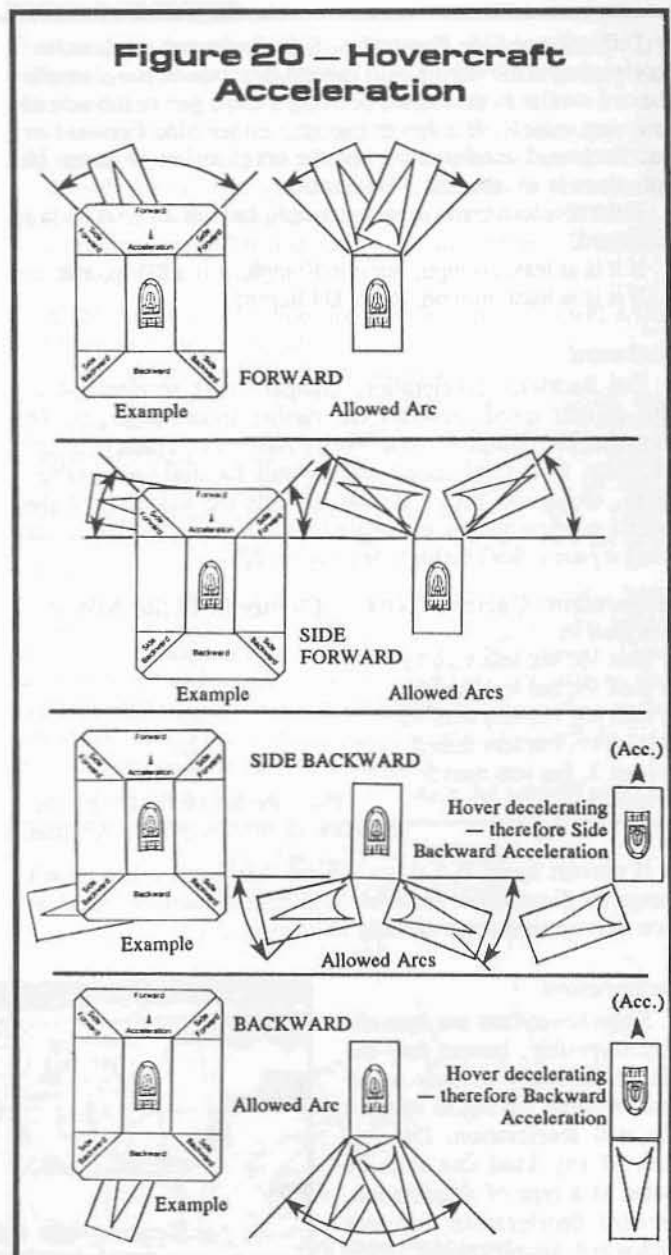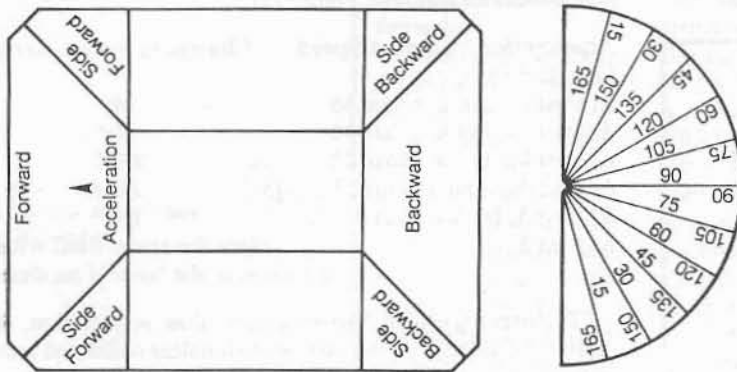**Figure 20 — Hovercraft Acceleration**

FORWARD

Example   Allowed Arc

SIDE FORWARD

Example   Allowed Arcs

SIDE BACKWARD   (Acc.)

Hover decelerating — therefore Side Backward Acceleration

Example   Allowed Arcs

BACKWARD   (Acc.)

Allowed Arc   Hover decelerating — therefore Backward Acceleration

Example

Movement

Figure 21 — Acceleration Template and Protractor

You may make copies of these tools to use with the game.

Difficulty of Side Forward or Side Backward acceleration: Accelerating to the side of your current direction of travel entails a hazard similar to the hazard of firing a large gun to the side of a moving vehicle. If a hover executes either Side Forward or Side Backward acceleration, but the acceleration is under 10 mph, there is an immediate D1 hazard.

If the acceleration is at least 10 mph, but not 20 mph, it is a D2 hazard.

If it is at least 20 mph, but not 30 mph, it is a D3 hazard.

If it is at least 30 mph, it is a D4 hazard.

Backward

For Backward acceleration, compare your acceleration to your current speed. Subtract the smaller from the larger. To determine the change in your Vector Arrow, compare your acceleration to current speed and consult the following table. Again, swing the Vector Arrow towards the direction of the hover's acceleration by the angle listed in the table (but never swing it *past* a flush facing). See Figure 22f.
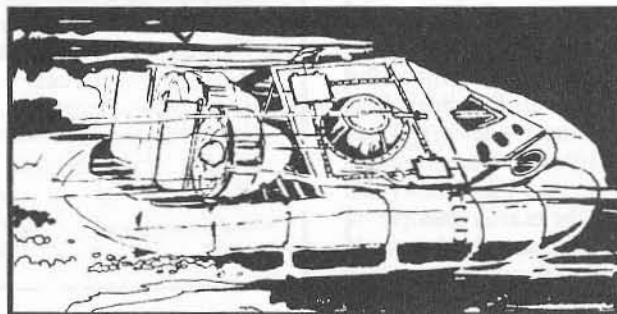
Acceleration / Current Speed	Change in Vector Arrow
Less than 1/5	0°
At least 1/5, but less than 1/3	30°
At least 1/3, but less than 2/3	60°
At least 2/3, but less than 1/2	90°
At least 1/2, but less than 3	120°
At least 3, but less than 5	150°
At least 5	Place the arrow flush with the direction of the hover's acceleration.

If current speed is 5 times greater than acceleration, don't change the direction of the arrow at all unless continued acceleration over several turns exceeds 1/5 current speed.

Deceleration

Since hover fans are immediately reversible, hovers may decelerate as easily as they accelerate, without having to spend a turn at 0 acceleration. Deceleration of any kind can thus be treated as a type of acceleration. Forward deceleration becomes Backward acceleration, Side Backward deceleration becomes

Side Forward acceleration, etc. If no thrust is put into acceleration, deceleration or simply maintaining speed, a hover will decelerate by 5 mph/turn.

Hovers may, in desperate situations, decelerate by dropping their skirt(s) to the ground and dragging. This is hazardous and damages the skirts. For an extra 5 mph/turn deceleration, a hover drops only the trailing edge of the craft. This inflicts 1d damage to the trailing skirt(s) and is a D3 hazard. To obtain an extra 10 mph of deceleration (*instead* of 5 mph), take 1d damage to the trailing skirt(s) and each of the two adjacent skirts. This is a D4 hazard. If the situation is sufficiently desperate, a hover can get an extra 15 mph of deceleration by taking 1d damage to all skirts. This is a D6 hazard.

Turning off all power causes the hover to drop to the ground and take 2d damage to all skirts and 1d damage to the underbody. It decelerates by 30 mph at the beginning of each turn. This is a D5 hazard. Turning off all power during a spinout is a D7 hazard.

Angles and How to Figure Them

Hovercraft movement relies heavily on angles, especially during acceleration. There are two ways to measure a specific angle.

Turning key: For angles up to 90°, you can use the turning key. To rotate an arrow 30° toward the front of a hover (for example), follow these steps (Figure 23):

(a) Hold the turning key over the hover and its arrow so that the point marked "30°" on the key is at the point where the two corners meet. Hold the key so that the rear of the arrow is flush with the edge of the key.

(b) Move the rear of the arrow around the corner of the key, keeping it flush with the key.

(c) Maintaining the arrow's new direction, move it back into legal contact with the hover counter. (This might require that the arrow be moved to a new corner of the hover counter.)

The key can also be used for angles over 90°, but the process is more difficult (Figure 24):

(a) First, find the turning key angle which corresponds to the angle you want to figure — 60° corresponds to 120°, and 30° corresponds to 150°.

(b) To rotate an arrow 120° toward the direction of the hover's acceleration, hold the turning key over the hover and its arrow so that the point marked "60°" on the key is at the point where the two corners meet. Hold the key so that the side of the arrow is flush with the edge of the key.
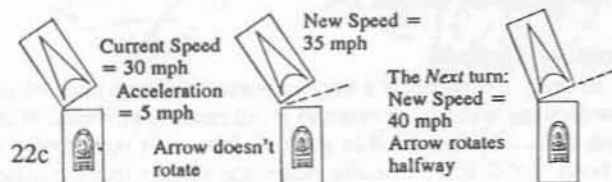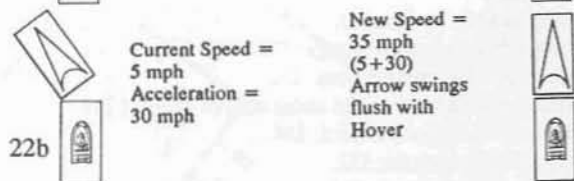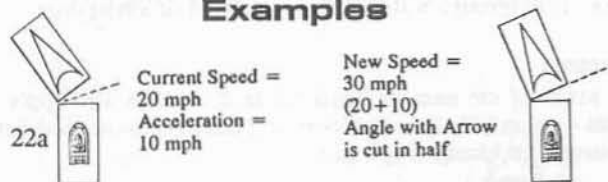
(c) Swing the arrow around the corner of the key, keeping it flush with the key. This requires that the arrow completely overlap the key, so be sure to keep the arrow in its proper new position while removing the key when you have finished.

(d) Maintaining the arrow's new direction, move it so that it is once more in legal contact with the hover counter. (This *will* require that the arrow be moved to a new corner of the counter.)
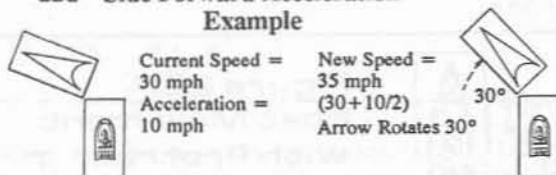
Protractor: The protractor (see Figure 21) can be used to measure any angle. It is marked in 15° intervals.

(a) To swing an arrow 45° (for example, see Figure 25), hold the protractor over the hover
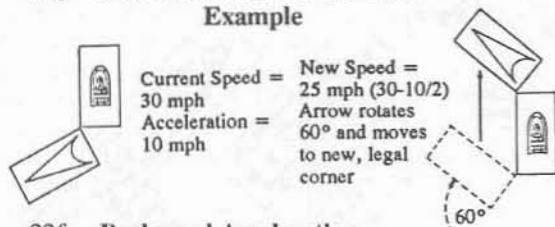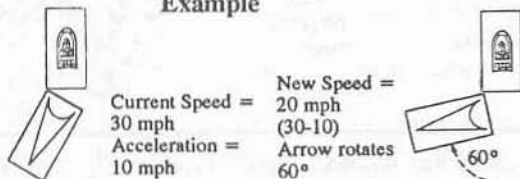
Figure 22 – Acceleration Examples

22a
Current Speed = 20 mph
Acceleration = 10 mph

New Speed = 30 mph (20+10)
Angle with Arrow is cut in half

22b
Current Speed = 5 mph
Acceleration = 30 mph

New Speed = 35 mph (5+30)
Arrow swings flush with Hover

22c
Current Speed = 30 mph
Acceleration = 5 mph
Arrow doesn't rotate

New Speed = 35 mph

The *Next* turn:
New Speed = 40 mph
Arrow rotates halfway

22d Side Forward Acceleration Example
Current Speed = 30 mph
Acceleration = 10 mph

New Speed = 35 mph (30+10/2)
Arrow Rotates 30°
30°

22e Side Backward Acceleration Example
Current Speed = 30 mph
Acceleration = 10 mph

New Speed = 25 mph (30-10/2)
Arrow rotates 60° and moves to new, legal corner
60°

22f Backward Acceleration Example
Current Speed = 30 mph
Acceleration = 10 mph

New Speed = 20 mph (30-10)
Arrow rotates 60°
60°

and its arrow so that the center point of the protractor is at the point where the two corners meet. Hold the protractor so that the side of the arrow is flush with the edge of the protractor.

(b) Swing the arrow (under the protractor) until it has rotated 45°.

(c) If necessary, move the arrow so that it is once more in legal contact with the hover counter.

This same protractor can be used to measure boat bends by following the procedure for Vector Arrows outlined in (a) and (b), above. Be sure to position the center point of the protractor over the proper point of the boat — the rear of dinghies and speedboats; the marked position on rowboats, cruisers, and yachts (Figure 26). Also note that this procedure results in slightly different movement for boats 1" long and shorter. Make sure all players agree on the system before play begins.

(4) The protractor can also be copied onto a transparent sheet and cut out, making it easier to see what you're doing.

Hazards

Hovers collect hazards just as cars do, except that hovers do not take any hazard from debris, obstacles or other low-lying objects such as curbs. Hovers also maneuver just the same (with no handling penalties) whether they are on road, off road or on water. Hovercraft may jump just as cars do; however, on landing, each skirt takes 1d damage and the hazard is at +D2. Small cargo and cargo hovers collect hazards from enemy fire as other oversized vehicles do.

Losing Control

Hovers use the same Control Table and speed modifiers that all other vehicles do. However, when a hover loses control, whether from a maneuver or a hazard, roll 2 dice and consult Crash Table 6 — Hovercraft, adding any appropriate modifier.

Boat Movement

Movement for boats is handled as for cars, with a couple of exceptions. First, the larger the boat is, the fewer difficult maneuvers it can perform.

Yachts can only perform D1 or D2 maneuvers normally; D3 maneuvers may be performed, but they are at +2 difficulty; and more difficult maneuvers cannot be performed.

Cruisers can perform D1 or D2 maneuvers normally; D3 maneuvers are at +D1; D4 and greater maneuvers are at +D2.

Speedboats can perform D1 through D5 maneuvers normally, and D6 or greater maneuvers are performed at +1 difficulty.

Dinghies, aquabikes and *rowboats* can perform all maneuvers through D6 normally.

A D6 maneuver in a Speedboat with a spoiler is still a D6 (+1 for size, -1 for the spoiler).

Boats can only perform bends, drifts and pivots.

The other difference in the way boats move is subtle but important. When changing direction with a bend, a land vehicle will move forward 1", and then pivot on a back corner to change directions. This is because the steering mechanism is in the front of the vehicle. Boats are steered from the *back* — so when a boat changes direction, the pivot must be done *first*, and then the boat is moved forward 1".

These turns can still be accomplished using a turning key, but they are a little trickier. For 1" counters, place the inside corner of the key against one front corner of the counter. Then move the counter forward, rotating it until both corners on the counter match the pair of marks on the key corresponding to the turn's difficulty. Finally, move the counter 1" forward. In Figure 27a, a Rowboat is making a D3 bend.

For boat counters longer than 1", place the marked point of
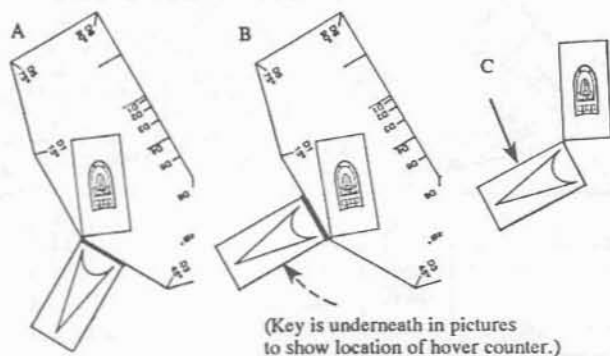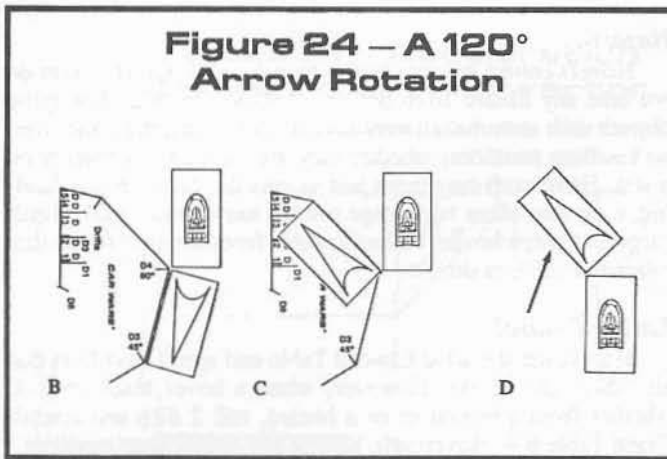
Figure 23 – A 30° Arrow Rotation

(Key is underneath in pictures to show location of hover counter.)

Movement

Figure 24 — A 120°
Arrow Rotation

B   C   D

the boat counter against the marked point on the key, making sure the counter is parallel to the first half of the turn. Then pivot the counter into the key until it touches the edge — that's the turn. Then, move the counter straight ahead one inch and the maneuver is completed. In Figure 27b, a cruiser is making a D2 bend.

Note that Rowboats (which are the same size as Cycles) have been placed on 1''-long counters, so that they can use the same turning key marks as the 1'' boats. *Do not* use this double-length counter for figuring arcs of fire, line of sight, etc. Use only the front half of the counter — the back half is simply an aid for maneuvering. For another method of measuring bends, see *Angles and How to Figure Them* (p. 22).

Boat Deceleration

Acceleration is covered in *Power Plants* (p. 65). Boats naturally decelerate at 5 mph/turn. In addition, the propellers or jets can be run in reverse to create an additional deceleration equal to half the boat's acceleration.

For example, a boat with an acceleration of 10 can decelerate up to 10 mph/turn, a boat with an acceleration of 5 can decelerate up to 7.5 mph/turn, and so on.

The exception to this is Jet Drives, which cannot reverse themselves for braking purposes.

Boats have one other option — dropping anchor. Anchors are standard equipment on all boats, included in the initial cost and weight, and permanently attached by a 10'' cable or chain. (If the anchor cannot reach the bottom because the water is too deep, then the anchor cannot help with deceleration.)

When an anchor is dropped, it descends at the rate of 1/4'' per phase; when it hits bottom there is an extra deceleration of 15 mph/turn. For every turn the boat continues to move, roll 2 dice; on a 2 or 12, the cable or chain breaks, and the anchor (and its deceleration) is lost. Replacing an anchor costs 2% of the body cost of the boat it is attached to.

Figure 25— A 45°Arrow Rotation
with Protractor

45°

B   A
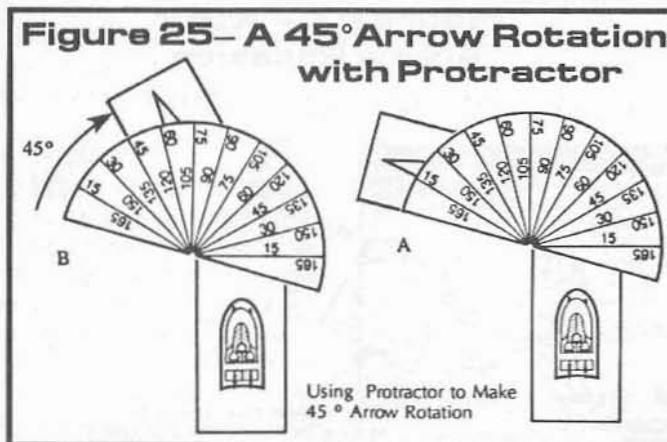
Using Protractor to Make
45° Arrow Rotation

All boats can move in reverse, at 2.5 mph/turn acceleration and a top speed of 5 mph. This is because the back of a boat doesn't cut through water the way the front of a boat does.

Hazards

Many of the hazards listed for land vehicles also apply to boats — especially the ones for taking damage. Some modifiers, however, are changed in water:

> Hitting debris: no hazard.
> Hitting obstacle or swimmer: D1.
> Colliding with smaller boat: D2.
> Colliding with boat of the same size or larger: D4.
> Colliding with fixed object: D4.
> Scraping soft bottom: D2.
> Scraping hard bottom: D4.

Running Aground

In many instances, it's very important to keep track of just how deep the water is, in order to avoid running aground. Water depth is usually measured in game inches, as is the "draft" of all boats. Draft is the distance below the surface that the underbody of the boat extends to. A boat cannot enter water shallower than its draft.

Figure 26 —
Boat Movement
with Protractor

Original position

D3 (45°) bend

Move forward 1''
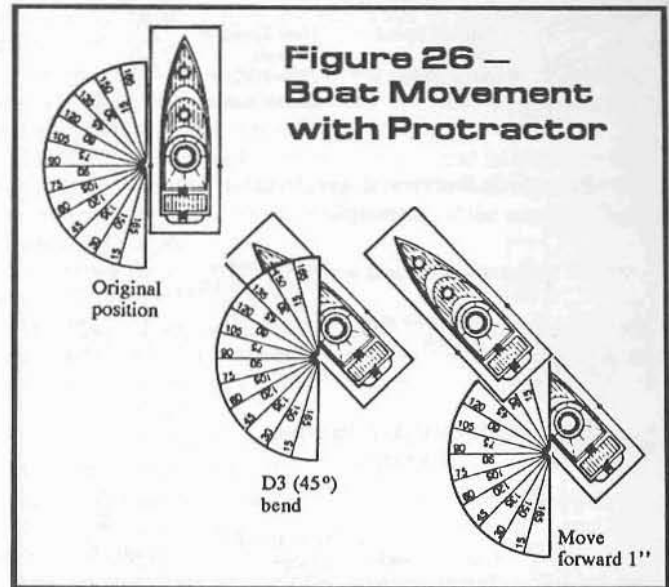
Aquabikes and *Rowboats* have no appreciable draft, and can operate in any depth of water.

Dinghies have a draft of 0'', which lets them operate in all but the shallowest waters.

Speedboats have a draft of 1/4''.

Cruisers have a draft of 1/2''.

Yachts have a draft of 3/4''.

If a boat enters water of a depth exactly equal to its draft, it scrapes bottom. This is a hazard (see above), and the hazard's D value is assessed every turn. If a hard bottom is scraped (concrete, coral, rocks, etc.), also roll 1 die. On a 1, the underbody armor takes the damage of a sideswipe collision. This damage roll is also made every turn. There is no possibility of damage when a soft bottom (mud, sand, carpeted jump ramp) is scraped.

Boats may intentionally "run aground" in order to jump. The jump angle must be between 15° and 45°. Boats jump like cars, with this addition; a grounded boat decelerates by 15 mph immediately (and its jump distance is figured on this reduced speed). Note that "running aground" against a fixed barrier angled at greater than 45° is *not* a sideswipe with the boat's

Figure 27 — Boat Bends
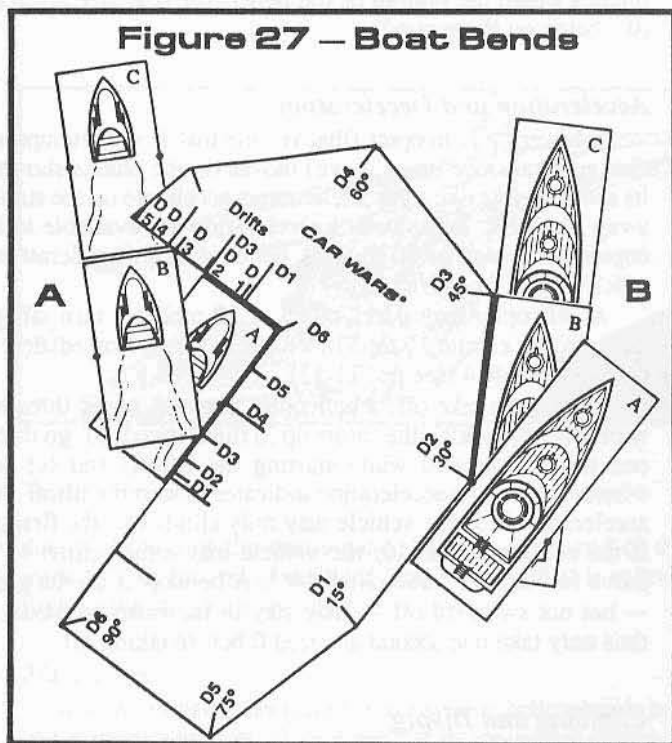
underbody — it is a collision with the leading edge of the boat. Every subsequent turn in which the boat continues moving aground, it decelerates an additional 30 mph (not 5 mph, as in water). Neither propellers nor jets affect its speed.

When a boat hits water of a depth less than its draft, it runs aground. Assess sideswipe collision damage to the underbody of the boat, based on the speed the boat was going. (Subtract 1 or more points per die of damage rolled when a boat grounds on a particularly soft bottom; add 1 or more points per die of damage when a boat grounds on a particularly hard bottom.) At the beginning of every turn in which the boat continues moving while aground, assess new damage at the boat's new speed.

If the underbody armor takes damage from either scraping or hitting bottom, roll another die: On a 1 to 3 the propeller(s) (but not a jet drive) also takes damage — assess the same number of dice of damage as the underbody armor took.

If the referee is kind enough to consider tides or other factors, getting unstuck may simply be a case of "waiting it out." If the boat's propellers or jet are still in water, you may attempt to get the boat out on its own power. This requires a roll of 10 or better on 2 dice, with the following modifiers:

Aquabike: +3
Rowboat: +2 (aground when it runs out of water)
Dinghy: +1
Yacht: -1
Two propellers: +1
Props damaged (one or both): -2

A boat may make an attempt to get unstuck on its own power once an hour. If an unmodified 2 is rolled, quit trying — the boat will never come free without outside help.

If outside help is required to unground a boat, the operation will take one hour and cost $1,000 for every 5,000 lbs. of boat weight (round up). The equipment needed to do the job is very specialized and expensive, and its operators will not enter an active battle area, no matter how much money they are offered. Fiendish referees may also want to consider the possibility that such specialized services are just not available in the vicinity of

the wreck, and that it may take a day (or two, or three . . .) for the equipment to arrive, with a commensurately higher price.

Example: Chasing a dinghy full of tobacco-smugglers, Capt. LeGrande of the Louisiana Coast Guard bears down in his high-powered cruiser at 130 mph. The smugglers know this particular bay very well, however, and dart up an inlet where the water is only 1/4'' deep. LeGrande follows, and before his sonar man can shout a warning, plows into the muddy bottom, immediately slowing down to 115 mph. The underbody armor of the cruiser takes collision damage at 35 mph — 1/4 of 130, rounded up. LeGrande rolls 2 dice, getting an 8, but because the bay bottom is soft, subtracts 1 per die, and the underbody armor takes 6 points of damage. Then LeGrande rolls 1 die to see if his propellers are damaged, and gets a 3 — bad news! The cruiser has two propellers, each of which has 8 DP, but which are protected by 10-point propeller guards. For the first propeller, LeGrande rolls 2 dice, gets 6, subtracts 2 for the soft bottom, then rolls a 4 on 1 die (to see if the propeller guard takes the damage) — so the remaining 4 points of damage are absorbed by the propeller guard. For the second propeller, LeGrande rolls a 9, subtracts 2, then rolls a 2 — so the remaining 7 points of damage are absorbed by the other propeller guard.

The cruiser continues, making additional damage rolls at the beginning of each turn, at 85 mph, 55 mph, and 25 mph. Unfortunately, the cruiser was unable to find a deeper channel during these three seconds, so it is finally stuck.

LeGrande now tries to get his cruiser unstuck. It takes a roll of 10 or better on 2 dice, adding 1 for having two propellers. LeGrande takes dice in hand, and rolls a 7, which is modified to an 8 — not good enough. An hour later, he can try again . . .

Optional Wake Rule

Boats leave a wake in the water which can be hazardous, especially to lighter boats. The edges of a wake (the dangerous lines where a hazard can occur) follow the two lines dividing the rear arc of fire from the side arcs of fire. To calculate their length, divide the boat's speed by 10 (rounding up). The two lines of the wake extend that many inches away from the boat. For Rowboats, the wake begins in the middle of the counter, not at the end, and follows the same lines a Dinghy or Speedboat wake follows. See Figure 28 for examples of boat wakes. It is

Figure 28 — Boat Wakes
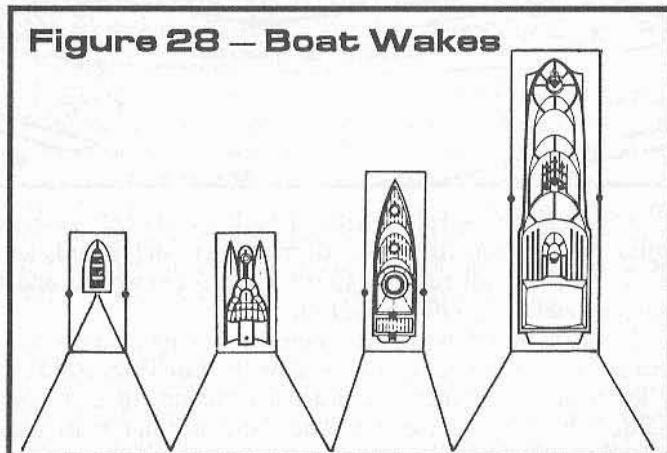
recommended that this rule only be used with a referee, because it is difficult to define the expanding location of the wake behind a turning boat.

To determine the hazard (if any) of crossing a wake in your boat, compare the weight of your boat to the weight of the boat causing the wake:

Your wt./wt. of boat creating wake	Hazard
Less than 1/4	D6
At least 1/4, but less than 1/2	D4
At least 1/2, but less than 2	D3
At least 2, but less than 4	D2
At least 4	No hazard
Crossing last half of wake	-D1

Losing Control

Boats use the same Control Table as land vehicles do, with the same modifiers for speed. When a boat loses control, whether from a maneuver or a hazard, roll 2 dice, add the appropriate speed modifier *and* the appropriate weather modifier (below), and consult Crash Table 5 — Boats, p. 12.

Weather

Rough seas can make water travel very difficult. Bad enough weather can even endanger the boat itself. The roughness of the environment is rated as follows:

Calm seas: Either no waves, or gentle, rhythmic ones. No modifiers.

Choppy seas: All weapons fire — hand and vehicular — is at -1. No other modifiers.

Rough seas: All weapons fire at -1. All maneuvers and hazards are at +D1.

Stormy seas: All weapons fire at -2. All maneuvers and hazards are a +D1. Also, add 1 to all rolls on Crash Table 5 — Boats (Rowboats add 2).

Major Storm: A lake squall, or perhaps an ocean thunderstorm. All weapons fire at -4. All maneuvers and hazards are a +D2. Add 2 to all rolls on Crash Table 5 (Rowboats add 6, Dinghies add 5, Speedboats add 4).

It is up to the referee to determine the weather for a particular area and time. Changes should be slow (by *Car Wars* standards, at least) in developing — at least ten minutes in each phase before advancing to the next one. And weather must move through the phases in the order listed; conditions cannot go from choppy seas (for example) to major storm in one instant.

Helicopter Movement

Helicopter movement is more varied than ground movement — there are three dimensions to keep track of instead of two. For each helicopter, you must keep a scratch-pad record of the chopper's altitude, measured in 1/4" in game scale. This height designates where the bottom of the helicopter is at any given time (0" being on the ground).

Acceleration and Deceleration

A hovering helicopter (that is, one that is not attempting to change its altitude up *or* down) moves on the phases shown for its speed — just like a car. Helicopters accelerate on the straightaway like cars. Two rates of acceleration are available to helicopters — 5 mph or 10 mph. A helicopter can accelerate more quickly by diving (see below).

A helicopter may decelerate 5 or 10 mph per turn safely. It may also decelerate 15 mph in a turn, but must immediately roll on Crash Table 4 (see pp. 11-12).

In order to take off, a helicopter must (a) spend three turns warming up, kicking the rotors up to flight speed; (b) go through one turn at speed 0 while starting the liftoff; and (c) go to whatever speed its acceleration indicates to start the liftoff. If the acceleration is 5, the vehicle may only climb 1/4" the first turn. If the acceleration is 10, the vehicle may either climb 1/2" or move forward 1/2" and climb 1/4". A helicopter on the ground — but not switched off — may stay in its warm-up mode, and thus only take one second at speed 0 before taking off.

Climbing and Diving

In order to climb, a helicopter sacrifices 1/2" of forward movement to climb 1/4". That is, a helicopter which has the option of moving 2" forward could instead move 1 1/2" forward and climb 1/4", or move 1" forward and climb 1/2". A helicopter may not climb at more than 1/2" per turn. To climb straight up, a helicopter should set its speed at 10 mph, and then convert that 1" of forward movement into 1/2" of climbing each turn.

A helicopter can lose altitude by a regular descent (not a dive) at the rate of 1/2" per turn. Such a descent does not affect the chopper's speed at all, and is not a hazard.

A helicopter descend more quickly, and accelerate at the same time, by diving. A too-steep dive can have disastrous effects, but a shallow dive can safely increase a vehicle's speed. A helicopter must spend a full second diving, moving as many inches as its current speed indicates. The player specifies how much altitude will be lost during a turn, within certain limitations (described below). For every 1/2" of altitude lost, the helicopter picks up 5 mph of forward speed immediately.

A helicopter must accelerate into a dive — the pilot can't simply go from level flight to a 60-foot dive and pick up 40 mph of speed, all in one second. A helicopter can pick up 10 mph/turn of acceleration while diving, above and beyond the helicopter's normal acceleration. Keep track of how much speed is picked up through diving, as this will have to be offset when the chopper pulls out of the dive.

A helicopter pulls out of a dive by applying some of its forward movement speed toward increasing altitude — with 1/2" movement lifting the vehicle 1/4". However, a helicopter which has been diving for speed must offset the dive rate before beginning to climb. The dive rate is reduced by 5 mph for every 1/2" of "climb." *Note:* Forward speed slows when the chopper pulls out of a dive.

Example: A diving chopper has gained 35 mph of speed because of the dive, losing 3 1/2" of altitude per second. Now its pilot wants to pull out of the dive. But he can't just "stop diving" — he has to "gain altitude" to offset the dive. Pulling out of the dive all in one turn would put too much stress on the copter and tear it apart. A diving helicopter can only put 1" of movement per turn toward climbing — thus, it goes to a 30-mph
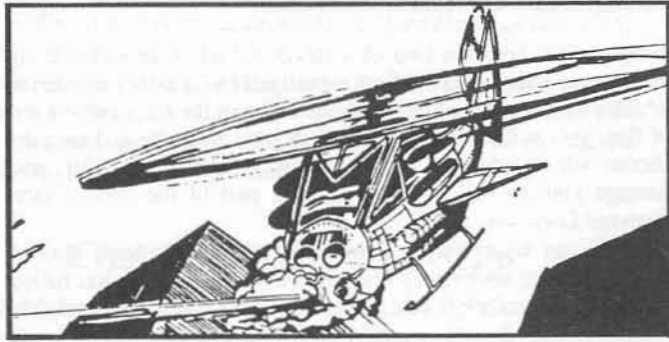
dive at the end of the first second, 25 mph at the end of the second, 20 at the end of the third, and so on until it is at level flight at the end of the seventh turn.

Maneuvers

In terms of game mechanics, maneuvering helicopters is just like maneuvering cars. During each of its movement phases, a helicopter player may specify a maneuver for the craft. Each maneuver has its own difficulty class, which reduces the helicopter's handling status for the turn.

A helicopter's initial handling class is determined by the size of the helicopter, and is modified by the pilot's reflex roll, which is in turn modified by the Helicopter Pilot skill. Pilot +1 adds 1 to the reflex roll, +2 adds 2, etc. Without this skill, a character cannot even start a helicopter, much less fly one. The base HC of a helicopter, plus any bonuses the pilot has in the Pilot skill, determines the amount the chopper's handling status is advanced at the end of each turn, just as for other vehicles.

A helicopter can make the following maneuvers:

Move straight ahead. This can be done while climbing or dropping; HC is not adjusted.

Dive. This is a D1 maneuver in any phase during which the chopper moves forward 2" or more.

Coordinated Turn. This is exactly like a "swerve" for cars, and is a treated just like that maneuver.

Veer. This is exactly like a "bend" for cars (see Figure 29; see also Figure 1, p. 7), and can be up to a D3 maneuver.

Shift. This is like a "drift" for cars, and is a D1 maneuver.

Drift. This is also a D3 maneuver, and is similar to the car's "steep drift" (Figure 29; see also Figure 3, p. 8).

Rotate. This is a D2 maneuver (see Figure 29), and is a fast means of turning around. It can only be done if the chopper is moving 20 mph or less. On each movement phase, move the helicopter in the direction it had previously been heading, but rotate it up to 90°. At the end of two phases, it is facing in the opposite direction to its original movement (see *Fly Backward*, below). Helicopters moving 0 and 5 mph may rotate as well, turning 90° each phase.

Fly Backward. This has few tactical advantages except for aerial maneuvering and takeoffs in uncomfortable situations. A helicopter may fly backward up to 20 mph; a helicopter flying backward may perform the same maneuvers described above, at +D1 at 5 or 10 mph, and +D2 at 15 or 20 mph.

These are the only maneuvers helicopters are allowed to attempt. A helicopter cannot do any maneuver greater than a D3.

Tighter maneuvers would subject a helicopter to too much stress and tear it apart.

Helicopters check for control in the same way as other vehicles. Cross-index the handling status of the chopper with its speed on the Control Table. If a control roll is called for, roll the die. If you lose control, add the appropriate modifier from the Control Table and roll on Crash Table 4 (see pp. 11-12).

Hazards

Hazards affect helicopters immediately, as they occur, decreasing the chopper's handling status. Some sample hazards:

Colliding with another aircraft or vehicle: D4.
Enemy fire, doing 1 to 5 points of damage: D1.
Enemy fire, doing 6 to 9 points of damage: D2.
Enemy fire, doing 10 or more points of damage: D3.
Stabilizing rotor destroyed or failed: D4.
Pilot injured or killed: D2.

Crashing

Helicopters crash in two ways. One is simply to lose control; the other is to run into something (whether flying horizontally or falling vertically). Crash Table 4 — Helicopters refers to the first. (Of course, you will eventually hit *something*!)

Free-Fall Damage Table

Time Elapsed	Distance	Total Distance	Speed
1st second	2 1/4"	2 1/4"	20 mph
2nd second	4 1/4"	6 1/2"	45 mph
3rd second	6 1/2"	13"	65 mph
4th second	8 1/2"	21 1/2"	85 mph
5th second	10 3/4"	32 1/4"	110 mph
6th second	12 3/4"	45"	125 mph
7th second	15"	60"	150 mph
8th second	17"	77"	170 mph
9th second	19 1/4"	96 1/4"	190 mph
10th second	21 1/4"	117 1/2"	215 mph

It is highly unlikely that a helicopter will be higher than 117", but if it happens, extrapolate from the chart. Note that unless a helicopter is flying level or climbing when it enters free fall, there will be additional downward speed in the collision. If a chopper was already dropping 3 1/2" a turn (35 mph), when the rotors fail, add that 35 mph to the final free-fall collision speed. Always round to the lower speed if the distance fallen is between two of the "Total Distance" numbers.

Example: Trying to pull out of a too-steep dive, a helicopter fails its control roll badly and loses its rotors. At the moment the rotors were lost, it was traveling downward at a speed of 30 mph and was 14" off the ground. On the table above, 14" is between 21 1/2" and 13", so we use the 13" line — when the chopper hits the ground, it will have a free-fall speed of 65 mph. Then add in the chopper's downward speed of 30 mph, and we get a collision with the ground at 95 mph. This is likely to hurt!

Rotor Failure

Any time a helicopter crashes or performs a stressful maneuver as indicated on Crash Table 4 (pp. 11-12), a Rotor Check must be made. There is the possibility that the rotors will fail — breaking, in the case of a maneuver, or snapping off, in the case of a collision. A spinning rotor blade will do 4d damage to whatever it hits.

If a helicopter's engine fails but its rotors are still intact, it has a chance of descending safely. Forward momentum slows by 5 mph/turn, and the copter drops 1/2"/turn. The helicopter player must roll on Crash Table 4 at the beginning of every turn.

3. Combat

Combat may occur during any phase, after movement. To attack, a player simply announces that he is firing, and names the weapon being fired and its target.

Results of all attacks during a phase are applied simultaneously. The referee may wish to have players declare fire secretly, by writing their fire/no fire order down on a slip of paper and handing it to him, or by some other method.

A given weapon may never fire more than once per turn. A given character may never fire more than once per turn, unless he does so by triggering linked weapons.

Rate of Fire

Usually, the above restrictions mean that each vehicle will only fire once per turn. Exceptions occur when (a) a weapon is on "automatic," (b) a vehicle has additional occupants, such as gunners, who may also fire, or (c) linked weapons are used.

General Combat Procedure

Briefly, the procedure for resolving a normal weapon attack is (a) make sure that there is a line-of-fire from the weapon to the target; (b) roll 2 dice to see if the weapon hits (see *Determining Hits*, below); (c) if the weapon hits, determine damage location and amount (see *Damage*, p. 30); (d) alter the vehicle's handling status and/or place debris or obstacle counters if required. Dropped weapons are an exception to the above and are discussed on pp. 32-33. All damage for the phase is resolved simultaneously at the end of the phase.

Line of Fire

To fire at a given target, there must be a line of fire (LOF) from the firing counter's center (for a turret weapon) or middle of the side where the weapon is located (for other weapons) to some part of the counter representing the target. Buildings, vehicles, pedestrians, etc., block LOF; debris and obstacles do not. Smoke and paint reduce chances of hitting but do not block LOF except for lasers.

Furthermore, the LOF must be traced within the arc of fire for that weapon position. Arcs of fire for vehicle weapons are shown in the diagram below. Pedestrians and turret weapons have a 360-degree arc of fire. Hand weapons fired from a car, truck or sidecar have a right or left arc of fire, depending on which side they're fired from; hand weapons fired by a cycle driver have a 360-degree arc of fire.

Front Weapons Only
Right Weapons Only
Rear Weapons Only
Left Weapons Only
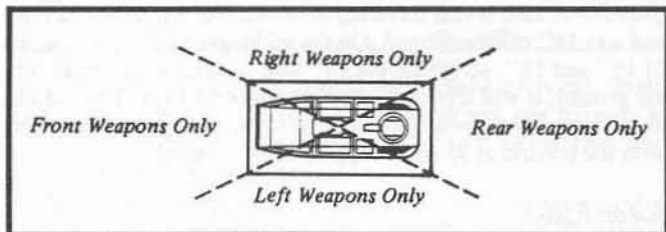
Car Targeting

Targeting is choosing what you're going to shoot at — whether it's the side of a vehicle or a specific part, like a tire.

A car has front, back, right, left, top and underbody "sides." When you fire at a vehicle, you can only hit a side that is facing you. Unless the target car is lined up exactly perpendicular to you, you will be able to choose between two sides. However, only if you are in a particular side's arc of fire may you attack that side with no penalty. If the firing vehicle is on the dividing line between two of a target vehicle's arcs of fire, it may target either side without penalty. If you target a side on which you have line of fire without being in the target side's arc of fire, you suffer a penalty of -2 to your to-hit roll. You may choose which side you wish to target. If you score a hit, any damage you do will be taken by that part of the vehicle (see *Damage Location*, p. 30).

You can never target a vehicle's underbody with normal weapons (note: underbody is a relative term — if a car has rolled and is sitting on its left side, that side is now the "underbody"). The underbody is automatically the target of a mine.

A vehicle's tires may be targeted. Each tire is a separate target; subtract 3 from the to-hit roll when shooting at tires.

A vehicle's turret may be targeted. All top armor protects weapons in the turret. If a vehicle has no turret, the top can only be hit if something is dropped (or fired) from above or if the vehicle rolls. Targeting a turret is at a -2.

Cycle Targeting

Compared to a car, a cycle is a small target, but every part is exposed. Therefore, after firing on and hitting a cycle, roll on the table below. Only one component of a cycle can be hit in each attack — the rest of the damage passes through the cycle and has no effect, unless it has a sidecar on the opposite side. In this case, roll 1 die. If the number rolled is equal to, or less than the number of spaces the sidecar has, it is hit. Otherwise the damage passes out harmlessly.

Attacking from front or rear — Roll 2 dice. On 2 to 10, you hit armor (if the armor is gone, roll again on the "side" table below for remaining damage). On an 11 or 12, you hit the exposed wheel.

Attacking from the side — Roll 2 dice. On 2 to 5, you hit the driver; 6 or 7, the power plant; 8 to 10, a weapon. Roll randomly if the cycle has more than one weapon; roll again if there are none. On 11 or 12, you hit a tire — roll randomly to see which one.

Sidecar targeting — A sidecar can only be hit from the side on which it is mounted. Imagine a line running lengthwise down the center of the cycle counter — if you're on the same side of the line the sidecar is on (or on the line), you can shoot at it. If you're not, you can't. Targeting a sidecar carries a -2 penalty to your to-hit roll. If you're just shooting at the cycle as a whole and you are on the sidecar side, roll 1 die. On a 1 to 4, the cycle was hit; use the tables above. On a 5 or 6, the sidecar was hit. Treat a sidecar as a tiny automobile, with armor in front, back, underbody, and both sides. It has one wheel (plus some small coaster-type wheels for stability if it ever rolls free), maybe one or two weapons, and possibly a rider. Once armor on part of the sidecar is lost, any fire hitting the exposed area has an equal chance of hitting each of the interior components.

Trike Targeting

Because trikes are low to the ground, their tops can be fired upon. Any attacker can choose to fire at the top of a trike if he has a line of sight on the front or either side. (A trike's top cannot be hit from behind, but its turret can be targeted.) Because the top is steeply sloped, any attack at the top is at an additional -2 to hit. Thus, for example, a shot at the top of a light trike (see table, p. 29) from the front would be at a -5, plus or minus any other modifiers that may be in effect. However, if a

trike has a turret, any successful hit on the top armor strikes the turret automatically with no further penalty.

When a trike is struck in the front by weapon fire, roll 2 dice. On an 11 or 12, the front wheel is hit. Any remaining damage is lost. On a 2-10, the front armor is hit. Any remaining damage after the armor is destroyed will affect internal components in the same way as cars are affected (see *Damage Location*, pp. 30-31).

For reversed trikes, all the above holds true — just reverse "front" and "back." The only exception is that an attacker still cannot hit the top of a reversed trike from behind, as the back is still the highest part of the trike.

Determining Hits

When a normal weapon (anything but a dropped or gas weapon) is fired, the attacking player rolls 2 dice to see whether he hit his target. He must make the to-hit roll or better for that weapon (see the *Weapon List*, pp. 34-35). Thus, to hit with a machine gun, a player would need to roll a 7 or better on 2 dice.

Targeting Modifiers

Accuracy is affected by a number of factors, including the skill of the firer, range, weather, and size and speed of the target. Consult the following list, and add all the factors that apply to the to-hit roll. All modifiers are cumulative.

For example, a machine gun has a base to-hit roll of 7. If the firer was using a targeting computer (+1) at point-blank range (+4) and was trying to hit the tire (-3) of a cycle (-2) at night (-3), there would be a total modifier of -3; the firer now has to roll a 10 or higher. No matter what the roll needed, a roll of 2 on the dice is an automatic miss. A roll of 12 is not an automatic hit. If, after all modifiers, a player needs a 13 or higher to hit, he cannot hit the target, but may still fire for sustained fire bonuses.

If a driver has made a maneuver or suffered a hazard in the phase he fires a weapon, the difficulty rating of the maneuver or hazard is subtracted from his to-hit roll.

When trying to hit a vehicle with a weapon's burst effect, or trying to place a burst of fire in front of a vehicle, the attacker suffers the speed modifier penalty as if the attacker were shooting at the vehicle itself. Use common sense; the referee has the final say. If the to-hit roll is missed while attempting a shot at the ground or wall near an enemy, use the grenade scatter rules to determine where the shot actually hit.

Targeting Modifiers Table

Range
Point Blank (less than 1" away): +4
Long Range: -1 for every full 4"; that is, 4" to 7.99" is -1, 8" to 11.99" is -2, 12" to 15.99" is -3, etc.

Movement
Target is not moving: +1
Firer is not moving: +1
Firing pedestrian is braced against solid object: +1
Target is moving between 30 and 37.5 mph: -1
Target is moving between 40 and 47.5 mph: -2
Target is moving between 50 and 57.5 mph: -3
Target is moving between 60 and 67.5 mph: -4
Target is moving between 70 and 77.5 mph: -5
Target is moving 80 mph or faster: -6

Firer is in Target's	Target is in Firer's		
	Front arc	Back arc	Side arc
Front arc	½ Target Speed	½ (T Speed - F Speed)	½ Target Speed
Back arc	½ (T Speed - F Speed)	½ Target Speed	½ Target Speed
Side arc	Target Speed	Target Speed	T Speed - F Speed*

* If cars are moving towards each other, the modifier is the target speed. If a vehicle is in more than one arc, rule in the defenders' favor.

Vehicle Targets
Compact or Subcompact: -1
Car: -1 from front or rear
Motorcycle or Sidecar: -2 from side, -3 from front or rear
Trike (any size): -2 from top
Light Trike: -3 from front/back, -2 from side
Medium Trike: -2 from front/back, -1 from side
Heavy Trike: -1 from front/back, -1 from side
X-Heavy Trike: -1 from front/back, no penalty from side
Ten-Wheeler Carrier: -2 from front
Ten-Wheeler Cab or Carrier: +1 from side
Mini-Bus or Tractor: +1 from side
Trailer or Bus: +2 from side
One-Man Helicopter: -1 from front/back, +1 everywhere else
Small Helicopter: -1 from front/back, +1 everywhere else
Standard Helicopter: +2 from top, bottom or side
Transport Helicopter: +2 from top, bottom or side
Rowboat: -2 from side, -3 from back, -4 from front
Dinghy: -1 from back, -2 from front
Speedboat: -1 from front
Cruiser: +1 from side
Yacht: +3 from side, +1 from back
One-Man Hover: -1 from side, -2 from front/back
Small or Standard Hover: -1 from front/back
Large Hover: +1 from side
Small Cargo Hover: +2 from side, +1 from front/back
Cargo Hover: +3 from side, +2 from front/back

Specific Target
Pedestrian: -3
Pedestrian in water (head and shoulders above surface): -5
Pedestrian swimming: -4
Vehicle Tire: -3
Hover Fan or Skirt: -2
Turret: -2
Motorcycle Rider (from side only): -3
Tractor's Fifth Wheel: -6
Legs of a Semi-Trailer: -5
Lamppost: -6
Building: +10
Helicopter Skid or Winch Cable: -8
Helicopter Pontoon: -3
Helicopter Rotor: -6
Searchlight: -3
Tongue on Unattached Car Trailer: -5
Tongue on Attached Car Trailer: -7
Unattached Hitch to Pull Car Trailer: -5
Attached Hitch to Pull Car Trailer: -7
Radar- or Wire-Guided Missile in flight: -6 for target vehicle, -10 for everyone else
Ejection Seat during launch: -6
Ejection Seat landing via parachute: -2

Visibility

Firing through smoke or paint: -1 per ½"
Rain: -2
Heavy rain, fog or night: -3
Target under cover of rubble: -4
Firer blinded by searchlight: -10

Miscellaneous

Targeting Computer used: +1
Hi-Res Computer used: +2
Cyberlink used: +3
Gunner Skill: equal to skill level bonus
Handgunner Skill: equal to skill level bonus
Laser Scope: +1 when mounted on a hand weapon
Firing while on Oil, Gravel or Bad Road: -1
Sustained Fire: second consecutive shot in as many turns at
    same target with same weapon: +1; third and subsequent
    shots: +2
Attacking vehicle is Remote-Controlled: -3
Attacking vehicle does a Trivial Skid or Minor Fishtail: -3 for
    the remainder of the turn
Attacking vehicle does a Minor or Moderate Skid or Major
    Fishtail: -6 for the remainder of the turn
Attacker not in arc of fire of target side: -2
Hazard or maneuver in same phase: penalty equal to D rating

Damage

When a weapon hits, calculate the amount of damage by
rolling the number of dice shown on the *Weapon List* (pp. 34-
35). The result is the number of hits taken by the target.

Burst Effect

Weapons that do additional burst-effect damage are identi-
fied on the Weapon List. In addition to the listed damage to
whatever was hit, burst-effect weapons do 1d damage to any
pedestrian in the weapon's burst radius. Pedestrians under cover
(behind an intact wall or vehicle) are not affected.

A grenade does full damage to any pedestrian within its 2"
burst radius, and half damage to vehicle components (armor, tires,
etc.) in a ½" radius. No other burst-effect weapon will affect
walls or vehicles (including tires) with its burst effect. Reason:
The other burst-effect weapons are shaped charges, exploding up-
wards (in the case of a mine) or into the target (in the case of other
weapons), and the burst effect is merely a bonus, not strong
enough to harm armored vehicles or vehicular components.

Area Effect

Weapons which may be used against pedestrians in an area
effect are identified on the Weapon List. These are weapons that
can sweep an area. When using such a weapon against several
pedestrians within 1" of one another, the firer may attempt to hit
several at once. He must make as many to-hit rolls as there are
intended victims. This determines *how many* he hits, but not
who — that is determined by the defender, who must pick pedes-
trians who are standing next to each other. If the potential vic-
tims belong to more than one player, they must agree which ones
are hit. If they cannot agree, the attacker chooses the victims!

Those who are hit take half the damage rolled for the weapon
(round up). *Exception:* The flamethrower and heavy-duty FT do
full damage against all targets!

Example: Four pedestrians are standing in a line 1" long; as
people this dim should be removed from the gene pool, an in-
trepid duellist decides to deep-fry them with his laser. He fires,
and rolls two hits and two misses. The player controlling the
pedestrians designates the two on the right. The duellist rolls a

13 on 3 dice, so each victim receives 7 points of damage (half of
13, rounded up) and is torched.

Recording Damage

Each vehicle component can take a certain amount of dam-
age, shown as "DP" (damage points) on the Weapon List,
Accessories List, and Vehicle Design List. Armor is lost a point
at a time; if you start with 12 points of armor on the front of your
car, and it takes 7 hits, you have 5 points left. Other components
work at full efficiency until they take their full amount of DP —
then they're gone. A machine gun (3DP) can take 2 hits and still
work, but the hits are recorded in the boxes on the Vehicle
Record. When that gun takes a third hit, it is destroyed. You can
repair damage yourself, using the Mechanic skill (see pp. 41-
42), or you can pay for repairs (see p. 55).

Damage Location

The location of weapon damage is controlled by the part of
the vehicle that was hit. Damage is taken by the components in
that part of the target, outermost first. Armor is destroyed first.
When all armor is gone, the next component inward is hit, and
so on. Components in each area of a car or truck, in the order
they are hit by an attack from that side, are:

Front: Front armor; (front-firing weapons); front motor;
(driver or gunner); cargo; back motor; (back-firing weapons);
back armor.

Back: As above, but in reverse order: Back armor first, etc.

Right: Right armor; (right-firing weapons); (gunner, driver,
cargo or motor); (left-firing weapons); left armor.

Left: As above, but in reverse order: Left armor, etc.

Underbody: Underbody armor; (motor, driver, gunner or
cargo); turret weapons; top armor. Tires may also take damage.

Top: As above, but in reverse order.

Turret: Top armor, then turret weapons. If the turret was
targeted from the side, "leftover" damage will pass above the
car, hitting nothing else.

Tires: Targeted tire/wheel only. "Leftover" hits have no
effect.

Many vehicles will not have every component listed. If a
component is not present, just skip it! Few cars will have both
front and rear power plants (motor); many will have no gunner,
turret or cargo. Passengers count as cargo. For a more complete
guide, refer to the Vehicle Record Sheet example on p. 3, which
has components in most of the possible locations. In case of a
dispute, the referee's decision is final.

After going through armor and weapons mounted to the ap-
propriate side, there are three (and only three) possible internal
locations. These are crew compartment, power plant, and cargo.
Power plant is your primary power plant or gas engine. Crew
compartment is any driver, gunner or passenger — any human
being in the car. Cargo is everything else. These three locations
may be placed in any order from front to back (not side by side).
The locations of drivers, gunners and passengers must still be
stated for determining their firing arcs.

When a weapon penetrates from the front or back, the dam-
age goes to each internal location in order. Only one actual item
in each location can be damaged by a single shot. When a weap-
on penetrates from the side, roll randomly to see which of the
three locations is hit. Re-roll for any nonexistent location. A
location that is destroyed (such as a destroyed PP) is still a
location which damage can hit and pass through. A car with
unused space *does* have a cargo location, even if it doesn't have
any actual cargo. A cupola gunner is *not* in the crew compart-
ment, and is hit as part of the turret.

For vehicles with ten armor locations, each section (front and
back) may have a separate cargo and crew compartment area.

Note that some weapons cannot be hit by certain attacks. There is no way, for example, to damage a front-firing weapon by an attack from the right — though you can hit it from behind by shooting through the car. Corner-mounted dropped weapons are considered to be on *both* applicable sides.

Where two or three components are listed in parentheses, only one will be hit by each attack. Roll randomly for each separate attack to see which one is hit.

Example: A mine explosion that penetrated the underbody armor would affect either the motor, driver, gunner or cargo — but only one. If that component took enough hits to destroy it completely, further damage from that explosion would go directly to the turret weapon or, if there was no turret, the top armor. A subsequent mine explosion might get a previously-unhit target, or hit in the same place, bypassing the other internal targets, and hit the turret or top again.

Similarly, if a vehicle takes "front-weapon" damage and has two or more front weapons, roll randomly for each attack to see which of the weapons is hit. If there are two or more front weapons, each attack will hit only one. Leftover damage from that attack goes "inward," not "sideways" to other front weapons.

Collision Damage

Damage from a collision is handled differently. It is divided evenly among all exposed (i.e., "outside") components on the affected side. For instance, if a car with two front MGs had no front armor left, and took 3 points of damage from enemy fire, you would roll randomly to see which MG took the 3 hits. However, if that same car took 3 points of collision damage to the front, it would be divided evenly between the exposed systems (the weapons) — 2 hits on one and 1 on the other. Thus, collision damage cannot penetrate to the interior of a vehicle until all armor on that side, and all components "outside" the one to be affected, have been completely destroyed. Corner-mounted dropped weapons are considered to be on *both* applicable sides. A rear-right-corner smokescreen would count toward right-side *and* rear-end collisions when determining damage.

Metal armor is 3 times more effective than its listed value against collision damage; 1 point of armor is lost for every 3 points of damage absorbed (rounded up), and the most points the armor can lose on that side is half the total on the side involved in the wreck (rounded up).

Example: A vehicle with 8 points of front metal armor hits a brick wall at a pretty good clip, and 7d of damage are rolled, yielding 29. The front armor will stop up to 3 times its value, which is 24 (3 × 8). The remaining 5 points of damage go to the interior of the vehicle and are distributed in the normal way for collisions. If the car survives, it will still have 4 points (half the original value) of armor on the front.

In a collision from the front or the back, all damage is divided by the number of individual items in that internal location (power plant, crew or cargo) and applied separately. Any remaining damage goes on to the next location. In a side collision, the damage is first divided by the number of internal locations and then is divided equally among the items in each location. Empty cargo space (or a previously destroyed location) still counts as a location — all of its damage just passes through to the opposite side.

Combat Results

Injury to Drivers

Most humans have 3 DP; they are wounded by the first hit, knocked unconscious by the second, and killed by the third. Standard body armor, when worn, also has 3 DP. Body armor takes damage first, effectively doubling a character's hit points.

Hits taken by a driver's body armor are no hazard, but if a vehicle's driver is wounded or killed, it is a D2 hazard. A wounded crew member's skills are at -2. When a vehicle's driver is unconscious, dead or stunned, all Driver skill and reflex bonuses are lost until the driver recovers (if possible).

Uncontrolled Vehicles

If a motorcycle's driver is killed or knocked unconscious, the cycle goes to Crash Table 1 immediately, adding 4 to its roll. Any passengers must jump or suffer the consequences of the roll. Any other ground vehicle (including a cycle with a sidecar) will continue in a straight line if the driver is incapacitated. It decelerates 5 mph each turn, moving in a straight line until it stops or hits something.

Substitute Drivers

If a cycle's driver is incapacitated, a sidecar passenger can steer the cycle, but cannot use the brakes or accelerator. He can fire any weapon, but not on any turn that he steers the cycle.

If a larger vehicle's driver is incapacitated, a front-seat gunner or passenger may attempt to take control. (Note: No vehicle may have more than two seats in front.) He may operate all vehicle controls, or the weapons, but not both in the same turn. Each maneuver he makes has an extra D2 of difficulty.

If a driverless vehicle can be stopped, it will take 5 turns (5 seconds) to push the late driver out or off and move any other occupant of the vehicle in as a new driver. On the 6th turn, the new driver may start to accelerate and/or fire.

Fire and Explosion

A vehicle which crashes may catch fire (see *Crash Tables*, Chapter 2). A vehicle hit in combat may also catch fire from certain weapons (see below), or on a 2 in 6 chance on any turn that the vehicle's power plant, flamethrowers or flaming oil jets are hit by enemy fire; a 4 in 6 chance if those items take damage from laser, flamethrower, incendiary ammo or flaming oil jet fire.

Vehicular Fire Table

Weapon	Fire Modifier	Burn Duration
Flamethrower	4	3
Heavy-Duty Flamethrower	5	3
Portable Flamethrower	3	2
Light Flamethrower	2	3
High-Temp FT Ammunition	+1	1 (only)
Flaming Oil Jet	3	2
Heavy-Duty Flaming Oil Jet	3	2
Machine Gun Incendiary Ammo	2	1
Rocket Launcher Incendiary Ammo	3	2
MML Incendiary Ammo	2	1
Incendiary Mini-Rocket	1	0
Incendiary Light Rocket	2	1
Incendiary Medium Rocket	3	2
Incendiary HR/WGM/RGM/Stinger	4	3
Incendiary MFR	½ (6)	1
Light Laser	0	0
Medium Laser	1	0
Laser	1	0
Heavy Laser	2	0
Twin Laser	1	0
Napalm Mine	4	3
Flame Cloud Ejector	3	1
Heavy-Duty Flame Cloud Ejector	3	1
Flame Cloud Gas Streamer	3	1

Gas-burning vehicles are likelier to ignite. They catch fire on a 1 in 6 if the engine takes 5+ points of damage on a single turn; 2 in 6 chance if the engine takes more than half its total DP in a single turn; 2 in 6 on a "Fuel System" result from the Engine Critical Damage Table (p. 53), 3 in 6 if an economy or heavy-duty gas tank is breached; 2 in 6 if a racing or duelling gas tank is breached. Add 1 to these if the damage was caused by lasers, flamethrowers, incendiary ammo or flaming oil.

If a vehicle has a fire extinguisher, there is a 3 in 6 chance the fire will go out at the end of each turn (4 in 6 if the vehicle has an improved fire extinguisher). If the extinguisher does not put the fire out at the end of the turn, the fire does one hit of damage to each occupant (body armor will take damage first), each vehicle component (including tires), and the armor on each part of the car. If the car has a gas engine, the chance of a fire extinguisher putting out the fire is 2 in 6 for a fire extinguisher, 3 in 6 for an IFE, or 1 in 6 for a portable fire extinguisher.

A burning vehicle may explode if it contains a gas engine, any type of flamethrower, flaming oil jet, any type of rocket or missile weapon, AT gun or tank gun. If the fire is not extinguished, roll 1 die at the end of each turn. On a roll of 1, the vehicle explodes, scattering debris. All occupants are killed immediately. Pedestrians or vehicles within 2" take 1d damage to the exposed side (if there are two exposed sides, the owner picks which side takes the damage). If the vehicle has both a gas engine *and* any of the volatile weapons mentioned above, the chance of explosion is 2 in 6.

If a vehicle's tire catches on fire, but the vehicle has FP armor, the car will *not* catch on fire. The tire will continue to burn, however, and fire extinguishers (except a PFE) have the normal chance of putting the fire out.

The sequence of rolls is as follows. If the vehicle has taken damage that could cause a fire, roll at the end of the turn to see if fire breaks out. If fire breaks out, and the vehicle has a fire extinguisher, then roll to see if the fire extinguisher puts out the fire. If the fire extinguisher succeeds at this point, no damage is taken from fire. If the fire extinguisher fails (or the target didn't have one), each vehicle component takes one hit of damage as outlined above. If the fire is still burning after the roll, then make one more roll for possible explosion as outlined above.

Starting Fires

Every weapon that has a chance to set a vehicle on fire is rated on the *Vehicular Fire Table* (p. 31) for two factors: "Fire Modifier" and "Burn Duration." Fire Modifier is the number the attacker must roll (or roll under) to set the target vehicle on fire. Burn Duration is the number of turns after the initial hit the Fire Modifier is in effect. Any hit to a gas engine adds +2 to the Fire Modifier, and any breach to a gas tank adds +3. All Fire Modifiers are cumulative.

Example: On turn one, our intrepid duellist gets hit by a single flamethrower shot. The FT has a fire modifier of 4, so the attacker must roll a 4 or less on 2 dice to set the target vehicle on fire. He rolls an 11, which isn't even close. The next turn, the flamethrower misses, but our hero gets hit by a laser. The laser has a fire modifier of 1, but this is also the first turn of the flamethrower's 3-turn burn duration — that's 4 more for a total of 5. The attacker, needing a 5 or less to start a fire, rolls a 6 — tough luck.

On the third turn, the flamethrower misses again, but the laser hits for the second time, and our hero drives through some flaming oil. The fire modifiers are 1 (for the laser) plus 3 (for the flaming oil) plus 4 (for the second turn of the FT's burn duration), for a total of 8. The attacker, needing only to roll an 8 or less, comes up with a 7. Our hero's on fire — let's hope he has a fire extinguisher.

Fireproof armor (p. 50) remains just that — fireproof — under these rules. If fireproof armor is breached and damage is taken by a power plant, flaming oil jet, or flamethrower takes damage, determine the chance of fire as above.

Odds and Ends

Automatic Fire

If a weapon is placed on "automatic," it will fire each turn until it runs out of ammo or is taken off automatic. Putting a weapon on automatic is a firing action, as is taking it off automatic. Letting it fire during the intervening turns is not a firing action. If you have a weapon on automatic, you may fire an additional weapon that turn.

This advantage, however, is offset by the inaccuracy of automatic fire. A weapon on automatic is not being aimed by the driver or anything else. It fires straight ahead (or behind, or to the side, depending on where it's mounted). A weapon in a turret cannot be put on automatic. A weapon on automatic cannot target an opposing vehicle's tire, turret or any other specific target, nor does it benefit from targeting computers. Putting a weapon on automatic breaks sustained fire, and subsequent automatic-fire shots do not get a sustained fire bonus.

When a vehicle lays down automatic fire, calculate the attack from that weapon at the end of all movement for that turn. Draw an imaginary line straight out from the middle of the side the automatic weapon is on. If a target (vehicle, pedestrian, building) crosses that line, figure all the standard modifiers and roll the dice. Putting a weapon on automatic is very effective for doing property damage and dealing with large groups of opponents; if you're duelling with just one or two other vehicles, automatic fire is probably a waste of ammo. Dropped and gas weapons are very useful as automatic fire (see below).

Dropped Weapons

Minedroppers, Spikedroppers, Oil Jets, and Flaming Oil Jets are dropped weapons. Dropped weapons do not require to-hit rolls. If a car is moving and fires a dropped weapon, the counter is aligned with the car. Where the front of the counter is placed depends on where the weapon is mounted.

Front: Centered, aligned with the front of the car.

Front-Corner: As front, but ½" off to the side.

Underbody: Centered, with the counter front in the center of the car.

Top: Same as underbody.

Side: As underbody, but ½" off to the side.

Back: Centered, aligned with the rear of car.

Back-Corner: As back, but ½" off to the side.

If the car is moving in reverse, reverse the "front" and "back" designations above.

If the car is stationary, rear-mounted weapons remain the same, side-mounted weapons are placed straight out from the side of the car, front weapons are placed straight out from the front of the car, top/underbody weapons are centered on the car, and corner-mounted weapons are placed diagonally out from the corners.
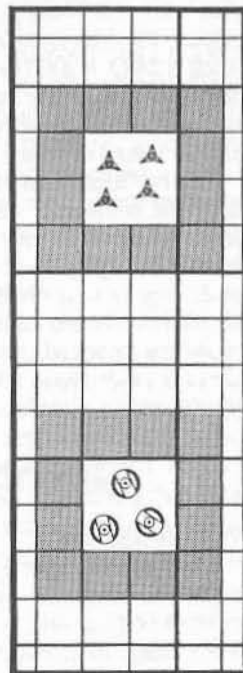
If the weapon is in a turret, the counter may be placed as if it were mounted in any of the above locations.

The smoke cloud from the flamethrower is always aligned along the line of fire.

A gas streamer on automatic is placed straight out from its location, or at a 45° angle for a corner mount. A gas streamer in a turret may fire at any angle.

If a dropped weapon is put on automatic, a counter of the appropriate type is placed behind the vehicle every phase the vehicle moves. It will continue to do this until it runs out of ammo or is taken off automatic. If a vehicle is not moving, a dropped weapon on automatic will fire once per turn.

The counters for mines and spikes show approximately where they are. If a vehicle crosses a tire-spike counter, roll 1 die. On a roll of 1 to 4, each tire takes 1d damage. If a vehicle crosses any square adjacent to the counter (see diagram on p. 32), roll 1 die; on a 1 or 2, the tire takes 1d damage. Spikes will stay on the road indefinitely. Solid and plasticore tires take half damage from spikes.

Mine counters work the same way, except that if any wheel of a vehicle crosses the counter, the mines will go off on a roll of 1 to 4. If the vehicle only crosses an adjacent square, the mines explode on a 1 or 2. Each tire within 1'' of any edge of the mine counter takes 1d damage, and the underbody of the vehicle that set the mines off takes 2d damage. The Spear 1000 mine works the same way, except that tires only take 1d-3 points of damage, while the underbody takes 2d+3! After a particular set of mines has been set off, the counter is removed.

Mines may also be remote controlled, either by radio or by cable. Setting off mines in this way counts as a firing action, but the mines go off when you want them to. If you want mines that will go off either by remote control or when they're run over, double the cost.

An oil slick is defined by the edge of the counter. When any part of a vehicle crosses an oil slick counter, it adds D2 to the difficulty of any maneuver attempted; it also adds D2 to the severity of any hazard encountered (such as enemy fire). It is not a hazard in itself. Flaming oil slicks are a D1 when driven over and add a D2 to any maneuver or hazard *and* also cause damage to the underbody and tires, as described in the individual weapons descriptions. Oil slicks last indefinitely, but flaming oil disappears after five turns.

Each vehicle checks only once for each counter — on the phase it first runs over the counter, or (if it's just going to touch the adjacent square area) the first phase it enters an adjacent square. Of course, if the vehicle returns to the counter's location, it will have to roll again.

For dropped liquids and dropped gases that do damage to a vehicle, roll for damage to the vehicle every five phases that the vehicle remains in contact with the damaging substance.

Paint and Smoke

Paint and smoke may be produced by rear-mounted or side-mounted weapons (see diagrams below). Do not try to line up a cloud with the grid lines. Orient it according to the vehicle's position. Smokescreens and paint clouds remain stationary. The life of a smoke cloud is one minute (longer than most battles will take). The life of a paint spray is one second. Remove it at the end of the turn after the one in which it is fired.

Any vehicle trying to trace a line of fire through paint or smoke must subtract 1 from its to-hit roll for each ½'' of cloud in the way. Lasers cannot fire through smoke or paint at all.

When a smokescreen or paint spray is placed on automatic, it fires once every *phase* the vehicle moves, or once every other phase for HD devices. This produces a continuous line of paint or smoke counters. It will continue to do so until it runs out of

ammo or is taken off automatic. If the vehicle is not moving, a smokescreen or paint spray on automatic fires once per turn.

Tear gas can be loaded in a smokescreen (CPS 50, WPS 1). Tear gas affects targeting the same way regular smoke does, as well as having serious effects on any unprotected pedestrians (for a full description of tear gas, see the Grenade rules on p. 48).
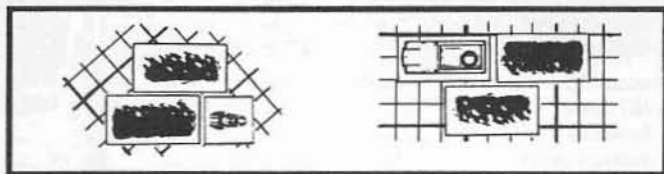
Any vehicle which comes into contact with a paint cloud gets paint on its windows. The vehicle will make all to-hit rolls at a -2 for the rest of that turn and the next three turns; after that, the windshield washers will have cleaned it off. Both paint and smoke are available in just about any color.

Linked Weapons

Another way to get more firepower per turn out of your vehicle is to link weapons. A weapons link costs $50, and has no space or weight requirements. Two or more identical weapons firing from the same side (or in a turret) may be linked, aimed and fired together. It is not necessary for linked weapons to be fired together — a link is essentially a third button, in addition to the first two, that fires both weapons simultaneously. You can still press one of the first two buttons to fire a single weapon, if you want.

When linked weapons are fired, make a separate to-hit roll for each linked weapon. All modifiers — negative or positive — that affect one linked weapon affect them all, including targeting computers, gunner skill and range.

Links can themselves be linked, provided all the weapons are identical. Four heavy rockets, linked in pairs that are also linked, gives the firer a number of options — fire any one, fire either of two pairs, or fire them all — at any time. Only identical weapons may be linked and aimed together. Weapons of the same family (a machine gun and a Vulcan MG, or a heavy rocket and a medium rocket) cannot be linked for full effect.

Weapons that are not identical can be linked, but only one can be aimed. The other weapon(s) are treated as if they are on automatic (except they fire when the button is pushed, and not at the end of the turn). The firer can pick which weapon he wishes to aim, and which one will be treated as automatic (see above for rules on automatic fire). If two identical weapons are linked with a third, different, weapon, then the two identical weapons may be aimed together and the third is treated as if it were on automatic. Weapons with a turret cannot be linked and aimed with weapons in the main body of the vehicle, or in another turret, unless the weapons are *smart-linked* ($500). Any type of dropped weapon or paint/smoke weapon can be linked with anything with no penalty, since they do not require to-hit rolls. A common tactic is to link a number of minedroppers and smokescreens together and fire them simultaneously to discourage pursuit.

Any number of weapons can be linked together with one link. For example, a pair of rear-mounted minedroppers can be linked to a pair of spikedroppers mounted on the sides, all to fire at the same time as the turreted machine gun. This requires a single link; when it is triggered, all five weapons must fire. If you just want the two spikedroppers to fire, that requires another link. The same is true for the two minedroppers.

Weapon List

Weapon	Abbv.	Effect	To Hit	Dam.	DP	Cost	Wt.	Spec.	Shots	CPS	WPS	L. $	L. Wt.	Mag. $	Mag. Wt.
Small-Bore Projectile Weapons															
Machine Gun	MG	area	7	1d	3	1,000	150	1	20	25	2.5	1,500	200	550	65
HD ammo	—	—	—	1d+1	—	—	—	—	20	50	5	2,000	250	1,050	115
Incendiary	—	—	—	1d	—	—	—	—	20	37.5	2.5	1,750	200	800	65
Antipersonnel	—	—	—	1d	—	—	—	—	20	125	2.5	3,500	200	2,550	65
Explosive	—	¼" radius	—	1d	—	—	—	—	20	50	5	2,000	250	1,050	115
Vulcan MG	VMG	area	6	2d	3	2,000	350	2	20	35	5	2,700	450	750	115
HD ammo	—	—	—	2d+2	—	—	—	—	20	70	10	3,400	550	1,450	215
Incendiary	—	—	—	2d	—	—	—	—	20	52.5	5	3,050	450	1,100	115
Antipersonnel	—	—	—	2d	—	—	—	—	20	175	5	5,500	450	3,550	115
Explosive	—	¼" radius	—	2d	—	—	—	—	20	70	10	3,400	550	1,450	215
Flechette Gun	FG	area	6	1d+1	2	700	100	1	20	10	2.5	900	150	250	65
Vehicular Shotgun	VS	area	6	2 hits	2	950	90	1	10	5	1	1,000	100	100	25
Gauss Gun	GG	area	6	3d	3	10,000	300	2	10	50	10	10,500	400	550	115
Recoilless Rifle	RR	2" radius	7	2d	4	1,500	300	2	10	35	5	1,850	350	400	65
HEAT ammo	—	—	—	2d+2	—	—	—	—	10	52.5	5	2,025	350	575	65
HESH ammo	—	—	—	2d	—	—	—	—	10	52.5	5	2,025	350	575	65
Autocannon	AC	2" radius	6	3d	4	6,500	500	3	10	75	10	7,250	600	800	115
HD Ammo	—	—	—	3d+3	—	—	—	—	10	150	20	8,000	700	1,550	215
Large-Bore Projectile Weapons															
Bomb	B	2" radius	9	4d	2	100	100	1	1	—	—	100	100	—	—
Cluster Bomb	CB	3" radius	9	2d	2	200	150	1	1	—	—	200	150	—	—
Starshell Launcher	SL	—	—	—	2	500	100	1	5	50	5	750	125	300	40
Spike Gun	SG	1" × 1"	7	1d	2	750	150	2	10	40	10	1,150	250	450	115
Grenade Launcher	GL	—	7	—	2	1,000	200	2	10	—	4	1,000+	240	50+	55
Anti-Tank Gun	ATG	2" radius	8	3d	5	2,000	600	3	10	50	10	2,500	700	550	115
HEAT ammo	—	—	—	3d+3	—	—	—	—	10	75	10	2,750	700	800	115
APFSDS ammo	—	—	—	3d+6	—	—	—	—	10	100	15	3,000	750	1,050	165
HESH ammo	—	—	—	3d	—	—	—	—	10	75	10	2,750	700	800	115
Mine-Flinger	MF	½" × ½"	9*	*	3	2,250	275	3	5	regular or napalm loads		—	—	—	—
Oil Gun	OG	½"/1" × 1"	7/5	—	3	1,000	250	3	10	25	5	1,250	300	300	65
Paint Gun	PG	½"/1" × 1"	7/5	—	3	1,000	250	3	10	25	5	1,250	300	300	65
Flaming Oil ammo	—	½"/1" × 1"	9/5	1d-2	—	—	—	—	10	90	5	1,900	300	950	65
Ice ammo	—	½"/1" × 1"	9/5	—	—	—	—	—	10	40	5	1,400	300	450	65
Blast Cannon	BC	2" radius	7	4d	5	4,500	500	4	10	100	10	5,500	600	1,050	115
HESH ammo	—	—	—	4d	—	—	—	—	10	150	10	6,000	600	1,550	115
Tank Gun	TG	2" radius	7	8d	10	10,000	1,200	10	10	100	20	11,000	1,400	1,050	215
HEAT ammo	—	—	—	8d+8	—	—	—	—	10	150	20	11,500	1,400	1,550	215
APFSDS ammo	—	—	—	8d+16	—	—	—	—	10	200	30	12,000	1,500	2,050	315
HESH ammo	—	—	—	8d	—	—	—	—	10	150	20	11,500	1,400	1,550	215
Rockets															
Mini Rocket	MNR	½" radius	9	1d-1	1	50	20	1/3	1	—	—	50	20	*	*
Light Rocket	LtR	1" radius	9	1d	1	75	25	1/2	1	—	—	75	25	*	*
Medium Rocket	MR	1" radius	9	2d	2	140	50	1	1	—	—	140	50	*	*
Heavy Rocket	HR	2" radius	9	3d	2	200	100	1	1	—	—	200	100	*	*
Anti-Power-Plant Rocket	APPR	1" radius	9	1d-1*	1	500	40	1	1	—	—	500	40	*	*
Surface-to-Air Missile	SAM	2" radius	6/11	4d	3	500	150	1	1	—	—	500	150	*	*
Radar-Guided Missile	RGM	2" radius	7	3d	1	3,000	100	1	1	—	—	4,000	200	*	*
Wire-Guided Missile	WGM	2" radius	6	3d	2	2,000	100	1	1	—	—	2,000	100	*	*
Rocket Magazine	—	—	—	—	0	50/sp	15/sp	1,2,3	—	—	—	—	—	—	—
Six-Shooter	MFR	2" radius	9	1d*	3	450	150	2	1	—	—	450	150	—	—
Incendiary Single-Shot Rockets	—	—	—	+1/die*	—	—	—	—	—	×2	×1.5	—	—	—	—
Micromissile Launcher	MML	1" radius	8	1	2	750	100	1	10	20	2.5	950	125	250	40
Incendiary Ammo	—	—	—	1d+1*	—	—	—	—	10	35	6	1,100	160	400	75
Rocket Launcher	RL	2" radius	8	2d	2	1,000	200	2	10	35	5	1,350	250	400	65
Incendiary Ammo	—	—	—	2d+2*	—	—	—	—	10	60	11	1,600	310	650	125
Flare Round Ammo	—	—	10	1d-2	—	—	—	—	10	20	5	1,200	250	250	65
Variable-Fire Rocket Pod	VFRP	2" radius	9	1d(×6)	5	2,000	200	3	30	35	7.5	3,050	425	1,100	240
Laser-Guidance Link	LGL	—	—	—	—	500	—	—	—	+200	—	—	—	—	—
Armor-Piercing (all normal rockets)	AP	—	—	+1/die	—	—	—	—	—	×1.5	—	—	—	—	—

Weapon	Abbv.	Effect	To Hit	Dam.	DP	Cost	Wt.	Spc.	Shots	CPS	WPS	L. $	L. Wt.	Mag. $	Mag. Wt.
Lasers															
Targeting Laser	TL	—	6	—	1	1,000	50	0	—	—	—	1,000	50	—	—
Light Laser	LL	area	6	1d	2	3,000	200	1	—	—	—	3,000	200	—	—
Medium Laser	ML	area	6	2d	2	5,500	350	2	—	—	—	5,500	350	—	—
Laser	L	area	6	3d	2	8,000	500	2	—	—	—	8,000	500	—	—
Twin Laser	TwL	area	6	2d+6	3	10,000	750	2	—	—	—	10,000	750	—	—
Heavy Laser	HL	area	6	4d	2	12,000	1,000	3	—	—	—	12,000	1,000	—	—
Infrared (all but X-ray)	IR	—	—	*	—	×2	—	—	—	—	—	—	—	—	—
Pulse (all but X-ray)	—	—	—	+1/die	—	×1.5	—	—	—	—	—	—	—	—	—
X-ray Laser	XL	area	7	4d	3	15,000	750	3	—	—	—	15,000	750	—	—
Heavy X-ray Laser	HXL	area	7	5d	3	20,000	1,500	5	—	—	—	20,000	1,500	—	—
Flamethrowers															
Light Flamethrower	LFT	area; max 5"	6	1d-2	1	350	250	1	10	15	3	500	280	200	45
High-Temperature Ammo	—	—	—	1d	—	—	—	—	10	60	4.5	950	295	500	60
Flamethrower	FT	area; max 10"	6	1d	2	500	450	2	10	25	5	750	500	300	65
High-Temperature Ammo	—	—	—	1d+2	—	—	—	—	10	100	7.5	1,500	525	550	90
HD Flamethrower	HDFT	area; max 15"	6	2d	3	1,250	650	3	10	50	10	1,750	750	550	115
High-Temperature Ammo	—	—	—	2d+4	—	—	—	—	10	200	15	3,250	800	2,050	165
Dropped Gases															
Smokescreen	SS	½" × 1"	—	—	4	250	25	1	10	10	5	350	75	150	65
Tear Gas	—	—	—	*	—	—	—	—	—	20	5	450	75	250	65
Paint Spray	PS	½" × 1"	—	—	2	400	25	1	25	10	2	650	75	300	65
Gas Streamer	GS	½" × 5"	—	—	1	100	50	1							
Smoke	—	—	—	—	—	—	—	—	2	50	25	200	100	150	65
Paint	—	—	—	*	—	—	—	—	2	50	10	200	70	150	35
Tear Gas	—	—	—	—	—	—	—	—	2	100	25	300	100	250	65
Flame Cloud Streamer	FCGS	½" × 5"	—	1d-1	1	200	100	2	2	300	25	800	150	650	65
HD Smokescreen	HDSS	1" × 2"	—	—	4	500	50	2	10	40	20	900	250	450	215
Tear Gas	—	—	—	*	—	—	—	—	—	80	20	1,300	250	850	215
HD Paint Spray	HDPS	1" × 2"	—	—	3	800	50	2	10	40	8	1,200	130	450	95
Flame Cloud Ejector	FCE	½" × 1"	—	1d-1	1	500	50	2	10	60	5	1,100	100	650	65
HD Flame Cloud Ejector	HDFCE	1" × 2"	—	1d-1	2	1,000	100	3	10	240	20	3,400	300	2,450	215
Dropped Liquids															
Oil Jet	OJ	½" × 1"	—	—	3	250	25	2	25	10	2	500	75	300	65
HD Oil Jet	HDOJ	1" × 2"	—	—	4	500	50	3	10	40	8	900	130	450	95
Flaming Oil Jet	FOJ	½" × 1"	—	1d-2	3	300	30	2	25	35	2	1,175	80	925	65
High-Temperature Fuel	—	—	—	1d	—	—	—	—	25	140	3	3,800	105	3,550	90
Heavy Flaming Oil Jet	HFOJ	1" × 2"	—	1d-2	4	550	60	3	10	140	8	1,950	140	1,450	95
High-Temperature Fuel	—	—	—	1d	—	—	—	—	10	560	12	6,150	180	5,650	135
Ice Dropper	ID	½" × 1"	—	—	3	750	50	2	25	20	2	1,250	100	550	65
HD Ice Dropper	HDID	1" × 2"	—	—	4	1,000	100	3	10	100	10	2,000	200	1,050	115
Dropped Solids															
Chaff Dispenser	CD	½" × 1"	—	—	2	300	25	1	10	10	2	400	45	150	35
Spikedropper	SD	½" × ½"	—	1d	4	100	25	1	10	20	5	300	75	250	65
Explosive Spikes	—	—	—	1d+1 (1d-1)	—	—	—	—	10	50	5	600	75	550	65
Drop-Spike Plate	DSP	½" × ½"	—	2d (1d)	4	200	50	1	1	—	—	200	50	—	—
Large DSP	LDSP	½" × 1"	—	2d (1d)	6	350	100	1	1	—	—	350	100	—	—
Junk Dropper	JD	½" × ½"	—	1d-3	4	50	25	1	5	0	25	50	125	50	115
Minedropper	MD	½" × ½"	—	1d/2d	2	500	150	2	10	50	5	1,000	200	1,050	215
Napalm	—	—	—	1d*	—	—	—	—	10	60	5	1,100	200	1,150	215
Spear 1000 MD	SMD	½" × ½"	—	1d-3/2d+3	2	750	150	2	5	100	10	1,250	200	550	65
TDX	—	—	—	1d+3/1d-2	—	—	—	—	5	100	10	1,250	200	550	65
Napalm	—	—	—	1d/2d*	—	—	—	—	5	150	10	1,500	200	800	65
Spider Mine	—	—	—	1d/2d	—	—	—	—	5	150	10	1,500	200	800	65
Dischargers															
Flechette	FD	—	—	0 (1d)	—	50	5								
Smoke	SkD	½" × 1"	—	—	—	50	5								
Point-Defense	PDG	2" radius	—	½d (1d)	—	150	5								
Paint	PD	½" × 1"	—	—	—	40	5								
Tear Gas	TGD	½" × 1"	—	—	—	75	5								
Flame Cloud	FCD	½" × 1"	—	1d-1	—	150	5								
Oil	OD	½" × 1"	—	—	—	50	5								
Flaming Oil	FOD	½" × 1"	—	1d-2	—	100	5								
Ice	IcD	½" × 1"	—	—	—	75	5								

Abbreviations: *Dam.* — number of dice of damage; *DP* — damage points; *Wt.* — weight; *Spc.* — space; *CPS* — cost per shot; *WPS* — weight per shot; *L. $* — loaded cost; *L. Wt.* — loaded weight; * — see rules for additional information.

See Chapter 12, *Weapons*, for more details.

Combat

Confetti (Optional)

A vehicle can take only so much damage at one time, regardless of its construction. If a vehicle takes 1/50 of its weight in damage (1 point per 50 lbs.) in a single phase, either by collisions or a tremendous volley of gunfire, the vehicle has shattered and is replaced by a generous handful of debris and obstacle counters — one for every 200 lbs. of shattered vehicle, dropped from 4" above the table.

Hand Weapons

Any character (driver, gunner, passenger or pedestrian) may use a hand weapon any turn he or she does not fire a vehicle weapon. For game purposes, hand weapons take up no weight or space. However, no character may carry more than six grenades or grenade-equivalents of equipment. A pistol counts as a grenade-equivalent; a rifle, shotgun or SMG counts as two. As cargo, a box of 12 grenades weighs 50 pounds and takes up one space. For complete stats on hand weapons, see p. 47-48.

Hand weapons do not get bonuses for computer aiming, but all other modifications for vehicular weapons apply. Handgunner skill is used with hand weapons, instead of the Gunner skill.

Hand weapons have little effect on vehicles — vehicle components are too heavily built. Most hand weapons do little damage to vehicles (see *Hand-to-Hand Combat* on p. 44). A few hand weapons are effective against vehicles; see p. 47-48.

Submachine guns do full 1d damage only on humans; on other targets, they do half damage (rounded down). Other hand weapons affect only tires and people.

Range

A grenade may be thrown up to 5" (see below for more on grenades). Other hand weapons have a maximum range of 20" for game purposes.

Firing Penalties and Bonuses

The driver of a moving vehicle must subtract 3 from his to-hit roll with any hand weapon. Gunners or passengers subtract 1. Pedestrians or stationary characters fire at the listed values. In certain situations, pedestrians may get bonuses for firing from a non-moving position. Firing from inside a moving vehicle is not considered as being stationary, but firing from a stopped vehicle is.

Grenades

Grenades come in a number of types, but all share some similarities. They have a simple time-delay switch (1 to 5 seconds), and an activation switch. Setting the time-delay takes 1 second, but they can be set ahead of time. Changing the time delay also takes 1 second. The timer may be replaced with an *impact fuse*, which sets the grenade off the instant it lands.

To throw a grenade, simply start the timer by pressing the activation switch, and throw it. The grenade will go off at the end of the turn in which the timer stops. If you set the timer at 1, it will go off at the end of the turn *after* the turn in which you press the switch. Grenades fired from vehicular or hand-held launchers are automatically activated upon firing.

Thrown and launched grenades take exactly 1 second to reach or impact their target; if you fire a grenade launcher in turn 1 on phase 3, it will hit the ground on phase 3 of turn 2. The to-hit roll is not made until the grenade touches down.

The to-hit roll for a thrown grenade is 9 or better on 2 dice. But that's misleading, because even a successful roll will not put the grenade in the exact square you were aiming for, unless you roll a natural 12. On a 12, the grenade lands in the exact 1/4" square you were aiming for. Any other die roll is a miss of one degree or another.

Any grenade toss that is less than the best possible (a 12), will deviate from the intended target. This deviation has two components — Direction and Distance. Or, to put it another way, which way did it go, and how badly did you miss?

Direction — Roll 1 die, and consult the following:

1 — Off to the right.
2 — Off to the left.
3 — On line, but short.
4 — On line, but long.
5 — Off to the right, *and* long or short (roll randomly).
6 — Off to the left *and* long or short (roll randomly).

Distance — How far the grenade lands from the intended spot depends on how badly you missed your to-hit roll. If your grenade was both off line and long/short, roll separately for each distance.

Made your roll or higher but rolled less than 12 — 1d-3 1/4" squares in each direction called for by the direction roll.
Missed by 1 — 1d-1 (treat a 0 result as 1) squares in each direction called for.
Missed by 2 — 1d+1 squares in each direction called for.
Missed by 3 — 2d-2 (treat a 0 result as 1) squares in each direction called for.
Missed by 4 or 5 — 2d+3 squares in each direction called for.
Missed by 6 or more — 3d squares (8 squares minimum) in each direction called for.

If the line of flight for the grenade is diagonal to the grid lines, just remember that each square is 1/4", and use a ruler to determine the final location of the grenade.

Example: George thinks an enemy vehicle is about to slip out a side alley, so he wants to toss a grenade into the open area where the alley intersects the street. George picks a target square and rolls the dice. He needs a 9 or better to hit, but rolls an 8. Not bad, but a miss. Next George rolls on the Direction Table, and gets a 5 — off to the right, and either short or long. He assigns "evens" to long, and rolls another 5 — indicating the grenade came up short, too.

Next, George consults the Distance Table — "missed by 1" means the grenade is off by 1d-1 squares in each direction called for by the first set of rolls, rolled separately. George's grenade is both to the right and short of his intended spot. George rolls a 2, then a 3 — so the grenade ends up one square (2-1) to the right, and two squares (3-1) short of the intended target.

If a grenade hits a large solid object — like a building or a car — while in flight, it will bounce 1d-1 squares and stop. The direction it bounces is determined by the angle at which the grenade hits the solid object. If the grenade hits the object squarely, it bounces straight back toward the thrower. If it strikes at an angle, it will bounce off at the same angle, away from the thrower. Grenades with impact fuses will not bounce; they will blow up at the point of impact.

The maximum range for a thrown grenade is 5", and standard range penalties apply — that is, if your intended spot is 4" to 5" away, there is a -1 penalty to hit, and if your intended spot is less than 1" away, there is a +4 bonus. If your intended spot is less than 1" away, you cannot miss by more than two squares in any direction. In no case can a grenade end up behind the thrower — if the distance "short" is greater than the distance first attempted, place the grenade at the thrower's feet. Also, a grenade thrower may place a grenade in his own or any adjacent square without having to roll to hit at all.

A grenade may be thrown from a moving vehicle at -2. There is no "automatic hit" for adjacent squares, but the +4 point-blank bonus would apply. A grenade dropped or thrown from a vehicle could go in any direction. A roll of 2 or 3 indicates disaster — the grenade is dropped inside the vehicle and rolls under the seat — or something equally nasty.

Buildings

Breaches and Collapsing Buildings

A building is at +10 to hit. It's big and doesn't move (so the +10 takes the "stationary" bonus into account). Each building has a DP value indicating the strength of its walls. Any weapon doing at least this much damage will produce a "breach." Lesser damage has no effect.

Example: A building has 10 DP. A weapon result of 10 points damage or more will produce a breach at the affected spot. However, any number of smaller hits may accumulate without causing harm — there is no need to keep track of building damage that does not create a breach. A breach, once created, is identical to a door or window for game purposes.

When a building accumulates breaches equal to its DP value, it will collapse. (A DP 4 building falls after four breaches. The DP 10 building mentioned above will take ten breaches before it collapses.) It does not matter where the breaches are. When a building falls, it creates rubble (see below). The fall of a building does not affect nearby buildings — even those with which it shares a wall. However, a breach in a common wall will affect both buildings.

Everyone and everything inside a falling building suffers as many dice of damage as the building has DP. For example, a 6 DP building will do 6d damage to anyone and anything inside.

Cars will take this damage to their top armor. If any top armor is left after the collapse, people inside the car will be safe — trapped, but safe. They won't be able to get out for as many turns as the building had DP. They'll still have to deal with the rubble as pedestrians after they escape from the car.

Some buildings will have two different DP numbers, with the second one in parentheses. The first number will be the number of damage points required to create a breach, and the second will be the number of breaches needed to collapse the building. For many buildings, this will be the same number —

and only one number will be used. But for some buildings, it's not logical. An example is a barn — only a few damage points will create a single breach, but it will take lots of breaches to collapse it. A barn like this will be described as having 4(15) DP — it only takes 4 damage points to create a breach, but the barn won't collapse until 15 breaches are made. When a building with two DP numbers collapses, use the first to determine the amount of damage it does, etc. (see above).

When a building collapses, it becomes rubble. No vehicles may enter rubble. Pedestrians may move through rubble at one square per second — moving only on Phase 1 of a turn. Rubble takes up the same squares that the building did.

Rubble continues to block line-of-sight between roads, just as if the building were still there. If the firer or the target is in an elevated position, rubble can be sighted over, however. A pedestrian in rubble can fire as though the rubble was not there; he is considered "braced" and gets the +1 bonus to hit. A pedestrian in rubble may be fired on, but the attack is at -4.

Collapse of a building will also scatter debris. When something collapses, take a dozen debris counters and drop them over the disaster site from a height of one foot, redropping any that fail to land on the street.

Cover

A line of sight may be traced through any door, window or breach. Therefore, a pedestrian may stand inside a building and fire outside. He must, however, be adjacent to the door or window for this line of sight to be traced.

A pedestrian leaning around an edge of a door or window presents a very small target. Therefore, although he may be fired at, he has the protection of the wall. He is not likely to be hit unless the wall is breached.

Example: A pedestrian is leaning out a window, looking for a good shot, when a duellist with a laser tries to take him out. The duellist needs an 8 to hit, and gets it. The wall has 6 DP. The duellist rolls 10 points of damage with his laser. The wall takes 6 points (breaching it); the other 4 go to the pedestrian. If the wall had not been breached (if it had 12 DP, for example), the pedestrian would have been unhurt.

However, a very good shot can go right through a door or window. If the roll to hit is at least 2 better than needed (in the above example, if the duellist had rolled a 10), then both the pedestrian and the wall take full damage.

Height Modifications

Situations may arise where duellists in cars want to shoot at pedestrians on rooftops; or a pedestrian gun battle may involve exchanging shots across a street into buildings. Firing at any target that is on a higher level than you is at a -1 for every ten feet of height difference. Firing downward is at no penalty, but throwing things (like grenades) is: -1 for every ten feet of height difference. Each level of a multi-story building is assumed to be ten feet high. Some heights — a third-story rooftop, and fourth floor or higher — cannot be hit by regular vehicular weapons on street level, unless the firing vehicle is farther away from the target than the target is high. Universal turrets (used to fight helicopters; see p. 84) and hand weapons are the only way to fire on them.

Missing

In most cases, a missed shot rockets off into the stratosphere, never to be seen again. In a scenario involving buildings, this is clearly inappropriate. A missed shot fired horizontally goes in a straight line until it leaves the map or hits an obstacle, like a building. If another vehicle or pedestrian is in the exact line of

fire, you can roll to hit, taking into account any additional range penalties and another -2 because you weren't aiming at him. When a "miss" does hit something, it does standard damage.

For shots fired upward, roll 1 die. On a 1 or 2, the shot hits one story higher than intended; on a 3 or 4, it hits two stories higher; on a 5 or 6, it misses everything and is gone.

For shots fired downward, a miss will overshoot the intended target by 1 to 6 inches.

If you try to put a grenade through a window and miss, the grenade lands at the base of the building below the window in question.

Burning Buildings

If a building is set on fire (a 50% chance every time it is hit by a laser, a flamethrower or flaming oil), place an "on fire" marker on it. Since most *Car Wars* battles last less than a minute, the effects on play will be minimal — but for long-term campaigns, it can be significant. The variant fire rules mentioned above can be used for this as well.

Helicopter Combat

Helicopter combat is the same as ordinary vehicular combat — with the added complication of a third dimension, of course.

Location of Damage

As with cars, helicopters can take damage in a variety of locations. If front armor is hit, the front armor takes damage, then whatever was behind it, then whatever was behind that, and so on. To determine what is behind helicopter armor in the various locations, check the following lists:

Front: Front armor; front-firing weapons; (pilot or co-pilot/gunner); motor; cargo; back weapons; back armor.

Back: As above, but in reverse order.

Right: Right armor (door); right-firing weapons; (pilot, co-pilot/gunner, motor and cargo); left-firing weapons; left armor (door).

Left: As above, but in reverse order.

Bottom: Bottom armor; bottom weapons; (cargo, motor, pilot or co-pilot/gunner); top armor.

Top: As above, but in reverse order.

Skids, pontoons, main rotors, and stabilizing rotors must be targeted individually. They will never be hit as part of another attack on a copter.

Skids are -8 to hit; pontoons are -3. If one or both skids or pontoons are destroyed, the helicopter will tip gracelessly over on one side (1 die damage to that side) when it lands, and the main rotor will break.

The stabilizing rotors and main rotors are a -6 to hit. If they are hit, roll 1 die. On a 6, the rotor takes 2 hits of damage. Otherwise, it takes 1 — no matter what weapon was used. This is because most of the effect of any weapon attack upon a rotor will go into empty air. If the main rotor is destroyed, the helicopter drops. If the stabilizing rotor is destroyed, the helicopter goes into an involuntary and unending series of counter-clockwise Rotate maneuvers, which will only cease when the helicopter lands. The pilot must make a Control roll during the first movement phase of every turn, and the helicopter's rotating maneuvers *do* count against its handling class.

Arcs of Fire

In combat, a helicopter may target anything within its arc of fire. It may be targeted by an attacker who is within the theoretical line of fire of one of its sides, and on that side only. In other words, if a helicopter can target a vehicle with its right side, the target vehicle can fire upon the helicopter's right side in return.

If the helicopter can target with both its underside and left side, the target may return fire upon both underside and left side, as it chooses.

Ground vehicles suffer some arc-of-fire problems when attacking helicopters. For example, a front-mounted weapon cannot target something directly overhead. Vehicular weapons can target any object that is farther away than the difference in their altitudes. That is, if Helicopter A is in Car B's normal arc of fire, and is 5" away and 4" up, Car B can hit it. If, however, it is 4" away and 5" up, Car B cannot hit it. If two vehicles are at different altitudes, add their two range modifiers together to get the correct range modifier for the shot. The point-blank range modifier is only used if both ranges are point blank.
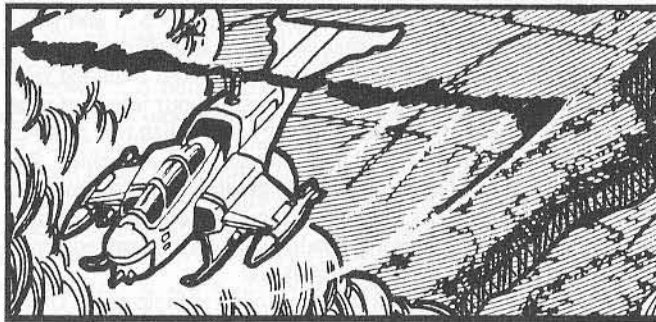
Examples: If the target is 7" away (-1 range modifier to hit) and 6" up (also -1), the total range modifier is -2. If the target is 10" away (-2) and 6" up (-1), the total range modifier is -3. If the target is 4" away (no mod.) and ½" up (point blank), because *both* ranges are not point blank, ignore the one point-blank result and change it to "no modifier." The total range modifier is 0. If the target is 1" away (point blank) and ¼" up (also point blank), then because both ranges are point blank, the point-blank modifier is in effect: +4.

Hand-held and tripod-mounted weapons effectively have no arc-of-fire limitations — they may be pointed at any target, no matter what the angle of fire.

If the vertical distance between a ground vehicle and a helicopter is greater than the horizontal distance — 7" up and only 2" away, for example — the car could only hit the bottom of the copter, and then only with a top-mounted weapon or a weapon in a universal turret. The helicopter could only target the car's top, and could only use bottom-mounted weapons or weapons in a bottom-mounted universal turret.

Bombs

Dropping a bomb is essentially a random attack. If the to-hit roll is missed, it could land almost anywhere. Use the grenade scatter rules to determine where the bomb actually landed.

Dusting

A helicopter can also "dust" a ground vehicle. If a helicopter drops to within 1" of a ground target over any terrain but the most scrupulously clean arena asphalt, the area is "dusted" — the blades kick up a nasty cloud of dust, gravel, trash and other materials, with the basic effect of a very large smokescreen. Put a smokescreen counter directly under the helicopter over a ½" by 1" area. This cloud stays under the helicopter as long as it's within 1" of the ground, moving wherever it moves, and is otherwise like a smokescreen in all respects. The "dusting" extends upward ½" from the ground.

Destroying Smoke and Paint Clouds

Any helicopter larger than one-man size can dispel a smoke or paint cloud by flying close to it. See p. 73.

4. Characters

Car Wars characters are identical in many ways. They all take up 2 spaces as vehicle crew members, and they all have 3 damage points and weigh 150 pounds (except bodybuilders — see below). Characters can be differentiated in three categories: skills, prestige and wealth.

Skills

Many different skills are available for characters. Some of these skills (Driver, Gunner, Cyclist, and so on) are useful in any *Car Wars* game. Others (Espionage, Fast-Talk, Streetwise and so on) will be important only in a campaign with a heavy roleplaying element. Should such a skill be suddenly called for in a campaign where none of the characters have taken roleplaying skills, the GM should fall back on "roll 2 dice and pray."

A character with a skill at the *base level* can perform that skill with no penalties or bonuses. Most skills can be attempted, at a penalty, even by those with no training; see below.

With extra training and experience, a character with a skill at base level (for example, "Driver") can improve it to "Driver +1," and eventually "Driver +2," "Driver +3," and so on. In the course of adventures, you will gain "skill points." Some skill points can only be spent on particular skills, while others can be spent on any skill.

Beginning Skills

When you first create a character, you get a few base skills automatically. Each character starts with base-level skills in Running, Climbing, and Area Knowledge for his home town.

Each character also gets a total of 30 skill points to spend as you wish. Each base level skill acquired during character creation costs 10 skill points. Each additional skill level costs 10 points up to Skill +3. Higher levels aren't possible with the beginning 30 points

You can spend the 30 beginning skill points to acquire three base level skills, or you can get one skill at base level and a second at +1. You could even sink all 30 points into buying one skill at +2, but your character would be pretty one-dimensional. You can also use some of your initial skill points to improve your Running skill.

Earning Skill Points

Every time a character drives a vehicle into combat and survives, one skill point is earned toward increasing the ability for that vehicle — Driver, Pilot, Cyclist, etc. (Combat is defined as an incident in which a vehicle exchanges fire with enemies.) The driver of a vehicle that scores a "kill" in combat gets an additional point toward that vehicle ability.

A "kill" is scored when an enemy vehicle can no longer move or fire, either because of a direct attack, a crash during combat, surrender of the occupants, or other circumstance. The occupants do not have to die. Killing a pedestrian does not count as a kill. (A bully hiding behind armor should get no credit for zapping a relatively harmless pedestrian with a laser!) If a vehicle can no longer move, but still has operable weapons, it is not a kill unless and until it is forced to surrender.

If the crew abandons a vehicle or surrenders, that counts as a kill. If a damaged vehicle escapes to safety, that does not.

Entering combat as a pedestrian is worth a *general* skill point (see below). If a pedestrian kills another pedestrian (or knocking him out), he earns a point for the skill used in the combat; scoring

a kill against a vehicle is worth 5 skill points! If you are firing hand weapons from a vehicle, no skill points are awarded except, possibly, as a referee award for heroic or miraculous shots!

Use of other skills, as per the skill descriptions, can earn points toward improving those skills. If no specific rules are given for a skill, the referee should simply award a point whenever it is used successfully in a combat or stress situation.

General Skill Points

In addition to the specific points awarded for skill use, the referee should award general skill points at the end of an adventure. These points may be applied for any skill, or saved to acquire a new skill at base level. Some suggestions for general skill point awards:

Winning an arena event: +3
Surviving an arena event: +1
Conspicuous bravery: +2
Risking your life to save a teammate or friend: +2
Using an unusual tactic: +1
Escaping an ambush alive: +1
Successfully knocking out a vehicle so it can be salvaged: +1
Winning a highway duel: +1
Winning a highway duel when you're outnumbered: +2
Completing a mission or adventure: Depends on the length and complexity of the task, but anywhere from +5 to +15 would be appropriate.

This list is far from complete. Spectacular escapes against overwhelming odds, brilliant tactics, or just plain lucky breaks could be situations worth extra skill points. While the players and even spectators are welcome to offer suggestions on how many points should be awarded, the referee's decision is final.

Spending Points to Improve Skills

To increase an existing skill up to Skill +3, spend 10 points; this improves the skill by one level. Higher skill levels cost 20 points each up to Skill +6, 30 points each up to Skill +9, etc.

To acquire a *brand-new* skill at base level, you must spend 10 points *and* pay $1,000 — and take 3 months off (in game time) for training. The only exception is the Mechanic skill (see below).

Using Skills

From time to time, the referee may call for a *skill roll* to see if a character can succeed at some feat. If you have a skill at base level, you succeed on a roll of 7 or more; otherwise, you fail. The effect of success or failure will depend on the situation.

The higher your skill, the easier it is to make a skill roll. Add your skill bonus to your die roll. Thus, if you have Mechanic +1, you would succeed on a natural roll of 6, because 6+1 = 7. However, a natural 2 always fails.

A character who does not even have a skill at base level (that is, did not spend at least 10 points on it) gets a -4 on any skill roll. He will not succeed except on an 11 or 12.

Depending on the relative ease or difficulty of a task, the referee may require some rolls to be made at a penalty or a bonus.

Vehicle skills (Driver, Cyclist, Pilot, etc.) are handled differently. In most cases, your vehicle skill simply affects any control rolls you must make. Occasionally, when a control roll does not seem appropriate (especially in a roleplaying situation), the referee may require you to roll against a vehicle skill. In this case, your vehicle's handling class affects your skill. If you have

a HC 2 (average) vehicle, roll normally. If its HC is lower than 2, subtract the difference from your skill. If it is above 2, add the difference to your skill.

So a HC 3 vehicle, for instance, gives you a +1 to your skill. A HC 2 vehicle gives no bonus or penalty; a HC1 vehicle gives you a -1 to skill, and so on.

Contests of Skill

When two characters compete in some way, the referee may call for a *Contest of Skills*. Each character makes a skill roll as above, adding any modifiers the referee feels are appropriate. If both players make or fail their rolls, then the contest is inconclusive and may continue if the situation or common sense warrants. If both players make their rolls, but one makes it by 5 more than the other, he wins. Obviously, if one player makes the roll and the other doesn't, the player who made his roll wins.

Some situations may call for a *quick contest of skills*. In a quick contest, each player only rolls once, adding all appropriate modifiers. The player with the higher score wins. If they tie, the contest is inconclusive.

Example: Two duellists, after a long and protracted road combat, sail into the protection of a ghost town. Larry (Driver +2), unwilling to give up the fight, spins through town attempting to find Curly's (Driver +1) car. Rather than play it out in a complicated double-blind fashion, the referee calls for a Contest of Driver Skills. Curly has been through this town before (Area Knowledge +1), so the referee gives him a +1 on his roll. Both players roll two dice. Larry gets a 9 (7, +2 for his Driver skill bonus), poor Curly gets a 5 (3, +1 for his Driver skill bonus, +1 for his Area Knowledge). Thus, Larry wins the contest, and gets the drop on Curly. The referee sets Curly's vehicle out in the open, travelling at a reasonable urban speed, and Larry is free to place his car anywhere nearby, moving at any speed.

General skill points may be used to improve these skills; so can any points earned by particularly successful or imaginative uses of the skill itself.

Skill Descriptions

Acrobatics — Gives the character the ability to jump farther (an extra ¼" per two levels of skill) and perform spectacular physical feats such as swinging from chandeliers, swinging from tree to tree or somersaulting over an oncoming car.

A failed Acrobatics roll means the character simply failed to perform the stunt, and stays in the same place he was when he attempted the stunt. If he missed by 5 or more, he hurt himself and takes 1d-4 damage.

Acrobatics makes a character harder to hit. When a character with Acrobatics is fired on, subtract half of his Acrobatics skill (round down) from the to-hit roll.

When a character attempts to board a moving vehicle, his Acrobatics skill bonus is added to the die roll.

Animal Husbandry — The care and handling of domestic animals, from gerbils to horses. This skill can be used to train animals. Roll once per week; on a failed roll, the animal didn't learn anything, while a roll missed by more than 5 means the trainer was attacked by the animal. The time to train, and modifiers based on familiarity, complexity of task and other variables, are up to the referee. When a character fights an animal, his skill bonus is a positive to-hit modifier (since the animal's behavior is predictable to an expert).

Area Knowledge — Used to get around in a particular city, state, duel circuit or patch of untamed wilderness. A successful Area Knowledge roll means the character can answer detailed questions about the area known; where to find someone or something, where to best set an ambush, etc. The amount of detail will decrease as the area known increases. Better rolls allow better use of the information, of course.

All characters are assumed to have this at base level for their hometown. Improvements to the skill add other areas or more detail about a known area, at the referee's option.

Archery — This is the ability to use bows of all types, from crossbows to longbows. Each level above base level adds +1 to the to-hit roll of the Archer. Each combat entered with a bow is good for 1 point toward this skill.

Blade — This is the ability to use edged weapons in combat. Each plus gives a +1 to hit with the weapon. This skill covers everything from pocket knives to machetes and axes. Blade skill (and an appropriate blade) can be used to parry other blade attacks; the defender attempts his own skill roll, but subtracts the amount by which the attacker made his to-hit roll. (A sword costs $75, weighs 3 lbs. or 2 GEs, has a to-hit of 7, and does 1d-3 damage to pedestrians and tires.)

Boat Pilot — This is the ability to control a boat. It is otherwise identical in all ways to the Driver skill (see below).

Bodybuilding — This is a character's ability to improve his damage points and his lifting ability. At base level, the character gains the ability to carry an additional 25 pounds of equipment (for the alternate encumbrance system). At level +1 the character gets an extra 1 DP, and at +2 he gains 25 lbs. of weight. This sequence is repeated for levels +3 to +5, and so on. A Bodybuilder +4 will weigh 175 lbs., be able to lift up to 70 lbs. without penalty and have 5 DP; a Bodybuilder +7 will weigh 200 lbs., be able to lug 95 lbs. without a penalty and have 6 DP.

Climbing — Like Running, everyone gets this skill at base level. Climbing skill is used to climb trees (at -1 to skill), fences (-2), some buildings (-3 to -5), etc.

Communications — Anyone can use a radio. Communications skill covers both the use and repair or design of radios and similar equipment. The most likely game use of Communications involves jamming and breaking through jamming (a contest of skills either way). More advanced equipment will give bonuses to a Communications roll.

Computer Tech — Most computer systems in the *Car Wars* world are very easy to use, and no roll is required. Computer Tech is the computer equivalent of Mechanic, and is used to program a system, break through a computer's defenses (a Contest of Skill between the hacker and the computer's defensive programming), etc.

Cyclist — This is the ability to drive any size motorcycle or trike. Anyone without this skill is at -3 on the handling class of any cycle he tries to ride. The skill is otherwise like Driver (below).

Driver — This is the ability to drive a standard car, pickup, van, etc. — anything with four or six wheels — or a reversed trike. Someone without this skill may attempt to drive such a vehicle, but always subtracts 2 from his handling class. At the base level, the character is an average driver. Each additional plus adds to his reflex roll. At the beginning of each combat, every driver makes a reflex roll: On a 5, the HC of the vehicle is raised by one for the duration of the combat; on a 6, the HC goes up by 2. A Driver +2, for example, would get to add 2 to the die roll. Each additional plus is also added to the base HC of a vehicle to determine how many points are recovered on the Vehicle Record Sheet at the beginning of each turn.

A good driver is better at keeping his vehicle under control. Whenever a vehicle is forced to roll on a Crash Table, subtract the driver's Driver skill bonus from the roll.

Engineering — This covers design and construction of vehicles, vehicular components and other technical equipment. Engineering can also be used to create traps, alarm systems, etc. from available materials. Requires Mechanic at base level or better.

Espionage — The tricks of covert and criminal operations,

including but not limited to smuggling, counterfeiting, and the gathering and interpretation of intelligence. Of course this includes *counter*-intelligence — defeating all of the above.

Explosives — This covers the planting and detonating of explosives that require more talent than just pulling a pin or lighting a fuse. It includes the knowledge of storing and caring for explosives so that they don't become inert (or explode spontaneously) and a general knowledge of explosives and detonators, both manual and remote.

Successfully planting and detonating an explosive device requires an Explosives skill roll. If the roll is failed, immediately roll 2 dice and consult the following table:

2 — The explosive goes off as the character is setting/placing it. Assess damage and scrape up what's left . . .

3, 4 — The explosive goes off earlier than intended. How much earlier depends on how long a delay was intended and should be determined by the referee.

5, 6 — Explosion only does half the intended damage.

7-9 — The explosive doesn't go off. It's a dud.

10, 11 — The explosive goes off later than intended. How much later depends on the length of the delay and should be determined by the referee.

12 — The explosion does twice the intended damage.

Fast-Talk — The skill of weaseling one's way out of a situation by getting someone else to make a snap decision in one's favor. To fast-talk a potential sucker, a character rolls against his Fast-Talk skill, adding any modifiers the referee feels appropriate (an enemy in a firefight will be more resistant to a pitch). Fast-Talk may also be used to *resist* someone else's attempt to Fast-Talk, in which case a quick contest of skills is required.

Gunner — This is the ability to use the targeting system common to all vehicles, and to fire any vehicular or tripod weaponweapon. A character without this skill has a -3 to hit with any vehicular weapon, -2 with a tripod weapon. Each plus adds 1 to the gunner's to-hit roll: a character with Gunner +3 adds 3 to any to-hit rolls he makes. Entering a combat while in control of a weapon is worth a Gunner skill point; each kill scored is also worth 1. Note that if the driver of a vehicle also pulls the trigger of the weapon that scores a kill, he gets two skill points — one in Gunner and one in Driver — for the kill.

Handgunner — The ability to use hand weapons and grenades. Anyone without this ability has -2 to hit with all aimed hand weapons, but may throw grenades without penalty. Each plus gives a +1 to hit with all hand weapons and grenades.

Helicopter Pilot — The ability to fly a helicopter. Characters without this skill can't even start a chopper, much less get it off the ground. The skill is in all other ways analogous to Driver.

Hobbies — Covers skills studied for their own sake or for recreation or aesthetic appreciation, such as musical performance, woodcrafting, sports, photography and other fine arts.

Hover Pilot — This is also exactly like Driver skill (see above), except that it relates to hovercraft.

Journalism — The ability to conduct an interview, retrieve data and use journalistic equipment (videocams, word processors and the like). This skill also covers professional writing and broadcasting.

In an interview situation, a failed roll means having to start over; a badly failed roll angers the interviewee, possibly to violence. A very successful (+5 or better) roll uncovers the *real* dirt — or at least a clue to where the real dirt lies.

Law — Provides a knowledge of general law, with specific knowledge of local laws and legal process. A successful Law roll will get the character out of court, should he find himself there. Given the frontier nature of justice in the 2040s, this may not be all that likely . . .

Leadership — The practical ability to command a group of

people effectively. A successful roll is required to lead non-player characters into a dangerous situation. A badly failed roll could get the character lynched; a wildly successful one inspires the troops to the point where they'll follow him *anywhere*.

Luck — Each level of Luck adds 1 in favor of the catch-all "roll 2 dice and pray" method for handling odd situations. Luck will *not* help if there is another skill that can do the job.

Martial Arts — This is the ability to fight more effectively in hand to hand combat (see p. 45). Characters with the base skill may attack twice per turn hand-to-hand. At +1, they get +1 to their to-hit roll; at +2, they get an additional point of damage. The cycle repeats beyond that: at +3, the character gets an additional attack per turn; at +4, he gets an additional +1 on the to-hit roll; at +5, he gets an additional damage point; and so on.

Mechanic — This is the ability to repair vehicles and components. The time it takes to repair something (if it can be repaired at all) is a function of the character's Mechanic skill, as well as the difficulty of the job and the tools that are available.

Repair Chart

Level	Trivial	Easy	Medium	Hard	Very Hard
No skill	2	11	x	x	x
Mechanic	1	9	11	12	x
Mechanic +1	1	7	9	11	14
Mechanic +2	1	5	7	9	11
Mechanic +3	1	3	5	7	11

To perform a given repair job, a Mechanic must roll 2 dice, and get the number shown on the chart (or higher). He may try once per hour (every 30 minutes for a Mechanic +3). An "x" means the job is impossible at that skill level. These numbers assume the mechanic has basic tools. If he is working with improvised tools (pocket knife, chewing gum, baling wire), subtract 2 from all rolls. If he has a portable shop (see p. 90), add 1. If he is working in a regular garage, add 2. A successful roll repairs 1 point of damage on the item in question (3 points if armor is being repaired), or successfully installs/dismounts/salvages the item in question.

Any number of mechanics can work on the same vehicle, but no more than three can work on the same item at once. Each one rolls separately for success.

Difficulty of Repair Jobs

Impossible (cannot be attempted): Repair damaged tires, repair computer.

Very Hard: Jury-rig rocket, missile or laser; repair copter rotor.

Hard: Jury-rig other components; repair laser, rocket, missile, radio or power plant.

Medium: Repair any weapon other than laser, rocket or missile; reweld or patch armor; remount kingpin on tractor-trailer rig; repair fifth wheel on tractor; salvage radio, power plant, or computer from a wreck.

Easy: Replace weapon link; salvage other items from a wreck.

Trivial (even someone with no Mechanic skill can do this): Reload ammunition; replace or salvage tire; salvage spare magazines and unused ammunition from a wreck.

Repair is the process of fixing a damaged part. Each time a successful roll is made, one DP is restored to the item (or 3 points in the case of armor). If a component is totally destroyed, it cannot be repaired — only jury-rigged.

Jury-Rigging is a temporary repair job. If the proper roll is made, the jury-rigged component regains 1 DP, putting it back in service. A jury-rigged component can never be properly repaired, and if it is damaged again, it cannot be jury-rigged a second time. Some items will be destroyed so totally that they

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cannot even be jury-rigged — like what's left of a cycle after a head-on collision with an 18-wheeler.

Salvage is the removal of a part from a wreck. A mechanic must make the appropriate repair roll to salvage any given part.

Installation is the opposite of salvage — putting a new part in to replace a destroyed one. The old part must first be "salvaged" (that is, removed), even if it was totally destroyed. The roll to install any part is the same as the roll to repair it — see the chart above. When the roll is successfully made, the part is installed.

Learning the Mechanic Skill

The only way to learn or improve this skill is to spend game time as a full-time mechanic at a duel arena, truck stop or garage. Since this is not especially thrilling, most high-level mechanics will be the referee's characters, or player characters that started by taking Mechanic +1 or +2. If a character decides to drop out of duelling to become a mechanic, it takes a year (during which he also earns $6,000 above living expenses) to get the basic skill. It takes 2 more years (clearing $8,000 a year) to get to +1, 3 more years (clearing $10,000 a year) to get to +2, and 5 more years (clearing $15,000 a year) to get to +3. A Mechanic +3 has a fairly safe life and earns $20,000 a year above living expenses. Mechanics may rise no higher than +3.

Paramedic — This skill helps save injured victims.

If a character is at 0 DP but not below, and the medic can get to him within 20 turns of the fatal injury, a successful roll will save the character's life. He will remain at 0 DP, but will be alive. DP are healed at the rate of one every 2 weeks of game time. If a victim is below 0 DP, or the medic doesn't get there in time, or fails his roll (only one chance), the victim is dead. Every successful use of the Paramedic skill is worth 2 skill points toward improvement of that skill.

If a victim has 1 DP left (that is, he's unconscious), a successful Paramedic roll will revive him for a few minutes (long enough to get some important information, for example).

Navigation — Use of stars, charts, satellite relays, nav computers and other tools to determine position and plot courses.

Politics — The techniques of winning votes, diplomacy, bootlicking and other social graces, as well as the administrative functions of office. This also covers etiquette and savior-faire.

Running — Everyone starts with this skill at its base level. Each plus adds 2.5 mph to a character's speed — with Running +3, you move at 20 mph and Sprint at 25 mph! No character may move faster than 25 mph (even while Sprinting). There is no way to earn points specifically in Running, but *general* skill points may be spent to improve the skill.

Security — The knowledge of security systems — techniques and methods of construction, and ways to disarm or fool them.

Science — This is broken into specific areas of study (biology, genetic design, astrophysics, psychology, mathematics, etc.) and indicates a character's knowledge in that field. A successful Science roll allows a character to remember or find valuable information related to the subject, or solve a complex problem.

Stealth — The ability to avoid detection on foot. This skill is *only* usable on foot, and cannot be attempted while under direct observation. Standard bonuses/penalties are:

good lighting:	-5
average lighting:	-3
fair lighting:	-1
poor lighting:	no modifier
appropriate camouflage gear:	+2
forest, jungle, etc.:	+2
plains, desert, etc.:	-3

Streetwise — This skill allows a character to get around in the underworld, get a piece of the action and make the contacts he needs. Successful use of Streetwise lets you find out where any sort of illegal activity is going on, who can (or must) be bribed, and so on.

Survival — A character with this skill has been trained in survival techniques in *all* different environments (forests, deserts, city ruins, etc.). Higher levels of Survival make it easier to find food, water, shelter, etc.

Swimming — Anyone with base level in Swimming, or Swimmer +1, can swim at 2.5 mph. A Swimmer +2 or +3 swims at 5 mph. A Swimmer +4 or more could swim at 7.5 mph (but only with *fins*, — see p. 47).

Anyone without base skill can still tread water if carrying no more than 3 GEs (or 10% of their body weight, if you are using the alternate encumbrance system).

Swimmers can only carry 3 GEs of equipment (or 10% of their body weight) without penalty. Anyone carrying more is slowed — 4 to 6 GEs (20% of their body weight) slows a swimmer by 2.5 mph, 7 to 9 (30% of body weight) slows by 5 mph, and any more slows to 0 mph (barely able to float). Anyone slowed below 0 mph is no longer swimming, but sinking; drop some encumbrance or die. Body armor, fire retardant suits, and other such "clothing" can be worn in water, but count as 2 GEs of equipment in water. Improved Body Armor counts as 3 GEs. Swimmers can change direction up to 90° each time they move.

Swimmers can swim underwater for up to 30 seconds, plus 10 seconds for every Swimming skill level above base level.

Teaching — The ability to instruct another character in the use of a skill. Takes 6 weeks per level. A teacher can train someone up to one level below his own in a particular skill; naturally, the teacher must *have* the skill in question.

Theft — The fine arts of electronic lockpicking, sleight of hand, picking pockets, breaking and entering, shadowing and other illicit talents. A failed roll means the thief didn't get what he wanted; a badly failed roll means he got caught. Further events are up to the referee.

Theft and Espionage overlap to some extent; which skill to use in a situation should be determined by the referee. Sometimes both are appropriate; for instance, a character might use Theft to pick the lock to an office, where he would use Espionage to determine whether anything there is valuable enough to steal, and then use Theft again to take possession of the material.

Trucker — This is the ability to drive any oversized vehicle: a bus, RV, ten-wheeled truck, or tractor-trailer rig. A non-Trucker subtracts 2 from HC when trying to drive an oversized vehicle — -4 if he doesn't have the Driver skill either! Otherwise, the skill is treated like Driver.

Prestige

This is a character's status among other autoduellists and the millions of TV autoduel fans. Prestige increases a character's possible arena winnings and decreases his expenditures for new cars, parts, repairs, etc.

Each character starts with 0 prestige. Arena combat always counts for prestige; road combat sometimes affects prestige. There is a 2 in 6 chance that any road combat will have been witnessed or filmed by helicopter TV crews, in which case it scores normal prestige. Otherwise, you're an unsung hero for that fight — no prestige. In some situations (inside a city, in an area with competing TV stations that devote more time to autoduelling, etc.), the chance of a witnessing TV crew may be higher. That decision is up to the referee.

An ace is a character who has participated in five *confirmed* kills — that is, arena kills or road kills that were witnessed. A double ace is a character with ten confirmed kills.

Scoring

Prestige is scored as follows:

For entering combat: +1

Winning an event: +2

For each kill your vehicle scores: +2

Your vehicle "killed" but you survive unhurt: -1

Your vehicle "killed" but you survive with injury: -2

You leave your vehicle while it can both move and fire: -1

You leave the arena in a vehicle that can both move and fire: -1

You attack with hand weapons while outside a vehicle: +1

You kill a vehicle occupied by a character with prestige of 15-20: +1

You kill a vehicle occupied by a character with prestige over 20: +2

You become an ace: +5

You become a double ace: +10

A character may earn up to 3 extra prestige points per game for excellent play, lucky shots, or survival against bad odds. These points are awarded by majority vote of the players and onlookers during that game. The referee breaks ties.

Being killed lowers prestige: -1 for a heroic death, -2 for an ordinary combat death, -3 for a mundane death, -5 for a cowardly death.

Advantages of Prestige

In any arena combat where cash prizes are offered, a character with prestige of 10 or better earns a percentage bonus equal to his prestige; that is, a prestige of 17 earns a 17% bonus. In addition, a character with prestige of 15 or better gets a 25% discount on all new car purchases and repairs (for his own use only); prestige of 25 or better earns a 50% discount. This is in return for the champion's sponsorship of various brands of ammunition, autos, weapons, etc.

Wealth

Each character begins with 0 wealth. He can get started in a number of ways. He could enter an "Amateur Night" arena scenario in which the network supplies vehicles for aspiring drivers, or he could be hired as a mercenary for a highway convoy. However a character gets started, there are several ways he can earn money:

Selling cars: A car may be sold for salvage after it has been used. Most arena contests give a survivor the right to salvage his kills, too.

Arena prizes: This is the big money. The referee for a continuing arena campaign may set cash prizes. A typical purse would be from ½ to 1½ times the total value of the vehicles competing.

Road salvage: You can earn money the way the cycle gangs do: pick a fight on the road, and strip your kill for salvage.

Perform missions: Many adventures involve doing something hazardous (deliver an item or person to another city, protect a person, steal an item) for pay. These can be very profitable, but the risk is high and the characters should be well-equipped and experienced. This is not for beginners.

Transactions with other players: Car sales, used equipment, side bets, and whatever else you think of.

Other than car repairs and ammo purchases, the only expense a continuing character has is $150 per week for food, a place to stay and power plant recharges. A character with no money must sell something or starve. A character with no money and no car is obviously afraid to enter the arena, so his prestige drops to zero and he's out of the game.

Staying Alive

An adventurous character can have a very short life. This can be frustrating if you spend a half-hour working up a character, and he dies in 15 minutes. There are three ways around this. The first, of course, is to run for home when the bullets start flying. This is safe enough, but not too interesting.

Organizations

Instead of playing an individual, you can play a whole group. You can run a trucking company, bus line, cycle gang, local police department, autoduelling club, vigilante group, hijacking ring, or truck stop. When an individual character dies, you can replace him — and the group goes on. You can standardize cars and equipment . . . and if someone gets killed, his savings go to the organization. A good campaign can have several such groups, sometimes cooperating and sometimes fighting, with plenty of room left for people who want to play individual characters.

Gold Cross

This is a real *life*-insurance plan, made possible by the miracles of medicine available to the wealthy in the 2040s. If referees wish to ignore this section and make their campaign a little (or a *lot*) more deadly, feel free.

Basically, Gold Cross is a clone bank. A few cells from your body are quickly grown into a mature clone. The clone will be in perfect health, and will seem about 25 years old. Should anything happen to you, your clone can be activated — and you live again! Your new body will be legally recognized as "you," and will have access to your bank account, ownership of your material goods, etc.

Naturally, there are a few catches. The process is expensive (see fee schedule, below). When something happens to you, your body must be transported to the Gold Cross center where your clone is kept, and it must get there within 24 hours of your death — or within a week if the body is frozen within 24 hours of death. A totally burned body, or a body that took more than 10 hits damage, cannot be "read." If your body gets there in time, though, the clone can be programmed with all your memories, up to the moment of death, and all your skills.

As an alternative to rushing your body to Gold Cross after something happens, you can transfer your memories to your clone *before* anything happens to you — just to play it safe. This way, no matter what happens, your clone can be activated. A new memory transfer has to be made every month, or the clone mind will go blank. In the past, memories could only be stored in the human brain. The year 2035 saw the development of a mechanical memory storage device (or MMSD).

The MMSD is a permanent repository for your memories, unlike the inactivated clone, which must be reprogrammed monthly. In the event you are no longer around, the MMSD can be used to program a clone. It's very expensive, and not very portable. In general, MMSDs must be moved on wheeled dollies — they weigh 800 pounds and take up 6 spaces as cargo.

If you let more than a month go by without re-programming your clone (and you have no MMSD), and something happens to you, your own body is the only source of your memories — so if something permanent happens to you, you're really dead. Note also that if your clone is activated from an old memory transfer or an MMSD, the clone will have only the memories and skills you had when you programmed it. Furthermore, it takes a month to grow a new clone. Unless you can afford to keep two clone bodies in storage or have an MMSD, don't get killed more than once a month.

In all cases, the donor (alive or dead) or his MMSD must be present to transfer memories. The process takes less than an hour.

When something happens to you, Gold Cross will act as soon as they hear about it — preparing your clone for activation if your body is on the way, awakening a previously programmed clone if that is necessary, or transferring the memories from your MMSD to a clone body. In most cases, notification must come from the friends of the temporarily deceased character.

Gold Cross has offices in all major cities. Its services are available to everyone, though wanted criminals often have to pay a substantial bribe to a doctor or administrator. It's a mercenary operation, as might be expected of anyone selling new lives. Keep Gold Cross paid, and they are very reliable. Miss a payment, and your clone will get chopped up for organ transplants.

Gold Cross Fee Schedule:
To grow a clone body: $10,000
First programming, a month after starting clone: $1,000
Each monthly reprogramming thereafter: $3,000
To program (or update) an MMSD: $25,000
Keeping clone alive if it is not reprogrammed monthly:
  $1,000/month
To read a dead body (or MMSD) into an unprogrammed
  clone: $5,000
To send refrigerated vehicle or helicopter for a body (on
  request): Variable, but always high! $5,000 for simple missions, lots more for long distances or hazardous travel.

Pedestrians

Not everyone has a car. Vehicles may face challenges from enemies on foot — or a driver may leave a wrecked vehicle and sprint for safety. A pedestrian is represented by a counter that is ½" × ¼". The pedestrian is considered to be in just the front half of the counter — a single ¼" square. The larger counter is provided for ease of handling. Anyone firing on a pedestrian must trace a line of fire to the particular square the pedestrian is in, not just any part of the entire *counter*. Pedestrian counters should always be lined up with the map grid.

Movement

The base movement rate for pedestrians is 12.5 mph, or five ¼" squares per turn. You may elect to go slower, and there are ways of going faster (see below). To determine the phases in which you move, multiply your speed by 4 and read the appropriate line on the Movement Chart, p. 4. Move ¼" in each phase the chart indicates. For example, someone moving 17.5 mph would move ¼" in each phase indicated on the chart for 70 mph. Pedestrians go before cars moving at the same speed.

Going Faster

Spending points to increase your Running ability will increase your base speed. For short periods of time, you may also opt to Sprint. A Sprinting character increases his speed by 5 mph for up to 10 seconds. After the 10 seconds, he can continue to run, but only at his base speed, and only for a maximum of 10 more seconds. Then he must stop and rest. After Sprinting, a character must stop and rest for 1 second for every 2 seconds spent Sprinting; if he Sprinted for 6 seconds, he must rest for 3, for example. A character who is resting can do nothing except catch his breath. You cannot Sprint up a flight of stairs, and you cannot fire a weapon while Sprinting — but if you need to get under cover fast, the extra speed could save your life.

There is no limit to the number of direction changes a pedestrian can make — don't bother with handling classes, control rolls or Crash Table rolls.

Stairs

Stairways are marked on *Car Wars* maps as a series of squares, with every other square marked with a floor number. When a pedestrian reaches the numbered square corresponding to the floor he is on, he must stop. On phase 1 of the next turn, he may move one square up or down. On phase 1 of the turn after that, he may move again. This continues until he reaches the floor he wants. On the turn after reaching the numbered square for any floor, the pedestrian may move on that floor normally. The uppermost box of many staircases is marked "R," and represents a hatch to the roof of the building. It takes one turn to move from the "R" square to any adjacent square — then movement continues normally.

The Running skill helps a pedestrian when climbing stairs. For each level of Running the character has above base level he can climb one additional square per turn, up to a maximum of 5. If a Runner +2 was climbing a set of stairs, he would climb one square on phase 1 of the turn, then another on phase 2, one on phase 3, and then again on phase 1 of the next turn.

Equipment and Encumbrance

Pedestrians may carry up to six grenades, or six *grenade-equivalents* (GEs) worth of equipment; see the list on pp. 46-48. This does not affect their movement. Carrying a heavier load, except with a pack or similar item, is prohibited. For more realism, see the *Alternate Encumbrance Rules* on p. 49, in which encumbrance is measured in pounds and *does* affect movement.

Combat

Pedestrians can use hand weapons only. A complete list is on p. 47-49. A pedestrian can only fire once a turn. Once a pedestrian fires, he cannot move for the rest of the turn. A Sprinting pedestrian cannot fire at all.

Pedestrians have 3 Damage Points — the first hit wounds, the second knocks unconscious, and the third kills. They *can* wear body armor, which adds DP.

If a vehicle collides with a pedestrian, use the collision system in Chapter 2. Remember, pedestrians have a damage modifier of ⅕. The collision system can also be used if pedestrians run into each other.

Hand-to-Hand Combat

For one pedestrian to strike another, he must be in a square adjacent to his intended victim. He must roll a 2 or higher to hit, but all targeting modifiers (except for the point-blank range bonus) are in effect, including the -3 for targeting a pedestrian, so the net effect is that — most of the time — he will need a 5 or better on 2 dice. A human fist does 1d-5 damage. If the attacker has something heavy in his hand — a pistol, an unused grenade, or a rock (any debris marker will yield something appropriate), the damage roll is 1d-4. The Martial Arts skill (see p. 41) can also affect the results of hand-to-hand combat.

If a pedestrian has moved more than half his movement allowance in a given turn, he cannot attack hand-to-hand this turn.

A pedestrian may also make a "hand-to-hand" attack against an adjacent vehicle. He must have something to hit it with — a bare-handed attack against vehicle armor is pointless. A pedestrian with a rock or other object may strike a vehicle once per turn (no to-hit roll is needed), for 1d-5 damage. A hand weapon used in this fashion will no longer be useful as anything but a club.

A hand weapon may also damage a vehicle in a more conventional way. Any hand weapon fired from point-blank range at a stationary vehicle hits automatically, doing 1 point of damage. A

hand weapon that would ordinarily do more than 1 point of damage against a vehicle (such as the SMG) gets the higher damage.

Hand weapons take one turn to reload; this replaces one magazine, one tube of a gyroslugger, etc. Nothing else can be done while reloading a weapon. When a pedestrian is hit by a weapon, he will always take a minimum of 1 point of damage from that weapon.

Dropping Prone, Crawling and Hiding

A pedestrian can drop prone instantly — this takes no time. A prone pedestrian can be in the open (an extra -1 to hit), completely safe (behind a wall, for instance), or covered but not completely safe (if he is prone in rubble, he is at a -5 to hit). A pedestrian can fire from prone position. Being immobile gives him a +1 to hit. A pedestrian who is in safe cover (such as behind a wall) but sticks his head out to fire is at a -2 for cover.

A prone pedestrian can crawl, moving in phases 2 and 4 only. He cannot fire while crawling.

It requires a full second to stand up from a prone or crawling position.

Spikes, Oil and Mines

It's possible for pedestrians to run afoul of the nasty surprises dropped on city streets and intended for vehicles. When a pedestrian enters a square covered by a spike counter (not the adjacent area, but the counter itself), he must roll 2 dice. On a 2 or 3, the pedestrian takes 1d-4 points of damage.

A pedestrian on oil is more likely to resemble a Keystone Kop than Clint Eastwood. When a pedestrian enters a square with oil on it, he rolls 2 dice. He must roll a 5 or better to stay on his feet. If he moves immediately to another square with oil, he must roll a 7; then a 9, and then an 11 for each subsequent square. If a pedestrian falls, he can either spend an entire second to stand up — which still requires a roll of 7 or better on 2 dice to accomplish — or crawl, moving only during Phases 2 and 4.

Flaming oil has the same effect as regular oil, and pedestrians also take 1 point of damage at the end of every turn they're in it. Body armor does protect against damage from flaming oil.

The weight of a pedestrian will not set off vehicle-type mines.

Pedestrians and Vehicles

A pedestrian must stand beside a cycle for one full turn (one second) to get on. The next turn, he is astride it. He must remain motionless for 3 seconds, this being about the time necessary to get a cycle running. After the 3 seconds, he can move normally. A driver getting off a cycle (or out of a vehicle) must spend a full turn beside it after coming to a complete stop (time to dismount) and then may run normally.

A driver or passenger may jump from a moving vehicle. Roll for damage as if the jumper were hit by a vehicle (with a damage modifier of 1) going 10 mph slower than the vehicle was going. The jumper lands in any adjacent square, and may move and/or fire beginning the next turn.

It would take about 30 seconds to pick up and restart a fallen cycle of any size. Most combats won't last that long.

To enter a larger vehicle, a pedestrian must stand beside it for one turn (opening the door). On the next turn, he may enter. The next turn he may close the door; if the side of the vehicle is hit while the door is open, treat that side of the car as if it had a sunroof (p. 92) to determine where to apply the damage. If the vehicle is not running, it will take 3 seconds to start it. If that's the case, it cannot move until the fourth turn — but it may begin firing weapons immediately.

Boarding Vehicles

To climb onto the outside of a vehicle, a pedestrian must make a roll, as follows:

Vehicle speed 10 mph or less: automatic success
15 mph: roll 4 or more on 2 dice
20 mph: roll 5 or more on 2 dice
25 mph: roll 7 or more on 2 dice
30 mph: roll 9 or more on 2 dice
35 mph: roll 10 or more on 2 dice
40 mph: roll 11 or more on 2 dice
45 mph or greater: impossible

A pedestrian trying to board a tractor reads the table at 5 mph higher than the vehicle's actual speed. In other words, a pedestrian trying to board a tractor moving 15 mph reads the table at 20 mph. A pedestrian trying to board any vehicle from the side reads the table at 15 mph higher than the vehicle's speed. These penalties are not cumulative (i.e., you don't add 20 mph when trying to board a tractor from the side). Use the worst applicable modifier. A pedestrian may attempt to board a vehicle any time the vehicle is in an adjacent square.

Being noticed: A pedestrian boarding an occupied bus or trailer will be noticed 5 out of 6 times. A pedestrian boarding an unoccupied trailer hitched to an occupied tractor will be noticed 3 out of 6 times. You cannot board any other occupied vehicle without being noticed. These odds can be modified by the referee for weather, poor visibility, well-planned distractions, etc.

Dropping On: A pedestrian may also drop onto the top of any vehicle if it passes directly beneath him. Roll 2 dice:

4 or better to land on a bus or any trailer except a tanker.
5 or better to land on a tractor (double damage for failure)
6 or better to land on a tanker (the top is curved!)
6 or better to land on a pickup or van
7 or better to land on a luxury or mid-sized
8 or better to land on a compact or subcompact.

Subtract 1 from the roll if the weather is bad. Subtract 1 if the vehicle is going 20 to 30 mph, 3 if it's going 35 or 40 mph, and an additional 2 for every 10 mph faster. A character who drops onto a vehicle has the same chance to be noticed as one who climbs aboard.

Vehicle-to-vehicle: A person on one vehicle may try to jump or climb to another while both are moving. If the vehicles are within 1/4" of each other, use the climbing-aboard rules — determine the relative speeds of the two vehicles, and read the appropriate line. Because of the difficulty, subtract 2 from your roll. If the vehicles are more than 1/4" apart, but less than 3/4", use the dropping-on rules — again, subtract 2 from your roll. Rules for being noticed are the same.

Failure: If you miss your roll, you hit the ground and take damage as if being rammed at (Vehicle Speed minus 10 mph).

Movement on top of a vehicle: A pedestrian can only move around atop an oversized vehicle or in a pickup bed. There is no place to go on a smaller vehicle! It takes one second to reach the top of a vehicle from the ground, or to stand up after dropping onto it. A pedestrian can safely move one square per turn (in Phase 5) while on top of a moving vehicle. Moving faster involves risks: Moving twice a turn (in Phases 1 and 5) requires a roll of 4 or better on 2 dice to stay on; moving three times (in Phases 1, 3 and 5) requires a roll of 6 or better to stay on. Moving any faster is not practical (or wise). A pedestrian who fails that roll is automatically noticed, and takes damage as above for jumping off a vehicle.

A pedestrian atop a vehicle can fire his weapon, throw grenades, etc., normally. He can also plant a limpet mine; no die roll is needed to succeed at this.

A pedestrian on a vehicle will be subject to fire from a turret

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on that vehicle, if he is at that turret's level. Use common sense to determine this.

Examples: A pedestrian atop a bus can be hit by a turret on the bus, or on another bus the same size. A man in the bed of a pickup cannot be hit by a turret on the pickup's cab, unless he stands up. A pedestrian on a trailer cannot be hit by a turret on the tractor, since the trailer top is higher than the tractor. A pedestrian cannot hide behind or on top of a turret; it moves quickly enough that he would be thrown off.

A pedestrian on a vehicle can also attack its front-, side-, top- and back-mounted weapons, using his own hand weapon, if he can move adjacent to the appropriate side/end of the vehicle. He automatically hits, doing one point of damage; there is a 50% chance each time that the damage will bypass the armor and hit the weapon directly.

Getting off: If a vehicle crashes with a person on top, it is assumed the pedestrian jumped clear, taking damage as described under *Failure* above, for hitting the ground. A person could also attempt to "swing down" from a moving vehicle. The chance of making it without injury, and of not getting noticed, is the same as for climbing aboard at the same speed.

Any hazardous event or maneuver may throw riders off the top of a vehicle. When a vehicle undergoes any D2 or greater hazard, or any D3 or greater maneuver, anyone on board must roll to stay on. The roll is 3 or better on 2 dice, plus 1 for every 10 mph the vehicle is moving — e.g., 8 or better at 50 mph.

A trailer has clearance of only 2 feet above the ground. Thus, no normal vehicle can pass under a trailer. However, a pedestrian could move (or hide) under a stationary trailer, provided he crawled (moving in Phases 2 and 4 only).

Pedestrian Equipment

Ammo clips — $50 + cost of a full load of ammo for that weapon, ½ GE each for most weapons, 1 GE for SMGs and GLs. *Extended Ammo Clips* are available for pistols, SMGs, and rifles. $80 + cost of ammo, holds twice as much ammunition as a standard clip. Extended ammo clips take up 1 GE for most weapons and 2 GEs for SMGs and GLs.

Backpack — $40, no GEs. The pack carries 5 GEs' worth of hand weapons that do not count toward the 6 GE limit. It takes a firing action to remove or don a backpack, and items may be added to or removed only from a laid-down pack. It takes 1d seconds to add something to or remove something from the pack. If the pack is carried rather than worn, it counts as 5 GEs.

Battle Vest — $75, 3 GEs. Holds one pistol, two grenades of any type, two hand-weapon magazines of any type, and one Bowie knife. Fits over body armor, but must be worn to gain benefits; if carried, counts as 6 GEs. Putting on or removing a vest counts as a firing action, but adding something to or retrieving it from the vest does not. An *armored* version is available for $225, which gives the wearer an additional 3 DP, but only works on a 1 to 4 on 1 die. The armored battle vest cannot be worn over IBA or impact armor.

Body Armor — $250. Gives the wearer 3 extra damage points, but does not protect from falling or collision damage.

Improved Body Armor — $1,500. Works like regular body armor, except that it has 6 DP instead of 3. If the wearer is in a burning vehicle, roll 1 die each turn. On a 1 to 3, the wearer takes no damage. On a 4 to 6 the wearer takes the normal point of damage. Anyone wearing improved body armor must subtract one from his reflex roll because of the bulk, and pedestrians in IBA have their speed reduced by 5 mph (2 squares/turn). The IBA also includes a built-in gas mask, and reduces the amount a person can carry to 5 GEs.

Impact Armor — $2,000. Impact armor gives the wearer 6 additional DP and is fully effective against falls and collisions. Furthermore, any fall or collision damage is halved before applying it to the armor's DP. Naturally, once the armor is destroyed (by collision or weapons fire), these benefits are lost. Impact armor has the same effects on carrying capacity, reflex rolls and running speed as IBA, but it doesn't give protection from fire or gas. This item cannot be combined with any other form of body armor except for a fireproof suit.

Blended Body Armor — $750 and up. Gives the wearer 3 extra DP, just like regular body armor, but is indistinguishable from street clothes. Custom tailoring may cost more. Regular body armor of any type cannot be worn with this item, and a fireproof suit will be obvious if worn. Improved Body Armor is also available in a blended version for $5,000 and up, but it does not offer protection from fire or gas (though its penalties still apply). Impact armor is not available in a blended version.

Spiked Body Armor — adds $100 to cost of any kind of body armor. Spiked armor inflicts an extra point of damage in hand-to-hand combat, through the use of spiked knuckles, knees, etc.

Fireproof Suit — $500, no weight or space. Worn under body armor, the suit will protect the wearer completely from vehicular fires for 30 turns — after that, the wearer takes 1 point of damage for every ten more seconds exposed. The suit protects the same way against flaming oil and building fires. If the wearer is hit by any type of flamethrower fire, damage is halved (round down). The suit offers no protection from other weapons.

Folding Stock — $10. Adds 1 GE for pistols, and subtracts 1 GE for rifles, shotguns, gyrosluggers or SMGs. Not available for other hand weapons. A folding stock give +1 to hit with pistols when unfolded, but -1 to hit for other weapons when folded. Folding or unfolding the stock counts as a firing action.

Gas Mask — $30, 1 GE. Gas masks protect against tear gas and other irritants. If exposed to paint, wearer has -2 to his to-hit rolls until the mask is removed.

Hollow-Point Ammo is available for light pistols, heavy pistols, SMGs, rifles and assault rifles only. Regular cost × 2; adds +1 to damage against pedestrians and tires.

Infrared Goggles — $750, 1 GE. Operates like standard IR equipment (see *Infrared Sighting System*, p. 89), includes a battery pack that's good for 200 hours. Recharge time and cost are trivial. These may be combined with gas masks.

Laser Targeting Scope — $500, no weight or space. This scope may be attached to any weapon or tripod weapon. It gives a +1 to hit with any weapon it is attached to. User may "fire" the LTS instead of the weapon it's attached to in order to gain sustained fire bonuses. No to-hit roll is needed.

The LTS (and laser rifle) can be used for laser guidance (see *Laser-Guidance Link*, p. 83) at the normal costs, and can guide tripod-mounted weapons, MPRL and PMML ammunition only. For laser-guidance purposes, the LTS has a to-hit of 6. When using the LTS for laser guidance the weapon does not get another +1 to hit because of the scope.

Light Intensifier Goggles — $300, 1 GE. Reduces the penalty "to hit" for night combat from -3 to -1. A LIG/Gas mask combination costs $400, but is still only 1 GE. Not available in a no-paint version. Paint not only adds a -2 penalty, but also negates the goggles' bonus at night.

Limpet Mine — $60, 1 GE. A limpet mine can be used like a standard grenade, doing regular grenade damage. However, it can be armed with a delay up to 15 minutes and attached to any fairly smooth surface. It does not stick magnetically, but by a special glue in plastic beads that break and adhere. When an emplaced limpet mine goes off, it does grenade-type damage to everything within its 2" burst radius, plus 1d+1 to the armor

below. If it is on a weapon port, the damage goes directly to the weapon! It will not stick if thrown; it must be placed by hand.

Medikit — $1,000. Counts as a pedestrian's full load when carried. When stored as cargo, it takes up 2 spaces and 50 lbs., and has 3 DP. Gives a +2 bonus to all Paramedic rolls.

Portable Medikit — $750, 3 GEs. Worn like a backpack (5 GEs if carried by hand), takes 2 seconds to put on or take off. Gives a +1 bonus to Paramedic rolls; this cannot be combined with the bonus for the Medikit. If the wearer is hit, roll 1 die: on a 1, the Medikit is hit first, taking damage to its 2 DP.

Mini-Mechanic — $50, 1 GE. When using this item for any sort of repair job, the penalty for using improvised tools is at -1 instead of -2. Will fit like a grenade in a battle vest.

Plastique — $3,000 per brick, 1 GE. As cargo, each brick weighs 5 lbs. and ten bricks take up 1 space. Detonators are $50 apiece, no weight or space. Plastique will not explode unless electronically triggered by a detonator. It can be run over, dropped, stepped on, burned or shot, and it will not explode. Each brick can be cut into halves or quarters, though it cannot be bought this way. A full brick has 2 Blast Points (see *Kami-bombs*, p. 89); 1/2 brick has 1 Blast Point and a 1/4 brick has 1/2 Blast Point. A plastique explosive does full damage to pedestrians, half damage to tires and vehicular components. A separate detonator is required for each charge; detonators can be set when the charge is placed to explode up to 24 hours later.

Shaped Plastique — 1.5 × regular plastique cost; burst radius is halved, and the shaped explosive does 1.5 × damage within that burst effect. If placed on a vehicle, it does full damage to that vehicle, using the limpet-mine rules (see p. 46).

Plunger and Contact Wire — $100, 1 GE. It will always set off an explosive, provided that it has been properly set up beforehand. Each 20" coil of contact wire costs $25 and is 1 GE.

Portable Camera — $400, 1 GE. Not intelligent, but otherwise like the vehicular camera (p. 92). It holds one cube and can be hand-held, or, for an extra $200, helmet-mounted for no GE.

Portable Field Radio — $500, 3 GEs. This radio duplicates all the functions of the standard long-distance vehicular radio, including the 25-mile range. It can be worn as a backpack and has 1 DP. If a person wearing a PFR is hit, roll 1 die: on a 1, the PFR is hit first.

Portable Fire Extinguisher — $150, 20 lbs., 1/2 space carried as cargo, 3 GEs when carried. Puts out a vehicular fire on 1 to 2 on 1 die (or a 1 for a gas burner). Can be "fired" 20 times before it must be refilled — which costs $20 and can be done at many truck stops, armories and hardware stores.

Portable Searchlight — $100, 2 GE. Internal battery holds enough charge for 4 seconds at full intensity (treat as a vehicular searchlight with a to-hit of 7), or 6 hours at low (flashlight) intensity. Charging cost — $5, no time.

Riot Shield — $750, 3 GEs. This transparent shield has 7 DP and acts like a wheelguard. When the pedestrian carrying it is hit from the front, roll 1 die; on a 1 to 4, the shield takes the damage first (with any leftover damage still hitting target), and on a 5 or 6, the pedestrian takes full damage. The shield is made from vehicular plastic armor, and thus will take half or no damage from many hand weapons. Only pedestrians (not passengers in vehicles or on motorcycles) can use this item, and firing hand weapons while encumbered by the shield is at -1 to hit.

Speargun — $200, 2 GEs, to hit 8, 2 points damage. The spears are $15 ($20 with line) and 1/3 GE. The speargun has a single shot; reloading takes 2 seconds.

Swim Fins — $50, 1 GE when not in use. Fins are necessary for a character to swim at 7.5 mph. They take 2 seconds to put on and 1 second to remove (together).

Tinted Goggles — $20, no GEs. Protects the wearer against searchlights exactly like a tinted windshield (see *Tinted Windows*, p. 92). These cannot be combined with LIG.

Tool Kit — $600, 6 GEs. Includes enough tools and spare parts to allow a mechanic to work in the field at no penalty. Has 2 DP; the first point of damage hurts the case, and the second point breaks the case and destroys or scatters the contents.

Tripod Weapons — Adds 10% to the weapon's cost, 5 GEs. May mount up to 2 spaces' worth of any vehicular weapon (or linked weapons). Extra magazines may be purchased, and do not count toward the tripod's "spaces" — they are placed on the ground next to the weapon. Each extra magazine is 2 GEs. Weapons that require power (e.g., lasers) will require a battery.

A *tripod gunshield* can be added, adding 1 GE to the weapon, at $10 and 4 lbs. per point of armor (max. weight 40 lbs.). The shield acts like a wheelguard: On a 1 to 4, the gunshield takes damage before the target. Gunshield armor is considered to be a vehicular component, and thus takes half or no damage from many hand weapons.

Tripod weapons cannot be used by a normal passenger in a vehicle. A passenger who wishes to use a tripod weapon takes up an additional space (i.e., a gunner would take up 3 spaces). Tripod weapons take up 2 spaces as cargo.

Walkie-Talkie — $250, 1 GE. This item works like a vehicular CB and has a 3-mile range.

Hand Weapon List

Weapon	Abbrev.	GE	Damage	To-Hit	Cost	Shots	CPS	L $	Notes
Submachine Gun	SMG	2	1d	6	$250	10	12	$370	a
Rifle	—	2	3 hits	7	$120	20	1	$140	
Anti-Vehicular Rifle	AVR	3	1d	8	$600	10	5	$650	f
Heavy AV Rifle	HAVR	4	1d+3	8	$800	10	10	$900	f
Assault Rifle	AR	3	1d+1	7	$400	10	15	$550	a
Laser Rifle	LR	2	1d	6	$4,500	2	—	$4,500	b, f
Gauss Rifle	GR	2	1d	6	$1,500	20	15	$1,800	a, b
Gyroslugger (1 barrel)	GS1	2	Special	8	$1,200	Special	Special	—	c, f
Gyroslugger (2 barrels)	GS2	3	Special	8	$1,500	Special	Special	—	c, f
Under-Rifle Grenade Launcher	URGL	1	Special	7	$200	1	Special	Special	d, e
Under-Rifle Gyroslugger	URGS	1	Special	8	$1,200	1	Special	Special	c, d, f
Shotgun	StG	2	2 hits	6	$120	10	1	$130	k
Double-Barreled Shotgun	DStG	3	2/4 hits	6	$200	10/5	1	$210	k
Heavy Pistol	HP	1	2 hits	7	$100	8	1	$108	
Light Pistol	LP	1	1 hit	8	$75	8	1	$83	
Machine Pistol	MP	1	1d-2	7	$250	6	12	$322	a

Weapon	Abbrev.	GE	Damage	To-Hit	Cost	Shots	CPS	L $	Notes
Gauss Pistol	GP	1	1d-2	6	$500	20	5	$600	b
Grenade Launcher	GL	2	—	7	$300	5	—	—	e
Light Anti-Tank Weapon	LAW	2	2d	8	$500	1	—	$500	f
Very Light Anti-Tank Weapon	VLAW	1	1d	8	$200	1	—	$200	f
Laser LAW	LLAW	3	3d	6	$2,000	1	—	$2,000	f
Laser VLAW	LVLAW	2	2d	6	$1,500	1	—	$1,500	f
Man-Portable Rocket Launcher	MPRL	6	2d	9	$800	4	50	$1,000	f
Portable Micromissile Launcher	PMML	5	1d	8	$900	8	30	$1,140	f
Bazooka	—	4	3d	8	$1,500	1	50	$1,550	f, g
Stinger	—	5	4d	7	$1,000	1	—	$1,000	f, h
Portable Flamethrower	PFT	5	1d	6	$750	5	25	$875	i
Bowie Knife/Bayonet	—	1	1d-2	8	$50	—	—	—	j

Abbreviations: *GE* — Grenade Equivalent, a measure of bulk and weight that determines a pedestrian's carrying capacity. Pedestrians can normally carry 6 GEs of equipment. *CPS* — cost per shot. *L $* — loaded cost.

Notes

a. Does half damage to vehicles.

b. This weapon requires a power pack ($1,000, 3 GEs) to function effectively. The laser rifle only gets two shots without it, but will get 20 more with the pack. The Gauss rifle gets 60 shots' worth of power from the power pack, and the Gauss pistol gets 100 shots' worth of power from it. Note that the Gauss weapons still require ammunition.

c. The gyroslugger and under-rifle gyroslugger fire rocket shells of varying types. Reload shells are ½ GE each. The gyroslugger must be reloaded like a shotgun by breaking it open and inserting the shells; this takes one second per shell.

Standard — $100, 2d damage, burst effect.

Armor-piercing (AP) — $150, 2d+2 damage, no burst effect.

HESH — $250, 2d damage, removes 1 point of metal armor on every 4, 5 or 6 rolled, rather than just on a 5 or 6.

Incendiary — $300, 1d damage, burst effect, fire modifier 2, burn duration 1.

Flare — $50, ½d damage, fire modifier 1, burn duration 0.

Smoke — $50, creates a 1" × 1" cloud at the impact site, or a preset distance from the firer.

Paint — $100, similar to the smoke round. When fired at a vehicle, it is treated as if fired from a paint gun.

d. Under-rifle weapons may be attached to any rifle (rifle, AV rifle, HAV rifle, assault rifle, laser rifle or Gauss rifle) or gyroslugger, adding its GE to the other weapon. Either the rifle or the UR weapon may be fired in one turn, not both. *Exception:* If a gyroslugger has an URGS attached, both can be fired at the same time.

e. A wide variety of grenades are available for the discriminating duellist. When carried, they are all 1 GE each.

Concussion Grenade — $40. Does 1 point of damage to all pedestrians and exposed cyclists in a 1" burst effect radius, but has an additional effect on people within a 2" radius. Roll 1 die:

1, 2 — Victim unconscious for 10 minutes.

3 — Victim unconscious for 1 minute and stunned (unable to operate vehicle or weapon controls) for 2 more minutes.

4 — Victim unconscious for 10 seconds and stunned for 2 more minutes.

5 — Victim stunned for 30 seconds.

6 — Victim stunned for 10 seconds.

7 or more — No effect.

Characters inside a vehicle with intact armor between them and the blast are safe from the effects. Characters with a building, wall or other solid object between them and the blast add 5. Characters in a doorway or window, or in a vehicle which has breached armor between them and the blast, add 3 to their roll.

Explosive Grenade — $25. Does 1d damage to all vehicles within a ½" burst radius. Does 1d damage in a 2" burst radius to non-vehicular items.

Fake Grenade — $5. Looks real, but is only plastic.

Flechette Grenade — $20. Does 1d damage to all pedestrians and exposed cyclists in a 2" burst radius. No damage to tires or vehicular components.

Flaming Oil Grenade — $75. Creates a ½" × ½" slick of oil which ignites after 1 phase, just like a standard FOJ slick.

Flash Grenade — $150. Any person within 2" of a flash grenade when it detonates is blinded for 1 second at night. Effects are doubled if the victim is wearing LI goggles. Naturally, if a character cannot trace line-of-sight to the grenade, he is immune to its effects. For this purpose, smoke blocks LOS.

Foam Grenade — $30. If this grenade is thrown within ½" of a fire, it puts out the fire on a roll of 1 on 1 die. The foam grenade can also be used offensively, because it blocks visibility like paint when used on a target vehicle.

Impact Fuse — $50 per grenade. This replaces the timer and causes the grenade to explode on impact.

Paint Grenade — $20. Creates a 1" × 1" paint cloud that is standard in every other way. Also available in colors.

Smoke Grenade — $20. Creates a 1" × 1" smoke cloud that is standard in every other way. Available in a variety of colors.

Tear Gas Grenade — $30. Creates a 1" × 1" cloud that lasts one minute. Effects on weapon and laser fire are the same as for smoke. Unprotected pedestrians and cyclists must roll once each turn they are in a cloud. Multiple rolls don't produce cumulative results — just apply the worst result rolled so far:

1 — Victim is unconscious for 5 minutes.

2-4 — For 1 minute, victim is -6 to hit with any weapon, and can only crawl at 3 squares per turn.

5-6 — Victim is -2 to hit with any weapon for this turn and 3 more turns.

Thermite Grenade — $100. Does 1d damage to all targets (including vehicles) in a ½" radius; has a burn modifier of 2/1.

White Phosphorus Grenade — $75. Does 1d damage to pedestrians, half damage to vehicles, within ½" of the blast. It creates a 1" × 1" smoke cloud on detonation; fire modifier 2; burn duration 1.

f. Does full damage to vehicles.

g. Spare bazooka shells are 1 GE each, and take 2 seconds to reload (1 second for two people). Characters reloading a bazooka cannot perform *any* other actions while reloading.

h. The Stinger is a one-shot weapon. To hit 7 against aerial targets or 11 vs. grounded ones. It has a 2" burst effect.

i. The PFT, when carried as cargo, weighs 75 lbs. loaded, 50 lbs. empty and takes up 1 space. The PFT will create a standard smoke cloud adjacent to the firing ped, pointed toward

the target. A pedestrian carrying a PFT moves only half as fast as other pedestrians. Should the wearer be hit, roll 1 die. On a 1 or 2, the PFT is hit (it has 2 DP), and will explode if the wearer rolls a 1 on a second die roll. Explosions are instantly fatal to the wearer and create a standard smoke cloud, aligned randomly. A PFT has a range of 5" and takes no time to set up or dismantle, since the user is wearing it as a backpack.

j. Only usable in hand-to-hand combat. When attached to the end of a rifle, it adds no GEs.

k. A double-barreled shotgun holds ten shells. One barrel or two barrels can be fired each turn. It uses the same ammo as the normal shotgun.

Alternate Encumbrance Rules

These rules are *optional*, and a bit more complicated than the grenade-equivalents system presented on p. 44. Feel free to use or ignore them.

A pedestrian can carry up to 200 lbs. of hand weaponry and other equipment. Several pedestrians can work together to carry heavier items (like tripod weapons) by dividing the weight among them. If you can get enough helpers, you can pull your car out of a ditch . . .

The amount of weight you carry counts against your vehicle's chassis limit (if you're in one), and affects your running speed:

Weight carried	Running Speed penalty
0-20 lbs.	None
21-40 lbs.	-1 square
41-60 lbs.	-2 squares
61-120 lbs.	-3 squares
121-200 lbs.	-4 squares (Anyone carrying this much weight must stop to rest every other turn.)

In addition to weight, personal equipment is also classified as to how it's carried: no-handed (on a belt, clip, or otherwise attached to the wearer), one-handed (most weapons fall into this category), two-handed (large weapons and other bulky items), and backpack. A pedestrian can carry one two-handed weapon or accessory in his hands at one time, or two one-handed weapons. Any number of no-handed weapons may be carried at one time. For obvious reasons, a pedestrian may only wear one backpack item. Backpacks are no-handed items when worn.

A pedestrian can wear up to six holsters (for pistols and other one-handed weaponry) and two slings (for rifles and other two-handed weapons). A weapon in a holster takes a turn to ready, while a slung weapon takes 2 turns to ready. Holsters and slings weigh 1/4 pound apiece.

Backpacks cannot be worn while driving, unless you're driving a motorcycle. Each backpack is assumed to take up 1/2 space when carried as cargo.

No-Handed Items

Armored Battle Vest	5 lbs.
Can carry up to 10 lbs. of one- or no-handed items.	
Battle Vest	5 lbs.
Can carry up to 10 lbs. of one- or no-handed items.	
Blended Body Armor	5 lbs.
Blended Improved Body Armor	10 lbs.
Body Armor	10 lbs.
Fireproof Suit	3 lbs.
Gas Mask	3 lbs.
Goggles (any type)	1 lb.
Improved Body Armor	25 lbs.

Laser Targeting Scope	1 lb.
Life Jacket	4 lbs.
Scuba Gear	60 lbs.
Silencer/Flash Suppressor	1/2 lb. for hand weapons, 2 lbs. for vehicular weapons.
Spiked Armor	+1 lb.
Swim Fins	4 lbs.
Under-Rifle GS/GL	8 lbs.

One-Handed Items

Ammo Clip	20% of weapon's weight.
Bowie Knife	1/2 lb.
Derringer	1/2 lb.
Extended Ammo Clip	30% of weapon's weight.
Gauss Pistol	2 lbs.
Grenade (any kind)	1 lb.
Hand-Held Flare Launcher	6 lbs.
Heavy Pistol	3 lbs.
Limpet Mine/Beacon	2 lbs.
Machine Pistol	5 lbs.
Mini-Mechanic	1/2 lb.
Pistol	1 lb.
Plastique, per brick	5 lbs.
Plunger/Contact Wire	1 lb.
Portable Searchlight	4 lbs.
Riot Shield	25 lbs.

Two-Handed Items

Assault Rifle	12 lbs.	
AV Rifle	25 lbs.	
Bazooka	20 lbs.	(Shells weigh 2 lbs.)
Double-Barreled Gyroslugger		18 lbs.
Double-Barreled Shotgun	12 lbs.	
Folding Stock		3 lbs. to pistols (subtract same weight from two-handed weapons)
Gauss Rifle	9 lbs.	
Grenade Launcher	11 lbs + wt. of grenades.	
Gyroslugger	14 lbs.	(Shells weigh 1 lb.)
Heavy AV Rifle	30 lbs.	
LAW	20 lbs.	
Laser LAW	25 lbs.	
Laser Rifle	10 lbs.	(w/o backpack)
Laser VLAW	18 lbs.	
Man-Portable RL	35 lbs.	
Man-Portable MML	30 lbs.	
Medikit	50 lbs.	
Personal Flamethrower	50 lbs.	(w/backpack)
Portable Camera	8 lbs. (3 lbs. if helmet mounted)	
Portable Fire Extinguisher	20 lbs.	
Rifle	10 lbs.	
Shotgun	8 lbs.	
SMG	9 lbs.	
Speargun	5 lbs.	
Stinger	30 lbs.	
Tool Kit	40 lbs.	
Tripod Gunshield	(Weight of the shield's armor)	
Tripod Weapons	25 lbs. + 1/2 weapon's weight.	
VLAW	10 lbs.	

Backpack Items

Backpack	5 lbs.	(Holds up to 20 lbs. of one- or no-handed items)
Portable Field Radio	15 lbs.	
Portable Medikit	25 lbs.	
Laser Rifle Backpack	30 lbs.	

5. Cars

Building a new car is complicated — just ask Detroit. When you first design a new vehicle, don't be surprised if it takes a little while. You must work within several constraints: *Space* available in the body size you pick, *weight* that chassis can carry, and *money* available. You have to make sure the car has enough power for decent acceleration. Within all these limits, you want enough armor and weapons to give you a chance to survive. And remember to allow money and weight for ammunition! When you come up with a good vehicle design, save it for later reference, or add it to the stock car list for your local arena.

Body Types

There are nine types of cars available to duellists, ranging from tiny subcompacts to large vans.

Type	Price	Weight	Max. load	Spaces	Armor Cost/Wt.
Subcompact	$300	1,000	2,300	7	11/5
Compact	$400	1,300	3,700	10	13/6
Mid-sized	$600	1,600	4,800	13	16/8
Sedan	$700	1,700	5,100	16	18/9
Luxury	$800	1,800	5,500	19	20/10
Station wagon	$800	1,800	5,500	14(+7)	20/10
Pickup	$900	2,100	6,500	13(+11)	22/11
Camper	$1,400	2,300	6,500	17(+7)	30/14
Van	$1,000	2,000	6,000	24(+6)	30/14

Price is the dollar cost of the body without armor, but with headlights, trim, seats, doors, instruments, basic targeting system, head-up windshield visual display, etc. *Weight* is the weight of the body and frame — it counts toward the *total* weight of the vehicle. *Maximum load* is the total weight (including the body and frame) the vehicle is allowed. Maximum load *can* be altered — see *Chassis*, p. 51. *Spaces* are the number of spaces available in the vehicle for equipment, weapons and people. Those vehicles with additional spaces listed in parentheses have cargo areas that can carry that number of spaces. Cargo areas cannot be used for vehicle components (except for items used to hold cargo, e.g., Armored Beer Refrigerators, Cargo Safes, etc.), but must be used for cargo.

Armor Types

Armor cost/weight is the cost and weight of a single point of ablative plastic armor. Cars carry armor in six positions: front, back, left, right, top and underbody. You can put different amounts of armor in different locations, but the cost per point is the same, no matter the location. The cost and weight per point of armor does vary according to the size of the vehicle, however. There are also a few special types of armor available to duellists — that can affect the cost and weight of armor, as well.

Fireproof Armor (FP) costs twice as much as normal armor, but weighs the same. As the name indicates, fireproof armor cannot be set on fire. It takes damage normally from all weapons, including flamethrowers and lasers, but if the armor is all that is damaged, you do not roll for the possibility of fire — it can't happen. If the armor is breached and internal components are damaged, regular fire rules apply to the inside. FP armor cannot be mixed with regular armor — the vehicle must be all fireproof or all regular. Repairing FP armor is at triple normal cost (see *Repair and Salvage*, p. 55).

Laser-Reflective Armor (LR) takes damage normally from all weapons except lasers. All types of lasers do half damage (round down) to reflective armor. Furthermore, laser-reflective armor will not take fire modifiers from lasers (though it will take them from flamethrowers and other fire weapons). Once the armor has been breached, internal components are vulnerable to normal chances of fire. Reflective armor costs and weighs 10% more than regular armor, and costs twice as much to repair as regular armor. Reflective armor cannot be mixed with regular armor.

Laser-Reflective Fireproof Armor (LRFP) combines the features of both types. It takes half damage from lasers (rounded down), and cannot be set on fire. It is 2½ times normal armor cost, weighs 10% more than normal armor, and costs four times as much to repair. It cannot be mixed with other armor types.

Radarproof Armor (RP) has twice regular armor cost, but the same weight. A vehicle with this armor is invisible to radar on a roll of 1 to 5 on 1 die; RGMs, radar-based ATADs, and other radar-guided weaponry cannot target the vehicle. On a 6+, the armor fails to shield, and the vehicle may be targeted normally. Add 1 to the roll for each facing of the car's armor (front, top, etc.) that is breached. Each vehicle trying to find the target vehicle can roll once per ten turns. If radar contact is broken, the vehicle which made contact must roll again.

All exterior armor on a vehicle must be radarproof, or the benefits are lost. Fireproof armor can be made radarproof for twice its usual cost. Laser-reflective and metal armor cannot be made radarproof.

Metal Armor costs 2½ times as much as normal plastic armor, and weighs 5 times as much. Normal armor is *ablative* — that is, it loses strength as it takes damage. Metal armor is only slightly ablative — any damage in excess of the armor value passes through to the interior of a vehicle, and the armor remains (more or less) intact.

If the damage rolled is greater than the value of metal armor at the location hit, damage in excess of the armor value penetrates the armor to affect internal components. In addition, every 6 rolled on a damage die reduces the value of the armor by 1 point. Burst-effect weapons reduce the DP by 1 point for every 5 *or* 6 rolled on a damage die. The loss of metal armor is taken *after* any damage has penetrated the armor. Metal armor is inherently fireproof. Metal armor can be polished and treated for a laser-reflective finish; this adds an extra 10% to the cost of the armor, but adds no weight.

Composite Metal/Plastic Armor means that a vehicle has two layers of armor; metal outside, and plastic (of any kind) underneath. Both layers of armor are treated normally; anything that gets through the metal will hit the plastic armor behind it. Composite armor is the only way to mix armor types, but only one kind of plastic armor may be underneath the metal. Any plastic accessories (wheelguards, spoilers, etc.) that have to match the car's armor type must match the plastic under the metal.

If any cost or weight calculations result in fractions of dollars or pounds, round up.

Modifications

Carbon-aluminum (CA) frame. Any vehicle body can have a carbon-aluminum frame. This alteration quadruples body cost, halves body weight, but does not affect maximum load. The CA frame modification is taken before chassis and suspension modifiers, and the chassis and suspension modifiers are based on the new body cost. A vehicle with a CA frame takes double damage in all rams, rolls and collisions.

Streamlining. Any vehicle body can be *streamlined*. It costs 50% of the body cost, weighs nothing, reduces interior space by 10%, increases top speed by 10%, and reduces power consumption (or raises mpg) by 10%. To reduce spaces, treat cargo and regular spaces separately and deduct 10% from each, rounding up. It doesn't affect chassis and suspension modifications.

Sloping. Armor can be sloped. This modification must affect the entire vehicle — you cannot have sloped armor in one location and non-sloped armor in another. Sloping armor doesn't add weight, but increases the cost by 10%. This cost is based on all armor (including ramplates), but not on accessories like wheelguards, spoilers and the like.

Sloping a vehicle's armor reduces the space available for internal components by 10% (round up). Treat cargo space separately and deduct 10% from there, too. A vehicle with sloped armor is at -1 to be hit, in addition to all other targeting modifiers. If a side with breached (or nonexistent) armor is targeted, the penalty does not apply. Sloping protects turrets, but does not protect tires, EWPs, rocket platforms or other exposed components; shots targeting these areas do not suffer the -1 penalty.

If a vehicle is both sloped *and* streamlined, subtract a total of 15% (rounded up) from the vehicle's spaces.

Chassis

The chassis can be strengthened (or weakened) to allow a vehicle to carry more (or less) weight.

Strength	Weight Modifier	Price
Light	-10%	-20%
Standard	none	none
Heavy	+10%	+50%
Extra Heavy	+20%	+100%

The price modifier is a percentage of the original body price. For example, putting a Heavy chassis on a mid-sized car would increase the maximum load 10% — from 4,800 to 5,280 (that's 4,800 + 480) — but would cost 50% of the original body price — another $300. Chassis strength is not a factor in vehicle weight or interior space.

Any car larger than a compact may have a six-wheeled chassis. It costs an extra $100, plus the cost of the extra tires. Pickups and vans with Extra-Heavy chassis *must* have six wheels.
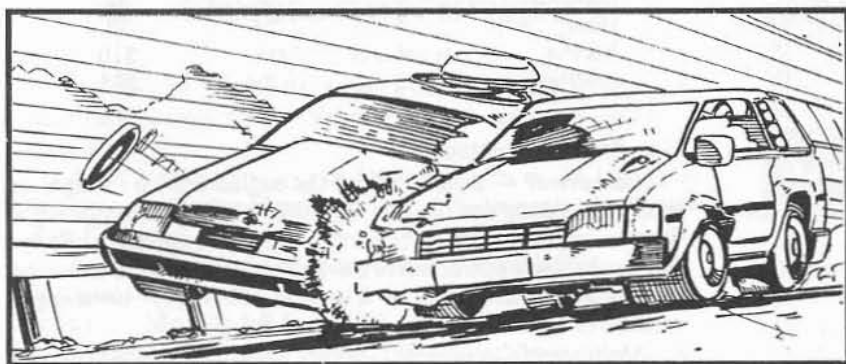
Suspension

Suspension determines a vehicle's beginning Handling Class (see *Handling Class*, p. 8).

Suspension	Price	HC	Van HC	Sub HC
Light	no extra	1	0	2
Improved	100% of body cost	2	1	3
Heavy	150% of body cost	3	2	4
Off-road	500% of body cost	2	1	3

Light suspension is standard. Better suspensions cost in relation to the original body cost of the vehicle — a Heavy suspension for a Luxury car would cost $1,200 (150% of $800). Suspension adds no weight and takes no interior space. The HC of a van (or of a pickup over 5,500 lbs.) is 1 less than that of a lighter vehicle with the same suspension. On the other hand, the HC of a subcompact is 1 higher than that of a larger vehicle with the same suspension. Off-road suspensions negate the handling-class penalty for driving off-road.

Power Plants

There are two kinds of engine available in 2040: gas and electric. With gasoline unavailable in many areas of the world, multiple-fuel-cell electric power plants are far more common than the old-style internal-combustion engines. Power plants take up space and weight inside a vehicle.

Plant	Cost	Weight	Spaces	DP	Power Factors
Small	$500	500	3	5	800
Medium	$1,000	700	4	8	1,400
Large	$2,000	900	5	10	2,000
Super	$3,000	1,100	6	12	2,600
Sport	$6,000	1,000	6	12	3,000
Thundercat	$12,000	2,000	8	15	6,700

DP are "damage points," the number of hits required to destroy the power plant. When the power plant is lost, a vehicle can no longer fire lasers or accelerate, but all other systems still work. The vehicle decelerates 5 mph per turn (more if you put on the brakes). Power Factors are used to compute acceleration and top speed, which is more fully detailed later in this section. Cost, Weight and Spaces should be self-explanatory.

Power Plant Accessories

Platinum Catalysts (PCs) increase power factors by 5% and cost 20% of the plant's cost.

Superconductors (SCs) increase power factors by 10% and cost 50% of the plant's cost. When combined with PCs, the set costs 70% of the plant's cost and increases power by 15%.

Extra Power Cells increase the cost and weight of any electric power plant by 25% (rounded up), and increase the plant's DP and spaces by 10% (rounded up). A power plant with extra power cells has 50% more power units per set of cells (see *Range*, p. 52). Each set of extra cells takes as long and costs as much to recharge as the original plant. Extra power cells do not affect the plant's power factors, maximum load or top speed in any way. Retrofitting extra power cells to an existing plant is a Very Hard task for a mechanic.

Improved Supercharger Capacitors (ISC) — $500, 1 space, 75 lbs., adds 1 DP to power plant. Each ISC will raise an electric vehicle's acceleration by 5 mph and add 20 mph to its top speed for three turns. Triggering the ISC is a firing action taken during the Acceleration phase. It cannot be used again until recharged (which takes two minutes, and costs $10). Triggering an ISC causes considerable damage to the power plant — divide the number of DP the plant originally had by three, rounding down, and give the plant that much damage when the ISC is triggered. This damage will not cause a fire or hazard, and component armor does not protect against it. However, damage caused by ISCs costs half as much to repair as normal damage. Up to three ISCs may be linked together for cumulative results. A

vehicle that is above its maximum speed when the ISC's charge is used up will decelerate by 10 mph/turn until at or below its maximum speed.

Range with Electric Power Plants

The subject of vehicle range has very little importance in the city or in the arena. But on the long stretches of highway between oases of civilization, running out of power is like signing your own death warrant.

Car, truck, helicopter and hovercraft power plants have a power capacity equal to their spaces times 50; cycle power plants have a power capacity equal to their DP times 25. These "power units" will last longer at lower speeds, and get eaten up quickly at higher ones. Power units (PU) are consumed at varying rates per mile, given by the formula (PU × Current speed)/(Maximum speed × 100).

On average, a vehicle will have enough power to travel 200 miles at its "cruising speed," which will be 60% of its top speed. At its top speed, it will have enough charge to travel 100 miles.

Speeds beyond the derived maximum for a given plant drain power even faster. Every turn spent over the maximum costs one power unit per full 10 mph over the limit. If a plant has a maximum speed of 90 mph, there is no additional penalty at 95, but it costs one power unit for each turn at 100 or 105, two power units for each turn at 110 or 115, and so on.

Laser fire also drains power plants. Every time you fire a light laser, it costs you one power unit. A shot from a regular laser costs two power units, and a shot from a heavy laser or twin-laser costs three power units.

Power plant recharges are readily available in towns, but on the highways they are usually available only at truck stops. A power plant recharge takes around ten minutes (most facilities can take two vehicles at a time) and costs $1 per five PUs.

Gas Engines

Type	Cost	Weight	Spaces	DP	Power	Base MPG
10 cid	$400	60 lbs.	1	1	300	80
30 cid	$750	115 lbs.	1	2	500	70
50 cid	$1,250	150 lbs.	1	3	700	60
100 cid	$2,500	265 lbs.	2	6	1,300	50
150 cid	$4,000	375 lbs.	3	9	1,900	45
200 cid	$5,500	480 lbs.	4	12	2,500	35
250 cid	$6,500	715 lbs.	5	14	3,200	28
300 cid	$7,800	825 lbs.	6	16	4,000	22
350 cid	$9,500	975 lbs.	7	19	5,000	18
400 cid	$10,500	1,050 lbs.	8	22	6,300	15
450 cid	$11,700	1,125 lbs.	9	24	7,800	13
500 cid	$13,000	1,200 lbs.	10	26	9,500	12
700 cid	$19,000	1,275 lbs.	14	30	13,000	10

Range with Gas Engines

How far a vehicle can travel on a tank of gas depends on two things — the efficiency of the engine and the size of the tank.

Engine Efficiency. Each engine has a "base mpg" rating; this is the number of miles per gallon the engine will deliver at its "cruising speed," which is 60% of its top speed. For every *full* 10 mph of additional constant speed, reduce the mpg by 10% (round down).

For every full 10 mph of constant speed *under* its cruising speed, *increase* the mpg by 10% (rounding down). The best the mpg can get in any case is 120% of the base value.

Once the final mpg has been calculated for a given speed,

multiply it by the gallon capacity of the gas tank. This will yield the range of the vehicle.

Gas Tanks. The gas tank is a separate component from the gas engine, and is drawn separately on the vehicle record sheet. A gas tank can hold any whole number of gallons — even one.

The number of spaces a gas tank takes up is the same for every type. A tank of 5 gallons or less takes up no space; 6- to 15-gallon tanks take up 1 space; 16- to 25-gallon tanks take up 2 spaces; 26- to 35-gallon tanks take up 3 spaces, and so on. If multiple gas tanks are used, calculate the space taken up using the total capacity of the combined tanks. Gas tanks are available in four types:

Economy Tank — Weighs one lb. per gallon and costs $2 per gallon of capacity. The economy tank has 2 DP.

Heavy-Duty Tank — Weighs two lbs. per gallon, and costs $5 per gallon of capacity. The HD tank has 4 DP.

Racing Tank — The racing tank utilizes compartmentalization and a sponge-like substance that holds the fuel and keeps it from sloshing and leaking. The result is that even if the tank is breached, fuel loss will be 1/4 that of the economy or HD tank. Racing tanks weigh five lbs. per gallon and cost $10 per gallon of capacity. The racing tank has 4 DP.

Duelling Tank — This top-of-the-line tank is for duellists who want to take as few risks as possible. The duelling tank has the same internal safety features as the racing tank, and it's more heavily armored. The duelling tank weighs 10 lbs. per gallon and costs $25 per gallon of capacity. The tank has 8 DP.

When gas tanks are hit, they take damage like any component. If a duelling tank (for instance) takes 5 hits of damage, it has 3 DP left. After the tank is breached, roll 1 die and multiply the result by 20% (5% for racing and duelling tanks) — that is the percentage of the tank's capacity that leaks out of the tank (see also *Fire and Explosion* on p. 31). If the tank is still holding fuel, it now has half the original tank's DP. If the breached tank takes damage in excess of its (new) DP again, it is automatically destroyed and all gas is lost.

Fuel — A gallon of fuel weighs 6 lbs. Fuel costs vary from region to region, but the average price per gallon is around $40, if it's available at all. The sample vehicles will assume a full tank of gas at $40 per gallon.

Tank type	DP	Wt./gallon	$/gallon
Economy	2	1 lb.	$2
Heavy Duty	4	2 lbs.	$5
Racing	4	5 lbs.	$10
Duelling	8	10 lbs.	$25

Gas Engine Accessories

Carburetor — Saves 25% of the engine cost, no weight or space. By taking out the fuel-injection system and replacing it with an old-fashioned carburetor system, you can save money. But the engine's power factors will drop by 15%, and base mpg goes down by 2 (only 1 if it started below 10). Installing a carburetor is a Medium job for a mechanic.

Multibarrel Carburetor — Saves 15% of the engine cost, no weight or space. Installing a multibarrel carburetor system drops engine power factors by 10%, and base mpg goes down by 1. Installing the multibarrel carb is a Medium job, but switching from a single carb to a multicarb system is an Easy job.

Tubular Headers — Adds 20% of the engine cost, no weight or space. Increases power factors by 5%.

Blueprinting — Adds 50% of engine cost, no weight or space. Increases power factors by 10%.

Turbocharger — $1,000 + $1 per added power factor, no weight or space. Increases power factors by 25%, and acceleration by 5 mph. It takes one turn at maximum acceleration to

activate a turbocharger; this is known as "turbo lag." If a car slacks off the accelerator (even by 5 mph), the turbocharger bonus is lost until another turn of full acceleration. A *variable-pitch (VP)* turbocharger costs $2,000 + $1 per added power factor, and adds 25% to the engine's power factors. A car may only mount one turbocharger system.

Supercharger — $3,000 + $1 per added power factor, weighs 20% of engine weight, 1 space. Increases acceleration by 5 mph (good at all speeds), and increases power factors by 40%. Reduces mpg by 1. A supercharger cannot be installed on an engine smaller than 150 ci.

Nitrous Oxide — $500, 20 lbs., 1 space. Opening a tank of nitrous oxide counts as a firing action. An opened tank increases acceleration by 10 mph and top speed by 50%, for 5 seconds. Then the nitrous oxide (and a full gallon of gas) are gone. Only one tank may be used at a time — that is, the effects are not cumulative. When a tank is opened, roll once on the Engine Critical Damage Table at -3 immediately.

After five seconds, the vehicle decelerates by 10 mph automatically until below its regular top speed. This deceleration does not count toward the hazard of excessive braking.

When adding accessories to a gas engine, all the power factor alterations are taken at the same time. Thus, if you blueprint the engine (+10%), add tubular headers (+5%), a VP turbocharger (+25%) and a supercharger (+40%), its power factors will be raised by 80%.

Engine Damage

Internal combustion engines are much more complicated than electric fuel cells, and are therefore easier to damage.

Each engine has a set number of DPs — when an engine takes more damage than it has DPs, it stops working immediately. The vehicle decelerates by 5 mph each turn.

Even a partially damaged gas engine may not function as well as an undamaged one. *Every time* the engine takes damage, immediately roll 2 dice, and consult the following table, adding 1 to the roll for every full 5 points of damage taken from that hit.

Engine Critical Damage Table
(Roll 2 dice)

2 or less — Black smoke pours out of the engine compartment (not enough for a smokescreen, but enough to deliver a good scare).

3 — Minor damage, but no immediate effects. Roll again on this table (at -4) after each full hour that the motor is run. Repair is an Easy job.

4 — Not So Minor damage, but still no immediate effects. Roll again (at -3) after every ten minutes that the motor is run. Repair is a Medium job.

5 — Serious Damage, but no immediate effects. Roll again on this table (at a -1) after every 2 minutes that the motor is run. Repair is a Medium job for a mechanic.

6 — Extensive damage. As minor damage, but re-roll (at -2) every 30 seconds. Repair is a Medium job for a mechanic.

7 — Hideous grinding noises come from the engine. Roll again on this table. If you get "7" again, stop rolling. Also, ignore any results less than "7."

8 — Crack! The car suffers a transmission hit. Acceleration drops by 5 mph each turn (if it goes to 0, the car cannot accelerate), and top speed drops by 10 mph each turn. If your car's top speed drops below its present speed, it will decelerate to match
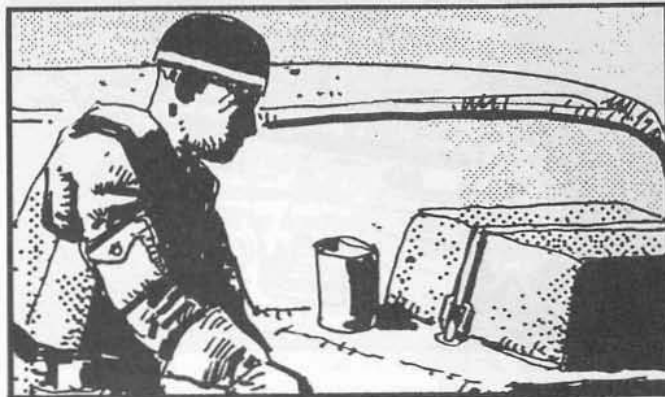
its new top speed. Repair can only be done at a garage, and is a Hard job for a mechanic.

9 — Radiator! In ten seconds, your temperature gauge will be in the red. For every second the engine continues to run after that, roll 1 die — on a 6, the engine seizes up and is totally ruined.

10 — Oil System! In 5 seconds, your oil pressure gauge goes in the red. Starting after 3 seconds, roll 1 die — on a 6, the engine seizes up and is totally ruined. If the car has a turbocharger, the engine will seize up on a 5 or 6. Note that there are 2 turns in which your engine may self-destruct without warning. If you get lucky and shut down the engine in time, repairs will cost 10% of the cost of the engine, and are considered a Medium job for a mechanic. In either case, place an oil slick immediately behind the vehicle — but only *after* the engine seizes up or the oil gauge drops — don't let the oil slick give the driver an early clue that there's a problem! See 12 (Disaster!) for the full effects.

11 — Fuel System! The car will shut down by itself in 1d+3 seconds (the engine is starved for gas), but otherwise, performance is unaffected. There is a chance the engine will catch on fire. Roll 2 dice every turn until the engine is shut off or runs out of gas. If there is a fire, the vehicle will leave a ½" × 1" patch of burning gasoline behind it (treat like an FOJ slick).

12 — Disaster! The block is cracked, or a rod is thrown, or something else equally nasty happens. The car decelerates by 15 mph every turn (more if brakes are applied) until the car is at 20 mph. The car lurches along for another 5 seconds at that speed, and then the engine dies a horrible, permanent death. Turning it off early won't help. Repair is impossible; the engine must be replaced.

13 or higher — FIRE! As 12, but the car is on fire as well.

Going Faster

Vehicles may accelerate beyond their power plant's maximum speed, but the power plant will probably take damage.

Each turn a vehicle travels faster than its rated speed, roll 1 die for every 10 mph (or fraction) faster the vehicle is going. For each die that comes up 3 or higher, the power plant takes one point of damage.

Example: A car with an acceleration of 5 and a maximum speed of 100 is traveling at 100 mph and needs to catch a foe. So the car accelerates to 105, and the driver rolls 1 die. He rolls a 1, so no damage is taken — so far. The next turn, the car continues to accelerate to 110, and again 1 die is rolled — this time it's a 5. The plant takes 1 point of damage. The next turn, the driver punches it to 115, and rolls 2 dice — a 4 and a 5. The plant takes 2 more points of damage. One turn later, our foolhardy driver pushes it to 120, and rolls 2 dice again — this time a 2 and a 6. The plant takes 1 more point of damage. The driver holds the vehicle at 120 and continues to roll 2 dice for possible plant damage for as many turns as he feels he can get away with it.
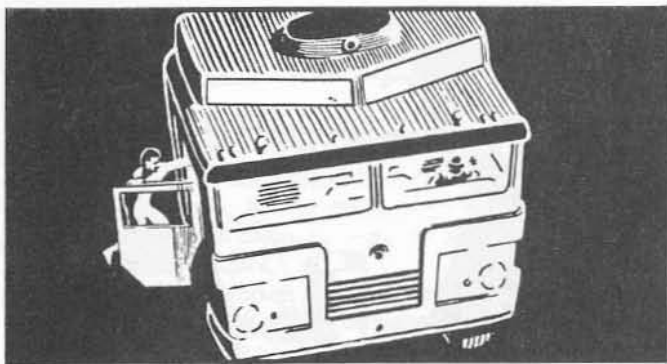
Once he decides to slow down, he can decelerate 5 mph per turn just by taking his foot off the accelerator — and he no longer has to roll for plant damage, even if he's still over 100, because the plant is no longer under strain.

A power plant reduced to 0 DP by overwork will explode on the first phase of the next turn. All adjacent components (usually front weapons and the driver and gunner) take 1d-2 points of damage; there is a 50% chance the vehicle will catch fire.

When pushing a gas engine, roll once on the Engine Critical Damage Table (see above), adding +1 to the roll for every 20 mph (or fraction) of current speed. As with power plants, no roll is necessary when decelerating.

Tires

To keep the bookkeeping as simple as possible, the weight of tires *does* count against the maximum load of the vehicle. A car's front tires must both be the same type, and the rear tires must be the same type (but tires needn't match front to rear) — handling class drops by 1 if this rule is broken.

Tire	Price	Weight	DP
Standard	$50	30	4
Heavy-Duty	$100	40	6
Puncture-Resistant	$200	50	9
Solid	$500	75	12
Plasticore	$1,000	150	25

The plasticore tire is a special design, with a standard rubber exterior around a solid core of fireproof armor-quality plastic. After a plasticore tire has taken 4 points of damage, the rubber exterior strips off, revealing the plastic. As soon as any one tire on a vehicle carrying plasticore tires is reduced to bare plastic, its HC drops permanently by 1. Unavailable in radial or off-road versions, plasticore tires cannot be steelbelted.

Spare tires carried as cargo take up one space. Even though they all have the same cost and weight, a luxury standard spare tire (for example) will not fit on a subcompact car. In most cases, you cannot mix tires from different size vehicles. There are two exceptions. Luxury cars and station wagons use the same size tire, as do vans, campers and pickups.

Tires may be modified:

Steelbelting increases the cost and weight of any tire by 50%, and adds 25% to its DP (round down).

Radial Tires — Any car, cycle or trike with radial tires on all its wheels has its HC raised by 1. Adds 150% to cost, 20% to weight, and subtracts 1 DP. Radial modifications are applied *after* steelbelting.

Off-Road (OR) Tires — Any car, cycle or trike with off-road tires on all its wheels has its HC raised by 1 when off-road, and will not take damage from normal off-road terrain. OR tires confer no benefits on the highway. This modification adds 20%

to cost and 5 lbs. to weight. Off-road benefits are applied *after* steelbelting. No tire may be both off-road *and* radial.

Racing Slick (RS) Tires — Any car, cycle or trike with racing slicks on all its wheels has its HC raised by 2. If they are only on two corners (front or back), then the vehicle's HC is raised by 1. The hazard for maneuvers on ice, oil, water and the like is at a +D4. In addition, just hitting oil, ice or water is a D3 hazard. Racing slicks take double damage from spikes, debris and obstacles.

Any non-oversized vehicle can mount slicks, but these tires are most beneficial on a professionally-maintained, glass-smooth racetrack surface. On a regular city street or highway, racing slicks take 1 point of damage for every ten minutes they drive on open road, just from accumulated trash.

Making a tire a slick adds 300% to the cost, 100% to the weight, and adds 1 DP. An RS may be made fireproof or steelbelted, but *not* radial or off-road.

Fireproofing doubles the cost of any tire (after any other modifications), no extra weight.

Weapons

Weapons are usually mounted on the front, back, right or left. Technically, they can also be mounted on the top or bottom, but they're not nearly as useful in those positions. Weapons may also be mounted in turrets. Dropped weapons (only) may also be *corner mounted*. Up to two spaces' worth of dropped weapons (four spaces on oversized vehicles) may be corner mounted.

For complete information on weapons, see Chapter 3.

The Human Element

For game purposes, all humans are assumed to weigh 150 pounds, unless they have built themselves up with the Body-building skill, p. 40. A human takes up one space. However, vehicle and weapon controls (and the freedom of movement to use them) also take one space. Therefore, two spaces must be allotted for each driver or gunner. For more on people, see Chapter 4, *Characters*.

Each vehicle can have only one driver, who sits on either the right or left side (the player specifies at the time the car is built). The driver can fire any of the vehicle's weapons; he can also use hand weapons. A gunner can also fire any of the vehicle's weapons, or hand weapons. There can be more than one gunner. The driver and gunner cannot share a targeting computer; each must have his own if both are to get an aiming bonus.

A vehicle can carry passengers either in cargo space or regular space. A passenger seat (with or without passenger) takes no space and adds no weight — the passenger, of course, weighs 150 lbs. and takes up one space. Passengers can use hand weapons but cannot fire vehicle weapons. A single passenger can ride behind a cycle's driver; he takes up no extra space but adds weight, and can use hand weapons only. Unless otherwise stated a passenger is located in cargo space.

Note that under the optional Encumbrance rules (p. 49), pedestrian equipment *does* count toward the vehicle's chassis weight limit.

Cargo

Likely cargo includes spare tires and ammunition (for yourself, or salvaged from a kill). In a campaign game, consult your referee about other "cargo" you want to pick up. Note that any vehicle can carry cargo if it has unused space, but pickups, vans and station wagons have a specific "cargo area" that can be used for nothing else. This means that *no* vehicular component can be placed in it except as cargo or salvage!

Computing Acceleration and Top Speed

Once you have determined what will go into your vehicle, you must compute its acceleration. This will be 5, 10 or 15 mph.

If the number of power factors in a vehicle's power plant is less than $1/3$ the vehicle's weight, it is underpowered and will not move. Throw something out, or get a bigger power plant.

If the power factors are $1/3$ the weight but less than $1/2$, the acceleration is 5 mph.

If the power factors are $1/2$ the weight but less than the weight itself, the acceleration is 10 mph.

If the power factors are equal to or greater than the weight, then the acceleration is 15 mph.

Example: A luxury car weighing 5,500 pounds has a Medium power plant (which has 1,400 power factors). Since 1,400 is less than $1/3$ of 5,500, the car won't move! So we decide to get a bigger power plant, a Large (with 2,000 power factors). Of course, the larger power plant took up more space, weight and money than the old one, so some other things had to go to keep the cost the same — but that's the way things go when you're building a car. Because 2,000 is between $1/3$ and $1/2$ of 5,500, the car can now move with an acceleration of 5 mph per turn. If we could find some way to cut the weight down to 4,000 pounds (or get a plant with at least 2,750 power factors), the acceleration would go up to 10 mph per turn (since 2,000 is $1/2$ of 4,000), but a luxury car that weighed only 4,000 pounds would be so stripped down it would be nearly useless. So it goes . . .

Every car will also have a top speed, based on the following formula: $360 \times$ power factors / (power factors + weight) for electric power plants, or $240 \times$ power factors / (power factors + weight) for internal combustion engines, rounded down to a multiple of 2.5 mph. In the example above, the 5,500 lb. luxury car with a Large power plant (2,000 power factors) would have a top speed of $360 \times 2,000 / (2,000 + 5,500) = 96$, which rounds down to 95 mph. If the luxury had a 250 cid engine in place of the Large plant, it would have a top speed of $240 \times 3,200 / (3,200 + 5,500) = 88.275$, which rounds down to 87.5.

Placing Weapons and Armor

Now that you've chosen all your components and determined that your car has enough power to accelerate satisfac-

torily, you can fill out the vehicle diagram. Refer back to the example on p. 3. This diagram shows (a) what weapons the car has and where they are located; (b) how much ammo is in each weapon; (c) how much armor the car has in each location; and (d) what other components the car has, and where they are. Note that the power plant can be either in front or in back.
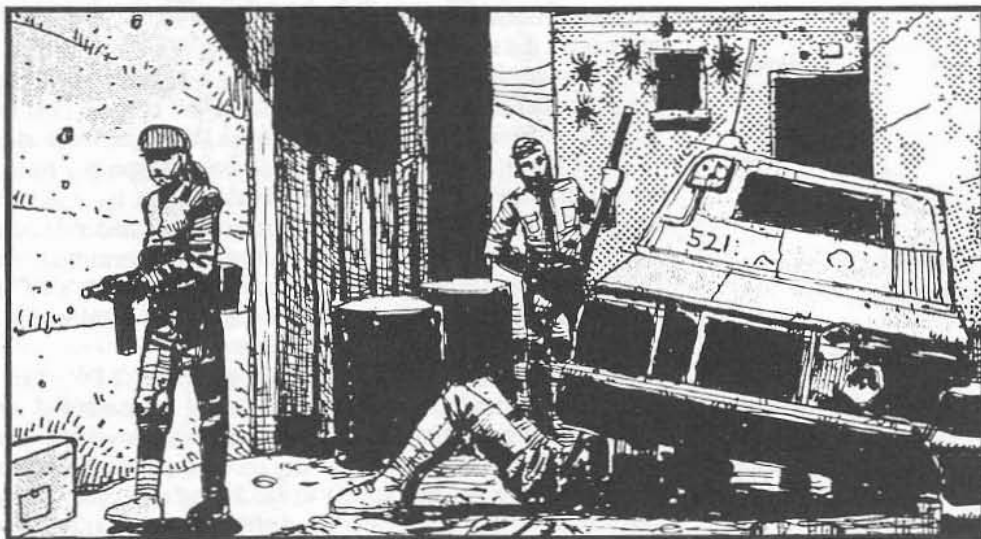
Weapon location restriction: No more than $1/3$ of the total spaces in a vehicle can be devoted to weapons that fire from any one side (round down). Motorcycles and sidecars are exempt from this restriction.

Dropped weapons and gas streamers can be *corner mounted.* Only two spaces' worth of dropped weapons can be corner mounted on any corner of a car or hovercraft, and up to four spaces' worth may be mounted on any corner of an oversized vehicle. Helicopters, boats, trikes and cycles cannot have corner-mounted weapons.

The vehicle diagram is used to keep track of ammunition expenditure and damage. Also located on the vehicle diagram are the Speed Track and the Handling Track (see Chapter 2).

Blank Vehicle Record Sheets for every type of vehicle in *Car Wars* are provided at the end of the book. You may photocopy them for personal use.

Repair and Salvage

In a continuing campaign, damaged vehicles will need repair. Damage to armor can be repaired at $50 per hit (multiplied by the armor's cost modifier — e.g., fireproof armor costs twice as much) — or the vehicle's entire armor can be replaced for its original cost (as per the vehicle building rules on pp. 50-51) plus 10%. A component that has taken only 1 hit can be repaired for 10% of its original price; 2 hits: 30%; 3 hits: 50%; and so on. It's cheaper to replace a badly damaged power plant (for instance) than to fix it.

Body armor cannot be repaired. Medical care for injured characters is free. (You're insured.)

The prices above are for parts and labor. If you do the work yourself, cut $1/3$ off the repair costs. Many repair shops will let you do your own work in their bays — for $50 an hour.

A vehicle or component may be sold for salvage. Salvage value is *(original cost - repair cost)*. Damaged parts may be bought for this value, or sold for half this value. If you stop on the road to strip a wreck, you can easily get tires, extra magazines, unfired ammunition, hand weapons, and cargo. Other components can be salvaged, but it takes time and requires the Mechanic skill (see pp. 40-41). A burned wreck is worthless.

Modifying Vehicles

New weapons and accessories can be added to an existing vehicle between duels, as long as weight and space limits are observed. Old components may be saved or sold. Add 10% to the cost of any parts that vary from a car's original design — retrofitting is expensive.

Exceptions: New tires can be added at their regular cost, and chassis and suspension cannot be changed from their original design.

If any cost or weight calculations using the above instructions result in fractions of dollars or pounds, round to the nearest whole number.

6. Cycles and Trikes

Cycles

Building a motorcycle is very similar to building a car. A cycle can use almost any weapon or accessory a car does. A medium or heavy cycle can also pull a sidecar — for one passenger, for cargo hauling, or just to get some extra firepower.

Frame	Price	Weight	Max. load	Spaces	Armor Cost/Wt.
Light Cycle	$200	250	800	4	10/4
Med. Cycle	$300	300	1,100	5	11/5
Hvy. Cycle	$400	350	1,300	7	12/6
Lt. Sidecar	$300	200	400	2	5/5
Hvy. Sidecar	$450	350	750	3	5/6

The weight of the sidecar and contents does not count against the load on the cycle frame. Instead, both the sidecar and the cycle must meet their maximum weight requirements separately. The weight is added together, however, when computing acceleration and top speed (which is done the same way as for cars). A cycle can only pull one sidecar. Cycle and sidecar chassis cannot be modified to increase weight capacity.

Cycle armor can be placed front and rear only. A sidecar is treated like a little car with no top. Sidecars carry armor in all six normal locations. Cycle and sidecar armor can be made fireproof, reflective, both or metal. All the armor on a sidecar or a cycle must be made of the same type, but an attached sidecar can carry a different type of armor from a cycle.

Suspension

Suspension can be upgraded to improve the handling class of the cycle or sidecar. To determine the HC of a cycle/sidecar combination, add the HCs of the two separate items together.

Suspension	Cost	HC
Light	no extra	0
Improved	100% of frame cost	1
Heavy	200% of frame cost	2
OR	300% of frame cost	2

Power Plants

Like car power plants, cycles use electric fuel cell systems. Like today's engines, they are more powerful for their size and weight than auto engines, but cannot be used in larger vehicles — they would burn up.

Plant	Cost	Weight	Spaces	DP	Power
Small Cycle	$500	100	1	2	400
Med. Cycle	$1,000	150	1	3	600
Large Cycle	$1,500	175	2	4	800
Super Cycle	$2,000	200	2	5	1,000
Super Trike	$3,000	250	3	6	1,200

Cycle acceleration and top speed is determined in exactly the same way as for cars. Cycles can use gas engines.

Tires

Cycles need two tires; sidecars need one. The front and rear tires on a cycle must match, and if a sidecar is attached, its tire must match, too. Cycle tires come in the same varieties available for cars. Cycle tires cost the same and have the same number of DP as car tires, but they weigh only half as much.
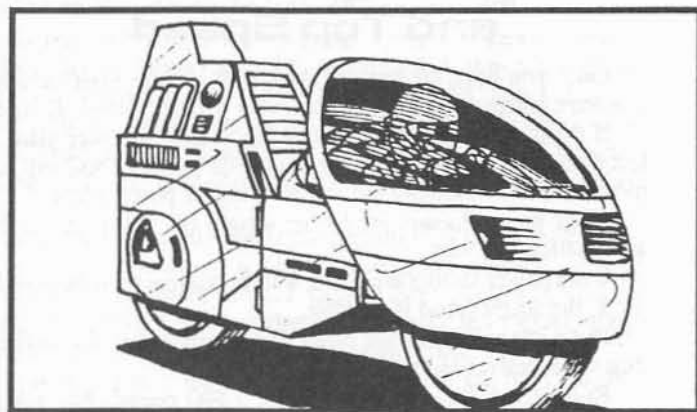
Weapon Placement

Weapons can only be placed on a cycle's front or rear. They can be mounted to the front, rear or side of a sidecar. A weapon on a cycle cannot be linked to a weapon on a sidecar, unless both are dropped weapons. If the sidecar becomes detached, the link is broken and must be replaced.

Cycle Accessories

Cycle Wheelguards — $10/2 lbs. per point of plastic armor, maximum 20 lbs. each. Only one wheelguard is required per tire. If the tire is targeted and hit, roll 1 die. On a 1 to 5, the wheelguard takes the damage. Cycle wheelguards do not lower HC.

Cycle Turret Sidecar — All sidecar turrets can fire in a 180-degree arc from straight forward to straight back on the side that they are mounted on. Universal versions that fire upwards as well are available for an extra $1,000. Turret weapons are protected by the sidecar's top armor, but you must put at least one point of armor in the other five areas. The turret can be targeted at -3 if the firer is in the turret's arc of fire.

The one-space CTS costs $1,500, weighs 250 lbs., has a maximum load of 550 lbs., and armor cost/weight is $5/5 lbs. Holds one space of weaponry in the turret, and one non-passenger space in the body.

The two-space CTS costs $2,500, weighs 450 lbs., has a maximum load of 800 lbs., and armor cost/weight is $5/6 lbs. Holds two spaces worth of weaponry in the turret, and one non-passenger space in the body.

Jettison Joining — $300, no weight or space. The joining's explosive bolts allow a desperate cyclist to ditch a damaged sidecar on the run. Triggering the joining is a firing action, but once they are fired, the sidecar becomes a separate vehicle traveling parallel to the cycle (place a 1/2" × 1/2" counter next to the cycle to represent the sidecar). If struck, treat the loose sidecar as an obstacle. The sidecar will decelerate 5 mph per turn, but must roll once per turn on Crash Table 1 with the appropriate speed modifiers. Vehicular weapons on a detached sidecar cannot be fired, although hand-weapon fire is still permitted. Firing the joining is a D2 hazard for the cycle, and the cycle's HC may be permanently reduced as well, but the cycle's acceleration and top speed may improve.

Cycle Windshell — $500, 50 lbs., no space, 2 DP. This can be mounted on any motorcycle, but cannot be combined with a sidecar. The windshell effectively streamlines a vehicle (see p. 51), but the cycle can still be streamlined again for increased benefits. The windshell adds 1 to the HC of any cycle going 60 mph or faster. In addition, the shell's DP acts as 2 points of

armor, protecting against shots from the top, underbody and sides. The second point of damage destroys the windshell, leaving a debris counter behind. If the cycle is traveling faster than its normal top speed, it must slow down next turn.

A cycle can carry a passenger while using this item; all riders have their hand-weapon arcs of fire restricted to the right and left firing arcs. To get on or off, the shell must be unlatched and swung up; it takes two turns to open, three to close and latch. The entire shell can be jettisoned in one turn; this destroys the shell and is a D3 hazard. The shell will destroy itself similarly if opened while the cycle is traveling over 20 mph.

Cycle windshells can be armored, at $10/5 lbs. per point of plastic, with a 50 lbs. maximum weight. This effectively increases the windshell's DP. Windshell armor must match the cycle's armor type.

Cycle Blades — $50, 20 lbs., no space. These jagged blades add 2 points to the damage any pedestrian takes when hit by a cycle. If the cycle just passes adjacent to a pedestrian, there is a 50% chance the blades will hit, doing 1 point of damage per 20 mph of speed. Doing this successfully is a D2 hazard for the cycle. Cycle blades are destroyed if the vehicle rolls. *Fake* blades are available, at $20 for the set, no weight or space. They do no damage, but they're great for scaring pedestrians.

Trikes

Tricycles are designed like any other vehicles. A trike counter is 1'' long, like that of a car. A trike's arcs of fire are different from those of other vehicles (see below); this should be taken into account when placing weapons and armor.

Construction

Trikes most closely resemble motorcycles in construction. They use the same tires and power plants as cycles, and use the same acceleration, top speed, and power consumption formulae as cars. Trikes can use gas engines.

A trike can have a Light, Standard, Heavy or Extra-Heavy chassis, at the same costs as for cars. Suspension works the same way as cycles — Light suspension is free and results in HC 0; Improved suspension costs 100% of the frame cost and results in HC 1; Heavy suspension costs 200% of the frame cost and gives a trike HC 2. Handling class for all size trikes is based on suspension.

Body	Cost	Weight	Max. load	Spaces	Armor Cost/Wt.
Light Trike	$250	300	1,600	8	11/5
Medium Trike	$300	500	2,100	10	12/6
Heavy Trike	$400	700	2,800	12	14/7
X-Hvy. Trike	$550	950	3,500	14	16/8

Trikes carry armor like cars — that is, they have six armor positions: Front, back, left, right, top and underbody.

Trikes can use any weapon or accessory a car or cycle can, with a few exceptions. Trikes cannot have ramplates, and they cannot pull sidecars. Light trikes cannot carry turrets; medium trikes can only use one-space turrets. Larger trikes can carry up to two-space turrets.

Trikes can use wheelguards — car wheelguards on the back two wheels, and a cycle wheelguard on the front. Wheelguards do not reduce HC on a trike, but will reduce HC by 1 on a reversed trike. Retractable wheelguards can be used on the back of a normal trike, or on the front tires of a reversed trike. A normal trike can use a spoiler, but not an airdam.

Reversed Trikes

The reversed trike design puts two wheels in front and one in the center of the back. This configuration provides greater stability than the traditional trike, but is not as efficient from a space standpoint. Reversed trikes come in the same body styles as regular trikes, but have one less space and cost an extra 50% for the chassis. HC for a reversed trike is one higher than for a regular trike (maximum HC is still 3). Reversed trikes can carry a ramplate, but in all other respects, they are the same as regular trikes. A reverse trike can use either a spoiler or an airdam, or both.

Trike Combat

A tricycle is not just a fat motorcycle or a three-wheeled car. The successful trike duellist (or designer) must keep the differences in mind if he intends to survive. Trikes have some significant advantages, but they have disadvantages as well.

Arcs of Fire

Trike weapons can be located front, back, or to either side; they can also be turreted. Front and back weapons have the same arc of fire a car's weapons do (see diagram below); turreted weapons, of course, have a 360° arc of fire.
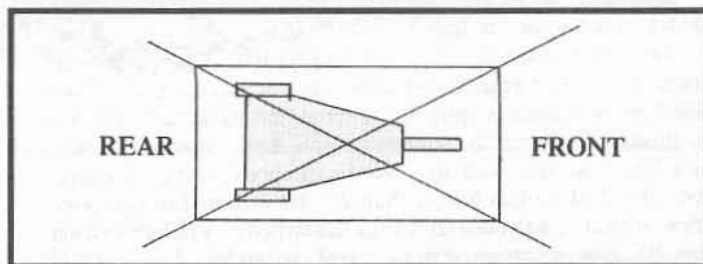
Side-mounted trike weapons have a greater arc of fire than a car's side weapons do, because of the wedge shape of the trike body. A trike's side weapons can fire into the "normal" side arc, plus the front arc of fire of a standard vehicle (see below).
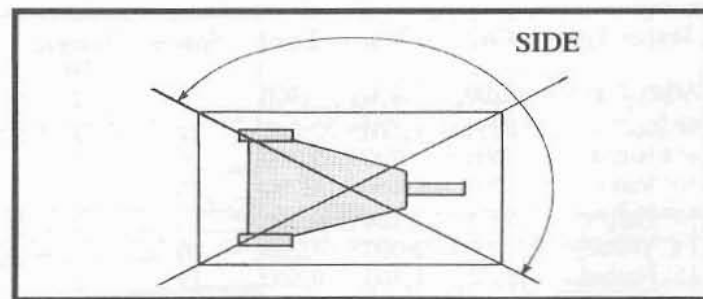
Any target in the front arc of fire can be hit by weapons mounted on both sides as well as the front! Right-side and left-side weapons can be linked together, or linked with front weapons, and aimed together for fire at targets in this front arc. The linked weapons must be of the same type, or only one can be aimed, and the rest are treated as if they were on automatic.

Cycles and Trikes
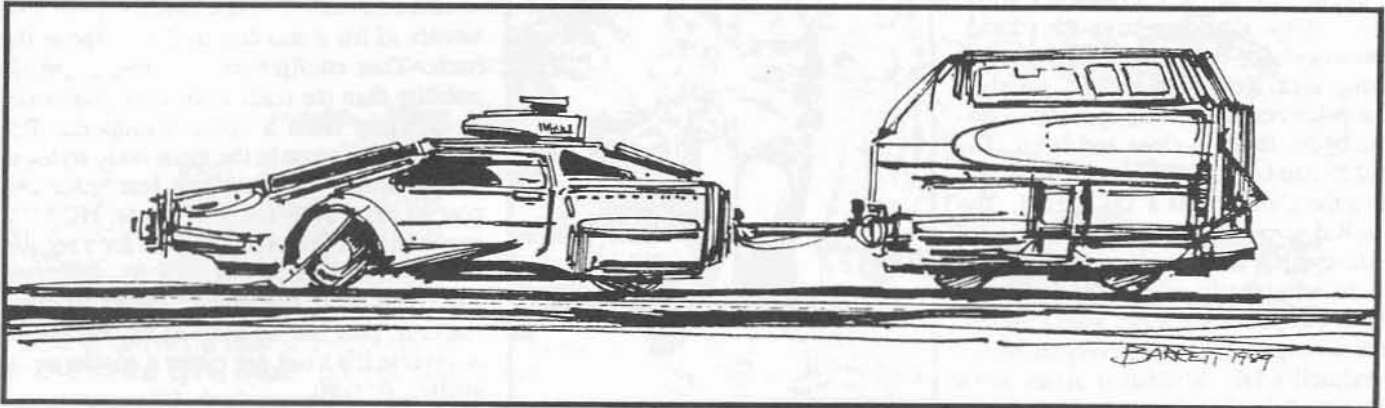
7. Car Trailers

Small trailers can be useful when you want to carry additional cargo or firepower. To differentiate them from the larger trailers pulled by tractors, they will be called "car trailers."

Body Types

Car trailers are little more than boxes with wheels — and, of course, armor and weapons. There are two basic types of trailer — the van and the flatbed. The van trailer has four sides, a top, and an underbody. Flatbeds are exposed — only underbody armor and wheelguards are allowed. A small armored box of up to 4 spaces is allowed on the back of a flatbed, with its own armor — the armor is $9 and 5 lbs. per point.

"Tongue DP" in the chart below refers to the damage points the trailer's tongue can take before breaking.

Trailers that are 20' long (or longer) have ten armor locations, not six like smaller vehicles. This is because each "long side" of the trailer is split into a front and back half. The ten positions are: Front, back, front right, back right, front left, back left, front top, back top, front underbody, and back underbody. Flatbed trailers longer than 20' are armored in two positions — front underbody and back underbody. Trailers smaller than 20' long are armored in the usual six positions.

Chassis Strength

A trailer's chassis, like a car's, can be strengthened to increase maximum load capacity. Costs and effects are the same as for cars. In addition, improving the chassis strength will increase the strength of the trailer's tongue. A trailer equipped with an Extra-Heavy chassis has its tongue DP doubled. Light and Heavy chassis decrease or increase (respectively) tongue DP by 50%, rounded down. See *Tongues and Hitches*, below, for more information.

Tires

Car trailers generally use car tires. Any type can be used, but all tires on a trailer should match. A trailer with unmatched tires subtracts 1 from the towing vehicle's HC. An exception is the mini-van, which uses motorcycle tires, though, again, all must be of the same type.

The size of a trailer also dictates the minimum number of tires required. Minis, 6' and 10' trailers need one pair of tires; 15' and 20' trailers use two pairs, and all longer trailers must have four pairs of tires.

Any car van trailer can be modified:

Reefer — Increases van trailer cost by 60%, and weight by 15%, rounded up. Reduces interior space by 15%, rounded up.

Tanker — Increases van trailer cost by 150%, and weight by 60%, rounded up. Reduces interior space by 15%, rounded up. Tanker trailers must have at least 20 points of armor (or 4 points metal) in each location or its contents will begin to leak. For every 5 points of armor under 20 (or every point of metal less than 5) that it has, a tanker will leak 1 space of contents per mile. This is *not* enough to create an oil slick.

Dumper — Increases van trailer cost by 75%, and doubles weight. Interior space is unaffected, but a dump trailer can devote no more than 1/6 of its spaces to weaponry. It cannot mount a turret and has no top armor. A dump trailer is raised and lowered the same as a dump carrier (see *Carriers*, p. 61).

Tongues and Hitches

Car trailers are attached to their towing vehicles by a tongue and hitch system. Every trailer has a tongue. The number of damage points a tongue can take is listed on the chart to the left. Targeting a tongue is at -5, -7 if the trailer is attached to a vehicle.

Trailer Type	Cost	Wt.	Load	Spaces	Tongue DP	Armor Cost/Weight
Mini-Van	$200	400	900	3	1	9/5
6' Van	$450	1,000	2,800	12	2	15/7
6' Flatbed	$300	700	3,700	8	2	15/7
10' Van	$700	1,600	4,700	20	2	19/10
10' Flatbed	$475	1,100	6,200	13	2	19/10
15' Van	$1,000	2,300	7,200	30	3	25/13
15' Flatbed	$675	1,500	9,500	19	3	25/13
20' Van	$1,300	2,800	9,400	38	3	30/16
20' Flatbed	$875	1,900	12,400	24	3	30/16
25' Van	$1,600	3,300	11,900	46	4	35/17
25' Flatbed	$1,075	2,200	15,700	29	4	35/17
30' Van	$1,900	3,500	14,100	54	4	40/18
30' Flatbed	$1,250	2,300	18,600	35	4	40/18

The towing vehicle's hitch must be bought separately, and is rated by the amount of weight it can pull. Hitches are mounted externally, and are not protected by the towing vehicle's armor; thus they can be targeted in combat at -5, -7 if the trailer is attached.

Hitch Type	Cost	Weight	Load Wt.	DP
Light	$250	10	2,000	1
Standard	$350	20	6,000	1
Heavy	$500	30	12,000	2
Extra-Heavy	$650	40	20,000	3

Load weight is the maximum weight a hitch can pull without breaking. Weight is what the hitch and its bracing system weighs — the hitch's cost and weight must be figured into the total cost and weight of the towing vehicle.

For an additional cost, hitches can be purchased that allow the instantaneous release of the trailer. These can be triggered from the towing vehicle, or, if specified, the towed vehicle as well. Releasing a trailer in this way is a firing action, and if released while moving, the trailer becomes loose (see below).

Explosive hitches blow the trailer free in an emergency. They are one-shot systems, and a new hitch must be installed after each use. They increase the standard hitch cost by $400.

Quick-release hitches are like explosive ones, except that they can be reused. Quick-release hitches cost an additional $900.

The trailer hitch can be armored at $15 and 4 lbs. (max. weight 40 lbs.) per point. This armor completely protects both the hitch and the attached trailer's tongue. However, the towing vehicle cannot perform any maneuver more difficult than D3. Furthermore, anytime the trailer jackknifes, the armor is auto-

matically and completely destroyed, regardless of whether the hitch actually breaks. This armor counts against the load of the towing vehicle and must match its, not the trailer's, armor type.

Weapons

Trailers that are 20' long or longer can mount weapons in "front" or "back" positions along each side. They can also mount two turrets, one on the front top and one on the back top. They have the same arc-of-fire limitations as turrets on 10-wheel trucks. If a trailer has two turrets, one must be designated as "higher" than the other. The higher turret has a full 360-degree arc of fire. The lower turret cannot fire in the direction of the higher turret. For trailers 20' or longer, weapons must be placed in the same way as armor. That is, not "right," but either "front right" or "back right." Each trailer this size has dots to show aiming points for these weapons; the arcs of fire are shown in the diagram on p. 64. Note that the arcs of fire overlap a great deal.
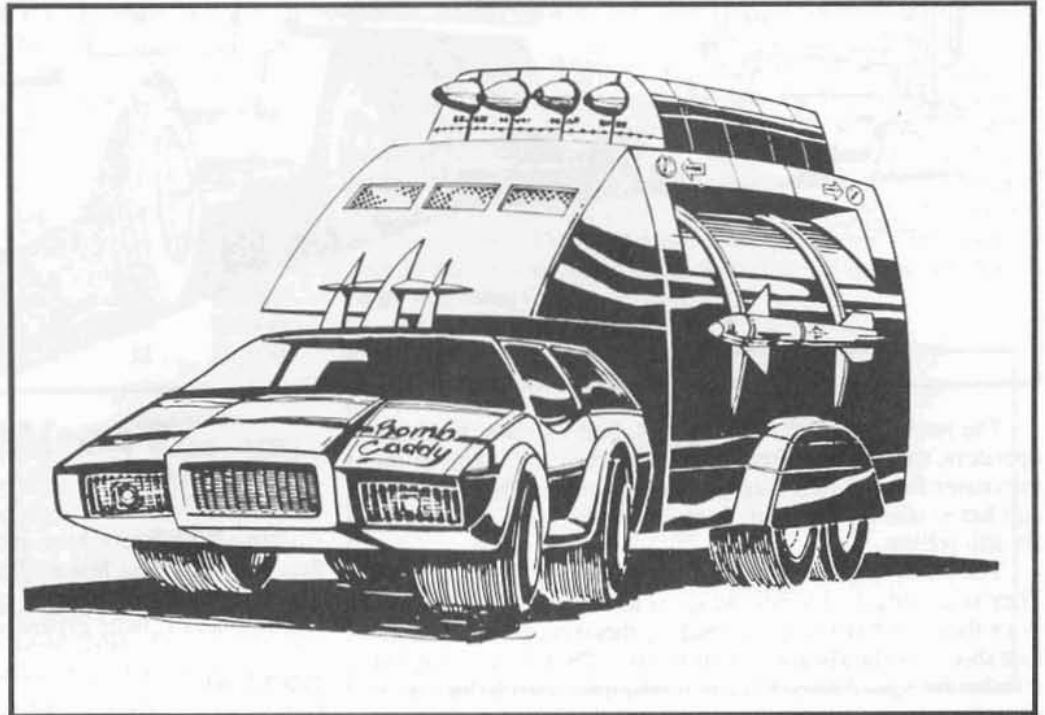
When an opponent fires at the top, underbody or side of a trailer this size, he must specify whether he is firing at the front or back half. He can only target a portion of the trailer at no penalty if he is in the arc of fire of that section of the target. Firing at a target within line of sight when the firer is not in that target's arc of fire is at -2. Because of the overlap of a trailer's arcs of fire, an attacker can often choose between targets with no penalty.

Smaller trailers (15' and less) mount weapons the same way cars do, and can only mount one turret. There are also limits to the turret's size — no more than three spaces for the 15-footer, two spaces for the 10-footer, one space for the 6-footer, and the mini-van cannot mount a turret at all.

Car Trailers
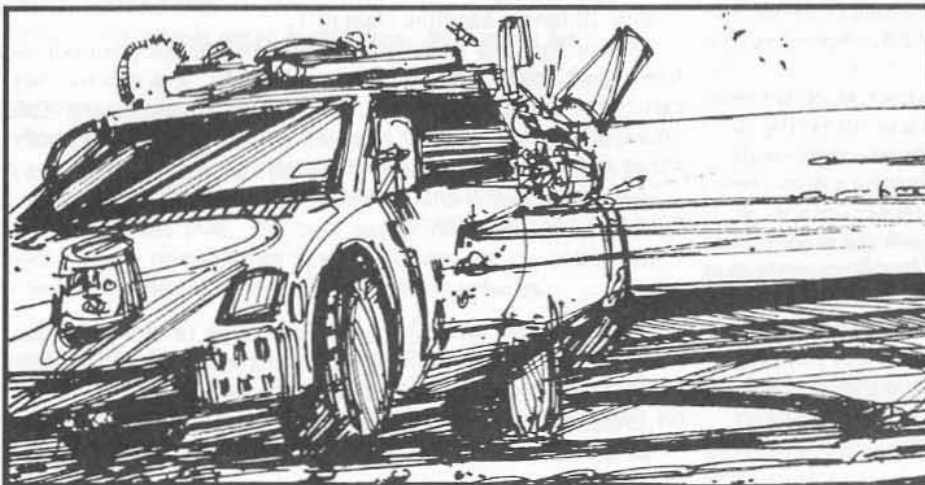
8. Oversized Vehicles
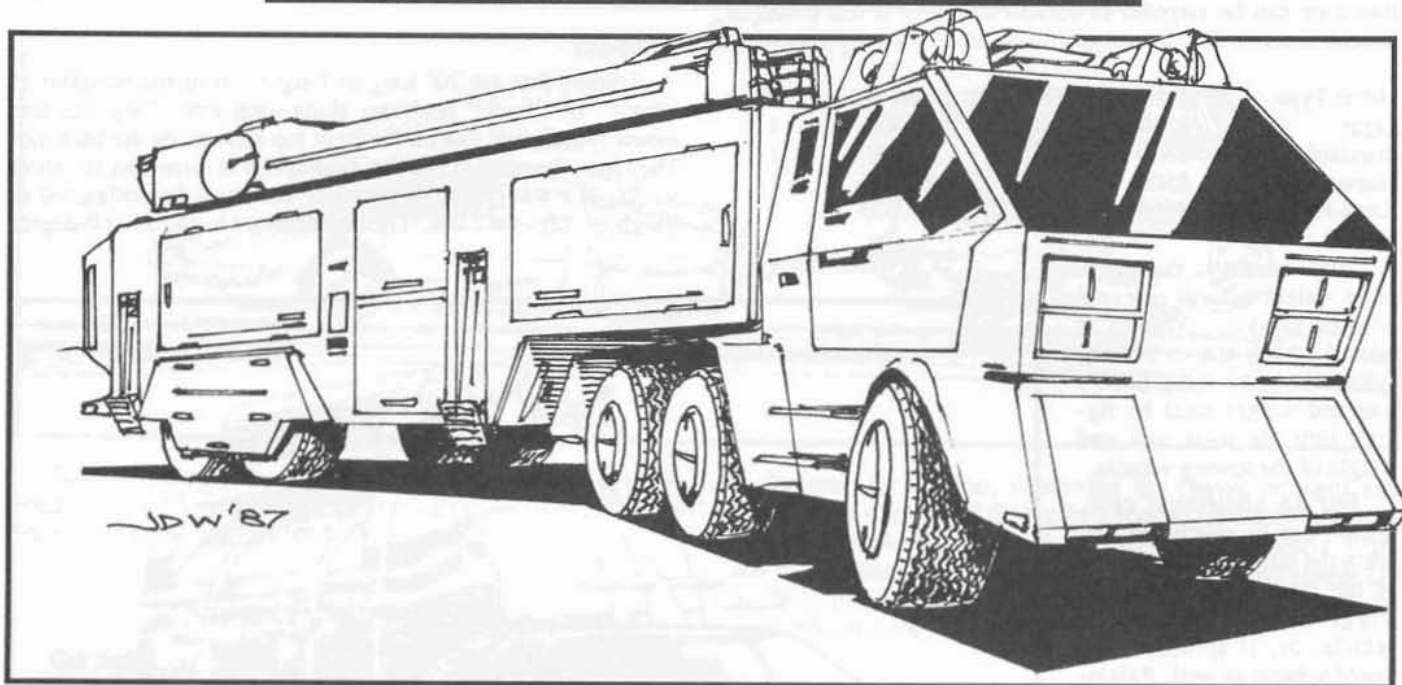
The roads are rough. Cycle gangs, highwaymen, barricade operators, random duellists . . . all take their toll. Most of the interstates haven't seen a repair crew in years. But somebody still has to take the big loads from city to city. And the big rigs are still rolling.

The truckers have quite a reputation. They're professionals. They're as skilled with their weapons as they are with their rigs — or they don't last long. A trucker, they say, never takes the first shot — but he always gets the last one. (Not always true, but it makes for a good story.) The men who make their living on the dangerous inter-city runs aren't interested in starting fights — only in finishing them. It's not a good idea to mess with the 18-wheelers. And their cousins, the ten-wheelers and armored buses, are every bit as formidable.

Truckers belong to a loosely organized but very serious society known as the "Brotherhood," which exists to deal with road problems that threaten the lives and incomes of its members. Unfair law enforcement, highwaymen, price-gouging and trigger-happy road duellists are typical problems; the Brotherhood's response may range from a service slowdown in the affected area to — occasionally — a full-scale attack. More often, they simply circulate descriptions and license numbers of offenders. If every truck, bus or armed courier is your enemy, you'd better stay off the road!

However, truckers are usually very courteous drivers, if you don't make trouble for them. A truck or bus will often stop to help a driver in trouble, or even intervene to break up an unfair road duel. Warning: anyone who attempts to ambush a driver by taking advantage of his good nature will certainly be marked by the Brotherhood if they find out who he is. Sending a brother to Highway One in a fair fight is one thing; double-crossing a Good Samaritan is *evil*.

Oversized vehicles are formidable in battle for a number of reasons. They pack a lot of firepower, and they're just plain big — big enough to make a collision with one a losing proposition. There are many other differences between a truck and a smaller duelling car, and understanding these differences is crucial to dealing with them effectively.

Ten-Wheelers

Cabs

Ten-wheeler cabs have more spaces and a heavier chassis than most cars, but fewer spaces and a lighter chassis than big rigs. There are two types of cabs — the basic cabover and the bigger, heavier, more expensive longnose.

Ten-Wheel Cab Type	Cost	Weight	Load	Spaces	Armor Cost/Wt.
Cabover	$10,500	3,000	15,000	17	$30/14
Longnose	$12,500	3,200	16,500	20	$32/15

The body price includes lights, standard CB, horns and other basics. Improved chassis strength can be bought for cabs. A Heavy chassis adds 10% to the cab's maximum load and costs an extra 50% of the cab's body cost, and an Extra-Heavy chassis adds 20% to the maximum load for an additional 100% of the body cost.

Improved suspension is not available for ten-wheeled trucks — they all have a handling class of 1.

Armor for cabs is bought in the standard six positions — front, back, right, left, top and underbody. If a cab has any carrier but a flatbed, however, back armor is unnecessary. Cab underbody armor protects the cab only. Separate underbody armor is necessary to protect the carrier.

Cab armor is available in all five types, with the same restrictions as for normal vehicles.

Tires

A ten-wheeler must have the same type of tire in all ten locations. Radials and off-road tires are not available for ten-wheelers, but the standard five types are, and these tires (except for the plasticore tire) can be steelbelted and fireproofed at the normal costs. Wheelguards do not affect HC on oversized vehicles.

Tire	Cost/tire	Wt./tire	DP
Standard	$150	60	8
Heavy Duty	$300	80	12
Puncture Resistant	$600	100	18
Solid	$1,500	150	24
Plasticore	$3,000	300	40

Solid and plasticore truck tires are totally immune to both spike and debris damage, but are still affected by obstacles.

Power Plants

Power plants for ten-wheelers and other oversized vehicles do not have power factors like other plants in *Car Wars*.

Instead, each plant is rated for the maximum amount of weight it can pull. Oversized power plants can push beyond their top speeds for short periods of time, with the same limitations and penalties as for car power plants. The power plant is always assumed to be in front of the driver, even in a cabover.

Plant	Cost	Weight	Spaces	DP	Maximum Load
Small	$8,000	2,500	8	16	15,000
Medium	$10,000	2,800	9	18	20,000
Regular	$15,000	3,000	10	20	40,000
Large	$20,000	3,500	13	26	60,000
Super	$25,000	4,000	16	32	80,000

Gas Engine	Cost	Weight	Spaces	DP	Maximum Load	MPG
Small	$12,000	1,500	6	18	18,000	12
Medium	$18,000	3,000	8	24	25,000	10
Large	$27,500	4,000	12	32	60,000	8
Super	$35,000	6,500	14	38	90,000	5

Maximum speed for electric power plants and gas engines is found by this formula: 200 × Max. Load/(Max. Load + Vehicle Weight). Gas engines can use carburetors, blueprinting and tubular headers.

Oversized vehicles are never geared for anything but gradual acceleration and heavy loads. All oversized power plants and engines have an acceleration of 2.5 until they reach 25 mph. After they reach 25 mph, they will have an acceleration of 5 mph. There is one accessory for truck engines that can give it better performance:

Truck Turbo — $2,000, 50 lbs., 1 space, gas engines only. Oversized vehicles with this item accelerate at 2.5 mph/turn until they reach 10 mph; acceleration then increases to 5 mph/turn until they reach 40 mph; and acceleration increases to 10 mph/turn beyond that.

Oversized-vehicle range is calculated the same as for cars.

Weapons

Weapons for cabs can be mounted on three sides — front, left and right. Because the carrier is usually taller than the cab, rear-firing weapons are not permitted, and turreted weapons cannot fire to the rear. The only exception is when a flatbed carrier is used, or no carrier at all. Cabs can use ramplates and any weapon available to any other oversized vehicles.

Extras

Doors can be installed on the back of a cab, allowing passage into a carrier from the cab. Obviously, if the carrier is a tanker, this isn't a good idea. Back doors cost $200, and take up no weight or space.

Carriers

Carriers are cargo areas for ten-wheelers. They are mounted and attached to the cab of the ten-wheeler.

Carrier Type	Cost	Weight	Spaces
15' Flatbed	$1,100	750	20*
15' Van	$2,300	1,150	30
15' Reefer	$3,800	1,350	25
15' Tanker	$6,150	1,900	25
15' Dumper	$4,000	2,300	30

There is no maximum load listing for carriers; that is determined by the chassis of the cab. Carriers are mounted directly on the cab, and do not use tires. They also do not have any suspension.

*Note that the "space" on a flatbed is an approximation. The higher cargo is stacked, the more a flatbed can carry. Twenty spaces of cargo is the maximum for safe hauling, but much more can be attempted. If more than 20 spaces' worth of cargo is loaded on a flatbed, roll 1 die every time the truck performs a D3 (or more difficult) maneuver or encounters a D3 or worse hazard. There is a 1 in 6 chance for every 5 full spaces over 20 that the load will fall off the trailer (2d spaces' worth of cargo will remain).
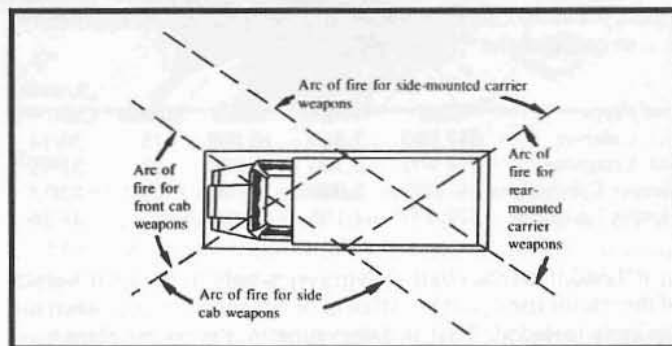
Example: A flatbed is loaded with 28 spaces of cargo, making the chance of disaster 1 in 6. After the mess happens, 2 dice are rolled, and come up, say, an 8 — that's how many spaces' worth of cargo is still on the trailer. It is up to the referee to determine what happens to cargo that hits the highway (20 spaces' worth, in this case). This should be based on how fragile the cargo was, how it was packed, and how fast the truck was going when the cargo hit.

A dump carrier can only devote 5 of its 30 spaces to weaponry — the rest must be used for cargo. A dump carrier has no top, and cannot mount turrets. The carrier can be raised to dump the contents. Controls are located on either side of the carrier; a duplicate set of controls in the cab allows the carrier to be raised from inside. It takes seven turns to raise the bed fully, and only five turns to lower it. Loose materials in the carrier will start to spill out after 2 seconds of elevation. The carrier will be completely empty after 10 seconds.

A tank carrier is required to have at least 20 points of armor in each location. A lighter tank would be in danger of leaking or exploding, even under non-combat conditions.

A "reefer" is a refrigerated carrier — similar to a van, except it carries perishable items.

Armor and Weapons

Armor is placed on a carrier in six locations — front, back, left, right, top and underbody. Normal carrier armor costs $30 and weighs 14 lbs. per point, no matter what type of carrier, and

Oversized Vehicles

can be modified normally. A flatbed carrier, of course, only needs to buy underbody armor. A flatbed carrier can mount a small armored box on the back for carrying and protecting defensive weapons. The box can carry up to six spaces of defensive weaponry, and is armored in the usual six locations. Armor for this box costs $11 and weighs 5 lbs. per point, and can be modified at the standard cost and weight penalties.

Weapons can be mounted on a carrier to the left, right or back (not to the front). Carriers can mount a single turret of any size (which can fire to the front). Carriers can also use the rocket platform, but it would take the place of the turret. A flatbed, of course, cannot mount a turret.

The Big Rigs

Tractors

The "tractor" — the unit that pulls a trailer — is the single most powerful vehicle on the road. A complete tractor will have a body, armor, ten wheels, and a power plant. At the purchaser's option, it may have a reinforced chassis, wheelguards, and various other items of equipment . . . plus, of course, weapons.

Body Types

Tractor bodies come in four styles. The body price includes lights, standard CB, loud horns, and fairly luxurious upholstery. It also includes the "fifth wheel."

Body type	Cost	Weight	Load	Spaces	Armor Cost/Wt.
Std. Cabover	$12,000	3,500	10,000	19	30/14
Std. Longnose	$14,000	3,700	11,000	22	32/15
Sleeper Cabover	$17,000	3,900	12,000	24	32/15
Sleeper Longnose	$20,000	4,100	13,500	27	34/16

"Load," on the chart above, refers only to the total weight of the tractor itself, not the amount of weight it can pull when the trailer is included. That is determined by the power plant used (see below).

The "fifth wheel" is the yoke on the back of a tractor — the hitch that allows a trailer to be attached. It is included in the tractor body price. A fifth wheel has 8 damage points and can be hit in combat. If this happens, it can be rebuilt or replaced for $150 per point of damage. It will work until it is totally destroyed, but if it is destroyed while in use, the trailer will come loose. The fifth wheel must be located outside the armor, and can be attacked at a -6 to hit. If a tractor is rammed from the rear, the fifth wheel takes damage after the rear armor and before any rear-firing weapons.
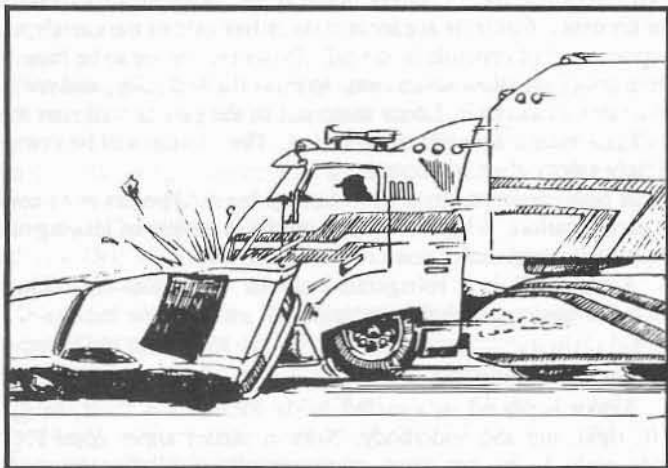
Suspension only comes in one type for the oversized vehicle: Heavy. Therefore, suspension cost is included in the body cost. Any tractor, by itself, has a handling class of zero. Any bus, RV or tractor-trailer rig has a handling class of 1.

Tractor armor is mounted in the same way as regular car armor — front, back, right, left, top and underbody — and can use the same options.

Chassis

The strength of a tractor, bus or RV chassis can be increased to allow more weight to be carried. The Standard chassis is regular equipment — it gives no bonus and costs nothing extra. A Heavy chassis costs 50% of the body price and gives a 10% bonus to the weight allowed. The Extra-Heavy chassis gives a 20% bonus to weight allowed, and costs 100% of the body price.

Power Plants

Tractors use the same power plants or gas engines as ten-wheelers, with two exceptions: the Small and Medium Truck power plants are not powerful enough to pull a big rig. The Regular, Heavy and Super plants all have the same acceleration (2.5 mph/turn up to 25 mph, 5 mph/turn thereafter) as they do in ten-wheelers. The plants can push beyond their maximum speed for short periods of time under the same rules as ten-wheelers. The power plant is always assumed to be in front of the driver and crew, even in a cabover.

Tires

A tractor must have the same type of tire in all ten locations. Tractors use the same tires as ten-wheeled trucks.

Personnel

Almost all tractors are designed for two people — one driver and one alternate driver or gunner. Some have space for three people. Two spaces and 150 lbs. must be allowed for each person riding in the tractor's cab. A "sleeper style" cab has more space than a normal cab (see Body Types chart above). If this space is actually used for sleeping room (rather than weaponry), allow three spaces per sleeping area. This lets one person sleep while the rig is on the road, allowing very long hauls.

Weapons and Armor

Weapons and armor for a tractor are located as for regular vehicles. A tractor can have a turret of any size.

The tractor's fifth wheel can be armored. The fifth wheel guard costs $15 and weighs 10 lbs. per point of plastic armor, with a maximum weight of 200 lbs. This completely protects the fifth wheel, and does not interfere with special kingpin functions. A tractor trailer with a fifth wheel guard cannot perform a maneuver of greater than D3 difficulty.

Trailers

A semi-trailer has eight wheels in back; a "full" trailer has eight in back and two or four in front. The front wheels on a trailer are tied into the steering system of the tractor to make maneuvering possible. When the tractor is disconnected (on purpose or by accident), the trailer's front tires automatically lock in a straight-ahead position. This allows the trailer to roll free, if necessary.

Each trailer must have a body and a kingpin. Armor is not required, but could be useful. Trailers can also have wheelguards, weapons and other accessories.

Trailer Type	Cost	Weight	Spaces
40' Flatbed	$3,000	2,000	50*
40' Dual-Level Flatbed	$4,500	3,000	70*
40' Van	$6,000	3,000	80
40' Reefer	$10,000	3,500	75
40' Tanker	$16,000	5,000	60
40' Dumper	$11,000	6,000	70

No maximum weight is given for trailer capacity, because a rig's maximum weight is determined by the tractor's power plant.

*The "space" rating of a flatbed trailer is an approximation. Use the rules given for flatbed carriers (see *Carriers*, p. 61), with these differences: there is a 1 in 6 chance for every ten full spaces over 50 that the load will fall off the trailer, and 3d spaces worth of cargo will remain.

A flatbed trailer has no top or sides. It can carry a small armored box, no bigger than 6 spaces, to house defensive weapons. The box is armored in the standard six locations and the armor costs $11 and weighs 5 pounds per point. It can be made reflective, fireproof or both, at the usual penalties to cost and weight.

A *dual-level* flatbed trailer can carry 70 spaces of cargo safely — 50 spaces on the bottom level and 20 spaces on top. Additional cargo can be stacked according to the above rules. Both bottom and top levels can be armored as a standard flatbed, but only one weapons box can be mounted.

A dump trailer acts just like the dumper carrier, except it can devote up to ten spaces to weaponry.

A tank trailer is required to have at least 20 points of armor in each location, just like the tank carrier on ten-wheeled trucks.

Armor

Armor on the big trailers is located in ten positions, not six. The ten locations are front, back, front left, back left, front right, back right, front top, back top, front underbody, and back underbody. Essentially, the four "long" sides are divided into two target areas each (see *Combat*, p. 64, for a fuller explanation). Armor for all types of trailers costs $40 and weighs 18 lbs. per point.

Tires

Trailers use the same tires as ten-wheeled trucks. A semitrailer must have eight tires (all of the same type), all on the back half of the trailer; they are paired two and two. (When shot at from the side, the outer tire always takes damage before the inner one.) A trailer adds two more (one on each side) or four more (a pair on each side) at its front end. Semi-trailers have legs that swing down and support the front when not attached to a tractor. These legs have 5 DP each, but cannot be attacked unless the trailer is resting on them, and are -5 to hit.

Kingpin

The kingpin fits into a tractor's fifth wheel, holding the two together. Each trailer must have one and only one kingpin. It cannot be fired at in combat, but can be destroyed voluntarily (see *Explosive Kingpin*, below) or as a result of a crash. There are three types of kingpin:

Standard Kingpin: Costs $100, adds no weight, uses no space. Cannot be released except from outside — about a five-minute process.

Explosive Kingpin: Costs $500, adds no weight, uses no space. Performs like a standard kingpin, but, in an emergency, it can be blown loose from inside the cab (this counts as a firing action). This releases the trailer instantly (see *Loose Trailers*, p. 16). The kingpin must be replaced before the trailer can be attached to any tractor (assuming the trailer survives at all).

Quick-Release Kingpin: Costs $1,000, adds no weight, uses no space. Performs like an explosive kingpin except that it doesn't destroy itself when activated. Thus, the trailer can be reattached (if it doesn't crash after being released). It takes about 30 minutes to reconnect a quick-release kingpin.
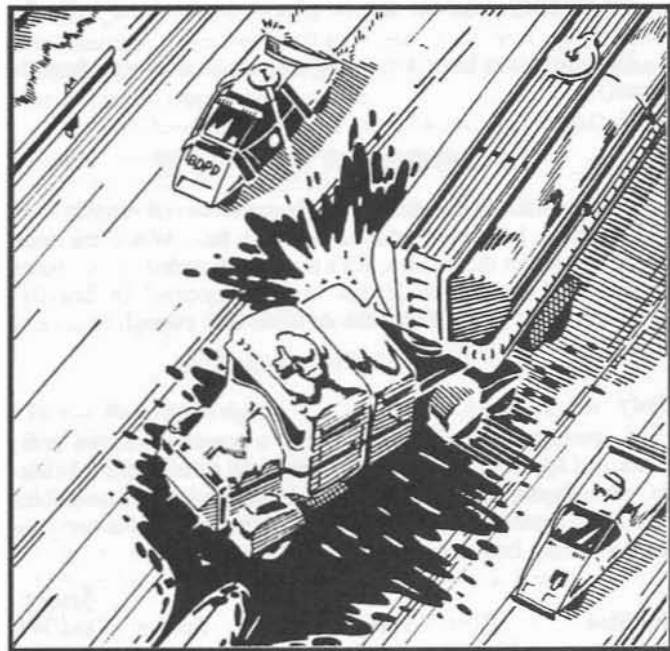
Ramps

Wheel ramps can be installed on flatbed trailers (or, occasionally, van trailers) so small vehicles can be driven on board. Cost for a set of two ramps is $300. Weight is 200 lbs.; no extra space is required. The ramps are only destroyed if the trailer is wrecked.

An assault ramp can be installed on a van trailer (or bus or RV) to allow men, cycles, trikes or subcompact cars to get in and out quickly. It is essentially an extra door in the back, a full 7½-feet wide. It can be dropped in any phase, but takes a full second (5 phases) to close. Since the assault ramp is essentially the rear armor, the vehicle's contents are exposed while the ramp is open. The ramp is only destroyed if all the rear armor is destroyed. An assault ramp costs $1,000, weighs 100 lbs. and requires one extra space for the opening/closing mechanism.

To determine how much cargo space a vehicle takes up, take the number of internal spaces (including cargo) the vehicle has. Then add ten for cars, four for cycles, and two for sidecars. A luxury car, with 19 spaces, takes up 29 spaces as cargo. A heavy cycle, with seven spaces, takes up 11 spaces as cargo.

Personnel

Trailers don't have drivers. Space for gunners or passengers can be allowed in a trailer. Each gunner takes two spaces; each passenger also takes up two spaces (rather than one as in a passenger vehicle).

Weapons

Just as armor is divided into ten locations, weapons and turrets placed on a trailer can be located in any of ten locations. If there are two turrets (one on the front top, one on the back top), one must be placed higher than the other — the higher one has a 360-degree arc of fire, the lower one cannot fire in the direction of the first turret. It is up to the referee to settle any disputes over what the lower turret can and cannot hit.

Other weapons restrictions:

Flatbeds cannot have turrets.

Tankers don't *normally* have turrets. (It is very rare for a tank trailer to have any weapons at all except defensive devices mounted on the rear, behind the tank, and antipersonnel grenades all around.)

No dropped weapons can be placed on the front half of a trailer.

No trailer can have a front-firing weapon (except those in turrets).

Buses and RVs

These are really two names for the same sort of vehicle — an RV is just a luxurious privately-owned bus. When the term "bus" is used in these rules, RVs are also included. Some buses are designed mostly for defense and are escorted by heavily-armed cycles or cars. Others mount more than enough weaponry to take care of themselves.

Body

A complete bus will have a body, a power plant, ten tires, armor and (probably) weapons. It can have a strengthened chassis, wheelguards and other accessories. Almost all such vehicles have large passenger compartments — they are built for carrying and protecting customers, not for duelling.

Bus Size	Cost	Weight	Load	Spaces	Armor Cost/Wt.
Minibus	$4,000	3,000	12,000	35	32/14
30-foot bus	$5,000	4,000	16,000	45	35/17
40-foot bus	$7,000	5,500	21,000	60	40/18

Chassis strength, power plant and suspension are all chosen as for a tractor. The handling class of a bus is 1. Buses have ten tires — two in front and two pairs of two on each side in back. Any truck tire can be used, but all must match. Wheelguards (up to three per side) can be added with no loss of handling class.

The minibus carries armor in the usual six locations. Like trailers, 30-foot and 40-foot buses are very long, and have ten positions which must be armored. Buses can carry any type of available armor, but all armor must match.

Personnel

These vehicles are designed for passengers. Space for luggage and aisles must be allotted — two spaces and 200 pounds per passenger.

Weapons

Weapons can be mounted on the front or back half of a bus counter's "long" sides. A bus can mount two turrets, but one must be designated as "higher" so it can fire over the other. Dropped weapons cannot be mounted on the front half of a bus.
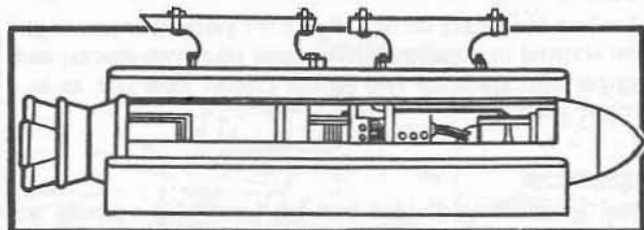
Combat

Turrets on a tractor, trailer or bus follow the same restrictions as turrets on ten-wheeled trucks.

Note that the fifth wheel on a tractor is exposed — not pro-tected by armor — and can be targeted at -6 by any opponent who can get a line of sight on the black dot on the counter, whether or not a trailer is attached. The fifth wheel will never be hit by gunfire unless it is being targeted.

The arcs of fire for a tractor are determined in the same way as regular cars. Draw two diagonal lines through the opposite corners of the counter, and the four arcs of fire are marked. Trailers and buses have more complicated arcs of fire, using the black dots on the long edges of each counter. The arcs of fire are as follows:

The dotted lines show how a straightedge can be placed between the dots to determine whether a target can be hit.
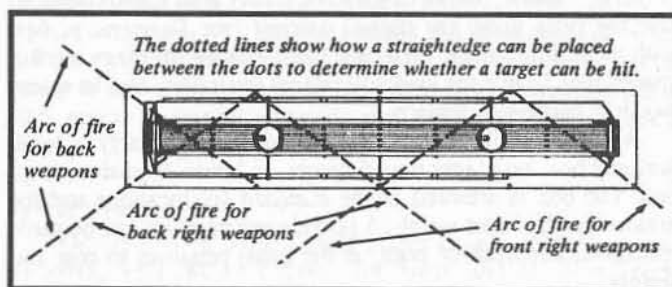
Note that the side arcs of fire overlap. Anyone attacking a tractor-trailer rig or bus from the side may have a choice of targets without penalty, and must specify what he's shooting at.

A tractor takes damage the same way a car does. A trailer or bus takes damage the same way a large car trailer does (see p. 59).

Oversized Vehicle Accessories

Semi-Trailer Emergency Plate — $1,500, 800 lbs., 2 spaces, 8 DP. This can be mounted on any type of semi-trailer. When the trailer is detached from its tractor (for whatever reason), a large skid plate springs down instantly, holding the trailer up. The plate retracts automatically when the tractor's fifth wheel reengages the kingpin (a process which takes ten seconds).

A detached trailer using this device is at HC -6 while moving, using Crash Table 2 as necessary; it cannot maneuver, and decelerates (without hazard) by 30 mph each turn. The plate takes no damage from the skid, but takes damage from obstacles as if it were a truck's solid tire and can be targeted at -5 when in use; when retracted, it is treated as an underbody-mounted weapon.

Windjammer — $500, 70 lbs., no space. This item is an airfoil that fits on the front part of the roof of the cab, directing airflow up and over the trailer. This improves the mileage of a tractor-trailer combination as follows:

Speed	Power Units/ 10 Miles	Speed	Power Units/ 10 Miles
40	7	80	14
55	8	90	16
60	10	100	18
70	12	110	20

The windjammer can be armored for $18 and 9 lbs. per point. Ten points of armor is the maximum; the armor can be any of the standard types at normal cost. The windjammer takes damage before the top armor in attacks from above.

You can mount a turret on a tractor with a windjammer, but the turret can no longer fire into the front arc. For $200, 30 lbs., and 1 space, a device can be installed to raise and lower the windjammer from inside the cab. This is a firing action, and takes one turn for the mechanism to lower or raise the windjammer.

You cannot mount both a windjammer and a spoiler on the same tractor.

9. Boats

The coastal waters of 2040 are as dangerous as the roads — if not more so. Even very small boats may be armed. Five types of boat, from rowboat up to yacht, are described in these rules.

Boat Types

The four smaller boats are armored in five locations: front, left, right, back and underbody. The yacht is armored in eight locations: front, front left, back left, front right, back right, back, front underbody and back underbody. Armor can be of any type available to land vehicles, at the regular cost and weight penalties. As with land vehicles, armor types cannot be mixed.

The rowboat is represented by a $1/2'' \times 1/2''$ counter, with a $1/2''$ "wake" added for use with the turning key (see p. 17). The dinghy and speedboat use a $1'' \times 1/2''$ counter. The cruiser uses a $1^{1/2''} \times 1/2''$ counter, and the yacht uses a $2^{1/2''} \times 3/4''$ counter.

Boat size	Cost	Weight	Max. load	Spaces	Armor Cost/Wt.	HC
Rowboat	$2,000	100	800	6	$5/3	3
Dinghy	$4,000	1,300	3,000	10	$13/6	2
Speedboat	$8,000	2,700	7,000	17(+3)	$20/10	2
Cruiser	$20,000	5,400	15,000	25(+12)	$30/15	1
Yacht	$45,000	10,000	40,000	40(+18)	$36/18	1

Boats cannot have their HC altered except with hydrofoils, an additional propeller, or a jet drive (see p. 66), and the maximum load cannot be modified at all. However, there is no maximum HC for a boat.

The cargo space listed in the larger boats is not necessarily in any one place, like a single cargo hold; it also includes open space on deck and other places. Just remember that vehicular components cannot be put into cargo space — only passengers and cargo can — and that cargo space won't absorb damage of any sort if it is empty.

Power Plants

Boats use special electric power plants that are lighter than car plants. Since propellers cutting through water offer much less resistance than a wheel pushing against the road, boat power plants are designed to produce very high rpm in the propeller motor, but not much torque. For this reason, boat power plants cannot be used in land vehicles, and land vehicle power plants cannot be used in boats.

Boats can use any gas engine; and turbochargers and nitrous oxide. They *cannot* use heavy-duty transmissions or overdrive.

Power Plant Table

Plant	Price	Weight	Spaces	DP	Power Factors
Mini	$400	200	2	4	500
Small	$1,000	400	3	6	1,000
Medium	$2,000	1,000	4	8	2,500
Large	$5,000	2,000	8	16	5,000
Super	$7,500	2,500	10	20	8,000
Heavy-Duty	$10,000	3,000	13	26	14,000

Top speed and acceleration for electric plants, and acceleration for gas engines, are all calculated by comparing a power plant's power factors to the weight of the boat being moved; maximum acceleration is 20 mph unless the boat has jet drives. Top speed for a gasoline engine is figured using a variation of the gas engine top speed formula:

(160 × Power Factors) / (Power Factors + Weight). Round down to nearest 2.5 mph increment.

For electric motors the formula is:

(240 × Power Factors) / (Power Factors + Weight). Round down to nearest 2.5 mph increment.

Boat Power Factors Table

Power Factors/Weight	Acceleration
2 or more	20 mph
At least 1, but less than 2	15 mph
At least $1/2$, but less than 1	10 mph
At least $1/3$, but less than $1/2$	5 mph
At least $1/10$, but less than $1/3$	2.5 mph
At least $1/20$, but less than $1/10$	2.5 mph
Under $1/20$	0 mph
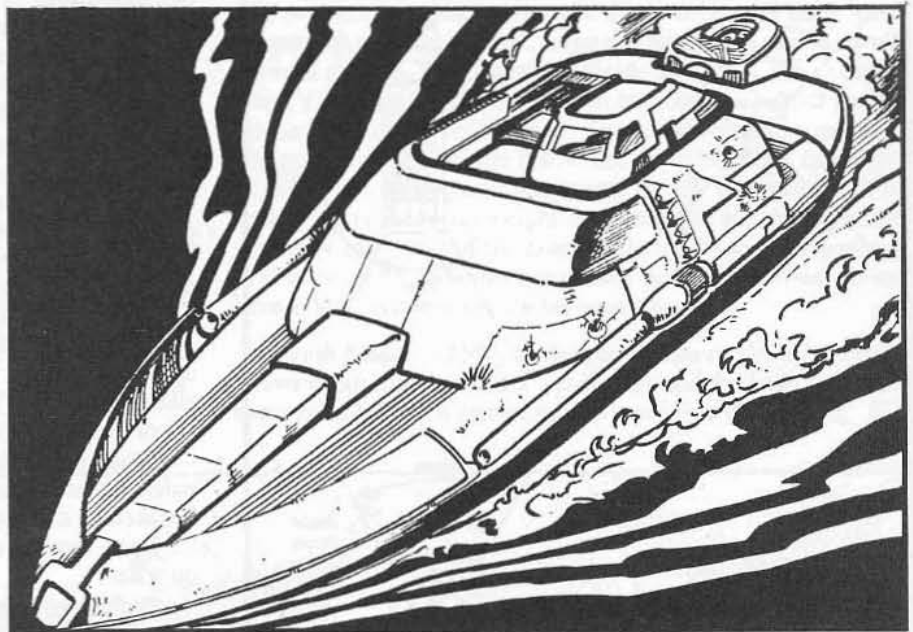
For example, if a speedboat weighing 4,980 lbs. carried a Medium power plant (with 2,500 power factors), it would fall in the *at least $1/2$, but less than 1* category (2,500 divided by 4,980 is just greater than $1/2$) — the boat would have an acceleration of 10 mph and a top speed of 80 mph. The same boat with a 150 cid gas engine (1,900 power factors) has 5 mph acceleration and a top speed of 42.5 mph.

A boat goes 200 miles on a charge, based on a constant speed of 20 mph. For every 10 mph of extra speed the number of "power units" consumed per ten miles traveled goes up by 2; at 30 mph, it costs 12 units to go ten miles, at 50 mph, it costs 16 units, etc. There is no power savings for going slower than 20 mph.

Boat power plants can exceed their maximum speed for short periods of time by "pushing" the plant. The rules for pushing are the same as for car power plants.

Boat power plants are always placed in the rear of the boat. If the boat is equipped with a deck (see p. 67), the power plant goes in the rear of the below-deck area.

Propellers and Jet Drives

Propellers drive the boat through the water. Boats with Mini power plants or 10 or 30 cid gas engines can have only one propeller; boats with Heavy-Duty plants or 500 or 700 cid engines must have two; the in-between sizes can have either one or two. Two propellers do not make a boat any faster, but they do make it more stable and they offer a measure of protection in case one is lost.

Boats with two propellers add +1 to handling class. However, if one propeller of a pair is lost, handling status drops to -6 immediately, and the boat's HC is permanently reduced by 2.

A damaged propeller does not affect a boat's performance in any way. If the last (or only) propeller is destroyed, the boat decelerates 2.5 mph/turn until it comes to a stop. Propeller armor can be bought — it costs $10 and weighs four lbs. per

point (just like wheelguards) and protects just like wheelguards; on a 1 to 4 on 1 die, the armor takes any damage directed at the propeller, and on a 5 or 6 the damage skips the armor and goes directly to the propeller. No more than 10 points of armor can be bought for a propeller.

Propeller Table

Power Plant Size	Propeller Cost	Weight	DP
Mini; 10, 30 cid	20	10	2
Small; 50 cid	50	15	4
Medium; 100, 150, 200 cid	75	25	5
Large; 250, 300, 350 cid	100	40	8
Super; 400, 450 cid	200	75	12
Heavy-Duty; 500, 700 cid	500	150	18

A *jet drive* costs $5,000 and weighs 200 lbs., taking 2 spaces. A jet drive replaces all of a boat's propellers, and increases calculated acceleration by 5 mph/turn and top speed by 20 mph. It adds +1 to HC, just as two propellers do. A boat's power plant must have at least half as many power factors as the weight of the boat before a jet drive will operate at all. A jet drive cannot be combined with turbochargers of any sort.
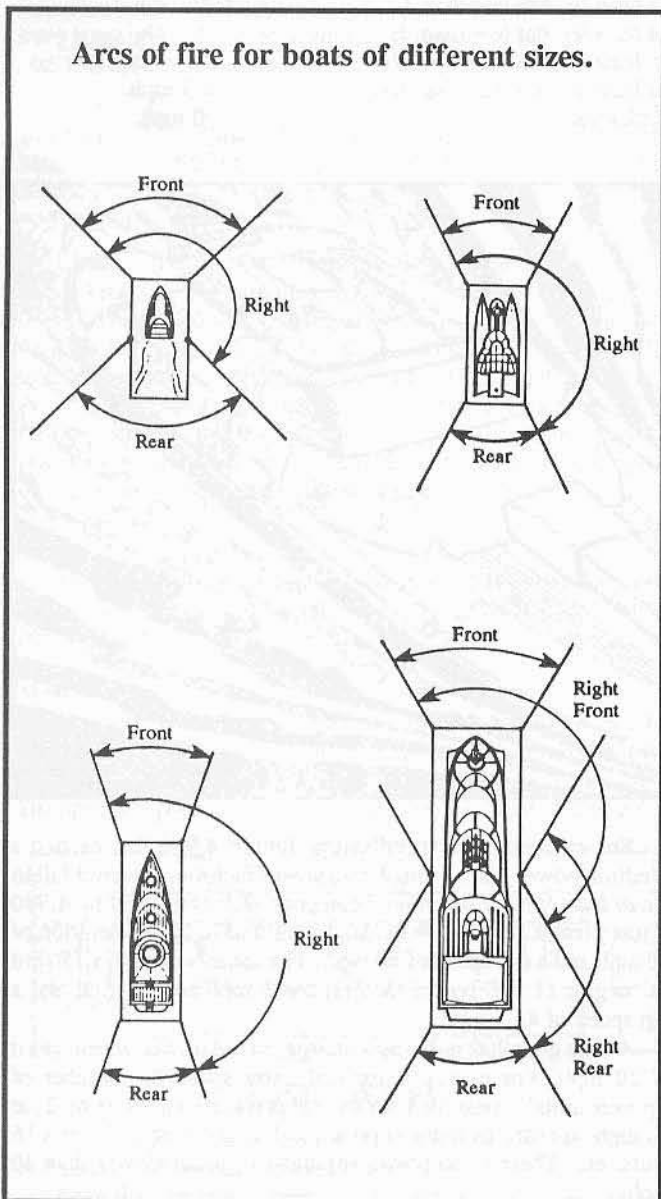
Sinking

Sinking is easy. When the number of spaces of water taken on equals or exceeds the (empty) capacity of the boat, it's time to head for Davy Jones' locker. Every time armor other than Top or Deck armor is breached, there is a chance that water will come in. If a side of a boat is unarmored, a breach will occur the first time the side is struck with weapons fire of any kind.

When the Underbody armor is breached, at least 1 space of water will be taken on per turn. Roll 1 die: on a 1-4, 1 space of water comes in; on a 5 or 6, 2 spaces of water comes in.

When the Side armor is breached, 1 space of water is taken on every time a maneuver is made to the side of the breach. For example, if a boat is breached on the right and makes a right bend, 1 space of water comes in. This will happen every time a drift or bend is performed; if the boat makes four right drifts in a turn, four spaces of water will come in.

When the Front armor is breached, 1 space of water is taken on every time the boat moves forward 1''. (With ½'' moves, take on ½ space.) This can sink a boat *fast*. If the boat is stationary or traveling in reverse, no water will come in a front breach.

When the Back armor is breached, no water will come in unless the boat is moving in reverse. Then, 1 space of water will be taken on every time the boat moves backward 1''.

Boats moving on their hydrofoils and aquabikes never take on water.

Each space of water adds 500 lbs. of weight to the boat; this is important for computing acceleration. For game purposes, the water fills no spaces, but fills in the room between components.

When a boat has taken on ¼ of its total spaces in water, all maneuvers are at +D2, and the power plant or engine will short out on a roll of 1 or 2 on 1 die (rolled once). When the boat has taken on ½ its total spaces in water, maneuvers are at +D3, and the power plant or engine will short out on a 1-4 on 1 die. When the boat is ¾ filled with water, the plant or engine shorts out and no more maneuvers are possible. When the boat is completely filled with water, it immediately sinks. Anyone below deck must roll a 1 or 2 on 1 die to escape; otherwise, they go down with the ship. Anyone above deck must roll a 3 or better on 2 dice; on the unlucky 2, his foot gets caught in the railing, or something else equally unfortunate occurs. Of course, simply escaping the sinking boat does not guarantee survival.

Arcs of fire for boats of different sizes.

Weapons

All weapons available in *Car Wars* can be used on boats, though there are changes in the way some weapons perform on the water. In addition, new, boats-only weapons are also available. Here is a list of changes in weapons made necessary by naval warfare:
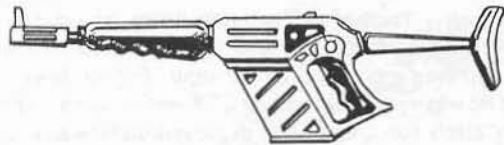
Anti-Tank Gun — These weapons cannot be mounted on a rowboat; they can only be mounted to front or back of a dinghy or speedboat.

Explosive Grenade — When exploded underwater, a frag grenade shoots fragments for only 1/4". However, it has the additional effect of a concussion grenade throughout a 10" radius *underwater*.

Spikedropper — Since the spikes sink immediately upon release, this weapon has no effect on boats.

Oil Jet — Oil has no effect on boats or anything else in the water, including swimmers.

Flaming Oil — Although it is not a hazard to a boat's handling, it does normal damage to underbody armor. It will also affect swimmers.

Smoke Weapons — The effect is normal above the surface. When fired below the surface, a normal-sized cloud is created. It remains totally *below* the surface and disperses in 15 seconds.

Paint Weapons — The effect is normal above the surface. A paint cloud will also work normally below the surface, except it will last ten seconds before the current disperses it. Underwater *flame clouds* don't ignite, but continue to act like paint clouds.

Ice Dropper — A sheet of ice acts as a debris counter, causing the equivalent damage (and hazard, if any). Once hit, it disintegrates.

Minedropper — Regular mines have no effect; they sink immediately, and will not detonate if they hit anything while sinking. Special amphibious mines are available at double the cost (regular mines only; not Spear 1000) and are fired from an unmodified minedropper. Amphibious mines float on the surface and are treated just like regular mines. They attack the underbody armor of boats.

Accessories

Most accessories available in *Car Wars* can be used on boats; the exceptions are accessories that improve a land vehicle's handling or maneuverability, such as anti-lock brakes, active suspension, etc. The only exception is the spoiler, which will reduce the difficulty of any Crash Table roll at 40 mph or higher by 1. A spoiler can only be mounted on speedboats and smaller craft.

In addition, some new, boats-only accessories are also available. Here is a list of those new items, along with the changes in old items made necessary by life on the water.

Bilge Pump — $500, 200 lbs., 1 space. On a roll of 1 to 4 on 1 die, a bilge pump will pump out 1 space of water, once per turn, at the end of the turn. Turning on a bilge pump is a firing action, but it can be left on for prolonged periods of time. Multiple bilge pumps can be installed for added safety.

Boat Top — A roof on a boat, completely enclosing the interior, costs and weighs 10% of the cost and weight of the basic boat body. A boat top can be armored (at the same cost as the rest of the boat), and can also mount a turret. For purposes of determining which turrets, platforms, EWPs, etc. each boat type can mount, treat a rowboat as a subcompact, a dinghy as a compact, a speedboat as a luxury, a cruiser as a van and a yacht as a bus. The yacht boat top is armored in two locations: front top and back top.

Deck — Not all boats have a deck; therefore, it's listed here as an accessory. A deck is a floor that is above the keel (the baseline, and lowest point, of the boat). A deck divides a boat into two sections, below deck and above deck, and has a hatch or stairway opening so crew, cargo and equipment can be moved between the two. The player can decide how many spaces out of a boat's total are allocated to the two sections, but neither section can have less than 1/3 of the total. There's no restriction on cargo and non-cargo spaces; the below-deck spaces can be cargo and all the above-deck spaces non-cargo, or any combination. The deck itself takes up no weight or space, and is armored at the same cost as the rest of the boat. (A deck on a yacht is armored in two locations: front deck and back deck.) A rowboat cannot have a deck; cruisers and yachts *must* have one.

Depth Finder — $500, no weight, no space. The depth finder allows depth readings in a 2" radius around the boat, using the sonar rules below. It cannot spot anything but the sea bed.
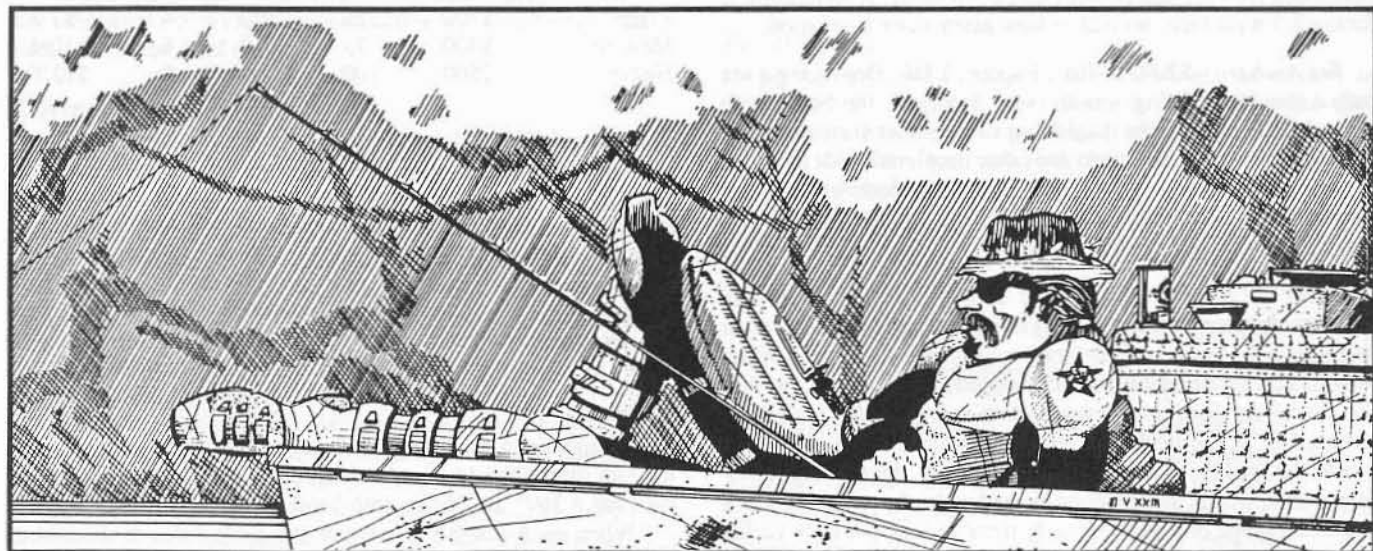
Half Top — Although similar to the boat top, it only covers the front half of the boat, leaving the rear of the boat open to the sky. The half top costs and weighs half as much as a full top for the same boat. A half top can be armored at the regular cost, and can mount a turret (with the same restrictions as above, except a yacht with a half top can only mount a single turret). When attacked from above, determine which arc of fire the attack is coming from. If the attack is coming from the rear arc of fire, the half top is bypassed completely; from the side, the half top is bypassed on a roll of 7 or more on 2 dice; and from the front arc, the half top is bypassed only on a roll of 11 or 12 on 2 dice. Remember, this is for attacks from *above* only.

Hydrofoils — Cost 100% of body cost, weigh 50% of body weight, 1 space. When a boat with hydrofoils reaches 35 mph, the foils automatically lift the boat out of the water. This is automatic — a boat with hydrofoils *must* rise at this speed. A hydrofoil adds ¼'' to a boat's draft, but decreases the boat's draft to 0 when in use. Once out of the water, a boat's top speed is increased by 20 mph and its HC is raised by 1, though acceleration is unaffected. A boat's underbody can be targeted at -3 while the boat is on hydrofoils and any underwater turrets the boat has are exposed during this time. The hydrofoils themselves can be targeted at -6 and have 15 DP; if they are destroyed, the boat falls back in the water (taking a sideswipe collision with the water) and immediately rolls on Crash Table 5 (p. 12) with a +2 modifier, in addition to any other modifiers for the boat's speed.

Hydrofoil armor costs and weighs the same as wheelguard armor, and has the same restrictions (see p. 86).

A metal hydrofoil costs and weighs as much as a plastic one, has 3 DP, and is damaged like metal armor.

Life Raft — $500, 25 lbs., no space. This is a four-man inflatable raft. Triggering the inflation device is a firing action. The raft inflates in three turns, and contains a radio transponder so searchers can find the raft. There are compartments for storing other emergency items (food, water, first-aid kit, etc.), but these items must be bought separately. The life raft is treated as a rowboat for weather conditions, etc., and uses the same sized counter.

Oars — Oars can be used on rowboats and dinghies for emergency movement. They weigh 10 lbs., take up 1 space, and cost $25 for a pair. Rowers (crew) can make the boat go faster. Top speed is 2.5 mph per rower, up to a maximum of 15 mph total speed (rowers and power plant combined). Acceleration is always 2.5 mph/turn, no matter how many rowers are used.

Sea Anchor — $200, 10 lbs., 1 space, 1 DP. Deploying a sea anchor requires a firing action; once deployed, the boat decelerates by 10 mph at the beginning of the next turn and each successive turn, in addition to any other deceleration. It takes ten seconds to retrieve an anchor, or it can be cut loose with a firing action. A sea anchor trails like a drag chute and floats when stopped. Hitting one is a D1 hazard.

Sonar — $4,000, 100 lbs., 1 space. Sonar operates like radar, except that it shows objects in and under the water, rather than above it. Sonar will detect boats, swimmers, underwater objects, and anything the size of a torpedo or larger. Sonar will also reveal the depth of the sea bottom to within ½'' (roll 1 die — on a 1 or 2, the reading is ½'' shallower than real depth; on 3 or 4, the reading is accurate, and on 5 or 6, the reading is ½'' deeper than actual depth) directly under the boat. Sonar has a maximum range of 1,000'' (nearly three miles), but only yachts and larger objects can be spotted at that range. Cruisers can be spotted within 500'', speedboats within 200'', smaller boats within 100'' and torpedoes within 20''.

Twin-Hull — Costs 50% of body cost, no weight, cuts internal space by 10% (round up). A twin-hull adds 1 to a boat's HC. It cannot be used with hydrofoils.

Underwater Turrets — If not pop-down, an underwater turret has the same effect on speed as an External Weapon Pod (EWP), slowing top speed by 10 mph. If pop-down, a turret needs to be waterproofed (adding 25% to the turret's cost) and it will only affect top speed when deployed underwater.

Waterproofed Weapons — In general, only dropped weapons, blue-green lasers (see above) and torpedoes can be fired while their ports are underwater. However, many duellists will find it handy to waterproof other ports, especially those mounted on the underbody of their craft. A waterproofed weapon can be submerged and then fired when it re-emerges. A laser or dropped weapon must also be waterproofed if it is submerged before it is fired. (Note that most weapons, even if waterproofed, can only fire when not underwater.)

The cost to waterproof a weapon is 25% of the weapon's cost (unloaded). Torpedoes do *not* need to have waterproofing added — this is part of their original design.

Weighted Keel — Costs 50% of body cost, weighs 10% of the boat's *maximum load* without the weighted keel, no space. A weighted keel subtracts 1 from any Crash Table roll. If a boat capsizes and has a weighted keel, it stays capsized for the rest of that turn and 4 more turns. On turn 6, the boat rights itself and can function normally beginning on the next turn. The weighted keel itself increases the boat's draft by ½''. A weighted keel cannot be placed on a rowboat or dinghy.

Aquabikes

Aquabikes are the sea-borne equivalent of motorcycles — small, fast, cheap and dangerous in numbers. Like Rowboats, Aquabikes use 1''-long counters, but only occupy the first ½''.

Aquabikes are powered by a tiny jet drive in back, and are steered by leaning the bike in the desired direction. All aquabikes have a base HC of 2. Riding an aquabike requires Cyclist skill.

Frame	Price	Weight	Max. Load	Spaces	Armor Cost/Wt.
Light	$300	50	350	4	$7/3
Medium	$400	75	750	6	$10/4
Heavy	$500	100	900	8	$12/6

Construction

Aquabikes carry armor in three locations: Front, Back and Underbody. Aquabikes use boat power plants or gas engines, and can use Cycle Windshells, Cycle Blades and hydrofoils. They can be streamlined and sloped at the usual costs. Aquabikes cannot have turrets of any kind.

They use the Boat Power Factors Table (p. 65) to determine acceleration and top speed.

Combat

Weapons can only be placed on an aquabike's front or rear, but can ignore the ⅓ spaces restriction. The driver of an aquabike has a 360° arc of fire with hand weapons.

When an Aquabike is hit, use the cycle rules to determine damage location.

10. Hovercraft
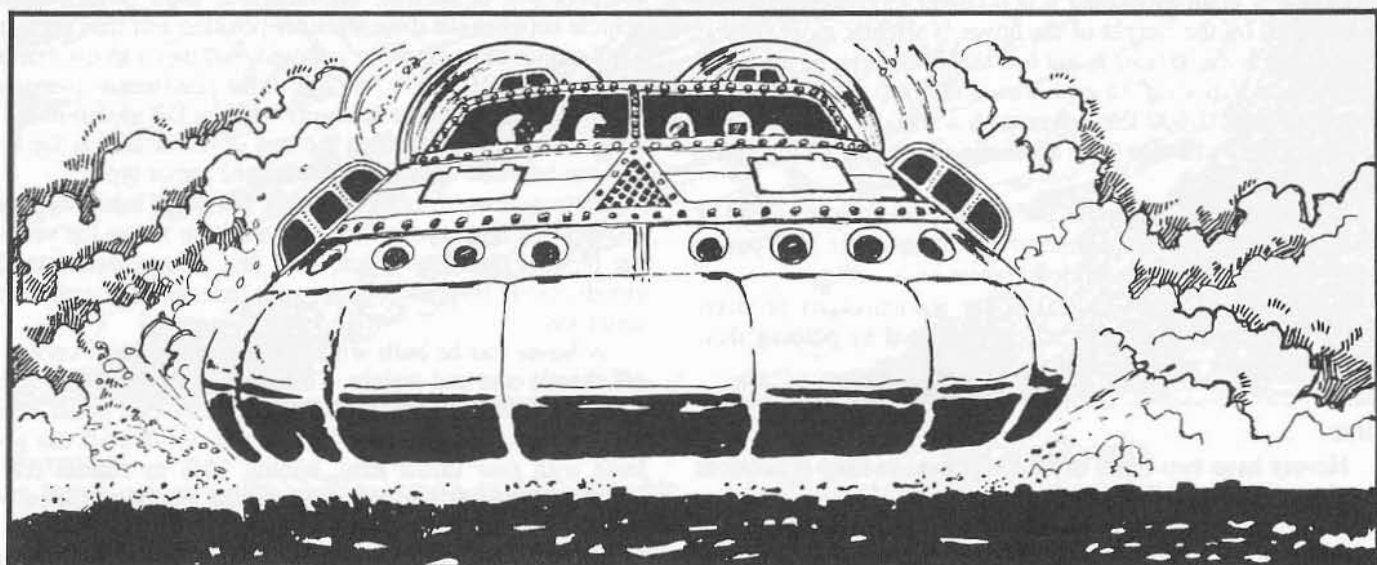
In a world where roads between cities are deteriorating from lack of maintenance, and combat along those roads often requires that vehicles be able to operate outside their confines, the hovercraft is the answer to many travelers' prayers. It floats above the ground on a cushion of air forced under the craft by a large, internal lift fan. The air is in a hollow area called the *plenum chamber*, trapped by the *plenum skirts*, or simply *skirts*.

Since the craft has no contact with the ground, the condition of the surface means little to the hovercraft. This makes it possible to travel on the road, off-road or on water with equal ease.

However, lack of contact with the road does have its disadvantages. Hovercraft do not maneuver or decelerate as well as cars because they have nothing solid to push against. The hovercraft is pushed along and maneuvered with thrust fans mounted at the rear of the craft. The loss of one or more of these fans will further aggravate the poor handling.

But the real weak point of any hovercraft is the skirts. Theoretically, these skirts aren't necessary for a craft to hover. However, the engines and plants available aren't powerful enough to lift an armored craft without most of the skirts in place. Hovercraft have many other advantages and disadvantages. Whether the advantages outweigh the disadvantages must be answered by each individual duellist.

Hover Types

The one-man, small, standard and large hovercraft are armored in six locations, just as cars are. The oversized hovers (small cargo and cargo) are armored in ten locations just like buses. The armor can be made of any of the standard types, at normal cost and weight penalties. Oversized hovers are treated like other oversized vehicle.

Each hover comes with a lift fan and two, three or four thrust fans (described on p. 70). These are standard equipment, and do not add additional cost or weight, or subtract space, from the numbers listed in the *Hover Types Table*.

The four smaller hovercraft are all represented by standard 1/2" × 1" counters. The small cargo hovercraft is represented by a 3/4" × 1 1/2" counter, and the cargo hovercraft by a 1" × 2" counter. Targeting the larger hovercraft is just like targeting a bus: each side has both a front and a back section and the section to be fired at must be specified when declaring your shot.

Hovercraft cannot have Chassis or Suspension modifications.

The cargo space listed for hovercraft is handled in all respects like the cargo space for cars — only passengers and cargo can be placed in the space reserved for cargo.

Hover Types Table

Size	Cost	Wt.	Max. load	Spaces	Armor Cost/Wt.	HC	Fan DP
One-Man	$1,500	700	3,300	8	$11/5	3	3
Small	$2,300	1,400	5,300	14	$16/8	3	3
Standard	$3,000	2,600	7,600	20	$20/10	3	4
Large	$3,800	3,700	10,500	20(+7)	$26/13	2	4
Cargo							
Small	$18,000	5,100	16,500	27(+14)	$36/16	2	5
Reg.	$27,000	7,800	24,000	27(+24)	$40/18	1	6

The Fan DP column on the above chart refers to the DP of each of the three thrust fans and the lift fan used to inflate the skirt. Loss of these fans is not good — see *Fans*, p. 70.

Power Plants

Since the power requirements for boats and hovercraft are the same high rpm and low torque, hovercraft use the same power plants and engines as do boats (see p. 65).

Top speed for both gas and electric engines is calculated using the normal formula for cars (see p. 55). For acceleration, compare power factors to the weight of the hovercraft and refer to the table below.

Hovercraft Power Factors Table

Power factors/Weight	Acceleration
2 or more	15 mph/turn
At least 1, but less than 2	10 mph/turn
At least 1/2, but less than 1	5 mph/turn
At least 1/3, but less than 1/2	2.5 mph/turn
Less than 1/3	Hovercraft will not lift

Hovercraft accelerations are lower than those of boats because the hover is pushing against air instead of water. Top speeds are higher for the same reason. Hovercraft require a higher power factor to weight ratio than boats because they must expend a portion of their power to simply stay off the ground.

For example, a standard hover weighing 7,600 lbs. has a Super power plant producing 8,000 power factors. Power factors divided by the weight of the hover is slightly more than 1. This falls into the *At least 1, but less than 2* bracket, so the hover has an acceleration of 10 mph/turn and a top speed of 182.5 mph. The same 7,600 lbs. hover with a 500 cid engine (9,500 power factors) will also have acceleration 10, but its top speed will be 167.5 mph.

A hover can go 200 miles per charge at a constant speed of 55 mph. For every 10 mph over 55 the number of "power units" consumed per ten miles increases by 2.

Hovercraft cannot use heavy-duty transmissions or overdrive. They can exceed their maximum speed by pushing their plant in the same manner as cars.

Fans

Hovers have two types of fans: *lift fans* to keep it airborne and *thrust fans* to push it along.

Every hovercraft is equipped with two, three or four thrust fans. Damaging a thrust fan does not affect the hover's performance. However, the *loss* of a thrust fan reduces the hover's HC by 1 for each fan lost. If all thrust fans are lost, the hover cannot maneuver and will decelerate by 5 mph per turn until it comes to a complete stop (but can still hover).

If a hover loses its lift fan, it drops to the ground and begins skidding, losing 30 mph at the beginning of every turn. The fall causes 2d damage to every remaining skirt, and 1d to the underbody. Dropping to the ground is, in itself, a D5 hazard.

All fans take damage as helicopter rotors (see p. 38): if a fan is hit by any weapon which can do vehicular damage, roll 1 die. On a 1 through 5 the fan takes 1 point of damage; on a 6 the fan takes 2 points. (Fan DP is listed in the *Hover Types Table*.)

The lift fan is in the body of the hover and is protected by the armor of the hover. It is considered a vehicular component for the purposes of damage allocation; it must be placed in the vehicle between the driver/gunner position and the cargo space. Fans cannot be component armored, but they can use fan armor which costs $10 and 4 lbs. per point (maximum 10 points — cannot be metal), and effectively adds its DP to that of the fan. This armor need not match the rest of the armor on the hover, and can be made of any of the standard armor types.

Note that even though the lift fan is an interior vehicular component, its purpose is to pull air from above the vehicle to the plenum chamber. Thus, it is just as susceptible to flame clouds, cloud bombs and other such damage as external components are.

A hover can be built with just two thrust fans, saving 10% off chassis cost and weight. This reduces the hover's HC by 1. Turreted hovers which originally had only two thrust fans can fire the turret weapon into the rear arc. Hovercraft can also be built with *four* thrust fans, adding 15% to chassis cost and weight. This adds 1 to HC. Thrust fans can be specifically targeted at a -2 on the to-hit roll.

A hovercraft can be equipped with *turbofans* for greater performance (+20% body cost, no space or weight). A turbofan adds 5 mph to acceleration and 20 mph to top speed. It is not compatible with turbochargers or superchargers.

Skirts

The skirts of a hovercraft help keep the air under the hover and keep it off the ground. The four smaller hovers require four skirts apiece, one for each side of the hover: front, left, right and back. The two larger hovers require six each: front, front left, front right, back left, back right and back. Skirts come in three types: standard, heavy and extra-heavy. These skirts can be mixed on a hover at no penalty to maneuverability. The *Skirt Table* below lists the cost, weight and DP of the skirts for all six hover types.

Skirt Table

Size	Standard $ / Wt. / DP	Heavy $ / Wt. / DP	Extra-Heavy $ / Wt. / DP
One-Man	250 / 60 / 12	375 / 90 / 15	500 / 120 / 18
Small	300 / 80 / 16	450 / 120 / 20	600 / 160 / 24
Standard	400 / 100 / 20	600 / 150 / 25	800 / 200 / 30
Large	500 / 120 / 24	750 / 180 / 30	1,000 / 240 / 36
Small Cargo	750 / 160 / 28	1,125 / 240 / 35	1,500 / 320 / 42
Cargo	1,000 / 200 / 32	1,500 / 300 / 40	2,000 / 400 / 48

Skirts can be made fireproof for double cost. Skirts can also have skirt guards which are similar to wheelguards, although HC is unaffected. Skirt guards cost $10 and weigh 4 lbs. per point, and can have a maximum of 10 points per skirt (2 points if metal). Skirt guards can be made from any standard armor type and must match the armor on the rest of the vehicle.

Losing a skirt (or all skirts on a side, for oversized hovers) has the same effect as losing a tire for a car. Handling status drops to -6 immediately, and HC is permanently reduced by 2.

Losing all the skirts on two sides collapses the plenum chamber and has the same effect as losing the lift fan, detailed under *Fans* (see p. 70). Skirts can be specifically targeted at -2 to the to-hit roll.
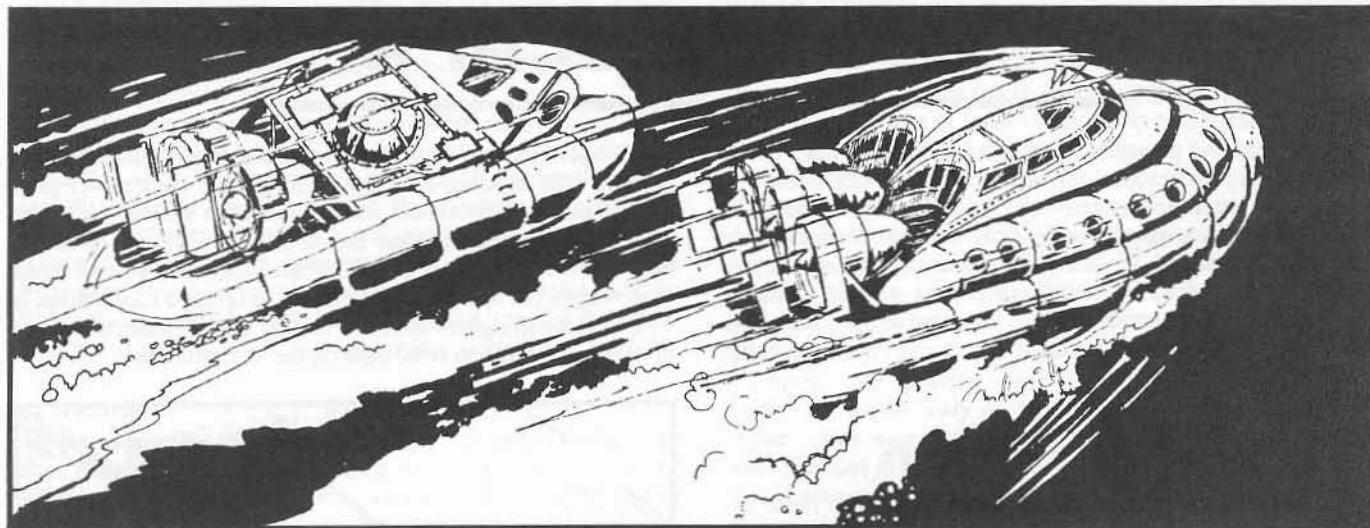
Weapons

Hovercraft can use all weapons available to cars, subject to the $1/3$ spaces per side limitation. In addition, a hover can use weapons designed for boats, subject to the same water-effect limitations. Also, since a hover does not touch the ground, it can mount dropped solid weapons on the underbody of the craft. Liquid or gas weapons are harmlessly dispersed by the lift fan. An AT gun can be side-mounted only on oversized hovers.

Accessories

Hovercraft can use all accessories available to cars — with the obvious exception of such things as active suspension, heavy-duty and anti-lock brakes, heavy-duty shocks, spoilers, airdams or any other accessory that modifies the handling or maneuverability of cars, boats or helicopters. Hovers cannot use any of the special accessories for boats except oars, life rafts, and marine radios. Hovercraft can use pontoons (see p. 73) so that they can land on water. These pontoons are mounted behind the skirts of the hover and can only be targeted after the skirt is destroyed, or if the firer can shoot at the hover's underbody. Hovers cannot tow trailers.

A hovercraft can also use a *vertical stabilizer* ($1,000, 150 lbs.). It is destroyed when the top armor is destroyed. Even if a hover's top armor could not otherwise be targeted, a stabilizer can be targeted at -2 (just as a turret can be targeted). This destroys top armor. A hover using a vertical stabilizer cannot mount a turret, rocket platform, etc. (except oversized hovers — see below). At speeds of 60 mph or greater, a vertical stabilizer reduces the difficulty of any maneuver by 1. A vertical stabilizer must be mounted at the top back on oversized hovers.

For purposes of determining which turrets, platforms, EWPs, etc. each type of hover can mount, treat a one-man hover as a subcompact, a small as a compact, a standard as a luxury, a large as a van and a small cargo or cargo as a bus. Note that a hover's top-mounted weapons cannot fire into its rear arc if it has three or four thrust fans.

Combat

Hovercraft are treated just like cars for the purposes of targeting and hitting. They are floating on a cushion of air, but this cushion is not very thick — only a few inches. Thus, they get no bonuses or modifiers for height, unless they are oversized. Oversized hovers have the same modifications in combat that any other oversized ground or sea vehicle does. However, dropped liquid weapons have no effect on hovercraft. Exception: the flaming oil jet which damages the hover normally (substitute "skirt" for "tire") but does not affect the handling of the hover in any way. Dropped solid weapons also have no effect on hovercraft, except radio-controlled mines can still affect hovers and proximity-fused mines are set off on the same rolls that normally set off regular mines. When allocating damage from these weapons substitute "skirt" for "tire." Skirts on one side of a hover cannot be targeted from the arc of another side of that hover (i.e., you cannot target the front skirts of a hover when your weapon is in the side arc of that hover, etc.).

In a collision, use a hover's actual weight for determining damage, but use only *half* its weight for determining speed after collision and conforming movement. Hovers are easier to shove around, because they don't have ground friction to help hold them on course.

11. Helicopters

Sleek, fast and powerful, helicopters cruise the skies of the 2040s. They're not practical for long-distance travel, but they're the premier attack and rescue vehicles of the age. Like their 20th-century counterparts, they're fast, versatile, maneuverable and have the potential for heavy firepower and armor. They're also less safe and more cantankerous than ground vehicles. They're also fairly expensive. But if you need to get somewhere fast, or need to go where no ground vehicle can cut it, a chopper is the way to go.

Construction

Helicopters follow construction rules similar to those for cars. The important factors are still cost, weight and space. To build an effective helicopter, these must be juggled with care.

Helicopters only have five basic types of components: body style (which also determines rotor diameter), power plant, weapons, armor and accessories. Helicopters do not have chassis, suspension or tires. The maximum weight of a helicopter is strictly a function of the power factors of the power plant (see below).

Body Types

Helicopters come in four basic types. Note that the base handling class goes down as the choppers get bigger.

					Rotor	
Body size	Price	Weight	Spaces	HC	DP	Armor
One-Man	$10,000	500	13	3	3/3	16/8
Small	$20,000	800	19	2	5/3	20/10
Standard	$40,000	1,200	24(+6)	2	6/4	30/14
Transport	$80,000	2,000	24(+17)	1	8/4	35/17

The numbers in parentheses under "Spaces" indicate the amount of cargo the chopper can carry. Spaces designated for cargo cannot be used for helicopter components (except where noted below).

"Rotor DP" indicates the number of damage points the helicopter's rotors have. The first number is for the main rotor; the second is for the stabilizing rotor.

The one-man helicopter can be purchased in a "stowaway" format. For an extra $1,000, you can purchase a one-man model that can be broken down into component parts. It has a hinged fuselage and folding rotors, and fits into any cargo area holding 13 spaces. The breakdown process takes a tool kit and 15 minutes. Assembly takes the same amount of time (and also requires a tool kit); it is an Easy job for a mechanic.

Power Plants

Helicopters use the same fuel-cell technology as cars, trucks and cycles. Helicopter power plants can only be used in helicopters, however — they are specifically designed for the types of power loads that flying demands, and are unsuited for other types of duties.

Power Plant	Cost	Weight	Spaces	DP	Power
Mini	$10,000	2,500	8	16	5,000
Small	$15,000	3,000	10	20	8,000
Standard	$20,000	3,500	13	26	14,000
Super	$25,000	4,000	16	32	20,000

Acceleration and top speed for helicopters is computed differently than for cars, as a significant part of their power goes toward merely staying off the ground. If a helicopter power plant's factors are less than the helicopter's weight, it is underpowered and will not lift off; if the factors are at least equal to its weight but less than 1½ times its weight, its acceleration is 5 mph on the straightaway; if the factors are 1½ times its weight or more, acceleration is 10 mph on the straightaway.

Helicopter top speed is computed as follows: (300 × power factors)/(power factors + weight). Helicopter power units are consumed at a rate given by: (PU × current speed)/ (20,000 × (maximum speed/100)). An average helicopter can travel about 200 miles at 100 mph on a full charge.

Helicopters need armor in six locations: front, back, left, right, top and bottom. The main rotor and the stabilizing rotor are not protected by armor. All the usual types of armor are available for helicopters, and mixing types is not allowed.

Weapons

Weapons work for helicopters pretty much the same way they do for land vehicles. There are certain differences in mountings, methods of aiming, and so on, but all of the weapons available to ground vehicles are usable for helicopters. Two weapons — the bomb and the cluster bomb — are usable only by helicopters. Full stats appear with the rest of the weapons. Note that dropped weapons won't be as useful. Paint sprays and smokescreens operate normally, but a helicopter has to be within 7½ feet — ½" in game scale — of the ground for oil sprays, spikedroppers and minedroppers to be effective; above that altitude, the oil, spikes and mines spread out too much. Above 7½ feet, smoke and paint will not block LOS between ground vehicles.

Vehicular weapons can be mounted on a helicopter's front, back, sides and bottom. Turrets can only be bottom mounted. A turret can fire as a left-, right-, front-, or back-mounted weapon, and is protected by bottom armor. Side- and bottom-mounted weapons can be mounted in cargo space. Back-mounted weapons

must be taken from cargo space, if the chopper has cargo space to begin with.

Arcs of fire must be considered three-dimensionally — see p. 38 for a full explanation.

Smoke and Paint — These weapons are rarely mounted on helicopters, because gusts of air from the rotors will disperse them. One-man choppers do not have this effect. Small helicopters disperse any smoke or paint cloud within 1''. Standard helicopters disperse clouds within 2''; transports disperse clouds within 2''. Double these distances for a cloud directly below the helicopter. However, a chopper which disperses a paint cloud by flying underneath it is treated as though it had entered the cloud; the paint is sucked down by the rotors and coats the windshield.

Accessories

A wide variety of special equipment is available for helicopters. Nearly every accessory listed in Chapter 14, can also be mounted on a helicopter — with some obvious exceptions, like wheelguards. What follows is a list of accessories that can *only* be used in helicopters.

Bomb Bay — $1,000, 1 space, 100 lbs. Bomb bays are bottom-mounted doors through which large equipment can be dropped. (Note that a helicopter does not have to have a bomb bay to use bombs. Bombs can be installed outside the chopper, or have their own little doors — used only for that bomb.) The bomb bay doors are actually the helicopter's bottom armor; when they are open, the helicopter has no bottom armor. To open the bomb bay doors, one crewman must activate them (which counts as a firing action); at the end of the next turn they are open. The same sequence is used to close them.

Coaxial Counter-Rotating Blade System (CACR) — 20% of body cost, 400 lbs., 2 spaces. Both blades have the DP specified for the main rotor. The CACR increases maximum speed to 250 mph, and adds 1 to HC (the maximum HC is still 3).

Roll randomly to see which rotor is hit by an attack; when one is destroyed, the effect is the same as if the stabilizing rotor were destroyed. The CACR blade system works like a stealth system at up to half speed and acceleration, except the range of hearing is 6'' (90') instead of 12'' (180').

Extra Rotor Blades — Each extra main rotor blade costs $1,000 and weighs 200 lbs.; each extra stabilizing rotor blade costs $250 and weighs 50 lbs. Unmodified helicopters are assumed to have two blades; up to three more can be added, for a total of five.

Each extra blade adds 1 DP to the DP of the rotors. In addition, any helicopter with four or more main and stabilizing rotors has its HC increased by 1, up to a maximum of 3. If this item is combined with CACR, the number of blades on each main rotor must match, and there is no HC benefit.

Improved Tail Assembly — 20% of body cost and weight. This assembly can only be mounted on helicopters and cannot be retrofitted. It reduces the HC penalty of any hazard by 1 when the chopper is traveling 60 mph or faster. Benefits are lost when the helicopter slows to below 60 or when its back armor is destroyed.

Maneuver Foils — Cost is 25 × the armor cost and 10 × the weight of one point of armor of the helicopter mounting them. They must match the armor type of the helicopter. If a helicopter mounts one set of maneuver foils, it gets a +1 to its HC when traveling above 60 mph. If it mounts two sets, it also gets a -D1 to all maneuvers done when traveling over 60 mph. More than two sets of maneuver foils have no additional effect.

Personal Parachute — $200, 2 GEs, 20 lbs. as cargo, 4 DP. Personal parachutes are used when people bail out of aircraft. (A person bails out by moving his counter to a square which is not considered floored — i.e., he steps out the door, or through the bomb bay.) Falling rates are described on p. 27. A parachute will not activate in time to save the wearer unless he bails out at an altitude of 20'' (300') or higher. The parachute opens once the character has fallen for 16'' (240'), brakes the descent for the next 4'' (60'), and then acts as a hang-glider (see p. 87). An open parachute can only be damaged by a flamethrower; however, it is +3 to hit due to its large size.

Pontoons — $500, 50 lbs., no space, 7 DP. Pontoons are skid mounts which enable a helicopter to land on water. If one or both pontoons are destroyed, a helicopter that has landed on water has only three turns to take off again — after that the chopper will have sunk too far to pull itself out; it will be completely underwater in another ten turns. Pontoons are targeted at a -3.

Retractable Landing Gear — $1,500, 150 lbs., 2 spaces. This item, *usable only on helicopters*, replaces the chopper's regular skids with a set of three retractable wheels. Each wheel has 6 DP and is targeted at -6 when extended. When retracted, the wheels are protected by the helicopter's underbody armor and cannot be independently targeted; furthermore, the helicopter's top speed increases by 10 mph when the wheels are up. Extending or retracting the landing gear takes a firing action and one full turn.

Rotor Armor — This armor effectively increases rotor DP. The cost and weight are different for main and stabilizing rotors:

Main rotor — Armoring the main rotor is twice the cost, and half the weight, of a single point of the helicopter's regular armor. It is triple the usual cost to repair.

Stabilizing rotor — Armoring the stabilizing rotor is 1½ times the cost, and half the weight, of regular armor. It is double the usual cost to repair.

No rotor can carry more than 10 points of armor. This armor is available in all varieties except metal, and must match the chopper's armor type.

Skid Stretchers — No space, 25 lbs., $300, 2 DP. Skid stretchers are man-sized cylinders mounted to a helicopter's skids for the purpose of carrying extra people. Each one adds one space of room to a helicopter, but that space cannot be used to house weapons. Skid stretchers are unarmored and thus defenseless, and are targeted as though they were pedestrians (-3 to hit).

Skids — No weight, space or cost. Skids are standard equipment on helicopters; all helicopters have a pair of skids for landing. Targeting a skid is at -8, and their DP varies — 8 DP each for a one-man or small chopper, and 12 DP each for a standard or transport helicopter.

Vehicular Parachutes — $1,500, 150 lbs., 3 spaces, 4 DP. Vehicular parachutes operate in much the same way as personal parachutes, but are used when dropping large crates of supplies or actual vehicles. Vehicles up to 2,000 lbs. can be dropped by vehicular parachute. The parachute can only be operated successfully from a height of 30'' (450') or more, opening after 20'' (300') of free fall, and acting like a hang glider after another 10'' (150'). They are +4 to hit with flamethrowers.

Winch — $500, 100 lbs., 1 space, 1 DP. Winches are mechanisms which haul up cargo and personnel on stout cables. They must be mounted on a side with a door (or in the bottom, in the case of a helicopter with a bomb bay) and can only be used when that door is open. The machine consists of a revolving drum mechanism and a 90-foot (6'' game scale) cord. The mechanism is capable of supporting 4,000 pounds. The mechanism safely reels out the cord at 1''/second; it will reel it in at 1''/ second if the weight attached is less than 1,000 lbs., ½''/second if the weight is 1,000 to 1,999 lbs., and ¼''/second if the weight exceeds 1,999 lbs. The cable takes one person and three seconds (six seconds in the case of a vehicle or similar-sized object) to attach to the object in question.

Example: A hovering helicopter can lower one crewman 90 feet in 6 seconds. That crewman takes another 3 seconds to attach the cable to another character being rescued, and then the winch mechanism takes another 6 seconds to reel the two of them up. If he'd attached it to a heavy motorcycle, it would take longer to attach the cable.

The winch cable can only be hit by weapons that can make "area effect" attacks (that is, machine guns, flamethrowers and lasers). Under those circumstances, it has 10 DP, and is -8 to hit.

Grasshoppers

The Grasshopper is an uncommon combination of helicopter and automobile. It is a mid-sized, sedan or luxury car, a small or standard hovercraft, a dinghy or a speedboat, or medium or light trike body which is modified (for $15,000 extra) to accommodate special helicopter equipment. This consists of a sliding roof panel (the only kind of turret which can be mounted on a grasshopper is a pop turret underneath) from which emerges a folding rotor attachment.

The rotor attachment takes one full turn to activate, during which time the roof panel slides back, and the rotors emerge and snap out to their full length. The rotors must spin for 3 seconds; on the fourth second the grasshopper takes off, at the rate of acceleration determined by the helicopter motor vs. weight rules (p. 72). A grasshopper's ground acceleration and top speed are figured based on the plant's power factors. Grasshoppers can only use Mini or Small Helicopter power plants. The plant takes the normal number of spaces, plus 1 space for the extra rotor equipment.

Driver skill is necessary to drive a grasshopper on land; Pilot skill is necessary for use in the air. Once in the air, the grasshopper behaves exactly like a helicopter; the rotor and stabilizing rotor (which pops out of the trunk) are each -6 to be hit. The main rotor has 5 DP; the stabilizing rotor has 3 DP. The grasshopper has a HC of 2 in the air. The grasshopper can use helicopter maneuver foils, but cannot use CACR, extra rotor blades, or retractable landing gear.

A vehicle which can travel on land, water *and* air is called a "triphibian."
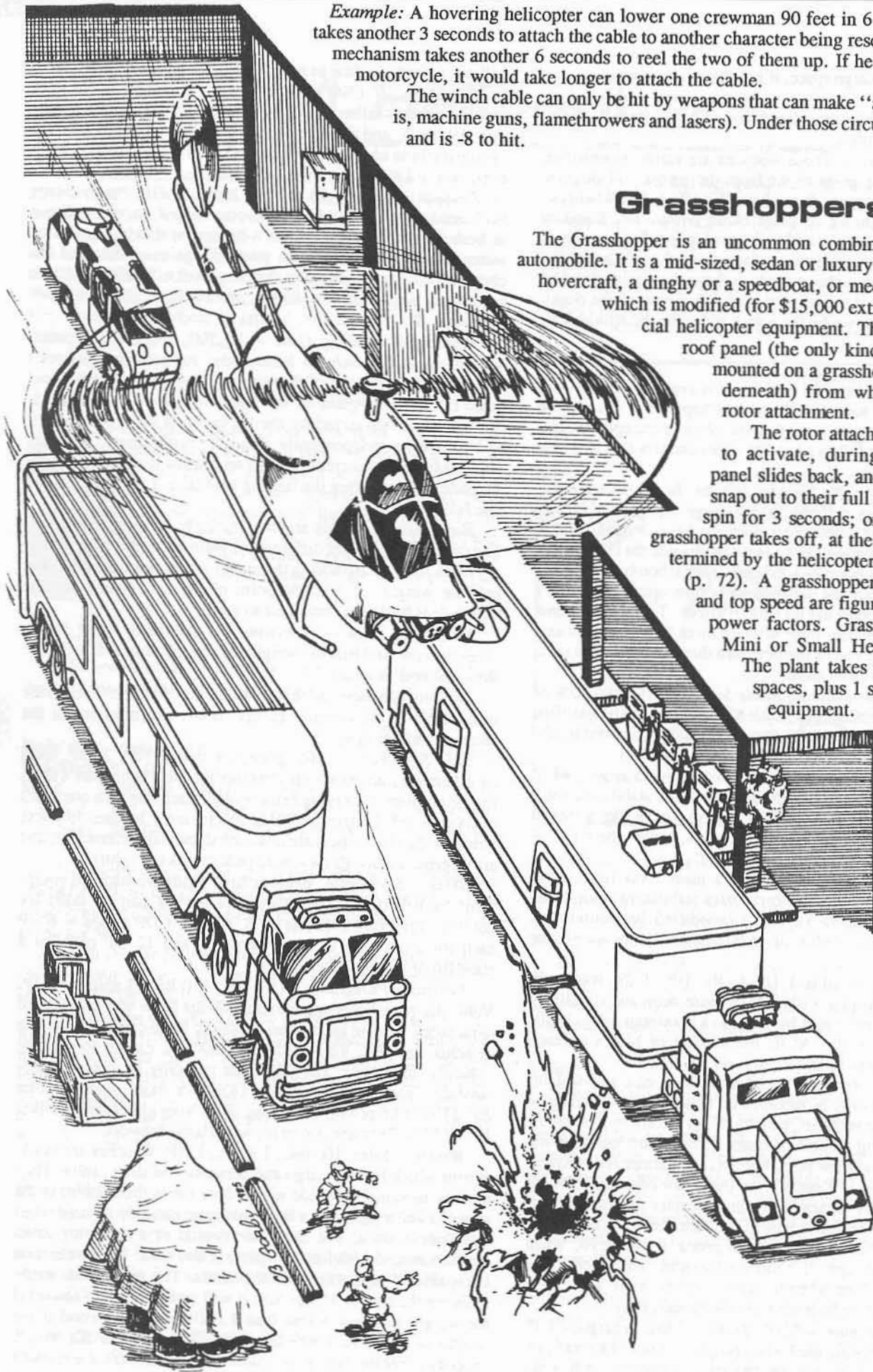
12. Racing Cars

There are many kinds of racing, some of which will require special vehicles. Racing vehicles tend to be lightly armed and armored — speed, not firepower, is of the essence. Many racing events are throwbacks to the days before autoduelling, when no combat was allowed at all! Of course, an occasional "accidental" bump could still result in an unfortunate spin or wreck, clearing the path to victory . . .

Body Types

There are five types of racing vehicles available. These are seen only on the racetrack, and not in the arena or on the streets.

Type	Price	Wt.	Max. Load	Spaces	Armor Cost/Wt.
Formula One/Indy	$6,500	600	4,000	15	$22/10
Can-Am	$6,500	800	4,500	18	$24/12
Sprint	$5,600	300	3,200	10	$15/7
Funny Car	$6,600	700	4,500	20	$26/13
Dragster	$6,200	600	4,000	16	$20/8

These cars use the same engines, armor, weapons, chassis, tires and accessories as normal *Car Wars* cars. The Formula One/Indy, Sprint, Funny Car and Dragster bodies are designed for a driver only — no gunners or passengers. The Can-Am can have one passenger or gunner, but no more.

All of the racing vehicles have racing suspensions that cannot be altered in any way. All the racing bodies except the Indy have a base HC of 5; the Indy body style has a base HC of 6. With racing slick tires, and other special equipment advantages, the base handling class or one of these devils could get up to 8 or more.

All racing bodies can mount up to a two-space turret.

The Formula One/Indy, Dragsters and Sprint car bodies cannot mount wheelguards, because the tires stick out beyond the body of the car. Armored wheel hubs can be used. The Can-Am and the Funny Car have no such restrictions, and can use wheelguards.

Funny Cars are hinged in the back, and the entire body shell is lifted off the frame hydraulically for easy access to the engine and weapons (which gives a +1 to all repair rolls). This is also the only way for the driver to get out of the vehicle, since Funny Cars do not have doors. It takes a full 5 seconds to raise or lower the shell, during that time the car is considered to have no front or side armor.

Dragsters are a special case. They use a 1½" × ½" counter. This should pose few problems, however — they still move forward in the usual way. When using the turning key for maneuvers, line the key up with the *front inch* of the counter.

Acceleration for Dragsters and Funny Cars is calculated the usual way, with one addition: if the number of power factors the engine has is more than twice the weight of the Dragster or Funny Car in pounds, then it has an acceleration of 20 mph/turn.

Dragsters use motorcycle tires in front, and car tires in back. Both the Funny Car and the Dragster can only have racing slicks on the back corners. Because of their odd shape, Dragsters cannot perform any maneuver greater than an *unmodified* D1 difficulty if they are going 20 mph or faster. At less than 20 mph, they can do up to an unmodified D3. Funny Cars can only perform an unmodified D3 or less if traveling 20 mph or faster; at a lower speed they can do any maneuver except the bootlegger.

Dragsters also have some weapon restrictions. No more than two spaces' worth of weaponry can be mounted in the front arc of the vehicle, due to the extremely narrow front end. The other restriction is with turrets. If the Dragster has the engine in the rear of the vehicle then the turret must be in front of the driver and cannot fire into the back arc. If the engine is in front of the driver, then the turret must be mounted behind him and cannot fire into the front arc.

Dragsters are a +1 to be hit from the sides, and a -1 to be hit from the front or back. This is in addition to any other targeting penalties that may apply.
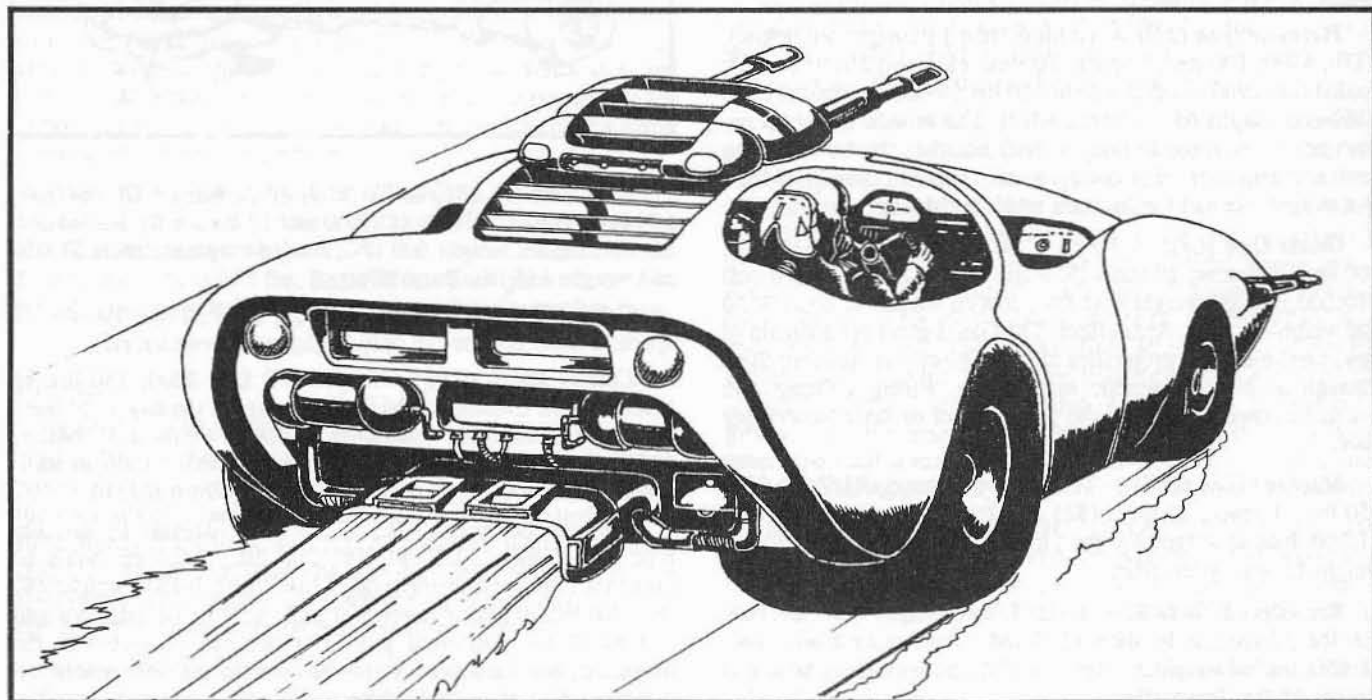
13. Weapons
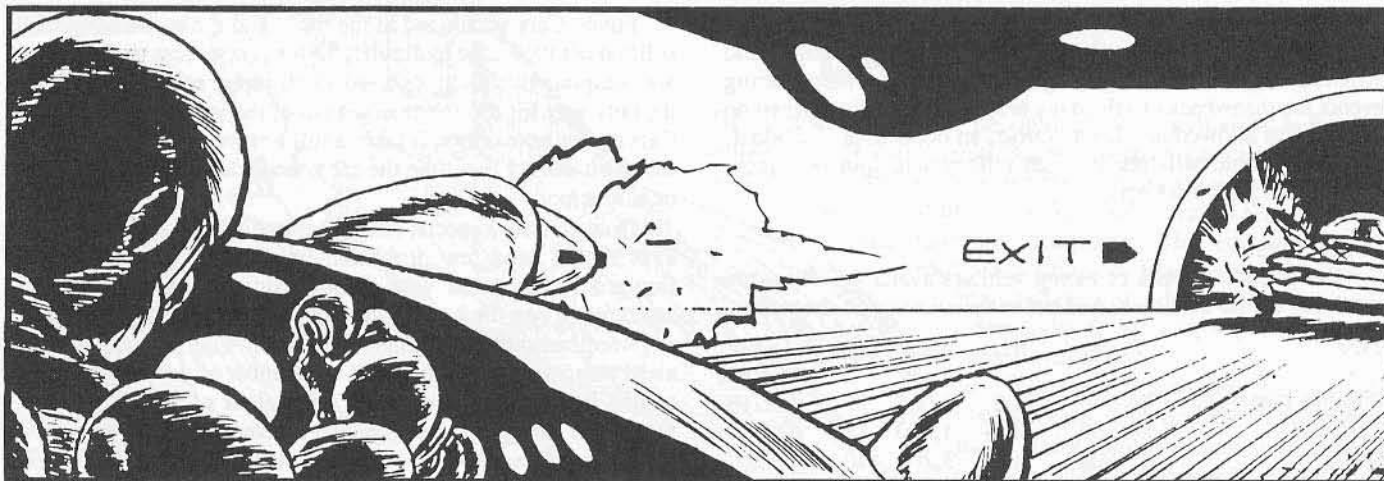
The following is a complete list of all weapons and munitions in *Car Wars*. They are arranged according to the following categories: small-bore projectile, large-bore projectile, rocket, laser, flamethrower, dropped solid, dropped liquid, dropped gas.

When describing your vehicle to other players, only the nature and location of the weapon's firing port must be revealed — the exact weapon remains unknown until fired. Thus, a front-mounted machine gun would be declared as a "small-bore projectile front," while a back-mounted flame cloud ejector (FCE) would be a "dropped gas back." The multi-fire rocket pod (MFR) and variable-fire rocket pod (VFRP) are both considered single weapons (rockets) for declaration.

Small-bore Projectile Weapons

Autocannon (AC) — To hit 6, 3d damage, 4 DP, $6,500, 500 lbs., 3 spaces; 10 shots ($75 and 10 lbs. each); loaded cost $7,250, loaded weight 600 lbs.; loaded magazine costs $800 and weighs 115 lbs. Burst effect.

Flechette Gun (FG) — To hit 6, 1d+1 damage (see below), 2 DP, $700, 100 lbs., 1 space; 20 shots ($10 and 2½ lbs. each); loaded cost $900, loaded weight 150 lbs.; loaded magazine costs $250 and weighs 65 lbs. Area effect. Has normal effect on pedestrians (even those in body armor) and tires, but no effect on vehicular armor or other components. Does full damage if fired at a motorcycle and the location result is "driver" or "tire."

Gauss Gun (GG) — To hit 6, 3d damage, 3 DP, $10,000, 300 lbs., 2 spaces; 10 shots ($50 and 10 lbs. each); loaded cost $10,500, loaded weight 400 lbs.; loaded magazine costs $550 and weighs 115 lbs. Area effect. The Gauss gun fires a stream of tiny, needle-shaped projectiles at high velocity by sending them through an electromagnetic mass-driver. Firing a Gauss gun drains ½ power unit from the power plant or laser battery per shot.

Machine Gun (MG) — To hit 7, 1d damage, 3 DP, $1,000, 150 lbs., 1 space; 20 shots ($25 and 2½ lbs. each); loaded cost $1,500, loaded weight 200 lbs.; loaded magazine costs $550 and weighs 65 lbs. Area effect.

Recoilless Rifle (RR) — To hit 7, 2d damage, 4 DP, $1,500, 300 lbs., 2 spaces; 10 shots ($35 and 5 lbs. each); loaded cost $1,850, loaded weight 350 lbs.; loaded magazine costs $400 and weighs 65 lbs. Burst effect.

Vehicular Shotgun (VS) — To hit 6, 2 hits damage, 2 DP, $950, 90 lbs., 1 space; 10 shots ($5 and 1 lb. each); loaded cost $1,000, loaded weight 100 lbs.; loaded magazine costs $100 and weighs 25 lbs. Does full damage to vehicles.

Vulcan Machine Gun (VMG) — To hit 6, 2d damage, 3 DP, $2,000, 350 lbs., 2 spaces; 20 shots ($35 and 5 lbs. each); loaded cost $2,700, loaded weight 450 lbs.; loaded magazine costs $750 and weighs 115 lbs. Area effect.

Large-bore Projectile Weapons

Anti-Tank Gun (ATG) — To hit 8, 3d damage, 5 DP, $2,000, 600 lbs., 3 spaces; 10 shots ($50 and 10 lbs. each); loaded cost $2,500, loaded weight 700 lbs.; loaded magazine costs $550 and weighs 115 lbs. Burst effect.
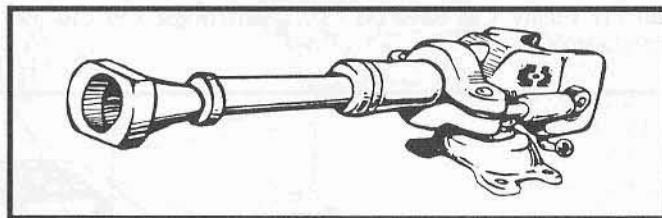
Blast Cannon (BC) — To hit 7, 4d damage, 5 DP, $4,500, 500 lbs., 4 spaces; 10 shots ($100 and 10 lbs. each); loaded cost $5,500, loaded weight 600 lbs.; loaded magazine costs $1,050 and weighs 115 lbs. Burst effect.

Bomb (B) — To hit 9, 4d damage, 2 DP, $100, 100 lbs., 1 space; 1 shot. Bombs can only be dropped from aircraft.

Cluster Bomb (CB) — To hit 9, 2 DP, $200, 150 lbs., 1 space, 1 shot. Cluster bombs do 2d damage to the target, 2d burst damage to everything (including vehicles) within a 3" radius, and 1d burst damage (vehicles are not affected) within an additional 2" radius. They can only be dropped from aircraft.

Grenade Launcher (GL) — To hit 7, damage by grenade type (see p. 48), 2 DP, $1,000, 200 lbs., 2 spaces; holds 10 grenades (cost by grenade type, 4 lbs. each); loaded weight 240 lbs.; loaded magazine costs $50 plus the cost of grenades and weighs 55 lbs. Different grenade types can be mixed in the magazine, but the player or referee must keep strict track of the order in which they are loaded.

Mine-Flinger (MF) — To hit 5 (no bonus for point-blank range), damage as per mine type, 3 DP, $2,250, 275 lbs., 3 spaces; 5 shots; loaded cost and weight as per mine type. This device throws mines like flying discs, up to 2" away. (Use grenade scatter rules, p. 36, to determine where the mines land. The firing player can place any section of the mine counter on the target square.) A missed to-hit roll means the mines are scattered too thinly to do damage.

Mines flung at a vehicle have a to-hit roll of 9 (point-blank range bonus does apply). The mines detonate on a die roll of 1 or 2; otherwise, treat the shot as a missed roll. The mine-flinger cannot use Spear-compatible mines, TDX mines, or proximity fuses.

Oil Gun/Paint Gun (OG/PG) — To hit 5, no damage, 3 DP, $1,000, 250 lbs., 3 spaces; 10 shots ($25 and 5 lbs. each); loaded cost $1,250, loaded weight 300 lbs. It shoots a plastic bag of oil that bursts on impact, creating a 1" × 1" oil slick centered on the point of impact. If the weapon misses, it is assumed that the bag shredded before impact and the oil is too dispersed to have any effect. The to-hit number applies when firing at a specific square; if the weapon is fired at a vehicle, add a -2 penalty in addition to any other bonuses or penalties that may apply. Oil on a vehicle has the same effect as paint, in addition to leaving a normal-sized (1" × ½") slick under the target. The paint gun is essentially identical, but shoots a bag of paint. If a bag of paint strikes the front of a car, that car will suffer the penalties of driving through a paint cloud — but the penalty is *doubled* and it takes ten seconds for a car's automatic systems to remove this heavier dose of paint from the car.

Spike Gun (SG) — To hit 7, 1d damage (see below), 2 DP, $750, 150 lbs., 2 spaces; 10 shots ($40 and 10 lbs. each); loaded cost $1,150, loaded weight 250 lbs.; loaded magazine costs $450 and weighs 115 lbs. Area effect. The spike gun can be fired like an oil gun to hit a specific square, leaving a ½" × ½" square of spikes that acts like a single normal spike counter. The spike gun can also be fired directly at a target (at a -4 penalty), doing 1d damage to tires and pedestrians only. The spike gun cannot use explosive-tipped spikes.

Starshell Launcher (SL) — 2 DP, $500, 100 lbs., 1 space; 5 shots ($50, and 5 lbs. each); loaded cost $750, loaded weight 125 lbs.; loaded magazine costs $300 and weighs 40 lbs. Fires an illumination flare which will fully illuminate the entire play area, negating any penalties for night targeting. When mounted in a vehicle, it must be mounted on top, and is protected by top armor. It need not be in a turret and does not preclude a turret from being mounted in addition.

Tank Gun (TG) — To hit 7, 8d damage, 10 DP, $10,000, 1,200 lbs., 10 spaces; 10 shots ($100 and 20 lbs. each); loaded cost $11,000, loaded weight 1,400 lbs.; loaded magazine costs $1,050 and weighs 215 lbs. Burst effect. Tank guns can only be installed on oversized vehicles, and must face forward or back.

Rockets

Anti-Power-Plant Rocket (APPR) — To hit 9, 1d-1 damage, 1 DP, $500, 40 lbs., 1 space; 1 shot. Burst effect. If an electric power plant is damaged by this weapon (even by a single point), the vehicle's electrical system short-circuits and the power plant immediately loses all power. It does not affect internal combustion (IC) engines or independently-powered devices, such as lasers with laser batteries. It does not drain batteries. A short-circuited plant can be recharged normally.

Heavy Rocket (HR) — To hit 9, 3d damage, 2 DP, $200, 100 lbs., 1 space; 1 shot. Burst effect.

Light Rocket (LtR) — To hit 9, 1d damage, 1 DP, $75, 25 lbs., ½ space; 1 shot. Burst effect.

Medium Rocket (MR) — To hit 9, 2d damage, 2 DP, $140, 50 lbs., 1 space; 1 shot. Burst effect.

Micromissile Launcher (MML) — To hit 8, 1d damage, 2 DP, $750, 100 lbs., 1 space; 10 shots ($20 and 2½ lbs. each); loaded cost $950, loaded weight 125 lbs.; loaded magazine costs $250 and weighs 40 lbs. Burst effect.

Mini Rocket (MNR) — To hit 9, 1d-1 damage, 1 DP, $50, 20 lbs., ⅓ space; 1 shot. Burst effect.

Multi-Fire Rocket Pod (MFR) — To hit 9, 1d damage per rocket, 3 DP (each point of damage destroys two active rockets), $450, 150 lbs., 2 spaces. This must be replaced after firing, just like a heavy rocket. Firing the MFR releases six rockets simultaneously — thus its nickname, "Six-Shooter." Roll separately to hit with each rocket. Treat each shot as a separate attack for building breaches and debris purposes, but treat it as one big attack for making a vehicle's control roll.

Radar-Guided Missile (RGM) — To hit 7, 3d damage, 1 DP, $3,000, 100 lbs., 1 space; 1 shot. Burst effect. The RGM gets no point-blank bonus and the normal range penalties do not apply. Instead there is a -1 penalty for every full 4" the target is closer to the firer than 24". The missile has enough fuel to fly for 5 seconds. RGMs suffer no penalties for visibility; on the other hand, gunner and computer bonuses do not apply. The firer must have line-of-sight (LOS) to the target at the time of firing; thereafter the missile must maintain LOS to continue tracking the target. The missile moves at 4" per phase and should be represented by a separate counter. Do not roll to hit until the missile reaches the target. If the roll is missed, or if the missile loses line-of-sight to its target, the RGM hits the ground and explodes. RGMs can be placed on rocket platforms, rocket EWPs and in rocket magazines, and can be made armor piercing.

Rocket Launcher (RL) — To hit 8, 2d damage, 2 DP, $1,000, 200 lbs., 2 spaces; 10 shots ($35 and 5 lbs. each); loaded cost $1,350, loaded weight 250 lbs.; loaded magazine costs $400 and weighs 65 lbs. Burst effect.

Surface-to-Air Missile (SAM) — To hit 6 vs. air targets, 11 vs. ground ones, 4d damage, 3 DP, $500, 150 lbs., 1 space; 1 shot. Burst effect. SAMs can be mounted on rocket platforms and other accessories and can be armor piercing.

Variable Fire Rocket Pod (VFRP) — To hit 9, 1d damage per rocket, 5 DP, $2,000, 200 lbs., 3 spaces; 30 shots ($55 and 7½ lbs. each); loaded cost $3,050, loaded weight 425 lbs., loaded magazine costs $1,100 and weighs 240 lbs. The VFRP can fire up to six rockets in one firing action. Roll separately to hit with each rocket, declaring the number fired before rolling for any. A VFRP can fire a "ripple salvo," spreading its attack over several targets within its arc of fire (a turreted VFRP must choose a single arc). Each rocket fired after the first will suffer a cumulative -1 to hit, so that the first rocket hits normally, the second suffers a -1 to hit, the third -2, and so on. If fired at the ground, use the grenade scatter rules (see p. 36) to find out where the shell actually hit. When a laser-guided VFRP is fired in a ripple salvo, the laser suffers the cumulative to-hit penalties.

Wire-Guided Missile (WGM) — To hit 6, 3d damage, 2 DP, $2,000, 100 lbs., 1 space; 1 shot. Burst effect. The WGM uses the same targeting rules as the RGM. Gunner and computer bonuses do apply, however, as do visibility modifiers. If the firer moves or loses line-of-sight to the missile, the WGM hits the ground and explodes. The WGM is in all other ways identical to the RGM.

Torpedoes

Standard Torpedo — 4d damage, 3 DP, $300, 100 lbs., 1 space. This is very similar to a heavy rocket, except that it travels at 50 mph, regardless of the speed or orientation of the firing vehicle. The torpedo travels ¼" below the surface of the water and will pass over objects deeper than that. Use a missile or pedestrian counter to represent the torpedo, and move it in a straight line. The torpedo cannot be detected visually by anything more than 4" away from it. If the torpedo counter collides with any other solid object of reasonable size, such as a rock or boat — not a beach ball — it hits automatically. Roll for damage. When a boat is hit by a torpedo, the underbody armor is affected. Torpedoes can be made armor piercing at the usual cost. A torpedo can be dropped from a flying vehicle. It is treated as a bomb until it hits the water, where it continues as normal. If it lands on something, it does 1d damage to whatever it hit and is destroyed — it will not explode. Wire-guided torpedoes cannot be dropped. A torpedo can be fired on, at -6 to hit. Any damage destroys the torpedo.

Heavy Torpedo — 6d damage, 4 DP, $600, 200 lbs., 2 spaces.

High-Velocity Torpedo — Buy this at twice the base cost (before homing, wire guidance, or proximity fuses are added). It allows the torpedo to travel at 80 mph.

Homing Torpedo — These torpedoes add $350 to cost, +20% weight. Treat as a regular torpedo, but the torpedo travels in a straight line until a boat-sized object is detected in the torpedo's front arc, within a 24" range. If more than one object comes in range simultaneously, the torpedo picks the closer one. If objects are at equal distances, it picks the larger one. If the sizes are also equal, it chooses randomly. Once a target has been selected, the torpedo will home in on it, turning up to 15 degrees every phase it moves (i.e., a D1 boat bend), with no loss in control. If the target manages to escape the torpedo's front arc, or gets farther than 24" away, the lock-on is lost, and the torpedo resumes its straight-line motion until it finds another target. When the torpedo counter reaches the target, it hits automatically — roll for damage. A homing torpedo will not lock on to the beach, a rock, or even a large fish, but only a boat-like object.

Mini Torpedo — 2d damage, 2 DP, $200, 75 lbs., ½ space.

Wire-Guided Torpedo (WGT) — This guidance system adds $200 to the base cost. A WGT is directed by the firing vehicle toward its target, turning up to 15 degrees per phase. The guiding wire is considered to be ¼" below the surface of the water; if a boat with a deeper draft crosses a line directly between the firing boat and its WGT, the line is cut, and the WGT continues in a straight line. If a boat crosses the wire while on hydrofoils, the wire has a 3 in 6 chance of being cut. A WGT can also have the Homing Torpedo option; when the wire is disconnected, the torpedo immediately reverts to Homing mode. WGTs cannot be fired by a ship moving faster than 50 mph.

Lasers

Blue-Green Lasers — Lasers tuned to the proper frequencies can fire more effectively underwater. Any normal laser can be tuned to a blue-green wavelength for +25% to the laser's cost. Firing a normal laser underwater is treated like firing an IR laser through smoke. Blue-green lasers have no such penalty. *IR and X-ray lasers cannot be blue-green.*

Heavy Laser (HL) — To hit 6, 4d damage, 2 DP, $12,000, 1,000 lbs., 3 spaces. Area effect. Drains 3 power units per shot.

Heavy X-Ray Laser (HXL) — To hit 7, 5d damage, 3 DP, $20,000, 1,500 lbs., 5 spaces. Area effect. Drains 5 power units per shot.

Laser (L) — To hit 6, 3d damage, 2 DP, $8,000, 500 lbs., 2 spaces. Area effect. Drains 2 power units per shot.

Infrared (IR) Lasers — Two times the cost of a normal laser. IR lasers can fire through smoke and paint, but suffer a -1 per die of damage for every ½" of smoke or paint between the firer and the target. IR TwLs will suffer a -1 to their damage bonus per ½" of smoke — thus, an IR TwL firing through 1½" of smoke will do 2d-3 (2d - 6 + 6 - 3) damage. An IR targeting laser cannot penetrate more than 1" of smoke.

Light Laser (LL) — To hit 6, 1d damage, 2 DP, $3,000, 200 lbs., 1 space. Area effect. Drains 1 power unit per shot.

Medium Laser (ML) — To hit 6, 2d damage, 2 DP, $5,500, 350 lbs., 2 spaces. Area effect. Drains 2 power units per shot.

Pulse Lasers — Multiplies the basic cost of any laser by 150% but leaves weight unaffected. It adds +1 damage per die — thus, a heavy pulse laser does 4d+4 and a pulse TwL does 2d+8. Pulse lasers have no area effect and *cannot* laser-guide rockets.
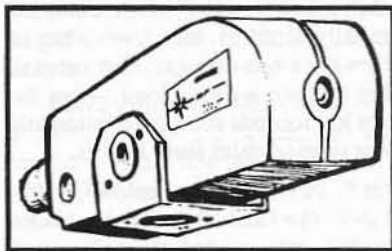
Targeting Laser (TL) — To hit 6, no damage, 1 DP, $1,000, 50 lbs., no space. It is usable with any type of rocket with a Laser Guidance link. It does not drain from the power plant.

Twin Laser (TwL) — To hit 6, 2d+6 damage, 3 DP, $10,000, 750 lbs., 2 spaces. Area effect. Drains 3 power units per shot. When reduced to 1 DP, one laser has been destroyed; damage drops to 1d+2.

X-Ray Laser (XL) — To hit 7, 4d damage, 3 DP, $15,000, 750 lbs., 3 spaces. Area effect. Drains 4 power units per shot. The beam of an X-ray laser is invisible. The target can tell the general direction an attack is coming from, but nothing more specific.

Flamethrowers

Flamethrower (FT) — To hit 6, 1d damage, 2 DP, $500, 450 lbs., 2 spaces; 10 shots ($25 and 5 lbs. each); loaded cost $750, loaded weight 500 lbs.; loaded magazine costs $300 and weighs 65 lbs. Area effect. Maximum range 10". When fired, any flamethrower creates a standard 1" × ½" smoke cloud, aligned along the line of fire.

Heavy-Duty Flamethrower (HDFT) — To hit 6, 2d damage, 3 DP, $1,250, 650 lbs., 3 spaces; 10 shots ($50 and 10 lbs. each); loaded cost $1,750, loaded weight 750 lbs.; loaded magazine costs $550 and weighs 115 lbs. Area effect. Maximum range 15".

Light Flamethrower (LFT) — To hit 6, 1d-2 damage, 1 DP, $350, 250 lbs., 1 space; 10 shots ($15 and 3 lbs. each); loaded cost $500, loaded weight 280 lbs.; loaded magazine costs $200 and weighs 45 lbs. Maximum range 5".
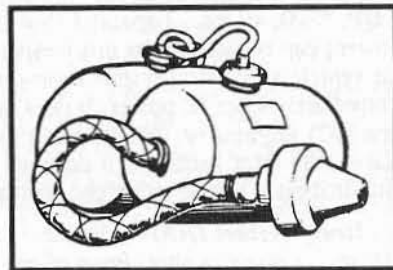
Dropped Gases

Cloud Bomb (CBSS) — To hit 6, 1 DP, $1,000, 100 lbs., 1 space; 1 shot. Point-blank bonuses do not apply. The cloud bomb creates a HDSS; after two phases, the "smokescreen" detonates, doing 2d damage to everything in or touching it (like a flame cloud) and 1d in a 2" burst radius (vehicular components are not affected). If the to-hit roll is missed, the chemicals are assumed to have dispersed, and the cloud is treated as a normal smokescreen.

Flame Cloud Ejector (FCE) — 2 DP, $500, 50 lbs., 2 spaces; 10 shots ($60 and 5 lbs. each); Loaded cost $1,100, loaded weight 100 lbs.; loaded magazine costs $650 and weighs 65 lbs. Creates a 1/2" × 1" cloud when fired. Flame clouds look like regular paint clouds and block fire in the same way. However, they will not stick (no lasting penalty for driving through the cloud). A cloud ignites after 1 phase; it burns for 2 turns, leaving behind a standard smoke cloud. All flame clouds, no matter what their size or source, do 1d-1 damage to every exposed vehicular component and armor location. Wheelguards take damage before armored hubs, which take damage before tires; fifth wheel guards take damage before fifth wheels; trailer-hitch armor takes damage before trailer hitches and tongues. Components behind a breached armored location are not exposed (apply a single 1d-1 damage as if it were a weapon hit), but components behind an unarmored location (side of a cycle, top of a roofless car) are exposed. Driving from open air into a burning flame cloud is a D2 hazard.

Flame Cloud Gas Streamer (FCGS) — 1 DP, $200, 100 lbs., 2 spaces; 2 shots ($300 and 25 lbs. each); loaded cost $800, loaded weight 150 lbs.; loaded magazine costs $650 and weighs 65 lbs. It creates a straight 5" × 1/2" flame cloud when fired. Unlike other dropped weapons, gas streamers can be aimed like regular weapons.

Gas Streamer (GS) — 1 DP, $100, 50 lbs., 1 space; 2 shots (cost and weight depending on ammo). Creates a straight 5" × 1/2" smoke, paint or tear gas cloud out from the side the weapon is mounted on. Gas streamers can be aimed like regular weapons. If a gas streamer is placed on automatic, it will fire immediately, and then once per turn, in the same phase on which it was originally activated.

Smoke loads: $50 and 25 lbs. each. *Tear-gas loads:* $100 and 25 lbs. each. *Paint loads:* $50 and 10 lbs. each. Both loads in the streamer must be of the same type — no mixing.

Heavy-Duty Flame Cloud Ejector (HDFCE) — 2 DP, $1,000, 100 lbs., 3 spaces; 10 shots ($240 and 20 lbs. each); loaded cost $3,400, loaded weight 300 lbs.; loaded magazine costs $2,450 and weighs 215 lbs. Creates a 1" × 2" cloud.

Heavy-Duty Paint Spray (HDPS) — 3 DP, $800, 50 lbs., 2 spaces; 10 shots ($40 and 8 lbs. each); loaded cost $1,200, loaded weight 130 lbs.; loaded magazine costs $450 and weighs 95 lbs. Creates a 1" × 2" cloud when fired.

Heavy-Duty Smoke-screen (HDSS) — 4 DP, $500, 50 lbs., 2 spaces; 10 shots ($40 and 20 lbs. each); loaded cost $900, loaded weight 250 lbs.; loaded magazine costs $450 and weighs 215 lbs. Creates a 1" × 2" cloud when fired.
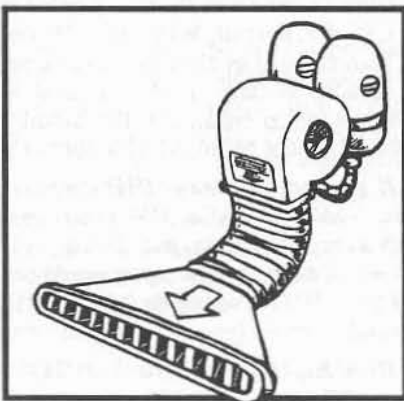
Paint Spray (PS) — 2 DP, $400, 25 lbs., 1 space; 25 shots ($10 and 2 lbs. each); loaded cost $650, loaded weight 75 lbs.; loaded magazine costs $300 and weighs 65 lbs. Creates a 1" × 1/2" cloud when fired.

Smokescreen (SS) — 4 DP, $250, 25 lbs., 1 space; 10 shots ($10 and 5 lbs. each); loaded cost $350, loaded weight 75 lbs.; loaded magazine costs $150 and weighs 65 lbs. Produces a 1" × 1/2" smoke cloud when fired.

Dropped Liquids

Flaming Oil Jet (FOJ) — 3 DP, $300, 30 lbs., 2 spaces; 25 shots ($35 and 2 lbs. each); loaded cost $1,175, loaded weight 80 lbs.; loaded magazine costs $925 and weighs 65 lbs. It drops a regular oil slick which bursts into flame 1 phase later. The burning slick is treated like a regular oil slick *and* does 1d-2 damage to the tires and underbody of vehicles that pass through the burning slick. It burns for 5 turns. Flaming oil acts as a smoke cloud while on fire. Once the FOJ slick has consumed itself, the counter is replaced by a standard smoke cloud of the same size.

Heavy Flaming Oil Jet (HFOJ) — 4 DP, $550, 60 lbs., 3 spaces; 10 shots ($140 and 8 lbs. each); loaded cost $1,950, loaded weight 140 lbs.; loaded magazine costs $1,450 and weighs 95 lbs. It creates a 2" × 1" flaming oil slick.

Heavy-Duty Ice Dropper (HDID) — 4 DP, $1,000, 100 lbs., 3 spaces; 10 shots ($100 and 10 lbs. each); loaded cost $2,000, loaded weight 200 lbs., loaded magazine costs $1,050 and weighs 115 lbs. It creates a 2" × 1" ice counter when fired.

Heavy-Duty Oil Jet (HDOJ) — 4 DP, $500, 50 lbs., 3 spaces; 10 shots ($40 and 8 lbs. each); loaded cost $900, loaded weight 130 lbs.; loaded magazine costs $450 and weighs 95 lbs. It creates a 1" × 2" slick when fired.

Ice Dropper (ID) — 3 DP, $750, 50 lbs., 2 spaces; 25 shots ($20 and 2 lbs. each); loaded cost $1,250, loaded weight 100 lbs.; loaded magazine costs $550 and weighs 65 lbs. The ice dropper drops a patch of water and endothermic chemicals to produce an instant 1" × 1/2" patch of ice. Any vehicle hitting an ice patch takes a D2 hazard; any maneuver performed on ice adds D4 to the maneuver's difficulty. If an ice patch is hit by a flamethrower, flaming oil or exploding napalm mines, it will melt, turning to water (see p. 9).

Oil Jet (OJ) — 3 DP, $250, 25 lbs., 2 spaces; 25 shots ($10 and 2 lbs. each); loaded cost $500, loaded weight 75 lbs.; loaded magazine costs $300 and weighs 65 lbs. It creates a 1" × 1/2" slick when fired.

Dropped Solids

Chaff Dispenser (CD) — 2 DP, $300, 25 lbs., 1 space; 10 shots ($10 and 2 lbs. each); loaded cost $400, loaded weight 45 lbs.; loaded magazine costs $150 and weighs 35 lbs. Creates a 1" × 1/2" cloud of radar-reflective foil strips next to the firing vehicle. All radar-directed fire passing through the cloud is at -1 to hit for every 1/2" of chaff. The cloud lasts one second. Any vehicle driving through a chaff cloud takes a D1 hazard.

Weapons
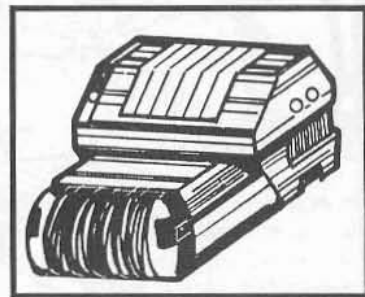
Drop-Spike Plate (DSP) — 4 DP, $200, 50 lbs., 1 space. The plate can be mounted on the underside of any vehicle except cycles, small trikes, reversed trikes, and subcompacts. The regular DSP measures 1/2'' × 1/2''. Dropping the plate is a firing action; when dropped, the plate appears directly beneath the dropping vehicle (the tires of the dropping vehicle are not affected unless the dropping vehicle is pushed onto the plate by a ramming vehicle). If any part of another vehicle touches the plate counter, all tires of the vehicle take damage — 1d damage for solid and plasticore tires, 2d for all others. The plate does not take damage by being run over.

Fake Drop-Spike Plate (FDSP or FLDSP) — 1 DP, $50 ($75 for a large one), 10 lbs., 1 space. The fake plate is indistinguishable from the real thing but doesn't affect tires at all; it's plastic with soft rubber spikes.

Heavy-Duty Chaff Dispenser (HDCD) — 2 DP, $600, 50 lbs., 2 spaces; 10 shots ($40 and 8 lbs. each); loaded cost $1,000, loaded weight 130 lbs. It creates a 1'' × 2'' cloud of chaff.

Junk Dropper (JD) — 4 DP, $50, 25 lbs., 1 space; 10 shots (no cost, 10 lbs. each); loaded cost $50, loaded weight 125 lbs.; loaded magazine costs $50 and weighs 115 lbs. When the junk dropper is fired, it drops two randomly selected debris counters in one 1/2'' × 1/2'' square located as for a spike or minedropper.

Large Drop-Spike Plate (LDSP) — 6 DP, $350, 100 lbs., 1 space. The large plate measures 1'' × 1/2'', and can only be used by buses and semitrailers longer than 20', but is otherwise identical to the regular DSP.

Minedropper (MD) — 2 DP, $500, 150 lbs., 2 spaces; 10 shots ($50 and 5 lbs. each); loaded cost $1,000, loaded weight 200 lbs.; loaded magazine costs $550 and weighs 65 lbs. Burst effect. Does 2d damage to the underbody, and 1d damage to each tire within 1''.

Spear 1000 Minedropper (SMD) — 2 DP, $750, 150 lbs., 2 spaces; 5 shots ($100 and 10 lbs. each); loaded cost $1,250, loaded weight 200 lbs.; loaded magazine costs $550 and weighs 65 lbs.

Spikedropper (SD) — 4 DP, $100, 25 lbs., 1 space; 10 shots ($20 and 5 lbs. each); loaded weapon costs $300 and weighs 75 lbs.; loaded magazine costs $250 and weighs 65 lbs. See p. 32.

Munitions

Anti-Personnel (AP) Ammo — Available for machine pistols, SMGs, MGs, VMGs, heavy pistols, light pistols, and rifles. It does double damage to pedestrians and normal damage elsewhere. When used in area-effect weapons, AP ammo does full damage to all targets in the area of effect. AP ammo costs 5×regular ammo, but weighs the same.

Armor-Piercing (AP) Rockets — 1 1/2 × cost, normal weight, +1 per die of damage. No burst effect. AP are available for all single-shot rockets, torpedoes and missiles, as well as RL, MML, VFRP and MFR.

Armor-Piercing Fin-Stabilized Discarding Sabot (APFSDS or Sabot) Warheads — 2 × normal cost, 1 1/2 × normal weight. For ATGs and tank guns. APFSDS does +2 damage per die — thus, 3d+6 for the ATG, or 8d+16 for the tank gun. There is no burst effect. They cannot be mixed with normal ammo.

Beacon Mines — $200 and 5 lbs. each. They are activated when dropped or by radio control. Any radar- or laser-guided weapons that pass within 3'' of an active Beacon Mine have a 2 in 6 chance of being diverted to hit the mines. Any hit (or multiple hits) of 5 or more points will disperse the counter, rendering it ineffective. They can be fired from a mine flinger, and mixed with other mine loads in a magazine.

Explosive Rounds — Loaded in MGs and VMGs. Double the cost per shot (CPS) and weight per shot (WPS) of regular ammo. Damage is unaffected, but the weapon gains a 1/2d burst effect in a 1/2'' radius. If the weapon is fired at multiple targets, apply a single burst effect for the entire area rather than several overlapping explosions.

Explosive Spikes — $50 and 5 lbs. each. Explosive-tipped spikes look just like regular spikes, and are loaded in a regular spikedropper. A loaded magazine costs $550 and weighs 65 lbs. A vehicle which hits the spikes detonates them. Damage is 1d-1 to solid tires, 1d+1 to all tires. No burst effect. Remove the counter after detonation.

Fake Mines — $10 and 5 lbs. each. They look just like the real thing, but are just weighted plastic imitations.

Flaming Oil Ammo — Loaded in a regular oil gun; $90 and 5 lbs. each. This ammo lays a 1'' × 1'' oil slick just like the regular oil gun round (see p. 77), but one phase after the slick is produced, it ignites! The flaming slick is treated just like that from a FOJ. If this ammunition is fired directly at a car, it is treated just like a regular oil gun round — the oil is too dispersed to ignite. It can be mixed with normal ammo.

Glow-in-the-Dark Paint — Loaded in any paint-using weapon; CPS 4 × normal, WPS same. When targeting a vehicle that has been covered in glow-in-the-dark paint, nighttime penalties are reduced to only -1; if combined with LIGs or any other nighttime vision enhancers, the darkness penalty is fully eliminated. It cannot be mixed with normal ammo.

High-Density Ammo (HD Ammo) — Available only for MGs, VMGs and ACs. HD ammo costs and weighs twice as much as regular ammo, and damage is increased by 1 point for each die of damage the weapon would ordinarily do (MGs would do 1d+1, VMGs would do 2d+2). HD ammo is not available for hand weapons (except for tripod-mounted MGs and VMGs).

High-Explosive Anti-Tank (HEAT) Warheads — Loaded in RRs, ATGs and TGs; CPS 1 1/2 × normal, WPS same. It does

+1 damage per die — thus, 2d+2 for the RR on up to 8d+8 for the tank gun. There is no burst effect. HEAT can be mixed with normal ammo.

High-Explosive Squash-Head (HESH) Warheads — Loaded in RRs, ATGs, BCs and TGs; CPS 1½ × normal, weight same. Damage is the same. However, HESH removes a point of metal armor for every 4, 5 or 6 rolled, rather than just on a 5 or 6.
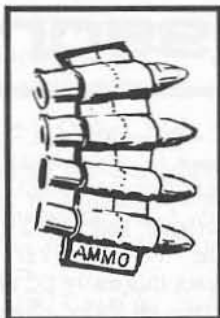
High-Temperature (HT) Ammo — Loaded in any flamethrower or flaming oil jet; CPS 4 × normal, WPS 1½ × normal. It does +2 points of damage per die — thus, a FOJ with HT ammo does a 1d, and an FT does 1d+2. The fire modifier is increased by 1, while the burn duration is reduced to 1. It cannot be mixed with regular ammo. HT-flaming oil ammo will burn for 2 turns.

Ice Ammo — Loaded in a regular oil gun; $40 and 5 lbs. each. It lays a 1" × 1" patch of ice that acts just like that from an ice dropper. If this ammunition hits a vehicle directly, a ½" × 1" ice patch forms under the vehicle but there is no additional effect — the water is too thinly spread to form ice on the car itself. It can be mixed with normal ammo.

Incendiary Ammo — Costs 1½ times as much as regular ammo, weighs the same. Available for MGs, VMGs and ACs only. It does normal damage to metal, regular or reflective armor and 1 point less to fireproof armor. It does normal damage to pedestrians and internal vehicular components. It also adds a fire modifier of 2 and a burn duration of 1.

MML Incendiary — 1d+1 damage (1d to FP armor), CPS 35, WPS 6. For MMLs only. Used the same as regular incendiary ammo, but the fire modifier is 2 and the burn duration is 1.

Napalm Mines — Loaded in a normal MD; $60 and 5 lbs. each; 1d damage to underbody and tires. Loaded in a Spear MD; $150 and 10 lbs. each; 1d damage to tires, 2d to underbody. Unless a vehicle has both fireproof armor and tires, it will take a fire modifier of 4 with a burn duration of 3. Like flamethrowers, napalm mines are volatile, and a vehicle carrying them may explode. If napalm mines ever end a phase underneath an ignited flaming oil slick or flame cloud, they immediately detonate.

Proximity Fuses — $100 per mine, no weight or space. These fuses automatically detonate mines if anything touches the counter. They detonate on a roll of 1 to 4 on 1 die when a vehicle comes within one square (¼") of the counter. Proximity fuses are not detectable. A proximity fuse will not arm itself until a certain number of phases (usually 2) after being dropped, to allow the firing vehicle to get clear. The arming time can be adjusted between combats; this is an Easy task for a mechanic. Different mines in a minedropper can have different arming times, but the player must keep track of the order in which mines are used.

Torpedo Proximity Fuses — The cost is $50 per torpedo. A torpedo with a proximity fuse hits when it comes within ¼" of the target — thus, it can damage hovercraft. Any damage a hover takes from a proximity-fused torpedo is taken on its facing skirt (see p. 70), or, if it has no skirt on that side, on the underbody armor. Proximity-fused torpedoes do half damage.

RL Flare Round — Loaded in a regular RL; $20 and 5 lbs. each. It can be fired directly at a target (to hit 10, 1d-2 damage, fire modifier 2, burn duration 0). If used for illumination, the round lights a 20" radius area for five seconds, reducing the nighttime targeting penalty to -1. The round does not have to be fired straight up; the center of illumination can be placed anywhere within 15" of the firer. It can be mixed with regular ammo.

RL Incendiary Missile — 2d+2 damage (only 2d to FP armor); $60 and 11 lbs. each; loaded magazine costs $650 and weighs 125 lbs. Due to slight size differences, incendiary rounds cannot be combined with regular RL rounds in the same magazine. They can only be used in RLs. They add a fire modifier of 3 and a burn duration of 2.

Single-Shot Incendiary Rockets — 2 × cost, 1½ × weight of a standard single-shot rocket. It inflicts an extra point of damage per die against non-FP armor, and adds a fire modifier and burn duration based on the rocket itself: 1/0 for a MNR, LRs get 2/1, MRs get 3/2, and HRs, WGMs, RGMs and Stingers get 4/3. Cost to make MFRs incendiary is the same, but each rocket in the MFR gets a fire modifier of ½ and a burn duration of 1. Incendiary rockets cannot be made armor piercing.

Smoke Rockets — Same cost and weight as normal rockets. Smoke rockets create a line of 1" × ½" smoke counters equal to twice the number of dice damage that a normal rocket would do (i.e., a heavy smoke rocket would create a 6" line, a medium rocket or RL round would create a 4" line and an MFR would create six overlapped 2" lines).

Spider Mines — Loaded in a Spear 1000 MD; $150 and 10 lbs. each. It does damage like a regular (not Spear) mine. The range of detonation for a spider-mine counter is enlarged to ½" — 2 squares in any direction, instead of the usual 1. Spider mines are identifiable from a distance. They can be mixed with regular ammo.

Two-Dimensional Explosive (TDX) Mines — Can only be used in a Spear 1000 minedropper; $100 and 10 lbs. each. When detonated, the TDX mine does 1d+3 damage to tires, but only 1d-2 damage to the underbody of the triggering vehicle.

Tear Gas Rockets — Smoke rockets can be loaded with tear gas for twice the cost.

Tracer Ammo — This ammo is mixed with whatever type of ammo is already in the gun and has the same cost and weight as the ammo it's mixed with. Tracer ammo can only be used in MGs, ACs and VMGs. When tracer ammo is used, a third-turn sustained fire bonus of +3 is possible. Subtract 1 point from every die of damage done. (Regular MG ammo, for example, does 1d-1 damage instead of 1d when tracer ammo is mixed in.) The bonus is available only when using tracer ammo.

Weapons

14. Accessories

Many accessories are available to customize duel vehicles. Some are defensive in nature; some are decidedly offensive; others are just convenient. Restrictions apply to the use of many of these accessories, so read each description carefully.

Offense

Blow-Through Concealment — $100, 10 lbs., no space. This special armor patch covers one weapon's firing port, concealing it from view. When the weapon is first fired, the patch is instantly blown away with a small explosive charge. The patch must be replaced to conceal the weapon again; this is an Easy job for a mechanic. Blow-through concealment patches need not match the vehicle's armor type.

Body Blades — These are like cycle blades (p. 57), but the cost and weight is the same as 3 points of plastic armor for that vehicle. They need not match armor type. Fake blades are available for $20 (no weight or space).

Bomb Racks (BR) — These hold bombs externally on the underside of aircraft. Bomb racks cannot be mounted on a vehicle that has a bottom-mounted turret. They cost $100 and weigh 50 lbs. per space of bomb capacity. The one-space BR will fit on small choppers and larger; the two-space rack will fit on small choppers and larger; the three-space will only fit on standard and transport helicopters; and the four-space BR will only fit on transport helicopters.

Brushcutter — $100, 20 lbs., no space. A front-mounted blade, this can be mounted with regular armor, but not with bumper spikes. It is destroyed when the front armor is destroyed, and adds 2 hits to damage done to any pedestrian hit by the front of the car. It allows the vehicle to mow down small trees (normally D2 or D3 hazard) with no ill effects, but has no effect on rocks, other vehicles, etc.

Bumper Spikes — Cost and weight equal to 5 points of armor for that vehicle, and must match that vehicle's armor. They can be mounted on the front or back only. Bumper spikes add 1d to all damage given in a collision, modified by the vehicle's DM (double damage to pedestrians). They cannot be mounted in conjunction with a ramplate or brushcutter. They are destroyed when all armor on that side is destroyed.

Cupolas — A cupola is a turret that carries a gunner inside it with the weapon. A three-space cupola can hold a gunner and a one-space weapon (a machine gun, for example). The cupola gunner has a +1 to hit, but he can fire only the cupola weapon (unless it is smart-linked to another weapon). If the top armor is penetrated, the gunner takes damage before the weapon does. A cupola can be designed to be entered from outside or inside the vehicle, but not both. Pop-up cupolas work like pop-up turrets; see p. 84.

Three-space Cupola: $3,500, 400 lbs., 2 spaces.
Three-space Pop-up Cupola: $4,500, 600 lbs., 5 spaces.
Four-space Cupola: $5,500, 500 lbs., 2 spaces.
Four-space Pop-up Cupola: $6,500, 750 lbs., 6 spaces.

	None	1 Space Only	Up To 2 Spaces	Up To 3 Spaces	4 Spaces
Turrets & Cupolas	Subcompact Lt. Trike Mini Van Trailer Motorcycles Lt. or Hvy. Sidecar Rowboat One-Man Hover	1-space CTS Compact Med. Trike 6-ft. Van Trailer One-Man Helicopter Dinghy Small Hover	2-space CTS Mid-size Sedan Luxury Station Wagon Hvy. or X-hvy. Trike 10-ft. Van Trailer Small Helicopter Speedboat Std. Hover	Camper Van 15-ft. Van Trailer Std. Helicopter Cruiser Large Hover	Tractors or 10-wheel Cabs 10-Wheel Carriers 20-ft. Van Trailer 25- or 30-ft. Van Trailers Semi-Trailers Minibus Buses Transport Helicopter Yacht Cargo Hover
Rocket Platform	Cycles Sidecars Helicopters	Subcompact Lt. Trike Mini Van Trailer Rowboat One-Man Hover	Med., Hvy., or X-hvy. Trike 6- or 10-ft. Van Trailer Compact Mid-size Sedan Luxury Pickup Station Wagon Dinghy Speedboat Small Hover Std. Hover	Camper or Van 15- or 20- ft. Van trailers 25- or 30-ft. Van Trailers Tractors & 10-wheel Cabs Semi-Trailers & 10-wheel Carriers Minibus Buses Cruiser Yacht Cargo Hover	No such item
EWPs (and Rocket EWPs)	Sidecars	Subcompact Compact Cycles Lt., Med. or Hvy. Trike Mini Van Trailer 6-ft. Van Trailer One-Man Hover Small Hover Rowboat Dinghy	Mid-size Sedan Luxury Pickup Station Wagon One-Man Helicopter 10-ft. Van Trailer X-hvy. Trike Speedboat Std. Hover	Camper Van Tractors & 10-wheel Cabs 10-wheel Carriers 15- or 20-ft. Van Trailers 25- or 30-ft. Van Trailers Minibus Small Helicopter Cruiser Large Hover	Std. Helicopter Transport Helicopter Buses Semi-Trailers Yacht Cargo Hover
Bomb Rack		One-Man Helicopter	Small Helicopter	Standard Helicopter	Transport Helicopter

Cyberlink — $16,000, 100 lbs., 1 space. This computerized helmet links the wearer to one particular weapon (like the SWCs, p. 84), and gives the wearer +3 to hit, with that weapon only.

Dual-Weapon Magazine (DWM) — $150, 50 lbs., 1 space, plus cost and weight of ammo. Must be attached to two identical linked weapons in the same facing. Like a normal magazine, this item holds the same number of shots as its weapon. However, this ammo is used by two weapons rather than one. If one weapon of the pair fires a shot from this magazine, the other must fire from this magazine as well. The DWM adds no DP to either weapon and is destroyed the instant one of its weapons is destroyed. This item can be combined with normal magazines and magazine switches, but rocket magazines are not available in a dual-weapon version.

External Weapon Pod (EWP) — These pods come in four sizes, holding from 1 to 4 spaces of weaponry. A single pod can be mounted in place of a turret on top of a vehicle (or bottom of a helicopter). When mounted to the side of a vehicle, a second pod of the same size must be mounted on the opposite side to match. Pods can fire either to the front or rear, but the direction must be specified upon installation. Matched pairs must fire in the same direction. Front-firing pods have the same arc of fire as front weapons; back-firing pods have the same arc as back weapons.

Pod armor costs $10 and weighs 4 lbs. per point of plastic, and has a 40 lb. weight limit. Pod armor is universal — that is, there is only one location. Pod armor can be made of any type of armor, so long as the weight limit is not exceeded. The type of armor on an EWP does *not* have to match the type of armor used on the rest of the vehicle.

If the side of a vehicle with an EWP is hit by enemy fire, roll 1 die. If the number is equal to or less than the number of spaces the pod has (i.e., 2 or less for a two-space pod), the pod armor takes damage first, then the pod weapons (if there are more than one, one is considered "outside" the other and takes damage first — the owner decides which one), then the vehicular armor on that side (as usual). If the number rolled is greater, the pod is missed, and the vehicle takes damage normally. But when firing at a side-mounted EWP from the side, the EWP is at a -2 to hit. If you miss your roll by 1 or 2, however, you still hit the side of the vehicle. A miss by more than 2 misses everything. A top-mounted EWP is targeted just like a turret.

If a vehicle rolls, any pods (and weapons in them) that are mounted on a side that hits the ground are automatically destroyed (torn off). If the side of a vehicle with an EWP is involved in a collision, the pod armor takes damage first, then the pod weapons, then the side of the vehicle (as usual).

A vehicle with one or more EWPs has its maximum speed reduced by 10% due to increased wind resistance.

For an extra $250, an EWP can be fitted with an ejection system. If a vehicle carries more than one side-mounted EWP, the EWPs must be linked and ejected simultaneously. Place an obstacle counter next to the ejecting vehicle's counter (treat as a "dropped weapon" counter in placing it).

If a vehicle, for whatever reason, has only one side-mounted EWP of a pair, its HC drops by 3 until the missing one is replaced, or the surviving one is removed.

One-space EWP: $500, 150 lbs.
Two-space EWP: $1,000, 250 lbs.
Three-space EWP: $2,000, 400 lbs.
Four-space EWP: $3,000, 600 lbs.

Extra Magazines — $50, 15 lbs., 1 space, plus the cost and weight of ammunition. An extra magazine for a weapon can hold the same number of shots the weapon itself can. More than one extra magazine can be attached to a weapon. Each extra magazine adds 1 DP to the weapon. Extra magazines do not count against the space limitations of a weapon in a turret or cupola, but do count against a vehicle's space and weight limit.

Fake Turret — $250, 50 lbs., no space. Looks like any regular (but empty) turret — it even rotates. The "turret" can carry any number of fake weapons (at $100 and 20 lbs. each). The turret is instantly destroyed when hit (and the top armor takes no damage).

Homing Anti-Radar Missiles (HARMs) — adds $100 per rocket (any rocket). They must be linked to a Radar Detector.

When active, a HARM will automatically fire at any incoming radar source (vehicular radar, RGMs, radar jammers, etc.) with a +1 to hit for every 4" range past the first full 4", provided that the radar source is within the HARM's arc of fire, up to a total bonus of +4 (it uses the rocket's own to-hit number). If the HARMs are fired from a RL, MML or VFRP, the HARM system will keep firing so long as the radar source is in its firing arc. If HARMs are fired manually, they suffer a -2 to hit against non-radar-generating targets, and use normal range modifiers.

Laser Battery — 1 DP, $500, 100 lbs., 1 space. This is located adjacent to the power plant, and is destroyed after the power plant is destroyed. A laser battery is *required* if a gas-powered vehicle is going to fire lasers or run power-draining electronics (radar, IR, etc.). The laser battery can hold 100 power units — good for firing lasers, running high-powered electronics, and so on. A recharge costs $10 and takes two minutes.

Laser-Guidance Link (LGL) — $500 for the electronics and laser tuning, plus $200 per guided rocket; no weight or space. It can be used with any rocket weapon except SAMs, RGMs and WGMs. If used with multiple-shot rocket weapons (RL, MML, VFRP, MFR, etc.) the $200 must be paid per shell. The guiding laser and the rocket must be linked (for $50) in order for both to fire; this is legal, since only the laser is assumed to be aimed. The LGL can guide any number of rockets at a time, if they come from the same vehicle and same arc of fire.

When a tuned laser and a modified rocket are linked and fired at the same target, roll to hit with the laser first. If it hits, roll 2 dice without modifiers for each rocket. On a 4 or better, the rocket automatically hits, but on a 2 or 3 it misses — the homing sensor lost track of the laser beam. If the laser itself misses, never reaches the target, or was not fired, the rockets have no chance of hitting — the guidance modifications make the rockets too inaccurate for unguided fire to be effective.

Link — $50, no weight or space. It links any two or more pieces of equipment, so that they can both be activated by a single firing action. It is normally used on weapons, but can be hooked to other equipment. For a more complete discussion of links, see *Linked Weapons*, p. 33.

Magazine Switch — $250, no weight or space. A magazine switch allows the firer to select the source magazine for the shot being fired; this takes no time and does not count as a firing action. Shots in the selected magazine are still used top to bottom, so if a magazine has a mixed load, you must still keep track of the order of shots fired. It is destroyed when the weapon is destroyed.

Weapons set on automatic will fire all shots from one magazine until it's empty, then switch to another of the player's choice (assumed to be programmed before combat).

Pintle Mount — $150, 20 lbs., no space. This mount can hold any 1-space weapon; a mount that will hold a 2-space weapon costs and weighs twice as much. A pintle mount must be mounted adjacent to a sunroof or convertible top. It allows a 180° arc of fire designated when the pintle mount is installed. The gunner for the weapon must stand behind it and physically aim and fire the weapon. The weapon is not protected by armor, but can use the tripod gunshield. If a vehicle with a pintle mount rolls, the pintle and weapon will break off when the vehicle rolls onto its top.
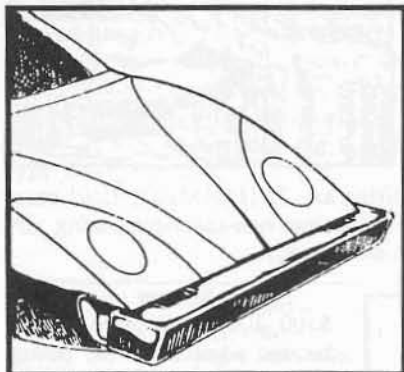
Ramplate — Cost and weight are in addition to the front armor of a car, truck, boat or reversed trike. Cost is 1½ times the cost of the front armor, and weight is half the weight of *all* the front armor of a vehicle. A ramplate can only be mounted on the front of a vehicle. When in a collision involving the ramplate, first determine damage the normal way. Then, the other vehicle takes twice that amount, and the vehicle with the ramplate takes half that amount. A *fake* ramplate costs and weighs as much as 5 points of the vehicle's front armor, including modifiers for special armor types and sloped armor. The fake ramplate cannot be distinguished from the real thing without a close inspection. Ramplates, real and fake, are destroyed when the vehicle's front armor is destroyed; a fake ramplate has no effect on collisions.

Rocket EWP — Weight and cost are half that of a similar EWP. No armor can be carried, and the rockets are vulnerable to damage and vehicular fires. A rocket EWP carries single-shot rockets of any type.

Refer to the table on p. 82 for mounting restrictions.

Rocket Magazine — Available in 1-, 2-, or 3-space sizes. Each magazine will hold its capacity of any one rocket type (Heavy, Medium, Light, Mini, RGM, WGM, etc.). Type is chosen at installation. The magazine costs $50 and weighs 15 lbs. per space of capacity. A rocket magazine has 0 DP, and is
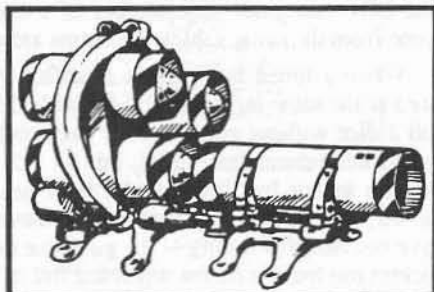
destroyed when one rocket inside it is destroyed (or, if empty, it is destroyed when the armor protecting it is breached). Rocket magazines allow a firer to gain sustained-fire bonuses with rockets. Rocket magazines cannot feed to rocket platforms, but can feed into turrets.

Rocket Platform — Available in three sizes: Mini ($75, 50 lbs., 1 space), Small ($100, 100 lbs., 2 spaces), and Large ($150, 200 lbs., 3 spaces). The rocket platform takes no space; it's mounted on a vehicle's top. The rocket platform holds 1, 2 or 3 spaces worth of single-shot rockets of any type and rotates like a turret. There are size restrictions for these; see the *Turret Table* (p. 82) for details.

Rotary Magazine — $500, 10 lbs., no space. Added to any single weapon or magazine, it allows the firer to choose ammunition freely from a mixed load within a single magazine. Choosing the round does not count as a firing action.

Smart Link — $500, no weight or space. It acts as a regular link between two or more weapons. In addition, it allows weapons in one location to be aimed and fired with weapons in a different location (for example, forward weapons smart-linked to a weapon in a turret). All weapons must be aimed at the same target — and naturally all must be able to aim at that target. Non-identical weapons still cannot be aimed together. The smart link itself can be linked.

Targeting Computer — $1,000, no space or weight. It adds +1 to all to-hit rolls for any single vehicular position (driver or gunner, but not both). It is destroyed when the power plant is destroyed. A *hi-res* version is available for $4,000; this model works the same way, but gives a +2 to-hit bonus.

A *single-weapon computer (SWC)* must also be set on installation to aid a single weapon type in a single position (VMG front, RR in turret, for example). Like a regular computer, it can only aid one crew member, and which crew member benefits is also set at installation. The standard SWC costs $500, and adds +1 to the to-hit roll; the *hi-res* SWC costs $2,500 and gives a +2. Targeting computers cannot be combined with each other or with the cyberlink for higher bonuses.

Turrets — Turrets take up space in a vehicle, but in turn can hold a number of spaces' worth of weapons that do not count against the vehicle's space limit. A *pop-up* turret hides inside the vehicle, possibly lulling an opponent into thinking you're lightly armed. Raising or lowering a pop-up turret is a firing action and takes 1 turn.
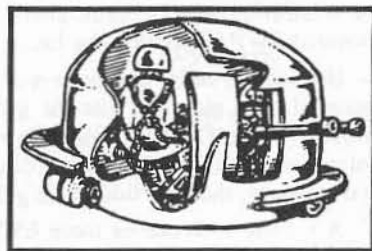
One-space Turret: $1,000, 150 lbs., 1 space.
One-space Pop-up Turret: $2,000, 300 lbs., 3 spaces.
Two-space Turret: $1,500, 200 lbs., 2 spaces.
Two-space Pop-up Turret: $2,500, 350 lbs., 4 spaces.
Three-space Turret: $2,500, 300 lbs., 2 spaces.
Three-space Pop-up Turret: $3,500, 450 lbs., 5 spaces.
Four-space Turret: $3,500, 400 lbs., 2 spaces.
Four-space Pop-up Turret: $4,500, 600 lbs., 6 spaces.

Universal Turrets, Cupolas and Rocket Platforms — Adds an extra $1,000, no weight or space. Ordinary turrets, etc. cannot fire higher than a 45° angle. A universal turret, cupola or rocket platform can fire straight up (or straight down if mounted on aircraft).

Vehicular Computer — $4,000, no weight or space. It is installed in any one crew position, just like a targeting computer. It gives a +1 to hit with all weapons fired from that position. In addition, a wide array of non-combat programs are available, stored on holographic data-storage cubes. The details of these are left to the referee, but examples include bookkeeping, data communications, entertainment and so forth.

Weapon Concealment — $250 and 50 lbs. per space of weapon concealed. It takes no space for a 1- or 2-space weapon, 1 space for larger ones. Component armor, extra magazines and fire-retardant insulators count as part of the weapon; the space taken up by concealment counts toward the 1/3-spaces-per-facing rule (see p. 55).

Concealment hides a weapon's presence until a crew member reveals it. Activating or deactivating concealment counts as a firing action for the weapon — it cannot be fired until next turn. Safety interlocks prevent firing the weapon while it is concealed.

Zero-Space Turret — $750, 75 lbs., 1 space. It can hold one targeting laser and can be mounted on any car or sidecar which does not already have a turret. A zero-space pop-up turret costs $1,750, weighs 150 lbs., and takes up 1 space.

Defense

Armored Beer Refrigerator (ABR) — 20 DP (fireproof), $250, 50 lbs., 2 spaces. It holds up to 60 cans of any brand of beer or other beverage. It includes its own backup battery good for 12 hours. It can also float with up to three pedestrians hanging on.

Armored Minifridge (AMF) — 10 DP (fireproof), $100, 30 lbs., 1 space. This holds up to 24 cans and can only support one pedestrian, but is otherwise like the ABR.

Armored Wheel Hubs — $10 and 4 lbs. per point of armor, maximum weight 40 lbs. each. Hubs must match the car's armor type, like wheelguards. They can be mounted on any wheel facing the outside (not the inner wheel of a pair). Armored hubs protect just like wheelguards — when the tire is hit, roll 1 die; on a 1 to 4 the armored hub takes damage first, and on a 5 or 6, the hub is bypassed and the tire takes damage directly. Armored hubs do not affect the HC of a vehicle in any way.

Armored hubs can be used with wheelguards for additional protection, but the wheelguards still affect HC as usual. When hubs *and* wheelguards are used on a tire, check to see if the wheelguard stops the damage first. If the damage bypasses (or blows through) the wheelguard, roll again to see if the hub stops the damage. Only if

neither the wheelguard *nor* the hub stop the damage, is the tire hit. Unlike the wheelguard, which stops damage from all sides, the armored hub stops damage only from the side (as defined by the vehicle's side arc of fire).

Cycles can use armored wheel hubs, but must buy two — one for each side.

Cargo Safe — $22,000, 12,000 lbs., 15 spaces. The safe holds 10 spaces of cargo, and has 100 points of fireproof plastic armor on each of six sides. It also comes with an electronic coded lock. An optional refrigeration unit costs $2,000; an oxy-

gen rebreather (for live cargo) costs $4,500; and a self-destruct system (triggered from the cab or when all armor on one side is gone) costs $900.

Component Armor — Assigned to any one vehicular component, it costs $5 and weighs 2 lbs. per point per space taken up by the component being protected.

Examples: Protecting a super power plant — 6 spaces — costs $30 and weighs 12 lbs. per point; armor for a laser — 2 spaces — costs $10 and weighs 4 lbs. per point. If the protected component takes up less than 1 space, or no space, the cost and weight of the armor are the same as for a 1-space component. A component can have up to 20 lbs. of armor per space. The armor also takes up a space. Component armor takes up 1/2 space on cycles.

Component armor is universal, providing full protection from all angles. It effectively increases the DP of the component in question. Extra magazines must be armored with the associated weapon, and laser batteries and other items attached to the power plant or engine must be armored with that plant/engine. It cannot be used to protect weapons in EWPs, but can protect turreted weapons and anything else in a vehicle. Component armor does not have to match vehicular armor.

Only one weapon per facing of a vehicle (front, right, top, etc.), along with its extra magazine(s), can be protected. Linked sets of identical weapons can also be protected — figure the cost and weight based on the total number of spaces of the linked weapons. Component armor cannot be placed in corner mounts.

Dischargers — Dischargers are one-shot weapons attached to the outside of a vehicle. They weigh 5 lbs. each but take up no space. Only one discharger of any type can be mounted for every 7 1/2 feet (1/2") of vehicle facing. For example, a car can mount one in front, two right, two left, two top, two underbody and one back. They can be mixed in any way. Each dropped-weapon discharger creates a standard cloud (or slick) exactly as if it were a regular dropped weapon. Dropped-weapon dischargers may affect the firing vehicle unless they are side or back mounted.

Whenever an armor location carrying a discharger is hit, roll 1 die. On a 1, one discharger on that side is destroyed. If an armor location takes ram damage (collision, rolls, etc.), all dischargers on that side are automatically destroyed.

Flame Cloud Discharger (FCD) — $150.

Flaming Oil Discharger (FOD) — $100.

Flechette Grenade (FD) — $50. It does 1d of damage to pedestrians and exposed cyclists in a 2" burst radius, but no damage to tires or vehicular components.

Ice Discharger (IcD) — $75.

Oil Discharger (OD) — $50.

Paint Discharger (PD) — $40. Available in a glow-in-the-dark version ($160).

Point-Defense Grenade (PDG) — $100. It does 1d of damage in a 1" burst radius, doing half damage to tires and vehicular components. The firing vehicle's armor is included in the burst, though its tires are not (unless the grenade was mounted on the underbody).

Smoke Discharger (SkD) — $50.

Tear Gas (TGD) — $75.

Ejection Seat — $500, 100 lbs., no space. Installation involves putting in a special seat and cutting breakaway roof panels. It must be designated for one particular seat (driver, gunner or passenger) at installation. Firing the seat is a firing action, but the seat does not eject until 3 phases after the action is declared. Once declared, the ejection cannot be aborted, even if the ejectee is knocked unconscious or killed in the intervening 3 phases. After use, it costs $300 to replace the seat rocket and roof panel (if the car survives). After ejection, the vehicle is considered to have no top armor if it rolls or is attacked from above.

Accessories
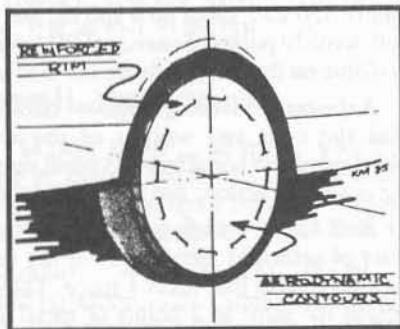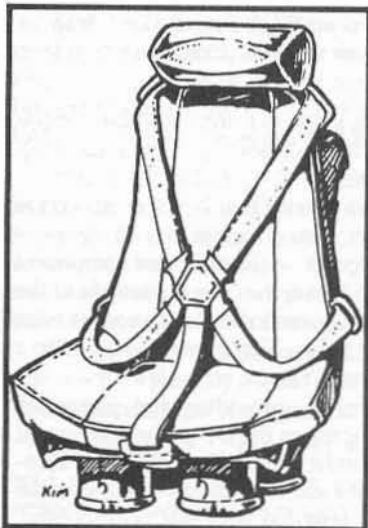
However, if the vehicle has a turret, it will still be protected from attacks.

Once fired, the seat climbs at 1" per phase for 10 phases. It is -6 to hit at this time. After the 10 phases have passed, the seat becomes a hang glider (see below) moving at 20 mph in the direction the ejecting car was moving. Option 1 — save $100 by leaving off the hang glider. Option 2 — replace hang-glider wing with parachute. The parachutist descends 1" per turn and is -2 to hit (in addition to any other penalties). Upon landing, the 'chutist takes 1d-4 points damage, -1 for each successful previous landing. Needless to say, few will survive a ride in an ejection seat *without* a chute or glider; falling this far will do 3d+3 damage. Remember that body armor (except impact armor, p. 46) does not protect against falls, and that a body that takes more than 10 hits of "extra" damage cannot be read by Gold Cross.

Fake Weapons — $100 and 20 lbs., no space. False weapons look exactly like their real counterparts from greater than 1" (game scale).

Fake Wheelguards and Armored Hubs — $2, 1 lb., no space. They are destroyed by the first shot to hit them, but do not decrease the damage going through them (i.e., a 7-point hit that destroys a fake wheelguard will still inflict 7 points of damage on the tire behind it). They need not match armor type. Fake wheelguards do not lower a vehicle's HC.

Fire Extinguisher — $300, 150 lbs., 1 space. Roll 1 die at the end of each turn a vehicle equipped with this item is on fire. On a 1 to 3 (1 to 2 with a gas engine), the fire is put out. The fire extinguisher is destroyed when the power plant is destroyed.

Fire-Retardant Insulators — $150 and 25 lbs. per space of component protected, 1 space. Only internal vehicular components can be protected with this item. Crew members cannot be protected, as they would suffocate. Likewise, internal combustion engines cannot be insulated, though gas tanks can be.

Components with fire-retardant insulators take no damage from vehicular fires, and only half damage from flame weapons. Volatile weapons so protected cannot cause a vehicle to catch fire or explode. The insulators provide no DP protection and cannot be combined with component armor.
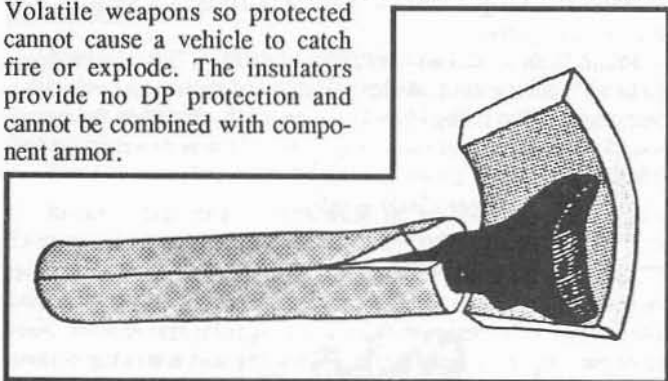
Hang Gliders — $500, 60 lbs. as cargo, 1 GE when "carried," 1 space. Hang gliders are unpowered gliders which can hold one flyer. A pilot must take off from a height and dive in order to achieve the speed necessary to keep the glider moving. The glider pilot runs at full speed for the edge of a 50-foot (about

3½" in game scale) or higher cliff or building side and launches himself into the air. Along the straightaway, gliders fly at an average of 20 mph. They have HC 2. They observe the same climbing and diving rules as helicopters, but stall at 15 mph; a stalled glider must immediately dive again to achieve a safe speed. Gliders depend on updrafts to climb and stay in the air — it is up to the referee to determine where such updrafts will be, if they're there at all, and how strong they will be. Hang gliders can perform Veer and Drift maneuvers, but not the Rotate maneuver (see p. 27). If a chopper flies over a hang glider within a distance that would dispel a smoke cloud (see p. 73), the turbulence caused is a D6 hazard.

Heavy-Duty Shock Absorbers — $400, 5 lbs. per tire, no space. HD shocks must be mounted on all tires of a vehicle to be effective. They reduce all road hazards (obstacles, debris, weapons fire and so forth) by D1. D0 hazards will not force control rolls.
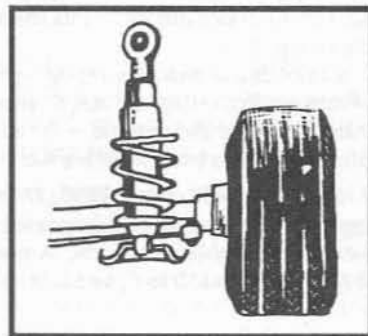
Improved Fire Extinguisher — $500, 200 lbs., 1 space. It will put out a fire on a roll of 1 to 4 (1 to 3 with a gas engine) on 1 die. Otherwise, it is identical to the regular fire extinguisher.

Laser-Reactive Web — $100 each, no weight or space. Each web is affixed to a single armor location (front, back, etc.) or other external item (wheelguard, EWP, etc.). The web senses any laser fire which scores a direct hit on that side; when fire is detected, the web sends a firing action to any items linked to it, including computer gunners. Any direct-fire weapons activated cannot be aimed. The return fire is resolved before any laser-guided rockets arrive, but after damage from the laser itself is applied. If the LR web is linked to a smokescreen, for example, the laser would hit, and the smokescreen would fire, breaking the rocket's sensor lock. Each web location is destroyed along with the armor it covers.

Mini-Safe — Comes in two sizes. The small one costs $150, weighs 20 lbs., and takes up 1 space. It can hold ½ space (or 3 GEs) of reasonably square materials. Papers, computer parts, or jewelry would fit — a rifle wouldn't. The large one costs $700, weighs 150 lbs., takes up 4 spaces, and holds 2 spaces of cargo. Both have 30 points of universal FP armor. The options normally available on the cargo safe are not available on the mini-safe.

Retractable Wheelguards — $250, 50 lbs., 1 space/pair, plus the cost and weight of the wheelguard itself. The wheelguards do not affect HC when retracted. Raising or lowering is a firing action, and takes one second.

Roll Cage — $150 per armor facing, weighs as much as 1 point of vehicular metal armor times the number of armor facings the vehicle has; takes 1 space. Thus, for a cycle, a roll cage weighs the same as 2 points of metal armor and costs $300, a mid-sized car's would be 6 points of metal armor at $900, and a bus's would be 10 points at $1,500. It prevents internal components from taking damage in a roll, and internal components (only) take half damage (round up) from rams. Roll cages must be original equipment.

Safety Seat — $500, 25 lbs., no space. A safety seat can be installed in any vehicle except a motorcycle or a sidecar. It is a specially padded, contoured seat which, combined with special restraining belts and nets, cuts the damage taken in collisions and rolls in half. For example, after the front armor, weapons and power plant have already been obliterated in a head-on colli-

sion, 12 points of damage remain to be divided between the driver and the gunner. The gunner has a regular seat, he takes his full 6 points of damage. The driver, equipped with a safety seat, takes half damage — only 3 points (the other 3 are absorbed by the seat). The safety seat provides no protection from weapons fire. It takes 5 turns to get into a safety seat, and 3 turns to get out. If you don't engage the harnesses, it only takes one second to get in or out, but the protection is lost.
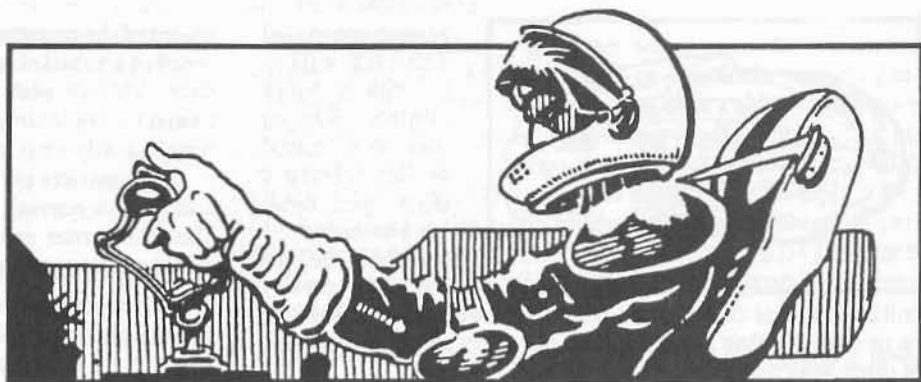
StealthKote Shield — This is bought for individual armor locations on a vehicle. Cost is ten times the cost of 1 point of vehicular plastic armor, and weight is the same as 1 point of plastic armor. It adds 1 DP to each armor location protected. When a vehicle side takes damage, the StealthKote Shield is destroyed by the first hit taken. It can be put over any type of armor; when taking fire or laser damage, the shield receives no special protection even if the armor is fireproof or laser-reflective. Accessories (spoilers, wheelguards, etc.) are considered covered at no additional cost or DP benefit when the appropriate side is covered.

Radar will not register a shield-covered vehicle, and a radar-based ATAD or radar-guided missile will not lock on. If the source of the radar has line of sight on any side of the vehicle that has had its shield destroyed (or never had it in the first place), the radar *will* lock on, and the benefits of the shield are lost. A vehicle with a turret must have the top armor shielded from ground-level radar, or it will be detected. Vehicles with unarmored external items (like rocket platforms, portable earth stations, rocket EWPs, and others), will be picked up by radar even if the vehicle itself is shielded. This item will not work on a motorcycle (unless that cycle has a Cycle Windshell), helicopters, or trucks with exposed cargo.

Wheelguards — $10 and 4 lbs. per point of armor. Wheelguards must be bought separately for each tire location, and have a maximum weight of 40 lbs. When a tire is targeted and hit, roll 1 die. On a 1 to 4, the wheelguard is hit instead. Wheelguards on the front wheels of a car or reversed trike reduce the HC of that vehicle by 1. They can be made fireproof, reflective, both or metal at the standard increases in cost and weight. Wheelguard armor must be of the same type as that on the rest of the vehicle.

Miscellaneous

Active Suspension — $4,000, 100 lbs., no space. Adds 1 to the HC of any car, trike or cycle. The bonus doesn't apply off-road. If a vehicle loses a wheel, it suffers a D6 hazard instead of going directly to HC -6, and its HC drops by 2 instead of 3.

Amphibious Modifications — 4 DP, $6,000, 200 lbs., 2 spaces, for cars, trikes and hovercraft only. Amphibious modification allows a car to travel on the water, like a boat. It consists of a rudder/propeller arrangement that folds out of the trunk and a watertight seal around all the doors and wheel wells. An amphibious car is treated as a Dinghy, except its HC is only 1. An amphibious car uses a regular car power plant or gas engine and acceleration and top speed in the water are calculated by comparing the regular power factors of the plant to the vehicle's weight using the *Boat Power Factors Table*. It takes one turn for the rudder/propeller system to extend from the car.

A grasshopper can also be made amphibious (which is, for grasshoppers, "triphibious") at the same additional costs. Triphibians can only use mini or small helicopter plants; when calculating their acceleration and top speed, use the listed power factors.

Anti-Theft System — $1,000 plus the cost of the dischargers, no weight, no space. Must be linked to at least one discharger on a vehicle. The dischargers go off if anyone tries to enter the vehicle (or pry open a door, or dismantle a piece of equipment) without first turning off the system by key/combination. Disarming is classified as a very hard job for a Mechanic. The system won't operate while the motor is running.

Antilock Braking System (ABS) — $1,000, no weight or space. This system eliminates tire damage due to rapid deceleration and reduces hazards due to braking (rain, snow, ice, oil, gravel) by D1. It cannot be used on oversized vehicles.

Automatic Target Acquisition Device (ATAD) — $4,000 for the central logic unit and $1,000 for the sensor package for each weapon or set of linked weapons connected to the logic unit, no weight or space. User can choose between laser-, radar- or sonar-based units. Laser-based ATADs will not work through smoke and paint, while radar-based ATADs will not pick up targets shielded from radar. Sonar-based ATADs will only work if the target and ATAD are both in the water and have line of sight. Prior to combat, or as a firing action, a character can designate a critical range (from 0 to 10 inches) for each controlled weapon. If any solid object larger than a basketball enters the critical range of the weapon and is in the weapon's arc of fire, the weapon will immediately target and fire on the object — treat it as automatic fire, even though the firing weapon *cannot* be aimed straight out. A weapon hooked to an ATAD can be fired normally by a crew member, but the ATAD cannot then set the weapon off in the same turn. Conversely, a weapon fired by an ATAD cannot fire again, voluntarily or not, in the same turn.

Autopilot — $9,000, 50 lbs., no space, destroyed when the power plant is destroyed. Autopilots cannot be used on motorcycles, but can be used on a motorcycle/sidecar combination. They require radar or infrared to function and must be linked to a computer navigator. A vehicle under autopilot control loses 2 HC, but recovers HC at base level. To program, turn on the computer navigator, insert the map cube, mark the roads and turns to take, set speeds for passing, turning and normal driving, and activate. The autopilot is programmed to ask permission to pass others when necessary via voice synthesizer and radio, and move into the far right lane when asked to be passed. It will perform the least hazardous maneuvers for passing and turning, and try to remain at least ½" away from nearby objects.

The autopilot will alert the driver when the vehicle takes damage, its path is blocked by something that will force a control roll to drive around, and when it reaches the destination. For an extra $500, it can be linked to a computer gunner for instant response to hostile fire.

Bollix — 1 DP, $5,000, 200 lbs., 2 spaces. This device blocks all radio reception, limpet beacons, radar-based ATADs and radar sets within three miles; all radar-guided weaponry and
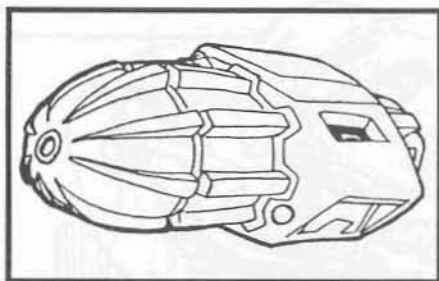
remote-controlled vehicles within one mile go out of control. Ranges may be increased at the referee's discretion; these are minimums.

The bollix drains 2 power units per minute of operation from the power plant. Turning it on or off is a firing action. It does not affect any laser weapons or other vehicular or personal functions.

Bollixes are illegal, except for government vehicles, in all North American states and nations.

Bulk Ammo Boxes — $50, 10 lbs., 1 space, does not include the cost and weight of the ammo itself. A bulk ammo box carries two complete loads of ammunition for any one type of weapon (MG, VMG, RL, FOJ, etc.) which must be specified when the box is purchased. An ammo box for one type of weapon cannot carry any other type of ammo. Differing ammo types (high density, armor piercing, incendiary, etc.) can be mixed freely in a single box as long as they can be mixed in the weapon itself. Transferring ammo from a bulk storage crate to a weapon or magazine is a Trivial task for a mechanic.

Bulk ammo boxes have 5 points of universal fireproof plastic armor and are damaged by hits to the cargo area of the vehicle. Volatile ammunition inside a bulk ammo box will not cause a burning vehicle to explode until the box is destroyed. If an ammo box is destroyed, its ammunition is scattered around the cargo area and becomes unusable in a weapon.

Bulk ammo boxes can be used for hand-weapon ammunition, in which case they hold 12 GEs worth of extra hand-weapon magazines.

Bumper Trigger — $50, no weight, no space. The trigger can be mounted on any side of a vehicle (front or back only on cycles), and more than one trigger can be mounted per side, attached to different weapons. Whenever a side with a trigger is involved in a collision, all weapons linked to the trigger fire *immediately*. Weapons that have already fired in that turn cannot fire; all fire is resolved as if the weapons were on automatic. Triggers can be activated or deactivated at will — doing so is a firing action for each trigger. A bumper trigger is destroyed if all the armor on the trigger-equipped side is lost. Damage from the trigger-linked weapons is applied *before* the damage from the collision that set the trigger off.

Camouflage Netting — $35, 20 lbs., ½ space (if carried as cargo) per 1" square. Camo netting is an open-weave cloth that makes things harder to find, especially from the air. It is available to match most terrain types (woods, desert, snow, etc.) and is completely ineffective if it does not match the surroundings. Camo net can be simply draped over an object or strung up on poles like a tent. Weights are sewn into the edges to anchor the net against blowing away.

Anti-radar netting is available for 3 × cost and 3 × weight of normal netting. It does not make the target invisible to radar, but confuses the echo, so that the target is not clearly identifiable.

Car-Top Carrier — This is usable only on cars and comes in three sizes. A 2-space carrier costs $100, weighs 50 lbs., armor cost/weight is $5/2 lbs. per point of plastic. A 4-space carrier costs $200, weighs 100 lbs., armor cost/weight is $7/3 lbs. per point. A 6-space carrier costs $400, weighs 150 lbs., armor cost/weight is $11/6 per point.

The size of a car-top carrier cannot be more than ⅓ the spaces of the carrying vehicle. The carrier reduces the maximum speed of a vehicle by 10% due to wind resistance, and cannot be streamlined or placed on turreted vehicles. The carrier is armored in five locations — front, back, left, right, and top. Carriers can only carry cargo.

Fake carriers may be bought to hide turrets, at half normal cost and ⅓ normal weight. Fake carriers cannot be armored. The fake carrier can be blown off by explosive bolts ($50) to reveal a turret underneath.

Computer Gunner/Autopilot Software — $2,500 for a package that gives +1 to HC or +1 to hit, no weight or space. If the power plant is hit (and the vehicle doesn't have a surge protector), there is a 1 in 6 chance of the software being scrambled, and changing the +1 bonus to -2. It can be purchased with any number of personality types.

Computer Gunner — $6,000, 10 lbs., no space. Destroyed when the power plant is destroyed. The computer works as a Gunner with skill 0; it cannot use any targeting computer or an ATAD, and must be linked (for $50) to a single weapon or set of linked weapons.
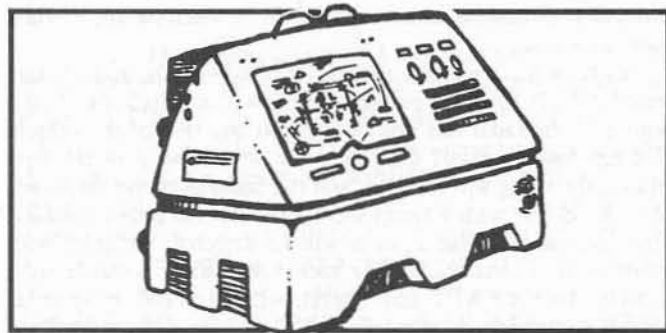
The computer gunner never initiates combat; it must have its target designated by a character in the vehicle. This can be done verbally ("Shoot the blue car" or "Try for the turret on the car on the right") or by firing the computer gunner's weapon at the appropriate target. The computer starts firing when ordered verbally, and fires at the start of each subsequent turn until told to stop, or its target leaves line-of-sight, its arc of fire or the map. Verbal orders do not count as firing actions, but the player must tell the referee exactly what the computer gunner is told.

If the verbal order is obviously confused ("Shoot!" "Fire at that tire," "Fire at the blue car" when there is more than one blue car around), or mistaken ("Shoot the nearest one" when the nearest one is a friend), roll 2 dice. On a roll of 8 or higher, the computer asks for clarification, which counts as that turn's firing action; on a 6 or less, the computer acts as the player ordered; on 7 exactly, it performs the most logically twisted wrong action that the opponents, referee and spectators can imagine (the referee's decision is final).

The computer's weapon cannot be fired twice or more in the same turn, so a character can't fire it if the computer has already used it, and vice versa.

Computer Navigator — $500, no weight or space. It displays a regional or local map, with your position highlighted. It requires a local (city) or regional (state) map card ($20, no weight or space), available at any truck stop. It ties into the satellite network and local transponders to determine exact positions — if access to these is cut off (say, by the satellite transmissions being jammed, or the city's transponders being sabotaged), or a town doesn't have transponders, the navigator will not function.

Convertible Hardtop — $1,500 ($2,500 to retrofit), 50 lbs., takes up 1/6 (round up) of the vehicle's spaces. It is not available for vans, station wagons, campers, buses, helicopters or cycles and only takes up 2 spaces on pickups. Raising or lowering the top is a firing action taken in the acceleration phase. It takes 1 full turn to raise or lower the top. When the top is down, the vehicle still has top armor, but the driver and any crew are not protected by it. Passengers and gunners can fire into any arc, and the driver can fire into any arc but forward. People in the car are targeted at -5.

Top armor is bought normally, but is limited to 20 points (plastic) for structural reasons. No top-mounted weapons or accessories (with the exception of a pintle mount) can be mounted with a convertible top.

Encoded Remote Ignition System (ERIS) — $500, transmitter is 1/2 GE, receiver is $100, no weight or space. It is destroyed when the power plant is destroyed. The system starts or stops a vehicle, unlocks and opens its doors, honks its horn or flashes its lights at the user's behest. Transmitter range is 15". Sending a command is a firing action. Each ERIS has a special "password" encoded into the transmission so others can't activate your vehicle by accident (or on purpose) while activating their own.

Extra Driver Controls — $1,000, 50 lbs., no space. Any one gunner (not passenger) station is converted to a backup driver's position. Switching from one driver to another is a firing action. The original driver's position has precedence for controlling the vehicle; even if the switch-over button has been hit (at the gunner position), the original driver controls will override the new controls. Of course, if the driver is incapacitated, his controls won't be doing much . . .

Fake Passengers — 1 DP, $50, 25 lbs., 1 space. Fully poseable, they can wear body armor and "hold" up to 6 GE. They can be equipped for limited movement (turning head, waving) for an additional $100.

Galley — $750, 150 lbs., 2 spaces. This is a small counter area, with cooking stove and mini-refrigerator — enough to cook reasonably small and simple meals. One week's rations for four can be stored here.

Heavy-Duty Brakes — $100 per wheel (must be bought for all wheels of a vehicle), no weight or space. This system increases safe deceleration by 5 mph, and each maneuver category of deceleration above safe levels is also raised by 5 mph. That is, HD brakes allow up to 15 mph deceleration without hazard; 20 mph deceleration is a D1 hazard; 25 mph is D3; 30 mph is D5; 35 mph is D7, each tire takes 2 points of damage; 40 mph is D9, each tire takes 1d of damage; 50 mph in one turn is D11 and each tire takes 1d+3. Deceleration of more than 50 mph in one turn is impossible.

Heavy-Duty Transmission — Same cost as vehicle's body cost (including chassis modifiers), 300 lbs., 2 spaces. This transmission is for cars only and the vehicle must have a heavy or extra-heavy chassis. This is a high-powered gearing system similar to a truck transmission; it effectively doubles power plant or gas engine's power factors (for purposes of maximum load the vehicle can carry or pull, *not* maximum speed or mileage). However, the vehicle accelerates like a truck (2.5 mph/turn up to 25 mph, 5 mph/turn thereafter). The maximum load is doubled, but chassis strength is not increased. Not usable with a Thundercat power plant.

Identification Friend or Foe (IFF) system — $200, no weight or space. A personal model is also available — same price, 0 GE. When linked to an ATAD or computer gunner, an IFF will check a potential target before the ATAD fires the weapon. If the target also has an IFF, and has the proper password, he will not be fired on. If the target has the wrong password, or no IFF, the ATAD or computer gunner will fire normally. A sonar version is available for homing torpedoes (same cost), so that the torpedo will not home in on friendly boats.

Infrared Sighting System (IRSS) — $4,000, 100 lbs., 1 space. When using IRSS, a vehicle does not need to rely on its own or other vehicle's lights to perform combat or navigation; it operates as though it were in daylight, taking no nighttime modifiers for targeting and not revealing its position (unless it fires a weapon). IRSS only ceases to function when the vehicle's power plant is destroyed. It drains 20 power units per hour of continuous use.

Jump Jets — These are simply top or bottom mounted Rocket Boosters (see p. 91). When fired, they subtract or add, respectively, 1/4" to a vehicle's rate of climb for every 10 mph of acceleration given by the booster. If a vehicle fires a booster while it has a 0" rate of climb on a flat surface, the first 20 mph do not add to the rate of climb; this acceleration is lost countering the pull of gravity. Jump Jets are gyro-stabilized to point straight down, so a vehicle using Jump Jets will quit rotating when the Jump Jets are fired. If a vehicle has a pitch of more than 45 degrees, the Jump Jets will act as Rocket Boosters and vice versa.

Kamibombs — 2 DP per space, $100, 100 lbs. A kamibomb is a large explosive, usually destined for suicidal destruction. Its Blast Points (BP) are found by taking the number of spaces the explosive charge occupies. Thus, a one-space kamibomb has 1 Blast Point, a four-space kamibomb (or 4 one-space kamibombs) has 4 Blast Points, and a ten-space kamibomb has 10 Blast Points. When a kamibomb is detonated (usually by bumper triggers or a remote detonator (see p. 90), it has a blast radius equal to twice its Blast Points in inches, rounded to the nearest 1/4". At 1/4" range, the bomb does 4d × BP (round up), 2d × BP at 1/2" range, 1d × BP at 1" range, 1/2 damage at 2", 1/4 damage at 4", and so on. For example, a 1-space kamibomb will inflict 4d damage to anything within 1/4", 2d out to 1/2", and 1d to any-

Accessories
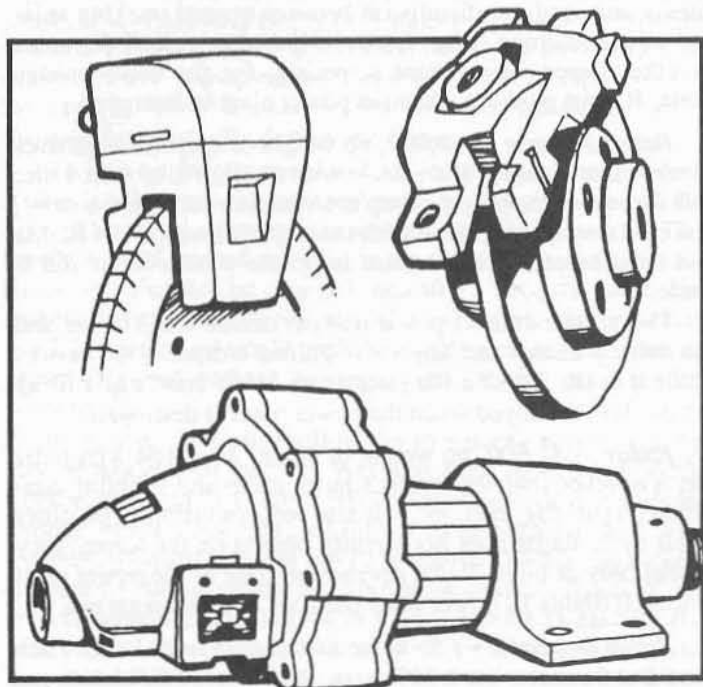
thing from ½" to 2" away from it. When used against a building check for damage for each ¼" of wall within range for purposes of breaching.

Long-Distance Radio — $600, no weight or space. It replaces a vehicle's standard CB, and has a 25-mile range.

Long-Range Radar — $10,000, 100 lbs., 1 space. It works like regular radar, but with a range of 15 miles. Note that, as with regular radar, hills and other large terrain features block radar line-of-sight, limiting the usefulness of this item on ground vehicles. It drains 15 power units/hour of continuous use.

No-Paint Windshield — $1,000, no weight or space. Paint clouds have no effect on vehicles equipped with this windshield. Helmets and gas masks can be modified with this material for $100.

Nuclear/Biological/Chemical Shielding (NBC) — 2 DP, $60,000, 50 lbs., 1 space. NBC shielding provides an airtight seal, protecting the inside components of a vehicle from minor radiation and hazardous biological or chemical contamination. If the NBC-shielded vehicle's armor is penetrated, the shielding will no longer protect against fallout, disease, gas, etc. An air recycling and filtering system is included; it switches between filtered air and an internal air supply whenever the outside air becomes too dangerous. The internal air supply will last for 12 man/hours. Additional air bottles are available at $100, 50 lbs., ¹/₃ space for each additional 12 man/hours.
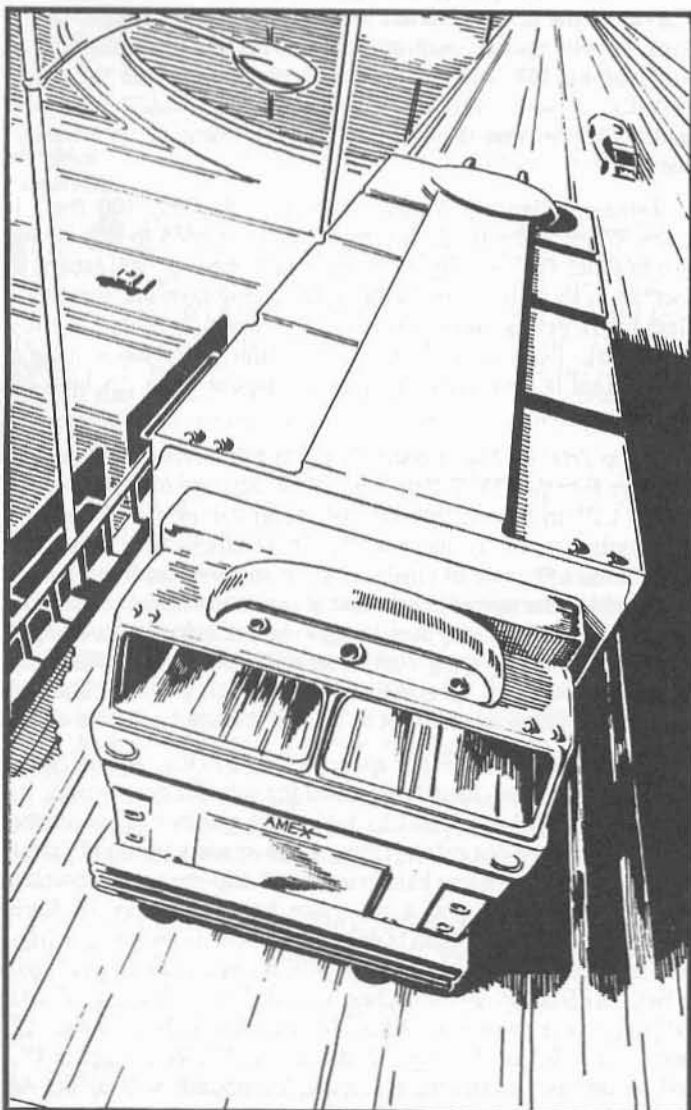
Overdrive — $100 per wheel of vehicle (must be bought for all wheels), no weight or space. It increases a vehicle's top speed by 20 mph when activated, but reduces acceleration by 5 mph (minimum 2.5 mph). Overdrive activation and deactivation counts as a firing action. If deactivated while above the vehicle's normal top speed, the vehicle is forced to decelerate at least 15 mph per turn until at or below its maximum speed (figured before the overdrive was activated). Power consumption while overdrive is activated is figured as if the vehicle was going 20 mph slower. Installation is a Hard job for a mechanic. Overdrive cannot be used on hovercraft, boats or helicopters.

Paint Pellet Ammunition — $1 per shot, same weight as normal ammo. It is not available for tank guns, Gauss guns, lasers or flamethrowers. It does no damage nor does it affect targets like defensive paint. Single-shot paint rockets cost ½ their normal cost but can be laser guided.

Passenger Accommodations — $500, 100 lbs., 2 spaces per passenger. Comfortable bunks which convert to daytime couch/lounging areas. Passenger accommodations can be placed in cargo space. They can only be used in a van or larger vehicle.

Portable Earth Station (PES) — 1 DP, $700, 150 lbs., 2 spaces. It's protected by top armor when not deployed, and cannot be mounted on a vehicle that has a turret, rocket platform, car-top carrier or other such item on the roof. When deployed, it automatically tracks the best available satellite for world-wide voice and data communications. It takes 2 turns to deploy, and can be targeted at -2 while deployed (the PES is *not* protected by the top armor in its deployed position).

Portable Shop — 4 separate cases, each 2 DP, $1,000, 75 lbs., 1 space. A mechanic working in the field with a portable shop adds 1 to all success rolls. If some of the shop cases are destroyed or missing, the chance of the mechanic finding the part he needs is equal to the percentage of cases left. For example, if three of the four cases are intact, there is a 75% chance that the needed part is still available — otherwise, the shop is useless for the particular repair attempted.

Radar Detector — $300, no weight or space. This item detects incoming radar signals and sounds an alarm when enemy radar locks on to the vehicle. It gives range and bearing to the enemy unit, and can distinguish between normal tracking radar and missile-homing radar. It can be linked to a chaff dispenser or other weapon for instant screening, for the usual linkage costs. It stops working when the power plant is destroyed.

Radar Jammer — $3,000, no weight or space. The jammer blocks radar aimed at the vehicle with a roll of 1 to 4 on 1 die; roll for each attempt to pick up the vehicle's location on radar, and each attempt to target it with radar-guided weaponry. RGMs and radar-based ATADs cannot target the vehicle if the roll is made.

The jammer drains 1 power unit per minute while in use, and the vehicle cannot use any radar-guided weaponry or devices while it is on. Turning the jammer on or off counts as a firing action. It is destroyed when the power plant is destroyed.

Radar — $2,500, no weight or space. A vehicle with radar can spot other vehicles within 3 miles under any visibility condition (night, fog, rain, etc.). It also reduces visibility penalties to hit by 1. Radar does not identify objects on the screen; they appear only as blips. Radar operates as long as the power plant works. It drains 10 power units per hour of continuous use.

Radio Detonator — $500 for the sending unit, 1 GE. Each modified detonator costs $50 extra. Radio-controlled mines can be set off by this item (assuming they are set to the proper frequency) for no extra cost. Sending unit must "hit" the deto-

nator with a roll of 4 or better on 2 dice. Subtract 1 from this roll for every full 20'' of distance between sending unit and detonator. For example, if the sending unit is 75'' away, the roll would be made at -3. If the roll is missed, the explosive does not go off. The detonator can be tried again every other turn.

Remote-Control Guidance System — Comes in two parts. The receiving set costs $2,000, no weight or space. The sending set costs $2,000, weighs 200 lbs., and takes up 3 spaces. A remotely-controlled vehicle can do anything a manned one can do, but its HC is 3 less than usual and all to-hit rolls are at -3 as well. A single sending set will control all functions of a vehicle — steering, acceleration, weapons, etc. Sending sets can be modified to accommodate more than one crew member, but the controlled vehicle is under normal restrictions as to weapon fire — only one firing action per turn. Remote-control equipment is destroyed when the power plant is destroyed. The receiver drains 2 power units per hour, and the sender drains 5 power units per hour.

Rocket Boosters — $50 per 10 lbs., 1 DP and 1 space per 100 lbs., or fraction thereof. Volatile. Acceleration or deceleration gained by a vehicle using Rocket Boosters is calculated using the following formula:

$$(\text{wt. of fuel burned} \times 1{,}000) / \text{wt. of vehicle}$$

This acceleration is applied in the phase that the rockets are fired, and firing a rocket booster counts as a firing action. A vehicle may combine normal acceleration and rocket boost. A vehicle may only gain acceleration from rocket boosters on one phase in any turn. The amount of boost that a vehicle can safely withstand each turn is determined by the chassis:

Light Chassis: 10 mph
Standard Chassis: 20 mph
Heavy Chassis: 30 mph
X-Heavy Chassis: 40 mph

Vehicles with Light and Standard chassis can fire for 10 mph boost over the limit; they have a 50% chance of bending the frame and making the vehicle undrivable (HC goes to 6 immediately and remains there for the rest of the game; this cannot be repaired). If these frames attempt to fire boosters more than 10 mph over the limit, they automatically ruin the frame as stated above. If vehicles with Heavy or X-Heavy chassis attempt to fire boosters 10 mph over the stated maximum, they have a 33% (2 in 6) chance of destroying the frame; a boost of 20 mph over the limit results in a 50% chance; boosts of more than 20 mph over the limit automatically destroy the frame.

Rockets can be purchased to burn for multiple turns; when a rocket is triggered, the car accelerates in that phase and in the same phase every subsequent turn until the rocket burns out. The weight of fuel burned per turn is set when the vehicle is constructed and cannot be changed thereafter. Once triggered, the rocket cannot be shut off till the fuel is exhausted. Firing rockets is a D1 hazard for each 10 mph of acceleration or deceleration, gained (forward or back for most vehicles, any direction for hovercraft).

Booster Rockets must follow the 1/3 spaces per side rule and may be mounted in External Weapons Pods (not rocket pods). Rockets mounted in a pair of EWPs, on either side of a vehicle, must be of the same size, set for the same burn rate and fired together. If one of a pair of EWPs is destroyed while the rockets are burning, the acceleration gained must be recalculated for the reduced weight of fuel burned in a turn, and the Hazard for the new acceleration is tripled because of the uneven thrust. An Ejectable EWP may not be ejected until the booster has completed its burn. Example: A 5,000-lb mid-sized car is fitted with rocket boosters. Using the formula above, we find that 50 lbs. of

rocket will accelerate the vehicle 10 mph per turn, a mid-size car can devote up to 4 spaces to booster rockets (to the rear), according to the 1/3 spaces per side rule. therefore, the vehicle can have up to 400 lbs. of rocket. Assuming the vehicle was equipped with an Extra Heavy Chassis we could set our rocket to burn 200 lbs. of rocket per turn for two turns and get 40 mph of acceleration over each of two turns, 100 lbs. of rocket per turn for 20 mph of acceleration every turn for 4 turns, etc. The rocket could be divided up into a number of separate rockets which could be fired separately so that all the acceleration does not have to occur at once, but remember, a car may only gain acceleration from rockets on one phase per turn, so multiple rockets would have to be set off at once or, if additional acceleration is needed after the first rocket is burning, any additional rockets would have to be ignited in the same phase the first rocket was, on a subsequent turn (if the first rocket is still burning).

The minimum acceleration for Rocket Boosters is 10 mph. Hazards for acceleration from boosters or is figured by rounding up. That is, if you have a booster which will accelerate your vehicle 15 mph per turn, the hazard will be a D2 for the higher 20 mph boost, rather than the D1 for a 10 mph boost.

Jump Jets are a special case of Rocket Boosters (see p. 89).

Searchlight — 1 DP, $200, 50 lbs., 1 space. A searchlight used on a moving object can track that object with a to-hit roll of 3 or more (plus all normal modifiers for range, target size and speed, etc. but not counting darkness modifiers); a crewman is required to operate the light. Any object thus tracked can be attacked with no penalty for darkness.

A searchlight can also be used to blind the driver and crew of another vehicle. With a to-hit roll of 6 or better (counting modifiers as above), the gunner can blind his target, and the target's player must turn away from the board and describe subsequent actions based on what he remembers while he is blind. He is blinded only as long as the searchlight hits him. A blinded character can still fire, but with a -10 modifier; all maneuvers are at +D3. Searchlights can be targeted at -3. Searchlights have no effect in daylight, and cannot blind people through smoke.

Armored Searchlight — 5 DP, $500, 75 lbs., 1 space. This searchlight functions just as above.

Side Door — $1,000, 500 lbs., no space. Side doors are standard equipment on helicopters; standard and transport helicopters come with one free side cargo door (on either the left or right side). However, if you want a second side door on the other side, or a smaller helicopter to have one, pay the $1,000 listed. Opening or closing the side door is a firing action and the door will be open (or closed) at the end of the next turn. An open side door means the vehicle has no functioning side armor on that side. Vans, oversized vehicles and aircraft can use this item.

Solar Panel — 1 DP, $1,000, 100 lbs., 2 spaces. The panel is protected by top armor (but only when not deployed) and can be mounted on any vehicle that can mount a turret. When deployed, each panel automatically positions itself for top efficiency, recharging 20 power units per panel per hour in daytime under clear skies (half that under partly-cloudy skies). It takes 1 turn to deploy or retract and can be targeted at -2.

Sound Enhancement — 2 DP, $6,000, 150 lbs., 1 space. Sound enhancement is another aid to sneakiness. The crew of a vehicle using stealth and sound enhancement can listen through the side of a car or through one building wall and hear what is being discussed beyond. The crew can only ''hear'' through one building wall; the crew *cannot* hear through the wall beyond that.

Sound System — 2 DP, $1,000, 100 lbs., 1 space. Sound systems have no combat use. They can be used as a public

Accessories

address system or to broadcast recordings or transmissions to people within a distance of many blocks. Appropriate music blasted toward targets can enliven any attack.

Spoilers and Airdams — Each costs 25 × the cost of 1 point of armor for the vehicle it is being put on, and weighs 10 × the weight of 1 point of armor for the vehicle. A vehicle with a spoiler *or* an airdam adds 1 to its HC when traveling above 60 mph. If a vehicle has *both* a spoiler and an airdam, all maneuvers performed at 60 mph or faster have the difficulty reduced by one. Spoilers/airdams do *not* have to match the armor type of the vehicle they are on. Spoilers/airdams have the same cost modifications as normal armor (i.e., a metal spoiler would cost 62½ × normal armor cost and weigh 50 × normal armor weight of the vehicle). A vehicle that has metal armor and plastic spoilers or airdams has the spoiler/airdam destroyed after 30 cumulative points of damage have been done to the front/back of the vehicle; otherwise they are destroyed when the armor on that side is destroyed.

Stealth — Available for helicopters and hovercraft ($16,000, 200 lbs., 2 spaces), cars ($6,000, 150 lbs., 1 space), trikes and cycles ($3,000, 75 lbs., 1 space). When active, stealth reduces a vehicle's maximum speed and acceleration by half, but muffles

the vehicle's drive systems so that it cannot be heard more than 2'' (game scale) away, or through a wall, closed vehicle door, etc.

For land vehicles, stealth is less effective; it can't do anything about the squeal of tires on pavement. A car, trike or cycle in stealth mode is audible a number of inches away equal to the total D hazard or maneuver taken. Thus, a D3 bend can be heard 3'' away, 25 mph deceleration can be heard 3'' (or 2'' if the vehicle has antilock brakes) away, and a vehicle performing a bootlegger reverse can be heard up to 7'' away.

Stealth cannot be used by boats or oversize vehicles.

Sunroof — $500, 25 lbs., no space. It can be installed in any vehicle that can mount a turret — but must be *in place* of a turret. It allows a passenger or gunner (*not* the driver) a full 360-degree arc of fire with hand weapons when open. It takes 1 phase to open or close. Standing up or sitting down is a firing action taken in the acceleration phase. When the sunroof is open, half of all damage from area effect weapons (round up) taken to the top of the vehicle bypasses the top armor and is applied as internal hits. For other types of weapons, there is a 3 in 6 chance the damage will bypass top armor and be applied internally. Otherwise, the damage is applied to top armor. A person firing a hand weapon from a sunroof can be targeted at an additional -2 (don't forget the -3 for targeting a pedestrian, and any other targeting modifiers that may apply).

Surge Protector — $250, no weight or space. The surge protector disconnects fire extinguishers, computers and other fragile hardware when the power plant is destroyed, saving them from that fate. The hardware won't work without power, but it doesn't have to be replaced.

Tinted Windows — $500, no weight or space. These special windows contain a fast-acting polarizing agent that allows the owner to ignore searchlight effects after only one turn of exposure. The effects of the searchlight are full for that first second, though. The protective polarization lasts for five seconds after the searchlight ceases to hit the vehicle, but the penalty for firing at night is increased by 1 at any time the windows are polarized.

Tow Bar — $500, 25 lbs., takes up 1 space as cargo. The tow bar hooks under the front wheels of a car, allowing it to be towed by another vehicle. The bar has 2 DP and is targeted exactly like a trailer tongue. The towed vehicle will break free if it loses one of its front tires.

Vehicular Camera — 1 DP, $1,500, 25 lbs., ½ space. This camera is used for recording and transmitting high-quality video. It is mounted as a weapon and responds to voice directions (on/off, pan left, zoom in and track the red cycle, and so on). It can record up to six hours on one holocube ($50, no weight or space), splice and add special effects in-camera, or transmit locally (range depends on the vehicle's radio; two miles for a normal CB, 25 miles for a LD radio, even farther for a portable earth station). The camera is designed with two cube slots; a 1-space camera costs an extra $200, and holds up to ten cubes.
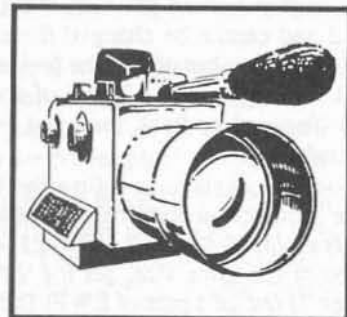
Weapon Timer — $350, no weight or space. The timer can be set to fire a weapon at a predetermined time, or after a specified delay. The weapon fires on automatic. It can be set to fire a specific number of shots or to fire until it runs out of ammo. It counts as a firing action.

15. Sample Vehicles

If you are just starting out, use one or more of these pre-designed vehicles. None of these are cut in stone, however; there are some simple changes that even a novice duellist can make:

Rearrange armor. As long as the total number of *points* of armor remains the same, you can change the distribution any way you like and it won't change the cost or weight of the vehicle. The exception to this is with ramplates. If the vehicle has a ramplate, do not move any armor from or to the *front* location of the vehicle.

Armor modification. Making regular plastic armor fireproof is simple — just double the cost without changing the weight. Converting normal plastic to normal metal is nearly as easy. Five points of plastic convert to one point of metal, reducing the cost by 50% of the plastic's cost; for FP plastic to metal, reduce the cost by 75%. To convert from metal to plastic, multiply armor points by 5 and double the cost. Making metal armor LR simply adds 10% to the cost of the metal.

Move the weapons. Take those rear-mounted weapons and put them to the front — it won't affect the weight or cost at all. Just remember that you cannot mount more than 1/3 of a vehicle's total spaces to weapons firing in one direction.

Add electronics. Since most electronic systems (computers, for example) have no weight and take no space, you can add one at any time for the price of the system. You can also remove them to save money.

Change weapons. Some weapons have identical weight and space requirements, so the only changes you'll need to make are the cost. For example, you can trade a flamethrower for a laser — it'll cost you $7,250. Or you can save that $7,250 by trading in a laser for a flamethrower. Other trades include replacing two HRs with a MD (costs $600 more), replacing a SD with a SS ($50 more), replacing a SD with a PS ($350 more) and replacing a SS with a PS ($300 more).

A note about nomenclature: the descriptions on the next few pages use quite a few abbreviations. The abbreviations for weapons and most accessories can be found on p. 112 or the item's description. The armor descriptions list the armor position and how many armor points are at that location — F5 means "five points of armor in the front position," R8/16 means "eight points of metal armor over 16 points of plastic armor in the right armor location," etc. Options will only list the changes in a vehicle. If an item is not listed, that means it did not change.

All these vehicles assume 150 lbs. per crewman/passenger. If the alternate encumbrance rules are being used, some weight will have to be trimmed to allow for pedestrian equipment.
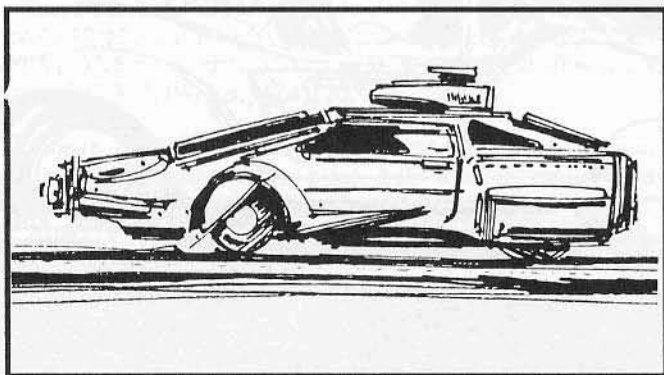
Cars

Killer Kart — Subcompact, std. chassis, hvy. suspension, medium power plant, 4 HD tires, driver, MG front, Armor: F5, R3, L3, B3, T2, U2. Accel. 10, top speed 135, HC 4; 2,300 lbs., $3,848.

Stinger — Subcompact, hvy. chassis, hvy. suspension, small power plant, 4 HD tires, driver, two linked MGs front. Armor: F10, R5, L5, B8, T5, U5. Accel. 5, top speed 90, HC 4; 2,400 lbs., $5,268.

Option I — Replace MGs with one RR, add 10 points of armor anywhere. $4,178.

Option II — Replace one MG and the link with one HR, add 20 points of armor anywhere. $4,138.

Option III — Replace MGs with one RL, add 30 points of armor anywhere. $3,898.

Option IV — Replace one MG with smokescreen or spike-dropper, add 25 points of armor. $4,293 with spikedropper, $4,343 with smokescreen.
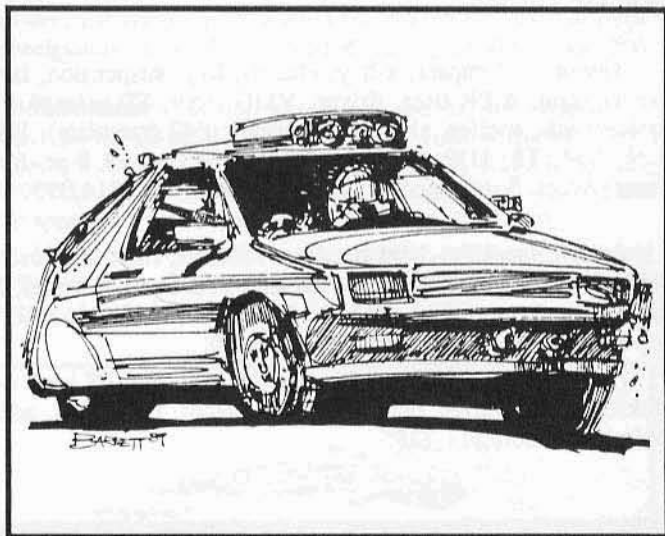
Yellow Jacket — Subcompact, hvy. chassis, hvy. suspension, small power plant, 4 HD tires, driver, laser front. Armor: F5, R4, L4, B5, T0, U0. Accel. 5, top speed 90, HC 4; 2,400 lbs., $9,998.

Shrimp — Subcompact, hvy. chassis, small power plant, hvy. suspension, 4 std. tires, driver, passenger, MML front. Armor: F15, R15, L15, B15, T1, U0. Accel. 5, top speed 90, HC 4; 2,400 lbs., $3,331.

Popcorn Shrimp Option — Downgrade to std. chassis and lt. suspension. Replace MML with JD back. Remove all but 25 points of armor. Top speed 95; 2,170 lbs., $1,325.

Firecracker — Subcompact, x-hvy. chassis, hvy. suspension, medium power plant, 4 PR tires, driver, SD w/explosive spikes back. Armor: F30 (ramplate), R17, L17, B16, T5, U10. Accel. 10, top speed 122.5, HC 4; 2,675 lbs., $4,990.

Mini-Sherman — Compact, std. chassis, hvy. suspension, large power plant, 4 HD tires, driver, two linked MGs front, SS rear. Armor: F35, R20, L20, B23, T10, U10. Accel. 10, top speed 125, HC 3; 3,693 lbs., $8,334.

Option — Remove one MG and link and smokescreen, add one RL and five points of armor; $7,849.

Capricorn — Compact, x-hvy. chassis, hvy. suspension, large power plant, 4 PR radial tires, driver, RL front, SS back, targeting computer. Armor: F45, R35, L35, B40, T37, U35, 4 10-pt. wheelguards. Accel. 5, top speed 110, HC 3; 4,437 lbs., $11,451.

Capricorn Plus — Replace RL with RR, replace PR radials with regular solids, remove wheelguards. $11,551.

Spitfire — Compact, x-hvy. chassis, hvy. suspension, medium power plant, 4 PR tires, driver, VMG w/incendiary ammo front, FT back, hi-res targeting computer. FP armor: F35, R25, L25, B35, T15, U15. Accel. 5, top speed 90, HC 3; 4,200 lbs., $14,900.

Duelbuggy — Compact, hvy. chassis, off-road suspension, medium power plant, 4 OR solid tires, driver, MG in turret, MFR front, brushcutter, car blades, spoiler, targeting computer. Armor: F30, R25, L25, B25, T17, U12. Accel. 10, top speed 120, HC 2 (3 off-road); 4,000 lbs., $13,000.

Sureshot option — Replace MG with light laser, add laser-guidance link and laser-guide the rockets, up grade the computer to hi-res. $19,200.

Xenon — Compact, x-hvy. chassis, hvy. suspension, large power plant, 4 PR tires, driver, VMG front, SD w/explosive spikes back, spoiler, airdam. FP armor: F42 (ramplate), R34, L34, B34, T8, U12, 2 8-pt. wheelguards back, 2 8-pt. hubs front. Accel. 5, top speed 110, HC 3; 4,433 lbs., $14,395.

Joseph Special — Mid-sized, std. chassis, imp. suspension, large power plant, 4 HD tires, driver, ATG front, RL rear, PS right side. Armor: F30, R15, L15, B25, T15, U15. Accel. 5, top speed 105, HC 2; 4,795 lbs., $10,340.

Joseph Special "T" — Replace AT, RL and PS with two linked MGs in turret, plus 4 HRs (two front, two back), add 3 points of armor; $11,238.

Messenger — Mid-sized, x-hvy. chassis, hvy. suspension, large power plant, 4 PR tires, driver, passenger, VMG in turret, FOJ back, spoiler, small mini-safe. Cargo capacity: 30 lbs., 1/2 space in mini-safe. Armor: F40, R35, L35, B40, T35, U30, 2 10-pt. wheelguards back, 2 10-pt. hubs front. Accel. 5, top speed 92.5, HC 3; 5,730 lbs., $14,865.

Marksman — Mid-sized, x-hvy. chassis, hvy. suspension, large power plant, 4 PR tires, driver, two RLs linked front, targeting laser front, laser-guidance link, FOJ back. Armor: F50, R40, L40, B45, T20, U22, 2 10-pt. wheelguards back, 2 10-pt. hubs front. Accel. 5, top speed 95, HC 3; 5,476 lbs., $19,497.

Mauler — Mid-sized, x-hvy. chassis, hvy. suspension, large power plant, 4 PR tires, driver, AC front, HDFOJ back, single-weapon computer on AC, spoiler, airdam. Armor: F55, R45, L45, B45, T26, U27. Accel. 5, top speed 92.5, HC 3; 5,734 lbs., $19,448.

Superzapper option — Remove AC, add turreted laser, up-grade computer to hi-res. Armor: F50, R40, L40, B45, T30, U23. 5,714 lbs., $24,998.

Rocket option — Remove AC, add VFRP and TL, add LGL, 2 8-pt. hubs front, 2 8-pt. wheelguards back, remove SWC. 5,737 lbs., $22,588.

Manslaughter — Mid-sized, x-hvy. chassis, hvy. suspension, large power plant, 4 PR tires, driver, GL in turret (w/explosive grenades), two extra magazines (one loaded with concussion grenades, the other with tear-gas grenades), magazine switch, FG right, FG left, brushcutter, car blades, bumper spikes front and back, spoiler, airdam. FP armor: F46, R40, L40, B40, T30, U30. Accel. 5, HC 3, top speed 92.5; 5,760 lbs., $19,840.

Cobra — Mid-sized, x-hvy. chassis, hvy. suspension, super power plant w/platinum catalysts and superconductors, 4 solid radial tires, driver, passenger, laser in universal turret, laser battery tool kit, radar, spoiler, overdrive. FP armor: F35, R30, L30, B30, T25, U12, 4 10-point wheelguards. Accel. 10 (5 w/overdrive), HC 3, top speed 122.5 (142.5 w/overdrive); 5,756 lbs., $33,684.

Cobra GT — Replace super power plant with sport power plant w/PCs & SCs, upgrade laser to pulse, add hi-res computer, ABS, HD brakes and airdam. Top speed 132.5 (152.5 w/overdrive); $49,184.

FTs back, FT right, FT left, fire extinguisher. Armor: F20, R10, L10, B20, T10, U10. Accel. 5, top speed 100, HC 3; 6,600 lbs., $14,600.

Option — Any FT can be replaced with an MG and 30 points of armor, costing $1,350 extra per swap. One rear FT can be replaced with a MD and 30 points of armor for $850 extra.

Bodyguard — Luxury, hvy. chassis, hvy. suspension, large power plant, 4 solid tires, driver, 2 linked MDs (L and R), 3 linked OJs (L, R and B), 2 linked PSs (L and R), "panic button" link for all weapons. Armor: F20, R45, L45, B50, T20, U20. Accel. 5, top speed 90, HC 3; 5,925 lbs., $15,400.

Bodyguard Shadrach — Convert to FP armor, replace OJs with FOJs. Top speed 95; 5,440 lbs., $21,425.

Rommel — Luxury, x-hvy. chassis, hvy. suspension, super power plant, 4 solid tires, driver, gunner, turreted RR, HDFOJ back linked to 2 SDs (right and left). FP armor: F40 (Ramplate), R35, L35, B35, T35, U15, 10 points CA around driver. Accel. 5, top speed 100, HC 3; 6,595 lbs., $24,150.

Rommel-B — Remove gunner, replace SDs with MDs, remove 10 points of armor. $25,050.

Vlad the Impala — Luxury w/CA frame, x-hvy. chassis, hvy. suspension, large power plant w/superconductors, 4 steel-belted fireproof PR radial tires, driver, passenger, 2 ACs linked F, RR w/HEAT ammo back linked to HDFOJ w/HT fuel back, spoiler. FP armor: F50, R40, L40, B40, T15, U30, 4 10-pt. wheelguards. Accel. 5, top speed 90, HC 3; 6,600 lbs., $53,500.

Intimidator — Station wagon, std. chassis, imp. suspension, super power plant, 4 PR tires, driver, laser in turret. Cargo capacity: 300 lbs., 11 spaces. Armor: F25, R15, L15, B25, T30, U15. Accel. 10, top speed 120 without cargo, Accel. 5 and top speed 115 with cargo, HC 2; 5,200 lbs., $17,400.

MG option — Remove turret and laser, add 3 pairs of linked MGs, upgrade chassis to x-hvy. Cargo capacity: 900 lbs., 7 spaces. Accel. 5, $17,850.
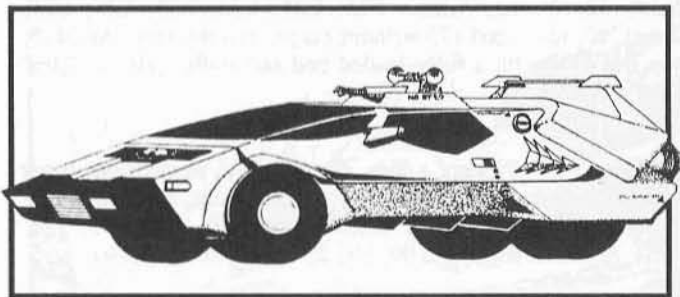
Comet — Station wagon, x-hvy. chassis, hvy. suspension, super power plant, 4 solid tires, driver, AC front, FCE back, 2 linked HRs on small rocket platform, fire extinguisher, hi-res targeting computer. Cargo capacity: 140 lbs., 6 spaces. Armor: F40, R30, L30, B30, T30, U20, 4 10-pt. wheelguards. Accel. 5, top speed 100, HC 2; 6,460 lbs., $25,000.

Buffalo — Station wagon, x-hvy. chassis, hvy. suspension, super power plant, 4 solid tires, driver, turreted TwL, laser battery, overdrive, HD transmission, hvy. trailer hitch. Towing capacity: 9,000 lbs. FP armor: F30, R30, L30, B30, T30, U21, 2 10-pt. wheelguards back, 2 10-pt. hubs front. Accel. 2.5 to 25, 5 thereafter, top speed 120 without a trailer, 70 w/fully-loaded (9,000-lb.) trailer, HC 3; 6,600 lbs., $30,140.

Harmon — Sedan, std. chassis, hvy. suspension, super power plant, 4 PR tires, driver, 2 RLs linked front, HDSS linked to MD back, SWC (RLs). Armor: F28, R25, L25, B22, T6, U5. Accel. 10, top speed 120, HC 3; 5,099 lbs., $12,748.

Agincourt — Sedan, x-hvy. chassis, hvy. suspension, large power plant, 4 solid tires, driver, 2 linked RLs (laser guided) and TL (with LGL) front, SD w/explosive spikes back. Metal armor: F12, R9, L9, B10. FP armor: T10, U10, 2 10-pt. wheelguards back, 2 10-pt. hubs front, 10-pt. component armor around each of driver, power plant and linked RLs and TL. Accel. 5, top speed 90, 5,999 lbs., $19,340.

Miglia — Sedan, hvy. chassis, hvy. suspension, 250 cid engine w/tubular headers, turbocharger, 15-gallon racing tank, 4 PR radial tires, driver, passenger, 2 linked MGs w/HD ammo front, convertible hardtop, spoiler, overdrive, streamlining. Armor: F30, R25, L25, B30, T20, U10, 4 10-pt. wheelguards. Accel. 10/15 w/turbo (5/10 w/overdrive engaged), top speed 117.5 (137.5 w/overdrive), 28 mpg at 70 mph (28 at 90 w/overdrive), HC 3; 5,190 lbs., $24,170.

Falcon — Sedan w/carbon-aluminum frame, std. chassis, hvy. suspension, super power plant, 4 PR tires, driver, turreted VMG, FCGS back, large mini-safe, spoiler, airdam, overdrive. FP Armor: F35, R35, L35, B35, T20, U15. Accel. 10 (5 w/overdrive), top speed 122.5 (142.5 w/overdrive engaged), HC 3; 5,005 lbs., $25,064.

Hotshot — Luxury, x-hvy. chassis, hvy. suspension, super power plant, 4 PR tires, driver, 2 linked MGs front, 2 linked

Sample Vehicles

Cycles

Shogun 100 — Light cycle, hvy. suspension, small cycle power plant, 2 PR tires, cyclist, MG front. Armor: F6, B6. Accel. 10, top speed 120, HC 3; 798 lbs., $3,120.

Shogun 150 — Light cycle, hvy. suspension, medium cycle power plant, 2 PR tires, cyclist. Accel. 15, top speed 180, HC 3; 600 lbs., $2,000.

Shogun 200 — Medium cycle, hvy. suspension, super cycle power plant, 2 PR tires, cyclist, MG front. Armor: F10, B10. Accel. 15, top speed 180, HC 3; 1,000 lbs., $5,020.

Shogun 250 — Hvy. cycle, hvy. suspension, super trike power plant, 2 PRR tires, cyclist, RL w/AP rockets front (laser guided), TL (w/LGL) front. Armor: F24, B20. Accel. 15, top speed 180, HC 4; 1,199 lbs., $14,353.

Quasar — Hvy. cycle, hvy. suspension, super trike power plant, 2 PR tires, cyclist, LL front. LR armor: F15, B15. Accel. 15, top speed 180 (Accel. 10, top speed 142.5 w/sidecar), HC 3 (4 with sidecar); 1,198 lbs., $7,996.

Quasar sidecar — Hvy. sidecar, imp. suspension, 1 PR tire, LR (laser guided), LGL to LL (on cycle). LR Armor: F6, R6, B4, T1, U1. 744 lbs., $5,094.

Trikes

Sandcrab — Medium trike, std. chassis, OR suspension, large cycle power plant, 3 OR solid tires, cyclist, VMG front, RL back. Armor: F12, R12, L12, B15, T9, U15. Accel. 5, top speed 97.5, HC 2 (3 OR); 2,095 lbs., $9,450.

Survivor — Reversed hvy. trike, hvy. suspension, super cycle power plant, 3 solid tires, cyclist, passenger, laser in universal turret, fire extinguisher. Armor: F12, R12, L12, B12, T18, U9, 1 3-pt. cycle wheelguard, 10 points CA around each of driver, passenger and power plant. Accel. 5, HC 3, top speed 92.5; 2,794 lbs., $17,430.

PC Option — Replace laser with MG and extra magazine, downgrade turret, make all three tires plasticore. Add 25 points of armor. 2,796 lbs., $12,830.
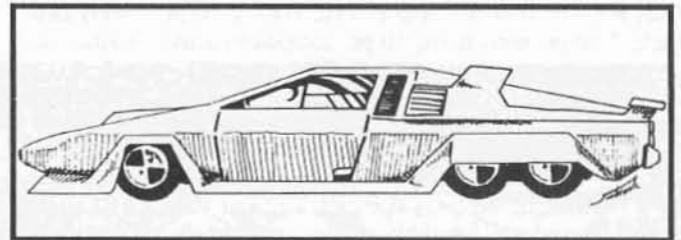
Blastmaster — X-hvy. trike, std. chassis, hvy. suspension, super trike power plant, 3 solid tires, cyclist, 2 RLs linked right, 2 RLs linked left, link connecting all 4 RLs, fire extinguisher, targeting computer. Armor: F20, R20, L20, B20, T15, U6, 2 8-pt. wheelguards back, 1 7-pt. cycle wheelguard. Accel. 5, top speed 92.5, HC 3; 2,794 lbs., $17,430.

Ten-Wheelers

Flattop — 10-wheel longnose cab, x-hvy. chassis, medium truck power plant, 10 solid tires, driver, gunner, 2 RRs linked in turret, RR front, 2 SWCs (driver/front, gunner/turret), im-

Morgan — Pickup, x-hvy. chassis, hvy. suspension, Thundercat power plant, 6 PR tires, driver, turreted VMG w/HD ammo, SS back, hi-res computer, x-hvy. trailer hitch. Cargo capacity: 735 lbs., 11 spaces. Towing capacity (with full cargo load): 12,300 lbs. Armor: F25, R25, L25, B25, T25, U25. Accel. 10, top speed 175 without cargo, 165 w/cargo, Accel. 5, top speed 90 with a fully-loaded bed and trailer, HC 2; 7,065 lbs., $29,650.

Ventura — Pickup, x-hvy. chassis, hvy. suspension, super power plant, 6 plasticore tires, driver, AC front, turreted VMG, HD shocks, spoiler. LRFP armor: F40, R30, L30, B33, T25, U20. Accel. 5, top speed 90, HC 2; 7,794 lbs., $37,140.

Thumper — Camper, x-hvy. chassis, hvy. suspension, super power plant, 6 PRR tires, driver, gunner, turreted TwL, VFRP (laser guided) front, TL (LGL) front, FCGS back. Armor: F40, R30, L30, B30, T20, U4. Accel. 5, top speed 90, HC 3; 7,791 lbs., $39,495.

Waterloo — Van, x-hvy. chassis, hvy. suspension, super power plant, 6 PRR tires, driver, turreted VMG, HDFOJ and FCE back, FCE right, FCE left, all dropped weapons linked. Cargo capacity: 156 lbs., 6 spaces. FP armor: F22, R22, L22, B22, T20, U16, 2 8-pt. wheelguards rear, 2 8-pt. hubs front, 10 points CA around each of driver, power plant, VMG, rear weapons, right FCE, and left FCE. Accel. 5, top speed 95, HC 3; 7,044 lbs., $29,210.

proved fire extinguisher. Cab armor: F40, R40, L40, B20, T40, U20, 6 10-pt. wheelguards. 15' flatbed carrier. Base cargo capacity: 5,780 lbs., 20 spaces. Carrier armor: U20. Top speed 117.5; 14,020 lbs., $69,940.

Maxim — 10-wheel longnose cab, x-hvy. chassis, medium truck power plant, 10 solid tires, driver, gunner, 4 HRs linked in turret, 4 1-space rocket magazines, improved fire extinguisher. Cab armor: F40 (ramplate), R35, L35, B0, T30, U20. 15' van carrier: 4 HRs linked in turret, 4 3-space rocket magazines, 3 OJs (linked left, right and back). Cargo capacity: 1,889 lbs., 13 spaces. Carrier armor: F25, R28, L28, B28, T30, U15. Top speed 105; 17,911 lbs., $79,310.

Laser-guided option — Add TL (with LGL) to each turret and laser-guide all rockets. Cargo capacity: 1,789 lbs. 18,011 lbs., $87,110.

Car Trailers

Bulldog — Mini-van trailer, imp. chassis, 2 PR tires, passenger. Cargo capacity: 30 lbs., 1 space. Armor: F5, R9, L9, B9, T3, U3, 2 5-pt. wheelguards. 870 lbs., $1,142.

Raven — 10' van trailer, x-hvy. chassis, 2 solid tires, gunner, turreted RR, SD right, SD left, HDOJ back, all dropped weapons linked. Cargo capacity: 1,010 lbs., 11 spaces. Armor: F25, R40, L40, B50, T25, U20. 4,630 lbs., $10,600.

Bunker — 10' van trailer, x-hvy. chassis, 2 solid tires, gunner, turreted VMG w/extra magazine and HD ammo, MD right linked to MD left. Cargo capacity: 1,005 lbs., 11 spaces. Armor: F15, R26, L26, B26, T25, U18. 4,625 lbs., $13,384.

Scimitar — 15' van trailer, x-hvy. chassis, 4 solid tires, 3 gunners, turreted VMG, HDFOJ right, HDFOJ left, FOJ back, MD w/napalm mines right, RL right, RL left, AC back, radar. Cargo capacity: 272 lbs., 3 spaces. Armor: F25, R45, L45, B50, T30, U21. 8,368 lbs., $33,375.

Permafrost — 15' van trailer, x-hvy. chassis, 4 solid tires, ID back, HDID left and right, MD left and right, all weapons linked. Cargo capacity: 1,934 lbs., 18 spaces. Armor: F30, R44, L44, B44, T30, U30, 4 10-pt. wheelguards, 4 10-pt. hubs. 6,706 lbs., $17,650.

Black Ice Option — Add HDOJ left, OJ back, all in original link. Cargo capacity: 1,599 lbs., 10 spaces. 7,041 lbs., $20,150.

Truck Cabs

Economy — Std. cabover, std. chassis, regular truck power plant, 10 PR tires, driver, gunner, RL front, rocket platform w/2 linked HRs, fire extinguisher. Armor; F25, R20, L20, B5, T15, U15. Top speed 160; 10,000 lbs., $38,250.

Magnum — Sleeper longnose, x-hvy. chassis, super truck power plant, 10 solid tires, driver, gunner, laser in universal turret, 2 laser batteries, 2 ejection seats with parachutes, anti-theft system, 12 FDs, sleeping area. LR metal/FP plastic armor: F10/10, R8/8, L8/8, B8/10, T8/14, U8/7, 6 10-pt. FP wheelguards, 20-pt. fifth wheel guard. Top speed 155; 16,192 lbs., $103,409.

Annihilator — Sleeper longnose, x-hvy. chassis, super truck power plant, 10 solid tires, driver, gunner, 2 linked TwLs in turret, 2 linked RRs w/bumper trigger front, cyberlink to turret from gunner, hi-res computer for driver. LRFP armor: F60

(ramplate), R30, L30, B14, T20, U20. Top speed 155; 16,190 lbs., $150,190.

Semi-Trailers

Budget Box — 40' van semi-trailer, 8 HD tires, 2 linked SDs (RB and LB), RL back, std. kingpin. Cargo capacity: 76 spaces. Armor: 10 in all locations. 5,840 lbs., $14,500.

Tailgunner — 40' tanker semi-trailer, 8 solid tires, 3 linked MDs w/extra magazines (RB, LB, B), 3 linked PSs (RB, LB, B), HDOJ back, link for all weapons, std. kingpin. Cargo capacity: 45 spaces. Armor: 60 in all locations, 4 10-pt. wheelguards. 18,265 lbs., $60,150.

Hellfire — 40' van semi-trailer, 8 plasticore tires, 3 gunners, 4 HDFTs (2 turreted back and front, 2 linked back), std. kingpin. Cargo capacity: 64 spaces. Metal/FP plastic armor: 12/12 in each location, 4 10-pt. FP wheelguards, 4 10-pt. FP hubs. 23,070 lbs., $65,900.

Brotherhood — 40' van semi-trailer, 8 solid tires, 3 gunners, 2 linked TGs (each with 2 extra magazines) B, 4 TwLs (2 linked RP, 2 linked LF), turreted GG (with extra magazine) and searchlight, 8 laser batteries, 2 GSs (with smoke RB, LB), 3 cyberlinks, std. kingpin. Cargo capacity: 26 spaces. Armor: F100, sides 157 each, B144, UF75, UB75, TF100, TB100, 4 10-pt. wheelguards. 35,551 lbs., $199,930.

Cargo Brother — Remove gunners, cyberlinks and laser batteries, replace TwLs and TGs with fakes. Cargo capacity: 75 spaces. Downgrade to 40 points of armor in each location. 12,665 lbs., $49,200.

on front rocket platform, TL and LGL on platform, 4 hi-res computers. Cargo capacity: 2,330 lbs., 18 spaces. Composite metal/plastic armor: F16/20, RF15/20, LF15/20, RB15/20, LB15/20, B14/20, FD8/10, BD8/10, TF7/20, TB7/20, UF15/30, UB15/30. Accel. 2.5, top speed 20, HC 2; 37,670 lbs., $149,890.

Hovercraft

Skimmer — One-man hover, medium power plant, 4 standard skirts, pilot, 2 MGs linked front, turbofans. Armor: F40, R35, L35, B30, T12, U10. Accel. 10, top speed 170, HC 3; 3,300 lbs., $9,582.

Mangler — Small hover, medium power plant with extra power cells, 4 hvy. skirts, pilot, vertical stabilizer, AC front, FCE back. Sloped armor: F31, R25, L25, B25, T25, U15. Accel. 2.5, top speed 120, HC 3; 5,298 lbs., $18,520.

Sulacco — Standard hover, large power plant, 4 standard skirts, pilot, 2 linked RLs w/inc. ammo front, HDFCE back, 2 torpedoes back, fire extinguisher, HRSWC on RLs. Armor: F25, R20, L20, B25, T17, U10. Accel. 5, top speed 150, HC 3; 7,600 lbs., $18,990.

Buses

Liberator — Minibus, x-hvy. chassis, small truck power plant, 10 solid tires, driver, gunner, 2 linked BCs front, 2 BC magazines, VMG w/2 extra magazines in turret, HDFCE w/2 extra magazines back, 10 points CA each around two blast cannons, HDFCE, power plant and crew. Metal armor: F12, R10, L10, B10, T7, U8. Top speed 100, 14,370 lbs., $63,119.

Metro — 30' bus, hvy. chassis, regular truck power plant, 10 solid tires, driver, 2 gunners, 9 passengers, 2 RRs linked in turret, 2 ATGs linked front, HDSS back, fire extinguisher. Armor: F40, sides 30 each, B30, TF10, TB24, UF15, UB15. Top speed 137.5; 17,596 lbs., $63,490.

Pusher — 40' bus, hvy. chassis, regular truck power plant, 10 solid tires, driver, gunner, 16 passengers, ATG front, 2 linked HRs front, 4 MGs (RF, RB, LF, LB), RL back, fire extinguisher. Armor: F90, sides 60 each, B70, top and underbody 30 each, 6 10-pt. wheelguards. Top speed 122.5; 25,200 lbs., $76,000.

Boats

Skeeter — Rowboat, mini power plant, propeller, hydrofoil, pilot, MML front, SWC. Armor: F12, R8, L8, B7, T0, U20. Accel. 10, top speed 80, HC 3; 800 lbs., $6,145.

Horizon — Dinghy, small power plant, 2 propellers, pilot, RL front, 2 linked torpedoes back, fire extinguisher. Armor: F20, R20, L20, B16, T0, U10. Accel. 5, top speed 40, HC 3; 2,996 lbs., $8,518.

Archer — Speedboat w/boat top, medium power plant, propeller, pilot, turreted RL w/extra magazine, RL left, RL right, TL in turret, LGL, FCE back, link for all RLs and TL, spoiler. Sloped FP armor: F30, R30, L30, B30, T25, U14. Accel. 5, top speed 40, HC 3; 7,000 lbs., $36,595.

Remora — Cruiser w/boat top, super power plant, jet drive, hydrofoil, pilot, gunner, turreted VMG, 2 homing torpedoes (1L, 1R). FP armor: F30, R30, L30, B20, T20, U34. Accel. 20, top speed 100, HC 2; 14,990 lbs., $70,040.

Orca — Yacht w/boat top. Below deck: large power plant, 2 propellers (w/10-pt. prop armor each), 6 homing torpedoes (2B, 2FR, 2FL). Above deck: pilot, 3 gunners, TG front, 2 linked ACs (1 LF, 1 RF), 2 linked TwLs in rear turret, 3 linked HRs

Wasp — Cargo hover, hvy.-duty power plant, 6 hvy. skirts, vertical stabilizer, pilot, gunner, turreted AC w/2 extra magazines, 4 RGMs (2 front, 2 back), improved fire extinguisher. Cargo capacity: 3,910 lbs., 25 spaces. Armor: F30, RF20, LF20, RB20, LB20, B20, TF15, UF20, UB20. Accel. 5, top speed 150, HC 1; 20,090 lbs., $81,700.

Helicopters

Fly — One-man helicopter, mini helicopter power plant, pilot, VMG w/HD ammo front. Cargo capacity: 52 lbs., 1 space. Armor: F39, R25, L25, T10, U35. Accel. 5, top speed 150, HC 3; 4,948 lbs., $25,896.

Garhawk — Small helicopter, super helicopter power plant, pilot, MG w/HD ammo in universal turret, 2 3-spc. rocket EWPs (ejectable), 6 SAMs linked in 3 pairs on EWPs front,

improved tail assembly. FP armor: F90, R50, L50, B60, T30, U39. Accel. 10, top speed 200, HC 3; 10,000 lbs., $71,310.

Tristan — Small helicopter, small helicopter power plant, pilot, 2 passengers, laser in universal turret under, laser battery, single weapon computer, long-distance radio, radar, radar detector, radar jammer, anti-theft system, 8 AP grenades, 2 space passenger lounge, velvet glove option. LRFP armor: F45, L40, R40, B45, U45, T35, 10-point normal main and stabilizing rotor armor. Accel. 5, top speed 150, HC 2; 8,000 lbs., $77,500.

Plunge — Standard helicopter, std. helicopter plant, pilot, gunner, 2 VMGs linked front, cyberlink from gunner to front VMGs, VMG in universal turret under, 2 pairs linked bombs under, fire extinguisher, infrared, 2 hi-res computers. Armor: F25, R25, L25, T10, U35. Accel. 10, top speed 180, HC 2; 9,330 lbs., $103,800.

Leviathan — Transport helicopter, super helicopter power plant, pilot, gunner, 2 linked lasers front, TG back, 2 VMGs linked in universal turret under, 3 bombs under, 2 hi-res computers, fire extinguisher. Armor: T70, 100 in all other locations. Accel. 5, top speed 150, HC 1; 19,940 lbs., $170,550.

Terminator — Transport helicopter, super helicopter power plant, pilot, 2 gunners, 8 GGs (3 linked R, 3 linked L, 2 [each with extra magazine] in universal turret U), CACR, 3 hi-res computers. LR metal/FP armor: T12/13, 16/15 elsewhere. Accel. 5, top speed 250, HC 2; 19,996 lbs., $237,865.

Racing Cars

Shooting Star — Can-Am, std. chassis, 300 cid engine w/variable-pitch turbocharger, 10-gallon duelling tank, 4 racing slick tires, driver, streamlined, 2 bottles of N2O, 6 PDGs (1F, 1B, 2L and 2R). Sloped FP armor: F45, R30, L30, B40, T8, U12, 4 10-pt. wheelguards, 2 10-pt. armored hubs, 10-pts. CA around each of driver and engine. Accel. 20, top speed 137.5, HC 7; 4,490 lbs., $38,218.

Firebug — Sprint, hvy. chassis, large power plant, 4 plasticore tires, driver, 2 linked MMLs front w/incendiary rounds, HRSWC, ISC, PDG (back). FP armor: F45, R30, L30, B35, T12, U15. Accel. 10, top speed, 130 HC 5; 3,519 lbs., $24,810.

Flashing Steel — Formula One, hvy. chassis, 450 cid engine w/variable-pitch turbocharger, 10-gallon duelling tank, 4 racing slick tires, driver, MG w/explosive rounds (front), overdrive, HRSWC. LR metal armor: F11, R5, L5, B10, T5, U5. Accel. 20, top speed 165, HC 7; 4,400 lbs., $36,630.

Rinaldi 2040B — Dragster, hvy. chassis, 450 cid engine w/variable-pitch turbocharger and supercharger, 2-gallon duelling tank, 2 solid cycle tires, 2 solid racing slick tires, driver (w/body armor), LFT (side), HRSWC, streamlined. Sloped FP armor: F40, Side80, B40, T19, U19. Accel. 30, top speed 177.5, HC 6; 4,396 lbs., $50,712.

Smiler — Funny Car, std. suspension, 400 cid engine w/variable-pitch turbocharger and supercharger, 2-gallon duelling tank, 2 solid front tires, 2 solid slicks back, driver (w/body armor), MFR (side), HRSWC, safety seat, improved fire extinguisher, streamlined, roll cage. Sloped FP armor: F25, Side64, T12, U12. Accel. 30, top speed 167.5, HC 6; 4,495 lbs., $48,021.

Special Vehicles

Stormhawk — Luxury triphibian w/CA frame, x-hvy. chassis, OR suspension, 4 OR solid tires, small helicopter power plant, driver, 2 linked RLs front (laser-guided), TL front (LGL), amphibious modifications. Armor: F40, R26, L26, B26, T5, U25. Accel. 15, top speed 195 on land, 5/162.5 in air, 20/100 in water, HC 2 on/off road and in air, HC 1 in water; 6,600 lbs., $72,010.

Police Cruiser — Luxury, x-hvy. chassis, hvy. suspension, sport power plant w/super conductors, 6 SB solid tires, driver, gunner, two passengers (prisoners), turreted RR w/HEAT ammo, 2 linked MGs w/anti-personnel ammo front, spoiler, overdrive, HD brakes, ABS. FP Armor: F25, R20, L20, B20, T15, U7, 10 points CA around each of driver, gunner, front MGs and power plant, 10 10-pt. wheelguards back, 2 10-pt. hubs front. Accel. 10 (5 w/overdrive), top speed 120 (140 w/overdrive), HC 3; 6,600 lbs., $34,155.

Car Record Sheet

Driver's Name: _____

Player's Name: _____

Vehicle Name:

Size: _____ Weight: _____ Cost: _____
Chassis: _____ Suspension: _____ HC: _____
Acceleration: _____ Top Speed: _____
Power/MPG: _____ Cruising Speed: _____
Driver Skill: _____ Gunner Skill(s): _____

Weapon	To hit	Damage	Ammo

Armor Type:

F(__/__): _____
R(__/__): _____
L(__/__): _____
B(__/__): _____
T(__/__): _____
U(__/__): _____

Extras and Notes:

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Turn	Speed	Handling Class
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2:	____	7 6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
3:	____	7 6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
4:	____	7 6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
5:	____	7 6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
6:	____	7 6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
7:	____	7 6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
8:	____	7 6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
9:	____	7 6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
10:	____	7 6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
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26:	____	7 6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
27:	____	7 6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
28:	____	7 6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
29:	____	7 6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
30:	____	7 6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6

Cycle Record Sheet

Cyclist's Name: _____

Player's Name: _____

Vehicle Name: _____

Size: _____ Weight: _____ Cost: _____

Suspension: _____ HC: _____

Acceleration: _____ Top Speed: _____

Power/MPG: _____ Cruising Speed: _____

Cyclist Skill: _____ Gunner Skill(s): _____

Weapon	To hit	Damage	Ammo

Armor Type:

F(__/__): _____

B(__/__): _____

Sidecar Armor:

F(__/__): _____

R(__/__): _____

L(__/__): _____

B(__/__): _____

U(__/__): _____

Extras and Notes:

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Turn	Speed	Handling Class
1:	____	5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
2:	____	5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
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4:	____	5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
5:	____	5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
6:	____	5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
7:	____	5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
8:	____	5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
9:	____	5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
10:	____	5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
11:	____	5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
12:	____	5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
13:	____	5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
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26:	____	5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
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29:	____	5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
30:	____	5 4 3 2 1 0 -1 -2 -3 -4 -5 -6

Trike Record Sheet

Cyclist's Name: _____

Player's Name: _____

Vehicle Name: _____

Size: _____ Weight: _____ Cost: _____
Chassis: _____ Suspension: _____ HC: _____
Acceleration: _____ Top Speed: _____
Power/MPG: _____ Cruising Speed: _____
Driver Skill: _____ Gunner Skill(s): _____

Weapon	To hit	Damage	Ammo

Armor Type:

F(__/__): _____
R(__/__): _____
L(__/__): _____
B(__/__): _____
T(__/__): _____
U(__/__): _____

Extras and Notes:

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Turn	Speed							Handling Class						
1:	____	6	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
2:	____	6	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
3:	____	6	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
4:	____	6	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
5:	____	6	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
6:	____	6	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
7:	____	6	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
8:	____	6	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
9:	____	6	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
10:	____	6	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
11:	____	6	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
12:	____	6	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
13:	____	6	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
14:	____	6	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
15:	____	6	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
16:	____	6	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
17:	____	6	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
18:	____	6	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
19:	____	6	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
20:	____	6	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
21:	____	6	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
22:	____	6	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
23:	____	6	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
24:	____	6	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
25:	____	6	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
26:	____	6	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
27:	____	6	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
28:	____	6	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
29:	____	6	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
30:	____	6	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6

Truck Record Sheet
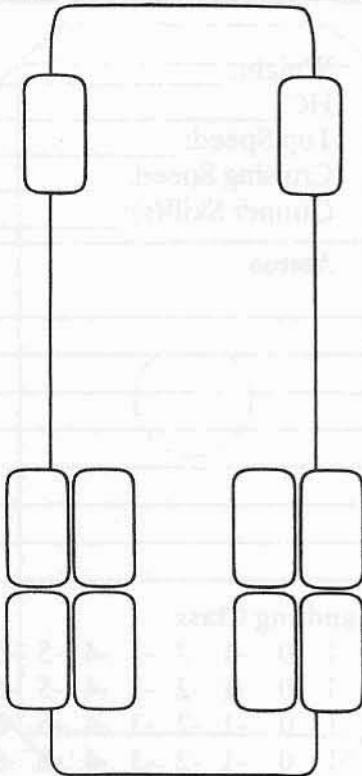
Vehicle Name:

Size: _____ Weight: _____ Cost: _____

Chassis: _____ HC: _____

Acceleration: _____ Top Speed: _____

Power/MPG: _____ Cruising Speed: _____

Trucker Skill: _____ Gunner Skill(s): _____

Weapon	To hit	Damage	Ammo

Armor Type:

F(__/__): _____

RF(__/__): _____

LF(__/__): _____

TF(__/__): _____

UF(__/__): _____

RB(__/__): _____

LB(__/__): _____

TB(__/__): _____

UB(__/__): _____

B(__/__): _____

Extras and Notes:

_____

_____

_____

_____

_____

_____

_____

_____

_____

Turn	Speed				Handling Class							
1:	_____	3	2	1	0	-1	-2	-3	-4	-5	-6
2:	_____	3	2	1	0	-1	-2	-3	-4	-5	-6
3:	_____	3	2	1	0	-1	-2	-3	-4	-5	-6
4:	_____	3	2	1	0	-1	-2	-3	-4	-5	-6
5:	_____	3	2	1	0	-1	-2	-3	-4	-5	-6
6:	_____	3	2	1	0	-1	-2	-3	-4	-5	-6
7:	_____	3	2	1	0	-1	-2	-3	-4	-5	-6
8:	_____	3	2	1	0	-1	-2	-3	-4	-5	-6
9:	_____	3	2	1	0	-1	-2	-3	-4	-5	-6
10:	_____	3	2	1	0	-1	-2	-3	-4	-5	-6
11:	_____	3	2	1	0	-1	-2	-3	-4	-5	-6
12:	_____	3	2	1	0	-1	-2	-3	-4	-5	-6
13:	_____	3	2	1	0	-1	-2	-3	-4	-5	-6
14:	_____	3	2	1	0	-1	-2	-3	-4	-5	-6
15:	_____	3	2	1	0	-1	-2	-3	-4	-5	-6
16:	_____	3	2	1	0	-1	-2	-3	-4	-5	-6
17:	_____	3	2	1	0	-1	-2	-3	-4	-5	-6
18:	_____	3	2	1	0	-1	-2	-3	-4	-5	-6
19:	_____	3	2	1	0	-1	-2	-3	-4	-5	-6
20:	_____	3	2	1	0	-1	-2	-3	-4	-5	-6
21:	_____	3	2	1	0	-1	-2	-3	-4	-5	-6
22:	_____	3	2	1	0	-1	-2	-3	-4	-5	-6
23:	_____	3	2	1	0	-1	-2	-3	-4	-5	-6
24:	_____	3	2	1	0	-1	-2	-3	-4	-5	-6
25:	_____	3	2	1	0	-1	-2	-3	-4	-5	-6
26:	_____	3	2	1	0	-1	-2	-3	-4	-5	-6
27:	_____	3	2	1	0	-1	-2	-3	-4	-5	-6
28:	_____	3	2	1	0	-1	-2	-3	-4	-5	-6
29:	_____	3	2	1	0	-1	-2	-3	-4	-5	-6
30:	_____	3	2	1	0	-1	-2	-3	-4	-5	-6

Boat Record Sheet

Pilot's Name: _____

Player's Name: _____

Vehicle Name:

Size: _____ Weight: _____

Cost: _____ HC: _____

Acceleration: _____ Top Speed: _____

Power/MPG: _____ Cruising Speed: _____

Pilot Skill: _____ Gunner Skill(s): _____

Weapon	To hit	Damage	Ammo

Armor Type:

F(__/__): _____

RF(__/__): _____

LF(__/__): _____

TF(__/__): _____

UF(__/__): _____

RB(__/__): _____

LB(__/__): _____

TB(__/__): _____

UB(__/__): _____

B(__/__): _____

Extras and Notes:

_____

_____

_____

_____

_____

_____

_____

_____

Turn	Speed						Handling Class						
1:	____	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
2:	____	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
3:	____	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
4:	____	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
5:	____	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
6:	____	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
7:	____	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
8:	____	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
9:	____	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
10:	____	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
11:	____	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
12:	____	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
13:	____	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
14:	____	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
15:	____	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
16:	____	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
17:	____	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
18:	____	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
19:	____	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
20:	____	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
21:	____	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
22:	____	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
23:	____	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
24:	____	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
25:	____	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
26:	____	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
27:	____	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
28:	____	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
29:	____	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
30:	____	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6

Hovercraft Record Sheet

Pilot's Name: _____

Player's Name: _____

Vehicle Name: _____

Size: _____	Weight: _____
Cost: _____	HC: _____
Acceleration: _____	Top Speed: _____
Power/MPG: _____	Cruising Speed: _____
Pilot Skill: _____	Gunner Skill(s): _____

Weapon	To hit	Damage	Ammo

Armor Type:

F(__/__): _____
RF(__/__): _____
LF(__/__): _____
TF(__/__): _____
UF(__/__): _____
RB(__/__): _____
LB(__/__): _____
TB(__/__): _____
UB(__/__): _____
B(__/__): _____

Extras and Notes:

_____
_____
_____
_____
_____
_____
_____
_____
_____

Turn	Speed	Handling Class
1:	_____	6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
2:	_____	6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
3:	_____	6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
4:	_____	6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
5:	_____	6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
6:	_____	6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
7:	_____	6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
8:	_____	6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
9:	_____	6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
10:	_____	6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
11:	_____	6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
12:	_____	6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
13:	_____	6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
14:	_____	6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
15:	_____	6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
16:	_____	6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
17:	_____	6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
18:	_____	6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
19:	_____	6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
20:	_____	6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
21:	_____	6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
22:	_____	6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
23:	_____	6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
24:	_____	6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
25:	_____	6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
26:	_____	6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
27:	_____	6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
28:	_____	6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
29:	_____	6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
30:	_____	6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6

Helicopter Record Sheet

Pilot's Name: _____

Player's Name: _____

Vehicle Name: _____

Size: _____   Weight: _____

Cost: _____   HC: _____

Acceleration: _____   Top Speed: _____

Power/MPG: _____   Cruising Speed: _____

Pilot Skill: _____   Gunner Skill(s): _____

Weapon	To hit	Damage	Ammo

Armor Type:

F(__/__): _____

R(__/__): _____

L(__/__): _____

B(__/__): _____

T(__/__): _____

U(__/__): _____

Extras and Notes:

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Turn	Speed	Height	Handling Class
1:	___	___	5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
2:	___	___	5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
3:	___	___	5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
4:	___	___	5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
5:	___	___	5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
6:	___	___	5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
7:	___	___	5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
8:	___	___	5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
9:	___	___	5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
10:	___	___	5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
11:	___	___	5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
12:	___	___	5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
13:	___	___	5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
14:	___	___	5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
15:	___	___	5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
16:	___	___	5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
17:	___	___	5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
18:	___	___	5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
19:	___	___	5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
20:	___	___	5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
21:	___	___	5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
22:	___	___	5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
23:	___	___	5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
24:	___	___	5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
25:	___	___	5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
26:	___	___	5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
27:	___	___	5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
28:	___	___	5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
29:	___	___	5 4 3 2 1 0 -1 -2 -3 -4 -5 -6
30:	___	___	5 4 3 2 1 0 -1 -2 -3 -4 -5 -6

Vehicle Weight Capacity		Acceleration		Top Speed		HC		Total Cost

Item	Cost	Total Cost	Spaces	Total Spaces	Weight	Total Weight	Notes
Body Size							
Chassis							
Suspension							
Engine							
Gas Tank							
Tires							
Driver			2		150		
Gunner							
Passengers							
Weapon							
Ammo							
Weapon							
Ammo							
Weapon							
Ammo							
Weapon							
Ammo							
Weapon							
Ammo							
Weapon							
Ammo							
Accessory							
Accessory							
Accessory							
Accessory							
Armor							
Totals							

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Y

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Abbreviations

ABR — Armored Beer Refrigerator
ABS — Antilock Braking System
AC — Autocannon
Accel. — Acceleration
AMF — Armored Minifridge
AP Ammo — Anti-Personnel or Armor-Piercing Ammo
APFSDS — Armor-Piercing Fin-Stabilized Discarding Sabot Warheads
APPR — Anti-Power-Plant Rocket
AR — Assault Rifle
ATAD — Automatic Target Acquisition Device
ATG — Anti-Tank Gun
AVR —Anti-Vehicular Rifle
B — Back
B — Bomb
BA — Body Armor
BC — Blast Cannon
BL — Back Left
BP — Blast Points
BR — Back Right
BR — Bomb Rack
CA Frame — Carbon-Aluminum Frame
CA — Component Armor
CACR — Coaxial Counter-Rotating Blade System
CB — Cluster Bomb
CBSS — Cloud Bomb
CD — Chaff Dispenser
CPS — Cost per Shot
CTS — Cycle Turreted Sidecar
d — die (6-sided)
D — Difficulty Rating
DP — Damage Points
DSP — Drop-Spike Plate
DStG — Double-Barreled Shotgun
DWM — Dual-Weapon Magazine
ERIS — Encoded Remote Ignition System
EWP — External Weapon Pod
F — Front
FCD — Flame Cloud Discharger
FCE — Flame Cloud Ejector
FCGS — Flame Cloud Gas Streamer
FD — Flechette Discharger
FDSP — Fake Drop-Spike Plate
FE — Fire Extinguisher
FG — Flechette Gun
FL — Front Left
FLDSP — Fake Large Drop-Spike Plate
FOD — Flaming Oil Discharger
FOJ — Flaming Oil Jet
FP — Fireproof
FR — Front Right
FT — Flamethrower
GE — Grenade Equivalent
GG — Gauss Gun
GL — Grenade Launcher
GP — Gauss Pistol
GR — Gauss Rifle
GS — Gas Streamer
GS1, GS2 — Gyroslugger
HARM — Homing Anti-Radar Missile
HAVR — Heavy AV Rifle
HC — Handling Class
HD — Heavy-Duty
HD Ammo — High-Density Ammo

HDCD — Heavy-Duty Chaff Dispenser
HDFCE — Heavy-Duty Flame Cloud Ejector
HDFT — Heavy-Duty Flamethrower
HDID — Heavy-Duty Ice Dropper
HDOJ — Heavy-Duty Oil Jet
HDPS — Heavy-Duty Paint Spray
HDSS — Heavy-Duty Smokescreen
HEAT — High-Explosive Anti-Tank Warheads
HESH — High-Explosive Squash-Head Warheads
HFOJ — Heavy Flaming Oil Jet
HL — Heavy Laser
HP — Heavy Pistol
HR — Heavy Rocket
HRSWC — Hi-Res Single-Weapon Computer
HT Ammo — High-Temperature Ammo
HXL — Heavy X-ray Laser
IBA — Improved Body Armor
IcD — Ice Discharger
ID — Ice Dropper
IFE — Improved Fire Extinguisher
IFF — Identification Friend or Foe
Imp. — Improved
IR — Infrared
IRSS — Infrared Sighting System
ISC — Improved Supercharger Capacitor
JD — Junk Dropper
L — Laser
L — Left
LAW — Light Anti-tank Weapon
LDSP — Large Drop-Spike Plate
LFT — Light Flamethrower
LGL — Laser-Guidance Link
LIG — Light Intensifier Goggles
LL — Light Laser
LLAW — Laser LAW
LP — Light Pistol
LR — Laser Rifle or Laser-Reflective
LtR — Light Rocket
LTS — Laser Targeting Scope
LVLAW — Laser VLAW
MD — Minedropper
MF — Mine-Flinger
MFR — Multi-Fire Rocket Pod
MG — Machine Gun
ML — Medium Laser
MML — Micromissile Launcher
MMSD — Mechanical Memory Storage Device
MNR — Mini Rocket
MP — Machine Pistol
MPG — Miles Per Gallon
MPRL — Man-Portable Rocket Launcher
MR — Medium Rocket

N_2O — Nitrous Oxide
NBC — Nuclear/Biological/Chemical
OD — Oil Discharger
OG — Oil Gun
OJ — Oil Jet
OR — Off-Road
PCs — Platinum Catalysts
PD — Paint Discharger
PDG — Point-Defense Grenade
PES — Portable Earth Station
PFT — Portable Flamethrower
PG — Paint Gun
PMML — Portable Micromissile Launcher
PR — Puncture Resistant
PS — Paint Spray
PU — Power Units
R — Radial
R — Right
Rev. — Reversed
REWP — Rocket EWP
RGM — Radar-Guided Missile
RL — Rocket Launcher
RP — Rocket Platform
RR — Recoilless Rifle
RS — Racing Slick
SAM — Surface-to-Air Missile
SB — Steelbelted
SCs — Super-Carburetors
SD — Spikedropper
SG — Spike Gun
SL — Starshell Launcher
SkD — Smoke Discharger
SMD — Spear 1000 Minedropper
SMG — Submachine Gun
SS — Smokescreen
StG — Shotgun
SWC — Single-Weapon Computer
T — Top
TB — Top Back
TDX — Two-Dimensional Explosive
TF — Top Front
TG — Tank Gun
TGD — Tear Gas Discharger
TL — Targeting Laser
TwL — Twin Laser
U — Underbody
UB — Underbody Back
UF — Underbody Front
URGL — Under-Rifle Grenade Launcher
URGS — Under-Rifle Gyroslugger
VFRP — Variable-Fire Rocket Pod
VLAW — Very Light Anti-Tank Weapon
VMG — Vulcan Machine Gun
VS — Vehicular Shotgun
WGM — Wire-Guided Missile
WGT — Wire-Guided Torpedo
WPS — Weight per Shot
XL — X-ray Laser
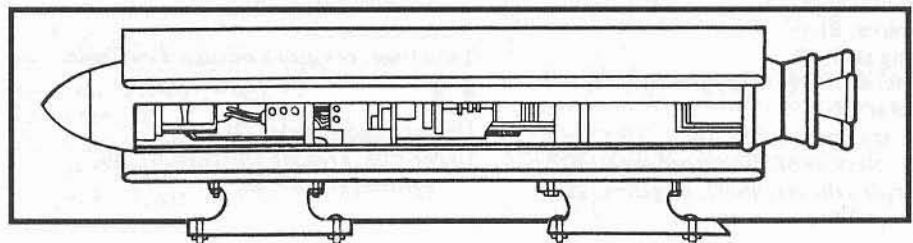
The Rules of the Road

He triggered the rear rocket-launchers once more.
A direct hit! The blue car skidded as the driver lost
control — then flipped and caught fire.

That would teach HIM not to tailgate . . .

Car Wars is the game of the freeways of the future — where the right of way goes to the biggest guns. Choose your vehicle — complete with weapons, armor, power plant, suspension, and body style. Then take it out on the road. You'll come home an "ace" — or you'll crash and burn. If you survive, your abilities will improve, and you can accumulate money to buy bigger and better cars.

Now, all your *Car Wars* rules can be found in one book — The *Car Wars Compendium*. Included are the rules from *Car Wars Deluxe Edition*, *Boat Wars*, *Dueltrack*, and the *Uncle Albert's Catalogs* through 2039 — as well as clarifications, improvements, and new rules from the pages of *Autoduel Quarterly*, streamlined for faster play. Design your own cars, cycles, trikes, vans, trucks, 18-wheel tractor-trailer rigs, boats, helicopters and hovercraft! The *Car Wars Compendium* is organized and indexed for easy reference, and includes 8 extra pages of charts and tables!

NOTE: This is *not* a complete game. You will need maps and counters from *Deluxe Car Wars*, *Boat Wars* or other *Car Wars* supplements to play.

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STEVE JACKSON GAMES