

GULLIVER LITE v1.0

Rules Upgrade for GURPS

What is GULLIVER?

GULLIVER is a big expansion for Steve Jackson Games' **GURPS**, focused on building and gaming creatures of any shape and size. It fixes "normal humans only" rules, details physical feats, and offers a ton of new design and play options. Its goal is not special-case rules for unusual creatures in the game, but is rather the stated goal of **GURPS** itself: "generic, universal" rules for humans – which happen to work just fine for Giants, Pixies, cats, and space blobs.

GULLIVER hews to real physics and biomechanics wherever reasonable. Its throwing rules can give the speed of a fastball in mph; its jumping rules work for track stars and fleas alike. It offers **GURPS**' first fleshed-out "scale rules" for creatures, and the first real look in *any* RPG at the effects of power vs mass in living things.

What is GULLIVER LITE?

This text boils the core of the full work down to 24 printable, portable pages. Unlike **GURPS LITE**, this recap does leave in a lot of options – after all, options are the point of it all. Simple and advanced versions of main text rules, as well as other options, are clearly marked. Whether options or main text, use only the bits you need and ignore the rest.

Should this actually not be enough, check out the full **GULLIVER** at T. Bone's **GURPS Diner** – there's more of everything covered here, plenty of things not covered here (including *a lot* of new traits), and examples galore.

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WORDS!

Names of game terms and traits (new and existing) are capitalized. Non-game traits are not capitalized.

Abbreviations: *BS*, Basic Set 3E; *BT*, Bio-Tech; *CI*, *CII*, Compendiums I, II; *MA*, Martial Arts 1E; *VE*, Vehicles 2E; *B1* – *BX*, **GULLIVER** Books 1 – X.

Area Scale: *Linear Scale* squared, representing surface area compared to the human norm. See *Size*.

athletics: A DX or skill roll involving full body movement: Acrobatics, Jumping, melee or sports skills, many more.

balance roll: Any DX or skill roll to maintain footing, avoid falling down (including after knockback or a failed kick), balance on a narrow perch, etc.

Combat ST: ST for damage purposes, not lifting or carrying. See *Load ST*.

Environment: The environments characters operate in: land, water, and air (or terrestrial, aquatic, and aerial). A **home** Environment is any that you operate "natively" in; your **primary** one is your main one for cost purposes.

GVER: GULLIVER.

linear dimension: Approximate height or length, generally head to hind feet (ignoring long necks and tails). Determines *Size*.

Linear Scale: *Linear dimension* compared to the human norm: $x1/2$, $x1$, etc. See *Size*.

Load ST: Half-priced ST for lifting and carrying purposes, not damage purposes. See *Combat ST*.

mass: Amount of "stuff", measured in pounds at 1-g. Unlike *weight*, does not change under natural conditions.

MAR: Mass-to-Area Ratio, expressed as a multiple of typical human norm (typically equal to *Linear Scale*). See *WAR*. Needed only for advanced stuff.

mobility, movement, maneuverability: *Movement* lets you go from A to B; *maneuverability* is ability to turn quickly, Dodge, etc. *Mobility* covers both.

mode of movement: Same as *Environment*, referring specifically to movement. You will likely have a different Move score in each of your modes.

MSR: Mass-to-Strength Ratio. *Mass* divided by *Load ST*. See *WSR*.

natural encumbrance: Encumbrance from body weight alone. Heavy creatures will be encumbered by their own weight (**positive** encumbrance); light ones will enjoy speed and agility bonuses (**negative** encumbrance).

Size: A label for rough size groupings, based on TH modifier for size. A human is Size 0, a humanoid half as large in all dimensions is Size -2, etc.

speed: Capitalized, the same as Basic Speed; uncapitalized, a generic term for speed of movement (i.e., Move).

thrust: Motive power in water or air; *Load ST* by default, but can differ.

traits: Advantages, disadvantages, and attributes.

Volume Scale: *Linear Scale* cubed, representing volume and mass compared to the human norm. See *Size*.

WAR: As *MAR*, but replacing mass with weight.

weight: *Mass* x gravity. Also changes with effects of buoyancy. Weight is measured in lbs. and can be negative.

WSR: Weight-to-Strength Ratio. *Weight* divided by *Load ST*. See *MSR*.



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Option: Quad ST

Quad ST is an alternate method for handling ST: Set Combat ST, scaled using Linear Scale, and purchase normally.

Now *square* Combat ST, divide by 10, and round appropriately; that's your *automatic* Load ST. (Ex.: Combat ST 15 yields Load ST 22.) It's free, is already scaled for size, and isn't adjusted further.

Quad ST is easy, elegant, avoids inconsistent pairings of Combat ST and Load ST (possible under **GVER**'s method), and lowers the cost of high ST. Used by many players, it's a highly recommended replacement for both **GURPS**' and **GVER**'s handling of ST.

Its only drawback is the sole reason **GVER** doesn't use it: It changes lifting abilities for most existing PCs. (You may not find this bad at all!)

Option: New Costs

Extra HP: [5/lvl] for first two, [2/lvl] thereafter.

Toughness and DR: Either is [10] for first level, [15] for second, [3/lvl] thereafter.

Benefits: With these costs, large creatures' HP, like their ST, costs less. Any given DR will cost more than the equivalent Extra HP, as it should. The too-low cost of DR (very valuable in **GURPS**!) is raised (while high levels remain cheap). High levels of Toughness become possible (for Giants, etc.). Toughness, which differs slightly from DR but offers equal utility, is no longer more expensive (though races like humans can be limited in how much of each can be bought).



Size -3

SIZE AND POWER!

Handling ST

Playing odd-sized creatures and fixing several **GURPS** problems require a reworking of ST. Current ST scores for large and small creatures are unrealistic, yet realistic scores yield extreme point costs, and damage stats that play poorly.

Divide ST into Combat ST, which determines damage, and Load ST, measurable lifting/carrying ability. This allows realistic abilities, with ST-based damage (and costs) that mesh with **GURPS**.

Do not use the "Natural ST" complication anywhere; **GVER** removes the problems it addresses.

Do not base skills on ST or let skills default to ST. Do not let ST replace a skill or other attribute, or vice-versa. These all cause trouble in **GURPS**.

Building Size into Characters

While **GURPS** doesn't address how to build size into designs, the system handles it well:

1. Choose a Size, based on linear dimension.
2. Choose "base" stats – stats appropriate for a human-sized version of the design.
3. Scale appropriate stats for Size.
4. Add Inconvenient Size if appropriate.
5. Pay for the final design normally.

The Scale Table makes this easy. It replaces the Size and Speed/Range Table for all purposes:

Scale Table

Size	Spd/ Rng	Linear Dim.	Linear Scale	Area Scale	Volume Scale
+10...	-10	100 yds	x50	x2000	x100K
+9	-9	70 yds	x30	x1000	x30K
+8	-8	50 yds	x20	x500	x10K
+7	-7	30 yds	x15	x200	x3000
+6	-6	20 yds	x10	x100	x1000
+5	-5	15 yds	x7	x50	x300
+4	-4	10 yds	x5	x20	x100
+3	-3	7 yds	x3	x10	x30
+2	-2	4.5 yds	x2	x5	x10
+1	-1	3 yds	x1.5	x2	x3
0	0	2 yds	x1	x1	x1
-1	+1	1.5 yds	x2/3	x1/2	x1/3
-2	+2	1 yd	x1/2	x1/5	x1/10
-3	+3	2 ft	x1/3	x1/10	x1/30
-4	+4	1.5 ft	x1/5	x1/20	x1/100
-5	+5	1 ft	x1/7	x1/50	x1/300
-6	+6	8 in	x1/10	x1/100	x1/1000
-7	+7	5 in	x1/15	x1/200	x1/3000
-8	+8	3 in	x1/20	x1/500	x1/10K
-9	+9	2 in	x1/30	x1/1000	x1/30K
-10...	+10	1.5 in	x1/50	x1/2000	x1/100K

Choosing Size

Sizes are approximate; pick the best match. Your Size is also your TH modifier as a target!

If design is largish or smallish for its Size, boost or reduce base ST and base HP (below) a bit.

Setting Stats

Round where necessary – but for very small creatures, fractional ST, HP and DR are fine!

ST: Start with "base" ST – above 10 for strong builds, below 10 for weak ones. (Consider at least +1 base ST per Size level above human size, for the stout builds of large creatures.)

Combat ST: Multiply base ST by Linear Scale.

Load ST: Multiply base ST by Area Scale.

DX: Not affected by Size, though may be higher in small creatures and lower in large.

IQ: Not affected by Size for game purposes.

HT: Not affected by Size, although may be lower in very large creatures. Don't confuse HT with HP; they're separate items.

HP: Start with "base" HP (=HT by default) and multiply by Linear Scale. Adjust as desired.

DR: Start with "base" DR and multiply by Linear Scale. (Do the same for free skull DR.)

Weight: Start with "base" weight, taking into account body shape, build, appendages, composition, etc. Multiply by Volume Scale.

Move: Multiply Move by Linear Scale.

Reach: Multiply Reach by Linear Scale.

Sustenance requirements: Multiply "base" sustenance requirements by Area Scale.

Senses: Senses in very large or small creatures may differ from ours, but not by default.

Inconvenience: Add Inconvenient Size for difficulties with clothing, tools, housing, vehicles, etc.: [-5 to -15] for either large or small Size.

Cost in a typical world: Dwarfism or Gigantism: [-5] (included in traits); 1 or 2 Size lvls difference from norm: [-10]; greater difference: [-15].

In a world with some accommodation for odd-sized races, or little to offer in tools, clothes, etc. (or a PC little able to use these anyway): 1 or 2 levels of difference: [-5]; 3 or 4 levels: [-10]; greater differences: [-15].

Cost of Size

The cost of size is the cost of your final traits. Your Size itself is bought as a trait, rolling several modifications into one easy purchase.

Attributes: Pay for DX, IQ, and HT normally. Pay for Combat ST normally. Pay for Load ST above or below Combat ST at half cost.

Extrapolate costs for fractional ST, HP, or DR.

HP: Purchase HP above/below base HP using Extra/Reduced Hit Points.

DR: Purchase DR normally.

Size trait: Size 0 or smaller costs [0]; Size greater than 0, [10/lvl]. This includes TH modifier, effects on Move, Reach, and sustenance requirements, and miscellaneous effects of size.

Other: Pay for any other size-related traits (such as modified senses) normally. There is no cost for weight, other than that of associated natural encumbrance.



Size +2

POWER AND MOBILITY!

Extending **GURPS'** encumbrance rules to the effects of *any* body weight – not just carried items, excess fat, and weight from high density or gravity – simulates differences in large and small creatures' mobility better than any RPG has ever done.

GVER uses one Table and set of encumbrance rules to cover all creatures, environments, and modes of movement, with no separate rules for animals, fliers, or fast Supers.

Computing Encumbrance



WSR and MSR are weight and mass, respectively, over Load ST. It's MSR that determines encumbrance, but resisting the burden of WSR cuts power available for mobility; you're stuck with a higher effective MSR.

Baggage: Carried items are simple to deal with: Add their weight and mass right into yours. Take your WSR or MSR from the *combined* weight or mass of your body and carried items.

The procedure: The Encumbrance Table gives an encumbrance level for any combination of WSR and MSR:

1. Find WSR on the Table; note Enc Factor.
2. Multiply MSR by Enc Factor.
3. Find encumbrance from this effective MSR.

Encumbrance Table

WSR	Enc Level	Half Mod	Full Mod	Move Mod	Point Cost	Enc Fact.	MSR
0.07	Neg 10	5	10	x20	200	1	0.07
0.15	Neg 9	4	9	x15	170	1	0.15
0.3	Neg 8	4	8	x10	155	1	0.3
0.7	Neg 7	3	7	x7	125	1	0.7
1.3	Neg 6	3	6	x5	110	1.1	1.5
2.5	Neg 5	2	5	x3	80	1.2	3
5	Neg 4	2	4	x2	65	1.4	7
10	Neg 3	1	3	x1.5	35	1.5	15
12	Neg 2	1	2	x1.2	25	1.6	20
14	Neg 1	0	1	x1.1	5	1.8	25
17	None	0	0	x1	0	2	35
19	Light	-1	-2	x4/5	-10	2.5	50
21	Med.	-2	-4	x3/5	-20	4	100
27	Heavy	-3	-6	x2/5	-30	7	200
35	X-Hvy	-4	-8	x1/5	-40	20	700
45	S-Hvy	-5	-10	x1/10	-50	65	3000
55	Extr. 1	-6	-11	x1/15	-51	inf	7000
65	Extr. 2	-6	-12	x1/20	-52	inf	15K
75	Extr. 3	-7	-13	x1/30	-53	inf	30K
85	Extr. 4	-7	-14	x1/50	-54	inf	70K

Shortcuts!

For humans and other land creatures in 1-g without Extra Encumbrance – i.e., nearly all game situations – the process shortens to simply looking up WSR; there's no need to mess with mass and MSR. Easy as **GURPS'**!

In weightless situations, WSR doesn't matter; just look up MSR.

Notes: Encumbrance on a border of two levels uses the better: WSR 21 is Medium, etc.

Max encumbrance is renamed Super-Heavy.

Effective WSR and MSR may vary with environment, as follows:

Land

Most situations on land will fall under the shortcut above, making for very simple computation. But situations involving changed gravity or unusual resistance to the effects of weight (Extra Encumbrance) may generate unique results.

Space

In 0-g, you only need to look up MSR. But you'll need Free Fall control rolls to make use of your newfound agility.

Water and Air

Find WSR and MSR using thrust (usually the same as Load ST). Adjust WSR and MSR as follows, then figure encumbrance normally:

WSR: Weight of items may be lessened in water; it can be 0, or even *negative* (the item floats). Eyeball weights, or compute from density: Weight = (weight on land / item density) x (item density - 1), where 1 is water density. Density of a typical creature is also 1, meaning no weight in water.

Weight causes *no* encumbrance if you fall, sink or float freely with it; effective WSR is 0. That includes buoyant swimmers on the water surface, or gliders. (The latter don't have thrust; compute their encumbrance from MSR x 10 alone, or MSR x 50 for the lesser gliders known as parachuters.)

Normally, though, you fight gravity to swim or fly in the opposite direction, or on a level. Weight matters here – a lot. Multiply effective WSR in water or air by 5 for lack of support beneath!

MSR: In water, multiply MSR by 2 for the difficulty of moving through the medium.

Effects of Encumbrance

Encumbrance of None or worse is "positive" encumbrance. Neg 1 or better is "negative" encumbrance. For any level, effects include:

Move Modifier

Multiply Move by Move Modifier. This replaces **GURPS'** adjustments to Move, and applies to all creatures, in any mode of movement.

Modifiers to skills

Half Modifier: Adds to Dodge, Stealth, Jumping, Dancing, sports skills, some martial arts, balance rolls, and other DX rolls to move quickly.

Full Modifier: Adds to Acrobatics, Climbing, Flight, and Swimming.

Modify skills like Swimming or Climbing for *control roll* purposes, but not for *Move* purposes.

Simple Rule: Mass vs Weight

While finding encumbrance from WSR, Enc Factor and MSR isn't hard or needed often, here's something even simpler, if less precise:

Look up encumbrance from WSR alone and from MSR alone, and use the worse of the two.

All special rules for environment apply (WSR x 5 in water or air, etc.).

More on Buoyancy

Positive weight sinks. Treat negative weight as positive weight, except it floats instead of sinks.

Swimming rolls to stay put on the sea bed take a free +1 for density of 1.05, +2 for 1.1, and +3 for 1.3 or greater.

Swimming rolls to float properly on the surface receive a +1 for any minuscule level of buoyancy, +2 for density of 0.99 or less, +3 for 0.97 or less, +4 for 0.94 or less, +5 for 0.9 or less, and +6 for 0.85 or less. Charge [1] for each such +1 to float.

If you're *really* light, you may be buoyant in air! Air has about 1/800 the density of water; use that in the formula (or use 1 to represent density of air, and set your density relative to that).

Fat and Swimming

Assume Fat characters gain their buoyancy from negative weight in water. This awards bonuses to float in water, but not to Swimming skill overall. And fighting that buoyancy means encumbrance when not on the surface. That, plus slowness from the *mass* of the fat, forces Olympic swimmers under **GVER** rules to be sleek, not chubby.

For simplicity, let flotation bonuses, changes in aquatic encumbrance, and other miscellaneous effects be no-cost special effects of Fat.

Acceleration Hazard

Systemic effects of long-term acceleration (*CII* 141) should also apply to high gravity, on top of the crushing effects described here.

The stresses of sudden acceleration or deceleration are covered on *CII* 131. Add the Half modifier for encumbrance to relevant HT rolls.

Move Enhancements

Move enhancements are multipliers to Move: Enhanced Move, Super Move, and, despite the name, Reduced Move.

GVER uses multipliers for Reduced Move, not subtractions: 2/3, 1/2, 1/3, 1/5, and 1/10, for 1 to 5 levels.



Reduced Move poster boy

Limbs and Control

A general rule for control modifiers involving number of limbs:

One limb: -6*

Two limbs: +0

Three limbs: +1

Four limbs: +2

Five to six limbs: +3

Seven to ten limbs: +4

Eleven+ limbs: +5

Examples include balance and number of appendages (usually legs) on the ground, or Climbing rolls and the number of limbs involved.

Multiple wings or swimming appendages offer these modifiers on Flight or Swimming control rolls.

When in doubt, use +0.

*Includes human balance with leg grappled, or after failed kick (p 8).

Extended Tables

A "..." in a Table row means to extend in that direction as needed. Additional rows follow the same progressions as previous ones; the methods should be obvious.

Burden

From mass: Any level of MSR is no burden on the system (even with names like "X-Heavy" or "Extreme"); it's only slowness.

From weight: WSR does represent burden; low levels are tolerable, high levels are dangerous.

Super-Heavy encumbrance: At this level you expend all energy to stay standing, afloat, or aloft.

Extreme encumbrance: At this level you can no longer fight gravity; you harmlessly fall in air or sink in water until you hit bottom (or float upward until you hit the water surface).

On land, you collapse and are slowly crushed. Roll immediately vs HT and again every hour, at a penalty equal to level of Extreme encumbrance. Damage is the amount by which roll was missed, times the level of Extreme encumbrance. Divide damage over the hour.

DR does not protect; Toughness protects with half value. Reduce effective levels of Extreme encumbrance for soft support underneath, up to 50% for a custom cushion or gravity sling.

Extra Encumbrance

Large designs require modification to bear their own weight. **GVER** reworks Extra Encumbrance into a leveled trait. Each level costs [5] and increases WSR cutoffs for positive encumbrance:

Extra Encumbrance Table

	levels of trait				
	0	1	2	3	X
None	17	18	19	21	15+2X
Light	19	21	23	27	15+4X
Medium	21	24	27	33	15+6X
Heavy	27	33	39	51	15+12X
X-Heavy	35	45	55	75	15+20X
S-Heavy	45	60	75	105	15+30X
Extreme 1	55	75	95	135	15+40X
Extreme 2	65	90	115	165	15+50X
Extreme 3	75	105	135	195	15+60X
Extreme 4...	85	120	155	225	15+70X

Extra Encumbrance lets your legs and back carry much and can reduce the weight burden a land creature feels, even if slowed tremendously by mass. It has no effect in midair or floating in water, or on *negative* encumbrance. Also, your *arms* are no stronger; max lift does not change.

A guide to the number of levels in a design:

Legs: One level for 3 to 5 legs (or other limbs supporting weight), two for 6 or 7, three for 8+. (This, not a separate chart, is **GVER**'s accommodation for load bearing in multi-legged creatures.)

A legless body may have up to three levels.

Design: One level for efficient load-bearing design (ox, elephant, Dwarf, etc.).

Size: One level for Size +1 to +3, two for Size +4 to +6, etc., for thicker-than-human bones.

Stance: One level *less* for splay-legged, Very Low stance (p 20).

Other: Adjust for exotic structure, magic, etc.

Cost of Natural Encumbrance

Natural encumbrance cost is based on *naked* encumbrance, without items that can be put down or removed. See Encumbrance Table for costs.

Encumbrance cost is based on final mobility, i.e., burden from *mass*. If burden from *weight* is different due to Extra Encumbrance, water, etc., that's a special effect of build and environment.

Encumbrance level may vary among modes of movement; see p 19 to price. If a design has both powered and unpowered flight with different levels of aerial encumbrance, base cost on powered flight encumbrance alone, for simplicity.

Option: Airfoils

The x5 WSR multiplier in air places strict limits on flight in big creatures. Reduce it to allow cinematic bird-men, all the way down to no multiplier – which lets a winged human fly with as much load as he can walk with.

Alternately, get real and do what birds do: gain lift from airfoils.

Simple rule: Ignore the weight multiplier. Add Cannot Hover/Fly Backward [-20%] to Powered Flight or Gliding. Lose flight ability if you slow to under half Move.

Detailed rule: Compute aerial encumbrance normally, with the weight multiplier. You may even be too heavy to fly at all (if so, add the above limitation to Powered Flight). Pay for aerial encumbrance (p 19).

Decide how much lift airfoils generate – 80% of body weight is good. Figure new encumbrance and Move using total weight minus this lift. Pay the difference for the improved encumbrance, but with a Requires Forward Move limitation [-20%]: Slow to between 2/3 and 9/10 full Move, and you lose half the improved levels; between 1/3 and 2/3 Move, three-fourths of the levels; slower than that, all improved encumbrance.

Added weight: Carried weight increases encumbrance, which lowers speed, which further increases encumbrance, which... Unless you want to tackle computation of the complex equilibrium, use this shortcut:

Increase encumbrance normally if you take on weight, then increase it again by half as many levels (round down).

Takeoff: Some powered designs relying on airfoils will need help to reach viable flying speed for takeoff. You may need to run fast, dive from a high spot, or face into the wind (it's Move *relative to the air* that counts).

Gliders: Most gliders use the Requires Forward Move limitation too (p 20). If you slow in mid-glide, you lose levels of Slow Fall as above, and if under one-third full Move, all ability to glide. A dive and pull-out may let you restart things (if there's time...).

Fortunately for gliders, added weight doesn't slow forward Move; no problem there. It does increase rate of descent (p 6).

ACTION!

All About Move

All forms of movement – running, flying, swimming, climbing, etc. – use the same Move calculation: (Base Move + adjustments) x adjustments.

Adjustments include skills, encumbrance, adaptation, enhancements, and size.

Round Move for combat, but keep fractions for long distance movement. Use the appropriate skill or attribute for control rolls.

Computed scores

Basic Speed: (DX+HT)/4. Also called Speed. Speed and Move are *not* the same.

Base Move: Basic Speed.

Move: Computed below.

Step: Move/5. Not necessarily a literal step.

Sprint: Move + Step. Requires a second of full-speed Move to achieve.

Despite the terrestrial wording, Step and Sprint apply to any mode of movement.

Land Performance



Skills and Move, terrestrial Creatures

Short-term speed boost: Use Running.

Long-term speed boost: Use Hiking.

Tricky maneuvers: Use Acrobatics.

Other: Jumping and Climbing are useful skills.

Running Move: (Base Move + Running/8) x Move Modifier x enhancements x Linear Scale.

Running control rolls: Roll vs DX or balance, with Half modifier for encumbrance.

Skills and Move, non-terrestrial creatures

Use Crawling or Flopping (both P/E, default to DX-4) to get about poorly. Other skills are generally not possible. Take a -2 on combat and other athletic actions, including Dodge.

Move: Base Move x Crawling/5 x Move Modifier x 1/10 x enhancements (Reduced Move only) x Linear Scale.

Without legs, multiply Load ST by 1/2 for one arm, 2/3 for two or more, for encumbrance purposes. With no limbs, halve Load ST and replace Crawling with Flopping.

Control rolls: Roll vs Crawling, with Full modifier for encumbrance. Flopping requires skill roll every turn to move in desired direction; roll direction randomly otherwise.

Current and Wind

Movement in water is relative to the current, not to the ground. Current moves you every turn whether you like it or not. After you move normally from point A to B, it moves you from B to C in its direction, at its Move. (Your actual path is a line drawn from A to C.)

Wind affects fliers in exactly the same way.

Water Performance



Skills and Move, aquatic creatures

Swimming defaults to DX for aquatic creatures.

Short-term speed boost: Use Speed Swimming (treat as Running).

Long-term speed boost: Use Long Distance Swimming (treat as Hiking).

Tricky maneuvers: Use Swimming; or Water Acrobatics (P/H) for acrobatic Dodges, water "walking", etc. Let Water Acrobatics aid leaps from surface (p 6) as Jumping skill does on land.

Move: (Base Move + Speed Swimming/8) x Move Modifier x enhancements x Linear Scale.

Swimming control rolls: Roll vs Swimming, with Full modifier for encumbrance.

Skills and Move, non-aquatic creatures

Only Swimming (defaults to DX-5, *not* to ST) and Water Acrobatics (limit skill level to Swimming) are available, and represent far more limited ability than the same in aquatic creatures. Take a -2 on combat and other athletic actions, including Dodge.

Move: Base Move x Swimming/5 x Move Modifier x 1/10 x enhancements x Linear Scale. (This looks different from GURPS, but gives the same results for average humans.)

Swimming control rolls: Roll vs Swimming, with Full modifier for encumbrance.

Air Performance



Skills and Move, powered fliers

Flight defaults to DX for flying races, DX-4 for others.

Short-term speed boost: Use Speed Flight (treat as Running).

Long-term speed increase: Use Long Distance Flight (treat as Hiking).

Tricky maneuvers: Use Flight; or Aerial Acrobatics (P/H) for barrel rolls, acrobatic Dodges, etc.

Move: (Base Move + Speed Flight/8) x Move Modifier x enhancements x Linear Scale x 2.

Flying control rolls: Roll vs Flight, with Full modifier for encumbrance.

Skills and Move, unpowered fliers

Relevant skills are Flight (Gliding) or Flight (Parachuting), defaulting to DX for gliding races, DX-4 for others, and cross-defaulting to each other at -2 (the latter also to Parachuting at -2).

There are no speed boost skills for gliders. Tricky maneuvers use the above Flight variants, or Aerial Acrobatics. (Many powered fliers can also glide, using Flight for general control.)

Move: Base Move x 1/10 *if* parachuter (p 20) x enhancements x Linear Scale x 2. Skills and encumbrance do not affect Move. (See also p 17.)

Gliding control rolls: Roll vs Flight variants, with Full modifier for encumbrance.

Option: Control

Your turning radius = one 60° facing change every ((current Move in yards squared/10)/ Move Modifier) yards. Minimum turn radius is your length, unless you can pivot in place.

Make a control roll (unmodified for encumbrance, which is already factored into radius), at a -2 to cut turning radius up to 2/3, -4 for 1/2, -6 for 1/3, -8 for 1/5, -10 for 1/7, and -12 for 1/10.

Option: Acceleration

Acceleration or deceleration in hexes per second is Move *without* Enhanced or Super Move.

Make a control roll at +2 to decelerate by twice the normal amount without tumbling.

Space Acceleration

Space fliers have an acceleration, not Move, stat (BT 136).

Find maneuverability from MSR (50 / acceleration), to get skill and Dodge modifiers (Move Modifier is irrelevant).

If there is gravity, you need to fight it. Find Encumbrance Factor from WSR and divide acceleration by that.

Option: Substitution

A neat trick: For all Move that adds some skill/8 to Base Move, let that skill *replace* its base attribute in Base Move instead: e.g., (DX + Running)/4 on land. This eliminates big Move bonuses for a mere half point in skill, yet reduces the too-high cost of Move bonuses at the high end.

Dodging skill

Some fighters duck blows rather than parry or block them. Allow a Dodging skill (P/E), which replaces DX to evade a slam or grapple, *and* substitutes for DX in the (DX+HT)/4 base for your Dodge score.

No Maneuverability

A non-flier in a fall (including mid-jump) or floating in space can not maneuver. Defenses and athletic actions are at -4, or may be impossible.

Climbing and Weight

The rules make climbing very difficult and slow, or impossible, for an unathletic WSR. But if a climb seems possible despite the numbers, set encumbrance at an arbitrary S-Hvy or X-Hvy and move on.

Simple Climbing

For a simpler climbing Move: Convert *BS* climbing times into a Move score. Multiply by Base Move/5 x Move Modifier x Climbing skill/10 x Linear Scale.

Multiply by 2 if no unusual position is required (a squirrel or lizard climbs in normal running position; a human doesn't). Climbing Move may not exceed running Move.

That's more detail than **GURPS**, though it doesn't reflect the huge importance of WSR as the full **GVER** rules do.

Simple Jumping

For quicker rules: $Jd = \text{Move Modifier} \times \text{Linear Scale} \times \text{enhancements}$. (There's no ST here; it's part of Move Modifier.) Boost *Jd* for skill, per main text.

Add your leg length to *Jd*. You now have your base broad jump distance; your high jump height is half that. Increase for Move per main text. That's that.

Fish jumping

To "jump" from water, swim fast to the surface. *Js* is Move; *Jd* is (*Js* squared)/10. Figure results normally from *Jd* and angle, with no bonuses for movement, body position, or Jumping skill.

Other actions

Climbing and diving: Use climbing and diving rules from *VE* 155. On a dive, you'll keep gaining speed until you reach the faster of diving terminal velocity (p 17) or weightless forward flight speed.

Hovering: Only fliers that can hover can move backward. Double cost for a rear or side hex.

Descent: *Simple rule:* Find a glider's Move Modifier from *effective WSR* only; rate of descent is 1 yard/sec, divided by this Move Modifier.

Detailed rule: Find terminal velocity (p 17). This will be based on your ratio of weight to area (see Slow Fall notes on p 19).

Soaring: Thermals or other upward currents confer a rate of ascent that offsets a glider's descent. Fliers not specialized as soarers (p 20) benefit from only half as much lift.

Taking off: Use a Change Position maneuver to go from resting to flight. This can take longer for encumbered creatures (use aerial encumbrance).

Landing: Make a balance roll to maintain footing in a high-speed landing, at -2 if landing speed is your running Move or faster, -4 if twice as fast, etc., for as many turns as it takes to decelerate. Roll vs Flight upon touchdown; add the amount by which you succeeded to those balance rolls.

Dodge: Change fliers' Dodge bonus to +1 Dodge per full 8 levels of encumbrance-adjusted Flight skill (max +3).

Weapon use: Limit weapon Acc bonuses to Flight skill (or half skill for a stricter rule). Other penalties on weapon use in flight apply to users of technology (including spells), not to natural fliers.

Microgravity Performance

Microgravity is 0.2-g or lower. Rules also apply to creatures on land or seabed with weight reduced to 1/5 mass or less by water, static lift, etc.

Skills and Move in microgravity

Free Fall handles control and tricky maneuvers, and defaults to DX for space natives. Athletic DX is limited by Free Fall skill; actions require a control roll vs Free Fall to avoid leaving the surface.

No speed boost skills are available, though Jumping helps you launch yourself at high speed.

Move along surface: Base Move x Move Modifier x 1/2 if using arms x Linear Scale x 1/2 for grip-and-release movement or magnetic boots. (Use x 1/3 for boots if no Vacc Suit skill.)

If using arms instead of legs, multiply ST per crawling on land.

Land movement or climbing enhancements may apply, depending on style of movement.

Control rolls along surface: Roll vs Free Fall, with Half modifier for encumbrance. Modify control for number of appendages gripping surface.

Move in free flight: Use appropriate Move for flight, or use acceleration (p 5) instead in vacuum.

Control rolls in free flight: Roll vs Free Fall in vacuum, with Full modifier for encumbrance.

Climbing

There's no "generic" climbing action; what's climbing to us is just running up a wall to a lizard. These rules cover all variations, telling whether you *can* make a climb and *how fast* you climb.

Skills and difficulty

Climbing skill: Base skill and default on DX, *not* ST. Skill (unadjusted for encumbrance) affects Move in some climbers.

WSR: Multiply WSR for slope: 15° = x1.2; 30° = x1.4; 45° = x1.6; 60° = x1.8; 75° = x1.9; 90° = x2; over 90° (overhang) = x3.

Multiply WSR for holds: Excellent (ladder) = x1; Good (tree or rock pile) = x1.1; Moderate (stone wall or rope-up) = x1.2; Poor (wall, minimal footholds) = x1.5; Very poor (wall, narrow finger-cracks) = x2; None (sheer wall) = no climb.

That's for humans. Geckos have excellent holds on all the above; squirrels, good or better on most.

Encumbrance from new WSR determines skill and Move modifiers for climb.

Move and control

Grip: Grip determines holds, above. Claws may be able to grip where hands or feet cannot, if they can "dig in". (This replaces **GURPS**' +2 skill for claws.)

Posture: Multiply Move by 1 to 1/20 for an obvious change in posture or way of moving. A lizard on a wall (no change from normal running posture) uses 1. A human uses 1/2 for a ladder, 1/5 for a tree or rock pile, 1/20 for a wall.

Move enhancements: If multiplier for posture is 1, climbing is just vertical *running*; use normal land movement enhancements. Otherwise, only special climbing enhancements (p 20) apply.

Move: Base Move x multiplier for posture x Climbing skill/5 if multiplier for posture is not 1 x Move Modifier x enhancements x Linear Scale. Climbing Move may not exceed running Move.

Control rolls: Roll vs Climbing -2, but modified for total number of limbs gripping (i.e., +2 for a human's four limbs, p 4). Add Full modifier for encumbrance and other appropriate modifiers, such as a penalty for slick-soled dress shoes.

If slope is 45°, extreme maneuvers (including Dodge) force control rolls, at -3 per additional full 15°. This replaces skill modifiers from *BS*.

Solid footing: The above rules assume precarious footing. If weight is able to rest on sturdy footing below, such as a human on a ladder or stout branches, halve any increases in encumbrance level. Extreme maneuvers take a +3 *bonus* on control, instead of the penalties above.

Swinging from arms: WSR multiplier for slope is 2. Move multiplier for posture is 1/5. Control rolls stay at -2, for only two limbs involved (p 4).

With the Brachiator advantage [5], Move multiplier for posture is 1/3. Add +2 to Control rolls. Climbing at DX and Acrobatics at DX-2 are free.

Jumping



Base jumping ability

Base ability, Jd, is the *lower* of:

Load ST x Linear Scale x 15 x enhancements / mass; or

Speed x Linear Scale x enhancements

Creatures with non-muscle acceleration mechanisms [10], like fleas, use the *higher* of the two.

Enhancements include Enhanced Jump, Super Jump, Poor Jumper, etc.

Increase for skill

Increase Jd by 10% per 2 full levels of Jumping skill (unadjusted for encumbrance) over 10.

Rolling: Optionally, roll vs Jumping. Every 2 full points of success increase Jd by 10% (minimum 10% boost for any success). Failure offers no bonus; critical failure is a fall or injury.

Angle and base distance

For any angle, multiply Jd as follows to get base height and base distance:

Jumping Angle Table

angle	height	distance
90°	x1/2	x0
75°	x9/20	x1/2
60°	x3/8	x9/10
45°	x1/4	x1
30°	x1/8	x9/10
15°	x1/20	x1/2
0°	x0	x0

High jump: At 90°, base height is Jd/2 yards.

Long jump: At 45°, base distance is Jd yards.

Add height or distance for movement

Choose one of the following bonuses:

Height: Add Move/18 to height, using the same units. (That's 2" per yard of Move.) Or:

Distance: Add Move/2 to distance, using the same units.

Add height or distance for body position

Results so far measure how far *center of mass* moves. Leg length also matters in height cleared, or in footprint-to-footprint broad jumps. Add a bonus as below, attaining *up to double* height or distance computed so far:

Height cleared: Add:

No roll: 1/3 leg length (a foot for a tall human).

Jumping roll: 1/2 leg length.*

Jumping -4 roll: Full leg length.** This is a flat-on-back high jumper's pose. Roll vs Jumping, balance, or Acrobatics, at -4, to land on your feet.

Clearing an obstacle requires forward momentum; a flatter jump (60° or so) is realistic.

Footprint-to-footprint distance: Add:

No roll: Half leg length (a foot and a half for a tall human).

Jumping roll: Full leg length.*

Jumping -4 roll: Leg length x 1.5.** Roll vs Jumping or balance to avoid falling upon landing.

* Requires momentum: Move >= linear dimension.

** As above, but Move >= twice linear dimension.

Jumping skill

Base Jumping on DX, defaulting to DX -4 or Acrobatics -4. Do *not* base Jumping skill or its default on ST, or let skill replace ST.

Add Half modifier for encumbrance to Jumping rolls for control, including body position, maneuvers, landings, etc. Do not modify for Jd boost.

Maneuvers: The body position rolls to add height and to add distance can be improved *separately* as maneuvers (max: Jumping +4).

Throwing

Below is one set of rules for all throws: weapons, baseballs, sacks of concrete, anything.

Note distinction between *TH* penalties (affect TH only) and *skill* penalties (affect skill for all purposes, including TH and distance).

Arm mass

Throwing performance is limited not only by the mass of the thrown object, but by a portion of arm mass. For throwing purposes:

Arm mass = body mass / 50.

Round appropriately. For the average human, it's an easy 3 lbs. For simplicity, use the same body mass / 50 even with more than one arm throwing.

Base throwing ability

Base ability, Td, is the *lower* of:

Load ST x Linear Scale x 10 / (arm mass + object mass); or

Speed x Linear Scale x 10

Enhancements that modify Td would mirror jumping enhancements in cost and effect.

Two-handed throws: You can throw heavier weights – slowly. Give Load ST a 50% boost in the first formula, but lower multiplier from 10 to 2 in the second formula.

More arms: As two-handed throw, but for each arm over two add 10% to Load ST, and reduce multiplier in second formula by 0.5, down to 1.0.

Weight limits: Thrown object weight is limited to max lift for the number of arms involved.

Misses

Close targets allow very flat angles. A miss won't fly far: no more than twice the target's distance from you, up to – but no less than one-fourth – the max range for the throw.

Jump/Throw Speed

Throwing speed in yards/sec upon release, Ts, is the square root of (Td x 10). For a flat angle, forward Move also adds to Ts.

Jumping takeoff and landing speed in yards/sec, Js, is the square root of (Jd x 10).

Speed in mph is twice Ts or Js.

Gravity

Divide jump/throw distances and heights by g.

In 0-g, a spacer can launch objects from a surface at a speed of Ts, or *herself* at Js! Either would travel at that Move forever unless stopped by something.

Hang Time

The time a jumper or thrown object spends in the air can be realistically computed as *twice* the time to fall from the jump's or throw's height.

But calculating flight times of missiles will introduce strange "time delay" attacks in combat, something RPGs ignore for simplicity!

Advanced Stuff: Distance and Move

Jump and throw distance bonuses for Move are simplifications. A more accurate bonus multiplies hang time by Move. A distance bonus of (Move x 0.9 x square root of height), where Move and height are in yards, comes close.

Throw Maneuvers

Range (Hard; defaults to skill; max skill+4) replaces skill for Td bonus purposes. Indirect Fire (Hard) reduces TH penalties for high angles.

Adding bonuses

Percent bonuses to Jd or Td are additive, i.e., a 20% Td bonus from AOA, 30% bonus from skill, and 10% bonus from Extra Effort combine to a 60% bonus.

Simple Throwing

GURPS' throwing rules work okay – but **GVER** may be even simpler, with one set of rules for all objects and no tables for weapon ranges. For typical humans with normal weapons, maximum range is an easy (Load STx10) / (weapon weight+3); 1/2 Damage Range is half that.

Advanced Throwing

For every full (max lift/10) lbs. of object wgt, cut Td as follows: 4/5, 2/3, 3/5, 1/2, 2/5, 1/3, 1/4, 1/5, 1/10, 0.

This gives more realistic distances for one- vs two-handed throws with heavy weights.

Starting height

If starting height matters in a jump or throw, use this fudge: Starting height adds to max height reached. It increases distance by 50% or by starting height, whichever is less.

An overhand throw starts at your height, half this if underhand (most two-handed throws). A high platform also offers starting height.

Balance Modifiers

Modifiers are cumulative, and generally last throughout your turn (or as long as the cause remains in effect).

Balance modifiers also generally affect Contests of Skill to avoid being pushed, thrown, tripped, grappled, etc.

Encumb.: Half mod.
Poor footing, or legs otherwise hampered: -2
Legs stuck in place: -4
Surprised or stunned: -4
Up to 1/2 Move: -1
Up to full Move: -2
Sprint: add. -2
Just made attack: -2*
AOA; weighted blow; too-big weapon; other "heavy" attack: Additional -2 balance*, -1 AD* each.

*Double for a missed blow!

Increase for skill

For *any* throwing skill and the appropriate object, increase Td by 10% per 2 full levels of skill over 10.

Rolling: Optionally, roll vs skill. Every 2 full points of success increase Td by 10% (minimum 10% boost for any success). Failure offers no bonus; critical failure is a slip or injury.

Increase for All-Out-Attack

You *can* use All-Out-Attack to throw harder: Increase Td by 20% as an AOA option.

This is the *normal* way to throw in sporting events or at a faraway foe – any time combat defenses are not a worry.

Angle and base distance

If throwing for maximum distance, a 45° throw flies Td yards. For other angles, compute height and distance of throws per jumps.

Add distance for movement

Add forward Move x 2 to distance, using the same units, up to double distance.

Throwing on the run is possible but hard: Take a -4 *skill* penalty. Some sports skills may reduce this penalty; others may disallow running (p 9).

Angles and combat

Define a "direct" throw as 15° or flatter. That angle halves maximum range.

For simplicity, let this range double as 1/2 Damage Range. Targets outside 1/2 Damage Range require a higher angle and become indirect fire: Lose Acc bonus, and take a -1 TH per 15° of angle above 15° (i.e., -2 TH at 45°, or max range). This is in addition to normal range penalties.

Throwing skills

Throwing: The Throwing skill adds a distance bonus as above (replacing **GURPS'** ST bonus) for *any* thrown (one-handed) object.

Allow a Two-Handed Throwing counterpart to the Throwing skill, cross-defaulting at -3.

Other combat skills: *Any* throwing skill boosts distance for the appropriate object: Spear Throwing lets you hurl a spear or javelin farther, etc.

New combat skill: Use Grenade/Rock Throwing (P/E) for any small, round object.

Option: Throws and Damage

Factors boosting throwing *distance* should boost *damage* too – ideally in proportion to boosts in *Ts*, but this is hard to work with.

A fudge: For a Td bonus of +100% or less (from skill, etc.), apply half that bonus as a damage bonus. Treat extra distance from movement as a +40% Td if significant Move (GM call) and a flat throw, +20% if a higher throw, no bonus if not significant Move.

Lifting

Max lift is Load ST x 6 for one hand, Load ST x 25 for two, plus 10% for each arm above two.

Lifting skill: Base on DX or HT, not ST. Boost max lift by 5% per 2 full levels of skill over 10 (or every 2 full points of success on a skill roll, minimum 5% bonus for any success). Failure offers no bonus; critical failure is a fall or injury.



Balance

Modify per the sidebar, and for number of legs on ground (p 4). Improved Balance adds +1/lvl; Poor Balance, -2/lvl (p 20).

When to check: Rules will indicate when to roll vs balance to avoid falling: after significant knockback, when walking on a narrow beam, etc. Lesser perils may force a roll at +4 (GM call).

Special: If balance is so poor that even a check at +10 risks a fall (roll only if 14 or less, for simplicity), then even "normal" athletic actions, like running, defending, or attacking, can cause a fall.

Make this special check for characters with Poor Balance, or after a weighted blow (p 14). You can ignore it in other situations, but it *does* nicely let an encumbered oaf knock himself over with a too-heavy sword and an AOA, and that's a fun thing.

Kicks: The **GURPS** balance roll after a missed (human) kick is this same check: balance +10, -4 for missed attack, -6 for one leg. (Call a *successful* kick only -2 as the leg returns quickly, -2 for an attack, or net -4 – generally, no check needed.)

Result of balance check: Failure by 3+ means you fall; lesser failure puts you off-balance.

Off-balance: Treat as 5 levels of Poor Balance: -5 athletic DX, -2 AD, and -10 balance.

Any athletic action will require a balance check (+10 as above, but -10 for off-balance). Failure by 3+ is a fall; otherwise, you remain off-balance. (Critical success moves you into balance.)

Recovery: Roll vs balance per above at the start of your next turn to recover, with a bonus for a Step in the direction of leaning (GM call): +4 if front hex, +2 if rear.

Success by 3+ is recovery, failure by 3+ a fall; any other result indicates continued off-balance.

Skill: Let Balancing (P/E; defaults to Acrobatics -2, Body Sense -2) replace DX in balance rolls.

Changing Position

To vary time: Roll vs DX+3 with Full modifier for encumbrance, or Acrobatics +3. Success means a full second to make position change; every 5 full points of success halves this. Failure means two seconds; every 5 full points of failure doubles this. (To make two position changes, roll one after the other, or make one roll at -5.)

A half-second change lets you go from kneeling to standing in the first half of a second, and act freely in the second half. Treat a quarter-second change as "zero time" (like a Fast-Draw roll); two of these make a half-second change.

Stealth and Tracking

See the sidebar for general modifiers.

A big shadower is very conspicuous. Apply Shadowing penalties: -2 for largish size, -4 for Gigantism, -8 for a full Size level larger than crowd, no reasonable possibility for larger size.

A large or heavy target is easy to track: Add half your target's Size to your Tracking skill, and *subtract* its Half modifier for encumbrance. Also apply modifiers for *absolute* weight, per Stealth.

Extra Effort

Extra Effort increases measurable abilities (such as ST) by a percentage, and abstract abilities (like a skill) by an absolute amount. Roll vs HT modified for Will, *not* vs ST or other stats, with a penalty for each level of desired effect:

Extra Effort Table

action	penalty	extra effect
lifting	-1	+10% Load ST
movement	-1	+5% Move
jumping	-1	+5% Jd
throwing	-1	+5% Td
Active Defense	-2	+1 AD
generic athletic skill	-2	+1 skill

Extra Effort costs a point of fatigue whether it succeeds or fails. (Critical success costs nothing.)

Critical failures indicate a fall, dropped item, physical strain, wild throw, etc.

Full effort is required before Extra Effort: You must first Sprint in a run, use AOA in a throw, etc., before boosting effects with Extra Effort.

Sports

GVER's rules for physical feats are detailed enough that sporting events can be fun to play:

Triple Jump: Make the first jump normally. The next two use Triple Jump (Easy maneuver; default: Jumping -2; max: Jumping) to boost Jd, travel only 2/3 distance, and only add up to x1 (not x1.5) leg length each. Add three distances.

Slam dunk: Add height, 2/3 arm length, and running high jump height (no leg length bonus). If result is a foot higher than the rim, SLAM! No special maneuvers are used, but roll vs Basketball (+2 if hand can "palm" ball) to slam net, not rim.

Special throws: Many throwing skills are specialized for distance, not quickness or target accuracy. The Td bonus for skill rolls is 10% *per point* of success, but skill requires a Ready action and suffers Half modifiers for positive encumbrance. To hit a target, apply a flat -4 TH for a 45° throw, with additional -1 per 15° higher *or lower*.

Examples include Hammer Throw and Discus Throw, whose Ready action is a spinning routine that disallows Move. Javelin Throw uses a second of full Move to Ready, but throwing on the run adds only another -4 TH penalty, not *skill* penalty.

Pitching: Baseball's pitch is unique. Pitching is P/H, increases Td by 20% *per point* of success on a skill roll, raises AOA Td bonus to 50%, and adds the equivalent of Basic Speed to speed (boosting distance by Speed x 2). But it requires a Ready for the wind-up and a Step for the pitch, and suffers Half modifiers for positive encumbrance. There's no TH penalty for a 15° or flatter pitch, but any steeper pitch suffers normal combat TH penalties *plus* a -4 *skill* penalty.

A pitch's speed in mph is (Ts + Speed) x 2.

Pitching has maneuvers such as Fastball (Hard; defaults to Pitching -4; max Pitching -2; boosts Td bonus for skill roll to 25% *per point* of success).

Other: A quarterback uses what is essentially a P/E combat throwing skill.

A few sports throwing skills, like Hammer Throw and Caber Toss, are two-handed skills.

Non-Athletic Feats

Dealing with large animals

Huge animals may ignore (or eat!) small characters. Rules of thumb: Animal Empathy bonuses are halved if you're 3 Size levels smaller, negated if 6 levels. Every level of Size difference over 3 subtracts from Animal Handling skill. Every full 3 levels of difference reduce Riding by 1.

Beast-Kin adds 1 to the above Size limits.

Social abilities

Base influence skills like Leadership (including defaults) on IQ, *not* ST. Add Strong/Weak Will, Charisma, and reaction modifiers.

Power and Intimidation: Take +5 for one Size level advantage, +1 per additional level; or up to +4 for lesser height advantage. Take -3 if one Size level shorter, -1 per additional level; or up to -2 for lesser height disadvantage.

Take up to +5 for displays of superior ST up to double target's, +2 per additional doubling.

These are guidelines for any power-related social skills. Modify appropriately: Power may affect Leadership less in "civilized" situations.

Other activities

Pickpocketing: Against smaller targets, apply Size level difference as skill penalty. Against larger targets, there's no equivalent bonus.

Holdout: Use relative Size modifiers: 8" Cidi suffer -6 skill, but Cidi-sized guns allow a +6.

Manual tasks: When appropriate, decide the "correct" Size for a task (such as Size 0 to pick a human-scale lock), and subtract Size differences from skill. Limit bonuses from smaller Size to +2.

Vehicles: Typical vehicle skills take a -3 penalty if operator is one Size level too large, -6 if two, normal operation not possible beyond that.

Cramped cabins are worse: -2 for somewhat tall, -4 for Gigantism, -8 for one Size level difference, normal operation impossible thereafter.



Stealth

A list of modifiers (V=vision, H=hearing):

Movement (vs V, H)

MV 1/10 or less: +4

MV 1/5 or less: +2

MV 1/2 or less: +0

Up to full MV: -4

Sprinting: -6

Unadapted to Environment: -2

Range (vs V, H)

Subtract Range modifier from Stealth

Distraction, target fatigue (vs V, H)

As GM determines

Size (vs V)

Subtract Size from Stealth

Hiding places, relative to your size (vs V)

Few hiding places: up to -5 (more if directly in field of vision)

Many hiding places: up to +5

Carried items (vs H)

Leather armor: -1

Scale, chain armor: -2

Plate armor: -4

Packs, treasure, weapon belts, etc.: -2 or worse

Feet (vs H)

Hard soles, hooves: -2

Claws: -1

Soft shoes/bare feet: +0

Surface (vs H)

Gravel, rocks: -2

Dry grass, leaves: -4 or worse

Listener (vs H)

Dogs: -5

Geese: -1/bird (max -6)

Weight (vs H)

Encumbrance: add Half modifier

Absolute weight: +1 per x1/10 multiple of human weight (max +5), or -1 per x10 multiple

Skill (vs H)

Light Walk adds skill/5

Light Walk

Apply the Full modifier for encumbrance to this skill, plus a modifier for absolute weight, per stealth.

Getting Close

You can get closer than default range in melee, but not closer than the larger of 1) target's linear dimension, or 2) target's speed (for swings: target's speed + attacker's weapon length), using same units.

If this range exceeds default, no bonus for close range is possible; use default range.

Ready: Spend a Ready action to get close (simultaneous with any position changes). You don't need to Ready before every attack; only if the target moves beyond default range again.

Position: Close range melee attacks may require kneeling, crouching, or other clumsy poses, as GM decides.

Power: A close range swing has damage reduced by the same percentage by which range was reduced. Thrusts have damage reduced by only one-third as much.

Example: You can swat a fleeing 1" (-11 TH) insect with a normal swing from default range (good luck!), or spend a Ready to move in close.

Minimum range is larger of target size (1"), or speed (say 6"/sec) + weapon length (12" for rolled-up newspaper). Minimum range is 18".

Combined speed and range is 24", or +3 TH.

Weapon is 4" wide; effective target size is 5", or -7 TH.

Net TH: $+3 - 7 = -4$. Add the +4 from AOA to even this up (you're not going to *defend yourself* against a bug!).

Range is 1/4 the default 2 yards; reduce swing damage to 1/4.

Simple Melee Range

Forget the main rules. When fighting small targets in melee, just *halve* penalties for Size difference with a Ready action. Assume this covers close range, aiming, everything complex.

FIGHT!

Move and Attacks

GVER allows missile attacks on the run (p 8), though with heavy penalties. Actions while Sprinting should also be possible, though messy. Assume no defenses are possible while Sprinting (think of it as "All-Out Move"), and any attack is a Wild Swing. Anything goes on a critical failure!

Melee Combat and TH

GVER uses the same rules for melee and ranged combat, including modifiers for size, speed, range, and aiming. Differences remain: Melee attacks have a default "minimum range" with restrictions on getting closer, and very short max range, which limits the TH bonus for a large target. Ranged attacks can't be "guided in" for the +4 TH bonus from AOA (although throws *can* gain a *distance* bonus for AOA).

Shortcut!

These rules' range and speed considerations "drop out" in normal stand-up-and-fight melee combat, coming into play only to resolve special situations. All that usually matters is the difference in opponents' Sizes, as a TH penalty to hit the smaller target and a bonus to hit the larger.

Size, speed, range, and aim

Target speed: The speed of a target stopped to fight in combat does not matter, but the speed of a target taking Move maneuvers (fleeing, etc.) does.

Range and speed: As with ranged weapons, total target speed (when it matters) and range to find a net TH modifier from the Scale Table.

Default range: Default range is attacker's linear dimension, regardless of actual distance. (See sidebar to whack small targets at closer range.)

Size: Apply target Size as a TH modifier in melee, just as in ranged combat. This is cumulative with modifiers for target location: An Ogre (Size +1) is +1 TH; her vitals (-3 TH) are a net -2 TH.

Size and range: Together, target Size and default range simplify to the *difference* in fighters' Sizes, as a penalty to hit a smaller foe or a bonus to hit a larger foe.

Example: A human attacks an Ogre at +1 TH, for a Size +1 target at human (2-yd) range. The Ogre strikes back at -1 TH, for a Size 0 target at Ogre (3-yd) range. An Ogre strikes an Ogre at no modifier, for a Size +1 target at 3-yd range.

Max bonus: Limit bonus to hit a larger target to +2 (or +3 with a long weapon) after Size, target location, etc. Unlike ranged weapons, additional target size is out of your reach and is irrelevant.

Aiming: Allow normal "aiming" with hand weapons (max +3 TH, defenses or disruptions can spoil aim, etc.). Target must be within range of weapon for aiming to be effective.

Large weapons

If a weapon is *wide*, add its width to target's linear dimension. (*Example:* 6" target + 6"-wide board = 12" target, or -5 TH.)

The following Table shortens this, giving effective target Size from the difference in weapon width Size and target Size:

Huge Weapons Table

weapon Size minus target Size	effective target Size	Dodge penalty
-3 or smaller	use target Size	0
-2	use target Size +1	-2
-1	use target Size +1	-4
0	use target Size +2	-6
+1	use weapon Size +1	-8
+2	use weapon Size +1	-10
+3...	use weapon Size	-12...

Most weapon width will be inconsequential (Size difference of -3 or more). But a weapon like a net is big even against a full-sized target.

Ranged Combat and TH

GURPS rules apply, with a few notes:

Range: Thrown ranged weapons generally require a minimum distance equal to (attacker's linear dimension plus weapon length) to be used effectively; otherwise, treat as a melee attack.

Guns can generally fire even if touching target (infinitely close range!). But for any ranged attack against a moving target that's not stopped to fight, minimum effective range is target's speed.

Weapon size: Use the rules for large weapons if a ranged attack has significant width: a wide flamethrower jet against a tiny foe, etc.

Defenses

Dodge basics

Dodge does *not* equal Move in **GURPS**, even if the rulebooks don't get it. They share the same initial base but are very separate stats.

Dodge: Basic Speed + Half modifier for encumbrance + adjustments. Round down. This is for *all* creatures; no special rules for animals are needed!

Adjustments include Combat Reflexes, Boxing skill, etc. But Size, Running skill, and Move enhancements do not affect Dodge.

Retreat: Use Step as the distance of a Retreat.

Part by part: Freely-moving limbs – arms, head, etc. – can Dodge more nimbly. Halve any Dodge penalties from encumbrance for these (or give +1 Dodge if encumbrance is None or better). The body (and legs supporting it) do not benefit.

A freely-moving appendage with eyes (usually the head!) also receives +1 Dodge vs attacks from within the field of vision. These are cumulative.

Position: Dodge penalties for sitting/kneeling: Legs, lower body -4; upper body -2; mobile limbs -1. Parries and Blocks use -2 regardless of target.

Dodge and size

A large weapon leaves a small target little room to dodge: no penalty if weapon width is 1/3 target size or smaller, but -2 penalty per Size level of difference above that (see Huge Weapons Table).

Retreat: This confers +3 on Active Defense and subtracts Retreat distance from weapon width.

Example: A human Dodges a flung 2-yard crate at -6 for size. But a one-yard Retreat to the side adds +3 Active Defense and cuts effective weapon width from two yards to one, for no size penalty.

Diving Retreat: Diving for cover lets you use broad jump distance as Retreat distance, which may help get out from under a huge weapon. This requires a Wait or AOD action, and a balance or Acrobatics roll at -4 to remain standing.

Parry, Block, and power

The power behind a blow, not the size of the weapon, can make these defenses difficult.

Breaking: When a big weapon hits a small one, check whether the BS 111 breakage rule applies.

Oomph: Compare the "oomph" of the attacking blow and the defending parry or block, where oomph = Load ST + weapon or shield mass.

Add 50% to Load ST for a fighter using two hands on a legitimate two-handed weapon, or 100% for a defender using two hands with a wide grip (polearm, staff, etc.). Either way, add another 10% Load ST per hand over two on a weapon.

High attack oomph results in a defense penalty:

Parry/Block Penalty Table

Ratio of attack oomph to defense oomph	Parry/Block penalty
less than x1.5	0
x1.5	-1
x2	-2
x3	-3
x5	-4
x7	-5
x10...	-6...

Losing your grip: If a defense fails because of the above penalty, the attack *overwhelmed* it. Check for breakage, as above. Roll vs weapon or Shield skill (or Retain Weapon/Shield, but *not* vs ST), minus the above penalty, at +4 if the weapon also broke, to avoid dropping the item.

Making the skill roll by only zero means the weapon or shield is "turned" and will require an extra second to ready. (A strapped-on shield can only be "turned", not dropped.)

Take note that a shield's high weight gives it good oomph for defense – and *attack*!

Shields and size

Shield category is relative to user size: A shield four Size levels smaller is a buckler (PD 1), three levels smaller is a small shield (PD 2), two levels smaller is a medium shield (PD 3), and one level

smaller is large shield (PD 4; -2 to attacks). A shield the same Size as its user would be extra-large (potentially *perfect* cover, but blocks user's vision, disallows attacks and Active Defense).

A crouching target is effectively one Size level smaller, raising effective Size and PD of shield.

Knockback

Base: Use basic hits to figure knockback, without modifiers for damage type, target location, etc. Knockback comes from bruising force; a bonfire flame causes damage but no knockback.

Calculation: Start with the GURPS rule – 1 yard per 8 basic hits – and make these changes:

a) Divide knockback by the square root of (mass/150). (This is the same as *multiplying* damage *needed* to cause knockback, by that same amount.) Round appropriately.

See p 24 for a quick estimate of this root.

b) The result is the *speed* of knockback, or Ks, in yards/second.

Example: For a 40-lb. PC taking 8 basic hits, Ks is 2 (i.e., every 4 hits gives Ks of 1 yard/second).

c) If blow penetrates armor, Ks is 0 for impaling attacks, halved for cutting attacks.

Bullets realistically cause no knockback, but do full or *double* knockback in cinematic settings.

Distance: For simplicity, the distance a target knocked along the ground travels is also Ks; it goes that far and stops in effectively no time.

Special cases may differ: A target may fly back at a Move of Ks for several turns if on ice, *forever* if in space!

If precise "pop fly" distances matter, knockback distance, Kd, is (Ks squared)/10. Guess at angle, and use Kd in place of Td in the throwing rules.

Collisions: Velocity change from a collision, push, or slam is also knockback; see p 16 to determine speed and other effects.

Fall from knockback

Make a balance check to keep your footing if you suffer significant knockback: twice your Step distance or more (two yards or more for humans). Halve that distance if the knockback moves you backward (a common situation). Lesser knockback may also force a roll (GM call), at +4.

Take a penalty on the balance roll for the amount of speed *change*: -2 per full multiple of your Move. Also take a penalty for your *new Move*: -2 per full multiple of Move. (Remember too that backward Move for a human is halved.)

Other modifiers: -2 if force was centered on your legs, -4 if below your knees.

If a Contest of ST was involved in the collision, the loser takes a -4 on any related balance rolls.

Shock penalties apply if damage was involved!

Fliers and swimmers: These usually can't move backward; significant knockback in that direction becomes automatic loss of control. Make the appropriate control roll every turn to regain control. (Drag stops aquatic somersaults in a turn or so.)

Advanced Stuff: Target Dimensions

Most targets

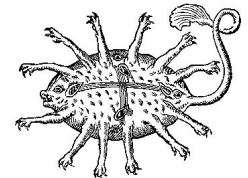
One dimension longer than other, up to 3x: Base TH on the longer (2 yards for humans).

Long, thin targets

One dimension over 3x longer than other: A swing (i.e., sword vs rope) can use the longer dimension for TH, with additional -1 for slender width. A thrust or missile attack uses shorter dimension for TH, with additional +2 for length.

Blocky targets

Both dimensions nearly equal (square, circle): Use appropriate TH, with additional +1.



Size & TH Example

To cut a 1/4" hangman's rope Robin Hood-style, a 1/2" arrowhead creates an effective 3/4" target, or -12 TH. But a 2" frog-crotch arrowhead allows a 2-1/4" target, for -9 TH.

Adding the advanced rules for dimension, the long rope allows a lot of room for vertical error: take +2 TH for length.

Option: Close Calls

An attack that would have hit a small target *without* a TH bonus from weapon size is dead-center. Otherwise, it's a bit off: for each point by which it *would have failed without* the TH bonus, reduce effective weapon Size by 1 for purposes of making Dodge difficult.

Option: Power & PD

Powerful attacks can ignore armor PD. Reduce PD by 1 per full (armor's DR) dice of damage.

More on Knockback

Max knockback

Max knockback speed should be the speed of the attack: perhaps 20 yards/sec for a thrust weapon, 30 yards/sec for a swung one.

The most *damage* a target should take from any blow is that from a *collision* at that impact speed (p 16). Double this for cutting blows; no max for an impaling blow or bullet (other than blow-through), or a blow that sandwiches the target against a surface.

These are rare considerations, but realistically limit both knockback and damage when a powerful blow strikes a very small target. In real life, a punch that would deck a human barely fazes a flying insect!

The calculation

Why rework knockback at all? Because these rules handle targets of any size, are consistent with how **GVER** scales power and damage, and provide *speed*, which is useful at times.

For a typical human, an 8-point blow still causes 1 yard of knockback.

Option: Easy Contests of ST

Why "fix" a Contest of ST? Because the **GURPS** Contest mechanism doesn't measure *relative* difference in stats, which is what ST requires. "Fixing" properly turns ST 1 vs 2, 10 vs 20, and 1000 vs 2000 into the same Contest.

But it looks clunky; ST and the Contest mechanism just don't mesh. A whole new mechanism may work best, such as:

Each side rolls 3d and multiplies by Load ST. The higher value wins.

Winning a Contest of ST by 10% with this rule equals winning by 1 in the main rules; winning by 50% equals winning by 5, etc.

Contests of ST

Main rules

Which ST: Run all Contests of ST using Load ST. **All references to ST in Contests or wrestling are to Load ST.**

Fixing: "Fix" all Contests of ST before rolling: Multiply the lower score by some X to bring it to (or fairly close to) 10, and multiply the larger ST by that same X. Then roll the Contest.

Modifiers

Preparation: A surprised, stunned, or otherwise unprepared fighter gets half ST and -4 skill or DX in Contests.

Size: Small foes can be tough to wrestle, as only your arms or even hands may be able to come into play. When initiating takedowns, pins, and throws, or resisting a small foe's attempts to break free, reduce ST in proportion to the difference in linear dimension: Use 1/5 ST against a foe 1/5 as large, etc. Cut weight bonuses the same way, unless you actually sit your weight on the little foe.

There are no penalties for the *small* wrestler, with some exceptions. Small hands could not choke a large neck efficiently; apply the above ST penalties for Size difference to a small strangler.

Limbs: Where indicated, adjust ST in wrestling-related Contests for number of arms used. One hand (or a biting mouth) uses 2/3 ST. Two hands use full ST, plus 10% ST for each hand over two.

With no hands, claws, coils, jaws, or other means of "grabbing", halve ST.

For an unusual number of legs, add the control roll bonus (p 4) x 5% to ST to make or resist takedowns, pins, and breaking free. (Use -10% for One Leg, -33% for No Legs). Double this modifier when making or resisting pushes and slams.

Unarmed Combat

General close combat actions



All-Out actions: Allow All-Out Attack and All-Out Defense in close combat, for any character. These have normal game effects.

AOA in unarmed combat: As new AOA options, allow +4 on DX-based Contests to make grapples, pushes, pins, slams, throws, etc., or +33% Load ST for such purposes.

However, any AOA removes Active Defenses for the turn and reduces ability to resist unarmed combat attacks: Take -4 on any defensive DX-based Contests (such as avoiding a grapple), and half ST to resist any push, pin, slam, throw, etc.

AOD in unarmed combat: Allow AOD versions of the AOA options above, with +4 DX or +33% Load ST for *resisting* the same actions. You can not perform any other actions or offensive moves that turn, including Break Free.

Hindrance: A tiny fighter in close combat might not hinder a big foe's Feint, Aim, Concen-

trate, etc. (GM call). As a rule of thumb, this covers foes with 1/5 your Load ST or less, which are not inflicting significant damage or pain.

Wrestling basics

Grapples: Roll vs DX, Judo, Wrestling, Sumo Wrestling, or Brawling to grapple. Use a Contest of Skill, or TH followed by Active Defense. Use most melee TH modifiers, including Size.

Take +3 for two hands, +5 for three, and +7 for four; take +1 per additional hand only if matched by a level of Full Coordination each.

Takedowns: Use a Contest of ST. Adjust ST for limbs used. Give the heavier foe a (weight difference in lbs. /10) bonus to ST, *before* "fixing" the Contest and rolling.

A tie leaves the target standing but off-balance, which will make further takedown attempts easier.

If the attacker commits to dropping and falling during the takedown, game as AOA, with an extra (full weight /50) bonus to ST *before* "fixing".

Option: The attacker *also* makes a balance check (p 8) after any takedown attempt, unless he won the Contest of ST by 5 or more.

Making a pin: Once the foe is down, roll per takedowns to apply a pin.

Breaking Free: *From grapple:* Use a Contest of ST, with +50% ST bonus for the grappler. Adjust ST for limbs used. "Fix" and roll. Success by 10 or more shakes off grappler with no action spent.

From pin: As above, but also give the pinner an additional (full weight /30) bonus to ST, *before* "fixing" the Contest and rolling.

Choking and crushing

General: All choking and crushing methods use Contests of ST. Some methods boost ST; these are bonuses to Load ST for Contests, not to Combat ST and damage.

Choking: Use a Contest of ST, not ST vs HT. Adjust for number of hands. Target is at 2/3 ST if unconscious. Reduce target's ST by 20% if attacker's hands are relatively very large, 10% if large. "Fix" Contest and roll each turn. Results:

Choker wins by 5 or more: Choker inflicts thrust/crushing damage to throat, plus suffocation.

Choker wins by 3 or 4: Choker inflicts half thrust/crushing damage to throat, plus suffocation.

Either side wins by less than 3: Target suffers one second of suffocation, but no damage.

Target wins by 3 or 4: No new ill effects, though breathing is tight.

Target wins by 5 or more: Target is unaffected, and can speak, shout, or take a breath and "undo" a second of suffocation already suffered.

Garrotes: Use the same rules, treating garrote as very large hands. Also add 20% to attacker's ST for leverage (optionally, add (skill x 2%) ST).

Choke holds: Roll vs skill to set. Attacker chokes with *full* ST using one arm, +30% ST for two. Resisting breaking free receives usual +50% ST for grapples, additional +50% for Choke Hold.

Bear hugs: Attacker gains +50% ST for use of arms instead of hands, and can "choke" large targets like a torso (but not small targets like a neck).

Constriction: Treat as choking, but double attacker's ST. Attacker can choke large targets, per bear hugs.

Target: As the target of choking or crushing, a neck resists with normal ST but multiplies damage by 1.5. A hand resists with normal ST. "Solid" parts like an arm or leg resist with double ST.

A torso resists with +50% ST. Torso squeezing pushes air out, adding an extra second of suffocation for every full three points by which the attacker wins the Contest of ST.

Rending

Grapple the appropriate parts. Use a Contest of ST. Adjust your ST for limbs used (but you need to be able to pull in at least two directions).

Base crushing damage to the limb on choking rules, but subtract limb HP from damage rolled; rending requires great strength to succeed. Toughness also protects fully, DR with half value.

Accumulated damage can cripple. Extreme damage in one attack can remove limbs (p 15).

Judo throws

Handle as takedowns, but preceded by a Contest of Skill for technique:

Contest of Skill: Roll Contest of Judo vs foe's balance, Judo, Wrestling, or Sumo Wrestling. Judoka may use the +4 skill AOA option; target may use the +4 skill AOD option.

Modifiers: Target takes all modifiers for balance. Judoka takes -1 per level of Size difference, whether larger or smaller, and adjusts skill for positive encumbrance.

Judoka adjusts skill for number of arms, per grapples, at -3 (i.e., -3 for one, +0 for two, etc.).

Sutemi waza: Judoka drops to the ground during the throw attempt. Treat as AOA, with extra +2 on the Contest of Skill, and the previously-mentioned takedown bonus (p 12) on the Contest of ST.

Result of Contest of Skill:

Failure on Judo roll and Contest: Complete failure; turn over.

Failure on Judo roll or Contest: Proceed with normal takedown, with no benefit from Judo.

Success on Judo roll and Contest: You can attempt a real throw, not just a takedown. Your degree of success is the *lower of* success on the Judo roll and success on the Contest.

Takedown: Use a normal takedown Contest of ST. Judoka adjusts ST for number of arms used. "Fix" the Contest, then add *twice* the above degree of success to the judoka's ST. Roll.

Success on the Contest of ST takes down or throws the target. Judoka can also add base punch damage (without bonuses from Karate, etc.) if success on both Contests was 5 or more.

Pin: A "judo pin" uses the same procedure above to make a pin, following a takedown.

Arm locks

As with takedowns, *anybody* can make a lock through brute force – but skill makes it easier. Use judo throw rules, with following differences:

Contest of Skill: Roll Arm Lock vs DX, Judo, or Wrestling. Attacker takes same modifiers as judoka, but target takes only *half* balance modifiers.

Result of Contest of Skill: As judo throw.

Lock: Use a Contest of ST to lock. Target uses full ST. Weight does not matter. "Fix" the Contest of ST, then add *twice* the Contest of Skill degree of success to the attacker's ST. Roll.

Attacker success means the target is locked.

Breaking Free: Use normal Breaking Free procedures, but a locked target is at 2/3 ST in Contest of ST. Attacker may repeat the Contest of Skill as an action to further reduce target's ST, at +4 skill for simply maintaining an existing lock.

Finger locks: As Arm Lock, but use the Finger Lock maneuver and reduce target ST by 20%.

Unarmed Combat Skills

Encumbrance: Apply the Half modifier for positive encumbrance to Fencing, Karate, Judo, Main Gauche, Katana, Short Staff, Tonfa, Boxing, Wrestling, Sumo Wrestling, all combat art or sport skills, and dynamic combat skills like Flying Leap. This replaces and expands the rule limiting certain skills to Light encumbrance or better.

Skills and damage bonuses: Replace striking damage bonuses from skills as follows. Figure thrust damage from effective Combat ST (remember: a punch does thrust -2 damage).

Karate, Boxing: Each skill level over 10 adds 10% to Combat ST for damage purposes.

Brawling: Each skill level over 10 adds 5% to Combat ST for damage purposes.

Maneuver damage: To match this system, turn each +/-1 damage from a specific combat maneuver into a +/-20% Combat ST bonus, except for damage bonuses related to *weight* (p 14).

Skills and wrestling bonuses: Replace wrestling-related bonuses from skills as follows:

Wrestling: Each skill level over 10 adds 5% to Load ST to perform or resist takedowns, pins, arm locks, and breaking free. Also let skill replace DX in any roll related to performing or resisting those actions.

Sumo Wrestling: Each skill level over 10 adds 5% to Load ST to perform or resist takedowns, breaking free (except from pins), slams, and pushes. Let skill replace DX in any roll related to performing or resisting those actions, or to evade a slam.

Ignore GURPS' bonuses for weight; mass is already part of GVER's rules.

Push (MA 40): Each skill level over 10 adds 10% to Load ST to perform pushes, slams, takedowns, pins, and throws. Let skill replace DX in any roll related to performing these actions.

Optionally, an additional roll vs Push mystically doubles knockback from pushes or slams.



Option: Part Sizes

A revised list of size-based TH modifiers:

Small targets

Head: -5

Eye: -10

Brain: -7

Ear: -8

Nose, mouth or jaw: -8

Nose/mouth area: -7

Heart or kidney: -6

Large weapons can lessen penalties. With a human fist (Size -7), an eye becomes -7 TH, the jaw -6, and the head -4.

Torso

Let untargeted blows roll location randomly, instead of hitting torso automatically. As a target, torso is -1 TH. Vitals are still -3 TH (not cumulative); any blow hitting torso has a 3 in 6 chance of hitting vitals.

Crouch

Let a crouch reduce target Size by 1, for ranged and melee combat TH.

Mouth

To throw or shoot *into* an open mouth (or jam an upright stick in there, Luke Skywalker-like), target the location at an additional -1 TH (a miss by 1 hits the head or jaw). Halve DR inside the mouth. Throat or brain hits (with no skull DR) are possible.

A shot "into" a *closed* mouth uses an additional -2 TH (a miss by 1 or 2 hits the head or jaw) and must get through teeth. Assume DR 2, HP 1 for teeth, scaled for size.

Gator Wrasslin'

To stop an alligator – or dragon – from chomping down, roll a Contest of your ST vs its jaw ST (same as its Load ST by default, but may differ), with sundry modifiers per choking rules.

Muscles that *open* jaws are weak: Roll the same to keep closed jaws from opening, but lower the beast's ST, from 2/3 ST for a blunt snout to 1/7 ST for a very long one.

Jet Attacks

Jet attacks can easily hit small foes (p 10). But assume that all of a jet has to hit a target to do full damage; if the jet is larger than the target, some will "wash over". Without worrying about exact areas involved, cut damage in proportion to relative linear dimensions: All of a 1- or 2-yard wide jet hits a 2-yard human, for full damage, but only a third of a 6-yard wide cone hits, for 1/3 damage.

The exposure hazard option (p 15) can further affect damage taken.

The width of a flame attack or sonic beam is up to you. A dragon's flame might have a width of 2 feet x the dragon's Linear Scale.

Quick rule for cones: Assume that basic width of the attack applies between 1/4 and 1/2 maximum range. Halve width at closer ranges; double width at farther ranges.

Blowthrough

Set the blowthrough damage limit to 10 points x Linear Scale, rather than to HT or HP.

Multiply blowthrough for bullet type and size. Also multiply by 1/2 for limbs, 1/3 for hands or feet, and 3 for vitals or the head (but not the brain, which does not use damage caps). Beam, fireball, and lightning attacks further double blowthrough for the torso, head, or vitals. Creatures with odd shapes or compositions may further modify blowthrough levels: raise for thick bodies, lower for thin, flat ones.

Option: Punches

Instead of thrust -2 damage for punches, use normal thrust damage, but based on 2/3 Combat ST (round down).

This is a better method that "scales" properly for any creature size.

Immovable Stance (MA 38): Each skill level over 10 adds 10% to Load ST to resist pushes, slams, takedowns, pins, and throws. Skill replaces DX in any roll – including balance – related to resisting these actions.

Optionally, an additional roll vs Immovable Stance mysteriously halves knockback from any push or impact, including weapons.

Tackling and Blocking: P/E; used in rugby, American football, etc. Each skill level over 10 adds 5% to Load ST to perform or resist takedowns, slams, and pushes. Skill replaces DX in any roll related to performing or resisting these actions, or evasion.



Notes on maneuvers:

Blinding Touch: The blow must be *capable* of doing damage of at least HP/10 to the target, even though it does no damage, to have its effects.

Pressure Points: Use the notes from Blinding Touch, or **GVER** shock rules. With the latter, let a successful Contest of Pressure Points vs target HT double shock value of damage. If both skill roll and Contest succeed by 5 or more, treat a pulled punch as non-pulled for purposes of shock.

Eye-Gouging, Face Attacks: Instead of special rules in MA, use **GVER** shock rules: Eye gouges use a shock multiplier of x3, face attacks a x2.

Neck Snap: Base technique on DX (defaults to DX-4), not ST. Roll a Contest of ST; add 5% to Load ST per skill level over 10. Attacker success inflicts crushing damage to neck per choking, but using swing damage instead of thrust. Toughness subtracts from damage. Other details per MA 53.

Retain Weapon: Skill replaces weapon skill or DX, but not ST, for any purpose related to holding on to weapon. Rather, each skill level over 10 adds 5% to Load ST in appropriate Contests.

Drop Kick: You must be able to high jump at least as high as the target area. Allow normal kick damage, with bonus of (square root of weight) /5, rounded down. The target *can* parry a small attacker, using p 11 rules for parrying big weapons.

Roundhouse Punch: Use standard punch damage with bonus for body weight, per Drop Kick.

Stamp Kick: Damage bonus is (square root of weight) /7 points.

Flying Jump Kick: Treat as Drop Kick, with extra distance allowed.

Piledriver: Replace given damage with regular punch damage. Add a 5% Combat ST bonus per skill level of Wrestling over 10, plus damage bonus for body weight equal to that from Drop Kick.

Biting and Clawing

Combat ST /20 dice of damage (see p 15 to handle fractions) for Sharp Teeth [5] follows the BS 140 system with no table required. **GURPS** suggests this for claw damage too (though there's no rule for buying that level of damage for limbs).

Use Combat ST /40 for human and herbivore teeth [0]. Allow Large Teeth [2] that inflict higher damage per Sharp Teeth, but crushing, not cutting.

Weight and Damage

Trampling

Trampling damage dice = (square root of weight) /20. Multiply damage for hardness of ground, per falling. Damage is for a full turn of intentional trampling; halve damage when trampler overruns target and moves through. Halve damage if the trampling beast is only annoyed, not angry, panicked, or charging. Halve damage for feet softer than hooves (like most shoes); halve again for soft, bare feet or paws.

Size differences: You need to be your foe's size or larger to overrun – slamming, knocking down, and trampling him, all on the same turn. If you're three Size levels or more larger, the GM can remove the knockdown check, ruling that you automatically overrun your foe on a successful slam.

Weighted blows

Any fighter can throw extra weight into a blow, whether barehanded or with hand weapons.

Roll the attack at -4. A hit adds (square root of attacker's mass) /10 points of damage. The attack is unbalancing; see p 8, including the sidebar, for effects. Make a balance check at +2 if you miss.

Fighters can learn Weighted Blows as an Easy maneuver for each type of attack, reducing attack and balance penalties by up to half.

Attacking downward: For weighted blows directed toward the ground, halve all penalties, and use a damage bonus of (square root of weight) /7 points. Depending on the attack, falling down might not be a problem.

Stomping: Treat as downward-directed kick, as above, but it's a natural move; the only penalty is a -1 TH. Any fighter may try this maneuver, but only Karate and Brawling practitioners can improve it as a Stamp Kick.

Other options

Damage limit: Regardless of Combat ST, limit a character's base thrust or swing damage to (square root of mass) /2 dice. This places a realistic limit on punching ability in very small and light creatures, or Supers without the mass to back up mega strength. (Ignore in cinematic settings!)

Higher damage: Weight-related damage in **GVER** is kept low, in line with trampling in **GURPS**. If it all seems *too* low, *double* all weight-related damage bonuses or dice, including trampling. (Ground softness and other factors will keep trampling damages in line.) This adds oomph to weighted combat blows and vehicle overruns.

Shortcut!

Some rules above call for the square root of mass or weight; others in **GVER** call for the square root of (mass or weight /150). The Square Root Table on p 24 gives instant estimates for these, with no calculator needed.

DAMAGE AND DANGERS!

ST and Damage

Combat ST vs Load ST: Use Combat ST to determine damage dice. Load ST can still be used to hurt (by throwing foes, etc.).

All-Out Attack: Use +33% damage, rounding up, instead of +2 points.

Low damage: Fractional damage matters if low Combat ST and HP are involved. Where **GURPS** fails to give damage scores, compute as a fraction of higher ST: For ST 2, roll damage for ST 10 and divide by 5, etc.

VE also suggests ways to roll low dice: Less than 0.1 die = no damage; 0.1 to 0.2 die = 1d-4; 0.21 to 0.4 die = 1d-3; 0.41 to 0.6 die = 1d-2; 0.61 to 0.8 die = 1d-1; over 0.8 die rounds up to 1d.

Damage and Shock Meta-system

Base the effects of all damage and shock on their level *relative to HP*, not on absolute levels. Use HT for rolls to avoid given effects of damage and shock. These rules work for beings of any size, and consolidate disparate **GURPS** rules.

Effects of damage

The following effects are the result of damage, not shock. Strong/Weak Will does not affect HT rolls here:

Slowdown from injuries: Move and Dodge are halved when HP is reduced to less than HP/3.

Knockdown: Knocked down on damage of over HP/2 and a failed HT roll. This is separate from falling down due to *knockback* (p 8).

Crippling: Arm or leg is crippled on damage of over HP/2, hand or foot on damage of over HP/3, in one blow. Excess damage is lost. Instead of **GURPS'** automatic stunning rule, double shock points and handle normally.

Optionally, neck is "crippled" on damage of over HP/2, body on damage of over HP, in one blow. (Double these if you find them too deadly!) Excess damage is not lost. Either paralyzes the character (attempt recovery roll normally).

Devastating damage: Devastating damage occurs on twice crippling damage (over HP for leg, etc.) and a failed HT roll, or automatically on four times crippling damage, in a single blow.

Devastating cutting or rending attacks cause amputation in limbs, decapitation in neck, and Conan-style cleaving in twain for body (requires sufficiently long blade). Actual damage to limbs is limited to crippling damage.

Devastating crushing blows hopelessly pulverize bone and muscle in limbs (no recovery), fatally snap spine in neck or body.

Double shock points and handle normally.

Knockout: Roll vs HT each turn while at HP 0 or less to avoid unconsciousness.

Death: Roll vs HT at -HP and every -HP/2 thereafter. Automatic death occurs at -HP x5.

Measuring Shock

Measure shock in points in all situations. Base shock equals damage, after normal modifiers for hit location, attack type, etc. Stunners, Pain spells, etc. may inflict a set number of points or dice of shock, with or without damage. Some multipliers:

Body target:

Crushing attacks to the vitals (including kidneys): x1.5

Crushing attack to the nose, jaw: x2

Any attack to the brain: x2 (above and beyond damage multiplier!)

Any other attack to head: x1.5

Any attack to the eyes: x3

Any attack to the groin (males): x2

Attack cripples or amputates: x2

Attack aggravates an existing wound: Add damage from existing wound to new shock.

Weapon Type:

Whip: x1.5, or x2 against limbs

Fire, electricity: x2

Target condition:

Target surprised or not in combat: x2

"Bracing" for pain: x1/2 (requires Concentrate maneuver and Will roll)

Low Pain Threshold: x2

High Pain Threshold: x0 (or see revision in B3)

Stun weapons, spells, etc.: 1d for Pain spell, etc.

Effects of Shock

The following effects are the result of shock, not damage. Adjust HT rolls for Strong/Weak Will:

IQ/DX penalty: -1 per (HP/10) points of shock.

To round: Use -1 penalty per point of shock for HP 8 to 14; per 2 points for HP 15 to 24; per 3 points for HP 25 to 34, etc. Use a -2 penalty per point of shock for HP 4 to 7, -3 per point for HP 3, -5 per point for HP 2, -10 per point for HP 1.

Stunning, general: Stunned automatically on shock of over HP/2.

Optionally, stunning occurs on a failed HT roll on shock of over HP/3, and is automatic on shock of over 2/3 HP.

Stunning, brain: Apply x2 shock multiplier to brain hits and use general stunning rule.

Stunning, limb: Arm or leg stunned on shock of over HP/2, hand or foot on over HP/3. Items held by stunned limb are dropped. (Allow HT roll to maintain grip if shock is just enough to stun.) Excess shock is not lost; total shock can cause overall stunning.

Knockout, general: Roll vs HT to avoid knockout on shock of over HP. Knockout is automatic on shock of over HP x2.

GM may ignore when shock comes mostly from sharp pain with low damage (i.e., whip blow to the hand), as opposed to high damage or stun gun.

Knockout, brain: Apply x2 shock multiplier to brain hits and use general knockout rule.

Other: Modify for special effects and circumstances: A stun gun or spell might not use shock multipliers for target location, etc.

Heart Attack

Apply a x4 damage multiplier for bullet or impaling damage to the heart. Heart damage of HP points or greater (including crushing!) forces a roll vs HT to avoid a heart attack (roll at -4 for HPx2 damage; -8 for HPx3 or greater).

Failure is a minor heart attack, failure by 4+ or a critical failure is a major heart attack, and failure by 8+ is fatal. Minor attacks do (2d x Linear Scale) damage, and stun (roll HT each turn to recover; a critical miss brings on a major attack). Major heart attacks do (6d x Linear Scale), and incapacitate.

Make a HT roll for crippling if you survive a major heart attack. Failure leaves behind (1d x amount roll failed) points of physical or mental disabilities.

A weak heart [-10, or -15 if add. -4 on related HT rolls] treats damage to heart as *double* for purposes of effect.

Option: Exposure Hazards

Exposure hazards include acid, flame, heat, cold, sunburn, poison gas, and electricity. The effect of these varies with exposure to the attack vs the amount of substance to be affected – i.e., the ratio of surface area to mass.

Assume stated damages are for human-sized targets. For other creatures, multiply damage by the square root of Linear Scale. Depending on the hazard, "damage" may be fatigue, rads of radiation, etc.

The net result is that small creatures will take less *absolute* damage from exposure hazards, but more *relative to HP*. The reverse is true for large creatures.

When effects call for HT rolls instead, apply half of Size as a modifier to the roll.

Load Rating

Regardless of thrust, airfoil lift, or the ease of gliding, wings can only support so much weight. Check WSR (no multipliers for air) using normal Load ST. If Super-Heavy, your wings will tire quickly; if Extreme, they fold up or collapse!

Advanced Stuff: Torque

Power systems have greater acceleration at low speeds. When adding a bonus for power to vehicles' effective mass in collisions, double bonus if traveling at less than 1/4 top speed; halve it if over 1/2 top speed.

Advanced Stuff: Traction

Extra effective mass from power in collisions only works if you can push forward effectively. On the ground, the bonus from power is limited to some multiple of the object's weight, based on traction:

Perfect (magic; ultra-tech): no limit

Excellent (spikes; slicks on asphalt): weight

Good (studded tires): weight x2/3

Standard (regular tires on asphalt): weight/2

Poor (regular tires in rain): weight/3

Very Poor (regular tires on snow, mud): weight/5

Near None (regular tires on ice): weight/10

Example: A 210 lb., Load ST 15 tackler can add a full Load ST x 10 (150 lbs.) to effective mass in a slam, using cleats on turf (excellent traction). With street shoes on wet road (poor traction), his bonus from ST is limited to weight/3 or 70 lbs.

Vehicles

Further multiply vehicles' effective mass bonus from power by the Off-Road Speed multiplier (VE 130), from Contact Area and Ground Pressure.

Recovery

Recovery from shock: Use normal rules for recovery from knockout. Roll vs HT each turn to recover from stunning (whether overall or a limb).

IQ/DX penalty disappears after one full turn. (Option: Make HT roll every turn; IQ/DX penalty is reduced only by the amount of success. Remaining penalty persists, cumulating with any new shock penalties.) Effects of specific attacks, such as high-tech stunners, may last longer.

Recovery from damage: A night of rest and a HT roll heal HP/10 damage. (Regeneration also uses this base.) Success by 10+ on the roll heals twice as much; success by 20+, three times, etc.

Regrowth: Divide speed of Regrowth by the square root of Linear Scale.

Lights

A "generic" working of light and dark:



Light Level Table

light level	effect	example
Blinding	blind	Flash attack
Near-blinding	-8 V, -4 DX/IQ	searchlight in face
Harsh	-4 V, -2 DX/IQ	police interrogation
Very bright	-2 V, -1 DX/IQ	sun in eyes
Bright	no penalties	sunny day
Normal	no penalties	shade, cloudy day
Slightly dim	no penalties	ordinary indoor light
Dim	-1 darkness	firelight, dim indoor
Very dim	-2 darkness	dim firelight
Dark	-4 darkness	moonlight
Very dark	-8 darkness	starlight
Total darkness	blind	no light

"V" = Vision; "darkness" refers to normal Vision and combat penalties for darkness.

Each level of light beyond Blinding adds -2 to related HT rolls and doubles duration of blinding.

Bad Sight (light sensitivity) [-10/-25] from B3 boosts slightly dim or brighter light by two levels, the milder version [-50%] by one level.

Night Vision removes penalties except in total darkness. The lesser version [5] from B3 reduces darkness level by 1 between slightly dim and very dark. Night Blindness increases the same by 1.

Sunglasses reduce light level by 1, heavy wrap-around dark goggles or welder's goggles by 2.

Collisions

Mass

Power: The ability to "push" into a collision adds to effective mass for collision purposes:

Creatures: Add Load ST x 10 lbs.

Vehicle accelerating: Add engine rating kW x 50 lbs., or thrust x 5 lbs. to mass if in water, thrust x 0.5 lbs. if in air.

Unpowered objects get no such bonus.

Combined mass: Add the effective masses of both colliding objects to get combined mass.

Speed

Combined speed: Add speeds in a head-on collision. Subtract the slower from the faster in a rear-end collision. In a side collision, use the speed of the object that hits the other (or average speeds for truly simultaneous hits).

Speed change: Figure how much each side's speed changes, in one of two ways:

Mechanistic: This is appropriate when both objects are inanimate. Look at each side's effective mass as a percentage of combined mass. Split combined speed in the same proportions – giving the *smaller* mass the *greater* speed change.

Example: Combined speed is Move 12. If of equal mass, each side has its Move changed by 6. If one side has twice the mass of the other, it makes up two-thirds of combined mass; its Move is changed by 4, the smaller side's by 8.

Contest: This method is more fun when one or both sides are animate. Roll a Contest of effective mass. (Tip: Dividing effective masses by 10 gives a Contest of Load ST + (mass /10), which is the exact same thing but looks more like the expected Contest of ST.) "Fix" and roll. Split combined speed between two sides as follows:

Slam Table

degree of success	loser's speed change	winner's speed change
less than 10	x1/2	x1/2
10-19	x2/3	x1/3
20-29	x3/4	x1/4
30-49	x4/5	x1/5
50-99	x9/10	x1/10
100 or more	x1	x0

Inanimate objects: Objects' resistance to toppling or movement from embedded foundations, friction with the ground, etc. is up to the GM.

Falling down: See knockback rules (p 11).

Damage

Base: The base damage each side takes is 1d per 5 mph of *own* speed change. Don't apply yet.

Mass: Each object multiplies own damage taken by square root of (*own* effective mass /150).

Dice: Take the two damage dice scores computed so far and apply the higher – usually the damage indicated for the smaller side – to both sides.

Hardness: Multiply the damage dice each side takes for the hardness of the *other* side:

Collision Hardness Table

surface hardness	damage
Very hard (stone, concrete, metal)	x1.5
Hard (packed soil)	x1
Yielding (soft soil, another character)	x2/3
Soft (mud, sand)	x1/2
Liquid (water)	x1/3 or less
Very soft (air bag, mattress)	x1/5

A sharp point will be very hard, and further inflict impaling damage.

Roll: Roll and apply damage for each side.

Absorption: If object can absorb impact over a large area (a full-body impact), subtract its HP from damage rolled. Subtract only HP/2 if damage is localized (human hit by a car or slam); subtract nothing if damage is very localized (vehicle with a ram plate; collision with a specific body location).

Rigid objects, including vehicles, generally won't get full HP subtraction; use HP/2 at most.

Armor protects as described in **GURPS**.

Sandwiched: A target slammed between colliding object and another unyielding object takes damage based on the speed and effective mass of the *colliding* object. Also modify for hardness.

Slams

Game slams as collisions. Notes:

General: There are no special considerations for Fat, Skinny, or superdense fighters; mass is an integral part of the rules. Adjust Contest for shields *after* "fixing", per *BS* 112, but not for movement (already part of the rules) or for rear attack (give the target half or no Load ST instead).

Hitting: Make a DX or skill roll followed by Active Defense, or game as a Contest of Skill. Use general TH modifiers in either case.

Speeds: Any Move – even a Step – allows an attacker to slam. Opposing movement by the target will help resist the slam (while painfully adding to combined speed).

Speed change: The Contest method is more fun in slams.

Damage: Ignore damage for simplicity, or calculate normally. Slams *can* hurt!

Flying tackle: Attacker may take extra attack distance of half linear dimension. Roll TH; success by 4 or more is also a successful grapple. Defender can Dodge, though outstretched arms count as a large weapon. Attacker automatically falls.

Low tackle: A flying tackle, or a Wait, kneel, and tackle defense against a charging foe, can target a foe's legs. Halve target's effective mass and ST; after balance penalties for a leg attack (p 8), the target is likely to go down. But also halve any speed change of the target; it's likely to topple *over* the tackler, rather than fly backward.

Pushing: Combined speed is 2, plus Steps from either side. Determine results using the Contest for slams. Ignore damage in a push.

Advanced rules: Combined speed of the "collision", Ps, is the *lower* of:

square root of (pusher's Load ST x Linear Scale x 100 / lighter of the two effective masses); or
square root of (pusher's Speed x Linear Scale x 10)

Adjust Load ST for limbs used (p 12).

Unlike throwing, complications like arm mass can be ignored, and there's no limit to the mass you can attempt to push.

Add Steps from either side to Ps. Split Ps using the Contest for slams, and take it from there.

Falling

Use the collision rules for a fall. Damage comes from impact speed, the falling object's own mass, and the hardness of the ground. Absorption of damage is important: A flat surface allows full-body impact; rocky ground, localized impact.

Speed

Approximations of speed, distance, and time:

Falling Table

speed (y/sec)	speed (mph)	yards fallen	time (sec)	damage
0.5	1	0.01	0.05	1d/5
1	2	0.05	0.1	1d/3
1.5	3	0.1	0.15	1d/2
2	4	0.2	0.2	1d-1
2.5	5	0.3	0.25	1d
3	6	0.5	0.3	1d+1
3.5	7	0.6	0.35	1d+2
4	8	0.8	0.4	2d-1
4.5	9	1	0.45	2d
5	10	1.25	0.5	2d
6	12	2	0.6	2d+1
7.5	15	3	0.75	3d
10	20	5	1	4d
12.5	25	7	1.25	5d
15	30	10	1.5	6d
17.5	35	15	1.75	7d
20	40	20	2	8d
22.5	45	25	2.25	9d
25	50	30	2.5	10d
27.5	55	35	2.75	11d
30	60	45	3	12d
32.5	65	50	3.25	13d
35	70	60	3.5	14d
37.5	75	70	3.75	15d
40	80	80	4	16d
42.5	85	90	4.25	17d
45	90	100	4.5	18d
50	100	125	5	20d
55	110	150	5.5	22d
60	120	180	6	24d
65	130	210	6.5	26d
70	140	245	7	28d
75	150	280	7.5	30d

Or, to do the numbers yourself: speed =

10 x seconds fallen x g; or

10 x square root of (2 x distance /10) x g

in yards/sec. Multiply by 2 to get mph.

Speed is limited by terminal velocity.

Subtractions from impact speed:

An Acrobatics roll or Catfall subtracts 20 mph.

A DX, Judo, Wrestling, or Breakfall *maneuver* roll (choose *one*) subtracts 10 mph. A Breakfall *skill* roll (P/E; use Half modifier for encumbrance) subtracts 20 mph plus 2 mph per point of success.

Landing neatly on feet subtracts jumping speed (Js). This may require a roll vs DX, Jumping, Acrobatics, Breakfall skill, or Bouncing skill.

Advanced Stuff: MAR and WAR

You don't need to mess with these stats, but they do allow the tricks below.

Actual calculation of the ratios is on pp 18-19, and a no-math shortcut for what you really want – square roots – on p 19.

Terminal Velocity

Terminal velocity (tv), the fastest you fall, is Move 50 (100 mph) x the square root of WAR x the square root of air density (1 at sea level).

For a human, tv will be 100 mph, or about 150 mph "diving".

Slow Fall (found in any flier that can glide) further reduces tv (p 20).

Air brakes: Powered flight keeps you aloft at up to WSR 45, after which it only slows fall. Multiply tv by 1/7 at WSR 46, 1/5 at 47, 1/4 at 48, 1/3 at 50, 1/2 at 60, 2/3 at 80, 3/4 at 100, 4/5 at 120, 9/10 at 240, and 1 at 480 or greater.

Drag and ftv

Real-life top speed in air or water is the point at which deceleration from drag negates acceleration. **GVER** doesn't compute Move in *that* much detail, but drag effects can be added:

"Forward tv" (ftv) is Move 10 x the square root of MAR. This made-up stat does not cap Move, but it's *hard* to move faster than ftv.

If Move exceeds ftv, take the average of the two; that's your actual Move. Buy enough Reduced Move to approximate the reduction.

Drag will likely cut Move in a fast flier or swimmer, or a very fast runner. It can even limit a Super's jumps, using ftv and Js in the same way to cut high Js.

Glider Move

The simple rule for unpowered flight Move rule (p 5) isn't likely too accurate. A better calculation: Move = ftv.

Water and Drag

In water, tv (the speed at which you sink, or float upward) and ftv are greatly slowed. Compute per p 17, but use 800 for air density. (Or ignore that, and divide final tv or ftv by 30.)

Be sure to base WAR on weight in water.

Computing MAR

Area differs between a full-body, "flat" position, and a head-first "forward" position.

A bird travels and dives in the "forward" pose, but presents "flat" area downward for gliding descent. A human runs in "flat" position, swims in "forward". And so on.

Really quick shortcut

MAR = Linear Scale.
Forward: x2. Flat: x1/2 with wings spread.

Detailed method

MAR = mass / area, where area = Area Scale x 150. Modify area as follows (be rough; precision isn't needed):

Default (human) creature: Flat: No change. Forward: x1/2.

Round / blocky shape: Area is small: x2/3 or so, in any position.

Thin or streamlined shape: Flat: x1.5 or more. Forward: x1/3 or less (such as x1/5 for a sleek fish). However, little streamlining is possible in tiny creatures.

Limbs: Extra limbs increase mass and area: say, +10% mass, +15% area for an extra arm.

Small or no limbs cut mass appropriately, and area to x2/3 or so.

Wings: Two wings add area of 450 "flat", 75 "forward", x wings' Area Scale (same as creature's by default, but differs in larger or smaller wings).

Two default wings generally quadruple area and confer +1 (almost +2) to Size as a target with wings spread wide.

Other: Horns, long fur, a tail, etc. can add to both area and mass.

Damage

Surface hardness: Per collisions. Use 1/3 damage for a belly flop into water, or half that with a successful Diving skill roll (P/E, defaults to Acrobatics -2, Swimming -2, or Breakfall -2; use Half modifier for encumbrance).

Falling objects: Use "sandwiched" collision rules for an object falling on a character. A skillful catch can "cushion" impact by a speed equal to throwing speed (Ts) for that object.

Other topics

Tripping: Treat a trip as a fall from height equal to your linear dimension, or half that height on a balance or Breakfall roll. Multiply distance by 2/3 for semi-upright posture or low stance, and 1/2 for horizontal posture or very low stance (p 20). These are cumulative.

Critical failure: On any roll to reduce damage in a fall or trip, this can mean a very localized impact on a randomly rolled body location.

Fatigue

Let Fatigue (capitalized) mean pool of energy to be drawn from (similar to HP); let fatigue mean points of energy lost (similar to damage). Either Combat ST or HT works as the base for Fatigue, as long as missing bits of rules are filled in.

General rules

Apply fatigue per BS 134.

ST loss: As in GURPS, don't recalculate damage or encumbrance as ST is lost to fatigue.

Movement: For any type of movement, Move and fatigue are connected as follows.

Move and Fatigue Table

Move is greater than...	type of Move	fatigue interval
0	slow ("walking")	hour
x1/3	brisk ("jogging")	10 minutes
x1/2	very brisk	1 minute
x2/3	fast ("running")	20 seconds
x1	sprint	10 seconds
x1 + Sprint bonus	Extra Effort sprint	1 second

Treat unpowered flight (including soaring) as slow movement for fatigue purposes.

Extra Effort: Costs 1 fatigue per turn.

Heat: In a hot environment, add 1 point to any fatigue assessed, twice that much if very hot or if in heavy clothing or armor.

Non-ST losses: A drop in Fatigue to 2/3 ST or less costs -1 IQ/DX; ST/2 or less, -2 IQ/DX; ST/3 or less, -3 IQ/DX. The penalties affect skills, Will, and other rolls as appropriate.

Lack of sleep: Take 1 fatigue for a half night of lost sleep, 3 for a full night. In addition to normal fatigue penalties, take -1 IQ/DX, including Will, per point of fatigue from lost sleep. Will rolls may allow temporary halving of these penalties. In

quiet periods, Will rolls may be necessary to avoid nodding off. Recovery requires sleep.

Magic and psionics: See p 23.

Recovery: Recover Fatigue at a rate of Fatigue/10 points per 10 minutes of rest. Double recovery rate per full 5 points of success on a HT roll; halve it per full or partial 5 points of failure.

Encumbrance: Ignore BS rules. Divide fatigue for movement and physical exertion by Move Modifier for encumbrance. (That's the same as multiplying fatigue time intervals by Move Modifier.)

Air and water: Movement in air and water carries two separate fatigue components. Apply both:

a) standard fatigue for movement, as above; and
b) the cost of fighting weight, if any, to keep from falling or sinking. Find Move Modifier from *effective WSR only*; take 1 point of fatigue, divided by this Move Modifier, every 5 minutes.

Super-Heavy encumbrance: Super-Heavy encumbrance from effective WSR (not mass) is a special case. Take an extra 1 fatigue per turn from efforts to remain standing on land, or level in air or water. Sitting or lying down may relieve this.

Basing Fatigue on ST

Set Fatigue to Combat ST. Limit cost of Extra/Reduced Fatigue to half cost of raised or lowered ST. Make the following changes:

Energy use: Rules need to consider different rates of energy expenditure among creatures of varied power. For *all* situations of physical fatigue (including lost sleep), apply Combat ST/10 points of fatigue wherever rules call for 1 fatigue.

ST loss: Lose Combat ST and Load ST in proportion to lost Fatigue.

HT: Let a HT roll halve fatigue for any physical exertion. Every full 5 points of success further halves it; every full 5 points of failure doubles it.

Fatigue 3 rule: Halve Move and Dodge when Fatigue is reduced to full Combat ST/3, not to 3 or less. Collapse when Fatigue reaches full Combat ST/10, and pass out at Fatigue 0.

Basing Fatigue on HT

This is arguably the easier method. Set Fatigue to HT. Use normal costs for Extra/Reduced Fatigue. You don't need to account for HT in loss, or modify fatigue for energy use. The GURPS Fatigue 3 rule works fine as is (halve Move and Dodge when Fatigue reaches 3; collapse at Fatigue 1). Other items work per general rules above, with one change:

ST loss: To account for effects on ST, lose Combat and Load ST in proportion to lost Fatigue.

HP base: Most players using this option also change the base for HP from HT to Combat ST. If you do, you can still set HP anywhere (even continuing to use HT x Linear Scale as typical HP), but you pay for HP above or below Combat ST with Extra/Reduced HP.

DESIGN!

Design and Points

General

Non-PCs: If your design isn't a PC, point costs don't matter a bit! Don't bother with them at all.

Rule of -5: To keep leveled disadvantages in rein, **GVER** limits many to 5 levels, often adding further effects to the final level.

Limitations: **GVER** sets the maximum value of limitations to a neat -80%. However, allow -100% if limitations remove *all* benefit from a trait.

Overlapping disadvantages: Group disadvantages into those whose effects overlap: multiple vision deficiencies, multiple mobility deficiencies, even paired Impulsive and Overconfidence.

Allow full value for a group's largest disadvantage, 1/2 for its next largest, 1/4 for its next, etc.

Total value of disadvantages is limited to 80% of the worst possibility, i.e., 80% of [-50], the value of Blindness, for all sight-related disadvantages combined. (These could total [-50] if they remove *all* sight, essentially becoming Blindness.)

Environment

Types of Environments

Environments in which you operate "natively" are *home* Environments (HE). If you have more than one (like an amphibious creature), pick one anyway as your *primary* Environment (PE).

Land and water: Land or water as a PE costs [0]. Add the other as a HE through Amphibious [10]. Add air as a HE through flight traits.

Air: A truly aerial creature might have air as its PE [-10 + cost of flight traits]. Add land and water as HEs for [10] each. No Earth creature has air as its PE, but do allow it for a very competent flier (45+ points in flight traits, levitation ability, etc.), to prevent such a PC from taking many points for *Lame* or other land- or water-based disadvantages that will rarely inconvenience him.

Default abilities: Creatures have poor default mobility in water or on land even if it's not a HE, but have *no* mobility in air without flight traits.

Cost of traits

Advantages affecting one Environment (ex. Enhanced Move): Buy separately for each Environment, at full cost.

Disadvantages affecting one Environment (ex. Reduced Move): Take separately for each Environment. PE: full value. Non-PE: 1/5 value.

Advantages affecting all Environments: (ex. Negative encumbrance): PE only: 4/5 cost. Non-PE only: 1/2 cost if one, 2/3 if two.

Disadvantages affecting all Environments (ex. Reduced Dodge): PE only: 1/2 value (1/3 if you have two non-PEs to fall back on). Non-PE only: 1/5 value, 2/5 if two.

Mobility: Mobility in your PE is worth a "free" [50]. Mobility-related disadvantages may total up to -80% of [50] (or -100% if *all* mobility is lost).

In a non-PE, cut those values to 1/5: An aquatic PC gets 1/5 value for land-based disadvantages, up to [-8] with any ability to crawl or flop, or up to [-10] if completely immobile (i.e., a whale PC with No Legs and horrid land encumbrance).

"Free" default mobility in air applies only to true aerial PCs with air as PE; otherwise, the max value of aerial mobility disadvantages is -80% the cost of flight traits (-100% if *no* benefit remains).

Upkeep

Below are suggested defaults for sustenance requirements and life span. They can vary tremendously, so customize with wild abandon. Purchase final levels normally using appropriate traits (Increased Life Support, Short Lifespan, etc.).

Sustenance Requirements

Base: Start with human requirements and adjust:

Size: Multiply by Area Scale, or $(\text{mass}/150)^{0.75}$ for an advanced calculation. This sets requirements *relative to body mass* high for small creatures, low for large, and is part of the Size trait.

Metabolism: As an option, multiply by (Basic Speed/5), or the square root of that in humanoids. Also tweak for unusually high or low base ST.

Diet: Base is for omnivores or fruit/nut-eaters; halve for meat-eaters, double for grass-eaters.

Lifestyle: Multiply by 1.25 for high activity (hard manual labor), 1 for mixed activity (adventuring), 4/5 for low activity (white collar lifestyle), 2/3 for minimal activity (couch potato), and 1/2 for near inactivity (bedridden).

Cold-blooded: Further multiply by 1/5 at rest, 1/2 when mildly active, no cut if fully active.

Lifespan

Base: Start with human milestones (onset of aging, increase in frequency of rolls, etc.).

Size: Multiply by the square root of Linear Scale, or $(\text{mass}/150)^{0.2}$ for an advanced calculation. This is correct for birds and humanoids; divide by 2.5 for other creatures.

Metabolism: Multiply by the square root of (5/Basic Speed).

Cold-blooded: Multiply by 2 in cool climates, 1.5 in temperate, 1 in hot.

Aging: When aging rolls indicate the loss of a point of ST or HT, scale losses of Combat ST, Load ST, and HP appropriately for Size.

New and Revised Traits

B3 offers dozens of new and revised traits, including existing ones reworked into "package traits", with costs based on exact effects. On the next page are a few basic and useful options. ("Add-ons" refers to suggested extras for packages, bought at normal cost.)

Computing WAR

Find WAR or its square root per MAR, but replace mass with weight.

How Slow Fall works

Slow Fall multiplies tv by some fraction, X.

To get technical: Unless it slows falls via magic or some such, Slow Fall does one (or some combination) of the below:

a) It divides "flat" area by X squared: SF x1/50 multiplies area by 2500.

b) Lift from airfoils multiplies body weight by X squared: SF x1/50 multiplies body weight by 1/2500 (*before* added weight of carried items).

Computing Square Root of MAR or WAR

Calculate stat normally, and take its square root.

Or use this rougher, no-calculator shortcut:

1) Find your mass or weight on p 24's Square Root Table.

Move up or down levels on the Table, as follows:

2) *If finding tv from WAR:* Up one level per level of Slow Fall.

If Slow Fall is based on airfoils, start with body weight, go up X levels to get your new (very low) weight, *then* add carried weight. Continue from this new level.

3) Up one level for each Size level *below* 0, *down* one level for each Size level *above* 0.

4) For shape, position: **Default (human):** Forward: Down one level.

Blocky / round: Down one level, in any pose.

Streamlined: Forward: Down two or more levels. Flat: Up one level.

5) Adjust for wings: Flat: Up one level for small wings, two levels for larger. Forward: Up one level only if larger-than-default wings.

Result: The multiplier in Col 2 is your square root of MAR or WAR.

Basic Body Structure

Inconvenient Form, Inconvenient Size [-5 to -15 ea.]: Clothes, armor, tools, etc. are difficult to use. Together should not exceed [-15].

Hybrid form [varies]: Centaurs etc. combine two "halves", each with different Size and HP. Average the costs of the two halves' Size, HP, DR and Toughness. Buy Combat ST and Load ST of lower half with Legs Only limitation [-50%]. Base encumbrance on Load ST of load-bearing half. Base overall TH on larger half. To specifically target one half, use its Size, at an additional -1; a miss by 1 hits the other half. Use the larger half's HP as the overall HP pool. Damage to that half has normal effect. Apply damage to the other half to the same HP pool, but with a damage multiplier of (large half HP/small half HP).

Posture [0]: How you hold your *body* (horizontal, semi-upright, upright, fishlike, etc.) is a special effect; points may come from associated traits, such as limitations on arm usage. See also Stance below.

Modified TH [10 ea. for first two -1; 5 ea. per add. -1. -10 ea. for first two +1; -5 ea. per add. +1]: Included with purchase of Size; use to buy TH modifiers beyond what Size confers. Halve value if modifier affects only swing attacks, or only thrust/missile attacks (p 11).

Invertebrate [0]: Appendages can be crippled, but do not suffer broken bones. Lower resistance to amputation vs cutting blows: Treat HP as 2/3 normal, and HT rolls to resist are at -2. No free skull DR. +2 on Escape, rolls to resist or escape from locks and holds, or recover from crippling injuries. Add-ons: Flexibility traits, reduced Load ST.

Flexibility traits: *Double-Jointed* [5]: As *BS*, add. +1 to resist or break free from pin, +2 to resist arm lock and effects (AD penalty in lock reduced by 1). Mechanic "bonus" only *reduces penalties* for cramped spaces (including vehicles, p 9) by up to 3. *Extra Flexibility* [5 for one limb, 10 for whole body]: Includes Double-Jointed, allows unusual positioning, neck can turn 180°. *Flexibility* [15]: More powerful Double-Jointed (cannot be combined); reduce penalties for cramped spaces by up to 5; double other bonuses of Double-Jointed. Neck turns 360°. *Squishy* [5]: Buy one of the above as prerequisite. Add +2 Escape, +1 to break free from pin or resist arm lock and its effects. Slow, minor deformation possible (stretch up to HTx2%; put head through opening half its width); takes two minutes, halved on DX (or P/A Change Control) roll. A good add-on for Invertebrate.

Fat [varies]: Base cost is that of reaction value: Overweight [0], Fat [-5], Obese [-10]. Add cost of encumbrance, which varies by character. Treat all other effects as 0-point effects for simplicity.

Dwarfism [varies]: Mix and match reaction modifiers, Short Legs, Short Arms, a lvl of reduced Size, Inconvenient Size, etc.



Legs

Single Leg [0]: One leg (or snake "tail", fish "tail", etc.) acts like two, providing normal default functionality. Use 2/3 HP, not HP/2, for the stout limb's HP (but there's no "backup" if it's lost). Add-ons: No Kick, No Jump, Inconvenient Form, etc.

Extra Legs: Provide stability, "backups" for injuries, power for pushing. Cost is [5 ea.] for "kicker", adjusted as follows: Back Legs (can kick, but not rear up), [x1/2]; Horizontal (1/5 Mv, 3 lvls Poor Balance reared), [x2/3]; Semi-Upright (1/2 Mv, 2 lvls Poor Balance reared), [x4/5]; Upright (can rear with no penalty), [x1].

Add [1.5 ea.] to Extra Leg to get base cost. Includes free Improved Balance for legs that remain on ground (p 4).

Adjust cost for number: First 2 Extra legs are full cost; next 2 [x1/2], next 4 [x1/4], next 8 [x1/8], next 8 [x1/16], next 8 [x1/32]...

Can also be used to buy extra wings or swimming limbs [1.5 ea.].

Stance [0]: How you position your *legs* on land. Default is straight-legged High Stance (humans, most mammals). Low Stance is spread or bowed legs (bulldog, fly); includes free lvl of Improved Balance (but net -1 to balance on a narrow perch). Very Low Stance is wide-splayed legs (salamander, roach), lowering body almost to ground; double effects of Low Stance, legs may hinder movement in tight spaces, "falling down" may mean you're flipped onto your back.

Poor Kicker [-1/lvl, max 5 lvls]: Each lvl gives kicks -20% Combat ST, -1 TH (-2 TH for targets higher than waist). 5 lvls give No Kick.

Long Legs [2.5/lvl/pair]: Each lvl increases length by one Size lvl. Add-ons: Enhanced Move, Enhanced Jump, Poor Balance.

Short Legs: *Short*: One Size lvl short [-1.5/pair]. *Very Short*: Two Size lvls short [-2.5/pair]. Add-ons: Poor Jumper (x2 for Short, x4 for Very Short), Reduced Move, Improved Balance, Poor Kicker.

Enhanced Jump [5/lvl]: +100% Jd per lvl (+50% for half-lvl [3]).

Poor Jumper [-1/lvl, max 5 lvls]: Each lvl cuts Jd using progression 2/3, 1/2, 1/3, 1/5, 0 (No Jump).

Flight



The first three traits below assume use of winglike structures.

Slow Fall [5 + 1.5/lvl]: Each lvl cuts falling speed using progression 2/3, 1/2, 1/3, 1/5, 1/7, 1/10, 1/15, 1/20, 1/30, 1/50... See p 19 for more.

Parachuting, the natural ability to float down with little forward movement, is bought as Slow Fall.

Gliding [5 + Slow Fall]: Adds ability to move forward during Slow Fall. Effect relies on airfoils in most gliders: Add Requires Forward Move [-20%] (p 4); lose ability as you slow down. Standard purchase is 10 lvls [5 + 5 + 15 = 25, -20% = 20], cutting fall to 1/50 speed.

Small gliders fall slowly to start with, and need few lvls of Slow Fall.

Powered Flight [30]: Add Slow Fall or Gliding at half cost. Insects, hummingbirds pay [30] (no gliding; wings don't stop beating); other birds typically pay [40] (add standard Gliding purchase above).

Wingless Flight: Buy one of the above flight methods and add Inaccessible Propulsion (air) [10].

Soaring [5]: Ability to locate, effectively use thermals or updrafts. Replaces Controlled Gliding limitation; add to any form of flight.

Manipulators

Base costs: First two fine manipulators are "free" [15 ea.]; first two "punchers" (weak strikers) [5 ea.]. Thus: No Arms [-40]; No Fine Manipulators [-30] (leaves 2 punchers); One Arm [-20]; One Hand [-15] (leaves 2 punchers); other combinations possible. No Manipulators [-50] is No Arms + No Kick [-5] + no crude manipulator at all [-5].

Option: Also use above manipulator disads as limitation on cost of ST (i.e., -40% limitation for No Arms, -20% for One Arm, etc.).

Extra Arms: Arms above default two cost [5] for fine manipulators, [5] for puncher, = [10 ea.] Adjust cost for number, per Extra Legs.

Long Arms [5/lvl/arm]: Lvl increases length by one Size lvl, adds +1 to grapple (max +4), +10% Combat ST with a swing (max +40%).

Short Arms: *Short* [-2 for one, -4 for two, -20% limitation on Extra Arms]; One Size lvl short; -1 grapple; 1/2 Td, Combat ST with swing. *Very Short* [-5 for one, -10 for two, -50% limitation on Extra Arms]; Two or more Size lvls short; -2 grapple; 1/5 Td; cannot swing wpn.

Other

Inaccessible Propulsion (Environment): Mobility relies on propulsion not easily hampered or injured. For [5], loss of propulsors has half normal effects; keep half mobility even with no propulsors (snake, fish moving with body after losing Single Leg). For [10], propulsors cannot be lost; mobility is entirely from torso, jets, magic, etc.

Environmental Intolerance (needs air) [-20]: You're purely aquatic, but must surface regularly to breathe air. Getting caught underwater will be fatal. Defining trait of whales, dolphins, etc.

Enhanced Move (climbing) [3/lvl]: Each lvl adds 100% to climbing Move. Replaces Super Climbing. Double cost if creature has Clinging; [-33%] if applies to brachiating only.

Poor Climber [-1/lvl, max 5 lvls]: Each lvl acts as Reduced Move (climbing), also gives -2 on Climbing. 5 lvls give No Climbing.

Tail [varies]: -3 TH, HP/3; or -2 TH, HP/2 if large. Cost is that of add-ons: Improved Balance; Flight, Swimming, Acrobatics, or Jumping bonus [2/+1]; striker [add cost of tail and striker, -10% on cost of cheaper]; counterweight [+1 DX, athletic skills and rolls only, -30%].

Improved Balance [2/lvl]: Lvls add to balance rolls. No benefit if associated limb(s) are crippled or hampered; half benefit if you are knocked through air or otherwise lose contact with ground. Internal sense of balance [+50%] always works fully.

Poor Balance [-5/lvl, max 5 lvls]: Land-specific. Each lvl gives -1 athletic DX (half this penalty, rounded down, on defenses), -2 balance, adds lvl of Poor Kicker. Athletic actions may cause falls (p 8). Effects may be halved by kneeling, negated by sitting or lying down.

Creatures

Below are basic stats for some creatures; B7 has complete write-ups. Animal Move in **GVER** is correctly termed Move, not Speed.

name	Size	mass	ST	DX	HT/HP	DR	enc	Mv	Dod	con	Jd	notes
cheetah	0	120	12/ 12	12	13/ 13	0	Neg 3	30.4	8	+4	1.5	EE x1; EM x2 (but tires quickly); CR
elephant	+4	15000	75/300	12	12/ 60	3	X-Hvy	12	2	-2	0	EE x3; EM x1. Wgt burden is Hvy.
tiger	+1	600	24/ 32	13	13/ 20	0	Light	11.7	6	+2	2.4	EE x1; EM x1/2; EJ x1; CR
cat	-3	10	4/ 1.2	14	12/ 4	0	Neg 3	9.8	8	+4	1.2	EE x1; EM x2; EJ x1; CR
horse	+2	1200	26/ 52	10	13/ 26	0	Med	13.8	3	0	1.3	EE x2; EM x1
dolphin*	+1	500	18/ 24	12	12/ 18	T1	None	9	6	0	–	Thrust 30. On land: Super-Hvy enc, No Legs
t. rex	+4	11500	90/360	13	13/110	5	Hvy	13	3	-2	2.6	EE x3. Jaw CST 100. Med. burden. Add +1 DX from tail.
rabbit	-4	4	2/ 0.5	12	12/ 2	0	Neg 3	9	7	+3	1.1	EE x1; EM x3, Running-12; EJ x2
shark*	+2	1300	26/ 65	10	14/ 30	2	Light	9.6	5	-2	–	Jaw CST 35. On land: Super-Hvy enc, No Legs
orca*	+3	6000	36/120	11	12/ 36	T2	Med	10.3	3	-4	–	Thrust 150. On land: Extreme enc, No Legs
hawk**	-3	4	3/ 1	12	12/ 3	0	Neg 4	16	8	+5	0.4	Enc Neg 2 w/o airfoils. On land: Leg LST 0.6, Neg 3 enc
Centaur	0/+2	1300	26/ 52	10	12/ 24	T1	Med	13.2	3	0	1.3	EE x2; EM x1. Upper body: CST/LST 13, HP 12
Ellyllon	-6	1.5	3/ 0.3	13	10/ 3	0	Neg 4	1.2	7	+2	0.3	Wgt, ST high for size. In air: No enc, Mv 2.3
Giant	+3	4500	42/150	9	14/ 42	T3	X-Hvy	3.8	2	-4	1.5	EE x2. Wgt burden is Hvy.
Merfolk*	0	195	10/ 10	10	10/ 10	0	None	10	5	0	0	Thrust 15, EM x1. On land: X-Hvy enc, No Legs
Ogre	+1	500	21/ 28	8	14/ 21	T2	Light	6.6	4	-1	1.4	In water: Light enc, MV 0.66 x Swimming/5, Dod 2, con -2

*aquatic performance stats. **aerial performance stats.

Character Example: Basic Stats and Performance

Here's a deliberately complex example: Ak, a child-sized, flying, amphibious alien, built like a stout barrel with two wings, two thin arms, and four thin legs. Most designs will be much easier!

Basic stats

Size -1 [0], DX 10 [0], IQ 10 [0], HT 12 [20]. At human size, Ak would be a spindly base ST 9, base HP 12, DR 3, and 265 lbs. (thanks to wings, extra legs, armor, and thick body). But at Size -1, multiply weight by Volume Scale: 88 lbs. Multiply ST, HP and DR by Linear Scale: Combat ST 6 [-30], HP 8 [-20, from Reduced HP x4], DR 2 [6]. Multiply ST by Area Scale: Load ST 4.5. There's no problem using this fractional stat (cost is midway between Load ST 4 and 5), but for simplicity round to Load ST 4 [additional -10, half the cost difference between Combat ST 6 and 4]. GM sets Inconvenient Size at [-5]. PE is land. Add water as a HE through Amphibious [10], air through flight traits [Powered Flight + Gliding w/ Slow Fall x10 = 40].

Add Extra Enc x1 [5] for four legs [two "back" Extra Legs, 8], and Enhanced Move (land) x1 [10].

Encumbrance

Ak has 20 lbs. of gear, but purchases enc based on naked weight.

Land: MSR, WSR = 22. With EE, WSR burden is Light, not Med. But eff MSR = 22 x Enc Factor 2.5 = 55: mobility of Med enc [-20].

With gear: MSR, WSR = 27. WSR burden = Med. Eff MSR = 27 x Enc Factor 4 = 108: mobility of Hvy enc.

Water: If weightless in water, eff MSR = 22 x 2 for water = 44: Light enc [would be 10 for diff. from Med in PE, x1/2 for non-PE = 5]. But Ak's gas-filled organs give him density 0.95 [3 for +3 on floating rolls] and about 5 lbs. of negative weight, or eff WSR 1.25 x 5 for water = 6.25. Eff MSR = 22 x Enc Factor 1.5 x 2 for water = 66: Med enc [no change from enc in PE = 0] swimming downward or level underwater, Light if swimming or floating upward or on the surface.

With gear: MSR = 27. Gear = 17 lbs. in water (GM call); negative and positive weight total positive 12 lbs. Eff WSR = 3 x 5 for water = 15. Eff MSR = 27 x Enc Factor 2 x 2 for water = 108: Hvy enc if Ak swims upward, level, or on the surface; Med (eff MSR = 27 x 2 for water = 54) if Ak lets himself sink with weight.

Air: Assume powerful thrust of Load ST 8. WSR, MSR = 11. Eff WSR = 11 x 5 for air = 55: Extreme 1 enc [-31 diff. from PE, x1/5 for non-PE = -6] and no flight (though "air brakes" cut tv to 1/3 in a fall). Add -20% limitation (Cannot Hover/Fly Backward) to flight traits.

Use airfoils: Assume lift equals 80% of body weight, leaving 17.6 lbs. Eff WSR = 2.2 x 5 for air = 11. Eff MSR = 11 x Enc Factor 1.6 = 17.6: Neg 2 aerial enc (8 lvls better!) [45 diff. from PE, x1/2 for non-

Abbreviations: Mv = Move; enc = encumbrance; EE = Extra Enc; Dod = Dodge; con = control; EM = Enhanced Move; EJ = Enhanced Jump; CR = Combat Reflexes; CST = Combat ST; LST = Load ST; eff = effective; T = Toughness. *ST lists CST followed by LST.*

PE = 23]. Difference due to airfoils is [-6 + 23 = 29, -20% (Requires Forward Move) = 24]. Ak pays a net [-6 + 24 = 18] for Neg 2 enc in air, which can drop to as much as Extreme 1 if he slows down.

With gear: MSR = 13.5. WSR is now 4.7 x 5 for air = 23.5. Eff MSR = 13.5 x Enc Factor 4 = 54, which would be Med enc, a drop of 4 lvls – but add another 50% loss (2 lvls) for the additional loss of lift from airfoils (p 4), giving X-Hvy.

Unpowered: WSR burden is 0 when gliding. Eff MSR = 11 x 10, or MSR 13.5 x 10 with gear: Hvy enc either way, worth nothing.

Load Rating: Ak's OK; his wings can support up to LST 4 (not thrust 8) x 35 = 140 lbs. before load hits Super-Hvy and trouble begins. But it's a moot limit – he can't fly anyway with that weight.

Performance

Ak's Basic Speed and Basic Move are 5.5. Without gear:

Land: Mv = 5.5 x 3/5 for enc x 2 for EM x 2/3 for Size = 4.4. Round to combat Mv 4, Step 1. Control: -2 for enc, +2 for Extra Legs = 0.

Water: As an aquatic creature, Ak's Swimming defaults to DX. Mv = 5.5 x 3/5 for enc x 2/3 for Size = 2.2. Control: -4 for enc.

For [1.5] ea., limbs beyond first two legs could add Extra Legs' benefit in water, adding to Swimming control rolls.

Air: Flight defaults to DX. At full speed: Mv = 5.5 x 1.2 for enc x 2/3 for Size x 2 for flight = 8.8 (round Step to 1); control: +2 for enc.

Gliding: 5.5 x 2/3 for Size x 2 for flight = 7.3. Control: -6 for enc.

Takeoff: Running Mv 4.4 lets airfoils kick in for only 1/4 effect and X-Hvy enc, for a clumsy, slow takeoff. Mv 5.9 would allow Med enc.

Landing: Mv 8.8 will require a balance roll at -4 to avoid falling.

Jumping: Jd is 4 x 2/3 x 15 / 88 = 0.45. Leg length is 0.67 yd.

Throwing: Rounding arm mass to 2 lbs., Td with Ak's 1-lb. razor-rang = 4 x 2/3 x 10 / (2 + 1) = 9. 1/2 Dam distance rounds down to 4.

Dodge: 5 + modifiers for encumbrance.

Advanced and optional stuff

Tv: Body weight after Slow Fall = 88/2500 = 0.035. "Flat" area = 100 (blocky body) + 50 (extra legs) + 450 (wings), each x Area Scale, = 300. Glide descent = Mv 50 x sqrt (WAR = 0.035/300) = 0.5 y/sec.

Ftv: "Forward" area = 100 (blocky body, no change from "flat" pose, but ignore extra legs) + 75 (wings), each x Area Scale, = 88. Ftv = Mv 10 x sqrt (MAR = 88/88) = 10. Glide Mv = Mv 10. Powered aerial Mv 8.8 is below ftv, avoiding slowdown from drag.

New costs: Using p 2 cost options, Ak's DR costs [25]. Using Quad ST, Load ST = Combat ST squared /10 = 3.6 (round to 4), at no cost.

New game world: If the game is based on Ak's 0.8-g, 0.9-air density world, his encumbrance, performance stats, and cost will all change...

Powers and Fatigue

Fatigue for superpowers and psi usually occurs in small doses and can be handled normally. But **GURPS** has trouble with fatigue and magic.

If fatigue is actual use of body energy to power a spell, Giants *should* be huge spell batteries. Base Fatigue on ST; 1 fatigue from spellcasting is a straight 1 Fatigue lost, not 10% of ST. This is easy and is in line with **GURPS**, but lets Giants power *lots* of spells, while tiny PCs may not be able to cast *any*.

In a tiny base scale game, scale both effects and fatigue down. Giant (i.e., normal human) wizards will wield huge reserves to fuel several giant fireballs, or countless scaled-down ones.

But if fatigue is the mental cost of *controlling* magic, then a Giant and Ellyl should cast the same number of spells. HT works as the base for Fatigue, as does ST if 1 fatigue = 10% of ST. But Giants now have no advantage over Pixies, throwing the same number of identical fireballs.

As a solution, a spell could carry fatigue costs for both the mental strain of casting *and* the fueling of physical effects. Spells like Detect Magic carry the former cost only, paid from a HT- (or optionally, Will-) based Fatigue pool; Giants and Pixies would cast the same number.

Spells that scale physically carry both the mental cost *and* a physical cost, the latter applied against a ST-based Fatigue pool. Casters can throw fireballs appropriate to their size, for appropriately modified physical cost (but still limited by unchanged *mental* cost).

Done right, such a system should work for any caster under any base scale, but it needs further development.

PLAY!

GVER rules are designed to be universal, working without modification for all creatures, even where tiny fractional stats are involved.

But working with ST 0.07 just isn't as smooth as handling ST 7. Happily, you can make it so:

Scaling the Game

GVER rules work regardless of measures – you can change units freely. Examples:

Weight: A man has Load ST 10 for use with pounds, or Load ST 160 in ounces.

Damage: Your sword strikes a 40 HP Giant for 8 points of damage – or, reworked, hits a 10 HP Giant for 2 points of damage.

Move: Move 10 in yards is also Move 30 in feet, Move 360 in inches, and Move 0.0057 in miles.

Just be careful with exponents. If a rule calls for the square root of weight in pounds and you want ounces, take that root and *then* multiply by 16.

Base scale

For games centered on odd-sized PCs, set PC size as "base scale", or Size 0. Scale PCs' stats to easy-to-use numbers; scale hexes and other characters to match. Keep units straight: A rule adding body weight in lbs. to Load ST works in ounces too, as long as both are equally multiplied by 16.

Example: Most PCs are 2" (Size -9) mini-people; average stats are Combat ST and HP 0.3, Load ST 0.01, weight 0.005 lbs., and Move 1.

Make their size the Base Scale: The PCs are Size 0. Combat ST and HP are 10, measured in tiny-sized damage units; Load ST is 10, measured in tiny "millipounds". Weight is 5 millipounds. Running speed is Move 36 in 1" combat hexes.

An inch-long (Size -11) insect is now Size -2, with roughly Combat ST 5, Load ST 2. A normal human is Size +9, with Combat ST and HP 300, Load ST 10,000, and a Move of 180 in 1" hexes.

Costs

Point costs are relative to base scale, i.e., to the "size" of the game. The above PCs start with the above stats for 0 points. Pay the usual [10] for +1 ST at that base scale (a tiny +0.03 Combat ST, +0.001 Load ST to us). A 4" PC is a giant: Charge normal costs for Size +2, Combat ST 20 or so, Load ST 50 or so, etc.

Combat

Combat works the same regardless of base scale or units. TH modifiers based on Size differences do not change. Ranged combat TH is the same whether a 2" target is Size -9 (-9 TH) at a distance of a yard-long hex (+2 TH), or Size 0 (+0 TH) at a distance of thirty-six inch-long hexes (-7 TH). (Results may vary slightly with base scale, only because of rounding of numbers or level cutoffs.)

Superpowers in odd-sized games

The "correct" way to scale magic, psi, or superpowers under a new base scale depends on the desired effect: Does the game call for 2" PCs to throw full-size fireballs or little smoke puffs?

You'll normally want to scale powers to the base scale, multiplying size and effect by Linear, Area, or Volume Scale as appropriate, such as Linear Scale for damage effects: A minihuman's fireball does 3d damage in tiny HP units.

But some scalings require consideration. *Example:* Given the high mobility of tiny creatures, the *square root* of Linear Scale may be the best way to scale actual linear dimensions, like spell ranges or the height of an Ice Wall. See B8 for more.

Superpowers in odd-sized PCs

What about PCs whose size is odd for the base scale (including normal human games)? Again, powers should be matched to the base scale: By default, a 2" PC in a normal-sized game pays for and throws the same big fireballs that 6" PCs hurl.

Exceptions are up to the GM's sense of what's "right" in the game. The PC could be given scaled versions of his powers, at changed cost. But one suggested *no cost* effect: When a small PC uses a power against a large target, allow the target +1 per level of Size difference on any resistance rolls.

Game Worlds

Small worlds

Facts of life for thumb-sized PCs: Environmental dangers will have harsh effects (p 15). Food needs are high. Kinetic force is ineffective with tiny weights; punches and hurled pebbles won't have much effect. Clothing will be relatively thick and stiff, a tiny "campfire" will burn out in seconds, and mini guns or machines are questionable.

Feel free to ignore all that, as fiction does. *Do* keep the *fun* things that fiction also ignores: Tiny PCs will have excellent natural encumbrance and mobility, jumping and climbing everywhere. (Unmapped basic combat may be a good idea.) They can heft what look like ridiculously large (but are really just amazingly *light*) objects, and are almost immune to falls. Scaled-down equipment will be remarkably sturdy for its weight.

Size -9 is fun: The physics are different but not *too* strange. And one hex really equals one inch!

Big worlds

Life for giants is just the opposite. Despite huge strength, the weights of tools and giants' own bodies are even more ponderous. Climbs and jumps are tough; falls are deadly. Weapons and other tools will need to be small relative to wielder size.

Fiction usually gets this backward, with giants wielding props overly *large* for their size. Allow this in cinematic games by boosting ST, cutting weights, or simply invoking visual special effect.

MORE TOYS!

Optional Rules for Defenses

High skill in **GURPS** too often leads to elite fighters choosing some tiny vital target on the foe (with TH to spare, why not?), over and over, waiting for the critical hit that's the only way to get by the foe's "unbeatable defenses". Optional fixes:

Smart tactics

Use feints, rear attacks, missiles, wrestling, and other intelligent tactics to get by high defenses.

Fast blows

Skilled fighters may throw faster-than-normal blows, reducing a foe's defenses by -1 for every -2 taken on TH. Fast blows can be used together with any melee skill, maneuver, AOA option, Feints, etc., but may not reduce TH below 12.

Benefits: This rule replaces *CII*'s "Only the Best Shall Win" rule. It boosts the power of skilled fighters less than that rule does, and only comes into play if a fighter *chooses* the option, rather than complicating every attack by every fighter.

Declaring defenses

GURPS allows all fighters the mysterious ability to foretell whether an attack will hit or not, and base defense decisions on that knowledge.

Remove that ability. Defenders must declare a specific defense after an attack is launched (the sword moves, the gun barrel points, etc.) but *before* TH is rolled.

The defense is used up whether the blow turns out to be accurate, misses, or never comes (i.e., is a Feint – though if you win the feint Contest, you see the ruse and don't waste the defense).

If you *don't* defend and the blow misses, you lucked out. If it is accurate, you are about to be hit and may make a last-chance panic defense, at -1 vs a melee attack, -2 vs a thrown weapon, -4 vs a missile like an arrow, -8 vs a bullet, -16 vs a hypervelocity round, and no chance vs a laser.

Benefits: Whether to spend or save defenses becomes a tougher choice. Also, there is a distinction between defending against the perceived *path* of a missile vs Dodging the *missile itself*.

Precognition: Precognitive abilities let you use normal **GURPS** rules, i.e., declare a defense *after* TH is confirmed, with no "last second" penalties.

Limits on Dodges and Retreat

Apply a cumulative -1 penalty to each Dodge after the first in a turn.

A Retreat for the full +3 AD bonus requires full Move remaining (backward movement prior to Retreat does not count against this). With between half and full Move remaining, the bonus is only +2; with less than half Move remaining, +1. A fighter who has used all his Move can not Retreat.

Separate AD and PD

Instead of adding Passive Defense (PD) to Active Defense (AD), keep them separate:

AD roll = 2 + the chosen Active Defense score.

PD roll = 2 + the total of all passive defenses.

If an AD roll fails, a PD roll provides a second chance. Non-defending targets get a PD roll only.

Shields: With a Block, shield PD adds to the AD roll *only*; without a Block, to the PD roll *only*.

Benefits: GMs know instantly how a blow was avoided. Minimum defense rolls become 3 if a character has any defenses at all. Active Defense rolls are boosted for non-fighters, but lowered to manageable levels for armored, skilled warriors.

Critical hits

Do not increase the chance of critical hits for skilled fighters; use 3 or 4 on 3d for *all* fighters. Let skilled fighters beat defenses through skill – i.e., smart tactics and fast blows – not dumb luck.

Optional Rules for Damage

New Toughness trait

Rename **GURPS'** Toughness "Soft DR", or toss it out. The Toughness below is a *different* animal:

Every creature has automatic, *free* Toughness equal to Combat ST /5, rounded down. (Halve for hands, feet, groin, nose, and throat. Eyes have no Toughness, and the brain has DR instead.)

Multiply basic hits that get through DR for damage type, location, etc., as always. *Now* subtract Toughness from remaining damage – but only from *basic* hits that got through, representing bruising force, and not from *extra* hits for damage type or location (Toughness doesn't reduce these).

Benefits: This realistically models how big muscles can shrug off a punch, but lessen a slash only partly, a knife to the vitals very little. On the down side, it adds an extra stat, and all damage gets reduced by Toughness, affecting play balance.

Revised ST damage

Rework thrust damage from Combat ST, per the sidebar: 1d per ST 10. For higher ST, keep the same progression, adding 1d per additional ST 10: ST 52 = 5d+1, ST 639 = 63d+3, etc.

For swings, use damage for Combat ST x 1.5. (However, limit additional damage dice from a swing to the square root of weapon weight in lbs.)

Benefits: Damage scales neatly with Combat ST; that mini table is all that's needed for any ST score! On the down side, damage gets raised for all combat blows, affecting play balance.

Both rules together

The higher damage from the ST Table and the reduction from Toughness balance each other perfectly. Together the two rules add a great realistic feel to combat, and more reasons to buy high ST.

Die, Monster, Die!

Does it seem wrong that slaving huge monsters swoon and pass out in fights just like PCs, instead of raging up to the killing sword stroke? If so, try this:

For monsters with IQ below 10, allow a +1 per point of IQ under 10 on rolls to resist unconsciousness from injury. But multiply effective "knocked out" HP below 0 by (IQ/10), for all purposes.

Example: A HP 120, IQ 2 giant mauve worm resists passing out from wounds at +8. But while it has full HP above 0, it has only 1/5 as much – effective HP 24 – below 0. It makes death rolls at -24 HP and every -12 HP thereafter, with automatic death at HP -120.

Size Without Natural Encumbrance

If you don't use natural encumbrance rules, multiplying Move by Linear Scale is too drastic an adjustment for size. Instead, multiply Move as if Size were *half* what it is. Round favorably.

Change the cost of Size to [3/level], for either large or small Size.

Example: Without natural encumbrance rules, a Size -5 creature adjusts Move using Linear Scale for Size -2, or x1/2. Its Size costs [15].

New ST Table

Damage is 1d per 10 Combat ST:

Combat ST	thrust dmg
10-11	1d
12-13	1d+1
14	2d-2
15-16	1d+2
17	2d-1
18-19	1d+3
20-21...	2d...

For ST under 10, take damage for a multiple above 10 and divide appropriately. Or use the p 15 low damage rolls.

USEFUL TABLES!

Scale Table

Size	Spd/Rng	Linear Dim.	Linear Scale	Area Scale	Volume Scale
+10	-10	100 yds	x50	x2000	x100K
+9	-9	70 yds	x30	x1000	x30K
+8	-8	50 yds	x20	x500	x10K
+7	-7	30 yds	x15	x200	x3000
+6	-6	20 yds	x10	x100	x1000
+5	-5	15 yds	x7	x50	x300
+4	-4	10 yds	x5	x20	x100
+3	-3	7 yds	x3	x10	x30
+2	-2	4.5 yds	x2	x5	x10
+1	-1	3 yds	x1.5	x2	x3
0	0	2 yds	x1	x1	x1
-1	+1	1.5 yds	x2/3	x1/2	x1/3
-2	+2	1 yd	x1/2	x1/5	x1/10
-3	+3	2 ft	x1/3	x1/10	x1/30
-4	+4	1.5 ft	x1/5	x1/20	x1/100
-5	+5	1 ft	x1/7	x1/50	x1/300
-6	+6	8 in	x1/10	x1/100	x1/1000
-7	+7	5 in	x1/15	x1/200	x1/3000
-8	+8	3 in	x1/20	x1/500	x1/10K
-9	+9	2 in	x1/30	x1/1000	x1/30K
-10	+10	1.5 in	x1/50	x1/2000	x1/100K

Encumbrance Table

WSR	Enc Level	Half Mod	Full Mod	Move Mod	Point Cost	Enc Fact.	MSR
0.07	Neg 10	5	10	x20	200	1	0.07
0.15	Neg 9	4	9	x15	170	1	0.15
0.3	Neg 8	4	8	x10	155	1	0.3
0.7	Neg 7	3	7	x7	125	1	0.7
1.3	Neg 6	3	6	x5	110	1.1	1.5
2.5	Neg 5	2	5	x3	80	1.2	3
5	Neg 4	2	4	x2	65	1.4	7
10	Neg 3	1	3	x1.5	35	1.5	15
12	Neg 2	1	2	x1.2	25	1.6	20
14	Neg 1	0	1	x1.1	5	1.8	25
17	None	0	0	x1	0	2	35
19	Light	-1	-2	x4/5	-10	2.5	50
21	Med.	-2	-4	x3/5	-20	4	100
27	Heavy	-3	-6	x2/5	-30	7	200
35	X-Hvy	-4	-8	x1/5	-40	20	700
45	S-Hvy	-5	-10	x1/10	-50	65	3000
55	Extr. 1	-6	-11	x1/15	-51	inf	7000
65	Extr. 2	-6	-12	x1/20	-52	inf	15K

Extra Encumbrance Table

	levels of trait				
	0	1	2	3	X
None	17	18	19	21	15+2X
Light	19	21	23	27	15+4X
Medium	21	24	27	33	15+6X
Heavy	27	33	39	51	15+12X
X-Heavy	35	45	55	75	15+20X
S-Heavy	45	60	75	105	15+30X
Extreme 1	55	75	95	135	15+40X
Extreme 2	65	90	115	165	15+50X
Extreme 3	75	105	135	195	15+60X
Extreme 4	85	120	155	225	15+70X



Square Root Table

value	Col 1	Col 2
0.01 – 0.02	0.12	x1/100
0.02 – 0.05	0.15	x1/70
0.05 – 0.1	0.25	x1/50
0.1 – 0.2	0.4	x1/30
0.2 – 0.5	0.5	x1/20
0.5 – 1	0.8	x1/15
1 – 2	1.2	x1/10
2 – 5	2	x1/7
5 – 10	3	x1/5
10 – 20	4	x1/3
20 – 50	6	x1/2
50 – 100	8	x2/3
100 – 200	12	x1
200 – 500	18	x1.5
500 – 1K	25	x2
1K – 2K	40	x3
2K – 5K	50	x5
5K – 10K	80	x7
10K – 20K	125	x10
20K – 50K	175	x15
50K – 100K	250	x20
100K – 200K	400	x30
200K – 500K	500	x50
500K – 1M	800	x70
1M – 2M	1200	x100

Column 1 gives the square root of the value; Column 2, a multiplier for the square root of (value/150).

Use to find square roots involving mass, weight, or any value.



Jumping Angle Table

angle	height	distance
90°	x1/2	x0
75°	x9/20	x1/2
60°	x3/8	x9/10
45°	x1/4	x1
30°	x1/8	x9/10
15°	x1/20	x1/2
0°	x0	x0

Huge Weapons Table

weapon Size minus target Size	effective target Size	Dodge penalty
-3 or smaller	use target Size	0
-2	use target Size +1	-2
-1	use target Size +1	-4
0	use target Size +2	-6
+1	use weapon Size +1	-8
+2	use weapon Size +1	-10
+3 or larger	use weapon Size	-12+

Parry/Block Penalty Table

Ratio of attack oomph to defense oomph	Parry/Block penalty
less than x1.5	0
x1.5	-1
x2	-2
x3	-3
x5	-4
x7	-5
x10	-6

Slam Table

degree of success	loser's change	winner's change
less than 10	x1/2	x1/2
10-19	x2/3	x1/3
20-29	x3/4	x1/4
30-49	x4/5	x1/5
50-99	x9/10	x1/10
100 or more	x1	x0



Extra Effort Table

activity	penalty	extra effect
lifting	-1	+10% Load ST
movement	-1	+5% Move
jumping	-1	+5% Jd
throwing	-1	+5% Td
Active Defense	-2	+1 AD
generic athletic skill	-2	+1 skill

Move and Fatigue Table

Move is greater than. . .	type of Move	fatigue interval
0	slow ("walking")	hour
x1/3	brisk ("jogging")	10 minutes
x1/2	very brisk	1 minute
x2/3	fast ("running")	20 seconds
x1	sprint	10 seconds
x1 + Sprint bonus	Extra Effort sprint	1 second

Formulae

Jumping distance (Jd) = lower of:

- Load ST x Linear Scale x 15 x enhancements / mass
- Speed x Linear Scale x enhancements

Throwing distance (Td) = lower of:

- Load ST x Linear Scale x 10 / (arm mass + object mass)
- Speed x Linear Scale x 10
(arm mass = body mass/50)