

GALACTIC

Science Fiction Adventures

Designed, Written, and Illustrated by David Johansen
Edited by Troy Desrosiers

Playtested by William McConnell, Roseanna McConnell, Richard, Amber Johansen,
Michael Roberts, Mary Roberts, Corinna Bachand, Barry Abbot

Special Thanks To: James Hargrove, Darth Tang, Cessna, Grubman, Doc Rotwang, Winna,

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INTRODUCTION

Galactic Adventures is a science fiction roleplaying game. This first volume is strictly a book of rules. The objective behind the design of these rules is to provide a complete game in a single book of a reasonable page count and price. A related objective is avoiding endless extra books containing essential rules and endless, incompatible, new editions. The author has spent a great deal of time trying to get things right, instead of rushing to press with the first untested concepts he penned some twenty three years ago.

There is no setting provided in this book. The alien races given as examples are deliberately generic and dull, if exceedingly common in the genre. One major feature of Galactic Adventures is its ability to emulate the settings of science fiction novels, movies, and television shows. The strong focus on effects, in the rules for designing devices, allows one to call a Technology Level fifty power plant a fusion reactor or a dark matter sink, as the setting requires. There are also rules for creating races, worlds, and psychic powers. Not only does this allow existing settings to be used, it allows cross setting "who would win" scenarios to be played out.

The rules themselves use a simple and direct percentile "roll-under" skill mechanic, which while common and unoriginal, works well and is easy to learn. In fact, while these rules may appear to be complex and involved, that is simply because the whole game is here, instead of lurking in a two year long release schedule of supplements. The reader won't have to wait for years to have a complete set of rules, only to have them replaced by a new edition.

The Obligatory How To Roleplay Bit

Storytelling and make-believe are the fundamental roots of roleplaying games. In essence, a group of players get together and make up a story together. One player must take on the duties of the narrator, referee, and director. This task is often referred to as running the game, or game-mastering. I prefer referee so I've used it throughout Galactic Adventures to refer to that particular player. The referee or game-master describes the world to the other players, telling them what their characters see, hear, and smell, much like the narrator of a story might describe a scene, as well as portraying the people they meet, and adjudicating the rules. Each of the other players create an individual protagonist or player character whose actions they describe as they encounter the situations and people presented by the referee.

Roleplaying games are inherently a cooperative endeavour. There is no winner or loser, rather, success is found in achieving character goals and the development of a continuing story. You may be wondering, if this is such a simple, friendly game, in which there isn't even a winner or loser, why there are so many rules.

In part, these rules help to define the world, how fast a character can run or who is the better musician, for example. In particular, the rules create a method of relating the relative capabilities of various individuals and measuring the results should they come into conflict. Equally important is the role of the rules in balancing the power of the referee. Roleplaying games are a social activity, and social conflicts within a group may occasionally spill over into the game. This is only natural, but at the same time, the referee is in a position of considerable power and authority. Nothing is less enjoyable than a referee who abuses the trust of the other players by using their broad mandate to bully the players or carry out personal vendettas. For this reason, I strongly suggest that the players should have an equal say in the implementation of any optional or house rules.

A friend of mine once said that a roleplaying game was mainly an excuse to sit around with his friends eating junk food and drinking pop, while smacking people with a foam-rubber baseball bat. I couldn't agree more. While a lot has been said about the art of telling a story, designing a scenario, and portraying a character, roleplaying games are mainly about getting together with your friends and having a good time.

CORE RULES

Galactic Adventures is a character driven game system. That is to say that all of the rules are derived from a core set of rules that are used to define the capabilities of the characters who inhabit the setting. These core rules cover the development of character backgrounds and the growth of skills through training and experience and the use of skills to accomplish tasks.

A character could be a robot, an alien, or even human. For the sake of building a functional simulation, they all have the same eight statistics: Coordination, Discipline, Endurance, Logic, Strength, Perception, Reflexes, and Talent. These and any skills the characters have learned are rated on a scale where humans have statistics that range from one to one hundred, with a fifty representing an average individual.

Success Rolls

These ratings are also used as the average percentage chance of successfully completing a task that would challenge a professional. In play, the success of most actions is determined by modifying the character's rating to reflect the circumstances and rolling a ten-sided die twice, reading the first roll as "tens" and the second as "ones" or, in other words, adding ten times the first roll to the second roll. A roll of two zeros is read as a result of one hundred (00=100). If the result of this "percentile" roll is equal to or less than the character's modified rating, the action succeeds.

The mechanism of determining success by rolling under a rating is often criticized because high ratings often exceed the range, making failure impossible. In Galactic Adventures, a wide variety of voluntary modifiers are available to enhance the chance of success or improve the results that are achieved. For instance, a scientist might reduce their chance of success to produce extensive documents that will act as a penalty for anyone trying to disprove their results. Generally speaking, these effects are self limiting, a one hundred percent chance of success needs no additional effort and reducing the chance to zero to gain improved results is futile.

Unskilled Actions

While all skills have a default value based on half of a related Statistic, it should be understood that tasks that require a professional degree of training (like brain surgery) are generally attempted with a penalty and time constraints that will generally prevent the unskilled from succeeding.

Marginal Success

A roll of 01-10 indicates a less than impressive, but still successful result. A real professional will want to do it over.

Hasty and Cautious Actions

Just a little more time is often all it takes to overcome the difficulties involved in a project. A ten point bonus is gained for each doubling of the time spent. Similarly, a ten point penalty is suffered each time the time spent is halved. A different method is used in combat, in which the combatants normally act in order of their Reflexes, but can reduce their rating for a bonus to their actions or decrease it in exchange for a penalty.

Assisted Actions

Many activities are best attempted by a team of skilled individuals. This has the simple effect of allowing the time needed to complete the job to be divided by the number of workers. The skill rating used is generally that of the team's leader, but, if more than half of the team is made up of people with a skill more than twenty points lower than the leader's there is a twenty point penalty.

Computers

Computers have skill ratings which they can be instructed to use on a character's behalf. However, a computer that is not connected to an appropriate set of robot arms (really big ones being useless for surgery, for instance) can only assist in an action as if it were an additional person. Computers can only make up half of the workforce on any project that requires hands.

Resisted Rolls

When two characters engage in a directly competitive activity such as arm wrestling, both contestants roll against their rating. If only one succeeds they are the winner. If both succeed, the individual with the higher rating wins. When both fail, they reach a stalemate and may break off or continue. Either contestant can opt to reduce their chance of success to reduce their opponent's chance by a like amount. Similarly if both contestant's agree to it, they may both take an equal bonus to their chance. Otherwise an arm-wrestling match between mice would last a very long time.

Risky Actions

Some actions have negative consequences. If a "Risky" action fails, roll again against the same modified rating immediately to try avoiding the consequences.

Example: a climbing character would not gain any ground if their success roll failed, but would fall if they failed the second roll.

CREATING A CHARACTER

A complete discussion of what the various skills and statistics mean can be found beginning on page 20.

1. Select the character's race.

The character's race is a fundamental feature in determining their statistics, personality traits, and may even provide some special abilities such as faster movement or natural weapons. The races available in a given setting will strongly affect its tone and style, so the referee must be consulted as to which races are allowed.

A list of generic races can be found on page 18.

Example: Nathaniel Black is a human.

2. Record any racial traits.

Not all races will have the same capabilities, and these differences should be recorded.

3. Generate Statistics

A character's initial ratings in their Statistics can be determined randomly or by distributing a pool of points between them.

To generate statistics randomly, roll a percentile for each in turn, adding forty to rolls from one to forty. When choosing a character's statistics, they each start at fifty, plus 1d10. The person creating the character then distributes forty points between the Statistics as they wish. Characters with ratings below forty are either children or crippled, and as such cannot be created by either method.

Example: Rolling the dice for Nathaniel Black's Statistics, gives him:

<i>Coordination</i>	53
<i>Discipline</i>	21 + 40 = 61
<i>Endurance</i>	79
<i>Logic</i>	57
<i>Perception</i>	79
<i>Reflexes</i>	17 + 40 = 57
<i>Strength</i>	92
<i>Talent</i>	63

4. Spend 50 points on skills.

In the time between the character's birth and maturity, they will have learned some skills. 50 points should be divided between whichever skills the player feels reflect their character's background. All skills have an initial value of ½ of their related statistic or 20 points lower than their best skill in the same category, whichever is greater. It doesn't hurt to check the requirements for a career that the character may wish to enter before spending these points.

Example: As a robust and large youth, we decide to focus on Nathaniel Black's Athletic skills.

<i>Climb (Coordination)</i>	26 + 5 = 31
<i>Marathon (Endurance)</i>	39 + 5 = 44
<i>Sprinting (Strength)</i>	46 + 5 = 51
<i>Swimming (Endurance)</i>	39 + 5 = 44
<i>Tackle (Strength)</i>	46 + 10 = 56
<i>Grapple (Coordination)</i>	26 + 10 = 36
<i>Wheeled Vehicle (Reflexes)</i>	28 + 10 = 38

5. Roll 2d10 x 50 mu (monetary units) for Savings

This roll also reflects the character's initial social standing as a wealthy family will generally have a higher place in society.

Example: We rolled a 12 for Nathaniel Black's savings, so he has 600 monetary units in the bank.

6. Select a Career

At this point, the character is 18 years old (or whatever alien age of majority might apply) and may wish to undertake a career. The career list is broken into Military, Mainstream, and Fringe careers. Each career has some requirements that must be met before the character can work in that field. It may be necessary to go to school in order to get the job. A notation of "Atomic Physics 60+" indicates that a rating of 60 or more is needed in the Atomic Physics skill before the character can enter the career.

The Career List Begins on page 7.

Example: Taking a look at the career list, we decide that Nathaniel Black should join the infantry.

7. Apply skill increases

Each year, a career will provide some “elective skill points” which can be applied to any skill the player wishes and some career skill points which can only be applied to the Career Skills listed. Because a more skilled character has difficulty finding teachers and new experiences, the number of points which can be added to a skill at one time is limited by the character’s current rating as shown below. Note that the limited annual development rate is for skill increases, age related skill decline can be paid for without concern for this limit. If the skill is at least twenty points lower than the best skill the character has in the same category, it is improved at half cost, but the maximum annual increase stays the same.

Limits To Annual Development Table:	
Current Rating	Maximum Development
01-39	15
40-69	10
70-89	5
90-99	1
00+	0

Some careers have a “Basic Training Skills” package which is received in the first year of the career instead of any elective or career skill points. These are generally entry level careers which include on the job training. A basic training package cannot increase a skill by any more points per year than normal training. In those rare instances where a Basic Training skill increase exceeds the maximum points per year, the remaining skill points must be spent on other career skills.

Some careers have a list of “Rank Skills”. For each of these which reaches the required rating, the character increases their rank in that career by one.

Example: Writing down the Basic Training Skills for the infantry, in his first year, Nathaniel gets:

<i>Rifle (Coordination)</i>	$26 + 10 = 36$
<i>Woodland Survival (Endurance)</i>	$39 + 5 = 44$
<i>Punching (Coordination)</i>	$26 + 10 = 36$

8. Roll For Events

For each year of prior experience, roll a ten-sided die and if the roll is under the number of years of prior experience taken so far, or under the number of years since the last event, an event occurs. The player must roll for an event on the appropriate table for their current career and write the results on their character sheet.

The event tables begin on page 5.

Example: Nathaniel’s event roll for the first year is a one, so his player rolls on the Military Event Table, which results in him getting wounded. Rather than spend a year in Education, Nathaniel decides to move on with his life and finish his character.

8. Select a Piece Of Gear

While in a career, the character obtains some of the tools of the trade, so for each year spent, pick one piece of the equipment listed for the career or 100 additional monetary units. Each year, the character also gains monetary units equal to the career’s Income + (Rank x 100) .

Example: The first year, Nathaniel manages to hold onto his service autorifle.

9. Continue In or Change Career

After each year, the player can choose to change the character’s career or continue for another year in their current one until they want to stop. As the character ages, their physical skills and statistics with high ratings will decline 5 points each year, as shown in the “Aging Table”. The Statistics and Skills affected by aging are Coordination, Endurance, Strength, Perception, Reflexes, and all skills in the Athletic, Energy Weapons, Firearms, Melee Weapons, and Unarmed skill categories. Any racial Statistic modifiers should be added to the Rating Affected column before applying aging results.

Aging Table	
Equivalent Human Age	Rating Affected
30+	90+
40+	80+
50+	70+
60+	60+
70+	50+
80+	40+
90+	30+
100+	20+

Example: Spending another year in the infantry lets us add fifteen points to any of the career skills listed and five points to any skills we want and pick another item. We could continue with character creation until he gets old and dies, but at this point, Nathaniel Black's Character Record looks like this:

Nathaniel Black
Age: 20
Human

Age Multiplier: x 1
Eye Sight Range: -10 / 200 metres
Preferred Light: day
Running Rate: x 1
Swimming Move: x ½

Statistics:

Coordination	53
Discipline	61
Endurance	79
Logic	57
Perception	79
Reflexes	57
Strength	92
Talent	63

Skills:

Climb	31
Marathon	44
Sprinting	51
Swimming	44
Tackling	56
Grappling	36
Wheeled Vehicle	38
Rifle	36 + 2 = 38
Woodland Survival	44
Punching	36
Outdoor Stealth (C)	26 + 4 = 30
First Aid (D)	30 + 5 = 35
Joint Lock (C)	26 + 4 = 30
Electronics (L)	28 + 5 = 33

Equipment: Flak Jacket, Autorifle

Education Events

- roll on the Personal Event Table
- roll on the Social Event Table
- discover hidden talents: +5 to an Artistic skill for free
- meet interesting people: +5 to a Social skill for free
- take a business program: +5 to an Administration skill
- get in shape: +5 to an Athletic skill for free
- run wild and party hard: gain no skill points this year
- gain a scholarship +2D10 x 500 mu
- wash out: cannot take Education next year
- roll on the Family Event Table

Family Events

- family member goes missing
- family member becomes rival
- family member becomes nemesis
- family member becomes enemy
- family member or you divorces
- family member or you marries
- child is born into family
- emulate a family member's positive trait
- pick up a family member's negative trait
- family member dies, Inherit 2d10 x 500 mu

Fringe Events

- roll on the Personal Event Table
- roll on the Social Event Table
- what a crook!: gain a criminal nemesis
- an offer you can't refuse: gain a criminal enemy or patron
- get caught: 1d10 years in jail and gain a criminal record
- make a bundle: income +1000 this year
- gain a criminal friend
- meet the right people: gain a business patron
- shouldn't have refused: roll on the Injuries table
- roll on the Family Event Table

Mainstream Events

- roll on the Personal Event Table
- roll on the Social Event Table
- gain a business friend
- gain a business rival
- get a raise, increase income by 100
- heavy work load: free +5 to a career skill
- get a better offer, increase income by 200
- get drafted, spend next 3 years in military
- swept up in unexpected events: end prior experience
- roll on the Family Event Table

Military Career Events

- roll on the Personal Event Table
- roll on the Social Event Table
- promoted: rank +1
- transferred: change service branch
- decorated: +5 to Leadership skill free
- wounded: roll once on the Injuries table
- gain a military friend
- gain a military patron
- gain a military rival
- roll on the Family Event Table

Personal Events

- 1 fall in love
- 2 new hobby: free +5 to a skill in a new category
- 3 pinch some pennies: +500mu
- 4 fitness kick: +5 to an Athletic Skill for free
- 5 self improvement: add a positive trait
- 6 put on a few pounds -5 to Endurance or Reflexes
- 7 free time: +5 to any skill that isn't occupational
- 8 this book changed your life: +5 to a Sociology skill
- 9 try to improve your image: +5 to a Social skill
- 10 win a small prize, gain 1d10 x 100 mu

Prison Events

- 1 gain a criminal friend
- 2 gain a criminal rival
- 3 gain a criminal nemesis
- 4 one year off for good behavior
- 5 one year more for bad behavior
- 6 escape: limited to fringe careers, double future jail time
- 7 take a class: +5 to any one skill
- 8 can't take it any more gain a negative trait
- 9 get therapy: loose any one trait
- 10 roll on the family event table

Social Events

- 1 gain a military friend
- 2 gain a criminal friend
- 3 gain a law enforcement friend
- 4 gain a judicial friend
- 5 gain a religious friend
- 6 gain an educator friend
- 7 gain a patron in current career
- 8 gain a rival in current career
- 9 roll on the Unusual Events table
- 10 gain a business friend

Unemployed Events

- 1 roll on the Personal Event Table
- 2 roll on the Social Event Table
- 3 get drafted: spend 3 years in the military
- 4 do charity work: gain a positive trait
- 5 watch tv: gain a negative trait
- 6 put on a few pounds -5 to Endurance or Reflexes
- 7 read a book: +5 to a mental Statistic
- 8 go camping: +5 to an Outdoors skill
- 9 get therapy: lose any one trait
- 10 roll on the Family Event Table

Unusual Events

- 1 friend becomes rival or vis versa
- 2 patron becomes enemy or vis versa
- 3 assaulted: gain a negative trait
- 4 robbed: gain a negative trait
- 5 defrauded: gain a negative trait
- 6 accused of robbery: spend two years in jail
- 7 convicted of assault: three years in jail
- 8 convicted of fraud: spend one year in jail
- 9 win a big prize: +1000 x 2d10 mu
- 10 friend becomes nemesis or vis versa

Personality Traits

Positive			Negative	
Aggressive	&		Passive	
Calm	&		Temperamental	
Contented	&		Greedy	
Empathic	&		Cruel	
Generous	&		Miserly	
Honest	&		Dishonest	
Industrious	&		Lazy	
Modest	&		Sleazy	
Patient	&		Rude	
Sober	&		Rowdy	
Brave	&		Cowardly	
Cheerful	&		Depressed	
Diplomatic	&		Offensive	
Friendly	&		Antagonistic	
Gentle	&		Sadistic	
Humble	&		Proud	
Loving	&		Hateful	
Outgoing	&		Shy	
Physical	&		Cerebral	
Practical	&		Imaginative	
Thrifty	&		Wasteful	

Injuries

1	Foot:	-10 Strength -5 Reflexes
2	Leg:	-15 Strength -10 Coordination -5 Endurance -5 Reflexes
3	Hand	-5 Coordination -5 Strength
4	Arm:	-10 Coordination -10 Strength
5-6	Chest:	-15 Endurance -5 Strength
7	Abdomen:	-10 Endurance -5 Strength
8	Head:	-5 Logic -5 Talent -5 Discipline
9	Eye:	-10 Perception
10	Ear:	-5 Perception

PRIOR EXPERIENCE

In order to enter a career, your character must have at least the required ratings in all of the Statistics and Skills listed.

Education

A character may wish to go to school to gain extra skills or prepare for a career. Each year spent in school, 1000 monetary units are subtracted from the character's savings, and 25 points are gained to divide between skills. The distribution of these points are limited by the normal Annual Expenditure restrictions just like points from careers. It is possible to accrue student debt up to 10 000 mu.

Unemployed

At times, it may be hard to find work. If desired, the character can end character creation in lieu of spending time unemployed. An unemployed character gains 20 points to divide between skills, subject to the normal annual restrictions. Each year spent unemployed costs the character 500 mu until they are broke and government dole kicks in preventing their savings from falling lower.

Jail

Prisons are generally enlightened institutions where the prisoners are rehabilitated with the intention of returning them to society. Of course, having a criminal record severely curtails their ability to re-enter society, such are the ironies of enlightened societies.

Military Careers:

Once your character has entered a specific branch of the military, they can only change their branch of the services by being honorably discharged and reenlisting or transferred by an event. If a character acquires a criminal record, they have been court-marshaled and are dishonorably discharged after serving any prison time. A character who has been dishonorably discharged cannot take a military or law enforcement career ever again.,

Aerospace Force

With runway to runway space-planes becoming commonplace, air forces extend their jurisdiction into orbit. The pilots get all the glory in the A.S.F., but support crew and technicians make up the bulk of the organization.

Income: 400

Required Statistics 50+:

Perception, Coordination, Logic, Reflexes

Basic Training Skills: Pistol +5, "Environment" Survival +5, any Technical +15

Rank Skills (+1 rank if 40+): Leadership, Management, Strategy, Fixed Winged Aircraft

Elective Skills: 5 points/year

Career Skills (15 points/year): Pistol,

"Environment" Survival, Space Craft,

Fixed Wing Aircraft, VERTOL, Sensors, Energy

Gunner, Projectile Gunner, Electronics,

Machinist, Mechanic, Rifle, Fist, Kick, First Aid,

Leadership, Navigation, Computer

Gear: Flight Suit, Auto Pistol, Survival Kit, Tool Kit,

Auto Rifle, Light Body Armor, First Aid Kit,

Dress Uniform, Portable Computer

Cavalry

As vehicles grow more complex, the army's vehicle crews become more specialized and make up the bulk of the fighting troops. Infantry is used more in specialized situations like counter insurgency and special operations, while battles are fought with armored fighting vehicles supported by troops in armored personal carriers and VERTOLs.

Income: 400

Required Statistics 50+: Discipline, Endurance, Logic

Basic Training Skills: Rifle +5, Gunner +5,

"Environment" Survival +5, any Technical +10

Rank Skills (+1 rank if 40+): Leadership, Management,

"Ground" Vehicles, Strategy

Elective Skills: 5 points/year

Career Skills (15 points/year): Rifle,

"Environment" Survival, Leadership,

Tracked Vehicles, Wheeled Vehicles,

Legged Vehicles, Pistol, Gunner, Mechanic,

Electronics, Projectile Gunner, Sensors,

Navigation

Gear: Auto Pistol, Flak Jacket, Combat Helmet,

Portable Computer, Tool Kit

Deep Space Force

Personnel patrolling deep space must endure long periods of separation from human society. The Deep Space Force is the space navy and expeditionary force, but may also take a hand in exploration or piracy depending on the government it serves.

Income: 400
Required Statistics 50+: Coordination, Discipline, Logic, Talent
Basic Training Skills: Astronaut +10, Sensors +10, Energy Pistol +5
Rank Skills (+1 rank if 50+): Leadership, Management, Diplomacy, Strategy
Elective Skills: 5 points/year
Career Skills (15 points/year): Electronics, Mechanic, Machinist, Energy Gunner, Space Craft, Energy Rifle, Grappling, First Aid, Astrophysics, Newtonian Physics, Astronaut Nuclear Physics, Quantum Physics, Sensors, Energy Pistol
Gear Light Space Suit, Portable Computer, Laser Pistol, Space Suit, Tool Kit, Laser Rifle, Hand Scanner, Portable Computer

Infantry

Space craft and vehicles generally reduce the use of infantry in warfare. The average foot soldier is still needed for police actions, counter insurgency, and garrison duty. Armored infantry fighting vehicles still support battle tanks, providing protection from infantry with antitank weapons.

Income: 400
Required Statistics 50+: Endurance, Strength
Basic Training Skills: Rifle +10, "Environment" Survival, +5, any Unarmed +10
Rank Skills (+1 Rank if 40+): Leadership, Management, Navigation, Strategy
Elective Skills: 5 points/year
Career Skills (15 points/year): Pistol, Submachine Gun, Knife, Support Weapons, First Aid, Grapple, Joint Lock, Navigation, Sensors, Stealth, Rifle, Wheeled Vehicles, Rotary Winged Aircraft, VERTOL, Demolition, Fist, "Environment" Survival
Gear: Auto Rifle, Auto Pistol, Submachine Gun, Combat Knife, Hand Scanner, Sniper Rifle, Portable Computer, Light Body Armor, Intruder Armor

Military Intelligence

Information can win wars. Every military service has an intelligence branch, which responsible for information gathering. Intelligence officers are responsible for everything from satellite surveillance to actual espionage.

Income: 600
Required Statistics 70+: Perception, Coordination, Discipline, Logic, Talent
Required Skills 60+: Politics, History, Sensors, Stealth
Base Rank: 3
Rank Skills (+1 Rank if 40+): Leadership, Management, Strategy, Diplomacy
Elective Skills: 5 points/year
Career Skills (15 points/year): Energy Pistol, Throws, Duping, Speak "Language", Read "Language", "Environment" Survival, Psychology, Criminology, Fist, Kick, Grapple, Joint Lock, Swim, Astronaut
Gear: Holdout Laser, Armored Clothing, Listening Device

Military Medic

In war people get hurt. Military forces always have a corps of trained medics to deal with the injured in the field and get them to the doctor in time. Medics are important to the morale of the troops and often have greater leeway with the officers than the average soldier.

Income: 500
Required Statistics 60+: Reflexes: Perception, Coordination, Discipline, Logic
Required Skills 50+: First Aid, Medical Sensors, Pharmaceuticals, Pistol
Base Rank: 2
Rank Skills (+1 Rank if 50+): Leadership, Biology Management, "Race" Medical,
Elective Skills: 5 points/year
Career Skills (15 points/year): Grappling, Intrusion, "Environment" Survival, Biochemistry, Pharmaceuticals, Genetics, Pistol, "Race" Medical, Energy Pistol, Psychology
Gear: Auto Pistol, Trauma Kit, Med Scanner, Flak Jacket

Navy

On many worlds, great oceans are still patrolled by ocean going ships. Military submersibles, aerospace craft carriers, and missile defense ships all figure heavily in planetary defense strategies.

Income: 400

Required Statistics 50+: Endurance, Coordination, Perception

Basic Training Skills: Floatation Vehicles +5, Rifle +5, Swimming +5, Any Technical +10

Rank Skills (+1 Rank if 40+): Leadership, Management, Navigation, Strategy

Elective Skills: 5 points/year

Career Skills (15 points/year): Navigation, Pistol, Submersible Vehicles, Projectile Gunner, Energy Gunner, Electronics, Mechanic, Machinist, Sensors, SCUBA, Swimming, Fixed Wing Aircraft, Rotary Winged Aircraft, VERTOL, Rifle, Floatation Vehicles,

Gear: Flak Jacket, Diving Gear, Inflatable Life Boat, Portable Computer, Auto Pistol, Auto Rifle, Tool Kit

Political Officer

Particularly draconian states often fear their military officers with good reason. Juntas are the most common cause of death among tin plated dictators. To maintain control of the armed forces, trusted "aids" or "commissars" are assigned to high ranking officers to keep them in line with political doctrine.

Income: 600

Required Statistics 60+: Strength Perception, Discipline, Endurance

Required Skills 50+: Politics, Management, Leadership
Base Rank: 4

Elective Skills: 5 points/year

Career Skills (15 points/year): Energy Pistol, Sword, Criminal Law, Business Law, Intrusion, Oration, History, Psychology, Computer, Criminology, Astronaut, Politics, Management, Leadership

Gear: Dress Uniform, Sword, Laser Pistol, Book of Policies and Regulations

Space Patrol

Interstellar nations need an equivalent of the coast guard and customs agencies. Equipped with fast patrol ships and space rescue gear, the space patrol is often seen as a glamorous career choice, until the first time the cadet's commanding officer assigns them to check 10 000 packages of underwear for drugs and contraband.

Income: 500

Required Statistics 60+: Perception, Coordination, Discipline, Logic, Reflexes

Required Skills 50+: Energy Pistol, Take Downs, Astronaut

Rank Skills (+1 Rank if 50+): Leadership, Management, Criminal Law, Diplomacy

Elective Skills: 5 points/year

Career Skills (15 points/year): Space Craft, Sensors, Energy Gunner, Criminology, Electronics, Mechanic, Navigation, Take Downs, Grappling, Fist, Kick, Astrophysics, Sub Assault Energy Weapons, Criminal Law, Intrusion, Energy Pistol, Throws, Astronaut

Gear: Laser Pistol, Space Suit, Portable Computer, Scanner

Fringe Careers:

In order to enter a career, your character must have at least the required rating in all of the Statistics and Skills listed. These jobs aren't always legal, but they aren't always illegal either. However, they do bring the character in contact with criminals more often than military or mainstream careers.

Artist:

Even in the future, there is demand for visually appealing works of craftsmanship. Of course, most artists make little money in their own lifetime. As the result of the stigma of poverty, the artist lives on the fringes of society, often associating with unsavory characters.

Income: 400
Required Statistics 70+: Talent
Required Skills 70+: Draw, Paint, Photography, Print Making, or Sculpt
Elective Skills: 15 points/year
Career Skills (5 points/year): Salesmanship, Draw, Paint, Photography, Print Making, Sculpt, Fast Talk
Gear: Art Supplies

Back Woodsman:

New worlds provide new wildernesses. Some maladjusted individuals choose to live in the wilds rather than deal with their own race. Often these back woodsmen are criminals or mad men in hiding.

Income: 300
Required Statistics 60+: Perception, Endurance
Required Skills 50+: "Environment" Survival, Stealth, Foraging
Elective Skills: 15 points/year
Career Skills (5 points/year): "Environment" Stealth, Knife, Trapping, Tracking, First Aid, Axe, Rifle, Ecology, Stealth, Fishing, Swimming, Riding, Navigation
Gear: Back Pack, Axe, Tarp, Rifle

Bounty Hunter:

It is not uncommon for the families of victims or large corporations to offer rewards for the capture of criminals. A bounty hunter is a tough, unsanctioned detective who hunts down criminals in order to cash in on these rewards. Bounty hunters are unpopular with both the police and criminals.

Income: 600
Requirements Statistics 50+: Perception, Coordination, Endurance, Reflexes, Strength
Required Skills 40+: Tackle, Grapple, Streetwise, Pistol, Criminal Law
Elective Skills: 15 points/year
Career Skills (5 points/year): Tackle, Grapple, Streetwise, Pistol, Criminal Law, Rifle, Criminology, Psychology, "Any "Vehicle, Sprint, Marathon, Swim, Intrusion, Fast Talk, Stealth
Gear: Handcuffs, Heavy Pistol or Auto Pistol

Burglar:

There is always money for the taking in the private residences of the rich. Even if money becomes purely electronic, there are collectible's and jewelry which a talented individual can acquire. The burglar of the future needs a wide range of skills to evade security sensors, guards, and dogs.

Income: 700
Required Statistics 60+: Perception, Coordination, Reflexes, Talent
Required Skills 50+: Stealth, Intrusion
Elective Skills: 15 points/year
Career Skills (5 points/year): Stealth, Intrusion, Climbing, Security Sensors, Fast Talk, Sprinting, Marathon, High Jump, Broad Jump, Swinging, Swimming, Tumbling, Criminal Law
Gear: Rope, Grapple Harpoon, Black Clothing, Lock Picks

Con Artist:

There is a fool with money born every minute. The con artist seeks out these people, involves them in complex, seemingly profitable schemes, and then vanishes with the cash.

Income: 800
Required Statistics 60+: Logic, Talent
Required Skills 50+: Bribery, Embezzlement, Fast Talk
Elective Skills: 15 points/year
Career Skills (5 points/year): Bribery, Embezzlement, Fast Talk, Under World Knowledge, Duping, Salesmanship, Business Law, Criminal Law, Psychology, Politics
Gear: Business Suit, Portable Computer, Brief Case

Consulting Detective:

Law enforcement divisions are often too busy to give proper attention to every complaint. A consulting detective is a private citizen with the skills needed to look into private matters and gather evidence for customers dissatisfied by the police force's indifference.

Income: 700

Required Statistics 60+: Perception, Logic, Talent

Required Skills 50+: Criminal Law, Criminology, Forensics

Elective Skills: 15 points/year

Career Skills (5 points/year): Criminal Law, Criminology, Forensics, Streetwise, Fast Talk, Pistol, Fist, Tackle, Grapple, Computer, Intrusion

Gear: Forensic Kit, Hold Out Pistol, Business Suit, Brief Case

Drifter:

Some people can't bear to be tied down. Wanderlust or past troubles draw them to the open road. In order to make ends meet, many take to carrying a few high priced, low volume goods from place to place. Criminal gangs and black markets often make up much of their number in drifters.

Income: 500

Required Statistics 50+: Endurance

Required Skills 40+: Wheeled Vehicles, Streetwise

Elective Skills: 15 points/year

Career Skills (5 points/year): Wheeled Vehicles, Streetwise, Pistol, Knife, Intrusion, Stealth

Gear: Old Cheap Motorcycle, Knife, Heavy Pistol

Gangster:

Criminals are often as organized and efficiently operated as any business. The gangster is a professional criminal in a suit and tie. Gangsters are ruthless and brutal individuals with few scruples and many enemies.

Income: 800

Required Statistics 50+: Perception, Endurance, Strength

Required Skills 40+: Fist, Submachine Gun, Streetwise

Rank Skills (+1 Rank if 50+): Leadership, Streetwise, Embezzlement

Elective Skills: 15 points/year

Career Skills (5 points/year): Leadership, Streetwise, Embezzlement, Submachine Gun, Fist, Tackle, Joint Lock, Throw, Criminal Law, Accounting, Intrusion, Business Law, Psychology, Choke,

Gear: Submachine Gun, Holdout Pistol, Business Suit, Brief Case

Knight:

As technology becomes more advanced, the options for equipping the common foot soldier increase exponentially. The sheer cost of many of these devices and the growing involvement of vehicles and robots in warfare keep governments from equipping their entire armed forces with the best money can buy. Into this niche a new knighthood may arise. Equipped by their own wealth or private backers, the knight is a highly skilled warrior. In some parts, orders of knighthood may even arise as they gather to popular causes in search of funding. While chivalry remains dead, those in this exotic profession take care to ensure that their service and style is a cut above the common mercenary.

Income: 800

Required Statistics: All at 60+

Required Skills 60+: Support Projectiles, Power Armor, Pistol, Sword

Elective Skills: 10 points/year

Career Skills (10 points/year): All Firearms,

All Energy Weapons, All Vehicles,

All Melee Weapons

Gear: Powered Armor, Support Laser, Machine Gun, Grenade Launcher, Motor Cycle

Law Enforcement :

The policing of society is a thankless task. Forced by tight fisted governments to draw on fines for speeding and parking violations, they are reviled by criminals and the people they work to protect. While the police force is technically a paramilitary career, they are considered a Fringe career because of their constant contact with the shady side of society.

Income: 600

Required Statistics 50+: Perception, Coordination, Endurance, Logic, Strength, No Criminal Record

Required Skills 40+: Tackle, Pistol, First Aid, Criminal Law, Wheeled Vehicle

Rank Skills (+1 rank if 40+): Leadership, Politics, Criminology, Forensics

Elective Skills: 15 points/year

Career Skills (5 points/year): Tackle, Pistol, First Aid, Criminal Law, Wheeled Vehicle, Criminology, Streetwise, Accounting, Business Law, Forensics, Stealth, Intrusion, Blunt Weapons, Fist, Grapple, Throw, Joint Lock, Psychology

Gear: Flak Jacket, Uniform, Heavy Pistol

Mercenary:

As mankind spreads to the stars, hired guns will still find their services required by everyone from criminals, to revolutionaries, to international relief agencies. Indeed, the “kinder gentler” hired soldier may find more customers than the hard bitten killer.

Income: 500

Required Statistics 50+: Coordination, Endurance, Strength

Required Skills 50+: Rifle or Energy Rifle, Knife, Fist, Stealth

Elective Skills: 15 points/year

Career Skills (5 points/year): Pistol, Submachine Gun, Rifle, Support Projectile Weapons, Energy Rifle, Support Energy Weapons, Fist, Kick, Tackle, Grapple, Knife, Stealth
“Environment” Survival, Wheeled Vehicles, Rotary Winged Vehicles, Navigation

Gear: Light Armor, Laser or Automatic Rifle, Combat Knife, Backpack

Performer:

Live entertainment will always be more exciting than its canned cousin, if only for that most basic human desire to watch someone screw up. A performer generally has to travel as their show will soon become stale and lose interest in a single location. Lacking a permanent residence and the shiftless nature of road crews draws the performer close to the criminal element.

Income: 600

Required Statistics 60+: Statistics: Talent, Discipline

Required Skills 50+: Acting, Dance, Play
“Instrument”, or Oration

Elective Skills: 15 points/year

Career Skills (5 points/year): Acting, Dance, Play “Instrument”, Oration, Pick Pocket, Stealth, Fast Talk, Streetwise, Salesmanship

Gear: Costume, Portable Stereo, Dot Mike, 2 Props (fake gun, sword, juggling balls)

Pirate:

Piracy is often the name given to the activities of revolutionaries who have access to space craft. In practice, a space craft needs the support of an advanced society to repair damage and maintain systems, and thus must be heavily linked to organized crime or rebellious worlds.

Income: 700

Required Statistics 60+: Coordination, Endurance, Reflexes

Required Skills: Energy Pistol, Sword, Astronaut

Elective Skills: 15 points/year

Career Skills (5 points/year): Energy Pistol, Astronaut, Grappling, Underworld Knowledge, Mechanic, Space Craft, Choke, Astrophysics, Sensors, Sub Assault Energy Weapons, Projectile Gunner, Energy Gunner, Electronics

Gear: Space Suit, Laser Pistol, Sword

Raider:

A small cadre of skilled combatants with fast vehicles can descend on isolated communities, wreak havoc and fade away before the government forces can respond. Raiders are either the strong arm of criminal gangs, or the elite strike force for a rebellion.

Income: 600

Required Statistics 50+: Perception, Coordination, Endurance, Reflexes, Strength

Elective Skills: 15 points/year

Career Skills (5 points/year): “Environment” Survival, Stealth, Rifle, Wheeled or Floatation Vehicle

Career Skills: Rifle, Pistol, Submachine Gun, Stealth
“Environment” Survival, Fist, Grapple, Wheeled or Floatation Vehicle, Streetwise

Gear: Auto Rifle, Motor Cycle or Jet Ski, Flak Jacket

Rebel:

Disgruntled youths with minimal training are the back bone of most rebellions. Whether drawn from the lower classes or universities, the foot soldiers of rebellion are rarely well supplied with any thing other than rhetoric. Often forced by circumstance to trade with the criminal element, rebels become cynical as they grow older and may turn to crime or mercenary work.

Income: 500

Required Statistics 40+: Perception, Coordination, Endurance, Strength

Required Skills 30+: Rifle, Stealth, History,
“Environment” Survival

Elective Skills: 15 points/year

Career Skills (5 points/year): Rifle, Pistol, Stealth, History, Politics, “Environment” Survival, Demolition, Marathon, Fast Talk, Leadership, Oration

Gear: Auto Rifle, Camouflage Suit

Spy:

In the face of war and peace the spy is the government's favorite servant. Deeply loyal and highly trained, spies infiltrate the government's enemies and send back information. Governments always believe that information is the ultimate weapon. But best of all, spies are deniable and expendable.

Income 800

Required Statistics 60+: Perception, Coordination, Discipline, Logic, Reflexes, Talent

Required Skills 50+: Computer, "Speak" Language, "Read" Language, Fast Talk

Elective Skills: 15 points/year

Career Skills (5 points/year): Carousing, Fast Talk, Speak "Language", Read "Language", Energy Pistol, Stealth, Computer Operation, Computer, Sensors, Intrusion, Pick Pocket, Street Wise, Accounting, Politics, History, Demolition

Gear: Listening Device, Micro Computer, Holdout Laser, Intrusion Kit

Vagrant:

In every society, no matter how enlightened, some people will fall through the social security net. Living on the streets and in the alley ways, they beg for money and search the garbage for food. Many turn to petty crime. Its a hard life, but its still life.

Income: 300

Required Statistics 40+: Endurance, Perception

Basic Training Skills: Urban Survival +5, Streetwise +5, Urban Stealth +3, Blunt Weapons +2

Elective Skills: 15 points/year

Career Skills (5 points/year): Urban Survival, Streetwise, Urban Stealth, Knife, Blunt Weapons, Fast Talk, Pick Pocket, Intrusion

Gear: Shopping Cart, Tarp, Heavy Piece of Pipe, Kitchen Knife, Assorted Trash

Mainstream Careers:

In order to enter a career, your character must have at least the requirements rating in all of the Statistics and Skills listed.

Athlete:

People are fascinated by the question: who is the very best? There is big money to be made in sports entertainment, but only for the very best. Athletes must train constantly to maintain their edge in a very competitive field. Many fall from grace to injuries or age and are left with little hope for future employment.

Income 1200

Required Statistics 70+: Coordination, Discipline, Endurance, Reflexes, Strength

Required Skills 70+: 1 Athletic, 2 Unarmed Combat

Elective Skills: 10 points/year

Career Skills (10 points/year): All Athletic, Oration, All Unarmed Combat

Gear: Brand Name Shoes

Administrator:

Middle management is the portion of big business and government which takes the hit when things go wrong. The pay is decent, but the work is unrewarding and stressful. Every administrator lives in fear of the day when someone higher on the ladder will gaze down on them and ask: what exactly is it you do, anyhow?

Income: 800

Required Statistics 50+: Discipline, Logic

Required Skills 50+: Accounting, Management

Elective Skills: 10 points/year

Career Skills (10 points/year): Business Law, Business Etiquette, Accounting, Management, Bribery, Economics, Salesmanship

Gear: Business Suit, Portable Computer

Biologist:

Bio-sciences are big business. Whether researching new medications or new organisms, a trained biologist can always find work.

Income: 800

Required Statistic 70+: Logic

Required Skills 60+: Biochemistry, Ecology, Zoology, Botany

Elective Skills: 10 points/year

Career Skills (10 points/year): Biochemistry, Ecology, Zoology, Botany, Writing, Oration, "Race" Medical, Management

Gear: Specimen Bottles, Micro-Scanner, Portable Computer

Broker:

A broker invests other people's money and manages investment accounts.

Income: 900

Required Statistics 60+: Discipline, Logic, Talent

Required Skills 50+: Broker, Accounting, Shipping and Handling

Elective Skills: 10 points/year

Career Skills (10 points/year): Embezzlement, Broker, Economics, Accounting, Business Law

Shipping and Handling, Salesmanship

Gear: Portable Computer, Warehouse, Business Suit

Chemist:

Materials science continues to advance in such fields as zero gravity metallurgy and nano-technology, creating an ongoing need for professional chemists.

Income: 800

Required Statistic 70+: Logic

Required Skills 60+: Chemistry, Mathematics

Elective Skills: 10 points/year

Career Skills (10 points/year): Biochemistry, Chemistry, Pharmaceuticals, Mathematics, Quantum Physics, Atomic Physics, Writing, Oration, Management

Gear: Portable Analysis Kit, Portable Computer

Colonist:

Once interplanetary colonization becomes established, the unskilled and impoverished masses are often exported to brave new worlds.

Income: 600

Required Statistic 40+: Endurance

Basic Training Skills: Botany +10, "Environment" Survival +10, Wheeled Vehicle +5

Elective Skills: 10 points/year

Career Skills (10 points/year): "Environment" Survival, Wheeled Vehicle, Rifle, First Aid, Botany, Ecology

Gear: Coveralls, Survival Kit, Carbine

Commercial Pilot:

A pilot can make a good living working for the corporate sector. The work tends to be dull and routine with most of the actual piloting being done by automated systems, but the corporations like to have someone to blame if anything goes wrong.

Income 800

Required Statistics 50+: Perception, Coordination, Logic

Required Skills 50+: Fixed Wing Aircraft, Sensors

Elective Skills: 10 points/year

Career Skills (10 points/year): Fixed Wing Aircraft, Space Craft, Sensors, Shipping and Handling, Business Law, Oration, Astronaut, Navigation, Newtonian Physics, Leadership, Management, Rotary Winged Aircraft

Gear: Luggage, Uniform

Corporate Manager:

A profitable business needs leaders, and when they have proved their worth by clawing their way to the top of the ladder : the corporation pays them very well, if only to protect itself from them.

Income: 900

Required Statistic 60+: Discipline

Required Skills 50+: Accounting, Management

Elective Skills: 10 points/year

Career Skills (10 points/year): Accounting, Computer Leadership, Advertising, Embezzlement, Personal Management, Shipping and Handling, Business Etiquette, Salesmanship,

Gear: Portable Computer, Business Suit, Brief Case

Doctor:

The range of ailments which can be healed in the future is staggering. It takes years of training to become a physician and finally deserve the revered title of "quack".

Income: 1000

Required Statistics 60+: Discipline, Logic, Talent

Required Skills 60+: First Aid, Medical Sensors, Pharmaceuticals, "Race" Medical, Biochemistry

Elective Skills: 10 points/year

Career Skills (10 points/year): First Aid, Medical Sensors, Pharmaceuticals, "Race" Medical, Biochemistry, Genetics, Chemistry, Writing, Diplomacy, Management, Leadership

Gear: Medical Kit, Portable Computer, Medical Scanner

Economist:

In an age of scientific rationality, fortune tellers still ply their art. With the arcana of charts, studies, and gut instinct, an economist augers the course of corporations and investors.

Income 900

Required Statistics 60+: Discipline, Logic, Talent

Required Skills 50+: Economics, Accounting

Elective Skills: 10 points/year

Career Skills (10 points/year): Economics, Management, Accounting, Salesmanship, History, Politics, Psychology, Oration, Writing, Business Law, Embezzlement, Fast Talk

Gear: Portable Computer, Good Business Suit

Engineer:

Technology is designed by engineers from scientific data, then outdated by technology designed by other engineers, requiring new technology to be designed to get ahead again. (It's a bit of a racket isn't it.)

Income 800

Required Statistics 60+: Logic, Talent

Required Skills 50+: Newtonian Physics, Drafting, Survey, Chemistry

Elective Skills: 10 points/year

Career Skills (10 points/year): Newtonian Physics, Drafting, Survey, Chemistry, Mathematics, Architecture, Construction, Salesmanship, Computer, Electronics, Mechanic

Gear: Portable Computer, Camera, Survey Scanner

Explorer:

As governments and corporations seek out new lands and resources, they employ explorers to take the initial risks. (You didn't expect the CEO to be out on Mars in his business suit did you?)

Income 800

Required Statistics 60+: Perception, Endurance

Required Skills 50+: Navigation, "Environment" Survival, Survey

Elective Skills: 10 points/year

Career Skills (10 points/year): Orienteering, "Environment" Survival, Survey, any Vehicles, Rifle, Archeology, Anthropology, Writing, Diplomacy, Ecology, Speak "Language", Read "Language"

Gear: Backpack, Tent, Inflatable Boat, Survival Kit

Emergency Services:

People are stupid. They take stupid risks. Ambulance drivers and paramedics are really specialists trained in getting people out of the more foolish situations alive.

Income 700

Required Statistics 60+: Perception, Discipline, Endurance, Strength

Required Skills: any two Vehicle skills, First Aid, Climbing, Swimming

Elective Skills: 10 points/year

Career Skills (10 points/year): any Vehicle skills, First Aid, Climbing, Swimming, Forensics, "Race" Medical, Criminology, Criminal Law, Pharmaceuticals, Intrusion, Axe, Leadership, Sensors

Gear: First Aid kit, Climbing Harness, Rope

Lawyer:

A lawyer is a specialist in sorting out the complex laws required to maintain an advanced society.

Income 900

Required Statistics 50+: Discipline, Logic, Talent

Required Skills 50+: Business Law, Criminal Law, Court Etiquette

Elective Skills: 10 points/year

Career Skills (10 points/year): Business Law, Criminal Law, Writing, "Culture" Etiquette, Oration, Diplomacy, Fast Talk, Embezzlement, Management, Accounting

Gear: Business Suit, Brief Case, Portable Computer

Menial Labor:

Whether you're flipping burgers, sweeping floors, pumping juice, or printing tee-shirts, it's a safe assumption that this isn't what you went to school for.

Income 500

Required Statistics 30+: Strength, Endurance, Logic

Elective Skills: 10 points/year

Career Skills (10 points/year): Cooking, Computer, Fast Talk, Shipping and Handling,

Wheeled Vehicle, First Aid, Salesmanship

Gear: Apron, Good Shoes, Rubber Gloves, Hair Net, Tacky Uniform.

Naturalist:

New worlds mean new ecologies. Native plants and animals can be valuable resources or dangerous threats, and so must be studied and catalogued by naturalists.

Income: 700

Required Statistics 60+: Endurance, Logic

Required Skills: any two Survival skills, Ecology, Sociology, Zoology

Elective Skills: 10 points/year

Career Skills (10 points/year): Survival skills, Ecology, Sociology, Zoology, Botany, Fishing, Tracking, Foraging, Archeology, Anthropology, Psychology, Climbing, Swimming

Gear: Survival Kit, Tent

Salesperson:

A winning smile that won't go away is the salesperson's best weapon. If they won't buy your product because they like it, they may buy it because they like you, or are desperate to be free of you. It doesn't really matter as long as you get your commission.

Income: 700

Required Statistics 40+: Logic, Talent

Required Skills 40+: Salesmanship, Fast Talk

Elective Skills: 10 points/year

Career Skills (10 points/year): Salesmanship, Accounting, Fast Talk, Speak "Language", Read "Language", Business Law, Streetwise

Gear: Business Suit, Product Samples

Secretary:

Many executives lack the basic skills required to get them through the day, like typing, setting appointments, answering the phone, and making coffee. (What do they do in those private offices any how?) The secretary is a specialist in keeping a high strung executive alive and out of trouble.

Income: 500

Required Statistic 40+: Discipline

Required Skills 40+: Computer, Business Etiquette, Writing, Diplomacy

Elective Skills: 10 points/year

Career Skills (10 points/year): Computer, Business Etiquette, Writing, Diplomacy, Accounting, Business Law, Management

Gear: Portable Computer, Business Suit

Spacer:

Commercial space craft are crewed by professional spacers. Many spacers grow up off world in orbital habitats. Due to the long periods of travel involved, even corporate ships are generally crewed by families.

Income: 600

Required Statistics 50+: Coordination, Logic

Required Skills 50+: Astronaut, one Technical Skill

Elective Skills: 10 points / year

Career Skills (10 points / year): Astronaut, Shipping and Handling, Tumble, First Aid, Streetwise, Astrophysics, Newtonian Physics, Spacer Etiquette, Sensors, Electronics, Mechanic, Space Craft

Gear: Light Space Suit, Laser Pistol, Life Support Pack

Physicist:

If the fundamental principles which govern our universe are ever fully understood, it's a safe bet that the physicists will just start on the next one. Most physicists work for schools or governments given the esoteric and incomprehensible nature of their work.

Income: 800

Required Statistic 70+: Logic

Required Skills 60+: Astrophysics, Newtonian Physics, Nuclear Physics, Quantum Physics, Writing

Elective Skills: 10 points/year

Career Skills (10 points/year): Astrophysics, Newtonian Physics, Oration, Nuclear Physics, Quantum Physics, Writing, Chemistry, Sensors, Survey, Computer, Mechanical

Gear: Portable Computer, Hand Scanner

Teacher:

Every student needs a unique angle on the lesson to understand it. Teachers must be innovative and patient individuals.

Income 700

Required Statistics 50+: Discipline, Logic, Talent

Required Skills 50+: Teaching, one other skill

Elective Skills: 15 points/year

Career Skills (5 points/year): Teaching, Leadership
Academic Etiquette, Oration

Gear: Appropriate Instructional Data,
Portable Computer

Technician:

Part of the whole technology racket is the maintenance and repair industry. Since technology is too complex for a lay person, trained specialists can make a living making it do what it was supposed to in the first place.

Income: 700

Required Statistics 50+: Discipline, Logic, Strength

Required Skills 50+: any one Technical skill

Elective Skills: 10 points/year

Career Skills (10 points/year): all Technical Skills,
Salesmanship, Accounting, Chemistry,
Newtonian Physics

Gear: Tool Kit, Coveralls

Trader:

Trade is the life blood of society. A trader tries to buy goods where they are cheap and sell them where they are more valuable to make a profit.

Income 800

Required Statistics 60+: Perception, Logic, Talent

Required Skills: Salesmanship, Accounting, Business
Law, Broker, Economics, Advertising

Elective Skills: 10 points/year

Career Skills (10 points/year): Salesmanship,
Accounting, Business Law, Broker, Economics,
Advertising, Fast Talk,
Speak "Language", Read "Language",
Diplomacy, Shipping and Handling, Psychology

Gear: Portable Computer, Business Suit

Generic Aliens

The following alien races all resemble various terrestrial animals and would, most likely, originate on earthlike worlds. None of these races are intended to be particularly tied to any setting, but they are all quite common in science fiction literature and film. All of these races are listed as being human sized but could be larger or smaller by applying the following modifiers:

- +10 Strength for:
 - Double Life Support Requirements
- +20 Strength for:
 - Double Life Support Requirements
 - 10 Reflexes
- 10 Strength for:
 - +10 Reflexes
- 20 Strength for:
 - +10 Reflexes
 - Half Life Support Requirements

Bugs

A large species with antennae, carapace and exoskeleton that give them an insect-like appearance.

- Age Multiplier x 2
- Target Size 0
- Eye Sight Range: 100 metres / -10
- Preferred Light: day
- Walking Move = Strength / 20
- Running Move = Strength / 5
- Swimming Move = Strength / 40
- Armoured Shell
 - Armour 120
 - 20 to Acrobatics, Grappling, Tumbling, and Swimming.

Pincers

- Penetration = 10
- Damage = Strength +10
- Bleeding Injuries
- +10 Endurance
- 10 Reflexes

Canines

A wolf or dog like race that can be found in varieties both larger and smaller than human.

- Age Multiplier x 2
- Target Size 0
- Eye Sight Range: 100 metres / -10 (Colour Blind)
- Preferred Light: day
- Walking Move = Strength / 5
- Running Move = Strength / 5
- Swimming Move = Strength / 20
- Scent Tracking: +10 Tracking
- Low Frequency Hearing
- Bite
 - Penetration =10
 - Damage = Strength
 - Bleeding & Entangle Injuries
- +20 Perception
- 10 Talent

Felines

This cat like race could also be as small as bobcats or as large as tigers.

- Age Multiplier x 2
- Target Size 0
- Eye Sight Range: 200 metres / -10
- Preferred Light: twilight
- Walking Move = Strength / 10
- Running Move = Strength / 2.5
- Swimming Move = Strength / 20
- Ultraviolet Vision (Ignore -10 darkness penalty)

Claws

- +10 Climbing
- Penetration = 5
- Hand Damage = Strength -10
- Foot Damage = Strength +10
- Bleeding Injuries

Bite

- Penetration =10
- Damage = Strength
- Bleeding & Entangle Injuries
- Perception +10
- Reflexes +10
- Discipline -10

Humans

This relative of the great apes has very thin body hair and a more upright stance than is normal, making them particularly ugly.

Age Multiplier: x 1
Target Size: 0
Eye Sight Range: 200 metres / -10
Preferred Light: day
Walking Move: Strength / 10
Running Move: Strength / 5
Swimming Move: Strength / 20
Sexual Dimorphism: Human females tend to be smaller than males. If the player of a female character wishes, they can Subtract 10 from their Strength and add 10 to their Reflexes.

Reptilians

This race might look like lizard headed men or man sized raptors. In either case, the females are generally larger than the males.

Age Multiplier: x 1
Target Size: 0
Eye Sight Range: 200 metres / -10
Preferred Light: day
Walking Move: Strength / 10
Running Move: Strength / 5
Swimming Move: Strength / 20
Scaley Hide: Armour 30
Claws
+10 Climbing
Penetration = 5
Hand Damage = Strength -10
Foot Damage = Strength +10
Bleeding Injuries

Bite
Penetration =10
Damage = Strength
Bleeding & Entangle Injuries

Sexual Dimorphism: Reptilian males tend to be smaller than females. If the player of a male character wishes, they can Subtract 10 from their Strength and add 10 to their Reflexes.

Cold Blooded: Reptilians have a particularly efficient metabolism that cuts their food requirements in half, but gives them a -10 to Reflexes and Strength for every full ten degrees that the temperature falls below thirty degrees centigrade.

Tinkers

This small and fuzzy race has genetically enhanced it's scientific prowess over the centuries.

Age Multiplier: x 0.5
Target Size: -10
Eye Sight Range: 200 metres / -10
Preferred Light: twilight
Walking Move: Strength / 10
Running Move: Strength / 5
Swimming Move: Strength / 10
Half Life Support Requirements
Strength -50
Reflexes +10
Logic +20

Warlords

While all of these races are more likely to be genetic constructs than naturally evolved species. The warlords are, in particular an artificial species. Bred to be larger and stronger than normal humans while retaining their speed.

Age Multiplier: x 2
Target Size: 0
Eye Sight Range: 200 metres / -10
Preferred Light: twilight
Walking Move: Strength / 10
Running Move: Strength / 5
Swimming Move: Strength / 20
+20 Strength
+20 Endurance
-10 Logic
-10 Talent
Chemical Dependency: in order to make their genetically engineered super-soldiers easier control, the biologists behind their creation have given them a genetically inherent addiction to a specialized series of steroids and amphetamines.

Particulars and Definitions

Statistics

Coordination: the character's flexibility, ability to move precisely, sense of balance, and hand-eye coordination

Discipline: the character's ability to carry on under difficult circumstances as well as rote learning and memorization

Endurance: the character's state of health and cardiovascular fitness, as well as their resistance to poison and injury

Logic: the character's ability solve problems using rational approaches and their capacity for critical thinking

Perception: partially the character's sensory acuity but also their general awareness and their attention to detail

Reflexes: the speed with which the character can react and act decisively in rapidly changing circumstances

Strength: the character's build, mass, and muscular development combined to reflect general physical power

Talent: the character's creativity and capacity for original thought, as well as their ability to understand other perspectives

Personality Traits

Passive	&	Aggressive
Calm	&	Temperamental
Contented	&	Greedy
Empathic	&	Cruel
Generous	&	Miserly
Honest	&	Dishonest
Industrious	&	Lazy
Modest	&	Sleazy
Patient	&	Rude
Sober	&	Rowdy
Brave	&	Cowardly
Cheerful	&	Depressed
Diplomatic	&	Offensive
Friendly	&	Antagonistic
Gentle	&	Sadistic
Humble	&	Proud
Loving	&	Hateful
Outgoing	&	Shy
Physical	&	Cerebral
Practical	&	Imaginative
Thrifty	&	Wasteful

Relationships

Enemy: A high ranking individual has reason to hate the character. Their forces are dedicated to other ends, but will not hesitate to inconvenience or even attack the character whenever their paths cross. Should the character offend their enemy again in any way, the enemy will become dedicated to the immediate destruction of the character.

Family: While the nature of family structures can vary between races and cultures, it is assumed that most will have more significant relationships with those that posses similarities in genetics and early developmental environment. In this case, the first consequence indicates that the character has gotten married and subsequent ones indicate offspring.

Friend: A close friend will often come to your characters' aid if asked. They will be roughly the same age and rank, but need not be from the same career background. Their career should be established when the perk is selected.

Nemesis : The opposite side is served well by your opposite number. This enemy has basically the same skills and Statistics as your character, but all attitudes are reversed. Instead of being a high ranking official with agents and servants, who often has other matters to attend to, the nemesis is a more personal enemy and more likely to seek out and attack the character.

Patron: The character is a servant of a more important individual. The patron acts as an employer, guardian, and mentor for the character. The patron will always be of a higher social standing or military rank than the character.

Rival: A rival is much like a nemesis, but serves the same side as your character and has similar attitudes. Sadly, this individual sees your character as an incompetent boob and will spare no effort to show you up or make you look bad to your mutual acquaintances. Worse still, your rival always falls in love with anyone you do.

Skills

The skills are all grouped into Categories. For example, Marathon, Sprinting, and Swimming are all found in the Athletic category. Each skill is also related to a Statistic, which is listed in parentheses “()” next to the skill’s name. On the character sheet, only the first letter of the statistic is listed to save space. This does not cause any difficulties since the statistics all start with different letters. Some skills have a word listed in quotation marks. These are actually large sets of skills and must be taken as such. ‘Play “Instrument” skill must be learned as Play Violin, Play Piano, Play Alto Sax, or any other musical instrument.

Initial Skill Ratings

All skills start with half the rating of their related statistic or the rating of their best skill in the same category minus twenty.

Improving Ratings With Training

During character creation and downtime, a fixed number of skill points are gained each year. These can be spent mostly as the player wishes. The only limitation is that a maximum number of points can be spent on one skill each year.

While skills are relatively easy to increase, Statistics can only be improved if the character has developed a related skill to a higher level. When a Statistic is increased, none of the skills related to it are increased. The default for related skills that have not been improved increases, but any related skills with a rating greater than half the Statistic do not.

Improving Ratings With Experience

In the course of exceptional experiences, it is possible for a character to increase their skills and statistics at a slightly greater rate than normal. In the course of play the referee should provide the characters with experience rewards. These are skill points which can be spent to improve skills which the character has been using extensively. The higher the skill rating the less often it will qualify to be increased. To qualify to improve a skill during a given game week, the character must encounter and overcome involuntary modifiers that reduce their chance of success to less than twenty percent. Generally speaking, the referee should be careful not to hand out more than fifty experience points per year.

Involuntary modifiers are exclusively ones which the player did not chose to experience. For instance, there is no advantage to making attacks from a greater distance, feinting, or even shooting in the dark when a light source is available. In general this should be seen as a guideline regarding when the character is facing a sufficiently difficult challenge or are particularly outclassed.

SKILLS

Administration Category:

- Accounting (Logic)
- Business Law (Logic)
- Criminal Law (Logic)
- Embezzlement (Talent)
- Management (Discipline)
- Shipping & Handling (Strength)

Advanced Projectile Weapons Category (physical)

- Energy Gunner(Perception)
- Energy Pistol (Perception)
- Energy Rifle (Perception)
- Sub Assault (Perception)
- Support Energy (Coordination)
- Pistol (Coordination)
- Projectile Gunner (Coordination)
- Rifle (Coordination)
- Sub Machine Gun (Coordination)
- Support Projectiles (Strength)

Artistic Category:

- Acting (Talent)
- Choreography (Talent)
- Cinematography (Perception)
- Compose Music (Talent)
- Drawing (Perception)
- Painting (Talent)
- Photography (Perception)
- Play “Instrument” (Perception)
- Printing (Logic)
- Singing (Perception)
- Sculpting (Perception)
- Writing (Talent)

Athletic Category (physical):

- Astronaut (Coordination)
- Broad Jump (Strength)
- Climbing (Coordination)
- Dance (Coordination)
- High Jump (Strength)
- Marathon (Endurance)
- Riding (Reflexes)
- SCUBA (Endurance)
- Sprinting (Strength)
- Swimming (Endurance)
- Swinging (Coordination)
- Tumbling (Coordination)

Biology Category:

- Biochemistry (Logic)
- Botany (Discipline)
- Ecology (Discipline)
- First Aid (Discipline)
- Forensics (Perception)
- Genetics (Logic)
- Pharmaceuticals (Logic)
- “Race” Medical (Logic)

Criminal Category:

- Bribery (Perception)
- Criminal Law (Logic)
- Embezzlement (Talent)
- Fast Talk (Talent)
- Intrusion (Coordination)
- Pick Pocket (Coordination)
- Stealth (Coordination)
- Streetwise (Perception)

Melee Weapons Category (physical)

- Axe (Strength)
- Blunt (Strength)
- Knife (Coordination)
- Pole Arm (Strength)
- Shield (Strength)
- Spear (Strength)
- Sword (Coordination)

Outdoors Category

- Ecology (Discipline)
- "Environment" Survival (Endurance)
- Fishing (Discipline)
- "Environment" Foraging (Perception)
- Outdoor Stealth (Coordination)
- Navigation (Logic)
- Stealth (Coordination)
- Tracking (Perception)
- Trapping (Discipline)

Physics Category

- Astrophysics (Logic)
- Atomic Physics (Logic)
- Chemistry (Logic)
- Mathematics (Logic)
- Newtonian Physics (Logic)
- Quantum Physics (Talent)

Social Category

- "Culture" Etiquette (Discipline)
- Read "Language" (Discipline)
- Speak "Language" (Discipline)
- Cooking (Perception)
- Diplomacy (Discipline)
- Fast Talk (Talent)
- Leadership (Discipline)
- Oration (Talent)
- Salesmanship (Talent)
- Teaching (Discipline)

Sociology Category

- Advertising (Talent)
- Anthropology (Discipline)
- Archeology (Discipline)
- Criminology (Perception)
- Economics (Logic)
- History (Discipline)
- Politics (Discipline)
- Psychology (Perception)
- Strategy (Talent)

Technical Category

- Architecture (Logic)
- Computer (Logic)
- Construction (Strength)
- Demolitions (Discipline)
- Drafting (Discipline)
- Electronics (Logic)
- Machinist (Coordination)
- Mechanic (Coordination)
- Navigation (Logic)
- Sensors (Perception)
- Survey (Logic)

Unarmed Category (physical)

- Choking (Strength)
- Punching (Coordination)
- Grappling (Coordination)
- Joint Lock (Coordination)
- Kicking (Coordination)
- "Natural Weapons" (Coordination)
- Tackling (Strength)
- Throwing (Strength)

Vehicle Category

- Air Cushion (Logic)
- Fixed Winged (Reflexes)
- Flotation (Reflexes)
- Legged (Reflexes)
- Power Armor (Coordination)
- Rotary Winged (Reflexes)
- Space Craft (Logic)
- Submersible (Logic)
- Tracked (Reflexes)
- VERTOL (Reflexes)
- Wheeled (Reflexes)

At first I wasn't going to write any skill blurbs. After all, I feel that the skill's name's are fairly self-explanatory. Skill blurbs always seem like a little bit of a waste. For this reason, I have kept the blurbs short and descriptive. None of the blurbs include tasks or vital game information. The reason they are here is to clarify what is involved in each skill, but if you don't want to read all of the skill blurbs, you can easily do without.

Some skills have a word listed in quotation marks. These are actually large sets of skills and must be taken as such. 'Play "Instrument" skill must be learned as Play Violin, Play Piano, Play Alto Sax, or any other musical instrument.

Accounting (Logic, Administration):

Bookkeeping, financial record keeping and business profit analysis are covered by the Accounting skill.

Acting (Talent, Artistic):

The character has learned to take on roles in plays and to imitate people. An actor has good control and understanding of their own emotions and can fake them with proficiency.

Advanced Projectile Weapons Category (physical):

Eventually, power production and high temperature superconductivity will make lasers, particle beams, and plasma weapons practical, but it will always be easy to kill things with high velocity projectiles. Developments like case less ammunition, armour piercing rounds, and liquid propellant systems are likely to keep slug throwers on the field of battle for a long time to come.

Pistol (Coordination)
Projectile Gunner (Coordination)
Rifle (Coordination)
Sub Machine Gun (Coordination)
Support Projectiles (Strength)
Energy Gunner(Perception)
Energy Pistol (Perception)
Energy Rifle (Perception)
Sub Assault (Perception)
Support Energy (Coordination)

Advertising (Talent, Sociology):

No matter how good your product is, it will sell better if it is properly advertised. A lone salesman can reach fewer customers in a day than a single leaflet taped to a light post. The Advertising skill focuses on marketing ideas and planning. Skilled camera crews, actors, artists, and other media specialists will still be needed to produce the advertisements.

Anthropology (Discipline, Sociology):

The rituals and lifestyles of cultures and races are studied in detail by anthropologists. An anthropologist can quickly assimilate to a new culture's morals and manners with a growing degree of effectiveness through observation.

Archeology (Discipline, Sociology):

The rituals and lifestyles of dead cultures and races can be pieced together by an archeologist. In campaigns with time travel, archeologists will be the people to talk to about period costume and society before leaving. Of course, archeologists are always rooting around in forbidden ruins and the like so they make excellent adventurers

Astronaut (Coordination, Athletic):

The skills and requisite training needed to get into a space suit and seal it properly, maneuver in free fall, and cycle air locks is covered by the Astronaut skill.

Architecture (Logic, Technical):

The structural design and planning of buildings is an important skill. The flow of traffic, placement of restrooms, and other such design elements can greatly influence the usefulness of a building. It also helps to have somebody to make a plan before you start building.

Astrophysics (Logic, Physics):

The motions of the stars and planets are charted with the Astrophysics skill. This skill is essential to navigating courses for space craft when traveling in star systems and faster than light voyages.

Atomic Physics (Logic, Physics):

Most advanced power supplies are atomic in nature. The atomic physicist understands these high energy reactions and the machines which control them.

Biochemistry (Logic, Biology):

Life is a subgroup of the complex chemical reactions common to the element carbon. A biochemist's field of study is the synthesis of drugs and medications including the advanced field of biological nano technology.

Botany (Discipline, Biology):

Plants synthesize a broad range of useful chemicals and are often an efficient source of medications. The botanist studies and catalogs plants and their uses. A farmer of the future is often a capable botanist.

Bribery (Perception, Criminal):

It seems likely that there will always be greedy individuals who are willing to look the other way for a little money. By engaging in a little casual conversation, this skill can be used to determine if an individual is likely to take a bribe and how much would be enough.

Broad Jump (Strength, Athletic):

The character has trained in the techniques and sport of long jumping. They can increase their normal broad jump distance by a percentage equal to their skill rating.

Business Law (Logic, Administration):

The application of laws regarding business practices, patents, intellectual property, and employee affairs is covered by this skill.

Chemistry (Logic, Physics):

A great deal of advanced knowledge of chemical reactions and the properties of elements becomes available with the Chemistry skill. Atmospheres can be analyzed, the composition of minerals determined, and materials synthesized by a chemist.

Choreography (Talent, Artistic):

Dances, stage productions, and cinematic fight scenes need to be carefully choreographed in order for the audience to be able to follow the action and to see and understand the important features. Choreography includes proficiency in stage management and direction.

Cinematography (Perception, Artistic):

Films and Hologram productions require careful filming and cutting to maintain the integrity of their story line and artistic vision. With the Cinematography skill, the character is proficient in the techniques, technology, and cultural imperatives that separate a well made show from a flop.

Climbing (Coordination, Athletic):

Steep embankments and even sheer cliff faces and overhangs can be ascended without equipment by a skilled climber. But a skilled climber is proficient in the use of ropes, grapnels, and pitons. A failed Climbing roll will generally cause the character to fall, and while overhangs and sheer cliffs don't give second chances, ropes and harnesses do.

Computer (Logic, Technical):

While every character is assumed to know how to operate a computer and use software suitable to all of their skills, for most people the intricacies of computer programming and hacking are an arcane science represented by this Technical skill.

Compose Music (Talent, Artistic):

Every race that can hear finds some sounds soothing and others discordant. By using these preferences and a finely tuned sense of rhythm and harmony, the character can create new works of music.

Construction (Strength, Technical)

There are a lot of techniques used in constructing buildings that the engineers and architects never really think about. The laborers who do the building solve hundreds of small problems, know how to work with the materials, and even operate the machinery used in constructing buildings.

Cooking (Perception, Social):

With the advent of navigation, chefs had to broaden their techniques and ingredients to include those from distant lands. With the advent of star travel, the variety increased exponentially. Cooking is not a specific skill for each culture, because chefs must always experiment with new foods to keep up with fashion.

Criminal Law (Logic, Administration, Criminal):

Every society has laws of conduct which define acceptable behavior. The Criminal Law skill covers the body of knowledge needed to enforce, adjudicate, and wriggle out of punishment for criminal acts.

Criminology (Perception, Sociology):

Criminal behavior and motivations are often studied for use in crime prevention. Along with Forensic Science, Criminology is one of the main tools of the detective. The skill can be used to piece together clues and witness statements to form an theory on how and why a crime took place and more importantly, "who done it".

"Culture" Etiquette (Discipline, Social):

What is rude in one culture is required behavior in another. For this reason, proper manners and an understanding of proper behavior in general is a separate skill for each culture.

Dancing (Coordination, Athletic):

Coordinating bodily motions to the rhythm of music in an appropriate and pleasing manner can lend control and grace to other athletic activities. Dancing is good also for cardiovascular fitness and flexibility.

Demolitions (Discipline, Technical)

Explosives are useful tools and powerful weapons when properly used by trained technicians. Unskilled persons working with explosives are quite likely to be hoisted by their own petard. Demolitions skill includes the proper tamping of charges, a little chemistry related to making explosives, and a little mechanical and electrical knowledge related to detonators.

Diplomacy (Discipline, Social)

The art of talking one's way out of fights can end wars, save relationships, and even get free drinks at the pub. The Diplomacy skill is the art of compromise and persuasion. A single great diplomat can win more battles than a million soldiers.

Drafting (Discipline, Technical):

When a great idea is handed to the technicians, it is often less comprehensible than hieroglyphics. A draftsman is a translator who turns great ideas on crumpled pieces of paper into usable plans that are easy to follow. Draftsmanship is a key skill that separates the engineer from a pure scientist.

Drawing (Perception, Artistic):

A proper arrangement of lines and shapes on a flat, solid surface can be used to create visually appealing, two dimensional representations of three dimensional objects and scenes.

Ecology (Discipline, Biology):

On any world, all the life forms form an ecology. Every type of creature is, in some way, linked. The ecologist studies ecosystems in order to understand and preserve their diversity.

Economics (Logic, Sociology):

Money is an illusion. The flow of goods and services and the value of a day's work are real. An economist is a monetary illusionist, studying the flow of goods and services to understand, predict and profit from it.

Electronics (Logic, Technical):

While there is considerable overlap between electronic and mechanical devices in a high tech setting, the Electronics skill is used to repair and build computers, sensor systems, force fields and other primarily electronic devices.

Embezzlement (Talent, Administration, Criminal):

Every system of laws and business practices has weak points. Every person has weak points. The Embezzlement skill allows both to be exploited and abused to the character's advantage.

"Environment" Survival (Endurance, Outdoors):

The skills needed to survive in the wilderness vary from one environment to the next. In forests and jungles, one must be able to find one's direction and avoid dangerous animals and insects. In the arctic wastes, shelter and staying warm are the important matter. There are different survival skills for every ecology, climate and region, of every world.

Fast Talk (Talent, Criminal, Social):

Individuals skilled in Fast Talk specialize in confusing double talk and a facade of confidence to get their way before their victim has time to think things through. Fast Talk can be used to bluff one's way through many difficult situations.

First Aid (Discipline, Biology)

In emergency situations, the immediate stabilizing of patients and proper techniques for moving them are more important than racial differences. Wounds must be closed, bleeding stopped, broken bones set, and breathing restored, before the patient can even be taken to the doctor.

Fishing (Discipline, Outdoors): Life begins in the water. The greatest diversity of life forms live in the waters of most worlds. Fishing is a valuable skill because it can be used to find food using a line and hook or nets, almost anywhere there is water.

"Environment" Foraging (Perception, Outdoors):

There are many things growing in the wilderness. Some of them you can eat, some of them will kill you. With the Foraging skill, your character knows how to tell edible roots and berries from poisonous ones.

Forensics (Perception, Biology):

Forensics is the skill of laboratory detective work. When solving crimes, the most useful clues are the invisible ones. A hair, a fiber, a stray skin cell, or the marks on the victim's skin can all point an accusing finger at the culprit.

Genetics (Logic, Biology):

A strand of DNA is a chemical so complex and diverse that scientists spend their entire lives studying its codes. Clones are grown and modified, inherited diseases cured, and new races given birth by geneticists.

High Jump (Strength, Athletic):

The high jump and pole vaulting can be useful athletic skills, allowing the character to increase the height of obstacles they can clear or cover they can dive behind.

History (Discipline, Sociology):

There are no new mistakes. Someone sometime has already screwed up every possible way. Those who do not learn from history's mistakes are doomed to repeat them. A historian is also a good person to ask why the terrorists are shooting at you.

Intrusion (Coordination, Criminal):

No matter how advanced security systems get, there will be people who specialize in getting past them. Intrusion covers lock picking, safe cracking, and camera avoidance, but does nothing with regard to explosives or creeping past live guards.

Leadership (Discipline, Social)

A leader is skilled in getting people to work towards a common goal. Leadership is different from management in that a leader stands with their followers and shares their fate. Building this bond of trust makes their followers more daring and self sacrificing because they know their leader would do the same for each of them.

Machinist (Coordination, Technical)

Precision parts for machines of all sorts are fabricated by skilled machinists who figure out how to make the parts and craft them with the aid of computerized tools. Large star ships often have a machinist on the crew if not a whole machine shop since it is easier to carry raw materials than replacements for every part on the ship.

Management (Discipline, Administration):

Running a business or bureaucracy requires people to be directed and work towards common goals. The Management skill is used to get the most out of one's underlings and rise in the office's pecking order.

Marathon (Endurance, Athletic):

With intense physical training, an athlete can learn to greatly extend the distances they can run without tiring. A character with the Marathon skill can make skill rolls to avoid exhaustion when running long distances.

Mathematics (Logic, Physics):

Underlying all the physical sciences, mechanical and electrical technology, and fantastic computers lies the arcane art: Mathematics. This skill goes far beyond basic arithmetic, into statistical analysis, high level calculus, and multidimensional geometry. A one use +10 bonus to any Physics category skill can be gained with a Mathematics roll with a success level greater than the skill it is applied to.

Mechanic (Coordination, Technical)

A mechanic specializes in fixing and building devices with moving parts. While a great many things are accomplished with electronics, gears, levers, belts, and wheels will likely always be the prime movers of technology.

Melee Weapons Category (physical):

The use of swords and shields left the battle field completely before 1900. As firearms improved, running towards your enemy with a sharp object would generally just get you shot. Still, the advent of force shields and advanced armour may bring hand to hand combat back to the battle field. These skills are also still found in sports, historical re-enactments, and theatre.

Axe (Strength)

Blunt (Strength)

Knife (Coordination)

Pole Arm (Strength)

Shield (Strength)

Spear (Strength)

Sword (Coordination)

Navigation (Logic, Physics):

This skill covers the use of maps and navigational information to get from point A to point B. Navigation covers orienteering, naval navigation, and satellite referencing. A character wishing to set a course for a starship should use the Astrophysics skill instead.

Newtonian Physics (Logic, Physics):

Gross physical reactions between objects can be predicted and analyzed with Newton's laws. This skill is used to predict and plan the workings of machinery, the structural integrity of buildings, and the trajectories of space craft.

Oration (Talent, Social):

The art of public speaking can be a powerful one. It draws more upon emotion than logic and is as much a matter of appearances and presentation as the actual words. In positions of great political, financial, and even military power, the ability to give a rousing speech is often more important than actual Leadership or Management skills.

Painting (Talent, Artistic):

Like Drawing, Painting produces two dimensional representations of three dimensional matters. Painting focuses far more on style and color than Drawing. If the painter is not particularly skilled in Drawing, their paintings will be abstract or stylized but still may please the eye.

Photography (Perception, Artistic):

With a camera, any idiot can produce perfect two dimensional representations of any three dimensional scene. But with the right knowledge of light, shadow, and the underlying technology, skilled photographers can create works of art instead of pictures of their thumbs.

Pharmaceuticals (Logic, Biology):

There is an endless race between geneticists, botanists, and biochemists to create new medicines. The variety of medications available is truly staggering. A pharmacist keeps up with these developments and their side effects, to be able to properly dispense dosages and information.

Pick Pocket (Coordination, Criminal):

Pockets will always be a simple and convenient way of carrying loose items like wallets. A Pick Pocket is skilled in simply and conveniently removing items from pockets without getting caught.

Play "Instrument" (Perception, Artistic):

It takes nimble fingers, good hearing, and patience to play a musical instrument. In skilled hands, even bagpipes can be a thing of wonder and beauty. (In unskilled hands, they can be the "Kazoo of Unimaginable Irritation.") Each instrument is a separate but related skill.

Politics (Discipline, Sociology)

Power, real power, comes by controlling the attitudes and beliefs of people. The Politics skill can be used to know who is who in government, how the government works, and even how to get into and control the government.

Printing (Logic, Artistic):

At some point artists started to look for ways to duplicate their works and thus sell multiple copies. This skill covers screening, etchings, and lithography, as well as advanced computer scanning and touch up techniques.

Psychology (Perception, Sociology)

The behaviours of different individuals are always based on some past experience or racial imperative. A psychologist studies people to understand why individuals behave as they do. A psychologist can also treat disturbed individuals and help them to understand their own behaviors. Psychology is not a different skill for each race because it involves studying individuals to understand their actions and can be practiced on aliens with a penalty based upon how alien they are.

Quantum Physics (Talent, Physics):

The search for a unified field theory has led to some pretty strange discoveries and theories. Chaos theory, multiple dimensions, infinite numbers of divergent time lines and the strange functions of faster than light engines are all grounded in Quantum Physics.

"Race" Medical (Logic, Biology):

The practical application of biological science to the healing of the sick and the wounded is the work of the medic and the physician. The physiology of each species is different, so there is a separate Medical skill for each race. Sheth Medical is a different body of knowledge than Human Medical.

Read "Language" (Discipline, Social):

Every character can read their own language with a skill level equal to their Discipline statistic. Other languages must be learned as skills. Languages which are part of the same language family gain a free advance from any other languages in the family regardless of the rating.

Riding (Reflexes, Athletic):

Riding animals bounce around and make sudden, unexpected moves. A trained rider can stay on a mount that is trying to throw them or just running scared, as well as being able to control the mount better.

Salesmanship (Talent, Social):

One basic truth of business is that more customers come to look out of curiosity than those who come to buy. A skilled salesman needs to believe in the product they are pushing. Sincerity is everything. Once you can fake that you have it made.

SCUBA (Endurance, Athletic):

Using diving gear like aqua lungs and gill masks requires training and skill. The deep sea can be as deadly as hard vacuum to the unskilled and unprepared.

Sculpting (Perception, Artistic):

Sculpting is a broad art. Producing three dimensional representations or three dimensional objects is conceptually simpler than reducing three dimensions to two, yet it requires broad knowledge of structure, familiarity with working in stone, woods, epoxies, and nanogels, as well as primitive casting techniques.

Sensors (Perception, Technical)

The amount of data advanced sensors can access is staggering. Out of endless streams of numbers and facts, the sensor operator specializes in sorting out an accurate picture of what all the data means. Is that an enemy star ship, or an automated mine on an inconsequential asteroid?

Shipping and Handling (Strength, Administration):

A basic fact of consumer societies is the need to organize and operate warehouses and shipping concerns. The character is familiar with the various methods of shipping products and can track their flow when things get lost.

Singing (Perception, Artistic)

Voice and music training will allow a character to sing beautifully instead of screeching off key.

Speak "Language" (Discipline, Social)

Every character can speak their own language with a skill level equal to their Discipline statistic. Other languages must be learned as skills. Languages which are part of the same language family gain a free advance from any other languages in the family regardless of the rating. A language skill over 75 is needed to speak without an accent. Actors can mimic accents but usually not well enough to fool the locals.

Sprinting (Strength, Athletic):

Over short distances, it is possible to move very fast. By training for short distance runs, the character can increase their movement rates. Move an additional number of meters equal to one tenth of your character's Sprinting skill if they move in a straight line for two consecutive actions.

Strategy (Talent, Sociology)

The best use of force to meet an end is the art of the Strategist. Battles are fought by men, but they are won by strategy and planning.

Stealth (Coordination, Criminal & Outdoors)

Avoiding unwanted attention and attacks by creeping through the shadows and hiding in nooks and crannies is an excellent survival skill.

Streetwise (Perception, Criminal):

As long as crime is profitable, there will be those who try to control it all for their own gain. Streetwise characters know who to talk to when navigating criminal hierarchies and hiring criminals, and can usually find black market goods.

Survey (Logic, Technical)

There is always a need for accurate measurements of large areas. Properties are defined and the future locations of buildings are planned based on the measurements gathered by surveyors. As the frontier of space opens up, there will be an increasing need to accurately measure the universe if courses are to be charted, worlds explored, or colonies built.

Swimming (Endurance, Athletic):

Most land animals are sufficiently buoyant to learn to swim. The Swimming skill is used when struggling against waves and currents or trying to rescue those who cannot swim.

Swinging (Coordination, Athletic):

Branches, ropes, chandeliers, and vines are all handy for swinging on. Swinging allows a character to move over things for a greater distance than long jumps and broad jumps permit.

Teaching (Discipline, Social)

Those who can do, those who can't teach. Of course it is always good to have a teacher who used to do. A character with the teaching skill at a higher level than any of their skills that is declining due to aging can teach that skill very well. They can function at the best level they achieved in the declining skill when teaching. (Meaning that as a teacher, their effectiveness isn't limited by aging)

Tracking (Perception, Outdoors):

By searching the ground for foot prints and broken branches, a character can follow prey and identify tracks in the wilderness.

Trapping (Discipline, Outdoors):

Animals and people can be trapped alive or dead using available materials or manufactured traps. The placement and baiting of traps is as important as their mechanical function, and this skill includes the knowledge to make the most out of different types of trap.

Tumbling (Coordination, Athletic):

Feats of gymnastics such as hand springs, vaults, and cartwheels are covered by the Tumbling skill. The rings and uneven bars are more properly handled with the Swinging skill.

Unarmed Category (physical)

When there is no weapon on hand, a character may need to learn to fight without one. There are many different martial arts which teach essentially the same types of attacks under different names. Specific martial arts can be simulated by building up skill in the types of attack it uses. Each of the following attacks is a separate skill.

- Choking (Strength)
- Grappling (Coordination)
- Joint Lock (Coordination)
- Kicking (Coordination)
- Natural Weapons (Coordination)
- Punching (Coordination)
- Tackling (Strength)
- Throwing (Strength)

Vehicle Category

To drive a vehicle well requires more than an understanding of its workings. The driver must, through experience, develop a sense of the location and shape of the vehicle so that it becomes a natural extension of the body. Different types of vehicles move in different manners, and require different specific skills.

- Air Cushion (Logic)
- Fixed Winged (Reflexes)
- Floatation (Reflexes)
- Legged (Reflexes)
- Power Armor (Coordination)
- Rotary Winged (Reflexes)
- Space Craft (Logic)
- Submersible (Logic)
- Tracked (Reflexes)
- VERTOL (Reflexes)
- Wheeled (Reflexes)

Writing (Talent, Artistic)

Every language with a written form can be mangled by the unskilled, murdered by the hopeful and the self possessed, and played like a fine musical instrument by the talented and the mad. Fiction and fact both sound better coming from a skilled writer.

EQUIPMENT

The variety of equipment available in different places and times is staggering. This list is as general as it could be made, but tends towards a TL 40 standard.

Encumbrance

While it may seem desirable to add up the mass of everything a character is carrying and assess a penalty to physical actions based on the total, this sort of number crunching is hardly appealing. Instead, use common sense, Strength requirements, and the encumbrance penalties listed for the individual pieces of equipment. If a character ever tries to carry more than one two handed weapon, three or four one handed weapons, or any similar nonsense, they are considered to be "burdened" and take a -20 penalty to all physical actions attempted including dodging. Similarly, suits of armour and many items apply a penalty to Athletic skills while carried.

Detailed Encumbrance (really pretty optional):

If you really do want to keep a detailed record of what a character is carrying, look up the character's Strength on the Game Statistic Index Table (found on page 77), to find the maximum mass they can normally carry. For every ten percent of this that a character is carrying, they take a ten point penalty to their Reflexes, and all activities involving athletic skills. This replaces the penalty for wearing the various suits of armour.

Computer Assisted Actions

A computer can be a very useful tool when faced with difficult tasks. Computers have a batch of skill points and a set of maximum ratings in skills based on specific Statistics. The skill points are allocated to specific skills when the computer is programmed, and the points dedicated to a skill cannot be moved around without erasing that skill. But the computer can run multiple copies of a skill that it is programmed with if it has unallocated skill points available.

While computers will often have very high ratings in skills, it is important to remember that a computer needs very specific instructions to operate properly. Any set of instructions that are supposed to function without supervision, only have a chance equal to the programmer's Computer skill rating of functioning as desired in any given circumstance. Furthermore, the computer is only able to operate equipment it is linked to. A computer with the Mechanic skill is only a reference work, if it isn't linked to a set of arms.

Computers

Computers have skill ratings which they can be instructed to use on a character's behalf. However, a computer that is not connected to an appropriate set of robot arms (really big ones being useless for surgery, for instance) can only assist in an action as if it were an additional person. Computers can only make up half of the workforce on any project that requires hands.

Example:

Agravain is trying to repair a damaged airlock. Unfortunately he is inside of it, with only a pocket tool and his handy pocket computer. Since Agravain doesn't have the Mechanic skill, and his Coordination is only 48, giving him a base skill of 24, he turns on the computer and checks its Mechanical reference guide. The computer has 50 points of Mechanic skill programmed into it. There is a 20 point penalty for having insufficient tools, which drops the computer's rating to 30. The referee decides that fixing the damaged mechanism will normally take 30 minutes. Agravain decides to spend two hours, or four times longer to get a +20 bonus, the computer essentially doubles the time spent once more, giving him a total of +30. Of course, if the airlock fails before he's done, he's done for.

GEAR

Art Supplies (1 item, 6 kg, 90mu)

Even as technology progresses and makes mass manufacturing cheaper and easier, there is always a demand for hand crafted work. A set of art supplies include: a case with a handle containing a set of wood working or stone cutting tools, or a set of paints, quick stretch canvases, and a folding easel.

Axe (1 item, 6 kg, 30mu)

A good sharp axe is an ideal tool for rough cutting trees. The axe can be used as a melee weapon in a pinch but is not really designed for doing so. (Strength Requirement 70, Parry -10, Penetration = 110, Damage = 180, Breakage = 210, causes Bleeding injuries, cannot be thrown)

Backpack (1 item, 2 kg, 10mu)

A good durable backpack with several compartments, a waist belt, and a frame does a good job of increasing a character's carrying capacity without tying up their hands. The pack is large enough for up to 40 kg of gear, enough room for a week's supplies with careful packing. Wearing a full backpack gives a character a -20 encumbrance penalty and provides an Armour of 77 to the back of the character's body.

Brief Case (1 item, 1 kg, 25 mu)

A high end case made from durable, impact absorbing materials is a good place to store a portable computer and a lunch. The case is designed to be carried one handed and has a lock to keep it from falling open in public. If necessary, the case provides a cover Armour value of 86 to any one hit location. Athletic activities suffer a -10 penalty when the character is trying to hold on to a brief case.

Climbing Harness (worn, 2 kg, 150mu)

An adjustable harness with multiple attachment points for climbing gear and ropes. A climbing harness will not help a character to climb any better, but with the help of a well tied rope, it will stop them from falling too far.

Combat Knife (1 item, 1kg, 15mu)

This is a large, solid knife that is designed to be useful as a tool and a weapon. (Strength Requirement 35, Penetration 75, Damage = 125, Breakage = 175, causes Bleeding injuries)

Diving Gear (4 items, 10 kg, 750mu)

A set of diving gear includes a skintight thermal suit which counts as armoured clothing, a face mask, flippers, and a life support pack. At around TL 30 the life support pack also acts as a ballast tank, but until then, weight belt must be worn to help the character sink to the desired depth. The life support pack provides air for a number of hours equal to the TL. The thermal suit keeps the character warm at temperatures down to TL - 10 and provides an Armour value of 117.

Filter Jug (1 item, 10 kg, 3mu)

This ten litre jug contains a built in water filtration and purification system that will make highly polluted and contaminated water safe to drink.

First Aid Kit (1 item, 2 kg, 10mu)

This kit contains minimal medical supplies intended to be used in minor emergencies. There are low strength pain killers, bandages, and antiseptics. The kit can bandage 8 Bleeding injuries, splint 2 Fractures, and has 20 doses of pain killers that restore the action per turn lost while injured but inflict a -10 penalty to all actions and last for TL minutes per dose.

Food Brick (1 item, 1 kg, 1mu)

Advanced life support systems recycle waste water and biological wastes in a hydroponic greenery. The greenery uses an advanced genetically engineered sludge that is mainly derived from blue-green algae to change carbon-dioxide into oxygen and to produce food bricks. The overall texture of a food brick is best described as grainy sponge. Food bricks contain all the nutrients a human being (or alien) needs for a full day, including water. They are filling and have a slight salty sweet taste that almost compensates for their texture.

Grapple Harpoon (1 item, 3 kg, 225mu)

This is a pistol-like device fires a robot grabber attached to a reel of strong cable about TL x 10 metres. The reel is powered and can be used to lift a load of up to 500 kg the entire distance. The battery is good for about 400 minutes of operation.

Hand Cuffs (1 item, 0.5 kg, 13mu)

This strong set of wrist restraints has a built in alarm which sounds if they are close to breaking or the prisoner's wrists have slipped out. It takes 140 points of damage to break the cuffs.

Hand Scanner (1 item, 2 kg, 150mu)

These small sensor suites normally mount five different low yield sensors which are suitable to their task, generally with a range of TL x 10 metres per -10. Combat scanners read infrared and visual light, and have a small radar unit built in. Medical sensors measure and map body temperatures, read pulses, respiratory and blood pressure levels and register trace chemicals being released into the air. Survey sensors measure distances, angles, and produce maps.

Hot Meal (1 item, 1 kg, 2mu)

Resembling a bulky freezer dinner, a "Hot Meal" contains a disposable microwave system that heats its contents. Hot meals can be stored for up to ten years without spoilage because the food is freeze dried and the container is airtight. A small water package hydrates the food as it cooks. It is safe to say that no degree of technology will ever serve to make the highly processed food taste right.

Inflatable Life Boat (2 items, 10 kg, 150mu)

This self-inflating boat is large enough to hold four people and will resist punctures with an Armour rating of 84 on the bottom.

Intrusion Kit (1 item, 2 kg, 450mu)

This black box includes patch cords to almost every major brand of security sensors and a camera system to insert the image of an empty hall. It can also the tools needed to pick mechanical and electronic locks.

Listening Device (1 item, 2 kg, 450mu)

Conversations can be picked up through windows, thin panel walls and over about TL x 20 metres with this complex laser sensor that reads and translates sound waves. The device looks like a 30 cm long black tube with a pistol grip and dial control.

Lock Picks (1 item, 0.5 kg, 113mu)

In a soft case that gives a -TL to sensor scans to detect the tools. These lock picks and files are suitable for opening mechanical locks. (And, one way or another, they are all mechanical locks.)

Luggage (2 items, 3 kg, 225mu)

A large suitcase and a smaller matching carry on bag will contain enough clothing for two weeks without a change. There is a large odour retardant laundry bag in the suitcase. Like the brief case, this luggage is solid enough to provide an Armour value of 86, the large case covering two locations and the small case covering one. Athletic activities such as climbing and tumbling are done at -60 while trying to carry luggage.

Machete (1 item, 2 kg, 10mu)

Two and a half feet of premium materials with a super hard, micro-serrated edge, this machete may well be a restricted weapon in places without large tracts of tangled undergrowth to hack through. (Strength Requirement 50, Penetration = 95, Damage = 150, Breakage = 190, causes Bleeding injuries)

Micro Computer (worn, 0.5 kg, 38mu)

A little larger than a wrist watch, this small computer has 25 points to program skills with, but is primarily used to record and carry data. The face of the micro computer is a digital camera capable of scanning ten point text from 40 metres away. The micro computer takes its instructions and communicates verbally.

Night Vision Goggles (worn, 1 kg, 75mu)

These goggles which allow the wearer to see Infrared and Ultraviolet light contain a battery with a 90 hour life span. The vision enhancement has a range increment of 200 metres.

Portable Analysis Kit (1 item, 4 kg, 900mu)

Mineral or chemical samples placed inside the small hatch in this blocky case with a handle are identified by spectral analysis and a small electron microscope. Trying to accomplish athletic feats while holding the kit by the handle incurs a -10 penalty.

Portable Computer (1 item, 2 kg, 150mu)

Capable of being programmed with 100 points worth of skills, this portable computer is very similar in size and shape to modern ones.

Rope (1 item, 4 kg, 20mu)

With materials science advances, this 100 metre rope is self coiling, tangle proof, nonslip coated, and capable of lifting TL x TL kg without breaking.

Scanner (2 items, 5 kg, 375mu)

A backpack size scanner system with a range of TL x 50 metres, but otherwise similar to the hand scanners described above.

Standard Rations (1 item, 1 kg, 2mu)

The box shaped, zipper opening package that seals in a day's worth of food keeps it good for as much as forty years.

Survival Kit (1 item, 125 kg, 150mu)

This small package contains a self inflating life jacket, two weeks of Standard Rations, a collapsible water purification jug, a locator beacon, 2 x 2 metre insulated tarp, and a folding survival carbine.

Tarp (1 item, 5 kg, 25mu)

A 5 x 5 metre tarp with eyelets and intelligent adhesive tabs along its edges. The tarp is made of highly durable fibres and provides 68 Armour to everything it covers.

Tent (2 items, 5 kg, 25mu)

A pole-less, self inflating, four man tent, made of durable fibres that provide 65 armour to everything inside. The tent is stuck to the ground with intelligent adhesive which can be turned on and off.

Tool Kit (1 item, 10 kg, 450mu)

This large case contains a professional quality tool set. A set of tools is a very personal thing, and a character's tool kit will contain the right tools for every job they are planning to take on.

Trauma Kit (1 item, 5 kg, 375mu)

A professional set of medical tools, such as forceps, scalpels, quick cast making materials. The kit can bandage 8 Bleeding injuries, replace 4 Blood Loss injuries, splint 4 Fractures, and has 40 doses of pain killers that restore twenty point penalty normally suffered while injured but makes any action attempted "Risky" as it impairs the patient's judgement. The effects last for 40 minutes per dose. The kit also contains a "doctor in a box" medical computer with a skill of 55 in two "Race" Medical skills, Pharmaceuticals, and First Aid.

ARMOUR

The mass given for the suits of armour described below is based on a creature of roughly human size. If detailed encumbrance is being used, the mass of a suit of armour should be increased or decreased by ten percent for each level of Size Increase, or Size Decrease affecting the character for which the armour is fitted.

Armoured Clothing

Materials and fiber technology advances to the point that even durable clothing provides a certain amount of Armour protection to the wearer. Armoured clothing inflicts no penalty on the person wearing it, 75 points of armour.

Battle Dress: (worn, 3 kg, 225mu) The combat uniform of the future is designed to "button up" in case of radiation or germ warfare. It has a hood and gloves that form an airtight seal and an air filter.

Business Suit: (worn, 3 kg, 450mu) This wrinkle and smell retardant suit is appropriate business attire, even if you wear it five days running.

Camouflage Suit: (worn, 5 kg, 675mu) A specialized combat uniform with all the features listed for Battle Dress, which also changes color to match the background. It provides a forty point bonus to the wearer's Outdoor Stealth skill.

Coveralls: (worn, 3 kg, 225mu) Clothing has a tendency to tear when working in the field, these coveralls are made with the most durable material possible.

Dress Uniform: (worn, 3 kg, 450mu) All of the features found in the Battle Dress described above are also built in to this formal dress uniform.

Uniform: (worn, 3 kg, 225mu) A standard duty uniform with the same features as the Battle Dress listed above.

Combat Helmet (worn, 3 kg, 135mu)

This helmet includes a sliding blast visor with heads up display and Battle Dress compatible seals. The helmet provides Armour 108 to the head.

Flak Jacket (worn, 4 kg, 225mu)

A bulky jacket of ballistic-resistant and energy-dispersing fibers which gives an Armour value of 108 to the body.

Flight Suit (worn, 5 kg, 450 mu)

This is essentially a light space suit with a built in self inflating life jacket and parachute harness. The suit provides an Armour rating of 75 to the whole body and 85 to the head. The suit is sealed and has air tanks for 4 hours.

Heavy Body Armour (worn, 24 kg , 1080mu)

A heavy suit of rigid ceramic and metal laminate plates with overlapping joint protection and a heavy ballistic and energy-dispersing fiber undersuit that acts as a fully functional space suit and provides an Armour value of 120 to the entire body. The Armour's bulk causes any athletic activities to be attempted with a -30 penalty.

Light Body Armour (worn, 12 kg, 540mu)

Rigid ceramic and metal laminate plates reinforce a ballistic and energy dispersing fiber suit in vital locations including a combat helmet with heads up display. The suit provides an Armour rating of 105 and functions as a full space suit if attached to a life support system. The Armour's bulk gives its wearer a -20 penalty to all athletic activities.

Light Space Suit (worn, 14 kg, 750mu)

This space suit is as light as a normal suit of clothing and can be "buttoned up" in instants to protect against vacuum. Most deep space force and patrol uniforms are a functioning light space suit. 101 Armour points are provided by a light space suit.

Space Suit (worn, 15 kg, 1125 mu)

A standard space suit is bulky and complex, but provides an excellent degree of protection from micro-meteors and radiation, which a light space suit does not. There is a -10 penalty to all athletic activities while wearing a Space Suit. The space suit has an Armour value of 116.

WEAPONS

As with the equipment list, this list of weapons is hardly exhaustive. Most of the firearms are fairly similar to modern ones, but there are some lasers and other advanced weapons listed as well. There are also a few specific rules relating to the use of weapons, regarding the Strength rating needed to use a weapon, explosives, and weapons that fire rapid volleys of projectiles.

Strength Requirements

Each weapon has a set Strength rating required to use it effectively, using a full set of limbs. (two arms for humans) For each limb in the set not being used, there is an effective -20 penalty to the user's Strength. If the weapon has a higher requirement than the user's Strength, the difference is subtracted from the chance of success for attacks made with the weapon.

Light Weapons

A weapon which has a Strength requirement 20 or more points less than the attacker's Strength can be used to make a free attack each turn, which does not count as an action.

Conventional Firearms

Even in the twenty eighth century guns are the most popular way to kill people. The bullet may be made of a complex composite laminate propelled by an electrochemical reaction but the end result is much the same. Since, over the centuries, the human body has gotten no better at dealing with recoil, better propellants tend to result in lighter rounds and lighter weapons with more ammunition and higher rates of fire. Military weapons are almost always illegal and cost 10 times the listed amount on the black market. Other weapons are sometimes illegal in highly restrictive regimes and cost 5 times as much on the black market.

Weapon Table Notes

* The shotgun's statistics are for shot loads, with the statistics for slugs being listed in the brackets.

1 x 10: This cartridge fires ten projectiles instead of one.

if AR>: The explosive charge only detonates if the target's Armour rating is greater than the weapon's Penetration using a normal round, otherwise, High Explosive Anti Tank rounds are treated as normal ammunition.

ss2h, this weapon has a shoulder stock, and as such, it's Strength Requirement is reduced by thirty when used two handed. Technically, a full set of hands must be used. Aliens with multiple arms in a set will need to use all of them to obtain the bonus.

SMG - Submachine Gun
GL - Grenade Launcher
P-Pistol - Pounder Pistol
AP - Armour Piercing
HE - High Explosive

Laser Weapons

At TL 40, laser weapons are still bulkier and less effective than conventional firearms. They are primarily used because they can be used to illuminate targets for visual light and infrared sensors, making them useful for forward observers guiding long range missile fire.

Pounders

The assault rifle with attached grenade launcher has been the standard infantry weapon for almost a millennium. The propellant and bullet have become more advanced as has the rifle. Of course, a hybrid, small caliber, semiautomatic grenade launcher has long been put forward as an alternative. Traditional military analysts have always disliked these "pounders" due to the expense and mass of their munitions. Of course the police, criminals and mercenaries like the intimidation factor of a twenty millimetre pistol, even if the projectile is short ranged and relatively slow moving.

Electromagnetic Accelerators

A common type of support weapon is a long barrelled railgun. Using an electromagnetic barrel to drag the ammunition up to speed allows the projectile to achieve velocities far beyond those possible with conventional munitions. These weapons also have lighter ammunition since they don't need any propellant. While electromagnetic small arms are certainly possible, they have not caught on with most military and mercenary forces.

HEAT - High Explosive Anti Tank
Frag. - Fragmentation
Conc. - Concussion
Incend. - Incendiary

Weapon Accessories

The Strength required to effectively use a weapon is often based on the weapon's mass, thus, when adding accessories it is a good idea to check the total of the weapon and accessory's mass times five on the following chart. If the new Strength requirement is greater than the old one, it should be used instead.

Mass x5	S	Mass x5	S	Mass x5	S	Mass x5	S	Mass x5	S
1.05	1	1.66	11	2.63	21	4.16	31	6.61	41
1.10	2	1.74	12	2.75	22	4.37	32	6.92	42
1.15	3	1.82	13	2.88	23	4.57	33	7.24	43
1.20	4	1.91	14	3.02	24	4.79	34	7.59	44
1.26	5	2.00	15	3.16	25	5.01	35	7.94	45
1.32	6	2.09	16	3.31	26	5.25	36	8.32	46
1.38	7	2.19	17	3.47	27	5.50	37	8.71	47
1.45	8	2.29	18	3.63	28	5.75	38	9.12	48
1.51	9	2.40	19	3.80	29	6.03	39	9.55	49
1.58	10	2.51	20	3.98	30	6.31	40	10	50

Bipod (1 item, 1.5 kg, 23mu)

Mounting a bipod on a weapon helps to brace it on the ground or other surfaces when firing. A bipod gives a ten point bonus to hit when the attacker isn't moving and properly braces the weapon.

Computer Sight (1 item, 2 kg, 450mu)

This sight contains infrared and laser emitters and a small, dedicated computer that tells the shooter when to fire in a deadpan voice. The computer has the Sensor and Weapon skill at 40%. These skills can be used to aim and attack if they are higher than the user's. The visual light sensors have a range of 600 metres per -10 to the chance of success. A standard interface socket is built into the sight, allowing it to be plugged into a heads up display in which case it will tell the user when to fire by flashing a red cross hairs on the heads up display, cancelling the penalty for firing while moving. The computer can even aim and attack normally in complete darkness.

Grenade Launcher (1 item, 1.2 kg, 90mu)

A rifle can have a breach loaded grenade launcher installed beneath the barrel. This has the same statistics as the grenade launcher in the weapon table but only has one shot.

Laser Sight (1 item, .5 kg, 112mu)

The red dot projected by a laser sight makes it easier to tell exactly where the gun is pointing. This allows the weapon to ignore the twenty point penalty for firing on the move, or to gain a ten point bonus to hit when stationary.

Telescopic Sight (1 item, 2 kg, 450mu)

The advanced optics in this sight have a range of 800 metres per -10 to the chance of success. Attacks made by a stationary combatant using a Telescopic Sight can use this range instead of their weapon's when calculating their chance to hit. The weapon's Penetration still drops off at the rate given for the weapon. The scope includes night vision features and a standard interface socket.

VEHICLES

All of the following vehicles have been designed at TL 40. Features listed as "external" are not protected by armour. These vehicles are all fairly common units. The only advances that have been used in their design are hybrid rocket-jets and warp drives. The cost as listed does not include any sub-craft, fuel, or munitions.

Vehicle Provision Costs

Air Tank Recharge	1mu per person / hour
Battery Recharge	1mu per 40 pu / hours
Fuel	1mu per kg
Life Support Supplies	3mu per person / hour

Stability is the velocity at which driving a particular vehicle becomes a risky action.

Resistance is the amount of automatic deceleration a vehicle experiences each turn as a fraction of it's current velocity

Battle Suit

Cost: 30 600mu
Loaded Mass: 520 kg
Empty Mass: 408 kg

Acceleration: 6 kph / round
Top Speed: 92 kph
Stability: 57 kph
Resistance: 1 / 15 kph

Target Size: 0
Structure: 95 (800 capacity)
Armour: 158

Features:
1 Crew (100 kg)
Computer (40 skill points)
Sensors (400 m / -10, 40 pu)
Transmission (800 power capacity)
Batteries (4 000 power unit hours or 5 hours)
Legs
2 Arms (200 kg capacity, 200 pu)
Laser Pistol in right arm (2500 pu / sec)
2 LAWs (Shoulder mounted)

Vehicle Computers

A vehicle's on board computer can act as a surrogate driver or aid the driver. Each computer has a fixed number of skill points which can be allocated to skills as desired, as long as the base level in the program is maintained. The maximum number of free skill points that can be devoted to a skill is the TL, or 40 in this case. For example, a 40 point skill program must be maintained at forty points at least once in the system or loaded in again from another computer that has the program. Any program can be duplicated within the system any number of times, so long as there are enough allocatable skill points remaining. A computer gains half of the Statistic related to a skill, just like a character, but cannot use skills without programs that allocate points to them. The TL 40 computers on these vehicles all have the following Statistics:

Coordination = 40 (+20)
Discipline = 90 (+45)
Logic = 90 (+45)
Perception = 40 (+20)
Reflexes: 90 (+45)
Maximum Points / Skill = 40

Example:

A TL 40 computer can devote up to 40 free points to any skill. A ground car, with 100 skill points, could have the Wheeled Vehicles skill rating of 40 + 45 (½ Reflexes), Sensors Skill 40 + 20 (½ Perception), and still have 20 points left over for a map program or music. If for some reason, the Wheeled Vehicles skill was dropped to using 20 points, it would have to be reloaded from an outside source to reach 40 again.

Ground Car

Cost: 13 000mu
Loaded Mass: 1020 kg
Empty Mass: 520 kg

Acceleration: 20 kph / round
Top Speed: 294 kph
Stability: 118 kph
Resistance: 1 / 15 kph

Target Size: +10
Structure: 112 (1800 capacity)
Armour: 120

Features:
1 Crew (100 kg)
3 Passengers (100 kg each)
Cargo (100 kg)
Computer (100 skill points)
Sensors (400 m / -10, 40 pu)
Transmission (5000 power capacity)
Batteries (20 000 power unit hours or 4 hours)
2 Head Lights (40 m / -10, 2 pu)
External Wheels

Ground Truck

Cost: 49 375mu
Loaded Mass: 3175 kg
Empty Mass: 1975 kg

Target Size: +10
Acceleration: 13 kph / round
Top Speed: 126 kph
Stability: 38 kph
Resistance: 1 / 10 kph

Structure: 130
Armour: 130

Features:
1 Crew (100 kg)
1 Passenger (100 kg)
External Cargo (1000 kg)
Computer (80 skill points)
Sensors (400 m / -10, 40 pu)
Transmission 10000 power capacity
Batteries (48 000 power unit hours or 4.8 hours)
2 Headlights (40 m / -10, 2 pu)
External Wheels

Jet Ski

Cost: 2 700
Loaded Mass: 208 kg
Empty Mass: 108 kg

Acceleration: 23 kph / round
Top Speed: 230 kph
Stability: 124 kph
Resistance: 1 / 10 kph

Target Size: 0
Structure: 80 (400 kg capacity)
Front Armour: 134
Left Armour: 101
Right Armour: 101
Back Armour: 101
Under Side Armour: 163

Features:
1 Crew (100 kg)
Transmission 1200 power capacity
Batteries (3600 power unit hours or 3 hours)
Head Light (40 m / -10, 1 pu)
Buoyant Hull

Main Battle Tank

Cost: 9 000 000mu
Loaded Mass: 40 000 kg
Empty Mass: 32 460 kg

Acceleration: 10 kph / round
Top Speed: 150 kph Land, 50 water
Stability: 60 kph water, 20 kph water
Resistance: 1 / 15 kph

Target Size: +10
Structure: 195 (80 000 kg capacity)

Front Armour: 206
Left Armour: 186
Right Armour: 186
Back Armour: 186
Top Armour: 186
Under Side Armour: 186

Features:
3 Crew (100 kg ea)
Air Tanks (40 person hours)
Cargo (40 kg)
Computer (400 skill points)
Sensors (8000 m / -10, 800 pu)
Transmission 100 000 power capacity
Batteries (60 000 power unit hours)
Power Plant (400 000 pu output)
250 kg fuel per hour
Fuel (5000 kg or 20 hours)
2 Head Lights (40 m / -10, 2 pu)
Tracks
Buoyant Hull

Turret Railgun
Power Requirement (400 000 pu / sec)
Rate of Fire: 20
Ammunition: 2000 x 1 kg shell
Range: 20 000 m /-10
Penetration: 230 (HEAT & HE 280)
Damage: 300 (HEAT 280, HE 130)
Injuries: Bleeding (HEAT Incendiary)
Frag HE: Bleeding
Concussion HE: Stun
Incendiary HE: Incendiary
Cost Per 100 Rounds: 900mu

Turret Laser
Power Requirement (15 000 pu / sec)
Rate of Fire: 1
Range: 200 m /-10
Penetration: 130
Damage: 165
Injuries: Incendiary

Motor Boat

Cost: 15 000mu
Loaded Mass: 1600 kg
Empty Mass: 600 kg

Acceleration: 20 kph / round
Top Speed: 200 kph
Stability: 45 kph
Resistance: 1 / 10 kph

Target Size: +10
Structure: 129 (3800 kg capacity)
Front Armour: 121
Left Armour: 121
Right Armour: 121
Back Armour: 121
Top Armour: 121
Under Side Armour: 156

Features:

1 External Crew (100 kg)
5 External Passengers (100 kg each)
Cargo (400 kg)
Computer (120 skill points)
Transmission 8000 power capacity
Batteries (40 000 power unit hours or 5 hours)
2 Head Lights (40 m / -10, 2 pu)
Buoyant Hull

Motorcycle

Cost: 2 625
Loaded Mass: 205 kg
Empty Mass: 105 kg

Acceleration: 23 kph / round
Top Speed: 234 kph
Stability: 78 kph
Resistance: 1 / 10 kph

Target Size: 0
Structure: 80 (400 kg capacity)
Front Armour: 127

Features:

1 Crew (100 kg)
Transmission 1200 power capacity
Batteries (3600 power unit hours or 3 hours)
Head Light (40 m / -10, 1 pu)
External Wheels

Transport Helicopter

Cost: 61 875mu
Loaded Mass: 1800 kg
Empty Mass: 825 kg

Acceleration: 7 kph / round
Top Speed: 200 kph
Stability: 200 kph
Resistance: 1 / 30 kph

Target Size: +10
Structure: 115 (2000 kg capacity)
Armour: 100

Features:

1 Crew (100 kg)
3 Passengers (100 kg ea.)
Cargo (500 kg)
Computer (120 skill points)
Sensors (4000 m / -10)
Rotary Wing (12 000 power capacity)
9000 power to generate lift
Rotary Wings are always external
Power Plant (12 000 power units output)
7.5 kg fuel per hour
Fuel (75 kg or 10 hours)
Batteries (2000 power unit hours)
2 Lights (40 m / -10)
Retractable Unpowered Wheels

SPACECRAFT

Bomber

Based on the same frame and engines as the Lander and the Fighter, this Bomber can dock in the same landing bays as they do, allowing naval vessels a variety of options. As a warship, the Bomber is as fast as the Fighter, but is less manoeuvrable in atmosphere and carries less fuel and more missiles or even a capital torpedo. Its laser turret is primarily a defensive weapon.

Cost: 1 37 500mu
Loaded Mass: 10 000 kg
Empty Mass: 5 500 kg

Acceleration: 160 kph / round
Top Speed: 9 600 kph Air, 1 600 kph Ground
Stability: 180 kph air, 10 kph ground
Resistance: 1 / 60 kph

Target Size: +10
Structure: 195 (80 tonne capacity)
Under Body Armour: 161
Other Armour: 150

Features:
2 Crew (100 kg ea)
Life Support (4 people, 400 pu)
Life Support Supplies (4000 person hours)
Computer (200 skill points)
Sensors (4 000 m / -10, 400 pu)

Batteries (15 200 power unit hours)
Hybrid Rocket - Jet (600 000 pu output)
375 kg fuel / hour in atmosphere
750 kg fuel / hour in vacuum
Fuel (3000 kg)
Vectored Thrust (120 000 pu capacity)
Retractable Unpowered Wheels
Wings (Stall Speed 600 kph)

Stealth (-40)
Missile Bay (1500 kg)
Triple Laser Turret
Power Requirement (45 000 pu / sec)
Rate of Fire: 3
Range: 200 m /-10
Penetration: 130
Damage: 254 (Blast 104)
Injuries: Incendiary

Cruiser

This huge capital ship is designed to operate with a fleet or independently for extended periods of time. It is even equipped with a centrifugal gravity simulation hamster wheel to allow the crew to exercise. It carries a limited supply of capital torpedos, relying primarily on its impressive laser batteries in combat.

Cost: 7 830 675 000mu
Loaded Mass: 60 000 tonnes
Empty Mass: 34 803 tonnes

Acceleration: 32 kph / round
Target Size: +30
Structure: 338 (8 000 tonne capacity)
Armour: 168

Features:
500 Crew (100 kg ea)
Rooms (1956 cubic metres)
Life Support (1000 person capacity, 100 000 pu)
Life Support Supplies (1 080 000 / person hours)
Hamster Wheel (15 people, 3000 pu)
Cargo (200 tonnes)
Computer (200 000 skill points, 5 000 pu)
Sensors (2 000 km / -10, 200 000 pu)

Power Plant (480 000 000 pu out, 300 tonnes fuel/ hr)
Batteries (500 000 000 power unit hours)
Thrusters (480 000 000pu capacity)
300 tonnes fuel / hour in vacuum
Fuel (2 000 tonnes)
Warp Drive (480 000 000pu capacity)
32 Light Years per day
4 Shuttles
8 Landers, Fighters, or Bombers

10 Triple Mount Laser Turrets
Power Requirement (12 006 000 pu / sec)
Rate of Fire: 3
Range: 20 000 m /-10
Penetration: 215
Damage: 254 (Blast 65)
Injuries: Incendiary

4 Laser Turrets
Power Requirement (40 10 000 pu / sec)
Rate of Fire: 1
Range: 2 000 000 m / -10
Penetration: 315
Damage: 354 (Blast 204, Cook Out 104)
Injuries: Incendiary

40 x 1000 kg Capital Ship Torpedos

Destroyer

The Destroyer is a ship intended to escort fleets of capital ships, providing long range sensor coverage and a massive payload of capital ship torpedos.

Cost: 378 000mu
Loaded Mass: 4114 tonnes
Empty Mass: 1680 tonnes

Acceleration: 31 kph / round
Target Size: +30
Structure: 261 (8 000 tonne capacity)
Armour: 180

Features:

100 Crew (100 kg ea)
Rooms (240 cubic metres)
Life Support (800 person capacity, 80 000 pu)
Life Support Supplies (2 000 000 / person hours)
Cargo (34.5 tonnes)
Computer (20 000 skill points, 500 pu)
Sensors (2 000 km / -10, 200 000pu)

Power Plant (32 000 000 pu out, 20 tonnes fuel / hr)
Batteries (80 000 000 power unit hours)
Thrusters (32 000 000pu capacity)
 20 tonnes fuel / hour in vacuum
Fuel (2 000 tonnes)
Warp Drive (32 000 000pu capacity)
 31 Light Years per day
Shuttle
2 Landers
100 x 1000kg Capital Ship Torpedos
5 Quad Mount Laser Turrets
 Power Requirement (16 008 000 pu / sec)
 Rate of Fire: 4
 Range: 20 000 m /-10
 Penetration: 215
 Damage: 254 (Blast 104)
 Injuries: Incendiary

Fighter

A long ranged heavy fighter with a folding wings that provide it with good manoeuvrability in atmosphere while allowing it to dock in the same bays as the Lander and Bomber. Its stealth and long range make it a good scout ship, and it's internal missile bays are sometimes loaded with extra air tanks to give it an extra 40 hours of air per missile replaced.

Cost: 1 035 000mu
Loaded Mass: 10 000 kg
Empty Mass: 4 600 kg

Acceleration: 160 kph / round
Top Speed: 9 600 kph Air, 1 600 kph Ground
Stall Speed: 200 kph
Stability: 180 kph air, 9 kph ground
Resistance: 1 / 60 kph

Target Size: +10
Structure: 177 (48 tonne capacity)
Armour: 149

Features:

1 Crew (100 kg ea)
Air Tanks (40 person hours)
Computer (400 skill points, 10 put)
Sensors (6 000 m / -10, 600 pu)

Batteries (100 000 power unit hours)
Hybrid Rocket - Jet (600 000 pu output)
 250 kg fuel / hour in atmosphere
 500 kg fuel / hour in vacuum
Fuel (5000 kg)
Vectored Thrust (100 000 pu capacity)
Retractable Unpowered Wheels
Wings (Stall Speed 214 kph)
Stealth (-40)

Forward Fixed Laser
 Power Requirement (400 000 pu / sec)
 Rate of Fire: 1
 Range: 2000 m /-10
 Penetration: 204
 Damage: 254 (Blast 104)
 Injuries: Incendiary
2 x 50 kg missiles

Freighter

By using an externally docked Shuttle as its main booster, this common model of Freighter manages to avoid needing to land at all. It still has thrusters to allow it limited manoeuvrability in orbit.

Cost: 7 462 500mu
Loaded Mass: 600 tonnes
Empty Mass: 99.5 tonnes

Acceleration: 2.6 kph / round
Shuttle Boosted: 37 kph / round
Target Size: +20
Structure: 292 (800 000 tonne capacity)
Armour: 188

Features:

5 Crew (100 kg ea)
Rooms (25 cubic metres)
Life Support (20 person capacity, 2000 pu)
Life Support Supplies (6720 / person hours)
Cargo (200 tonnes)
Computer (540 skill points, 27 pu)
Sensors (400 km / -10, 40 000pu)

Power Plant (400 000 pu out, 250 kg fuel / hour)
Batteries (200 000 power unit hours)
Thrusters (400 000 pu capacity)
250 kg fuel / hour in vacuum
Fuel (200 tonnes)
Warp Drive (400 000 pu capacity)
2.6 Light Years per day
External Shuttle

Lander

While the primary role of these small ships is that of a life boat, the Lander is designed as a versatile and fully functional mini-shuttle. It is no mistake that this common civilian vessel has a nearly identical profile to the navy's Fighters and Bombers. The design and manufacturing were deliberately placed in the public domain to give the navy a dose of free anonymity.

Cost: 412 500mu
Loaded Mass: 10 000 kg
Empty Mass: 5 500 kg

Acceleration: 160 kph / round
Top Speed: 9 600 kph Air, 1 600 kph Ground
Stability: 180 kph air, 10 kph ground
Resistance: 1 / 60 kph

Target Size: +10
Structure: 195 (80 tonne capacity)
Under Body Armour: 161
Other Armour: 150

Features:

2 Crew (100 kg ea)
2 Passengers (100 kg ea.)
Life Support (4 people, 400pu)
Life Support Supplies (4000 person hours)
Cargo (1 500 kg)
Computer (200 skill points, 5 pu)
Sensors (4 000 m / -10, 400 pu)

Batteries (400 power unit hours)
Hybrid Rocket - Jet (600 000 pu output)
250 kg fuel / hour in atmosphere
500 kg fuel / hour in vacuum
Fuel (3000 kg)
Vectored Thrust (120 000 pu capacity)
Retractable Unpowered Wheels
Wings (Stall Speed 600 kph)

Shuttle

A common workhorse in both military and civilian use. This basic heavy hauler is found in a wide variety of roles where the ability to lift large cargos off planet is needed.

Cost: 4 800 000mu
Loaded Mass: 200 tonnes
Empty Mass: 64 tonnes

Acceleration: 120 kph / round
Top Speed: 7200 kph Air, 1200 kph Ground
Stability: 60 kph air, 4 kph ground
Resistance: 1 / 60 kph

Target Size: +20
Structure: 239 (630 tonne capacity)
Under Body Armour: 196
Other Armour: 150

Features:

2 Crew (100 kg ea)
8 Passengers (100 kg ea.)
Life Support (10 people, 1000 pu)
Life Support Supplies (40 000 person / hours)
Cargo (75 tonnes)
Computer (400 skill points, 10 pu)
Sensors (40 km / -10, 4000pu)

Batteries (100 000 power unit hours)
Hybrid Rocket - Jet (6 000 000 pu out put)
 3750 kg fuel / hour in atmosphere
 7500 kg fuel / hour in vacuum
Fuel (60 tonnes)
Vectored Thrust (2 000 000 pu capacity)
Retractable Unpowered Wheels
Wings (Stall Speed 600 kph)

Transport

Commonly used to transport small and valuable goods and important people. The Transport is often converted to a yacht using the large cargo bay as a grand hall. Given the valuable nature of their cargos, these ships have two sockets for installing weapons. Older ships often serve as tramp freighters, hauling just about anything imaginable, anywhere reachable.

Cost: 5 578 500mu
Loaded Mass: 200 tonnes
Empty Mass: 74.38 tonnes

Acceleration: 100 kph / round
Top Speed: 6000 kph air, 1000 ground
Stall Speed: 300 kph
Stability: 120 kph air, 4 kph ground
Target Size: +20
Structure: 230 (8 000 tonne capacity)
Armour: 177

Features:

5 Crew (100 kg ea)
15 Passengers (100 kg ea)
Rooms (100 cubic metres)
Life Support (40 person capacity, 4000 pu)
Life Support Supplies (28 800 / person hours)

Cargo (50 tonnes)
Computer (3 800 skill points, 95 pu)
Sensors (400 km / -10, 200 000pu)

Power Plant (100 000 out)
 62.5 kg fuel / hour
Batteries (200 000 power unit hours)
Vectored Thrusters (2 000 000pu capacity)
Hybrid Rocket - Jet (5 000 000 pu output)
 312.5 kg fuel / hour
Fuel (62 500 kg)
Warp Drive (560 000pu capacity)
 11.2 Light Years per day

2 empty 200 kg sockets

Missiles

Many of the preceding vehicles use the following guided munitions.

50 kg missiles

These general purpose smart rockets are used by aerospace fighters and ground based main battle tanks.

Cost: 3 750mu

Mass 50 kg

Sensors: 400 m / -10, skill 70%

Computer

Winged Aircraft Piloting 70%

Sensors 60%

Spacecraft Piloting 70%

Acceleration: 480 kph / round

Top Speed: 28 800 kph in atmosphere

Range: 16 minutes

Stability: 48 kph

Stall Speed: 375 kph

Target Size: 0

Structure: 88

Penetration: 335 HEAT (185 Frag)

Damage: 335 HEAT (335 Frag)

Injuries: Incendiary HEAT (Bleeding Frag)

1000 kg Capital Torpedo

These smart missiles are designed to function in space.

Cost: 75 000mu

Mass: 1000 kg

Sensors: 4000 m / -10, skill 60%

Computer:

Newtonian Physics 95%

Space Craft Piloting 95%

Sensors 60%

Strategy 40%

Acceleration: 320 kph / round

Range: 8 hours

Target Size: 0

Structure: 145

Penetration: 383 HEAT (275 Frag)

Damage: 383 HEAT (383 Frag)

Injuries: Incendiary HEAT (Bleeding Frag)

Light Anti Vehicle Weapon

This is a shoulder fired missile designed to allow infantry to successfully engage armoured vehicles.

Cost: 375 mu

Mass: 5 kg

Sensors: 200 m / -10

Computer:

Sensors 50%

Winged Aircraft Piloting 55%

Acceleration: 160 kph / round

Top Speed: 9580

Stability: 240 kph

Stall Speed: 150 kph

Range: 2.4 minutes

Target Size: -10

Structure: 15

Penetration: 280 HEAT (130 Frag)

Damage: 280 HEAT (280 Frag)

Injuries: Incendiary HEAT (Bleeding Frag)

COMBAT

These rules are intended to allow small unit actions to be played out with miniature figures or counters on a map or a table with model scenery. It is possible to fudge things and use them in a narrative fashion when roleplaying. While these are fairly detailed rules, they are fairly simple to use in play.

Summary

The combatants take turns in order of their Reflexes ratings. Attacks are resolved by making a success roll against the appropriate weapon skill. If an attack hits and the roll is ten or less, the attack only grazes the target and does fifty points less damage than normal.

The target suffers one injury for every hundred points (or fraction thereof) that the weapon's damage is greater than their Endurance. The type of weapon used determines the type of injuries suffered. For example: swords and daggers cause Bleeding injuries.

For every hundred points that the target's armour exceeds the weapon's penetration, one injury is ignored. Any remaining points serve to change one injury to a Stun.

If a combatant has accumulated two or more injuries to the head, they are knocked unconscious. When a combatant has accumulated three or more injuries they must make an Endurance - 20 (for being wounded) roll or fall unconscious. When they have accumulated four injuries and for each injury they take after that, they are automatically knocked unconscious and must make an Endurance -20 roll or die.

Taking a large amount of damage from a single attack can cause additional effects. An attack that causes two injuries will cause a Fracture injury instead of a second injury of the type that is normally inflicted by the weapon. Attacks that cause three injuries cause a permanent crippling injury such as the loss of a limb. Any attack causing five or more injuries kills its target outright.

Trading off points from one rating to improve another is a general theme in these combat rules. Points of Reflexes can be dropped to increase the chance of hitting, by aiming or looking for an opening in the target's defences. Highly accurate attacks can be attempted, reducing the chance of getting a hit to increase Penetration or Damage. In close combat, tricky shots can be tried, trading a reduction in the chance to hit to reduce the target's chance of deflecting the blow.

Scale

Small unit actions are resolved using three and six tenths of a second (3.6s) "Rounds" during which each combatant can take an action in order of their Reflexes rating. At this scale, a velocity in kilometres per hour is equal to a velocity in metres per Round. In general, it is easier to use a ground scale of one centimetre is equivalent to one metre, but if many vehicles are involved in a conflict, a scale of one centimetre is equivalent to ten metres may prove more useful.

Initiative

The actions taken by the combatants during a Round are assumed to be largely simultaneous. As such, the Reflexes based sequence largely measures a slight but critical edge in getting started.

A combatant can deliberately reduce their Reflexes to gain an equal bonus to hit their target or reduce their chance to hit in order to increase them. The bonus gained by taking a reduction in Reflexes represents waiting for an opening when fighting, or aiming when shooting. Taking a penalty to Reflexes represents hasty snapshots and careless blows.

Any bonus to hit gained in this way is lost when the target takes their turn. If this bonus is carried over into the next round, the attacker automatically has priority over their target by one point regardless of any hasty actions the target attempts.

It is possible for an individual with a high Reflexes rating to wait and take their action later in the Round, when doing so their action takes Initiative over actions declared by slower individuals, even if they wait into the next Round. Waiting does not increase the waiting individual's chance to hit.

Example:

Nathaniel Black is being stalked by a large alien predator. He hears it, but can't see it, so he readies his autorifle and waits. Since he has a 57 Reflexes and the predator has a 87, it would normally take its turn first, but when it pounces, Black has been waiting for several Rounds, and thus has Initiative.

Combat Modifiers

General (Initiative, Shooting, and Fighting)	
Injured	-20
Bad Light	-10 per Level
Too Weak To Use Weapon	- 5 / point
Multiple Weapons	-10 one target
Multiple Weapons	-20 more targets
Called Shot	-20
Initiative	
Aiming	- attack bonus
Hasty Attack	+ attack penalty
Looking For an Opening	- attack bonus
Move and Attack	-20
Shooting	
Moving and Shooting	-20
Per Range Increment	-10
Target Size	By target
Target Velocity	
greater than range	-10
greater than range x 10	-20
greater than range x 100	-30
per x 10	-10
Aiming	+ Initiative penalty
Hasty Attack	- Initiative bonus
Pinpoint Accuracy	- Damage bonus
Pinpoint Accuracy	- Penetration bonus
Automatic and Volley Fire	
Base Chance To Hit	30% + Rate of Fire
Strength Requirement	+ Rate of Fire
Suppression Fire	+ Rate of Fire x 5
Dodging	
Beams and Bullets	-160
Fighting	
Looking For An Opening	+ Reflexes penalty
Feinting	- Parry penalty
Hasty Attack	- Initiative bonus
Parrying	
	- Feint penalty
	- Breakage bonus
	- Riposte chance

Applying Damage

Penetration > Armour
 Penetration - Armour
 Attack Roll < Final Chance -11
 Attack Roll > 10

Damage Ignores Armour
 - 1 injury per full 100, remaining points less than 100, 1 Stun injury
 Direct Hit +200 Damage
 Solid Hit +100 Damage

Modified Damage < Strength
 Modified Damage - Strength

barely a scratch, target ignores it completely
 1 weapon appropriate injury per 100 points, 1 Stun for less than 100

Cumulative Injury Effects

2 injuries to the head
 2 or more injuries in one blow
 3 injuries in one blow
 3 injuries in total
 4 injuries in total
 5 injuries in one blow

target knocked unconscious
 second injury changed to a Fracture
 limb or neck destroyed or severed, spine fractured if body was hit
 Make an Endurance - 20 roll each round or pass out
 target knocked unconscious, roll Endurance -20 or die
 target dies

Driving and Piloting Modifiers

Per 30 degrees turned	-10
Reckless Driving	+ Initiative Penalty
Cautious Driving	- Initiative Bonus

Sensor Operations Modifiers

Range Increment = Sensor Range + Target's Power Output	
Per Range Increment	- 10
Behind Target's Engines	+ 20
Stealth Target	- TL
In Vacuum	Distance / 1000
Target Size	As for target
Target Velocity	
greater than range	+10
greater than range x 10	+20
greater than range x 100	+30
per x 10	+10
Scanning	
Technology	+ sensor's TL
Target is Area Jamming	+ 20
Locking On	
Target is Area Jamming	- target's TL

Organism Hit Locations

1	Head	knock out with two injuries
2	Neck	all Fractures hit spine
3	Arm	drop item, unusable if Fractured
4	Wing	cannot fly if Fractured
5	Leg	lose half of move per Fractured leg
6	Tail	lose any tail attacks if crippled
7-8	Chest	
9-10	Abdomen	no fracture on tenth injury

Light Levels

Lighting is vital to many activities. Any action requiring light takes a penalty based on the light level the character's race is best adapted to. The lighting levels are: Blinding, Bright, Day, Twilight, Night, and Darkness. For every stage the light level is away from the character's preferred light, there is a cumulative -10 penalty.

Example

Nathaniel Black is trying to repair a broken communicator at night with only his trusty pocket tool. Being a human, his preferred light is day, so there is a -20 penalty for being two light levels off. Since he lacks the proper equipment there is an additional -20 penalty. His Electronics skill is 87, so he'll need a roll of 47 or less. The first die comes up a 3 and the second a four giving (3 x 10 + 4) him a roll of 34, indicating that the communicator has been successfully repaired.

Movement

A combatant can jog a number of metres equal to one tenth of their Strength score and still evade or make an attack. Firing from behind cover is treated as if the character had moved, since they pop out of their protected position and duck back in. At a full out run, the distance moved is doubled. If a running character comes into contact with an opponent, a blow can be struck against that target, but no attacks can be parried. When running in a straight line a successful Sprinting skill roll allows the distance moved to be increased by one tenth of the skill rating.

It is important to remember that movement takes place over the entire period of the round. The main thing reason is that a moving combatant is in the open and can be fired upon if they moved into the line of sight at any point during the move.

When moving and attacking, there is a twenty point penalty to the Initiative of the action. It generally isn't a good idea to charge a foe that has a gun.

Using Weapons

Weapon Strength Requirements

Each weapon has a set Strength rating required to use it effectively in one hand. If a full set of arms (two arms for humans) is used, the Strength requirement is reduced by twenty points. A weapon with a shoulder stock has its Strength requirement reduced by thirty if it is wielded with a full limb set. If the weapon has a higher requirement than the user's Strength, five times the difference is subtracted from the Initiative and chance of success for attacks and parries made with the weapon.

Light Weapons

A weapon with a Strength requirement twenty points less than is needed to use it can make two attacks per round. Or, one of the attacks may be sacrificed to make an additional parry, reload, or draw the weapon in the same round as one attack is made.

Example:

The autorifle has a Strength requirement of 79, and Black has a Strength of 92. Since his Strength isn't twenty points higher, it isn't a light weapon. Using it two handed, his Strength becomes 112 and the shoulder stock reduces it's Strength requirement to 69. Now it is a light weapon and he can make an extra attack with it each round unless he's too busy running.

Using Multiple Weapons

A human can use a weapon in each hand to make two attacks in one Round. Attacks or parries made with both weapons are made at -10 if directed at a single opponent and -20 if targeted against two. Multi-limbed aliens may be able to use more weapons, but are penalized in the same manner.

Drawing And Loading Weapons

It normally takes one round to draw a weapon or to reload it. The number of shots reloaded depends on the type of weapon. A light weapon can be drawn or reloaded in place of making its free attack.

Breaking Weapons (optional)

A weapon that is used to parry will eventually wear out and break. Every weapon has a breakage number. Whenever the weapon is used to parry, is deliberately struck, or strikes a target with a Structure and Armour greater than its Damage and Penetration respectively, the weapon's breakage number will be reduced by the difference between the Damage done and the weapon's Breakage number. When this reaches zero, the weapon is broken.

Facing

Normally, it is quite safe to assume that the combatants are more mobile than the figurines that represent them. They can crouch and crawl behind cover, climb obstacles, and otherwise do anything an actual person might do. For this reason, there is generally no need to mark which way a figure is facing. At times, however, it is useful to know when something is behind someone. A running figure is facing in the direction they are running for the whole turn. Similarly, when fighting, shooting or aiming, the combatant is obviously facing their target and cannot see what is behind them.

Sighting

At times it will be very important to know what a combatant can see. In particular, one usually wants to see the enemy when shooting at them. If a straight line can be drawn between the attacker and the target, which does not cross through any scenery then the target is visible to the attacker. If a combatant wants to try and locate an enemy that they cannot directly see, they can make a Perception check, with a minus ten penalty for each full increment of their racial Hearing or Smell range.

Shooting

Attacks made with ranged weapons, like firearms and lasers can be "Aimed" trading in some of the character's time for an equal bonus to hit. This bonus is lost when the target takes their turn. If round ends before the attack is made, the next round the bonus carries over and attacker will automatically have Priority over the target, regardless of any hasty actions they may take.

It is much easier to aim an attack when stationary, so there is a twenty point penalty for moving and shooting in the same round. By aiming for vital spots or the joints in the target's armour with "Pinpoint Accuracy" the Penetration or Damage of the weapon can be increased by reducing the attacker's weapon skill by the same amount.

The distance to the target reduces the attacker's Weapon skill. For every full increment of the weapon's Range that lies between it and the target, there is a ten point penalty. The maximum range increment that a creature can take advantage of is the Range increment of the sensor being used to target the attack. Humans, for example have a 200 metre "eyeball" range, and thus cannot take advantage of any Range increment greater than 200 metres per -10.

Large targets are easier to hit. Each race has a Size Modifier that is applied to the shot's chance to hit. For humans this is zero. A fast moving target can also be harder to hit, if the target's speed, in kilometres per hour, is greater than the distance to it, there is a minus ten penalty and for each factor of ten that the velocity is greater than the distance, an additional ten point penalty is incurred.

Any attack roll of ten or less indicates that, the attack has only grazed the target, and therefore causes the damage done by the weapon to be reduced by fifty points.

Blast Attacks

An explosion automatically hits any targets in a radius of one tenth of its Damage rating. For each metre a victim is away from the centre of the Blast, the Damage and Penetration are reduced by ten points. When a Blast attack misses, it goes astray, scattering in a random direction by one range increment.

Automatic Fire

Most advanced weapons are able to fire very rapidly, which increases the chance of hitting something and may even cause multiple hits from a single attack. Such weapons have a rate of fire rating greater than one.

Because of the increased recoil the Strength Requirement for the weapon is increased by the Rate of Fire, this reduces the attacker's weapon skill, but not the flat chance to hit. The arc of fire effected by the attack, in degrees is five times the Rate of Fire. To execute the attack, start with the closest target. If they are hit, apply the damage and roll to hit them again, until a shot misses, then proceed with any targets behind them. If the roll to hit is ever greater than the attacker's weapon skill, they have lost control and the rest of the shots either fly over the heads of the potential targets or hit the ground ahead of them.

All the attacks are made with a flat chance of thirty percent plus the Rate of Fire. All other shooting modifiers still apply. It is not possible to get more hits than there were shots fired.

Suppression Fire

By holding the trigger down for the whole round, an attack can be made against every combatant that enters the arc of fire until the attacker's next turn. This expends five times as much ammunition as the weapon's normal Rate of Fire and increases the Strength Requirement by the number of shots fired as well. These attacks are all made with the base thirty percent chance plus the Rate of Fire, not the number of shots fired.

Example:

As the creature leaps at him, Black opens fire. Since it's closer than his autorifle's 96 metre range increment, he gets no penalty for the distance, but it's movement of 38 is greater than the distance so there's a -10 penalty. Since it has a fair bit of ground to cover, he drops ten points off his Initiative to aim. The autorifle has a rate of fire of 10, and Black's skill is 38 so if he rolls 48 or more, he'll lose control of the burst. The dice roll a 16, so the first bullet hits. He rolls again, now with a base chance of 30%, -10 for its speed, + 10 for the rate of fire. The next roll is a 23 giving him another hit but the roll after that is 43, so the rest of the hail of bullets just chews up the undergrowth. If there were another critter coming close behind it, the base chance would still be 30%.

Volley Fire

Some weapons, like shotguns fire a large number of projectiles with a single pull of the trigger, these are treated much like an automatic fire weapon, except the attacker's skill is used for all the rolls to hit, with a ten point penalty per prior hit obtained.

Dodging

A character that is shot at can attempt to dodge. Against thrown weapons, arrows, and blast effects, this is treated as a Reflexes roll, with a forty point penalty. It is virtually impossible to dodge bullets or energy weapon fire, so against these, the penalty is one hundred and sixty points. A successful dodge includes a run move, but costs the character their next turn. When dodging a Blast, if the move doesn't get the target out of the area effected, they are still hit.

Fighting

Combat at close quarters with knives and bare hands is much more of a personal contest than a firefight. It is possible to trade points of Reflexes (in even ten point increments) for an increased chance to hit, which is lost when the target takes their turn. If the round ends before the attack is made, the bonus is carried over to the next turn, and the attack automatically has Priority over the target's turn. A penalty to the chance of striking the target can be taken to reduce the target's chance of successfully Parrying or to increase the Penetration or Damage of the weapon.

Any attack roll of ten or less indicates that, the attack has only grazed the target, and therefore causes the damage done by the weapon to be reduced by fifty points.

Parrying

It is normally possible to block away one foe's blow with each melee weapon a combatant is wielding. A character that is running cannot parry if attacked. A success roll, penalized by any Feint penalty applied by the attacker, indicates that the attack has been harmlessly knocked aside.

A skilled fighter can reduce the chance of their weapon breaking by taking a penalty to their chance of parrying and adding the same amount to the weapon's Breakage rating. Since every close combat attack made creates an opening in the attacker's defences, the chance of parrying can be deliberately reduced to gain a chance of a riposte (counter attack) which counts as a free attack and occurs immediately after the initial attack is parried.

Blocking with multiple weapons, like attacking with multiple weapons is done at -10 against one opponent and -20 against multiple opponents.

Example:

If the predator survives being shot up, and reaches Black, he's going to be in trouble; it has a Claw skill of 87. It fakes left before its final pounce, dropping 20 points off its chance to hit to reduce his chance of blocking its claws with his rifle. Black only gets half of his Coordination for his chance to parry, so he'll need a $(53 / 2 - 10)$ 16 or less to parry.

Hit Locations

Once an attack has struck its target, the part of the target hit must be determined. The Hit Location Tables are arranged to handle a wide variety of targets without resorting to extra tables or dice rolls. One table deals with damage to organisms and the other to vehicles. The tables are used by rolling one die for each attack and looking up the result on the appropriate table. Since not every target will have every listed location: if a missing system is rolled, the attack hits the system one point higher. So, for example, a snake's head is hit on a roll of 1 and its body is hit on a roll from 2 - 10.

In all cases, the attack will hit the closest part of the type listed based on the direction the attack came from. On larger vehicles, this is especially important as only weapons and sensors capable of affecting the attacker can be hit. If there are several of the listed targets, the attacker chooses which one is struck.

Organism Hit Locations

1	Head	knock out with five injuries
2	Neck	Fractures hit spine
3	Arm	drop item, unusable if Fractured
4	Wing	cannot fly if Fractured
5	Leg	lose half of move per Fractured leg
6	Tail	lose any tail attacks if crippled
7-8	Chest	
9-10	Abdomen	no fracture on tenth injury

Prone Targets

Lying down can provide some protection against ranged attacks, which are made at -10. For prone humans and other upright bipeds, an attack from the head side of the target should be treated as an attack from above, and an attack from the feet side of the target should be treated as an attack from below.

Example:

Rolling the location for his two hits on the predator, yields a 6 and a 4. Since the creature has no tail or wings, the shots hit the chest and a leg. Since the creature is charging Black, this is determined to be one of its front legs.

Cover

Cover does not reduce the chance to hit. Instead, if a hit location is struck that is behind cover, the attack must penetrate the cover before damage is applied to the character. If the character is concealed behind a vehicle, the vehicle is hit instead of the character, in the area the character occupies. The Armour values of ten centimetres of cover are as follows, add ten points each time the thickness of the cover doubles.:

concrete	100
reinforced concrete	150
bunkercrete	200
earth rampart	75
stone	125
wood	50

The parts of the target which are not covered are determined by the actions taken in the turn. Special weapons or racial abilities may allow a combatant to violate these guidelines:

Fire Pistol:	One Arm, Head
Fire Rifle:	Both Arms, Head
Fire Support Weapon:	Head, Both Arms, Chest
Fire Two Pistols:	Both Arms, Head, Chest
Run:	Whole Body
Spot:	Head

Armour and Cover

Armour ratings are not directly cumulative because they are measured on a logarithmic scale. If an attack must pass through cover and armour, use the higher Armour rating plus one tenth of the lower one. This is intended to be simple, not mathematically accurate and may be considered to reflect the change in course and velocity passing through cover can cause.

Applying Damage

Instead of determining damage with an arbitrary accumulation of "hit points," Galactic Adventures attempts to model injuries in terms of burns, blood loss and broken bones.

Grazes and Direct Hits

If the attack roll is ten or less, the attack only grazes the target and does the normal listed Damage. If the roll is greater than ten, one hundred points are added to the Damage. An attack roll that is within ten points of the final chance to hit indicates a direct hit and adds two hundred points to the Damage.

Armour and Penetration

If the target has Armour with a rating greater than the weapon's Penetration, then they will receive some measure of protection against the attack. For every full hundred points the target's armour is greater than the weapon's Penetration, one injury is deflected or absorbed completely. The remaining points of Armour in excess of Penetration alter one injury from the type normally inflicted by the weapon to a Stun injury.

Injuries Inflicted

If the weapon's Damage rating is less than the target's Strength, it is insufficient to cause them any serious injury. For every hundred points, or fraction there-of, that the Damage is greater, the target suffers one injury of the type normally done by the weapon.

Cumulative Injury Effects

If a target takes two or more injuries from a single attack, the second injury will be a Fracture unless the injury was to the abdomen where it will cause an internal bleeding injury that cannot be treated with first aid. A single attack that does three or more injuries will cause a crippling injury, such as spinal damage or severing a limb. A combatant who has taken three injuries in total must make an Endurance roll each round or they will pass out. In any case, when they have taken four injuries in total, they will fall unconscious and need to make an Endurance -20 roll or die, this roll must be made each time they take an additional injury, with an additional -10 to the roll. Taking five injuries from a single attack automatically causes death.

Example:

The creature has been hit in the chest and the leg. Black's autorifle has a Penetration of 64 and a Damage of 180. The creature has an Armour of 30 and a Strength of 95. Since it's Armour is less than the gun's Penetration, it gets no protection there. Because the Damage is less than a hundred points greater than it's Strength, it only takes a single Bleeding injury.

Had the attack roll been within ten points of Black's skill, the Damage would have been increased by a hundred points, so the creature would have taken an additional injury which would have been a Fracture.

Had it been five range increments away (480m), the bullets would only have a penetration of 14, so the creature's thick hide would convert the injury to a Stun.

Recovering From Injuries

Aside from Stun and Asphyxiation injuries, at least some medical attention is required to recover at all. The First Aid skill is used to stabilize patients so they can be transported to a fully equipped medical facility.

A successful First aid roll will prevent any further bleeding, additional injuries from fractured bones flopping around, and the Endurance rolls to avoid dying from massive trauma. Applying First aid normally takes ten turns per injury but prevents further ill effects after the first turn. There is also a ten point penalty to the roll per injury.

Once Stabilized the wound begins to recover at the rate appropriate to they type of injury. Often a successful Endurance roll is required to recover.

Proper medical treatment ensures that the injury will not get worse. It normally takes an hour per injury being treated. A successful "race" Medical skill roll removes the need to make Endurance rolls in order to recover. There is also a ten point penalty to the roll per injury.

Type	Recover one injury
Asphyxiation	each round of deep breathing
Bleeding	roll Endurance weekly
Corrosion	roll Endurance monthly
Entangle	contest of Strength each round
Fracture	roll Endurance bi-monthly
Incendiary	roll Endurance monthly
Blood Loss	roll Endurance daily of resting
Radiation	not normally
Stun	each round

Injury Types and Abbreviations

A- Asphyxiation: the target recovers from one injury effect of this sort for each round spent gasping for air.

B-Bleeding: the target is losing blood. For every ten rounds a character has an untreated Bleeding wound they take a Blood Loss wound. These wounds are too deep to heal unless the character gets stitches or similar treatment to stop the bleeding. The character may roll against Endurance each week to recover from one Bleeding injury.

C-Corrosion: acids, strong bases, and nano-disassemblers can cause serious burns, but don't start fires. A Corrosive attack that does not penetrate armour causes no injuries, but reduces the Armour rating by ten per injury effect. Since corrosive substances need to be neutralized before they stop causing damage, each turn after such an injury is received there is a 50% chance that another injury is suffered. Once a roll for continued burning fails, the agent is neutralized and causes no further damage. Extreme cold can greatly reduce the effect of chemical reactions, reduce the chance of continuing damage by ten per ten degrees centigrade below 20. It takes a month to get an Endurance roll to recover from a Corrosion injury.

E-Entangle: this is not so much an injury type as a weapon effect. The attack grabs hold of the target and immobilises it. Entangle injuries are not reduced by the target's Armour, regardless of penetration. The target's turn is lost until they can make a Strength or Coordination roll with a penalty equal to the binding material's Technology Level or the grappling opponent's Strength minus fifty to break free.

F-Fracture: the target has a broken bone in the location, limbs are crippled by this and may no longer be used. Any additional hits to the location cause an extra Bleeding injury as the bone is driven through the skin. Amorphous creatures treat Fractures as Stuns. It takes two months to get an Endurance Roll to recover from a single Fracture.

Attacks to the Body or Neck may damage the character's spine. Spinal damage to the Body cripples the character's legs. Taken to the neck, a Fracture injury automatically indicates a broken neck, which cripples the character's entire body. Spinal damage can only be healed with advanced technology.

I-Incendiary: the target is burned and any flammable items catch fire if their Armour rating is lower than the Damage rating of the weapon. A burning object has a damage value equal to its Armour rating, which it inflicts on contact. After a month, the character can make an Endurance roll to recover from a single Incendiary injury.

L-Blood Loss: the character can make an Endurance roll every day to recover from one Blood Loss injury if they can get good, iron-rich food to eat or are on an intravenous drip.

R-Radiation: causes a permanent point of Endurance to be lost per injury suffered. These points can only be regained with advanced medical treatments. Radiation injuries don't accumulate towards unconsciousness and death like other injuries, but they do cause hair to fall out and skin to peel.

S-Stuns: accumulate like other wounds, but a character automatically recovers from one Stun wound per round.

Permanent Injuries

In the course of all this adventurous living, there is a change of suffering serious, permanent harm. Any hit that causes a Fracture may cause a permanent injury if left untreated for more than a couple of days. Hits that destroy limbs, break the spine, or cause two Fractures to the head in a single blow, always cause a permanent injury. This can drastically impair one's Statistics as described below. Obviously, a hand or foot is lost with an arm or leg, so these are already worked into the penalty for the loss of the limb.

Foot: -10 Strength
-5 Reflexes
Leg: -15 Strength
-10 Coordination
-5 Endurance,
-5 Reflexes
Hand -5 Coordination
-5 Strength
Arm: -10 Coordination
-10 Strength
Chest: -15 Endurance
-5 Strength
Abdomen:-10 Endurance
-5 Strength
Head: -5 Logic
-5 Talent
-5 Discipline
Eye : -10 Perception each
Ear: -5 Perception each

UNARMED COMBAT

At times, characters will want to fight without weapons, either to avoid killing their opponents, or because they are unarmed.

Natural Weapons: Most natural weapons are only able to attack once per Round. The exception being teeth and claws. It is possible to make a claw attack with each limb in a set (2 for terrestrial animals), make a bite attack, and grapple all in one round.

Choke

Damage = Strength - 10

Penetration = 0

Injury Effects: Asphyxiation

A choke is an attempt to cut off the target's air or blood supply to make them pass out or even die. Chokes can only be made on a grappled opponent. This sort of attack is most effective against creatures with a neck and head attached to their breathing apparatus and least effective against those who breathe by osmosis.

Joint Lock

Damage = Strength

Penetration = 0

Entangle and Stun

Resisted by the target's Coordination

A joint lock can be applied after a successful unarmed parry or a successful grapple attack. The places where a limb bends are particularly vulnerable to being bent in the wrong direction. This painful attack is quite effective at immobilizing the target, but is useless against tentacles.

Punch

Damage = Strength

Penetration = 0

Stun 1

A character can use all of their fists (a full limb set with manipulative members) to make attacks in a single Round just as if using multiple weapons. (-10 to both if attacking a single target and -20 if attacking multiple targets) A tentacle cannot make a fist strike.

Kick

Damage = Strength + 20

Penetration = 0

Stun

A kick can only be made with one leg per limb set. Only legs can be used to kick.

Tackle

Damage = Strength +30

Penetration = 0

Stun 1, Knock Down

Resisted by the target's Strength

A successful tackle drives the target to the ground. If a tackle is dodged, the attacker must make a Coordination roll to avoid falling instead.

Grapple

Damage = Strength - 10

Penetration = 0

Resisted by the target's Grapple skill

Entangle and Stun

A successful grapple attack immobilizes the attacker and the defender, but the attacker can still attack with one action per turn. The target may only try a single grapple attack to break free each turn. Successfully breaking free does not cause any damage or immobilize either combatant.

Throw

Damage = Target's Strength + 10

Penetration = 0

Stun

Resisted by the target's Throw skill

A throw attack can be made after a successful unarmed parry or a successful grapple attack. If the throw is successful, the target falls to the ground with considerable force.

VEHICLE COMBAT

Vehicles are a common feature of modern and futuristic combat. The following rules add to the normal combat rules and build on the concepts found there. One particular issue is the Reflexes rating of vehicles with large crews. In general, it is acceptable to use the individual Reflexes ratings of the driver and other crew members for their actions, but for very large vehicles, it is advisable to use a single rating for the whole crew.

Crew Quality	General Rating
Green	55 + 1d10
Veteran	65 + 1d10
Elite	75 + 1d10

Vehicle Facing

In contrast to living combatants, the direction a vehicle is pointing is quite important. A vehicle can only change its heading and direction as discussed below and may even risk going out of control at high speeds. The vehicle's facing is also important in determining which way its weapons are pointing. Fixed mount weapons can only fire at targets that are directly in line with the side they are mounted on, while weapons in turrets can fire at targets in any direction, as long as the line of sight does not pass through the vehicle itself. Generally this means that targets on the opposite side of the vehicle from the turret cannot be fired upon. For instance, a turret mounted on the left side of the vehicle cannot fire at targets on its right side. As always it is important to remember that attacks may be resolved at any point in the vehicle's movement.

Power Use

Most vehicles have a variety of systems that draw power. In particular the motive system, whether it is a rocket or a propellor will need power to maintain its present velocity or to accelerate. Other systems like life support, weapons and sensors also have power requirements which must be met if they are to function in the present turn.

Vehicle Movement

Acceleration and Deceleration

Since a turn is 3.6 seconds long, a vehicle's speed in kilometers per hour is the same as its speed in meters per turn. A vehicle must supply power equal to its mass for every four kilometers per hour of acceleration. For example, a 2000 kilogram truck, with 20 000 units of motive power available can accelerate by 40 kilometers per hour each turn.

The vehicle's resistance is the number of kilometers per hour that causes the vehicle to decelerate one kilometer per hour each turn due to wind and surface resistance. For example, a vehicle with a resistance of 100 that is traveling three thousand kilometres per hour will automatically decelerate by 30 kilometres per hour each turn and will need to apply enough power to compensate for this if it is to maintain its speed. A vehicle can decelerate at a greater rate if the operator makes a skill roll on the appropriate vehicle skill, -10 for each multiple of the normal free deceleration desired.

A vehicle automatically decelerates by its Resistance, once per turn for free and again as often as desired for a Piloting skill roll with a minus ten penalty, per additional Resistance unit of deceleration.

Hills and Velocity

The vehicle's speed can be reduced by the acceleration rating at both the start and end of the driver's turn. Vehicles which are climbing hills or gaining altitude automatically decelerate by "36 x local gravity" kilometers per hour. Vehicles diving or rolling down hill accelerate at a similar rate and can even exceed their top speed. The pilot of a fixed wing aircraft which falls below its stall speed while climbing must make a skill roll to maintain control. Even if the roll succeeds, the aircraft automatically accelerates "36 x local gravity" kilometers per hour straight down for one turn.

Relative Velocity

Quite often, it is important to know how fast two vehicles are moving relative to each other. If the two vehicles are approaching head on, add their velocities; if one is moving away from the other subtract the lower velocity from the higher; lastly, if one vehicle is approaching the other's side, add half of the higher velocity to the lower one.

Turning

If the vehicle changes its course by more than 30 degrees in one turn, the driver loses an additional action and must make a roll against the appropriate Vehicle skill to stay in control. There is a -10 penalty for each additional 30 degrees the vehicle's course is changed in a turn. This penalty is cumulative, so if a driver turns 15 degrees at one point in their move and 45 degrees later, the second maneuver requires a skill roll at -20. Most vehicles also have a Maneuverability modifier which is applied to the pilot's skill. A failed roll indicates that the vehicle travels in a straight line.

If a vehicle makes a turn at a speed greater than its Stability rating the action becomes risky and if the second roll is failed, the vehicle goes out of control and rolls over. Ground vehicles subtract their Stability from their speed each time they flip and take damage to each side in turn as if they had hit a wall at the same speed until they stop. Water vehicles are swamped and stay upside down. Aircraft lose altitude equal to their present velocity.

It may seem that there needs to be a special rule inflicting a greater penalty at high speeds, but in practice, a fast moving vehicle will need to make sharper turns more often, and thus accumulate a larger penalty.

Collisions

When vehicles collide with each other, obstacles or pedestrians, the Penetration is found by looking up the Relative Velocity of the vehicles on the Game System Index Table, and the Damage is found by looking up the mass of each vehicle. Buildings and other obstacles have no velocity, and their Armour rating as cover can be used for their Damage.

Crew in Combat

The crew of a vehicle can perform a variety of actions while in combat. At the very least: one crew member must drive the vehicle. Firing each weapon or a group of weapons in linked mount or linked by computer requires one crew member. Sensors and ECM systems also require an operator. The rest of the crew will generally perform damage control duties. On larger vehicles, the location and actions of the crew can become important and require recording. For example if fifty men are working on repairing the power plant and two teams of ten are repairing damaged weapons.

Game Statistic Index Table

Many values generated by the technology rules need to be converted from real world figures to game statistics.

Index	Base Rating
1 to 9	0
10 to 99	50
100 to 999	100
1000 to 9999	150
10000 to 99999	200
100000 to 999999	250
x 10	+50

Value	Statistic	Value	Statistic	Value	Statistic	Value	Statistic
1.05	1	1.91	14	3.47	27	6.03	39
1.10	2	2.00	15	3.63	28	6.31	40
1.15	3	2.09	16	3.80	29	6.61	41
1.20	4	2.19	17	3.98	30	6.92	42
1.26	5	2.29	18	4.16	31	7.24	43
1.32	6	2.40	19	4.37	32	7.59	44
1.38	7	2.51	20	4.57	33	7.94	45
1.45	8	2.63	21	4.79	34	8.32	46
1.51	9	2.75	22	5.01	35	8.71	47
1.58	10	2.88	23	5.25	36	9.12	48
1.66	11	3.02	24	5.50	37	9.55	49
1.74	12	3.16	25	5.75	38	10	50
1.82	13	3.31	26				

Sensor Operations

The frequency-agile sensors of the future are capable of scanning areas and locking on to targets in both active and passive modes. In game terms, there are specific modifiers related to the use of sensors that relate to the way they are being used. Making a sensor scan or getting locked on to a target counts as the sensor operator's action for the turn.

Range Modifiers

The Range of the sensor system is added to the target's power output to find the Range Increment. For each Range Increment between the sensor system and its target there is a ten point penalty to the sensor operator's Sensor skill. It is easier to detect targets in a vacuum than it is in the atmosphere, barring any electromagnetic or cosmic radiation static, so all distances are divided by one thousand when calculating sensor related range modifiers.

Other Modifiers

Fast moving vehicles are easier to locate with sensors. For this reason, there is a ten point bonus if the target's velocity exceeds the distance to it and an additional ten point bonus for every multiple of ten thereafter. If the target is employing Rockets, Jets, or Thrusters they are particularly easy to detect from the rear, and are thus targeted at +20. Some vehicles are coated with absorbent surfaces, angled to deflect radiation at odd angles, and have their engine output masked. Such "stealth" vessels are detected and targeted with a penalty equal to their Technology Level.

Active and Passive Modes

An active sensor is very much like a broad spectrum flashlight or the flash of a camera, bouncing particles and wavelengths off of the target to get a better view of what's out there. Of course, this makes the user of the sensor system easier to see. Passive sensors draw very little power, but need existing sources of radiation to see, much like the human eye or a camera. In particular, larger targets will reflect more of the sensor beam. For this reason, active sensors apply the Target Size modifier to their chance of success.

Scanning

The most basic function of a sensor system is detecting the target. Scanning provides information on the general location and size of the target but does not provide detailed information or firing solutions. The sensor system's Technology Level is added to scanning attempts because more advanced sensor systems can sort the information taken in more quickly. Area Jamming Countermeasures produce a great deal of static which makes it easier to detect the target and thus add twenty points to any attempt to detect a target employing them.

Locking On

A sensor system can also be used to eliminate the Range based penalty to hit the target with weapons fire and gain detailed information. Area Jamming Countermeasures are designed to prevent sensors from obtaining a target lock, so their Technology Level is subtracted from the operator's chance of success.

Sensor Operations Modifiers

Range Increment = Sensor Range + Target's Power Output

Per Range Increment	- 10
Behind Target's Engines	+ 20
Stealth Target	- TL
In Vacuum	Distance / 1000
Target Size	As for target
Target Velocity	
greater than range	+10
greater than range x 10	+20
greater than range x 100	+30
per x 10	+10
Scanning	
Technology	+ sensor's TL
Target is Area Jamming	+ 20
Locking On	
Target is Area Jamming	- target's TL

Vehicle Damage

Damage to vehicles is handled much the same as damage to organisms. Only, using the vehicle's Structure rating instead of Endurance, calling the results damage effects instead of injury effects, and rolling the hit location on a different table. One important note, surface systems, like weapons and manipulator arms, that are rolled on the Vehicle Hit Location table are ignored, adding one to the roll and checking the next result instead, if there isn't a unit of that type mounted on that side of the vehicle. For example, a turret on the top of a vehicle cannot be hit from the bottom. A simple rule of thumb is that a system that can hit the attacker can be targeted. If a system is destroyed and another attack hits that specific system, the attack goes through the hole in the armour and automatically penetrates. Lastly, specific injury result types don't apply to vehicles. Damage is damage.

Vehicle Hit Locations

1	Defences	Lose one facing defensive system	
2	Weapons	Lose one facing weapon system	
3	Power Plant	-50% of power output	
4	Sensors	-20 to detection rolls	
5	Life Support	-100 person hours, explosive	
6	Fuel	-50% of fuel, explosive	
7	Personnel	-50% of crew and passengers	
8	Sub Craft	apply damage to sub craft	
9	Cargo	-50% of cargo	
10	Motive System	-20 Manoeuvre and as listed below	
	1	Air Cushion	-100 kph Top Speed and Stability
	2	Anti Gravity	-500 kph Top Speed and Stability
	3	Floatation	-50 kph Top Speed and Stability
	4	Legs	-50 kph Top Speed and Stability
	5	Thrusters	-200 kph Top Speed
	6	Tracks	-50 kph Top Speed
	7	Vectored Thrust	-200 kph Top Speed and Stability
	8	Warp Drive	- 50% Top Speed or +100% Resistance
	9	Wings	+ 200 kph Stall Speed and -200 kph Stability
	10	Wheels	-50 kph Top Speed and Stability

Crew Casualties

When an area of the vehicle that contains crew members is hit, ten percent of them per damage result affecting the area are wounded, incapacitated, or killed. In particular, damage control teams will be located in the area they are working on, otherwise, the crew is generally considered to be hit on "personnel" results.

Internal Explosions

Some vehicle systems are likely to explode when hit. Fuel and weapons with ammunition with explosive payloads or propellants have a base chance of not exploding when damaged equal to the vehicle's Technology Level modified as follows:

To Avoid An Explosion	TL
per injury effect	-10
in a vacuum	+20
in a relatively inert atmosphere	+10
in an earth like atmosphere	0
in a oxygen rich atmosphere	-10
in a flammable atmosphere	-20
Incendiary damage	-20
Corrosive damage	-10

An internal explosion ignores the vehicle's armor and causes an extra (ten sided die times the number of damage effects that hit the exploding system) damage effects.

SPACE BATTLES

Space battles function much the same as normal vehicle battles, but the distances and velocities involved are far greater. You will need to set the length of the turn and the distances used to match the velocities the vessels are moving at. A low tech orbital battle is poorly served by a scale that is useful for FTL deep space battles. You can safely multiply the length of a turn by any number you wish, as long as you multiply the meters per square or inch by the same number. In general, you will want to set the meters per inch so that no vessel will be able to accelerate more than ten inches per turn.

A particularly useful scale is one millimeter equals 100 kilometers and one turn equals 360 seconds or 6 minutes. In this scale, you can use the normal acceleration for ships, and the planetary templates still fit in this book.

In space, only rockets, faster than light engines, and reaction-less engines will provide any thrust. All other propulsion forms require air or surface friction to operate. Air breathing power plants will, of course, not work. The only factor limiting top speeds in space is the speed of light. The apparent mass of a vehicle doubles at about half the speed of light. And may be assumed to double again for every halving of the remaining portion.

Standard Movement Method

The ship's Acceleration rating is normally divided by ten when playing out space battles.

Since an object in motion will retain that motion as long as no other forces act upon it, movement in the vacuum of space is handled quite differently from surface or aerial combat. A rocket ship can rotate on its axis without changing its vector or subjecting the crew to extreme gee forces. If this concept seems counter-intuitive, consider a car spinning out on ice, which will spin on its axis while maintaining its original direction of movement until the limited friction brings the car to a halt. In fact, for major course changes, a rocket will usually rotate to point in the desired direction using maneuvering thrusters and then fire the main engines. Ships with vectored thrust systems are able to bring their full thrust to bear in a wider arc and are more manoeuvrable.

The playing area should have one corner designated 0/0 and then ships have their velocities listed as a simple change in coordinates such as +3/-5. Acceleration can then be applied by changing the values on a point per point basis. If the ship in the previous example applied a thrust of 2 meters per second squared, it could change its vector to: +5/-5, +3/-7, +4/-6, +2/-6, or +4/-4.

It is simple to add the third dimension to this method by simply adding a vertical axis.

Gravity

Gravity works as a fixed thrust applied towards the center of the planet. The gravity rings on a planetary template are given in space per turn increments. If a ship passes through a planet's gravity bands, apply each one crossed or entered to the ship's vector at the end of the round. If the ship is in a gravity band at the start of its turn, it is also affected by that gravity. Naturally, staying in a gravity well longer will change a ship's vector to a greater degree. With practice, you will be able to slingshot ships through gravity wells and set up orbits by applying a vector perpendicular to the planet's gravity with a vector length equal to the radius from the planet's core.

Alternative Movement Methods

Alternately, each ship's vector can be marked on the playing surface each turn. The next turn, the line from the previous turn is extended to twice its length, to find the point the ship would reach if it did not maneuver. The thrust is applied to move this point a number of spaces equal to the thrust used and a new line is drawn from where the ship started the turn to the newly plotted point. The ship is then moved to that point.

If all of this seems too technical, there are always reactionless engines, which violate some major laws of physics by their very existence. Reactionless engines may move a fixed distance per turn and are restricted in turning in the same way as an aircraft. As an advanced option, reactionless engines may ignore gravity or apply it as they choose.

Firing

Obviously, it is possible to fire 360 times or more in a single space combat turn. However, the ranges and velocities are such, that only one normal turn of attacks can be made from the optimum point in the ship's movement. For this reason, attacks can be made from the point in the ship's movement when it is closest to the target.

If a ship's movement carries it directly into contact with another ship, it can try to ram (which is suicidal) or it can make a firing pass. To successfully ram, a Resisted roll is made against the other pilot's Spacecraft skill rating and if successful, damage is applied like a normal collision (at horrific velocities and with huge vessels, in a vacuum!).

When making a firing pass, a Resisted Spacecraft skill roll is made and the success level is multiplied by 10 to find the range in meters the vessels close to. One normal turn of attacks can be made in a firing pass. If two ships match vectors and make a firing pass, play out normal 3.6 second combat turns until one ship is destroyed or tries to break off. Breaking off requires a Resisted Spacecraft skill roll which, if successful, ends the point-blank firing spree. In cases where many ships are involved in a point-blank firing spree at matched vectors, the roll to break off is not Resisted if no other vessel opts to pursue.

SPACE TRAVEL

Space craft are a key feature of many science fiction settings. The following rules deal with some common environmental realities of space travel.

Atmospheric Reentry

A craft in orbit is moving at a tremendous velocity. If sufficient fuel is available, the craft could decelerate to a speed where it would simply fall straight down, without the archetypical pyrotechnics of atmospheric friction. A craft can use the atmosphere to decelerate by up to its mass per second per second, but takes one point of damage for every kilometre per hour shed. For example, atmospheric braking of 100 kilometres per hour per turn causes 100 points of damage, not to mention the force of roughly three gees that the crew and passengers are subjected to. In practice, it is uncommon to brake at a rate greater than 100 kilometres per hour per turn.

Free Fall

Space craft are often in situations which leave the crew and passengers without the handy aid of gravity. Over longer periods of time, zero gravity causes muscular and skeletal deterioration. To combat this, many vessels have large, spinning sections that use centrifugal force to approximate gravity. A vessel which is accelerating applies a force to its contents which, if the floors are arranged perpendicular to the drives, acts the same as an equal gravitational field. Particularly advanced societies may even have artificial gravity and inertial dampening technologies, allowing their vessels to have floors arranged however they like.

Characters manoeuvring in free fall or zero gravity have some unusual difficulties. They can either crawl along the walls at half running speed, or launch themselves with a vector equal to a normal running move. This vector continues unaltered until the character collides with another object or passes close enough to make a grab. In both cases, the character must make an Astronaut skill roll or drift in a randomly determined direction. Velcro or magnetic shoes may allow unskilled characters to move normally.

Thrown weapons and primitive missile weapons have a maximum chance to hit equal to the character's Astronaut skill because the user doesn't need to allow for gravity.

In System Travel

The best way to handle in system travel is with some counters and the Planetary Movement Simulator. The simulator will need to be photocopied four times, cut out and assembled as shown. A counter for each planet is placed at the orbit dot closest to its present orbital position in degrees. A random orbital position can be found for each planet by rolling 3d10 x 12. The time squared advantage gained in accelerating is lost when decelerating, so the vehicle's movement can be simply counted off on the Planetary Orbit Simulator. Since the trajectory will be a parabolic arc, the distance should not be measured with a ruler.

The size of a square on the Planetary Orbit Simulator doubles after each orbit. From the centre of the system to the first orbit, each square is 18 750 000 km across, from the first orbit to the second orbit, each square is 37 500 000 km across, from the second to the third, 75 000 000 km per square.

To use the Planetary Orbit Simulator, first, find the velocity the ship will be travelling at. Multiply the vehicle's acceleration by half the time spent accelerating. The other half is spent decelerating. Acceleration per hour is 1000 times the acceleration per turn. Divide 37 500 000 by the velocity per day to find out how many days it takes to cross one square between the system's primary and orbit one. For each orbit out, the time is doubled. Count the number of days between the two planets using the squares. Every 30 days spent travelling, advance each planet's position by one orbit dot.

At speeds faster than light, in system travel times are far shorter. A parsec is 30 748 250 000 000 kilometres, so one parsec per day is 1 281 177 100 000 kilometres an hour! An FTL ship can cross a solar system in under a minute! However, there may be gravity or obstacle density reasons not to.

Orbiting

The minimum velocity needed to orbit a world is 29 000 kilometres an hour times the world's gravity in Gs. The escape velocity need to leave a planet's gravity well is 40 845 kph times the world's gravity in Gs. Naturally, a ship will need to fly out of the atmosphere before it can accelerate to such a velocity. The standard method of reaching orbit is to fly from a runway until maximum airspeed is reached and then to climb out of the atmosphere. To do this, a ship will need an acceleration greater than 3.6 (or four if you're lazy) times the world's gravity.

High Gee Manoeuvres

When a vehicle makes a turn at high speeds or accelerates at a great rate, the forces impacting the crew and passengers can cause them to fall unconscious or even be severely injured. When a manoeuvre is made with a force of more than three gees, an Endurance roll must be made in order to avoid taking a Stun injury. A gee is defined as a change of 36 metres from the point the vehicle would have reached had it proceeded in a straight line. Each gee beyond three inflicts a -10 to the roll and another Stun Injury.

Radiation

Space is very radioactive. Earth has magnetic fields and a thick blanket of ozone which protects the surface from much of this radiation. Space craft used for long term voyages will also be well shielded from radiation. When a character takes damage which is designated as radiation damage, the damage is directly and permanently removed from their Endurance.

INTERPERSONAL ACTIVITIES

There may be times when a player wants to use their character's interpersonal skills. Actually, the reason interpersonal skills have been included in the game is that they encourage the players to try talking through some of their characters' problems. In general, roleplaying out situations is a superior solution to simple dice rolling, but at times it can be quite helpful to have a few rules regarding how these things are handled, particularly in terms of any relationship Perks a character may have. After all, these characters are people and will not put up with endless abuses of their good will.

In all cases, the appropriate interpersonal skill must be used to get results. Salesmanship is of no more use in getting your soldiers to charge across open ground into enemy fire, than Leadership is in getting a miser to sign on the dotted line.

Generally speaking, interpersonal actions are handled with a simple skill roll. The modifiers listed reflect the character's relationship to the non player character, as well as how extreme the situation is.

Requests for trivial things that cost the other person nothing or benefit them are made with the character's normal skill rating.

Requests for minor favours, like the lending of a few dollars until payday or to watch the kids are made with a ten point penalty with the risk of slighting the other person, and making them dislike the individual who made the request.

Requests for major favours, like a large loan or gift, or watching the kids for a week are made with a twenty point penalty. If the success roll fails the other person automatically takes a dislike to the individual making the request. If the risk roll fails, the other person will become angry and bear a lingering dislike for the idiot that dared to ask for such a thing.

Requests for exceptional favours, like hiding a body in the basement or robbing a bank are made with a thirty point penalty. If the attempt fails, they will automatically become angry and take a dislike to the insane individual who offended them. If the risk roll fails, their relationship will decline permanently, by one step.

A successful interpersonal skill roll, with no request, and that benefits the other person to an appropriate extent can improve the relationship by one step. For example, sending tickets for a weekend getaway will rarely be successful with a stranger or acquaintance, but an offer of lunch or a drink might.

There are also modifiers for personality traits which are particularly likely to improve or diminish people's reactions to each other. These modifiers only apply when the characters know each other well enough to be aware of their conflicting personalities. The modifier is minus ten per opposed trait and plus ten per shared trait. A request that directly violates one of the other person's personality traits, such as asking an honest person to commit a crime, suffers a twenty point penalty.

Lastly, in many situations, interpersonal activities can be handled as contests. In these cases, either character can take a direct penalty to their chance of success and apply it as a penalty to the other character's. This is representative of dissembling or trying to beat down the other character's resistance over time.

Interpersonal Activity Modifiers

Minor Favour	(risky: dislike)	-10
Major Favour	(risky: anger)	-20
Exceptional Favour	(risky: enemy)	-30
Per Shared Personality Trait		+10
Per Opposite Personality Trait		-10
Request Violates a Personality Trait		-20

Relationship Modifiers

Family	+30
Friends	+20
Liked Acquaintances	+10
Acquaintances	0
Strangers	-10
Disliked Acquaintances	-20
Enemies	-30

Personality Traits

Passive	&	Aggressive
Calm	&	Temperamental
Contented	&	Greedy
Empathic	&	Cruel
Generous	&	Miserly
Honest	&	Dishonest
Industrious	&	Lazy
Modest	&	Sleazy
Patient	&	Rude
Sober	&	Rowdy
Brave	&	Cowardly
Cheerful	&	Depressed
Diplomatic	&	Offensive
Friendly	&	Antagonistic
Gentle	&	Sadistic
Humble	&	Proud
Loving	&	Hateful
Outgoing	&	Shy
Physical	&	Cerebral
Practical	&	Imaginative
Thrifty	&	Wasteful

ECONOMICS

It can be interesting to follow the economies of individual worlds in play. The following rules govern large scale economic trends, government activities, market investments, and the speculative trading of commodities. At times a skill rating for a character will be needed in a hurry. The following values can be used.

World Leader	85 + 1d10
Excellent Professional	75 + 1d10
Average Professional	65 + 1d10

Macro Economics

The main factor in determining a world's wealth is its population. If the population is too large, the world's resources will be overtaxed and the world will be poor, but if the population is too small, many goods and services will have to be imported and the world will still be poor. In order to reflect this, each world has a rating for its Population, Infrastructure, Mineral Resources, and Ecosystem. The Infrastructure is initially equal to the Population, but the Mineral Resources and Ecosystem are determined by the world's physical characteristics. The difference between a world's population and its various resources will have an impact on those resources in the future as shown on the World Trade Status Table. Ecosystems and Mineral Resources are particularly vulnerable aspects of a world's economy as Mineral Resources are never regained and Ecosystems can only recover to their original level.

World Trade Status Table

Situation:	Trade Status:	Annual Effect:
Population > Ecosystem Population < Ecosystem	Food Importer Food Exporter	Population +(RF-10) % of surplus Ecosystem +RF % of deficit
Population > Infrastructure Population < Infrastructure	Goods Importer Goods Exporter	Infrastructure +RF % of surplus Infrastructure +(RF-10) % of deficit
Population > Mineral Resources Population < Mineral Resources	Raw Materials Importer Raw Materials Exporter	Infrastructure + RF % of surplus Mineral Resources + (RF-10) % of surplus

The Random Factor (RF)

Each year, 1d10 is rolled to indicate the prevailing economic trend. This roll is modified by any government policies in effect and the world's import and export status. A successful Economics skill roll will allow the roll to be made before determining policies or investment strategies. However, investment strategies must be chosen before government policies are revealed, unless a successful Politics skill roll is made. This use of the Politics skill is Risky, because if it is discovered, it will kick off a huge government scandal that will cause all government policies to be scrapped for the rest of the year and the random factor to be re-rolled.

Random Factor (RF)

- 1d10
- +1 per Export Factor
- 1 per Import Factor
- 1 Political Unrest
- 2 Government Scandal
- 3 State of War

Import and Export Sources

Note that for an economy to function properly, there must be places to import from and export to. If there is nowhere for the goods to go to or come from, such as during a military blockade, all the Import effects are halved and all the Export effects are doubled.

Military Budget

Those wishing to play detailed military campaigns may want to know how much money the military has to spend each year. Normally, the military can hire personnel equal to one percent of the Population and has a budget equal to the Infrastructure for building new hardware. In times of war, the military can increase its personnel to RF% of the population and double its budget for hardware.

Government Policies

The leadership of a world may attempt to pursue a variety of policies to modify their situation. Since people dislike change even more than they dislike taxation, they all share the risk of causing unrest. A successful Politics skill roll is needed on the part of the world's political leader to enact any of these policies. There is a ten point penalty for each policy attempted after the first.

Construction Subsidies:	+RF% Infrastructure, -RF% Resources
Military Buildup:	x 2 military budget, - RF% Infrastructure
Protectionist Policies:	no Export or Import modifiers to RF
Research Subsidies:	TL opposed Science Roll for +1 TL or 1 Advance, - RF% Infrastructure
Social Programs:	+ or - RF% Population, -RF% of Military Budget or -RF% Infrastructure
Tax Reductions:	End Political Unrest, -RF% of Military Budget

Market Speculation

One fundamental economic truth is that there is money to be made by loaning money. In the end, all stock and commodities markets serve the function of providing those with money a way to make more of it off the work of others. This isn't necessarily a bad thing, since those workers might not be working if their workplace is underfinanced.

Investments are basically rated by their type and the amount of money contained in the account. The markets fluctuate, partially in response to the macro economic situation, but also to the wide range of social and environmental circumstances that can only be reasonably represented by rolling dice. As noted before, an Economist can predict the Random Factor at the start of the year with a successful skill roll.

Annual Market Value Alteration
 -1 per import category
 +1 per export category

Investment:	Growth / Decline:
Business Shares	(RF -5) x 2 %
Capital Bonds	RF %
Commodities	
Importer	(RF - 5) x 3 %
Exporter	(RF -3) x 3 %
Government Bonds	RF / 2 %

Trading

While major shipping concerns will always dominate the hauling of goods, there is still a niche for small traders. This niche tends to be one time shipments and the purchase and resale of the odd bits of product left over from bulk purchases by the megacorporations. This means, that the independent trader must both seek out potential cargos, as well as advertise the availability of cargo space. At times it may even be possible to charter out an entire ship to a wealthy patron, though such jobs tend to be particularly difficult and demanding.

As a general rule, the Advertising skill is used to find charter cargos and passengers. Economics skill is used to find small lots of goods to purchase and transport. Salesmanship is used to sell the goods at the best possible price. Using the Diplomacy skill will permit the trader to get special deals when purchasing goods, or a better price from charter customers. All of these activities, except finding goods for sale with the Economics skill, are governed by the rules for Interpersonal activities.

Purchase Price	
Importer	- (RF x 2) %
Exporter	- (RF x 5) %
Sale Price	
Importer	+ (RF x 5) %
Exporter	x (RF x 2) %

Various Cargos

The following list of cargo types gives a base purchase price per unit weight. In general, special handling requirements are tied to price increases. For instance, medical chemicals or supplies are valuable, require extra caution in handling, and are often carefully regulated. Live cargos (including passengers) require life support and special handling.

Chemicals

Corrosive	3 mu / 10 kg
Euphoric	10 mu / 10 kg
Flammable	3 mu / 10 kg
Medical	7.5 mu / 10 kg
Sedative	5 mu / 10 kg
Radioactive	5 mu / 10 kg
Toxic	2 mu / 10 kg

Food

Grains	1 mu / 100 kg
Live Grains	1 mu / 10kg
Prepared Grains	3 mu / 100 kg
Fresh Animal Products	5 mu / 100 kg
Frozen Animal Products	1 mu / 100 kg
Live Animals	3 mu / 10kg
Prepared Animal Products	2 mu / 100 kg
Fresh Vegetables	2 mu / 10kg
Frozen Vegetables	1 mu / 100 kg
Live Vegetables	3mu / 10kg
Prepared Vegetables	2mu / 100 kg

Goods (Examples: Appliances, Clothing, Equipment, Furniture, Materials, Parts, Protective Gear, Toys, Vehicles, Weapons)

Consumer	2mu / 100 kg
Industrial	2mu / 100 kg
Luxury	1mu / 10 kg
Medical	5mu / 10 kg
Military	3mu / 10 kg

Minerals

Carbon	1mu / 100 kg
Silicon	1mu / 100 kg
Metal	1 mu / 100 kg
Ore	1 mu / 1000 kg
Radioactive	5 mu / 10 kg
Rare	1 mu / 10 kg
Toxic	3 mu / 10 kg

Passengers

Steerage	500mu / light year
Second Class	1500mu / light year
First Class	3000mu / light year

Steerage class passengers need no more than half a cubic metre and one hundred kilograms of cargo space, but are illegal in most civilized areas. They may also require extra security.

Second class passengers each need at least two cubic metres and one hundred and fifty kilograms allocated to their comfort for journeys over eight hours. For day trips, they only require a passenger seat and ten kilograms of cargo. The crew of the ship must also be supplemented with one steward for every twenty second class passengers.

First class passengers need at least three hundred kilograms and five cubic metres allocated for journeys over eight hours. For day trips, they require a passenger seat and one hundred kilograms of cargo. The crew of the ship must also be supplemented with one steward for every five second class passengers.

SCIENCE AND TECHNOLOGY

Amazingly enough, most “science fiction” games pay more attention to psychic phenomena than to the capabilities of scientists and technicians. The following rules describe how to handle some of the more common scientific activities. Many of these activities are performed by a large team of scientists and strongly influenced by the appropriateness of the equipment being used.

Team Efforts

Most of these feats are undertaken by teams. Being able to make several rolls over the fixed time period increases the chance of success and reduces the chance of turning out bad data. Large devices can be built and repaired faster by more people, and, of course the project leader needs people to blame and yell at when things don't work.

Common Modifiers:

Sufficient and Proper Equipment:	-0
Insufficient or Improper Equipment:	-25
Insufficient and Improper Equipment:	-50
Well Understood Principles:	-0
Cutting Edge Principles:	-10
Unknown Phenomena:	-20

Cross Checking

By taking a great deal of extra care in checking and rechecking experimental results and using double blind systems, a penalty can be taken to a project's chance of success to provide an equal penalty to any future attempts to disprove or invalidate the project's results.

Extensive Documentation

If the team working on a project takes the time to make detailed descriptions of how the results were achieved and step by step descriptions of the process used: a penalty can be taken to the project's chance of success to provide an equal bonus to future uses of that research in later stages such as building prototypes or setting up mass production.

Research

The fastest way to solve a problem is often to research what has been done to solve the same problem before. In this case, the speed of the research is often a factor of the medium you are searching. It will take at least a day to get a Perception roll to find the information in a cluttered home library or a poorly organized personal computer. An unfamiliar but well organized library or file cabinet will usually take an hour. It takes only minutes to find information in a decent library data base, personal file system, or well organized personal home library (which counts as cluttered for everyone but the owner). Of course, the information must exist before you can find it, so if no information exists on the digestive systems of the bugblat worms of Rigel-IV, no amount of research will help.

Analysis

One major role of scientists is figuring things out, whether it be an alien disease, an unusual atmosphere, or unknown technology. In order to perform a proper analysis, the scientist must have appropriate sensory equipment and make a success roll against the appropriate science skill. The time required is one hour to form a roughly accurate hypothesis, one day to get an accurate view of whatever is going on sufficient to formulate a plan of prevention or action, and one week to develop an understanding on the level needed to duplicate new technology or develop an experimental treatment for a disease.

Experimentation

In particular, experimenting in order to improve existing technology and scientific understanding. While experimental processes are used in analyzing unknown phenomena and technology, in this case we are dealing with working from scratch to come up with new angles on physical laws, new medical techniques, and new chemicals and materials. Every month a roll on the appropriate science skill can be made, to come up with sufficient information to move on to designing a prototype. Experimental data is often questionable: the referee should make the roll against the appropriate science skill. Experimentation is risky and if the second roll fails, the scientists should be told that they succeeded, but all attempts to build working prototypes will fail.

Verifying Results

Experimentation can also be done to verify the results of a successful experiment, reducing the odds of having incorrect data. Further experimentation is usually required in the form of safety tests before a new device can legally be produced for use by the public. Both of these types of experimentation must be done by another group of scientists working independently to provide any benefit.

Chemistry Experiments

Chemicals and medications generally yield usable products. The only problem is that if the information is incorrect, or has missed an important side effect, people could easily be killed. For this reason, this sort of product is generally subject to a great deal of cross checking before it becomes legal. Of course, the cross checking scientists are very unlikely to be as brilliant as you are. If they fail, you go back to the drawing board trying to disprove their results. (So you see, the base experimental times aren't really unrealistically short after all) Then too, a device still needs to be designed and built to produce the chemicals or medicines in larger quantities.

Designing Devices

Once the basic principles have been researched, analyzed, or provided by experimental process the prototype can be designed. This step takes a number of hours equal to the Technology Level of the device, requires a successful roll against the appropriate science and the engineer's Drafting skill to produce a functional design. As with experimentation, design work is risky and if the second roll fails, the device only works on paper. Chemicals and medications do not need to be designed as they come out of the experimentation stage as finished prototypes, but they can have dangerous side effects and often require far more safety testing.

Prototyping

A prototype can be built by making at least a Mechanical skill roll, depending on the device. If the device uses power from an outside source, an Electronics roll must also be made. If the device requires computer control or input, a Computer skill roll is also required to get a prototype up and working. Each of these stages take about a day, but may take longer if the device is large and the workforce is small.

Repairing

A damaged system can be repaired if appropriate parts are available. A roll should be made on the available Parts Inventory rating to see if the needed parts are available. If not, a machinist can attempt to build the parts, which takes a man/hour per kilogram (another time a good team can be handy). The repairs take one man/minute per kilogram of the device per roll against Mechanics, Electronics, and / or Computer as needed.

Upgrading

An existing system can be upgraded by installing a new device by making an Electronics, Mechanical, and Computer skill roll as appropriate. One reason robots may never become common is the broad spectrum of skills needed to work on them. Upgrades take a man/ hour per kilogram of the larger device.

CREATING THE UNIVERSE

The first task of the Architect is to create or select a universe to set the campaign in. This could be my published setting or someone else's. It could be your favorite series of books or movies. The isometric star grid is just a fancy way to draw your maps. Draw a pencil line between the intersection of the x and y axis out to a ninety degree angle from the intersection of the x and z axis to figure out where to mark each star. The distance between two stars is calculated by using the Pythagorean theorem twice. (This works out to adding the squares of the difference between each coordinate and taking the square root of the total)

Tracking Planetary Motion (Optional)

It is possible to track all of the planetary motion in the setting, for the purpose of In System Travel (q.v.), by setting an initial orbital position for each planet. This starting point is rolled on 4d10 x 9. Every "Orbit #" days of the campaign, it's position advances by one point. Thus, by keeping track of the length of the campaign in days and dividing it by 360 x orbit number, the orbital position can be updated.

Star Systems

STEP 1: Number of Stars

- 1-5 one
 - 6-9 two
 - 10 roll again
 - 1-6 three
 - 7-8 four
 - 9 five
 - 10 six
- Star Orbits 2d10 from largest

STEP 2: Star Classes

- 1-2 IV + 2 H
- 3-8 V Main Sequence +1
- 9 VI Dwarf
- 10 roll again
 - 1-2 Ia Super Giant +6 H
 - 3-4 Ib Super Giant +5 H
 - 5-7 II Giant +4 H
 - 8-10 III Giant +3 H

Star Type, +1 if Ia, Ib, or V

- 1 O White +6 H
- 2 B Blue-White +5 H
- 3 A +4 heat
- 4 F Yellow-White +3 H
- 5 G Yellow +2 H
- 6 K Orange +1 H
- 7-11 M Red

* Multiple Star Systems

If there is more than one star in the system, any instances of H - Orbit Number must be calculated from both stars, ignoring results less than zero for the farther star.

STEP 3: Orbital Contents

- 1d10 + orbit number - H
- 1 or less End of Occupied Orbits
- 2-4 Empty Orbit
- 5-8 Planet
- 9 Asteroid Belt
- 10 Empty Orbit
- 12 Small Gas Giant (2d10 moons)
- 13 Medium Gas Giant (3d10 moons)
- 14 Large Gas Giant (4d10 moons)
- 15-16 Planet
- 17 End of Occupied Orbits

STEP 4: Planetary Details

planets + 7, planetary moons +0, gas giant moons +3

Roll	G	Size	Volume
1-3	0	Tiny 600 km diameter	8.48 teralitres
4-6	+1	Tiny 900 km diameter	28.6 teralitres
7-9	+2	Tiny 1200 km diameter	678 teralitres
10-12	+3	Small 3000 km diameter	1 060 teralitres
13-14	+4	Medium 6000 km diameter	8 470 teralitres
15	+5	Medium 9000 km diameter	28 600 teralitres
16	+7	Large 12 000 km diameter	67 800 teralitres
17	+10	Huge 15 000 km diameter	132 000 teralitres

Planetary Moons 1d10 - 10 + G (moons orbit at 2 x planetary radius + 1d10 x planetary radius x G)

Gravity

A high gravity is a good indicator of mineral resources.

Roll + G	H	Gravity:	Gs	Atmosphere
1	-3	Micro	0.1	Vacuum
2-3	-2	Minimal	0.25 G	Faint
4-6	-1	Low	0.5 G	Thin
7-10	0	Average	0.75 G	Thin
11-15	+1	Average	1 G	Normal
16-17	+2	High	1.5 G	Normal
18-19	+3	Extreme	3 G	Dense

Atmosphere

Roll	L
1	-2
2	
3-4	+1
5-6	-1
7-8	-1
9	-3
10	-5

Atmosphere
Flammable Un Breathable
Flammable Breathable
Breathable
Un Breathable
Tainted Breathable
Poisonous
Corrosive

Hydrosphere

Roll + G - H	L	Water
+ Orbit number	1	None
1-3		Scarce
4-6	+1	Limited
7-10	+2	Normal
11-15	+3	Plentiful
16-17	+2	Flooded
18-19		

Climate

H -Orbit #	L	Temperature Range
5 or less	-32	Completely Frozen to the Core
-4	-16	Frozen Atmosphere
-3	-8	Frozen Water, Frozen Atmosphere at Poles
-2	-4	Cold, Frozen to Tropics
-1	-2	Cool, Frozen to
0	-1	Average, Frozen at Poles
1	-2	Warm, Small Frozen Poles
2	-4	Hot, Scalding Steam Common in Tropics
3	-8	Hot, Scalding Steam Common Except at Poles
4	-16	No Liquid Water
5 or more	-32	Barren, Atmosphere Boiled Off

Roll + L Life Forms

1-6	None
7-9	Proto Cellular
10-11	Single Celled
12	Simple: Fish,
13	Complex: Lizards, Insects
14	Advanced: Mammals, Birds
15+	Amazing: Dinosaurs, Sentients

1d10 x 10 to the power of n

Where n = Life Forms Modifier +1d10
 -2 if atmosphere not breathable
 -1 average heat
 -2 cool
 -3 hot
 -4 cold
 -5 if any other heat
 -4 if minimal or extreme gravity

Mineral Resources = Gravity x 5 000 000 000 / Volume
 Ecosystem / Sentient Population

CREATING ALIENS

While this information is provided in random tables, the referee is free to pick and choose from the tables. There are some simple facts which guide the design of alien creatures: To exist at all, life requires input in the form of energy and materials, environment shapes the form of the organism, and the organism's form always follows function.

Step 1: General Form

Evolution's branching path creates similarities in wide varieties of creatures, forming kingdoms, phyla, families, and genres of related species. Whole phyla of animals can be generated by simply using the same general form information for several types of animals. The size of a creature plays an important role in determining their Strength, Endurance, and Reflexes. Larger creatures being stronger and tougher, but slower to react. Size even increases the Discipline of animals due to the confidence gained from being larger.

Structure

- 1 Amorphous: -20 Size Modifier
- 2-4 exoskeleton: -10 Size Modifier
- 5-10 endoskeleton:

Reproductive Strategy

- +1 if exoskeleton
- +2 if endoskeleton

- 1 Asexual Division
- 2 Sexual Division
- 3 Parasitic Infestation
- 4 Parasitic Egg Laying
- 5-8 Mass Egg Laying
- 9 Egg Laying and Parenting
- 10-11 Mass Live Bearing
- 12 Limited Live Bearing

Dietary Strategy

- 1-4 Herbivore: 1 free defense
- 5-7 Carnivore: 1 free weapon
- 8-9 Omnivore: 1 free feature
- 10 Reducer: move rates x 1/2, +10 Endurance

On earth, most creatures have a pair of everything. Starfish are a notable exception. They have a five way symmetry. Following this concept, roll for the race's magic number, and then for the number of limb sets they possess. Limb sets will become specialized in the next part of race creation. Be aware that it takes a full limb set to count as two handed for meeting Strength Requirements for weapons and that the equivalent Strength of one limb is -10 per limb in each set. (A set of five limbs has an equivalent Strength of -50 per limb.)

Symmetry		Limb Sets	
0	1	0	
1-7	2	1	1
8	3	2-7	2
0	5	8	3
		9	5

Step 2: Ecology

Environments: Environmental factors will generally produce certain features invariably. If the creature is native to one of the following environments, apply the modification listed

- Dry: Moisture Storage
- High Pressure: +10 Endurance
- Low Pressure: +10 Size Modifier
- High Temperature: Cooling Surfaces
- Low Temperature: Insulated
- Fluid Medium: Fins, Breathe Fluid
- Night: preferred light
- Twilight: preferred light
- Day: preferred light
- Bright: preferred light

Base Statistics

- Coordination: 3d10 + 60
- Discipline: 1d10 + Size Modifier
- Endurance 3d10 + 60
- Logic: 1d10
- Perception: 3d10 + 60
- Reflexes: 3d10 + 60 - Size Modifier
- Strength: 3d10 + 60 + Size Modifier
- Talent: 1d10

Animal Base Skills: 1/2 related statistic + 25, in "Natural Weapons" and "Environment" Survival

Racial Features (Amorphous Creatures +2)

- 1 1 set Manipulative Limbs
- 2 1 set Wing Limbs
- 3 Movement Rate x 2
- 4 Infrared Vision
- 5 Telescopic Vision
- 6 Ultraviolet Vision
- 7 Low Frequency Hearing
- 8 High Frequency Hearing
- 9 Scent Tracking
- 10 roll again and add 8
- 11 1 set Tentacles
- 12 Gas Bags
- 13 Chameleon
- 14 roll for a weapon
- 15 roll for a defense
- 16 Complex Brain
- 17 Youthful
- 18 roll two more features

Weapons

- 1 Horns
- 2 Sharp Beak
- 3 Teeth
- 4 Claws
- 5 Pellets
- 6 Paralytic Poison
- 7 Caustic Poison
- 8 Irritant Spray
- 9 Statocysts
- 10 Roll again and add 8
- 11 Bio-Incendiary
- 12 Acid Spray
- 13 Bio-Laser
- 14 Spinnerette
- 15 Improved Strength +10
- 16 Improved Coordination +10
- 17 Improved Discipline +10
- 18 roll for a weapon and a defense

Defenses

- 1 Size Modifier +10
- 2 Size Modifier -10
- 3 Movement Rate x 2
- 4 Thick Hide
- 5 Camouflage
- 6 Armored Plates
- 7 Armored Shell
- 8 Spines
- 9 Quills
- 10 roll again and add 8
- 11 Needles
- 12 Bio electricity
- 13 Cloud spray
- 14 Regrowth
- 15 Improved Logic
- 16 Improved Endurance
- 17 Improved Reflexes
- 18 roll for a weapon and a defense

Step 3 Balancing Features

In many cases, a race will have disadvantages as well as advantages. This is especially true in the case of sentient races that are intended as player characters. Generally, a race should have at least one disadvantage for every two features (this is because the disadvantages are quite extreme.)

- Distasteful Characteristic
- Extensive Life Support Requirements: x 2
- Incomprehensibly Alien
- Personality Traits
- Racial Enmity
- Short Life Span
- Toxic Life Support Requirements

Racial Traits

The exact game effects of each trait are described below. Many of the more exotic attacks are extremely restricted in their number of uses per day. If one results twice, it can be done twice as often.

Acid Spray

- Range = 1/10 Endurance
- Penetration = 50
- Damage = 100 (Corrosion)

A short ranged spurt of acid can be squirted from this creature's glands. The acid will melt through most materials given enough acid and time. Only one dose of acid can be produced in a twenty four hour period.

Armoured Plates

These boney ridges and plates over vital body areas give the creature an Armour Value of 100. The creature's default ratings in Acrobatics, Grappling, Tumbling, and Swimming are all reduced by 10 due to reduced flexibility.

Armoured Shell

Being protected by a rigid exoskeleton, shell, or mineral deposits gives the creature an Armour Value of 120. The creature's defaults for Acrobatics, Grappling, Tumbling, and Swimming are all reduced by 20 due to reduced flexibility and its movement rates are all divided by 2.

Bio-Electricity

- Range = Touch
- Penetration = 80
- Damage = 130 (Stun)

The nervous system of this creature can generate enough current to give a potentially lethal shock upon being touched. The creature can build up a new charge every hour, but must choose to begin building a charge an hour before one can be used, after which it is depleted.

Bio-Incendiary

Range = 1/10 Endurance

Penetration = 40

Damage = 90 (Incendiary, Blast)

Chemicals secreted in a pair of glands produce a burst of flame where the two sprays meet. It takes twenty-four hours for the creature's body to produce more chemical agents after using a Bio-Incendiary.

Bio-Laser

Range = 1/2 Endurance

Penetration = 40

Damage = 90 (Ignite)

A simple chemical laser using photons from bioluminescent bacteria can be fired from an eyelike organ. Using the laser heats up the organ causing an Incendiary injury to the user each additional time it is used, unless it is given half an hour to cool off or is immersed in water.

Breathe Fluid

This creature has gills or a similar mechanism for breathing the fluids of its native environment.

Camouflage

The skin of this creature is particularly suitable to its native environment and provide it with a +10 to its Stealth skill.

Caustic Poison

The creature possesses glands that generate a poison which inflicts an intense burning sensation on its victim. Any wounds caused by its natural weapons receive a +10 to damage and cause an additional Corrosive injury.

Chameleon

The creature's skin changes color to match its surroundings giving it a +20 to the Stealth skill. This feature is more common in smaller animals, so apply a -10 Size Modifier.

Claws

Range = Melee

Penetration = 5

Hand Damage = Strength +10 - 10 x # hands

Foot Damage = Strength +30 - 10 x # feet

The limbs of this creature terminate in sharp blade like protrusions. Claws count as light weapons, making two attacks per action. Clawed hands can attack once per limb in the set plus one for being a light weapon. Having claws also improves the creature's Climbing skill by 10 points. If claws are received twice they are either retractable or exceptionally large giving a +10 bonus to damage.

Cloud Spray

Radius = Endurance / 20

When fleeing, the creature expels a dense cloud of obscuring gases. These act as an obscuring agent giving a -20 to attacks on the creature which must pass through the gasses. It takes a day for the creature's body to "reload" after using the Cloud Spray.

Complex Brain

The creature is sentient, all of its statistics are rolled on the Birthright Table instead of the animal profile above. Other racial traits can still modify the base values. A sentient creature's Size modifier is not added to it's Discipline.

Double Movement Rate

One of the creature's movement rates is doubled. This can be done more than once to one mode of transportation.

Fins

The creature's primary motive limbs are fins, which are well suited to movement in fluid environments. The creature's base swimming movement rate is x 1.

Gas Bags

These specialized glands separate the lighter gasses from the atmosphere and allow the creature to drift in the air with the wind. If the creature has fins, it can steer, but its over all direction and flight speed is always determined by the wind.

High Frequency Hearing

This creature can hear high pitched sounds outside the human range. This adds 10 points to it's Perception rating.

Horns

This set of long bone protrusions are well placed to make devastating attacks when the creature charges. These add 20 points of Damage and Penetration to any Tackle attacks the creature makes as well as causing Bleeding injuries if the attack penetrates the target's Armour.

Improved "Statistic"

One of the creature's statistics starts with a higher rating than normal. Perception is not included on the list because it is increased by several other traits.

Infrared Sense

A special set of heat sensitive pits allow the creature to "see" the heat signature of creatures. This works well in any degree of light other than "Blinding", which generally generates too much heat. The creature can ignore light level modifiers to its actions as long as they relate to objects closer than its Perception in meters. It is not possible to read text with a sentient creature's Infrared sense.

Irritant Spray

Range = 1/10 Endurance

Radius = 1/20 Endurance

A stinging, smelly spray of oils from this gland gives the target, and anyone breathing the local air within the radius from the target, a -10 penalty to all activities until it is thoroughly washed clean. The spray can only be used once every twenty four hours.

Low Frequency Hearing

The creature's large ears allow it to pick up sounds so low and quiet that a human would miss them. This adds 10 points to the creature's Perception rating.

Manipulative Limbs

One set of the creature's limbs end in some sort of grasping hand, allowing it to use tools and manipulate objects. Manipulative limbs can be used to make Punch and Grapple attacks.

Moisture Storage

This creature is well suited to life in the desert. It can live for a number of days equal to 1/10 of its Endurance rating without water or other fluids. The creature must be able to take in great quantities of fluids over a whole day in order to recharge this ability.

Needles

Range = 1/10 Endurance

Rate of Fire = up to Strength

Penetration = 25

Damage = 75 (Bleeding)

This creature can launch barbed feathers or hairs with a muscle spasm. The number of needles available is equal to the creature's Endurance and all of them can be fired at once. It takes a month for a needle to regrow once fired, but the needles regrow simultaneously.

Paralytic Poison

These glands contain a poison which causes paralysis or delirium. In either case, the target must make an Endurance roll or be unable to act for the next hour. Even a successful roll, the target will act at -10 for an hour. If the creature has another natural weapon, the poison is delivered by that attack, otherwise it is a contact poison. It takes two turns for the poison to begin to take effect.

Pellets

Range = 1/5 Endurance

Penetration = 20

Damage = Endurance (Stun)

A long bone tube and an inflatable bladder (possibly a proboscis and the creature's lungs) allow it to fire small stones at high velocities. The creature must load another pebble to fire again, which takes only one action in a stream bed or gravel pit, but may take much longer in other places.

Quills

Range = Touch

Penetration = 40

Damage = Unarmed attack's (Bleeding)

The hair of the creature is long, thick, stiff, and sharp enough to deliver nasty punctures when touched. Any successful unarmed attack against a creature with quills causes as much damage to the attacker as it does to the creature itself and causes Bleeding injuries. Of course, armored attackers or ones which are large enough to kill the quilled critter in one blow will be in a little less danger.

Regrowth

This creature can regrow lost limbs and damaged bone structures. These injuries still take the normal time to heal, but are not treated as permanent injuries to the creature. A creature with Regrowth can even recover from serious nerve damage, but can't grow a new brain.

Scent Tracking

The olfactory abilities of this creature give it a +10 Tracking skill bonus and add 10 to its Perception.

Sharp Beak

Damage = Strength + 10 (Bleeding)

Penetration = 10

The mouth of this creature is designed for breaking hard shells and nuts.

Size Modifier

A positive Size modifier is added to a creature's Strength and a negative one is subtracted from it. For every ten points added to Strength the creature's Life Support requirements can be doubled, one of its movement rates can be halved or ten points can be subtracted from the creature's Reflexes.

Similarly for every ten point subtracted from the creature's Strength, ten points can be added to the creature's Reflexes, one of its movement rates can be doubled, or its Life Support requirements can be cut in half.

For every fifty points added to Strength, a +10 Target Size bonus is gained and for every fifty points subtracted from Strength a -10 Target Size penalty is incurred.

None of these modifiers can be doubled up until all three have been taken.

Spines

Bony ridges and spikes protrude from the creature's flesh. If the creature slams or tackles a target or it is attacked in these ways, the spines cause 20 points more damage and cause Bleeding injuries.

Statocysts

Range = 1/20 Endurance

Penetration = 5

Damage = Strength -20 (Entangle)

Barbs dragging a long filament are fired by a muscle contraction. They also Snag the target and can draw it towards the creature. The target must either move towards the creature unless a resisted Strength roll can be made. Each statocyst hit penalizes the target's Strength by 10 when resisting. The creature has a number of statocyst orifices equal to its symmetry number.

Spinnerette

Range = 1/10 Strength

Damage = none (Automatic Entangle)

Strong organic filaments can be drawn from this orifice. These can be sticky or not at the creature's discretion. By attacking a target, the creature can then use actions to reel the target in by making a Strength roll. The target is drawn in at a rate of 1/10 of the success level for each successful action. The target can actively resist but loses actions if they do so. Strong webs can also be spun with a radius calculated in the same way as the attack's range. It takes an hour to spin a web. The creature can metabolize enough material to produce a single web or make a number of attacks equal to their range each day.

Teeth

Penetration =10

Damage = Strength (Bleeding & Entangle)

This particularly common natural weapon is used to hang onto one's food and chew it at the same time.

Telescopic Vision

The eyes of this creature are optimized for long distance viewing. This gives them an "eyeball" range of 500 meters as opposed to the usual 100, when looking for things or aiming weapons.

Tentacles

this set of limbs is extremely flexible and equipped with a gripping surface on one side. A creature with Tentacles has a +10 Grappling skill bonus and counts as having the Reach advantage in close combat. Tentacles may not be used to make punch attacks.

Thick Hide

The leathery epidermis of the creature gives it an armour rating of 30.

Ultraviolet Vision

Being able to see farther into the blue end of the spectrum allows this creature to see well at night even if that is not its preferred light condition. It also adds 10 to the creature's Perception.

Wings

A creature with wings can either fly, flit, or glide.

The way it flies is largely a matter of how large the creature is, and if flying is its primary mode of movement. A glider can make a (4 x normal movement) rate move when falling and land safely. A flitter can make moves with a maximum height equal to their normal move. To actually fly, the creature's Strength minus its Size modifier must be greater than 100, and it must apply at least one Double Movement Rate trait to its flight speed. Wings count as one of the creature's limb sets.

Youthful

Creatures of this species enjoy long lives. Treat them as being half as old when calculating aging effects.

Racial Disadvantages

Distasteful Characteristic

This race has a bad odor or inherent habit which disgusts and frightens most other races. This could be anything from a poor reputation to a need to eat live sentient beings. The main point is that most races will not deal with the race if they can help it, and many individuals would not mind if they were all wiped out.

Extensive Life Support Requirements

The race consumes life support supplies at twice the normal rate. This will make their vessels larger and thus slower. As well as costing more to feed, the race needs more atmosphere and possibly special trace elements that will be unpalatable to others.

Incomprehensibly Alien

Most other races cannot learn to speak the language this race uses. The race's concepts of appropriate action and motivations are so bizarre that they seem insane to more conventional creatures. While this may seem inappropriate to player characters, it can be a lot of fun in the hands of the right player.

Personality Traits

Any of the personality traits listed in the Characters chapter can be used as a common racial trait.

Racial Enmity

There are multiple wars and atrocities in the history of this race and one other which is important in the setting. So great is the hatred between these two races that the most mild mannered among them will try to kill each other at the first possible opportunity. They may work together for very short times to please a peacemaker, but "accidents" will happen.

Short Life Span

This race's age multiplier is doubled. That is to say that its members begin aging at 15 and suffer annual aging effects as if their age was twice what it actually is.

Skill Incapacity

This race is limited in learning a specific skill. This is a one time -20 to the base rating in that skill.

Toxic Life Support Requirements

The very air this race breathes is poisonous to most other races. As such, the atmospheres breathed by most other races is poisonous to this race.

PSIONIC POWERS

Superhuman mental powers are a common feature of popular science fiction, even if there is little or no real evidence of such things in mainstream modern science. Of course, since these rules are intended to simulate popular science fiction settings as well as hard science fiction (where the laws of physics as we understand them are rarely even bent), rules for the unfathomable powers of the mind must be provided.

The sample powers are all learned as skills and have their capabilities determined by their skill ratings. The following rules can be used to set the capabilities of new powers and even comic book super powers. These are very loose guidelines for the referee to apply since such powers work differently in different settings.

Intensity

All powers are rated with an Intensity score. If the Intensity is less than one, the power will not work at all. For the sample powers, the Intensity is based off of the character's skill in the specific psionic power. There are other ways to rate intensity to represent different types of power. The rating could be tied directly to a Statistic, a straight percentile roll could be used to represent innate talents, or a number of points could be given out to divide between powers as desired to allow the creation of super heroes.

If the result produced by the power is a Statistic, or an Armour rating, the rating provided is equal to the power's intensity. If a power provides multiple traits, there is a -10 penalty to the intensity for each additional one.

Order of Magnitude

In setting ratings for powers, it is possible to set an Order of Magnitude which is added or subtracted from the power's Intensity to represent the power level of the setting. It is suggested that the Order of Magnitude for the sample powers be set at 0.

Effects

The actual game effects a power produces may alter its Intensity, reflecting their relative usefulness.

Range: base value 1

- 50 Intensity for Intensity / -10 metres
- 50 for each additional x 10
- +50 if no other rated, linked effects

Radius: base value 0

- 10 Intensity per Intensity / 10
- Or -100 for Intensity

Bonus or Penalty: -10 Intensity per +/-10 inflicted

Fixed Ratings: base rating is equal to Intensity

Resisted: powers that impose their effect on the target are resisted, it is the Success Roll based on the Skill rating which is resisted, not the power's Intensity.

Persistent: the power is always active and cannot be deactivated.

Concentration: the user must spend an action each turn, concentrating to activate the power.

Fixed Duration: the power lasts for a while after activation

- minutes -10
- hours -30
- days -50
- weeks -70
- months -90

Sample Powers

Clairvoyance (Perception)

Concentration
Range: Intensity x 10 metres / -10
Intensity = Clairvoyance Skill -50

The character can see and hear what is going on in distant places if they concentrate. Like a telescope, it takes some time to locate an exact spot with Clairvoyance.

Disorient (Discipline)

Concentration
Range: Intensity metres / -10
Intensity = Disorient Skill - 50
Penalty: -10 per 20 Intensity
Resisted by Discipline

This power allows the user to make the world spin and blur in the eyes of the target, making actions more difficult.

Enhance "Statistic" (Discipline)

Concentration
Duration: -10 per minute
Intensity = Enhance "Statistic" Skill -50
Bonus: +10 per 20 intensity

The character can use their force of will to boost the specified Statistic for a few minutes. While the power is active, half of this bonus is added to the Skills related to that Statistic.

Precognition (Talent)

Concentration
Range: 1 day per -10
Intensity = Telepathy Skill - 50

The character can see forward in time from their present position. The difficulty is that the time forward must be scanned in realtime, so the character would have to spend a day in their current position to see what happens there a few days in the future. The future is blurry at best because it is based on the psychic echos of the intentions of people in the present. For this reason, it is impossible to read documents using Precognition.

Telekinesis (Discipline)

Concentration
Range: 10 metres / -10
Strength = Telekinesis Skill -50

Telekinesis allows the psi to levitate and move objects using their force of will. The objects can be moved a number of metres per turn equal to 1/10 of the power's Strength score per action spent concentrating.

Telepathy (Talent)

Concentration
Range: 10 metres / -10
Intensity = Telepathy Skill -50
Resisted by Discipline

Telepathy is the ability to read and send thoughts. If successful, there is no language barrier to telepathic communication. Characters with the Telepathy skill can waive their resistance to other telepaths or use their skill to resist instead of Talent if they so choose.

TECHNOLOGY

When shaping the setting, the technology available is the strongest tool in the architect's hands. These rules are intended to allow technology to be designed to fit the desired setting instead of trying to fit the setting into a preconceived set of assumptions. The base line of technology is set at what modern scientists believe is really possible under current theories, but rules are provided for many "hypothetical technologies" as well. There are tools here for designing vehicles, weapons, sensor systems and many other types of devices. These tools require a bit of book work and math, but are as simple as they could be and still accomplish a reasonable measure of realism.

Technological Advancement

Instead of ramming the capabilities of every culture into the "Technology Level", Galactic Adventures assumes a base line of technical capabilities which can be improved by developing specific technologies. The Technology Level only represents advances in general mechanical, materials, and energy technologies. This allows different races and nations to have their own advantages and disadvantages. Instead of trying to invent new theories on how things are accomplished, the focus is on results, which makes it easier to fit the game to different settings. The modern world has a TL somewhere between twenty and twenty five.

Setting Device Costs

In the real world, the price of an item is almost always less than the total price of its parts. The main reason for this is mass production. The cost of a device is worked out from its empty mass. The type of device determines the number the mass is multiplied by. Looking at the table, most military vehicles have a cost multiplier of 5 (exceptional) x 9 (complex) = x 125. A civilian vehicle would cost 3 (common) x 25 (complex) = x 75.

Unique Items and Prototypes	x 27
Rare and Exceptional Items	x 9
Uncommon Items	x 3
Common Items	x 1
Expendable Items (fuel, munitions)	x 1
Simple Items (axes, hoses, simple tools)	x 5
Complex Items (computers, vehicles)	x 25

Game Statistic Index Table

Many values generated by the technology rules need to be converted from real world figures to game statistics.

Index	Base Rating
1 to 9	0
10 to 99	50
100 to 999	100
1000 to 9999	150
10000 to 99999	200
100000 to 999999	250
x 10	+50

Value	Statistic	Value	Statistic	Value	Statistic	Value	Statistic
1.05	1	1.91	14	3.47	27	6.03	39
1.10	2	2.00	15	3.63	28	6.31	40
1.15	3	2.09	16	3.80	29	6.61	41
1.20	4	2.19	17	3.98	30	6.92	42
1.26	5	2.29	18	4.16	31	7.24	43
1.32	6	2.40	19	4.37	32	7.59	44
1.38	7	2.51	20	4.57	33	7.94	45
1.45	8	2.63	21	4.79	34	8.32	46
1.51	9	2.75	22	5.01	35	8.71	47
1.58	10	2.88	23	5.25	36	9.12	48
1.66	11	3.02	24	5.50	37	9.55	49
1.74	12	3.16	25	5.75	38	10	50
1.82	13	3.31	26				

BASE LINE TECHNOLOGIES

The following types of technology are basically extensions of current theories and are probably available in every setting. The absence of the advances listed here will tend to indicate racial and cultural preferences rather than impossibilities.

Medical:

Medical nano-tech and biotech create a revolution in medicine. No longer is medicine limited to helping the body to heal itself, damaged tissue and organs can actually be repaired with the right tools. Of course, the damage that can be inflicted by unskilled use of such technology prevents all but the most limited of advances from finding their way into first aid kits and medicine cabinets.

Antiseptics

At low Technology Levels, infection and disease generally kill more people than injuries. Antiseptics are generally integrated with other medical supplies such as bandages at higher levels of technology.

Bandaging

Stopping the bleeding is often the very first priority in treating injuries. As bandages are replaced with sprays and synthetic skin, the patient becomes more mobile after treatment. The Technology Level of the bandages is the percent chance of a bleeding injury beginning to bleed again if the patient moves. The number of injuries which can be treated by bandaging is 1/5 of the Technology Level per kilogram.

Bleeding Injuries Treated = $TL \times Mass / 5$

Blood Replacement

At first, blood of a matching type is infused to the patient, but at higher levels of Technology, concentrated blood plasma is used in the field. More advanced methods follow the trend of lighter and more universally compatible artificial blood and blood replacement nanites. One kilogram of blood replacement supplies will heal 1/10 of the Technology level blood Loss injuries.

Blood Loss Injuries Treated = $TL \times Mass / 10$

Painkillers

Painkillers generally restore the twenty point penalty for being injured. However, the penalty to Priority remains because the individual is drugged. The anesthetic generally lasts for $TL \times 10$ minutes per dose. Overdoses are dangerous if not terminal. Painkillers are generally stocked at doses equal to the Technology Level per kilogram.

Doses = $TL \times Mass$

Duration = $TL \times 10$ minutes.

Radiation Therapy

Radiation damage often affects the very genetic makeup of cells and makes it hard for the body to heal. Advanced radiation therapies can heal a maximum number of points of permanent Endurance loss in a lifetime equal to the Technology Level. The supplies for a single treatment have a mass of 50 kg / TL.

Treatment Mass = 50 kg / TL

Splinting

Broken bones must be set properly before they heal, to avoid permanent crippling deformities. Ideally, a bone needs rigid support and serious protection from impacts. Splinting and casting supplies are stored at 1/10 of the Technology Level per kilogram.

Number of Splints = $TL \times Mass / 10$

Advance:

Carapace Splints:

By bonding to the skin of the patient these specially flexible and jointed casts allow a broken limb to be used normally and still heal in the normal amount of time. One kilogram of Carapace splints can be used to treat a number of Fracture injuries equal to 1/5 of the Technology Level.

Surgery:

Particularly bad injuries will require surgery to heal properly. Vital organs can only be healed in a proper medical facility. The time involved in a surgical procedure is one hour per injury treated minus Technology Level percent. Surgical supplies to treat one injury are stored at 1/100 of the Technology Level per kilogram. In addition to the supplies, a proper surgical facility can never weigh less than the largest patient it will treat.

Minimum Surgery Mass = Maximum Patient Mass
Vital Injuries Treated = 100 kg / TL

Limb Replacements and Cybernetics:

Crutches, wooden limbs, and cybernetic replacements repair permanent injuries to an extent limited by the available technology.

Limb and Organ Replacements:

A device to replace a permanently damaged body part will restore the statistic loss incurred but all actions using that limb suffer a -30 + TL penalty. Once the technology is sufficiently advanced to more than cancel the penalty; either a bonus is gained, or the additional points represent a percentage of the character's mass that can be used to install other devices.

Implants:

Devices massing no more than TL - 30 % of the character's body mass can be installed in a character's body cybernetically. Only half of this percentage can be installed without appearing unnatural.

Youth Extension:

Age related skill decline is delayed by TL years. Youth extension can only be used once per person.

Longevity Treatments:

Age related skill decline is stopped for TL/ 10 years/ dose.

Immortality:

Aging related Skill and Statistic decline is stopped permanently.

Auto-Regeneratives:

Microbes or nanobots constantly patrol the organism's blood stream repairing damage. The human body already does this very well, so this is almost a hypothetical technology. All healing times are multiplied by TL/100.

Genetic Engineering

With the successful mapping of a genome, it becomes possible to radically alter a species in the course of one generation. Different cultures choose to develop this controversial technology at very different rates. These technologies are developed from basic information as shown below. Because a society may wish to control the spread of superior beings, a variety of controls and balances may be applied by both engineered and social methods. In all cases, the architect decides what is allowable for player characters.

Character Balances

As custom character races become available, it may be necessary to balance their improved capabilities with some limitations. Any of the racial limitations would be applicable, but it is also common for the company producing an organism to hold proprietary rights to the species in the form of a monthly licencing fee or required indentured servitude. It is common to build in a chemical dependancy to keep the clones from running away.

Clone Organisms:

Members of complex species can be reproduced using stem cells and a volunteer's womb. The time involved is still the normal gestation time for the species.

Clone Replacement Body Parts

Limbs and organs can be grown from stem cells to replace crippled ones in about half the normal gestation time.

Customize Microbes

While originally developed for biological warfare, custom microbes can also cure diseases and perform specific medical functions like removing blood clots before they get loose and hit the brain. Custom microbes are just treated as one more type of chemical. These rules are aimed at describing the results technologies produce, not the exact methods.

Advances:

Cure Specific Diseases:

Viruses and bacteria are extremely mutable and can adapt to overcome cures. The primary competitors for humanity's place at the top of the food chain are the smallest organisms. A vaccine is developed like any other chemical and cures the disease in about a day, at which point the damage caused can begin to heal.

Mechanical Wombs

A mechanical womb allows a clone to be grown without the use of a surrogate mother.

Forced Clone Growth

The time required to grow clones and limbs is now reduced by the Technology Level percent.

Graft Specific Racial Features

A clone can be created with specific features from other races. Each feature must be developed as an individual advance.

Design Custom Races

Truly customized races can be developed from the ground up to meet specific needs. Obviously, Grafting Racial Features is a prerequisite for this.

HARDWARE

Advanced frictionless surfaces, improved materials and manufacturing techniques, and various procedural breakthroughs ensure that mechanical engineering continues to improve alongside the growing biosciences. While most of the following devices are described in terms of installing them in a vehicle, they can also be used to design other devices.

Air Filtration

A vehicle can be equipped with filters to remove toxins out of the air before the crew and passengers breathe it. The filtration system has a mass of one kilogram per person and requires one power unit per kilogram.

Mass = 1kg / person

Power Consumption = 1 pu / kg

Air Tanks

Bottled air can be supplied to the passengers and crew of a vehicle. These systems provide TL / 100 person / hours per kilogram and require no power. For every 5000 kg of Air Tanks installed, one square metre a standard airlock interface or for every 25000 kg, one square metre of airlock can be installed for free.

Person Hours of Air = Mass x TL / 100

Armour

Throughout history, armour has been worn in layers that protect against different types of attack. A suit of chain mail, while very resistant to a cutting edge, offers little or no protection against crushing blows until worn over a thick layer of padding. A kevlar vest will stop bullets, but is easily cut and thus is often augmented with thick ceramic or metal trauma plates. Under these rules, most armour on vehicles and people is made up of several laminated layers that provide protection against a wide range of attacks. If desired, the mass of the armour may be multiplied by three and distributed between the following three types: Impact Distribution (Stun), Energy Dissipation (Incendiary), and Penetration Resistance (Bleeding).

A vehicle's Armour rating is based on the mass of the armour devoted to that side, divided by the surface area of the vehicle. This is the most intimidating formula in the game, but preserves the volume to surface area advantage gained by large objects. Since a vehicle has six sides, the mass of the armour can be applied thicker on some sides and thinner on others. Armour applied to one side is six times more effective than normal.

Personal Armour is handled in roughly the same fashion, using a volume of 1 kilolitre per 200 kilograms. Armour must be applied to specific hit locations. Consider the body and wings to count for two units, while limbs and tails count for one. Total the number of units. For a human, there are seven units total. A human helmet's armour would be 7 times more effective, while a vest would be 3.5 times more effective than a full suit.

Armour Index = $\frac{\text{Armour Mass per side} \times \text{TL}}{((\text{Cube Root of Volume})^2)}$

Volume = Armour is always an external feature.

Artificial Gravity

Rotating centrifugal "hamster cages" and similar artificial gravity solutions can greatly improve the range a spacecraft can travel by allowing the crew to combat the deleterious effects of free fall. A rotating area has a mass of 100 kg per cubic metre and requires power equal to its mass. The minimum size is one cubic metre.

Volume = 100 kg / kl

Power Consumption = 1pu / kg

Auxiliary Craft

Smaller vehicles can be carried inside of a larger one, or on the surface. An internal hanger for a specific vehicle only needs to add the vehicle's loaded mass and volume to the parent craft. A craft trying to enter a custom landing bay must be a third to a fifth of its volume, depending on the craft's layout. General use hangar space requires twice the volume of the largest craft intended to land. External docking clamps and top decks need only add the mass of any docked vehicles. It is important in both cases that the vehicle's Structure be sufficient to handle the load. An external docking clamp that is designated to only take a specific vehicle can use any Rockets, Jets, or Thrusters mounted on the Auxiliary Craft to push the main craft if its Structure can handle the extra stress.

Volume = Auxiliary Craft's Volume
Mass = Auxiliary Craft's Mass

Batteries

Storage batteries are commonly used to supply power for small vehicles or auxiliary power for larger ones. Batteries produce a number of Power Unit Hours equal to the TL x 5 per kilogram. Any number of power units may be drawn, but the more power used, the shorter the battery's duration.

Power Unit Hours = TL x 5 x Mass
Volume = 1000 kg / kl

Buoyant Hulls

In order for a vehicle to float, it must have a density (volume / mass) of less than one thousand kilograms per cubic metre and an armoured underside. In order to count as a streamlined surface vehicle, a boat or ship needs an armoured underside and a density of less than five hundred kilograms per cubic metre.

Stability = Volume x 100 x TL x Resistance / Total Mass

Cargo

Hauling Cargo is the primary function of most vehicles. More than just empty volume, it includes shelves and winches for moving loads.

Mass = Desired Cargo Capacity
Volume = 500 kg / kl

Computers

After TL 20, almost everything has dedicated chips and similar technology built into it. These, along with nanotech, are assumed to be a part of the technological advances that cause the improvements in efficiency and capacity. The computers discussed here are only the programmable tools used to speed up or even totally automate tasks.

Generally speaking, a computer is treated as an additional person working on the task under the user's direction. If the same skill is installed multiple times, the computer counts as that many people working on the task. A computer can also run identical machines in unison on one skill program. A computer module weighs one kilogram and allows a number of skill points equal to the TL. Unlike living characters, a computer cannot use skills it doesn't have skill points dedicated to. The maximum skill rating for a computer is the TL plus ½ of its related Statistic. A computer is incapable of increasing its skills through experience. A computer's Statistics cannot be increased.

A computer requires power equal to its mass to function.

Computer Base Ratings:

Coordination = TL
Discipline = TL + 50
Logic TL + 50
Perception = TL
Reflexes: TL + 50
Talent TL - 50 (AI's only)

Advances

Electromagnetic Pulse Shielding (x 2 mass):

The computer shuts down and re-boots if struck by an electromagnetic pulse.

Electromagnetic Pulse Immunity (x 4 mass):

The computer is immune to electromagnetic pulses.

Artificial Intelligence (minimum mass 10 000 / TL):

A complex enough computer can develop a personality and learn new things, such computers receive the Talent Statistic, but still acquire skills by buying units at a rate of TL points / kg. However, AIs can make connections which a normal computer would not, so they can use skills that they have not put points into at half their related Statistic level and can improve their Statistics.

Contact Suspensions

These can be wheels, tracks, or legs, with the individual characteristics of such systems being indicated by the system's rating. Tracks have the advantage of providing 50% of their motive power while in water, if the vehicle is buoyant enough to float. Wheels are a little faster when driven on roads. Legs allow the vehicle to step over obstacles and even climb them at a steeper angle than wheels or tracks would allow. Contact Suspensions can be internal or external as the designer desires. Internal Contact Suspensions can be retractable or fixed at the designer's discretion.

Un-streamlined Resistance = 1 kph / 10 kph

Wheels on roads = 1 kph / 11 kph

Streamlined Resistance = 1 kph / 15 kph

Wheels on roads = 1 kph / 16 kph

Mass = Desired Mass

Volume = 1000 kg / kl

Dive Tanks

A buoyant vehicle can be built to dive under water by filling tanks with water. These tanks count as empty volume when empty, thus increasing the vehicle's buoyancy. When full, they allow the vehicle to sink beneath the surface. Obviously, the vehicle needs to be fully enclosed and have Life Support or Air Tanks installed. The top submerged speed should be calculated for the mass of the vehicle with full dive tanks, and the top surface speed for the mass of the vehicle with empty tanks.

Mass = As needed to cancel out buoyancy

Volume = 1000 kg / kl

Hover Fans

There is a distinct lift advantage to be gained when hovering a small distance above the ground. With the aid of a flexible skirt, a hovercraft can skim over level ground and water with equal ease. Power equal to 5 x the vehicle's mass is needed to hover. The Hover Fan can draw its power from a Jet or a Power plant.

Mass Capacity = Power Consumption / 5

Power Consumption = TL x TL x Mass

Volume = 1000 kg / kl

Jets

A jet heats air or water drawn in from around the vehicle, heats it and fires it away to produce thrust. Obviously, a jet doesn't work at all in vacuum.

Power Output = Mass x TL x 10

Volume = 1000 kg / kl

Fuel Consumption Per hour = Mass x 10 / TL

Advance: Rocket / Jet Hybrid

Special Hybrid Jets can be developed that allow the same nozzles and much of the hardware to be used in space at the cost of doubled fuel consumption.

Life Support

A complete air and waste recycling system can only be installed in areas completely enclosed in enough armour to resist any pressure differences between the inside and outside of the vehicle. The basic Life Support machinery requires one hundred kilograms of machinery per person. The supplies like air, water, and toilet paper are stored at a rate of TL person hours per kilogram. For every 1000 kg of Life Support installed, one square metre of standard airlock interface is included for free, or for every 5000 kg, one square metre of airlock can be included.

Equipment Mass = 100 kg / person

Equipment Volume = 1000 kg / kl

Supplies = TL person hours / kg

Supplies Volume = 500 kg / kl

Lights

Most vehicles will mount a set of lights to improve visibility at night. Lights are basically a very limited spectrum active sensor without any passive sensors built in. They don't actually get a better range than sensors, but do consume less power.

Range = Mass x TL

Power Requirement = Mass

Volume = 1000 kg / kl

Manipulator Arms

A vehicle can be equipped with arms for a variety of purposes. Weapons can be installed in arms as long as the arm's mass is five times greater than the mass of the weapon. A manipulator arm's Strength can be found by looking up its Power Requirement on the Size Table on page 76.

Power Requirement = Mass x TL

Strength Index = Mass x TL

Volume = 1000 kg / kl

Parts Inventory

A section of cargo space can be dedicated to spare parts. The percentage chance of having the right parts to make a repair quickly is based on the percentage of the vehicle dedicated to parts.

Supply Roll = Parts Inventory Mass x 10 / Total Vehicle Mass
Volume = 500 kg / kl

Passengers

A basic crew or passenger seat takes up only a fifth of a cubic metre of the vehicle's volume. If the crew or passengers are non-humans the mass and volume of the seat should be modified to represent the differences in mass between that race and humans.

The crew is treated exactly like the passengers, except that they are a required feature of the vehicle. All of a vehicle's systems are assumed to include any necessary controls and crew stations in their base mass.

If the crew and passengers are intended to spend a great deal of time aboard the vehicle, between two and ten cubic metres of extra volume must be provided for each person. This volume has no mass, but must be installed internally, thus increasing the amount of armour the vehicle will need.

Mass = 100 kg / person for humans
Volume = 200 kg / kl + 2 - 5 kl / person for rooms

Power Plants

In the future, the internal combustion engine will quickly give way to clean and efficient fuel cells and fusion reactors. In general, larger powerplants will be nuclear or even antimatter fueled, with much of the actual "fuel mass" representing safe containment systems. As technology advances, the nuclear power plants grow smaller, eventually replacing fuel cells in all practical functions.

Power Output = Mass x TL
Fuel Consumption Per hour = Mass / TL
Volume = 1000 kg / kl

Rockets

Rockets heat and fire fuel away from the vehicle to push it forward. As such, rockets require a great deal of fuel.

Power Output = Mass x TL x 10
Fuel Consumption Per hour = Mass x 20 / TL
Volume = 1000 kg / kl

Rotary Wings

A wing can be spun on a central pivot to generate lift. A rotary wing can draw power from a Power Plant or a Jet. It takes five power units per kilogram to generate enough lift for the vehicle to fly. A rotary wing is basically a specialized transmission, so it doesn't require one. Rotary wings are always an external feature.

Power Consumption = Mass x TL
Mass Capacity = Power Consumption / 5
Volume = 1000 kg / kl

Sensors and Communications

A Sensor system has a range increment equal to its mass times the Technology Level times ten. Sensors can be operated in both active and passive roles and used for scanning and locking on to targets. In general, a sensor system is dispersed over the vehicle's hull and has redundant units, and thus is only blinded in one direction when damaged.

All advanced sensor systems can function as a communications system, broadcasting with their normal range or sending line-of-sight-restricted, tight-beam, messages with 1000 times their range.

Range = Mass x TL x 10
Power Requirement = Mass x TL pu
Volume = 1000 kg / kl

Advance: Meson Sensors

These subatomic particles pass through solid objects well and can be used to create density maps of the interior of vehicles and buildings

Advance: Tachyon Sensors

These faster-than-light particles can be used to detect objects travelling faster than light but not in other dimensions, such as hyperspace.

Solar Panels

Solar Panels are electrical power plants that don't need any fuel. They produce TL power units per 100 kilograms and divide their output by the distance to the star in astronomical units. Solar Panels must be mounted externally. They cannot have their efficiency modified like Batteries or Power Plants.

Power Output = TL x mass / 100 x AU from star
Volume = External Only

Advances:

Photoelectric Armour

With this advanced technology, the 50% of the vehicle's surface area that faces the star at any given time acts as a solar panel. The disadvantage of this is that the vehicle's Armour rating is reduced by 30 points against energy weapons because it absorbs them rather than deflecting or dissipating them.

Power Sink Armour

This advanced photoelectric armour actually allows energy attacks to be absorbed to charge batteries. If the vehicle's batteries are full, it still takes damage like Photoelectric Armour.

Damage Absorbed Index = TL x Surface area / 2
Power Absorbed =
Attack's power consumption / 10 000 x range increments

Stealth

A vehicle can be made much harder to detect with sensors by covering a vehicle's surface with wavelength-absorbing materials and carefully angling its outer features. Stealth vehicles cannot have any externally mounted features. A vehicle with Stealth gives a -TL modifier to all attempts to detect or target it with sensors. Stealth, like armour, is always an external feature, and never adds to the vehicle's volume. The mass of a Stealth coating is equal to the vehicle's surface area.

Mass = Surface Area
Volume = Always External

Structure

A vehicle's Structure resists damage and high accelerations. A vehicle needs a Structural capacity of at least 1/10 of its motive power output or its mass.

Structural Capacity = TL x Structure Mass
Volume = 1000 kg / kl

Transmission

In order to draw power from a power plant or battery to propel a vehicle, a transmission must be installed. This represents a drive train, electric motors in legs or wheels, or propellers and rudders that allow the power to be directed to produce controlled movement. A Transmission is rated for the maximum number of power units it can handle.

Power Consumption = TL x Transmission Mass
Volume = 1000 kg / kl

Thrusters

A thruster system is basically a Hybrid Jet which is linked to the vehicle's Power Plant, allowing it to generate thrust by directing power to the thrusters. Using thrusters in space increase the Power Plant's fuel consumption because some of the fuel must be fired away from the craft in the form of reaction mass. Thrusters include air intakes which allow them to use the local atmosphere instead of reaction mass. A Thruster's Sensor Profile is equal to its output.

Power Consumption = TL x TL x Mass
Fuel Consumption = Mass kg / hour
Volume = 1000 kg / kl

Turrets

Weapons and sensors can be mounted in turrets, allowing them a much wider arc of fire. Placing a feature in a turret doubles its mass and volume and increases its power requirement by the new mass.

Mass and Volume x 2
Power Requirement = Mass

Vectored Thrusters

Dorsal vents or rockets can be used to lift the vehicle off the ground. There is a minimum power requirement to remain airborne, equal to the mass of the vehicle. For this reason, it is not uncommon for a vertical thrust vehicle to be equipped with wings as well.

Mass Capacity = Power Consumption / 10
Power Consumption = TL x TL x Mass
Fuel Consumption if from Power Plant = Mass x TL
kg / hour
Volume = 1000 kg / kl

Weapons

A weapon can be mounted internally or externally but it must always be a surface feature. Weapons can be mounted in a turret for twice their mass. Turrets need operating power equal to their mass. The design rules for weapons are found later in this chapter.

Projectile weapons that are mounted on vehicles may cause the vehicle to move if their recoil is sufficiently powerful. For this reason, aircraft, space craft, and air cushion vehicles will often be equipped with rockets or energy weapons as these do not have recoil. Surface vehicles have good traction and will rarely be moved by recoil.

Recoil Acceleration =

$\text{Energy} \times \text{Rate of Fire} / (\text{Vehicle Mass} \times 250 \times a)$
where $a = 10$ for surface vehicles
and 1 for others

Volume = 1000 kg / kl

Wings

An aeroplane can fly because it takes longer for air to pass over its wings than under them. The air pressure decrease above the wing increases as the aeroplane moves faster, creating lift. In essence, the air pressure beneath the plane becomes sufficiently greater than that above it for the aeroplane to float on air. Of course, if the airspeed is reduced below the critical velocity at which the lift becomes greater than the mass of the vehicle it will begin to fall.

Stall Speed = Total Vehicle Mass x 15 / Wing Mass

Volume = 500 kg / kl

HYPOTHETICAL TECHNOLOGIES

There are a variety of devices which are common to science fiction that are highly questionable from the point of view afforded by modern physics. These devices can really alter the shape and texture of a campaign and are all optional for that reason. All of these "hypothetical technologies" are considered to be advances which must be developed instead of growing out of increased TL ratings. It should be realized that the power requirements of all the following technologies are very high, and that they will probably be next to useless at low TL levels.

Anti-Gravity

If gravity can be turned off, the universe opens up in amazing ways. People can fly, space craft can get into orbit on only enough fuel to reach orbital velocity, advanced zero-gee production techniques can be applied planet side, and worlds can be shattered. Anti-gravity devices do not generate any thrust.

Anti-gravity devices require less power to operate than an equivalent set of vectored thrusters, only needing power equal to the vehicle's mass times the local gravity to get off the ground. An anti gravity device's mass must be greater than the vehicle's total mass divided by the Technology Level.

Mass Capacity = TL x Mass

Power Consumption = Vehicle Mass

Volume = 1000 kg / kl

Advances:

Gravity Shearing:

The energy requirement does not go up in higher gravity fields.

Anti-Gravity Metal:

This advanced form of anti gravity requires no power to generate lift and is unaffected by local gravity.

Synthetic Gravity

Increasing understandings of gravitation may one day make it possible to provide gravity for the whole vessel through plates in the floor or ceiling. Synthetic gravity systems mass one kilogram per cubic metre effected and use one power unit per kilogram.

Mass = Volume Effected

Power Consumption = Volume Effected

Volume = 1000 kg / kl

Energy Torpedoes

Research into electro-magnetic fields, quantum physics and stars, may lead to the development of weapons that fire complex “mini suns” with a continuing fusion reaction contained in an electric field. Energy torpedo projectors require power equal to ten times their mass. A torpedo’s energy level and duration are key variables. The total energy output is ten thousand times the mass of the projector, this must be divided by the desired duration and speed in metres per second. The remaining energy is divided between Penetration and Damage as the designer wishes, as with any other energy weapon.

$$\text{Energy Level} = 10000 \times \text{Mass}$$

$$\text{Volume} = 1000 \text{ kg / kl}$$

Advance:

Guided Torpedoes:

Normally a torpedo moves in a straight line from its projector at its fixed speed until it strikes a target or runs out of duration. This advance allows the torpedoes to be guided, increasing their chance to hit and allowing them to turn and chase the target. This is probably accomplished by firing a particle beam from the ship to direct the torpedo since the ball of plasma is not a viable surface for control devices.

Faster-Than-Light Drives

There are a wide variety of ways in which the limitations of relativity may be circumnavigated. Unfortunately, most of these are mathematical loop holes requiring “unobtainium” , normally in the form of negative mass energy (which is very different from producing energy or anti-matter which has positive mass) Some popular forms:

Hyper Drive:

The ship enters a hypothetical dimension which is adjacent to the entirety of our dimension and pops out at a preestablished point. Hyper drives generally displace the vessel forward in time, causing the trip to have an apparent FTL velocity instead of an instantaneous transit. Because the velocity of the vessel and forces acting on it affect its destination, it can be very dangerous to activate a hyper drive in a gravity well stronger than .001 G.

Jump Drive:

The ship can pass through naturally occurring gravitic anomalies which are not strong enough to create a natural worm hole. These points generally have fixed exit points creating a web like map of jump connections. The transit is normally instantaneous but, since the points tend to be located in the outer system, considerable travel time is involved in just reaching the jump point.

Warp Drive:

By forming an extra-dimensional bubble around the vessel, the speed of light can be literally surpassed. A warp drive can be a type of time sump, quantum super string winder, or even an electron tunnelling macro emulator. If faster than light sensors are not available, warp drives, can be very dangerous to use since a ship travelling faster than light in real space is capable of colliding with things.

Wormholer:

This particular drive requires 100 times the normal energy. It allows an actual wormhole to be opened and multiple vessels to pass through instantaneously. These are often built as large solar or quantum flux powered bases called jump gates.

The pseudo-velocity achieved is the power consumption divided by the vehicle’s mass, in light years per day.

$$\text{Power Consumption} = \text{TL} \times \text{TL} \times \text{Mass}$$

$$\text{Volume} = 1000 \text{ kg / kl}$$

Faster-Than-Light Sensors

If it is possible for ships to travel faster than the speed of light, it may also be possible to track them. The tachyon is a hypothetical particle with a negative mass. Having a negative mass means that it cannot move slower than light. A vessel moving faster than light is assumed to have a tachyon signature which can be detected with FTL sensors.

Force Fields

While force fields are generally pseudo-science at best, there have been recent advances in cold plasma, similar to that used in some high-end computer monitors which may allow spacecraft to be shielded from energy weapons and radiation. In a similar vein, magnetic fields like those used to contain experimental fusion reactions may, someday, be used to deflect metallic objects and plasma of the type found in solar flares. Of course, for the moment, the power required to generate such fields is great enough to make them completely impractical.

When an attack strikes a Force Field, compare the Penetration and Damage ratings to the force field's rating instead of the shielded unit's Armour and Structure. If the Penetration is greater than the force field's rating, it offers no protection. Otherwise, the force field's rating is reduced by one hundred points for every hundred points of fraction thereof that the Damage is greater than it. If an attack reduces the Force Field rating below zero, the remnant of the attack's Damage is applied normally.

The basic force field prevents all particles and wavelengths from penetrating it, rendering the vessel incapable of attacking, using sensors, or using thrusters, rockets, or jets. Nor will it function in an atmosphere. It can be "flickered" momentarily to allow such activities. Set a flicker rate from 1-10 this is the chance in ten that a shot will be blocked by the field. This chance applies to outgoing attacks as well as incoming ones, since the flickering field can interrupt firing solutions.

Power Capacity = TL x TL x Mass
Force Field Rating Index = Power / Surface Area
Volume = 1000 kg / kl

Advances:

Transparency: sensors can see out
Non-radiant: no bonus to detect and target
Cloaking: acts as Stealth for whole vehicle, doubling effective range
Discriminatory: can fire out, apply thrust, pass air not bullets etc.

Force Beams

A force field can be extended like an invisible fist to strike targets. Force beams are designed just like any other energy weapon, but inflict physical impact damage instead of heat transfer damage. Generally, force beams will inflict Stun damage and have a high damage bonus.

Inertial Dampeners

Gravity manipulation or force field technologies can lead to systems capable of reducing the impact of high gee manoeuvre on the human (or alien) body. A dampener system is generally a part of the vehicle's life support systems. The system has a capacity equal to its mass times the Technology Level divided by the number of gees it can cancel out. Inertial Dampeners require power equal to their mass.

Acceleration Compensated = Mass x TL / Vehicle Mass
Power Consumption = Mass

Mind Scanners

Since the human mind functions on bio-electrical principles, it may be possible to read neural activity and translate it. The basic Mind Reader has a range of 1 metre per kilogram, and requires 10 power units per kilogram. At the most basic level, it can only be used to scan for the presence of sentient life forms. Mind scanners are affected by ECM and Stealth like a normal sensor.

Advances:

Mind Readers:

A translator which can read the thoughts of specific targets and even project visual images from their imagination.

Mind Controller:

A weapon which can be used to cause its target to take actions chosen by the weapon's user. A mind controller is designed exactly like an energy weapon, but causes no damage. Instead, if the target's Discipline is lower than the beam's "Damage" they are controlled for one minute per ten points.

Quantum Flux Generators

The vacuum of space is not really empty. It is full of quantum fluctuations of subatomic particles which may or may not be there. Theoretically, it may be possible to draw power from the vacuum of space itself. This is a really universe shaking technology and should not be allowed lightly. The basic model generates "TL" power units per 10 kg and is a great way to charge batteries but not much else. Each advance thereafter increases the energy produced by 10 times.

Power Output = TL x Mass / 10
Volume = 1000 kg / kl

Reactionless Drives

The requirement that reaction mass be expelled in large quantities at incredible velocities means that real space travel is far too slow to be bothered by Einstein's special relativity equation. A reactionless drive simply violates the most basic rules of physics. (Although there is some interesting work being done relating to the Gauss constant...) Even so, this drive is a good way to simplify space travel. The basic form moves on vectors.

Reactionless drives are essentially Thrusters that don't double the Power Plant's fuel consumption when used in a vacuum.

Power Consumption = TL x TL x Mass
Volume = 1000 kg / kl

Advances:

Turns like an aeroplane, just like on TV.
Turns on a dime, hope you have really good inertial dampeners.

Repulsor Fields

A force field or gravity manipulation device can be used to deflect incoming projectiles. A repulsor field generates a bonus to the Armour rating of the vehicle or person it is mounted on. Look up the power consumption of the repulsor field divided by the mass of the vehicle times 100 on the Game Statistic Index Table to find the bonus it applies to the vehicle's Armour rating.

Power Consumption = TL x Mass
Armour Bonus Index = Power Consumption / 100 x Vehicle Mass

Stasis Fields

Stasis is a state of absolute unchanging. The particles in a Stasis Field are frozen in time and space. The current vector of the objects in the field cannot be changed. Nor can they be damaged by any force. A Stasis Field generator masses 10 percent of the vehicle's total mass and requires power equal to its mass. The field lasts for up to one year per TL as decided before activating the field. It is not possible to activate the field for less than 29 minutes.

Vehicle Mass Capacity = Generator Mass x 10
Power Consumption = Mass

Advance:

The field generator can be outside of the field and the field changes vectors with the generator. This allows the Stasis field to be employed planet side and used for non-vehicular purposes.

Teleporters

By destroying an object to obtain its quantum information, it can be recreated elsewhere. This is real science, it has been proven experimentally, but only at the atomic level. Doing more appears to be a near impossibility due to the power required. It takes one power unit to move one kg one metre. The mass of the device is 100 kg per power unit of capacity. The basic teleporter requires a device at both ends of the transport and a communications system to transmit the quantum information.

Object Mass Capacity = 100 x Maximum Power Consumption
Power Consumption = object mass x distance

Advance:

Free point teleporters can teleport a target to a device or from a device to a point where there is none. If the target materializes inside a solid object, there is an explosion with a damage rating equal to the energy involved in the teleport and a blast radius of one meter per 10 points of base damage.

Tractor Beams

A force beam that is used to move distant targets against their will. Defining an energy weapon to be a tractor beam removes its ability to do damage. Divide the beam's Base Energy by the range in metres and the target's mass to find the acceleration it is capable of effecting upon the target.

Tractor beams are an advance of force field technology. An additional advance allows a tractor beam to do damage by shaking its target.

DESIGNING VEHICLES

A vehicle is designed by allocating the desired mass and volume to each desired system. The basic order this is done in is to either start with a hull of a fixed volume and install the systems desired or to make a list of the desired systems and build a hull that fits them. After that, the vehicle's performance is worked out, after which it may prove necessary to tweak the original design to achieve the desired performance.

External Features

Most systems can be installed externally. This means that they don't add to the vehicle's internal volume, but are not protected by armour.

Calculating Surface Area

The vehicle's surface area is calculated by taking the cube root of the total volume, squaring the result. Since this is fairly math intensive, several bodies with preset values are listed on Table II.

Crew Requirement

- 1 pilot, 3 for non-stop operations
- 1 sensor operator, 3 for non-stop operations
- 1 gunner per turret
- 1 engineer per TL x 1000 kg of power plants, rockets, jets, and transmissions
- 1 Command Crew (officers) per 20 other crew.

The pilot will often supervise a computer sensor operator on smaller craft. Similarly, computers can reduce the number of gunners. Computers cannot replace engineers but robots can. Neither can replace command crew.

Target Size Table

To find the vehicle's Target Size modifier, add the volume of any external features to the vehicle's total volume and check the following chart. This chart is basically the Surface area of the vehicle with a full external load at a rate of ten points per factor of ten.

Total Volume + External Volume	Target Size Modifier
0.03 to 0.99	-10
1.00 to 31	0
32 to 1000	+10
1001 to 32 000	+20
32 001 to 1 000 000	+30

Structure Index = Structure Mass x TL / 10

Armour Index = Armour Mass Per Side x TL / Total Surface Area

Acceleration = Motive Power x 4 / Total Mass

Top Speed = Motive Power x 4 / Total Mass x Resistance

Resistance:

Aircraft with no external features = 1/60

Aircraft with external features = 1/30

Surface vehicles with no external features = 1/15

Surface vehicles with external features = 1/10

"Mode" Stability = TL x Mode Resistance x Mode Mass / Loaded Mass

Stall Speed = Total Mass x 15 / Wing Mass

Dive Depth = Vehicle Volume / Dive Mass x 100 metres

Look up the vehicle's structure's capacity on the Game Statistic Index Table on page 76 to find its Structure for the purpose of calculating damage.

Sample Hulls	SA / Side	SA
1 cubic metre	1	6
2.5 cubic metres	1.84	11.1
5 cubic metres	2.92	17.5
10 cubic metres	4.64	27.8
25 cubic metres	8.55	51.3
50 cubic metres	13.6	81.4
100 cubic metres	21.5	129
250 cubic metres	39.7	238
500 cubic metres	63.0	378
1000 cubic metres	100	600

Example:

TL 40 Lander

System	kilograms	cubic metres	notes
Rocket	1500	1.5	600 000 pu output, 37.5 kg /h
Fuel	3000	3	
Vectored Thrust	75	0.075	120 000 kg capacity
Wings	750	1.5	Stall Speed =200 kph
Wheels	250	0.25	Unpowered
Batteries	10	0.01	2000 pu / hours
Passengers	400	2	
Cargo	1000	2	
Life Support	400	2.5	
Life Support Supplies	100	0.2	4000 person / hours
Sensors	10	0.01	4000 m / -10, 400 pu
Computer	5	1.5	200 skill points
Structure	1500	1.5	80 000 kg capacity (8 gees)
Armour	1000	0	250 U, 150 Other Sides
TOTALS	10000	16.045	

Surface Area = 6.36 / side
 Underside Armour Index = $250 \times 40 / 6.36 = 1571$
 Underside Armour = 161
 Other Side Armour Index = $150 \times 40 / 6.36 = 943$
 Other Side Armour =149

Resistance = 1 kph / 60 kph
 Acceleration = $600\,000 \times 4 / 10000 = 320$ kph / round
 Top Speed = $320 / (1/60) = 14\,400$ kph

Hardware Summary Table

m ³	MASS	VOLUME	NOTES
Power Plants Fuel Batteries Jets Rockets Solar Panels Transmissions	Output / TL as desired as desired Output / (TL x 10) Output / (TL x 10) Output / (TL / 100) Capacity / TL	1000 kg / m ³ 500 kg / m ³ 1000 kg / m ³ 1000 kg / m ³ 1000 kg / m ³ external 1000 kg / m ³	Mass / TL fuel per hour Mass x 5 x TL power unit hours 10 x Mass / TL fuel per hour 20 x Mass / TL fuel per hour
Computers Manipulator Arms Sensors Lights Weapons Turrets	TL points / kg as desired as desired as desired see Weapon Design system mounted x 2	1000 kg / m ³ 1000 kg / m ³ 1000 kg / m ³ 1000 kg / m ³ 1000 kg / m ³	Power - Mass Power - (TL x mass) Mass x TL Power if active Power - Mass may need power Power - Mass
Air Tanks Air Filtration Artificial Gravity Life Support L.S. Supplies	TL Person Hours / 100 kg 1 kg / person 100 kg / m ³ 100 per person TL Person Hours / kg	200 kg / m ³ 1000 kg / m ³ 100 kg / m ³ 1000 kg / m ³ 500 kg / m ³	Power - Mass Power - Mass Power - Mass
Cargo Parts Inventory Passengers & Crew	as desired as desired 100 per person	500 kg / m ³ 500 kg / m ³ 200 kg / m ³	
Contact Suspensions Dive Tanks Hover Fans Rotary Wings Thrusters Vectored Thrusters Wings	as desired as desired Capacity / (TL x TL) Capacity / TL Capacity / (TL x TL) Capacity / (TL x TL) as desired	1000 kg / m ³ 1000 kg / m ³ 1000 kg / m ³ 1000 kg / m ³ 1000 kg / m ³ 1000 kg / m ³ 500 kg / m	Power Ppower - 5 x total vehicle mass Power - 5 x total vehicle mass x2 fuel consumption in vacuum Power - 10 x total vehicle mass
Structure Armour Stealth	Mass Capacity / TL Mass x TL / surface area surface area	1000 kg / m ³ none none	

WEAPON DESIGN

Strength Requirements

Most weapons have a Strength Requirement based on their mass and either can be used to find the other. The mass based Strength Requirement for a weapon is shown on the following table. Firearms, rail guns, and fluid projectors have recoil which can make them harder to aim. Automatic fire weapons are harder to control, add ten to their Strength requirement for every multiple of ten shots. Using a weapon with a full limb set adds 20 to the character's effective Strength.

Energy Weapon Design

Since less is known about the workings of futuristic energy weapons than firearms, they are dealt with in a simpler and more flexible fashion. The weapon's energy requirement is worked out and used as a base figure to represent its effectiveness. This energy is then divided by the desired Rate of Fire and the product is split as desired between the Penetration and Damage index values. The range is based off of the weapon's Penetration, since the more harmful and energetic wavelengths are absorbed better by atmosphere and are harder to focus into a tight beam.

A highly energetic beam may produce an explosion or expose those around it to excessive heat and radiation. For this reason, the weapon's Damage value are used to calculate its Cook Out and Blast Damage.

Mass = Input Energy / (TL x 100)
Output Energy = Input Energy x TL / 500
Penetration Index = (Output Energy - Damage Index) / 10
Damage Index = "any amount up to Output Energy"
Range = Penetration Index / 10

Cook Out Damage = Damage - 250
Blast Damage = Damage - 150
Mass Strength Requirement Index = Mass x 5

Firearm Design

Even in the distant future, a small high-velocity projectile will be an effective way of killing things. As energy weapons become viable, the recoil of the weapon limits the main thrust of firearm development to using smaller amounts of improved propellants to increase the number of rounds that can be carried and improved mechanisms that allow greater rates of fire. Liquid and electro-thermal propellants are likely developments as are electrically ignited propellants that allow several bullets to be stacked in a single barrel.

Ballistics are a hot topic among gamers. Working out the ballistics physics of an individual firearm is a little out of the range of a usable game mechanic, so the following basic assumption has been made: The main source of damage from a gunshot wound is the large, bleeding hole it leaves through the victim's body. For this reason, the base damage for firearms is derived from the mass of the projectile. In some ways, the diameter would be a little more accurate in describing the size of the wound, but the inertia represented by the bullet's mass also makes it more likely to shatter bones than glance off of them. Penetration is derived from the energy generated by the propellant and the barrel's length, which allows the energy to be fully utilized. Range is also based on the muzzle energy, because while a larger bullet will move slower given the same amount of propellant, it will also lose that velocity more slowly.

The figures below can be used to design anything from a holdout pistol to a battleship cannon. Be aware that while one can get some silly values by under or over powering a round, for this reason there are formulas for maximum possible ratings given.

Barrel Length = 5 to 15 as desired
Propellant Mass = as desired
Projectile Mass = as desired (around Projectile Mass x 20 / TL)
Cartridge Mass = Propellant Mass + Projectile Mass
Energy = TL x Propellant Mass x Barrel Length (5-15)

Range = Energy / 20
Maximum Range Rating = (Energy / Projectile Mass)

Penetration Index = Energy / 10
Maximum Penetration Index = Projectile Mass x 1000

Damage Index = Projectile Mass x 1000
Maximum Damage Index = Energy x 50

Action

Breech Loader

Action Mass = 0
Rate of Fire = 1
Reload = 1 action

Multi Barrel Breech Loader

Action Mass = Empty Mass x Number of Barrels
Rate of Fire = Number of Barrels
Reload = 1 Barrel per action

Manual (Revolver or Pump)

Action Mass = Cartridge Mass x Shots x 5 (Minimum 300 grams)
Rate of Fire = 1
Reload = 1 Shot per action

Semi Automatic

Action Mass = Cartridge Mass (Minimum 400 grams)
Rate of Fire = 1
Reload = 1 action to replace magazine

Burst Controlled

Action Mass = Cartridge Mass x 2 (Minimum 1200 grams)
Rate of Fire = 3
Reload = 1 action to replace magazine

Light Automatic

Action Mass = Cartridge Mass x 3 (Minimum 1500 grams)
Rate of Fire = TL / 4
Reload = 1 action to replace magazine

A light automatic's barrel and receiver are not heavy enough to sustain a high rate of fire indefinitely. For this reason, they never have an ammo capacity greater than 2 x TL. If one is modified to fire from a larger source, such as a snail drum, there is a 1% chance per subsequent turn of fire that the weapon will jam.

Heavy Automatic

Action Mass = Cartridge Mass x 6 (Minimum 3000 grams)
Rate of Fire = TL / 5
Reload = 2 actions to link belts or replace hopper

Multi Barrel Automatic

Action Mass = Cartridge Mass x 4 x Number of Barrels
(Minimum 2000 x Number of Barrels)
Rate of Fire = TL x Number of Barrels / 5
Reload = 2 actions to link belts or replace hopper

Unloaded Mass = Barrel Length Squared x Cartridge Mass + Action Mass

Loaded Mass = Unloaded Mass + Shots x (Cartridge Mass)

Recoil Strength Requirement Index = Energy / 50

Mass Strength Requirement Index = Mass x 5

The higher of the Recoil and Mass indices is used to set the weapon's Strength requirement.

Accessories

Folding Stock: + 500 grams, -10 recoil
Solid Stock: + 1000 grams, -10 recoil
Pneumatic Stock +1500 grams, -20 recoil
Bipod: + 1500 grams, +10 to hit when braced
Tripod: + Weapon Mass x 0.5, -20 Strength requirement
Stabilizer Arm: + 10 000 grams, Strength Index = TL x 8

Example

TL 20 Submachine Gun
8 gram bullet
4 gram propellant
12 gram total cartridge
Barrel Length 7

Energy = 20 x 4 x 7 = 560
Range = 560 / 20 = 28 m / -10
Penetration Index = 560 / 10 = 56
Penetration = 87
Damage Index = 8 x 1000 = 8000
Damage = 195
Rate of Fire = TL / 10 = 4

Mass = 7 x 7 x 12 = 588 grams
+ 3000 (heavy automatic)
+ 500 (folding stock)
+360 (30 shot clip)
= 4448 grams

Mass Strength Requirement Index = 2.948 x 5 = 14.5
Mass Strength Requirement = 58
Recoil Strength Requirement Index = 560 / 50 = 11.2
Recoil Strength Requirement = 52

Electromagnetic Accelerators

It is possible to build firearms that use a magnetic coil barrel to accelerate the projectiles. The weapon requires both a power supply and ammunition. The power supply must at least provide Power Unit seconds equal to the weapon's Energy per shot.

Projectile Mass = as desired
Energy = Barrel Length x TL x Projectile Mass
Unloaded Mass = Barrel Length Squared x Projectile Mass x 4

Penetration Index = Energy / 10
Maximum Penetration Index = Projectile Mass x 1000
Range = Energy / Projectile mass x 2
Maximum Range Rating = (Energy / Projectile Mass)
Recoil = Energy / 100
Damage Index = Bullet Mass x 1000
Maximum Damage Index = Energy x 50
Rate of Fire = TL / 2

Recoil Strength Requirement Index = Energy / 50
Mass Strength Requirement Index = Mass x 5
The higher of the Recoil and Mass indices is used to set the weapon's Strength requirement.

Shell Types

Armour Piercing:

+10 Penetration
-10 Damage

Flechette:

Divide shell mass by twice the number of flechettes
Work out penetration using the Energy divided by the number of flechettes x 2 and damage using the mass of individual flechettes.
+ TL Penetration

Gas:

Radius = $3.14 \times \text{Cube Root of (Projectile Mass} \times \text{TL)}$
Chemical "Strength" = TL

High Explosive (Incendiary, Stun, or Fragmentation):

Damage Index = Projectile Mass x TL
Penetration Index = Projectile Mass x TL / 10
Blast
Incendiary, Stun, or Bleeding Injuries

High Explosive Antitank:

Damage Index = Projectile Mass x TL
Penetration = Damage
Incendiary Injuries

Nuclear:

Damage Index = $1000 \times (\text{Projectile mass} - (3000 / \text{TL}))$
Penetration = Damage
Blast x 10 radius
Causes Incendiary and Radiation injuries

Riot:

Penetration - TL
Causes Stun injuries

Shot:

Divide shell mass by number of pellets
Work out Range and Penetration using the Energy per pellet.

Sabotaged: Work out range and damage using a smaller bullet

Spring Weapon Design

Simple Bows are the basic type of spring weapon. Crossbows, catapults, and spring guns are more advanced models which allow the bow to be held loaded and fired with more power and accuracy.

Most spring weapons use sharp projectiles and cause Bleeding injuries, but they can be use blunt projectiles to cause Stun injuries.

Damage = Strength Requirement + 100

Penetration = Strength Requirement

+ TL for sharp projectiles

Range = Damage / 10

Powerful Bows, +10 Damage, -10 to hit

Advances:

Locking Mechanism: Bow can be carried loaded
x 2 mass

Required for following:

Lever Loading

2 actions to load

+10 damage

Winch Loading

3 actions to load

+10 damage

Motor Loading

TL 20 required

2 actions to load

+20 damage

Melee Weapon Design

Melee weapons are designed by combining the features listed below. The base Breakage rating is 100 + TL+ Strength Requirement. A melee weapon's mass is directly related to the damage it inflicts. The base damage for a one handed weapon is its Strength Requirement + 50. If a weapon does not have a feature that loses its ability to be thrown, it has a range of one fifth of the user's Strength - Strength requirement.

Damage = Strength requirement +10

Breakage = Strength requirement +100 + TL

The following traits can be combined with any other traits:

Unbalanced: per level

+10 Damage

-10 Parry

Reach: -10 Parry and Damage per level after first

Powered:

+TL Damage

Incendiary, Bleeding, or Stun

Requires TL x mass power

Only one of the following traits can be taken:

Spiked:

+10 Damage

Penetration =TL

Causes Bleeding

Blunt:

Stun

+10 to hit

Hooked:

+10 Damage

Penetration = TL + 10

Causes Bleeding

Risky

Cannot throw

Edged:

+10 Breakage

Penetration = TL + 5

Causes Bleeding

Pointed:

Penetration = TL +10

+10 Damage

Causes Bleeding

A blunt or spiked weapon can be:

Flexible:

Entangle (not if unbalanced)

Risky

+10 Damage

-10 to Parry

-10 to be Parried

Fluid Projector Design

Fire hoses and flamethrowers work on the same basic principles. They are treated as automatic fire weapons for the sake of simplicity. The power for a fluid projector can come from a simple hand pump. In this case, the number of actions required to prepare one shot is the Fuel Use value. Most fluid projectors don't cause a base injury, but still have a damage value based on their Power Requirement.

Penetration = 0

Range = TL x Mass / "Rate of Fire"

Fuel Use=TL x Mass x Rate of Fire

Power Requirement = Fuel Use

Fuels:

Water: puts out fires, neutralizes acids

Slip spray: - TL to surface manoeuvres and actions

Napalm: Ignite, 100 + TL Damage, starts fires

Glue: hardens in 1 hour / TL, Strength = TL

Foam: Stun, extinguishes fires TL x better than water

Acid: Damage = TL + 50 (Corrosion)

dissolves TL points before neutralized

Missile and Rocket Design

Missiles and rockets are designed as small vehicles, leaving room for a payload. The payload's effect is calculated just like any other ammunition. Remember that the payload effects are listed in grams, so multiply the mass of a payload that is in kilograms by 1000 before working them out.

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