Vanguard Free Roleplaying

Matthew DeBell and Mark Kalina

Science Fiction Roleplaying in AD 2140

Vanguard Free Roleplaying

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Created and written by Matthew DeBell.
Game design and development by Mark Kalina and Matthew DeBell,
with assistance from Dan Liebgold.
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Common-sense disclaimer: Vanguard is fiction. At some points the text adopts a tone declaring facts about law, medicine, or other subjects. This is for fictional flavor. Nothing at all in this book is fit for use as a source of information about the real world or as a prescription for behavior (other than the obvious offering of rules for playing a game).

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Email us with your feedback!
Matthew DeBell md@vanguardRPG.com
Mark Kalina mk@vanguardRPG.com

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Introduction to Vanguard Free Roleplaying

Vanguard is about leaders in a new revolution: humankind's explosive expansion through interstellar space. At the forefront of this revolution are a class defined not by their nationality, their race, or their jobs, but by a creed. The leaders of the revolution embrace confrontation with the unknown. They pursue the lure of the expanding frontier. They blaze new trails and create new settlements. They strive to solve mysteries, and they make their names and fortunes 'round distant suns. These people who lead, strive, and create are the Vanguard. *Join them*.

Humans have long lived in a cave, where darkness and confusion reign. You, the *Vanguard,* are the people whose vision and tenacity are leading humans out of the cave, and who will draw civilization in your wake. You are explorers, innovators, adventurers. You are individualists, and you are collaborators. Your creativity, your openness to invention, and your pioneering spirit make your lives the most gripping of all.

"Baloney!" cry the Luddites, perpetual naysayers and enemies of progress. "Innovation is disruption. Progress is illusion. Pioneering is a hazard."

You decide which side you're on. This is a game about the *Vanguard*.

This Book & its Progeny

Vanguard Free Roleplaying (VFR) is a free roleplaying game with a complete set of rules and a sketch of background. We're working on the full, 300 page version for release next year, which will be called Pioneer Vanguard. However, VFR provides the core rules and will get you started in the Vanguard universe.

This version of VFR is a draft. Feedback from readers and players is welcome; please share your impressions by emailing authors@vanguardrpg.com. Your feedback will be invaluable in developing the final product.

Pioneer Vanguard will more than double the size of this book. Right now, we're working on a host of additions and revisions, including:

- new technology chapter
- new colonies & space settlements chapter
- new business & economy chapter
- dramatically expanded adventuring chapter
- new vehicles & vehicle combat chapter
- revised and extended chapter on political conflict
- more complete medical rules
- expanded listings of weapons and equipment
- comprehensive index
- over two dozen illustrations

Updates for VFR and news on Pioneer Vanguard will be available from www.vanguardrpg.com

The Setting

> *Be not afraid of greatness.*
> *Some are born great,*
> *some achieve greatness,*
> *and some have greatness*
> *thrust upon them.*
> *Shakespeare, Twelfth Night*

The setting for Vanguard is an imaginary future. The year is 2140, and faster than light transportation has allowed humankind to travel to the stars. The exploration and conquest of space are underway and vast resources have been discovered on distant planets, which are magnets for colonization. The pioneers building these new worlds face a radical array of challenges and opportunities, while Earth is the font from which this revolution springs. Human beings live in the infancy of a budding interstellar civilization, and Vanguard characters are at the forefront of this civilization.

Beyond the advanced and still developing Earth, a new frontier is rapidly being opened, explored, and settled. The ascent of humanity from its home planet promises permanent, profound, and irrevocable changes for civilization. Many facets of these changes are still emerging, but inevitably the development of an interstellar civilization puts new twists on old conflicts.

Vanguard embroils characters in the social conflicts of this developing interstellar civilization. Space piracy and privateers, shifting blocs of economic and political alliances, brewing wars of colonial rebellion, the lure of the expanding frontier, and the opportunity to make one's fortune 'round distant suns draw the Vanguard into confrontation with the unknown. Characters and adventures as diverse as human experience may be played, but in particular the Vanguard consist of spaceship crews, colonists, mercenaries, journalists, detectives, secret agents, scientists, and explorers who are grappling with the changes wrought on society by technology and space development.

The colonization of space was driven in part by international economic competition following the end of the US-Soviet twentieth century Cold War, and in part by the new dynamics of the twenty-first century US-Japan Cold War. In the post-Cold War era the space infrastructure was further developed in pursuit of commercial gain, and when faster-than-light (FTL) travel was developed in the 2050s explorers promptly found worlds to colonize. Since then the flux of colonists has been straining the capacity of shippers to deposit them off-Earth. In 2140, the same inducements that started space development continue to sustain it: space offers amazing sights, important lessons, valuable military advantages, and opportunities for profitable commercial enterprise. All pushing in the same direction, these factors constitute an irresistible force.

Several planets have been subjects of large-scale colonization, with a total population of over fifty million people. Three large extra-terrestrial nations have secured independence from their mother countries on Earth. These new countries, the Empire of Furehjelm (pronounced "fur-a-helm"), the Republic of Mitsukawa, and Elysium, as well as the developed Earth nations, rely substantially on interstellar trade for their prosperity.

The nations of Earth and the new worlds have coalesced into three blocs, which have a history of hostility to one another: the Multi-Planetary Co-Prosperity Sphere, the United Nations, and the Interstellar Security and Development League face one another in a climate of political tension.

Rules Introduction

There are many methods which players and GMs may use to decide the outcome of events beyond the control of characters. Vanguard offers rules to provide coherent realism in the outcome of events. Four primary areas of rules exist, covering Character Creation, general Action Resolution, Combat Resolution, and Wounds.

Character Creation Preview

Characters are created according to the imagination of the players. There are no dice involved in the process to stifle your creativity. To achieve balance and consistency players keep track of the number of "points" they have spent for various levels of ability (learned skills and innate attributes) and endeavor to keep from spending too many, but players are essentially free to play whatever sorts of characters they desire and can agree on with the GM. Character creation begins on page 9.

General Action Resolution Preview

Whenever a character does something he or she is performing an Action. Cooking a meal, sailing across a bay, treating a wound, and repairing a fan car are all actions. One of the game master's jobs is to tell the characters what happens when they try to perform actions such as these.

All actions in Vanguard are resolved by finding the number of successes achieved in an action attempt. This is done with dice and a chart called the Action Resolution Chart, or ARC, that describes the meaning of successes achieved when a character attempts an action. The *ability* of the character (rated on a 1–10 scale) attempting the action, the *difficulty* of the action (usually rated from –3 to +3) being attempted, and the random result of a *2d6* roll are added together to find a number of successes that describe the action results. The ARC explains the meaning of successes for various kinds of actions. Depending upon the type of action attempted, the description will either be a simple adjective like "good," a fraction of the number of bullets fired that actually hit the target, or an indicator of whether the task was completed in less time, more time, or about the same amount of time as

Dice Jargon

The dice primarily used in Vanguard are six-sided (i.e. conventional cubical dice) or ten-sided (which are available at hobby stores). When referring to any dice, common shorthand is to say or write "d" to indicate "die" followed by the number of sides on the die. Thus "d6" means "a six-sided die" and "d10" means "a ten-sided die."

To add together the sums of several rolls, we put the number of rolls before the type of dice to be rolled. "2d6," for example, means the sum of the rolls of two six-sided dice. An expression like "2d6+2" means you roll 2d6 and add two to the result.

To find percentages (to roll "percentile dice"), or roll a d100, the most popular method (rather than actually using a die with 100 sides) is to roll two ten sided dice, designating the result of one of the dice as the number in the tens place of your 1 to 100 number and the second die as the ones place number. For example, you roll a 3 and then a 9 on two ten sided dice, indicating 39. (If you roll 00, that's 100.)

would normally be expected. This core system is explained in more detail beginning on page 33.

Combat Resolution Preview

In a lot of role-playing adventures it turns out that the characters get themselves into a fight of one sort or another. The resolution of such fights can be a precipitous obstacle for the game master, particularly because most game masters are lucky enough to be very inexperienced in the ways of combat. The combat resolution rules come to the rescue by providing a coherent means of precisely describing the outcome of combat.

To keep things as manageable as possible while still giving the players detailed descriptions, combat is resolved in slices of time five seconds long. Within these five second turns, each character acts in an order determined by an initiative number which varies by character and situation. Characters may use weapons or conduct unarmed attacks according to the rules in the Combat section. Actions in combat are resolved with the ARC, as described in the Actions section and previewed in the section above. The combat resolution rules begin on page 44.

Wounds Preview

When a character is wounded the game master rolls for general hit location and determines the Wound Class and Severity based on hit location and delivered damage. Within each Wound Class, Severity indicates temporary stun effects, if any, as well as the difficulty of successfully rendering first aid, the penalties the character will suffer when attempting tasks, and the consequences of failing to get first aid, such as bleeding to death. Medical rules begin on page 61.

Character Creation

All of the people in the fictional world of Vanguard are characters, whose abilities, feelings, and thoughts are left to the players to develop. As a player, you will experience the Vanguard universe through your character. Before a game of Vanguard, players create, in their own imagination and on paper, the characters they will perform and control during the game.

Character Creation In a Nutshell

1. Conceive a personality and background.
2. Spend 250 character points on attributes, skills, and contacts; see page 14 for the Ability Cost Chart.
3. Calculate a few things; see page 30.
4. Play.

Character Concept

The first step of this creative process takes place solely in your mind as a player. You must decide for yourself what sort of character you are interested in playing. The character's personality and background are entirely in your hands. You decide the aspirations, dreams, values, interests, fears, and tastes of your character. Of course, your character will develop over the course of the game; you need not have him or her fully fleshed out before starting. However, you should have at least an outline in your head. Ask yourself questions about the kinds of people your character likes to be around, what your character does for a living, what he or she does with free time, what important milestones he or she has passed in life, and what goals he or she is still working to attain. Know whether your character attends religious services regularly, or enjoys music, or has a sweet tooth. Ask yourself whether the character is introverted or extroverted, fastidious or messy, ambitious or content, easy-going or high-strung, quiet or thrill-seeking, cautious or risk-taking. In short, take the first steps toward knowing your character well enough that you have a reason for declaring what this person thinks or does in a given situation. Also, decide the character's age, sex, nationality, height, weight, and appearance.

As you conceive your character, it may be useful to think about how he or she fits in to personality categories like the following.

- *Rationalist/Scientist*: Concerned with being "rational" and doing things "right," the rationalist dislikes rigid, rule-bound environments and is apt to question authority. Rationalists want the freedom to act on their curiosity, and they have little patience for people who seem to have no reasonable basis for their opinions or behavior. This personality type often describes intellectuals.

- *Idealist/Emotivist*: Idealists are relationship-oriented and value their membership in a group. They are concerned with the emotional aspects of issues and are distressed by insincerity, criticism, or actions that jeopardize emotional connections or status. They take things personally. They want to have a mission and know where they fit in.

Generally non-confrontational, idealists are apt to submit to authority. Teachers, diplomats, and consultants often fit this personality type.

- *Conformist/Planner*: Conformists need consistency. They like rules, structure, and clarity in their lives because these things assure predictability. They need to either be an authority figure or have a clear relationship to one. Conformists want to serve and be useful. Administrators usually fall into this category.

- *Adventurer/Athlete*: Adventurers dislike routine and hate to wait. They want to be free and spontaneous, to make an impact, and to be liked for the excitement and pleasure they bring to others. They prefer hands-on activities and like to learn by doing. Competitive, they try to cultivate skills that will elicit admiration. Entertainers and people who "want to be where the action is" usually fall into this category.

Abilities

The second part of character creation, after you think of a character concept, involves an investment of *character points* to obtain tangible measures of the abilities of the person taking shape in your mind. These measures will allow you and the game master to more easily describe the ways your character interacts with the world. We suggest that you **spend about 250 points on your character's abilities and other assets** (including contacts, special possessions, and luck, all of which will be explained later), but the game master may adjust this total as he or she sees fit, given the adventure in which the character will be played.

Character abilities fall into two general categories: attributes and skills. *Attributes* are the character's innate abilities, such as agility, strength, and intelligence. All humans have the same abilities, though they vary qualitatively. (All people have, say, agility, but some are more agile than others.) *Skills* are abilities that aren't universal, such as speaking English, driving a car, or playing lacrosse; they are things that it is possible for a physically and mentally normal adult to be entirely incompetent to do. For most purposes of the game, skills and attributes are subsumed as abilities which allow actions to be performed. We differentiate between them by requiring that all characters posses every attribute to some degree, while skills are all optional. Otherwise, skills and attributes are identical.

Your character's abilities (both attributes and skills) will be rated in levels from 1 to 10, where 3-to-4 is average and higher numbers indicate greater proficiency or capability in the performance of actions. The number of character points that you choose to invest in an ability determines the level at which the ability is rated. Each attribute and skill that your character has is rated with such a level, which allows the game master to determine whether or not your character succeeds at attempted actions.

Further, each ability is rated as *easy*, *average*, or *hard* to acquire. Each attribute is average, while the skill difficulty ratings vary according to the amount of effort typically required to attain a given level of proficiency in the skill. Easier skills have a lower difficulty rating, and cost fewer character points per level of expertise. For example, it requires more character points to gain expertise in surgery than the appraisal of collectible coins, so surgery is a hard skill while appraisal is rated as easy.

At this point you know that higher ability ratings on the 1 to 10 scale indicate increasing levels of ability, but the actual meaning of an ability level is more precise than that. The table below the next paragraph summarizes the information. For attributes, the level is a guide to the character's percentile rank position among the human population. As you can see, for example, an attribute level of two indicates a below-average attribute, superior to that of about 20% of human adults, and thus inferior to about 80% of human adults. An attribute level of 6 would put the character's ability at the 95th percentile, superior to 19 out of 20 people. As you can see, the ability scale is biased toward the high-end; it is better at distinguishing among the superbly able than the mediocre.

For skills, the calibration of the levels is slightly different. While attribute abilities can be compared to the population at large, it doesn't make sense to compare a character's skill to that of the whole population when many people in the whole population lack the particular skill of interest. Instead, skill levels can be interpreted according to somewhat more abstract descriptions. The first level is the realm of the novice who is just becoming familiar with the skill. A person who has some natural aptitude, limited personal experience, or a small amount of training will have this degree of skill. The next level is still the realm of the relatively inexperienced, but indicates more substantial ability. A student who has completed much of a training program would have a skill of two, as would a longtime casual amateur. The range of levels three and four indicates appreciable competency. Dedicated amateurs or people with moderate work experience, college degrees, or training certificates usually have skill at one of these levels. For example, a young professional or tradesperson who has recently begun a career is likely to be in this range; a young mechanic, technician, doctor, lawyer, or engineer would typically have a level of three or four in the main skill he or she used on the job, and a recent college graduate would typically have a skill in the same range in his or her major. After some years of experience or the attainment of a Master's degree, skill level would be expected to be more like four or five. With many years of experience, levels in the range of six or seven can be expected. Levels of eight and nine represent a very great deal of expertise, and 10 is essentially unheard of. Of course, the descriptions here are only rough guides; people may take significantly more or less time than normal to attain skill levels.

Table of Ability Levels

Ability Level	*Description*	*Average Success*	*Academic Equivalent*	*Experiential Equivalent*	*Attribute Percentile*
1	beginner	poor	a course or two	a few months	5
2	some experience	marginal	a few courses; a minor concentration	1 year	20
3	competence	low average	a bachelor's degree	2-3 years	40
4	highly competent	high average	some graduate work	4-5 years	60
5	good	good	advanced graduate work	5-10 years	80
6	expert	very good	seasoned professional	10-20 years	95
7	excellent	excellent	leading in the field	20+ years	99
8	excellent	excellent	potentially among most famous	20+	99
9	legendary	excellent	potentially among most famous	20+	99
10 or more	super-human	excellent	god-like genius	transcendent wisdom	99

A note on the attributes of extraterrestrial humans: The table above applies to people born in conditions of Earth-like gravity. People born and raised in non-standard gravity differ from terrestrial humans in agility, stamina, and strength. People native to low gravity or microgravity normally have agility in the range of 4 to 5, and stamina and strength in the range of 2 to 3. People from high gravity environments normally have agility in the range of 2 to 3 and strength and stamina in the range of 4 to 5. Those born and raised in high gravity also average about 10cm shorter than their terrestrial counterparts, and those born and raised in low gravity or microgravity are 10cm or 15cm taller, respectively, than Earthers.

The Character Sheet

Players use a "character sheet" to record their character's abilities, health status, possessions, and so forth. You can write this information down on a blank page, or use a computer, but traditionally players prefer to make notes in pencil on a pre-printed character sheet. An example is offered on the last page of this book.

Language

The first skill you will probably want to establish for your character is the ability to speak one or more native languages. Native speakers usually have a skill of at least level 5 in their primary language, and 6 is more appropriate for the well-educated. Native language skill is allocated in a unique way: characters start with 8 *levels* of language, to be allocated among languages as the player sees fit.

Wondering what languages to choose?

Some of the world's most commonly spoken languages are Arabic, Chinese, English, and Spanish. Almost everyone with a decent education speaks some English, no matter where they're from.

One might, for example, choose a skill level of 5 in English and a level of 2 in Spanish, and a level 1 in Chinese. This is the only case in Vanguard where skills are obtained by levels, rather than by spending character points.

In addition to allocating 8 levels of native language ability, players may use their character points to buy skills in languages, just like any other skills. Of course, if players do not want their characters to have 8 levels worth of language ability, they are not obliged to allocate all the levels. If you want to give your character a level of 6 in one language and leave it at that, it's up to you.

Attributes

After determining the character's language ability you should attend to the attributes: agility, attractiveness, awareness, intelligence, motivation, stamina, and strength. Each one defines an aspect of the character's innate potential. Attributes serve three functions in the game. First, they are used to perform tasks to which no training or skill can apply. Second, they are used to calculate several game-related values for the character, such as how much physical injury he or she can endure, and how quickly he or she learns. Third, they are a backup allowing a character to attempt some tasks for which he or she has no appropriate skill. All attributes are rated as "average" difficulty. The attributes are:

AGILITY: This represents physical adroitness, including manual dexterity. Agility figures into the value that determines how fast the character learns skills requiring any sort of coordination. Agility also counts toward determining how well and quickly a character can move.

ATTRACTIVENESS: Attractiveness indicates how pleasing the character's physical form is to other people. Naturally this is variable and subjective, so the attribute level represents an average of other people's judgments. Some people will find the character slightly more attractive than his or her attractiveness level implies, others less. To find a rating of how attractive a specific person finds a character, make a task check (which is explained in the action resolution section at page 33).

AWARENESS: This attribute represents the ability of the character to keep track of events going on in his or her immediate vicinity. It is a measure of the character's sensory acuity, particularly along the dimensions of smell, hearing, and sight.

EMPATHY: This represents the ability to perceive the emotional states of other people, recognizing what they need, want, or feel, and to respond appropriately. This is an essential aspect of human interaction. People with low empathy are apt to go through life blundering into social circumstances that are unpleasant, at least for others, and most likely for themselves as well. Those with high empathy are better able to forge relationships with others and are apt to be more successful in winning trust and being viewed as understanding and pleasant.

INTELLIGENCE: Intelligence is a representation of the character's memory, intuition, and capacity for logical and creative thinking. As such, intelligence figures into the rate at which characters learn new skills. Although how smart a character acts is up to the player, it is appropriate that a character who is expected to be played smart be given a high intelligence score.

MOTIVATION: This represents a character's willpower and personal discipline, which influence such things as resistance to pain, fatigue, and injury, the ability to stay calm in

trying circumstances, and the ability to study and learn new skills. Overall, motivation indicates the character's ability to defer short-term gratification in favor of attaining a larger long-term reward.

STAMINA: Stamina represents the physical endurance, health, and fitness of the character. Note that the amount of physical strain a character can endure is a function of strength, while how long the character can endure this strain is determined by stamina. Stamina figures prominently into the character's ability to withstand fatigue and injuries.

STRENGTH: Strength determines the force a character can exert on another object. It applies to lifting weight, pushing things, etc. Strength determines how much a character can carry (though stamina determines how long he or she can carry it) and figures into the amount of damage a character can cause in hand-to-hand combat.

As explained above, to obtain levels of ability for your character in an attribute or skill you will spend character points, and the number of points you spend determines the level of ability which your character obtains. Further, this varies according to the difficulty rating of the ability. As mentioned previously, all attributes are acquired at average difficulty, while the difficulty of skills ranges from easy through hard. The number of points which must be spent to attain a given ability level for a skill of any difficulty rating is indicated on the table below. You can see, for example, that to buy an average difficulty attribute or skill to level five, starting from zero, will cost 21 points, and to move from level eight to level ten with a hard skill will cost 27 points, the difference of 59 and 86.

Ability Cost Chart

Skill level	*Easy*	*Average*	*Hard*
1	2	3	4
2	4	6	8
3	7	10	13
4	11	15	20
5	15	21	27
6	20	28	36
7	25	36	47
8	32	45	59
9	39	55	72
10	46	66	86

If you look closely at the chart you notice that as skill levels progress, it becomes more difficult to gain expertise. This is because it requires more time and effort to make an expert into a super-expert than it does to show a newcomer the ropes. Thus it costs considerably more character points (i.e., it takes more time and effort) to progress from, for example, level 7 to level 8 than it does to progress from level 2 to level 3.

Skills

After determining your character's seven attribute levels you are ready to proceed to the selection of skills. In selecting skills for your character, keep in mind your character's past

and present experiences. What your character does for a living now, did for a living in the past, or studied hard in school are likely to be among his or her highest skills. Other skills include hobbies both past and present, such as musical instrument playing for a musician or literature for an avid reader, proficiencies developed for convenience rather than vocation, such as cooking or automobile driving, and natural aptitudes enjoyed without much practice.

The skills are described below. Each skill name is printed in small caps, followed by the skill difficulty level in parentheses, after which comes a short description of the abilities which the skill confers on a character who possesses it. These descriptions give a general idea of the kinds of tasks which each skill will enable a character to perform.

ACCOUNTING (avg.): Accounting is the skill of analyzing, compiling, and maintaining financial records, including data on expenditures, receipts, assets, and debts, as well as the preparation of tax returns and financial reports.

ACTING (avg.): With this skill characters may portray a persona or impersonate others.

AIRCRAFT PILOT, FIXED-WING (avg.): This skill allows a character to fly airplanes, including propeller and jet aircraft and space-planes, while they are in the atmosphere.

AIRCRAFT PILOT, VECTORED THRUST (avg.): This skill allows a character to fly vectored-thrust aircraft, helicopters, and ducted fan air vehicles.

ANIMAL RIDING (easy): This skill allows a character to ride a horse or some similar animal. At a low skill a character can simply stay mounted and move. At higher skills, faster riding and various tricks and unusual maneuvers are possible. The same skill is also used to tame, break, and care for riding animals. It is actually quite useful in unindustrialized areas, both on and off Earth.

ANTHROPOLOGY (avg.): Anthropology is the study of symbols, traditions, and other aspects of culture shared by groups of people.

APPRAISAL (of a type of property) (easy): This is a skill dedicated to the estimation of the market value of a specific type of property. It is particularly appropriate for merchants or brokers who have reason to need to be able to estimate what property is worth. It is necessary to specify a type of property to which the skill applies, such as musical instruments, real estate, space ships, etc. Note that skill in the use of a particular type of property will also confer some familiarity with the market value of such property; pianists can appraise pianos, gunsmiths and marksmen can appraise firearms, etc.

ARCHAEOLOGY (avg.): Archaeology is the study of the fossils, monuments, and other artifacts left behind by people of the past, as a means of studying their culture, lives, history, etc.

ARCHERY (avg.): This allows for the use of bows to fire arrows. Note that crossbows are fired with RIFLE skill.

ART (specific medium) (avg.): The character should choose the medium for the artistic skill: drawing, painting, stone sculpting, wood carving, etc. Note that separate skills exist for COMPUTER IMAGING, DISGUISE, Musical instruments and composition, PHOTOGRAPHY-VIDEO and PHOTOGRAPHY-STILL-IMAGE .

ARTILLERY (easy): This applies to mortars, howitzers, rocket launchers, and other artillery pieces. Note that a forward observer is often necessary to call for fire, designate target coordinates, and make instructions for corrections. Note also that many artillery weapons are computer controlled and require no skill to operate.

ASTRONOMY (avg.): This is the study of the various phenomena of space, including planets and solar systems, stars, interstellar gas, and background radiation. This skill subsumes astrophysics and planetary science.

AUTOFIRE (avg.): This skill allows the character to fire a rifle or rifle-like weapon (laser rifle, machine gun, submachine gun or machine pistol, etc.) using automatic fire. Automatic fire consists of firing more than one shot for each pull of the trigger. In game terms, the skill *may* be used when 6 or more shots are fired per turn, and it *must* be used when 21 or more shots are fired unless RIFLE or PISTOL is substituted per rules in the Skill Substitutions section (page 37). Note that some weapons are not capable of rates of fire high enough to use the autofire skill. The Rate of Fire rules are on page 49.

BICYCLE RIDING (easy): Riding bicycles.

BIOLOGY (avg.): Biology is the science of the natural characteristics of living things. The skill allows characters to recognize and recall information about life-forms and their role in an ecosystem, to understand scientific literature on biological subjects, and to carry out biological research. When encountering a new or unrecognized life-form, biology skill allows the character to predict the likely behavior patterns, ecological role, and life cycle of the life-form, and to carry out research to investigate such predictions or explain observed characteristics.

BOAT/SHIP PILOT (avg.): This skill allows the piloting of powered watercraft. (For sailing, use the SAILING skill.)

BUREAUCRACY (easy): This skill involves practical familiarity with bureaucratic organization, hierarchies of power within such organizations, and the means of dealing with them efficiently and effectively. Bureaucracy skill is especially useful for characters seeking special treatment from a bureaucracy, whether they work for the bureaucracy or are simply encountering it once. The skill can be used, for example, to attempt to persuade an official to slightly bend the rules or depart from standard operating procedures to accommodate the characters, such as by granting a meeting with a high-ranking official when one would not otherwise be granted, by releasing information which is not ordinarily divulged, or by performing services which are not ordinarily performed. For characters working within a bureaucracy, the skill is useful when the characters seek special assignments or want to receive supplemental equipment, resources, or authority.

BUREAUCRACY, LAW ENFORCEMENT (easy): This skill gives the character specialized ability to navigate the red tape of law enforcement bureaucracies. A character's rank in a given law enforcement agency may be based on this skill, at the GM's discretion.

BUREAUCRACY, MILITARY (easy): This skill involves knowledge of military protocol, and is indicative of the level of familiarity with standard military operational procedures. All characters in the military should have this skill at at least level two. The GM may choose to consider a character's MILITARY BUREAUCRACY skill when figuring the rank of characters in the military.

CHEMISTRY (avg.): Given the proper tools and facilities, a chemist can identify, recall information about, modify, and manufacture a variety of substances. The skill reflects familiarity with the theories and scientific literature of chemistry and the ability to conduct research on chemical phenomena.

CLIMBING (avg.): Climbing skill facilitates movement along steep slopes. The use of equipment, such as cams or ice axes, can allow movement on otherwise impassable

grades. With other equipment, such as ropes and harnesses, characters can set up safety systems to help avoid falls. The skill also confers the ability to rappel.

COMMUNICATIONS (avg.): This involves knowledge of the use of electronic communications equipment, as well as Morse code and typical radio jargon. This skill is not required to use a walkie-talkie, telephone, or wristcom, but is required to attempt to triangulate a transmitter's position, to attempt to jam other communications, or to successfully communicate despite jamming unless the character is using equipment that automates these functions.

COMPUTER IMAGING (easy): This is the art of creating and manipulating images (pictures) with computer software. It may also be used to attempt to identify photographs that have been retouched.

COMPUTER INTELLIGENCE THEORY (hard): Computer intelligence theory is a field of study dedicated to creating and understanding artificial intelligence (AI). AI allows computers to emulate certain aspects of human intelligence, including the ability to understand or communicate in natural language, to learn, and to perform limited acts of judgment or analysis. In combination with computer programming skill, computer intelligence theory allows a character or team of characters to create a program with a virtual skill level in a skill requiring the use of natural language, learning, or judgment or analysis.

COMPUTER PROGRAMMING (avg.): Computer programming skill allows characters to write advanced computer programs. No skill is necessary to ask Agent software to create trivial programs.

COMPUTER SECURITY THEORY (hard): Computer security is concerned with the prevention of unauthorized use of computers or access to data, whether directly or over a network. Skilled characters may attempt to provide security for a system, or to violate a system's security. The skill also applies to the creation of, and defense against, viruses.

COMPUTER TECHNICIAN (avg.): A computer technician can maintain and repair computers.

CONSTRUCTION (avg.): Construction skill is used in building buildings. It involves interpretation of the architects' or engineers' drawings, grading and excavating the building site, working with wood, concrete, insulation, masonry, metals, and other materials, as well as interior finishing and painting.

COOKING (easy): Cooking is the art of preparing food with good flavor, nutrition, and visual presentation.

DEMOLITIONS (avg.): This skill allows the manufacture, safe storage and transport, placement, detonation, and disposal of explosive devices.

DISGUISE (easy): This skill allows the character to use various forms of make-up or props to change the physical appearance of a subject, including himself or herself.

ECONOMICS (avg.): Economics deals with both broad, general aspects of a nation's economy, such as fluctuations in income, employment, and price levels, and effects of monetary and fiscal policies, as well as small-scale economic relationships, such as supply and demand, income distribution, and markets, as they might relate to an individual company (firm) or household.

ELECTRONICS/ELECTRICAL TECHNICIAN (avg.): This skill covers the maintenance and repair of electrical and electronic devices.

ENGINEER – AEROSPACE (hard): Aerospace engineers design, maintain, modify, and repair aircraft and spacecraft.

ENGINEER – CIVIL/STRUCTURAL/ARCHITECTURAL (hard): This type of engineer designs buildings, roads, bridges, etc.

ENGINEER – COMPUTER (hard): This skill allows the design, modification, and repair of computer hardware.

ENGINEER – ELECTRICAL/ELECTRONICS (hard): This skill allows the character to design, maintain, modify, and repair electrical and electronic devices.

ENGINEER – MANUFACTURING (hard): Manufacturing engineers design assembly lines and machine tools to allow the products designed by other engineers to be manufactured. The current forefront of the field is autoproduction and Cyberprod design.

ENGINEER – MARINE (hard): Marine engineering is the design of various maritime systems, from submarines to surface effect ships to conventional vessels.

ENGINEER – MATERIALS (hard): This skill involves the design and manufacture of materials for a variety of purposes, including armor protection, superconductivity, radiation shielding, strength, etc.

ENGINEER – MECHANICAL (hard): This skill applies to the design, maintenance, modification, and repair of mechanical systems with moving parts.

ENGINEER – NUCLEAR (hard): A nuclear engineer can design, construct, operate, modify, and repair nuclear reactors.

ENGINEER – SPACESHIP DRIVE (hard): This skill allows a character to design, construct, maintain, modify, and repair the conventional propulsion systems of starships, including fusion drives and conventional rockets.

ENGINEER – SPACESHIP FTL DRIVE (hard): This skill applies to the design, construction, maintenance, modification, and repair of faster-than-light jump drive systems for spacecraft.

FARMING (avg.): The farming skill allows characters to plant, care for, and harvest crops.

FIRE FIGHTING (avg.): This skill covers the strategy and tactics for containing and extinguishing fires in buildings and the wild. The skill includes the use of firefighting equipment and techniques for preventing fires.

FIRST AID (easy): Skill in first aid confers knowledge of basic lifesaving techniques such as stanching bleeding, clearing an airway, and treating for shock. The most advanced medical equipment which a character using first aid skill may employ is an advanced first aid kit. EMERGENCY MEDICINE skill allows the use of more advanced medical equipment in the performance of the same tasks.

FORENSIC PSYCHOLOGY (avg.): When provided with information such as the location and time of a crime, the position and condition of the victim(s), the weapons or tools involved, and the kinds of paraphernalia found at the scene, the forensic psychologist can create a profile of the criminal. Such profiles allow informed speculation as to the perpetrator's motives and mental state, including a determination of whether he or she is a professional criminal. Profiles can sometimes predict the perpetrator's sex, marital status, educational achievement, employment status, approximate age, area of residence, and other characteristics with moderate confidence, thus helping detectives to narrow the focus of their investigations. Profiling is most often used in cases involving serial killers, terrorists, rapists, arsonists, kidnappers, and hostage-takers. Creating a profile requires analysis of crime scene descriptions; a typical base time for such a task would be several hours. Compare MEDICINE – PSYCHIATRY and PSYCHOLOGY skills.

FORENSIC SCIENCE (avg.): Forensic science involves the identification and analysis of physical evidence, typically at crime scenes. The forensic scientist can identify and determine the sources of traces of glass, soil, hair, paint, tissue, or fibers, and can identify toolmarks, footprints, bullets, ashes, or explosive residue. The forensic scientist can also identify individuals on the basis of dentistry, DNA, fingerprints, photographs, skeletal remains, and voice recordings. Compare MEDICINE – FORENSIC MEDICINE.

FORGERY (avg.): Forgery applies to the fabrication of "official-looking" or "authentic-looking" physical documents, such as identification cards or passports (or the exceptionally rare artifact known as "paper money"), including the duplication of signatures. This skill does not apply to electronic documents or electronic signatures—the appropriate skill for this would be COMPUTER SECURITY THEORY.

FORWARD OBSERVER & FORWARD AIR CONTROLLER (avg.): This skill is used to direct artillery and air strikes on targets which are not in the direct line of sight of their attackers.

GEOGRAPHY (specify planet) (avg.): Geography is the study of the physical and political features of an area, such as the location and characteristics of a river basin or mountain or nation's capital.

GUNSMITH (avg.): The gunsmith skill allows the character to produce ammunition, make repairs on weapons, etc. It applies only to bullet firing weapons. Note that a character who has skill in PISTOL or RIFLE, *does* know how to clean his or her weapon, and need not acquire GUNSMITH to be able to care for it.

HAND-TO-HAND COMBAT: See MELEE.

HISTORY (avg.): Specify an area of history, such as a particular geographic area (e.g. American history, east Asian history, etc.), temporal period (e.g. the twenty-first century, the Middle Ages, etc.), or discipline (e.g. the history of science, the history of art, military history, etc.).

HOVER VEHICLE PILOT (avg.): This skill allows the character to pilot craft which operate in ground effect, such as hover-vehicles with plenum chambers (air-cushions) and Wing-In-Ground-effect craft.

INDIRECT FIRE (avg.): Indirect fire refers to the use of any weapon which sends a projectile on an indirect path to its target. Firing a grenade over a wall at a target on the other side is indirect fire. This skill applies to only to grenades fired from grenade launchers and mortar bombs fired from small mortars.

COMBAT INITIATIVE (avg.): This skill reflects the character's ability to remain calm, think clearly, and keep track of events taking place during combat. It reflects both training and natural aptitude, and is an important determinant of a character's combat effectiveness See the Combat rules on Actions and Initiative beginning at page 44 for details on how the skill is applied. (Note that tactics of air combat and spacecraft combat are covered in the combat piloting skills for those vehicles. If players wish their characters to learn the theory behind vehicle combat maneuvering without learning how to actually do it, they may take a vehicle combat tactics skill or a spacecraft combat tactics skill.)

INTERROGATION (avg.): Criminal interrogation is a difficult task, especially in liberal legal climates. The investigator takes a person into custody against their will, tells them they don't have to talk, and explains that anything they say will be used to put them in jail. Then the investigator tries to get the crook to reveal his or her worst sin. Amazingly, investigators sometimes pull it off, because they are great con artists. They trick suspects

into believing that the case against them is air tight, so they'd better confess and hope for leniency. Or they build a faux friendship with the suspect and goad him or her into bragging about the crime. All the while, they are alert for cues in language or demeanor that the suspects are weaving lies into their stories to make themselves look better. This is an essential skill in police work, though it can readily apply in espionage/intelligence scenarios or any other setting in which conversations are held for the purpose of extracting information from uncooperative or unwitting subjects.

INVESTMENT (avg.): Investment is the skill of allocating money to assets which are likely to increase in value or to yield an income. This skill includes the design of investment portfolios appropriate for various objectives and the assessment of the relative merits of stocks, bonds, commodities, real estate, collectibles, mutual funds, annuities, and other investment instruments.

INTELLIGENCE ANALYSIS (avg.): This skill covers the interpretation and synthesis of information about an enemy to produce a prediction or estimate of the enemy's abilities, activities, intentions on a tactical or operational scale. The skill allows the assessment of the effects of battle damage observed on enemy targets and the identification of terrain, activities, and objects, particularly military or strategic hardware, revealed in photographic images or other sources of data. This skill applies to tactical or operational analysis; strategic analysis would combine a variety of tactical and operational analyses with expertise in MILITARY STRATEGY and other fields such as POLITICAL SCIENCE and PSYCHOLOGY.

LANGUAGE (avg.): Specify a language. English is the *lingua franca*. Starting characters receive 8 levels in this skill to be allocated as they see fit. A level 5 represents basic fluency and is an appropriate minimum for a native speaker, but a skill of 6 is more common, especially among the college-educated; level 3 represents the minimum proficiency required to read or have conversations without excessive demands for repetition, clarification, or references to a dictionary.

LAW – CIVIL (specific country) (avg.): In this context, civil law skill refers to all law other than criminal, international, and military law. The skill allows the preparation and interpretation of contracts, wills, and other legal documents, and allows the lawyer to devise and execute strategies for trying civil cases, such as lawsuits over issues of tax liability, copyright or trademark infringement, non-payment of debts, breach of contract, professional malpractice, or other wrongdoing.

LAW – CRIMINAL (specific country) (avg.): Criminal law is used in the prosecution and defense of accused criminals.

LAW – INTERNATIONAL (avg.): IL covers treaties between countries and the laws regulating nations and international organizations (such as the International Diplomacy Organization). This includes space law, the law of the sea, laws of war, human rights law, and laws governing international financial transactions and international extradition.

LAW – MILITARY (specific country) (avg.): Military law covers the special laws applying to militaries.

LEADERSHIP (avg.): Leadership skill will help the GM determine the reactions of NPCs to a character's instructions. Players may choose to role-play the obedience and confidence of their characters who are led by a good leader, but they are not bound to be confident in another PC with leadership skill. When exercised in combat, this skill allows a character

to improve the initiative of those under his command. The GM may choose to consider a character's leadership skill when determining the rank of characters in the military.

LIGHTER THAN AIR VEHICLE PILOT (avg.): This skill allows characters to operate lighter-than-air craft such as balloons and airships.

LITERATURE (avg.): This skill quantifies the character's familiarity with techniques of literary interpretation and the extent to which the character is conversant with well-known works of literature.

LOCKSMITH (avg.): This skill allows a character to install, repair, and pick mechanical locks. It applies only to mechanical locks, not electronic locks. The corresponding skill for electronic locks is SECURITY TECHNICIAN.

MACHINIST (avg.): The machinist can manufacture a variety items from metal, plastic, or other materials, using lathes, saws, presses, milling machines, etc.

MARKETING (avg.): The skill of marketing is used to find buyers for a product. It includes the design and distribution of advertisements, the development of promotional strategies, and familiarity with marketing opportunities available through various media.

MATHEMATICS (avg.): Mathematics is the science of determining numerical values from the relationships of others.

MECHANIC (specify equipment type) (avg.): Mechanics can use tools, follow directions in a repair manual, recognize and handle parts, diagnose mechanical problems, and understand the function of, repair, and maintain whichever type of equipment is their specialty. Sample specialties: air cushion (hover) vehicles, aircraft, automobiles, or turbines.

MEDICAL LAB TECHNICIAN (avg.): The medical lab technician performs lab analysis of patient tissue to aid physicians in diagnosis. The skill allows the use of a variety of medical laboratory equipment.

MEDICINE – BIOMEDICAL/GENETIC ENGINEER (hard): Biomedical engineers produce special characteristics in life forms through the modification of an organism's DNA or other processes.

MEDICINE – EMERGENCY MEDICINE (hard): The emergency medicine specialist treats wounds, poisoning victims, heart attack victims, etc. Emergency physicians patch up patients and send them on to surgeons or internal medicine specialists. The skill allows the use of advanced medical equipment which characters skilled in FIRST AID cannot use.

MEDICINE – FORENSIC MEDICINE (hard): This skill is concerned with analysis of blood and other biological materials, identification of remains, and determination of time and cause of death. It also provides familiarity with the range of pathogenic agents, including radiation, life-threatening diseases, and toxic chemicals, and their effects on the human body. The skill is not concerned with the treatment of patients—rather, it is concerned with explaining people's deaths. See also FORENSIC SCIENCE.

MEDICINE – INTERNAL MEDICINE (hard): Internal medicine specialists deal with diagnosis and treatment of ailments and other problems not requiring surgery. This is the most general of the medical skills.

MEDICINE – PHARMACOLOGY (hard): Pharmacology is the study of drugs and their effects on living beings.

MEDICINE – PROSTHETICS/BIOMECHANICAL ENGINEER (hard): This skill covers the medical and technical knowledge used to design mechanical prosthetics or cybernetics to replace

parts of the human body which have been damaged or lost. Some devices may be clamped on mechanically, while others require installation by a surgeon.

MEDICINE – PSYCHIATRY (hard): This skill allows the diagnosis and treatment of mental disorders. Compare with PSYCHOLOGY and FORENSIC PSYCHOLOGY.

MEDICINE – SURGERY (hard): Surgery is the treatment of diseases, injuries, or other afflictions by means of operation. This skill includes anesthesiology.

MELEE – BALANCED WEAPONS (avg.): Balanced weapons are those whose weight and balance facilitate rapid movements such as those required in parrying. Most swords are balanced, as are some fighting sticks. Some machetes are balanced and some are not. Compare to MELEE – UNBALANCED WEAPONS, below.

MELEE – KNIFE THROWING (avg.): This skill lets the character accurately throw knives and other small bladed weapons. Although dedicated throwing knife works best, any sort of knife may be thrown.

MELEE – KNIVES (avg.): This skill allows the character to effectively fight with knives and other short bladed weapons. The skill is used for attacks and defense, and may modify damage done. Compare to the skill for knife throwing, above.

MELEE – SHIELD (easy): This skill allows the effective use of a shield in melee combat, both as a weapon and to block attacks.

MELEE – TWO-WEAPON FIGHTING (hard): This skill allows the use of two weapons at once in melee combat, which confers a +1 bonus to attacks and defense. When fighting with two weapons, the effective fighting skill is equal to the average of two-weapon fighting skill and the skill for whatever type of weapon is used.

MELEE – UNBALANCED (easy): This skill applies to weapons used for swinging, smashing strikes, such as axes and batons. It is also used for similar improvised weapons such as baseball bats, shovels, or sticks. The distinctive feature of an unbalanced weapon is that it is not well suited for parrying because its balance makes quick response difficult. Most weapons likely to be used in hand-to-hand combat in Vanguard are unbalanced. Compare to MELEE – BALANCED, above.

MELEE – UNARMED FIGHTING, STRIKE (avg.): This skill covers hand-to-hand combat between unarmed opponents and describes a style of fighting that emphasizes striking the opponent with blows, such as boxing, Karate, and Tae-Kwon-Do. The skill is used for attacks and defense, and may modify damage done.

MELEE – UNARMED FIGHTING, SUPPLE (avg.): This skill covers hand-to-hand combat between unarmed opponents and describes a style of fighting that emphasizes movement with/against an opponent, as in wrestling, Aikido, and Judo. The skill is used for attacks and defense, and may modify damage done.

MILITARY STRATEGY (avg.): This skill allows the planning, implementation, and interpretation of large scale military operations. It is appropriate for high-ranking military officers and civilian defense officials or analysts to possess this skill.

MISSILES, PORTABLE (easy): With this skill characters may use a variety of portable missile weapons, including hyper-velocity missiles, anti-armor missiles, and LAAWs. Proper use of guided missile weapons merely requires a skill level of one; the weapon uses its own skill to attack the designated target.

MOTORCYCLE DRIVING (avg.): Motorcycle riding requires this skill. This applies to any two-wheeled powered vehicle.

MUSIC (composition and theory) (avg.): This covers music theory and techniques and styles for writing music.

MUSIC (instrument) (avg.): This skill allows the character to play music on a specific instrument.

NAVIGATION (avg.): This includes the use of modern navigation equipment, as well as more traditional equipment such as the sextant. The skill involves map and compass reading, as well as taking Sun sights and the ability to move through forests/undergrowth in a generally straight line. With a compass and a map, a navigator gets a bonus of +3 to each task. For characters moving cross country, make a +3 check for each hour of travel. Failure means that the character is not quite sure of his or her position and/or has deviated slightly from the intended path. At this point the character can backtrack and attempt to determine his or her position; this is a +4 check and takes a few minutes. If the partially lost character proceeds without attempting re-orientation, the next check is made without modifiers. If this check is failed the character is well on the way to becoming totally lost. Navigation can be accomplished without a skilled navigator by carrying a GPI (global position indicator) or similar device. Remember that landmarks are enormously helpful to navigators.

NBC DEFENSE (easy): NBC defense allows quick and secure donning of protective suits, knowledge of effects of nuclear, biological, and chemical weapons, and proficiency at decontamination procedures.

NEGOTIATION (avg.): This is the art of dealing or bargaining with others to reach an agreement using various approaches such as tact and diplomacy or intimidation and manipulation.

NUCLEAR TECHNICIAN (avg.): The nuclear technician is trained in the repair, maintenance, and operation of nuclear reactors.

PALEONTOLOGY (avg.): Paleontology is the study of ancient periods based upon the study of fossils. It covers the location, removal, analysis, and identification of fossils.

PARACHUTE OPERATIONS (easy): Modern parachutes are highly maneuverable, allowing pinpoint landings and slow or high speed descents. This skill allows maneuvering with the parachute, re-packing a 'chute after use, landing fast or slowly, positioning oneself so as to avoid injury in a fast landing, etc.

PHOTOGRAPHY – STILL IMAGE (easy): This is the art of creating interesting photographs. The skill is not necessary to take non-artistic photos.

PHOTOGRAPHY – VIDEO (avg.): This is the art of making aesthetically interesting video photographs, including video editing. The skill is not necessary to make non-artistic video recordings.

PHILOSOPHY (avg.): Philosophy investigates wisdom, ethics, logic, aesthetics, metaphysics, and the nature of knowledge. Characters skilled in philosophy will be familiar with thought on the subject from the ancient through the contemporary.

PHYSICS (avg.): Physics is the branch of science dealing with mechanics (motion, momentum, gravitation, etc.), electricity and magnetism, optics, radiation, fluids, and particle phenomena. The skill covers knowledge of the current theories and scholarship on the subject as well as the ability to conduct experiments and calculations in various fields of physics.

PICKPOCKET (avg.): This is the skill of lifting objects off a person without the target being aware of it.

PISTOL (avg.): This skill allows up to 20 shots per combat turn to be fired from pistols. Machine-pistols can be used with either AUTOFIRE or PISTOL skill if they fire 6-20 rounds per turn. PISTOL skill cannot be used for more than 20 rounds per turn; AUTOFIRE skill must be used instead. If you wish to review the rules for rate of fire, turn to page 49.

PLANETARY SCIENCE (avg.): Planetary science (or planetology) subsumes geology, meteorology, and basic solar system astronomy. This is an important skill for planetary exploration and colony development. It is useful for a variety of tasks such as the identification of soil and rock types, weather prediction, locating seismic fault lines, estimating the likelihood of an eruption from an active volcano, or identifying promising areas in which to prospect for minerals. The planetologist can also estimate risks from flooding, landslides, and earthquakes, and judge where to look for springs, wells, or caves.

PLUMBING (avg.): Plumbing is the installation and repair of piping systems to move fluids and the devices at the ends of those piping systems, such as water faucets, toilets, gas meters, etc.

POLITICAL SCIENCE (avg.): Political science is the study of socialized conflict and its resolution, as it relates to who holds or wants governmental power, the basis for their power, and what is done with that power in relation to the economic, social, and security interests of states and people. The skill confers understanding of political institutions, formal rules, traditions, popular opinion, and power dynamics, and allows explanation and prediction of the roles of various institutions and groups in the political process.

POWER ARMOR OPERATION (avg.): This skill allows a character to use powered combat armor, including maneuver and the use of integral equipment such as weapons.

POWER ARMOR TECHNICIAN (avg.): Power armor technicians can maintain and repair suits of powered combat armor.

PSYCHOLOGY (avg.): Psychology is the study of human thinking processes, motivation, development, learning, and social interaction; psychology skill confers familiarity with theories about the psyche. A psychologist can explain and predict the effect of situations, past experience, or people's actions on individual or group thought or behavior, and can attempt to profile personalities. (Note that while PSYCHOLOGY includes the study of abnormal psychological processes or conditions, the diagnosis and treatment of mental disorders is the domain of MEDICINE-PSYCHIATRY. Also see FORENSIC PSYCHOLOGY.)

RELIGION (avg.): Characters may elect to pursue a general education in the various religions, or may specialize (which is probable if they are faithful) in a specific religion, such as Buddhism, Christianity, Hinduism, Islam, Judaism, Shintoism, Taoism, or others.

RIFLE (avg.): This skill is used in firing as many as twenty shots per combat turn from rifles (or rifle-like, two-handed weapons, such as crossbows, laser longarms, direct fire grenade launchers, shotguns, etc.). This skill is not used for extended automatic fire of more than twenty shots per combat turn; AUTOFIRE skill is used instead. (Rate of Fire rules are on page 49.)

SAILING (avg.): This skill allows the handling of sailboats.

SCUBA OPERATIONS (avg.): A character must have SWIMMING skill to use SCUBA OPERATIONS. This skill applies to the use of self-contained underwater breathing apparatus, which allows diving with tanks.

SECURITY TECHNICIAN (avg.): This includes the installation and defeat of various security systems, from electronic locks to motion sensors. This does not include mechanical lockpicking, for which the appropriate skill is LOCKSMITH.

SENSORS OPERATION (easy): This skill is used to operate and maintain a variety of military sensors and detection gear, concentrating on mobile combat sensors.

SKIING (avg.): This skill allows the use of downhill and cross-country skis.

SNOWMOBILE DRIVER (easy): This skill allows the character to drive snowmobiles.

SPACE COMBAT TACTICS (avg.): This skill reflects the knowledge and ability to conduct a battle among spacecraft. The skill covers everything from combat with individual fighters to squadrons of battleships. In game terms, this skill influences initiative in space combat, and may improve the quality of maneuver and fire control. No separate gunnery skill is required to use spacecraft weapons.

SPACE OPERATIONS (easy): This skill allows agile movement in microgravity, as well as the use of vacuum suits.

"You can operate very nicely out there if you know what you're doing and just slow down. You have to let zero gravity work for you, not against you."
James Lovell, pioneer American astronaut, on working in space.

SPACESHIP DRIVE TECHNICIAN (avg.): This skill covers repair and maintenance of the conventional (rather than FTL) propulsion systems on spacecraft, such as chemical rockets and nuclear fusion drives.

SPACESHIP FTL ASTROGATION (avg.): This skill allows the planning and execution of faster-than-light (FTL) jumps using the FTL jump apparatus aboard a starship. The skill is used to identify regions of space where FTL jumps may be initiated, known as "wormholes" or "jump points," and to operate the FTL drive to make a jump.

SPACESHIP FTL DRIVE TECHNICIAN (avg.): This skill allows repair and maintenance of FTL drive systems.

SPACESHIP LIFE-SUPPORT TECHNICIAN (avg.): This skill allows the maintenance, repair, and operation of the life-support equipment used to maintain a livable environment aboard spacecraft. This includes the maintenance of breathable atmosphere and appropriate temperature and pressure, the production and recycling of food, the handling of waste, and radiation shielding.

SPACESHIP NAVIGATION/HELM (avg.): This is the skill of flying a spacecraft, which may be done on-ship or by remote control. It includes the ability to handle telemetry, tracking, launch, docking, navigation, and maneuvers. This skill applies to spaceships using conventional (chemical or fusion) propulsion systems. SPACESHIP FTL ASTROGATION must be used for FTL jumps.

SPACESHIP SENSORS (avg.): This skill is used to operate sensor equipment aboard spaceships.

SPORT (avg.): This skill confers proficiency at a given sport or athletic activity. A particular sport must be specified.

STEALTH (avg.): Stealth is the skill of avoiding detection, whether by people, animals, or electronic sensors. This involves sneaking about and hiding, as well as techniques of camouflage, distraction, diversion, and the use of rudimentary tactical sign language by which police or soldiers can communicate such instructions as "wait," "cover me," "there are three bad guys over there," etc.

STREETWISE (avg.): This skill represents knowledge of the underground and criminal subculture, as well as of the "street" culture of most metropolitan centers in the 22nd century. It allows a character to fit in with homeless people, gangsters, or drug dealers, to learn rumor or pick up "the word on the street," to beg or panhandle, to recognize gang graffiti and gang colors, and to obtain illegal goods (such as drugs or weapons) and services (such as those of prostitutes, mercenary soldiers, or hit-men). Note that some of these abilities are specific to one's city, while others are more universal, so it may be appropriate for the GM to apply a significant penalty to streetwise tasks performed in a new city until the character has become familiar with the region.

SURVIVAL (avg.): This skill allows the character to survive in a given sort of terrain or environment. It confers knowledge of where and how to find water, shelter and food, and how to avoid various dangers of the given environment. The player must specify the kind of environment in which the character's skill is specialized, such as temperate, arctic, jungle, or desert environments.

SWIMMING (easy). This skill allows the character to swim.

TEACHING (avg.): This skill allows the character to attempt to teach another character a skill. The teaching character must have both skill in teaching and the skill to be taught. Teaching skill affects the speed at which students learn new skills. Rules in the teaching section outline this process; see page 31.

THROWN WEAPON, GRENADE (easy): This skill allows the safe use and accurate throwing of hand grenades.

TRACKED VEHICLE DRIVER (easy): This skill allows the character to operate tracked vehicles.

TRACKING (avg.): This is the ability to identify tracks left by people and animals, and includes pursuit, covering one's trail, and figuring certain details about whatever made the tracks, such as how long ago they passed, how fast they were moving, etc. An unmodified (average, +0) skill check would have to be passed in order to detect the recent passage of unstealthy individuals in a forest with soft ground. An area of several square meters may be searched for tracks in less than a minute.

UNARMED COMBAT: See entries under MELEE.

VEHICLE COMBAT TACTICS (easy): This skill allows the character to effectively react to combat in a vehicle. This skill involves knowing how to identify a target, maneuver effectively, stay calm, and retain awareness of the situation in the chaos of combat. This skill, together with the appropriate pilot skill, figures directly into Initiative, and may influence fire control.

WEAPONS TECHNICIAN (avg.): This skill allows the character to maintain and repair a variety of advanced heavy weapons systems, including rockets and their launchers, lasers, mortars, and cannon.

WHEELED VEHICLE DRIVER (easy): This skill allows the character to drive a wheeled ground vehicle like a car or truck. Note that most vehicles have effective autopilots, so this skill is chiefly recreational or useful only for unusual maneuvers that the autopilot will not perform.

WRITING (avg.): Writing is the skill of written communication. All characters with skill in a language are able to write in that language, however, the skill of writing confers a flair for clear, concise, and eloquent expression.

Skill Selection for Professions

The entries below provide suggestions for generating characters with qualifications in a variety of professions. As you will see, most interesting jobs involve a combination of skills.

Doctor: Medical doctors have a variety of specialties and a diverse field of employment. Doctors serve on spacecraft to provide care to passengers and crew, they staff hospitals to care for patients, they do research for drug companies, they work in forensics laboratories for the police, they maintain private practice, they teach in medical schools, and they work for the military. At minimum, a doctor should have skill in internal medicine and one other medicine skill, with one skill at level three and the other at level four; the skill levels should be higher if the character has more experience than a recent medical school graduate. A doctor in general practice would maximize internal medicine skill, a surgeon would emphasize surgery, a drug researcher would emphasize pharmacology, and a psychiatrist would emphasize psychiatry. In addition to these basic skills, doctors should have supplementary skills based on their jobs. For example, a doctor assigned to a starship would have skill in space operations and possibly spacecraft life-support technician. A forensic medicine specialist might also have skill in forensic science. A professor of medicine would have teaching skill. Doctors may also have skill in medical laboratory technician and are likely to be skilled in biology and chemistry.

Lawyer: Many lawyers practice law, but many apply their knowledge of law in other ways, such as by working as researchers, teaching, being news reporters, or working in business. If a character is supposed to have finished law school and passed the Bar examination, then skills in both civil law and criminal law are required, with one at level three and the other at level four. Accounting, bureaucracy, negotiation, and interrogation are also appropriate lawyer skills. Further, lawyers with particular specialties other than criminal law or general civil practice will require further skills. Medical malpractice lawyers should have some skill in medicine (perhaps level one or two in internal medicine), tax lawyers should be competent accountants (at least level three), lawyers in the military should have military law skill, lawyers practicing international law should have international law skill, and specialization in the law of securities regulation demands skill in investment, economics, and accounting. A prosecutor or public defender might have streetwise skill. Further, patent lawyers need skill in biology, chemistry, or physics of at least level three, or an engineering skill of at least two.

Merchant spaceship captain: Spaceship captains typically have experience in most spaceship crew positions, including the engineering, technician, and nav/helm roles. Leadership is also an appropriate skill for a ship captain. Also, the captain of a merchant ship may be the owner or lessee of the ship, in which case he or she probably handles the business aspects of the ship's operation. This requires some knowledge of accounting, appraisal of the kinds of products which the ship transports (assuming that the merchant buys and sells goods, as opposed to simply transporting them on contract), bureaucracy, civil law, international law, investment, negotiation, and streetwise.

News reporter: The two primary skills of a news reporter are research and writing. Additionally, the reporter should be skilled in a subject of expertise, such as political science, medicine, science, law, economics, or art, whichever is the primary subject on which he or she reports. Bureaucracy and interrogation can also be valuable skills for reporters. Also, news reporters should have a variety of contacts from whom they may seek information.

Planetary survey scientist: Members of teams which explore and survey newly discovered planets can make use of a diverse repertoire of skills. Biology, chemistry,

planetology, and physics are the most fundamental skills for planetary survey. Survival skills, land navigation, space operations, vehicle operation and mechanic skills, climbing, scuba, tracking, stealth, and rifle are also potentially useful.

Police detective: The basic tasks performed by police detectives are the investigation of crimes and the apprehension of criminals. As such, their basic skills are criminal law, civil law, research, law enforcement bureaucracy, pistol, unarmed fighting, and combat initiative. Additionally, rifle, interrogation, negotiation, general bureaucracy, forgery, forensic science, streetwise, locksmith, and security systems are especially appropriate skills for detectives. Those who investigate white-collar crimes may have use for accounting, investment, or political science. Also, a variety of underworld or other contacts can be helpful as a source of informants.

Soldier: Typical minimal training for combat soldiers includes rifle to level two and autofire, military bureaucracy, combat initiative, land navigation, NBC defense, first aid, and temperate survival to levels one or two. In addition, it is common to have further specialized training in some combination of weapons, close and distant unarmed combat, survival, stealth, tracking, equipment technician, mechanic, vehicle pilot, vehicle combat tactics, demolitions, emergency medicine, military strategy, intelligence analysis, or leadership.

Contacts, special possessions, and luck

Finally, a few other assets may be "bought" using character points, such as contacts with important or influential NPCs, resources and equipment above and beyond that which is commonly available, and luck points, which can be used to alter reality (as far as the game is concerned) to save the life of the character.

Contacts

A contact is an NPC whom a character knows and from whom the character may be able to obtain information or a favor. For example, a reporter who is looking for a scoop about a mayor's campaign for reelection is more likely to be able to obtain important information if it happens that the reporter has a preexisting positive relationship with someone on the mayor's staff. Such a person on the mayor's staff would be a contact for the reporter.

Contacts can have a variety of relationships with the character. They may be distant family members, current or former coworkers, business acquaintances, ex-spouses, or many other things.

Most contacts are bought just like skills of "easy" difficulty. For example, and ordinary contact of level 3 costs 7 skill points, just like an "easy" skill at level 3. The level to which the contact is bought determines the degree to which the contact will be receptive to the character's requests for help. At low levels the contact will give information or do minor favors which cause no imposition. Around levels four or five the character will be willing to accept more personal cost out of kindness or feeling of debt to the character, provided the request has some basis in reason. At higher levels the contact may be willing to assume significant personal risk or inconvenience if the favor is very important to the character.

Contacts of particular power and influence should be bought at "average" or "hard" difficulty. Important corporate, military, political, religious, or other leaders should be bought at one of these higher difficulty levels, at the game master's discretion. If the GM wishes to place limits on the power of contacts, for instance by refusing to allow any

characters to have the President of the United States as a contact, this is his or her prerogative. It is suggested that normal contacts be bought at "easy," while contacts of some special power, such as local politicians, the upper management of major corporations, or general-ranked military officers be bought at "average" and powerful politicians or the very top leaders of major groups or institutions be bought at "hard."

When a contact is initially bought it is described in very loose, general terms by the player, and the level of the contact (from one through ten) is recorded. Apt descriptions at this point would be, "corporate executive," "police officer," "physicist," or "musician;" a simple classification is all that is required upon initial purchase. Contacts are defined in detail later during the game when a player decides that it is time to evoke a character's contact. Contacts can be defined at any reasonable time and place, but once defined their identity is fixed, and they become NPCs under the control of the game master. The player of the reporter used in the example above may, having created a "political staffer" contact when the character was generated, decide that in order to obtain information about the mayor's campaign it is appropriate to define the contact as a being a member of the mayor's staff. At the time of definition, the nature of the contact's relationship to the character should be worked out between the player and the game master, and the game master should determine the contact's personality.

(Note: sometimes the effect of having a contact can be achieved by a character's status, without spending points on individual contacts. For example, being a member of the city council is likely to make the city bureaucrats respond to you as though they were all your contacts at some low level. However, you do not buy these contacts because their loyalty is directed at the position you occupy rather than at you personally; when you are replaced as a council member, the bureaucrats will be responsive to the new council member, not you.)

Special equipment and property

Character points may also be spent to obtain special equipment or other property for the character. One character point buys $200 worth of special equipment or property of any kind. Normal possessions do not require character points to obtain; a variety of possessions are assumed, and their details are worked out with the game master. However, exceptional possessions, including items which are illegal or very rare and thus not readily obtainable, must be obtained either by spending character points or by role-playing the scenario in which the character obtains the desired item. For example, if a player wants a character who owns a pet ferret but lives in a jurisdiction where ferrets are illegal, the player would allocate character points to buy the ferret.

Luck

Finally, character points may be spent to give a character luck if the GM opts to use these luck rules. Luck is used to save the character in life-threatening situations, and is represented in a depletable pool of luck points. Building a character's luck pool costs one character point per luck point, up to a maximum of 20 luck points.

Luck works by allowing the player to spend any number of available points to affect any action check which puts the character at a significant risk of death. Each luck point expended modifies a check or roll by one success factor. Thus, spending a luck point is like

momentarily giving your character an extra skill level, or rolling one point higher on 2d6, or making the task one degree easier.

If the GM and players prefer an especially hard edge to their campaign, the GM should probably disallow the use of luck. However, sometimes luck can add to the drama of an adventure, and it is particularly appropriate to use luck rules if the GM and players desire a more heroic feel to their campaign.

Some Calculations

After character points have been allocated to abilities and other assets, there are a few calculations to make which will make future game-play easier. Once this arithmetic is done, so is your character.

First, choose your character's **height** in centimeters and **mass** in kilograms.

Now calculate your character's **base movement** speed: **15 + Strength + Agility**. This is the character's comfortable running speed expressed in meters per five second turn. To convert to kilometers per hour, multiply by 0.72; for miles per hour multiply by 0.43. The sprinting speed is 1.5 times base movement, the jogging speed is half base movement, and walking speed is one quarter base movement.

Calculate **carrying capacity**: **Strength** x 4. This the mass in kilograms that your character can carry without getting tired quickly. Consult the encumbrance rules in the Fatigue section (page 61) for details on this.

Calculate four **fatigue levels**. The fatigue levels are used to determine the character's response to exertion and injury. Round all of these results to the nearest whole number.

Fatigue Impairment (-1) Level: (Stamina + Motivation) /2 .

Fatigue Delirious (-3) Level: (Stamina + Motivation).

Fatigue Incapacitation/Unconsciousness Level: (Stamina + Motivation) x 2.

Fatigue Death Level: Stamina x 6, or the Fatigue Incapacitation/Unconsciousness Level plus one, whichever is higher.

Ability Improvement: Experience

Murphy's Military Law #36:
Field Experience
is something you don't get
until just after you need it.

During each adventure the game master should award experience points to the characters based upon the actions of the characters during the previous phase of the adventure. Experience points may be used to purchase contacts, or to increase skill levels, or to improve attribute levels, or, if the optional luck rules are being used, to buy luck points. Characters in the police or military may wish to apply experience points to advance in rank, and may do so as the GM allows.

Ideally, players should spend their points to increase only those abilities which their characters have used in the most recent part of the adventure.

The number of experience points awarded for each adventure, as well as the frequency with which they are awarded, is left largely to the GM's discretion. However, as a

guideline, over the course of an active session (the better part of a day spent playing in which the characters get a lot done in the adventure) a generous GM might award skill points to each character equal to half of their intelligences, plus a point or two for especially noteworthy action successes.

Skill Improvement: Study and Instruction

Murphy's Military Law #7: Professionals are predictable; it's the amateurs that are dangerous.

Characters who want to develop skills may seek instruction from teachers, books, computer programs, instructional videos, or some other regimen of study. Whatever the instructional medium, two characteristics of the instructor are important: skill (or virtual skill) in teaching, and skill in the subject to be taught. The teaching skill is important in determining how fast the student learns, and the skill in the subject to be taught limits the progress that the student can make under the instructor's tutelage; teachers—whether they are real human teachers or impersonal training programs—cannot educate students to levels of skill higher than their own level of skill (so, for example, a biology teacher with a biology skill of level 5 cannot teach biology past level 5, and a training program that lacks material beyond level 3 cannot convey skill above that level).

The time necessary for a character to gain one skill point is a function of the instructor's skill level and the pupil's motivation and intelligence or motivation and agility. The relevant pair of attributes depends on whether the skill being studied is primarily an intellectual or physical skill. This should be obvious from the nature of the skill; if it's not obvious, then consider all three attributes relevant.

Earning skill points through instruction is a time-based, cooperative task. (These terms will make sense once you've looked at the action resolution chapter beginning on page 33 and read the Cooperative/Collaborative Action section on page 39.) The base time to earn one skill point is 20 hours. To determine the time spent, make a check on the ARC for the student's learning and a second check for the teacher's teaching. This is a "weakness dominant" task, so use the worst result from these two checks. This is a Timed action, so use the Time column of the ARC. First, make a Moderate(+0) check against the instructor's instruction skill. Next, make a Moderate(+0) check against the average of the pupil's relevant attributes (i.e. motivation paired with intelligence or agility, or perhaps both). Whichever multiplier is higher in the Time row of the ARC should be multiplied by 20 hours to determine the time required for the student to gain one skill point in the skill being taught. The game master may apply negative modifiers to the number of successes if the student is beset by distractions or studies day in and day out.

Competent professional human teachers generally have skills in teaching in the range of 3 to 6. Textbooks, videos, and computer programs can be found with a similar range of Vskills, though media of lesser Vskill are also to be found. Computer instruction systems using hardware that takes full advantage of virtual reality combined with cleverly written instructional programs could have teaching Vskills in the range of 4 to 7.

Action Resolution (Tasks)

An action or task is anything a character (or sometimes a piece of equipment) attempts to do in the game, from repairing a damaged spaceship drive to climbing a cliff. Actions are described in terms of a goal (such as repairing a damaged spaceship drive) and the difficulty of achieving a goal (which, in the case of the spaceship drive, would depend on how badly it was damaged).

Action results are described in terms of *successes*; this result is a number usually in the range of about 1 to 20. To find the number of successes a character achieves for any action, you simply add the character's ability level, 2d6, and a modifier for the action's difficulty. As explained in the previous section, abilities (skills and attributes) are rated on a scale from 1 to 10 where average is 3 to 4. As will be explained below, task difficulty is a positive or negative modifier, usually in the range of –2 to +2. You simply add the ability level, the modifier, and 2d6 to find the number of successes. Thus:

success = ability level + difficulty modifier + 2d6

Action Resolution in a Nutshell

Most actions are resolved with the ARC. To use the ARC, do the following:

- Decide the difficulty of the action and assign a difficulty modifier, usually from -2 (very hard) to +2 (very easy).
- Find the level of ability the character uses to attempt the action.
- Roll 2d6.

Now add up the three numbers to find the number of successes the character achieved while attempting the action. Ten or more means success; nine or fewer means failure. When you want gradations of success and failure, look at the ARC to see what that number of successes means for the specific kind of action (qualitative, timed, or fire combat) being performed.

What Successes Mean: The Action Result Chart

For any action, you usually want one of three kinds of descriptions of the results: quality, time, or hits. That is, you either want a general description of how well you did, or you want to know how long the task took, or, if you're shooting at a target, you want to know how many times you hit. More successes mean that you've done better, worked faster, or hit more often. To make these descriptions more specific, look at the Action Result Chart (ARC) after you find the number of successes for an action. Each number of successes corresponds to a specific quality, time, or fire combat result, as indicated below.

Action Result Chart

Success: 2d6 + ability + modifiers	*Qualitative Result*	*Fire Combat Result*	*Timed Result*
16 and up	divine	all shots hit	.25
15	excellent	3/4 (ss hit*)	.5
14	excellent	2/3 (ss hit*)	.5
13	very good	½	.75
12	good	¼	.75
11	high average	1/8	1
10	low average (succeeded)	1/16	1
9	marginal (barely failed)	1/32	1.5
8	poor	1/64	1.5
7	poor	1/128	2
6	poor	1/250	3
5	terrible	1/500	4
4	terrible	1/1000	5
3 or less	disaster	miss	10

*"ss hit" means that a single shot scores a hit

In the leftmost column is the number of successes: 2d6 + ability + modifiers. Just add them up, and that's the number of successes achieved. The columns to the right describe success results in practical, game-world terms. The second (Qualitative Result) column describes the quality of the result in terms like "excellent" or "good" or "terrible." When you need a simple "succeeded or failed" result, most of the time you can draw the line at 10; nine or fewer is failure and 10 or more is success. The next column, headed "Fire Combat Result," applies to tasks that involve shooting guns at targets. The numbers in this column describe the fraction of bullets fired that hit the target. For instance, on the 10 successes row the fraction is "1/16," which means that one shot out of every 16 hit the target. If you fired fewer than 16 shots, then you missed. The Combat rules will flesh this out in detail. The last column (Timed Result) tells you how long an action took as a fraction of the amount of time one would ordinarily expect the action to take. For instance, on the row for seven successes the Timed Result number is 2, indicating that the action takes twice as long as one would normally expect. We'll give more detailed examples of the use of the ARC later in this section.

Almost all actions in Vanguard are resolved using the ARC, and you have just seen how it is used: to resolve an action with the ARC, first add the character's ability level, the action's difficulty modifier, and 2d6 to find the number of successes the character achieved. Then look on the ARC to find the description for the kind of action being performed. That's all there is to it. But you don't yet know much about "difficulty modifiers," so read on.

Modifiers and Action Difficulty

Obviously not all actions are of the same difficulty. It is easier to fly an airplane on a clear day than in a storm, and the action system addresses this sort of issue by adding or subtracting "modifiers" (a.k.a. action difficulty ratings) from the number of successes indicated on the ARC.

An action difficulty is a rating of how hard an action is to perform relative to other actions of the same general type. For example, recalling the accomplishments of a famous person like George Washington is much easier than recalling the accomplishments of a person of relative obscurity, like Franklin Pierce (who was President of the US from 1852 to 1856). Recalling information about Washington might be a very easy action, while recalling comparable information about Pierce would likely be pretty hard.

An action difficulty rating directly modifies the number of successes rolled on the ARC. Action difficulty modifiers are as follows:

Difficulty	*Modifier*
Very easy	+2
Easy	+1
Moderate (Average)	+0
Hard	-1
Very hard	-2

Thus, when a character attempts an Easy (+1) task, the GM adds 1 to the sum of 2d6 and the character's relevant ability level to find the total number of successes. For a very hard (-2) task, the GM subtracts two.

In addition to these action difficulties, some actions may be deemed Extraordinary, and have a special modifier greater than +2 or less than –2, specified in the action description.

While actions have a general difficulty rating, the results of an action attempt are often influenced by the conditions in which the character attempts to perform the action. For example, if a character has a bad cold, or is injured and in pain, or has the benefit of unusually good equipment, the fundamental difficulty of the attempted *action* is not changed, but the *character's ability to perform it* is certainly affected. (This is especially important in combat actions, and combat modifiers will be explained in the combat sections.) Thus even when a task is ordinarily hard (-1), a character could enjoy a net +1 (or other) modifier if the GM adds extra bonuses to account for unusual circumstances.

A Note on Action Difficulty

When we talk about action difficulty we use a consistent frame of reference. While changing tires on a car may be fairly easy for an experienced mechanic and extremely difficult for a novice, we rate all actions from an objective, distant perspective and describe the difficulty of actions relative to one another. Thus we assign an arbitrary "average" action and then rate other actions from there.

Action Resolution Examples

We will now give three examples of non-combat action resolution. Combat action resolution, including actions that use the Fire Combat column on the ARC, are provided in the Combat section, which begins on page 44.

Qualitative: A qualitative action, as explained above, is an action for which the outcome may be described in terms of quality (good or bad) and for which time may be unimportant. Imagine that a character, whom we will name Don and assign an astronomy skill of 3, is asked what the approximate surface temperature of the Sun is. The GM decides that knowing the surface temperature of the Sun is an Easy(+1) action. He rolls 2d6 and gets 5, which makes 9 successes (3 + 1 + 5 = 9). As we can see from the Qualitative column on the ARC, 9 successes is described as "marginal." For an action like knowing the surface temperature of the Sun, the GM decides that a marginal success means Don knows the temperature varies from layer to layer and believes it is about 5000 degrees C at what is generally called the surface. In fact the temperature is closer to 6000 degrees, but because the success was "marginal," the GM decided Don was off a bit.

Sometimes qualitative descriptions aren't important, and all you really want to know is whether your character succeeded or failed. In circumstances like this, treat results of 10 or more as success, and treat results of 9 or fewer as failure.

Don't Work Too Hard

It is important to consider the fact that *not all actions require die rolls for resolution*. Remember that a skill level *assumes* a certain ability that does not have to be checked each time by the GM. For example, the GM must not make action rolls when a character with an English level of 6 carries on a normal conversation. The ability to carry on a normal conversation is implicit for any character with a language level greater than 3 or so, and making checks would be ridiculous. A time when the GM would make a check would be when the when the character wants to write an essay, to determine how long it takes and how well it is done, or to define an esoteric word, to see if the character knows it.

Time based: A time based action is an action in which the amount of time taken is the primary result of success or failure. For example, consider the character Mr. Qena who has a wheeled vehicle mechanic skill of 5. He wants to perform basic maintenance on a car. With a skill of 5, Mr. Qena is a skilled professional mechanic and there is no question that he will succeed at performing basic maintenance. (See sidebar.) The question is how long he takes. The GM determines that standard maintenance on a car should take about 30 minutes and is an Extraordinary(+3) action. He rolls 2d6 and gets 8. Adding the skill of 5 and 3 for the Extraordinary(+3) action yields 16 successes, for which the Time multiplier is x0.25. Therefore the maintenance takes 30x0.25 = about 8 minutes.

Examples of combat actions will be provided in the Combat rules.

Qualitative & time based: It is not uncommon to want to know both how well an action is performed and how long it takes. For example, consider the example above in which Mr. Qena wishes to maintain his car. System-wise, the reason no action roll is necessary when he performs routine maintenance is that the positive modifier to the number of successes is so high that failure is not a possibility.

However, for a character with a lower skill level the performance of routine maintenance would not have assured success. Imagine that Don, whose wheeled vehicle mechanic skill level is 1, wants to perform maintenance. In this case it could be important to determine both the time Don takes and how well he does the job. The two are not necessarily linked, so it would not be appropriate to connect them in the action resolution system. *In cases in which the GM and players find it relevant*, the GM should make two action rolls: the first to determine the quality of success, and the second to determine how much time is taken. Note that it will often be adequate to make only one roll for whatever is more important about an action: the time taken or the quality of result.

Action Failure

There are two reasons why characters fail attempted actions. A character may simply be incapable of performing the action, or the character may theoretically be capable of performing the action but have suffered a failure in this particular attempt.

Often, if a character fails an action, the player will say, "I'll try again." This is possible if the character knows how to do something but failed at one particular try. If the character doesn't have any idea what to do, however, trying again is fruitless.

Time Is Up To the GM

The GM must decide how long it takes to accomplish any given action. This gives GMs a great deal of latitude in how they run their campaigns. We give guidelines for various action difficulties and times throughout the book, but in the end you will have to decide appropriate "base" or expected times for yourself.

To clarify the ways in which action attempts can fail, let's place the different failures in the context of a hypothetical game situation. Say that a character, Mr. Quigley, attempts to hack into a computer net to find some secret information. Mr. Quigley might have very little experience with computers, and fail the action because he simply has no idea how to go about it. On the other hand, he might think himself able to accomplish the action, but start working on it and find after several hours that the secret information is too well protected for him to access. As still another possibility, Mr. Quigley might start working, and after several hours find that the information has very intricate protection that will require days of work to circumvent. Because the real world has infinite variability and all dice-based action resolution systems can only produce finite results, the GM will have to take things into his or own hands and decide the nature of the failure based on the character involved, the situation, and the overall story. For most non-combat actions, assume that the character has the knowledge to perform certain elementary actions, so eventual success is possible. For example, if a character who is a well trained auto mechanic wants to perform basic maintenance on a car, no action check is needed; barring bizarre mishap, the action will succeed automatically. The only reasons to make an action roll are to determine the length of time necessary to complete the action and, possibly, to check for a mishap.

Skill Substitutions

For some actions a character will not have the skill which is most exactly appropriate to the action attempted. For example, a character may have no RIFLE skill but want to use a rifle anyway, and the player will point to a related skill such as PISTOL in hopes of persuading the game master to allow a rifle shot. After all, the player may argue, the character with a PISTOL skill understands basic principles of firearms use, and rifles are similar to pistols in several salient ways. Such arguments are reasonable, since a character skilled with a pistol will have some chance of using a rifle successfully even if he or she has not used one before.

The skill that a character should ideally use to perform a task is called the *demanded* skill. For instance, a task of surgery has a demanded skill of MEDICINE-SURGERY, and the task of firing a pistol demands the skill of PISTOL. Alternative skills that characters draw upon when they do not have the demanded skill are called *substitute* skills. RIFLE can be a substitute skill for tasks involving pistol use, for instance, because the tasks of firing rifles and pistols are fairly similar.

When a character lacks a demanded skill but tries to perform a task anyway, the GM has two decisions to make. The first is to determine what skills may be substituted for the skill demanded by the particular task. The second is to determine how well those substitute skills stand in for the demanded skill.

Identifying substitute skills: Use common sense and the knowledge of the players to determine what skills will bear upon a *particular task*. Consider the following generalizations about skill substitutability:

Skills in applied science, such as medical and engineering skills, can often substitute for the skills in the sciences upon which they are based. For instance, medical skills can often substitute for biology, and engineering skills can often substitute for physics or chemistry.

Skills of the same variety are usually good candidates to substitute for each other. For example, a law skill is usually a better candidate to substitute for another law skill than is any other skill, and a mechanic skill is usually a better candidate to substitute for another mechanic skill than is any other kind of skill.

Attributes can sometimes substitute for skills. For instance, actions involving skills like climbing, sports, and unarmed combat may be attempted without having those skills, simply on the basis of agility.

Skill relationships are not bidirectional. That's a concise if awkward way of saying that just because skill A can be substituted for skill B, that doesn't mean that skill B can be substituted for skill A. For instance, knowing physics gives you some ability to do math because you have to know math to understand physics, but knowing math doesn't give you any ability to do physics.

Some skills allow few or no substitutions: For instance, literature and music will admit few, if any, substitutions.

Weighing substitute skills: If the GM decides that a character has a reasonable substitute for the skill that would ideally be used to perform a specific task, then the GM must decide how to weigh the substitute skill in action resolution. Usually a substitute skill will not set a character in as good stead to perform a task as the demanded skill. For instance, a character with MEDICINE – INTERNAL skill can attempt to perform an emergency medicine task, but that character (and the patient!) would be much better off with an equal level of skill in MEDICINE – EMERGENCY.

To reflect the fact that substitute skills are usually less well suited to task performance than the ideal, demanded skill, *GMs should usually allow a character to use only a fraction of his or her indicated skill level when a substitution is being made*. For instance, the GM might decide that a substitution of Forensic Medicine for Internal Medicine warrants allowing the character to attempt the internal medicine task using one quarter of his or her Forensic Medicine skill, or a GM might decide that a substitution of Physics for Math should allow the character to use half of his or her Physics skill.

Also, remember that *skill substitutability is task-dependent*: Skills with broad applicability often have good substitutes for some of the tasks in their domain and no good substitutes for other tasks. For example, consider the tasks in the domain of chemistry. Chemistry allows the manufacture of explosives, for which demolitions is a perfect alternative skill, and it allows the performance of various tasks for which physics is a good substitute (such as calculations involving the behavior of gases under certain conditions), but it also allows the performance of more esoteric and specialized tasks, such as predicting the result of mixing exotic chemicals, for which no good substitute skills may exist. Or, while chemistry can be substituted for demolitions in the manufacture of explosives, there are no substitutes for demolitions skill in the performance of the task of planting explosives for maximum effect. Likewise, if your character has MEDICINE – INTERNAL, this will substitute for some tasks demanding BIOLOGY skill, like using a microscope to identify bacteria. This is intuitive because physicians trained in internal medicine always know this kind of biology. However, other tasks demanding biology skill, like knowing whether the flowers your dog just dug up are marigolds or petunias, will not admit internal medicine as a substitute because doctors do not study flowers. Thus, even if MEDICINE – INTERNAL usually substitutes for BIOLOGY at one half, a character with MEDICINE – INTERNAL at level 4 is still better off with BIOLOGY at level 2 than without, because the medical skill only substitutes for BIOLOGY in certain cases. Details of this application depend upon the GM's judgment.

Some skill substitution questions are likely to come up frequently, so we suggest the following guidelines:

PISTOL and RIFLE substitute for each other at ½, and they substitute for AUTOFIRE at ¼. Similarly, AUTOFIRE substitutes for PISTOL or RIFLE at ¼.

MEDICINE—SURGERY and MEDICINE—EMERGENCY MEDICINE generally substitute for each other at ½. Other medical skills generally substitute for each other at ¼. (Note that EMERGENCY MEDICINE and FIRST AID are perfect substitutes, except that FIRST AID does not allow the use of any medical equipment more sophisticated than a medical scanner, and it generally does not substitute for other medical skills.)

MELEE skills generally substitutable for one another at ½.

Engineering and Medicine skills often confer their base sciences (BIOLOGY, CHEMISTRY, or PHYSICS) at ½.

FORENSIC SCIENCE and MEDICINE—FORENSIC are generally substitutable at ¼.

MECHANIC skills often substitute for each other at ½.

Cooperative/Collaborative Action

Often characters will work together to accomplish a task. For example, two or more characters can work together to build a shelter or repair a car. When characters work together to accomplish a task the GM needs to determine the task's suitability to cooperative

completion, and the nature of that suitability. Some tasks are generally unsuited to cooperative accomplishment; driving a car is an example. Tasks which are suitable for cooperative accomplishment fall into several categories.

There are two tiers of categorization for cooperative tasks. We use some obnoxious jargon to describe these categories: first, tasks are identified as being *divisible* into smaller sub-tasks or as being *indivisible*. Then (and here's where the jargon gets really ugly), the nature of the cooperative work is identified as *resource-additive*, *weakness-dominant*, *strength-dominant*, or *interactive*. (Ugh! Do you have to memorize these terms? No.) These are seemingly weighty terms but they describe tasks with fairly obvious distinctions, so don't be intimidated! Each of these task types is explained below. But first, let's look at the list of task types with examples:

Types of Cooperative Actions

1. Indivisible additive: Lifting weight.
2. Indivisible weakness dominant: Three-legged race.
3. Indivisible strength dominant: Language translation.
4. Indivisible interactive: Medical treatment.
5. Divisible additive: Marketing.
6. Divisible weakness dominant: Artillery firing.
7. Divisible strength dominant: Terrorism. [volley rifle fire at one target]
8. Divisible interactive: House construction.

Divisible tasks: Some tasks can be divided into several other sub-tasks. Writing a textbook, for example, could be divided into the tasks of writing each chapter. The tasks of writing each chapter could then be assigned to different characters. Marketing is a divisible additive task because you can market a product to multiple separate groups of people, but the overall demand for the product is what determines success. For example, you can market canned soup in New York, Chicago, and Los Angeles. If it sells poorly in New York, moderately in Chicago, and well in L.A., then the soup probably is selling moderately overall.

Indivisible tasks: Some tasks can't be usefully divided into other sub-tasks, even if they are worked on by several different people. For example, it is usually beyond the scope of the interests of players (and GMs) to divide tasks of equipment repair into a lot of sub-tasks. Simply "repair of damaged equipment" is sufficient. Thus a single basic job is worked on by all the cooperating characters.

Addition of resources (resource-additive): Sometimes the benefits of additional helpers or the consequences of additional task performances are simply added up. Up to a reasonable maximum, each additional character working on the task improves on some aspect of its accomplishment. A task based on Strength, for example, falls into this category because additional characters can add their lifting power together to lift a heavy object.

Weakness dominant: For both divisible and indivisible tasks, in some cases the outcome of the whole job can only be as good as the performance of the least successful member of the team because the cooperating characters rely totally on each other's performance for their own overall success. For example, placing artillery shells on a target cannot be accomplished unless both the forward observer and the artillery firer are

successful. Likewise, people running a three-legged race cannot do better than the worse of the two participants. The principle operating here is that a chain is only as strong as its weakest link.

Strength dominant: Some tasks will be performed as well as the best performer among the cooperating group. For example, if several football players are trying to sack the quarterback it only takes one of them to succeed to make their common goal a success. Likewise, if characters are trying to understand someone speaking a foreign language, or to break a code, or to design a mechanical part according to specifications, the best solution that anyone comes up with will generally be the one adopted and inferior performance of other participants becomes irrelevant.

Terrorism is a divisible, strength dominant action (at least in certain situations) because the purpose of terrorism is to create terror. The task is divisible because there are many ways to create terror. (Hijacking aircraft, planting bombs, kidnapping, etc.) If several avenues of terrorist activity are pursued several different tasks are being performed in order to accomplish the same goal, and the goal can be achieved through success at any one of the terrorist activities.

Interactive: For some tasks the link is neither a weak link nor a strong link — it is something in-between. For example, when characters are building a house or performing first aid, it is possible for the contributions of a single collaborator to be the best or the worst without determining overall success.

How to Resolve Cooperative Actions

Resolving most cooperative tasks is quite straightforward. For additive tasks, like weight lifting or marketing, just add up all the successes or abilities of the participants. To resolve strength-dominant tasks, such as language translation or terrorism, resolve each participant's attempt separately and use the best result. For weakness-dominant tasks, resolve each participant's attempt separately and use the worst result. For these types of tasks the distinction between divisible and indivisible tasks only serves to indicate whether the participants could be working under different conditions (using different skills, or different success modifiers).

For tasks which are time-based it often makes sense to simply divide the base time by the number of workers and resolve each worker's time separately. For example, if a task were expected to require 100 worker-hours, five workers could hope to accomplish it in twenty hours. Thus each worker is working on a time-based task with a base time of twenty hours. Of course, there are limits to the benefits of additional workers; you can't just pile on more people and be done in two seconds. The GM must decide whether added labor has the potential to help.

One task type is more complicated than these simple situations described above. This is the interactive task. To resolve interactive actions, such as medical treatment, designate one participant primary and the other secondary. If the distinction is not obvious then it does not matter which is which. You roll for the secondary actor first. Use only condition modifiers; do not modify the result by the difficulty of the action. Next roll for the primary actor. Subtract 10 from the secondary actor's success result and add this to the number of successes achieved by the primary actor, with the following limitation: the modifier is limited to an absolute value of 3, i.e. it cannot be greater than +3 or less than -3. If -4 is rolled, for example, make it -3.

That sounds hard. It is, in fact, one of the more complicated rules in Vanguard, so we will reiterate it before proceeding to the example below. To resolve aggregate actions, you first distinguish between primary and secondary actors. Resolve the secondary actor first, using condition modifiers but no modifier for basic task difficulty (i.e., treat it as a Moderate(+0) task). Note the result, and then roll for the primary actor using all applicable modifiers to success. Subtract ten from the secondary actor's result and add the result to the number of successes achieved by the primary actor, with the limitation that the change cannot be of greater magnitude than three.

Example: Jack and Jill are performing first aid on a patient. Arbitrarily we will assign Jack to be the secondary actor, and thus we resolve his role first. He has an Emergency Medicine skill of 5, he's using equipment that confers a +1 modifier, and the injuries of the patient confer a -2 modifier. He rolls 7 on 2d6. Adding 5 for his skill, one for the situation modifier, and ignoring the +1 for equipment and -2 for the basic difficulty of the task we find that he has 13 successes. Now we subtract 10 successes and get 3. Thus Jack's work has helped the work of Jill, the primary actor, by 3 successes. She has a skill level of 5 and rolls 4 on 2d6, which is reduced by 1 by the equipment and action. The result is 9 successes, which is boosted by 3 because of Jack's help. Thus the two of them have achieved 12 successes in the performance of first aid on their patient.

Note: In the event that the potential influence of the secondary actor is deemed to be marginal by the GM the maximum permissible range of the influence on success may be limited to +1 to -1. As always, use common sense to evaluate the results generated by the rules and discard or alter the results you find inappropriate.

Contested Actions: Comparative and Opposed Actions

Two types of contested actions exist: those in which the actors are directly affecting each others' success, and those in which different levels of success are merely compared. The comparison of success is straightforward: actors act and the number of successes they have is compared. Whoever achieved a higher degree of success is the winner, and the difference between their levels of success indicates the margin of victory. A foot race is an example of such a contest; each runner's performance is evaluated in comparison to the performance of the other runners, but no one's performance affects (except perhaps psychologically) anyone else's.

Sometimes characters attempt to adversely affect each other's success at actions, such as in a fistfight or in a game of chess. To resolve such contesting, first find the number of successes for each actor normally. Taking an actor's number of successes as a base value, subtract 10 successes and apply the result as a negative modifier to the opponent's number of successes. (Note that if after subtracting 10 you are left with a negative number of successes, applying a negative number of successes as a negative modifier produces a positive modifier. Thus if a roll gives a final value of less than four successes it will actually help the opponent, due to a mistake on the part of the character whose roll was poor.) Note that it is possible for both actors to fail or both to succeed.

Example: Agent Quist and one of Gweedo's[†] goons are wrestling. Agent Quist has a close unarmed combat skill of 4, and the Goon has a skill of 2. Quist and the Goon attempt

[†] Yes, *we* know that Gweedo is traditionally spelled Guido. However, Gweedo's parents obviously did not.

to pin each other while avoiding being pinned. With rolls of 9 and 7, respectively, Quist has 13 successes and the Goon has 9. Since the Goon is opposing Quist, we subtract 10 successes from the Goon's result (getting -1) and subtract that result from Quist's successes to get 13 - (-1) = 14. Now checking the Goon, we subtract 10 from Quist's 13 successes and get 3, and we subtract that from the Goon's successes: 9 - 3 = 6. Since Quist ended up with 14 successes to the Goon's 6, Quist comes out on top in this struggle.

Combat

Combat has the potential to advance several of the important themes of adventuring; mystery, risk, opportunity, and surprise will be present in good combat scenarios. Because combat has such potential to further the themes of an adventure, GMs are often called upon to rule on the outcome of combat-oriented actions. Ergo, this combat system is offered. It is designed to strike a balance between detailed realism and ease of play. Combat actions are resolved using the Action Results Chart (ARC) in generally the same manner as standard non-combat actions, although attending to nuances of combat necessitates greater detail for a combat system.

Combat Turns

Combat is played in turns that represent about five seconds of game time. Turns help the GM and players keep track of the frenetic cascade of actions that take place during combat, allowing each series of combat events to be resolved in succession. Whenever you encounter the word "turn" in this context, it refers to five-second period in the characters' world.

Actions and Initiative

During combat turns, characters can take actions such as ducking for cover, shooting at a target, or saying their prayers. Some actions (such as firing a bullet from a gun) are short enough that more than one can be completed in a single turn, while others (such as donning an armor suit) might span several turns. These actions should be described in everyday language, but the GM will resolve them turn by turn, treating each five-second period of game time one after the other.

Initiative in a Nutshell

- During each combat turn, characters act descending order of their initiative scores, which can be determined by a Combat Initiative skill check.
- Characters who continue an action from one turn to the next, such as aiming at a target and standing ready to fire, get a +5 bonus to their initiative.
- Characters can take hasty actions, adding 3 to their ordinary initiative point, at the costs of a –3 success penalty for the action and potentially taking a penalty to initiative in the next turn; see text.

Characters cannot begin actions willy-nilly during a combat turn. A character's state of readiness and speed of response depend on ability checks in COMBAT INITIATIVE.

The Combat Initiative skill describes a character's state of readiness and speed of response in combat situations. As noted in the skill description entry, the skill reflects both training and natural aptitude allowing a character to remain calm, think clearly, and keep track of events taking place during combat.

A character "has the initiative" when he or she has the option of taking an action immediately. Who has the initiative at any given point in a combat turn depends on the particular combat situation and on the result of Initiative

skill checks for the characters. Sometimes skill will seem less relevant to the GM than the particular circumstances the characters face. When this is the case, it's fine for the GM to ignore Combat Initiative skills and make his or her own ruling on who has the initiative. For instance, if one character has surprised another or has prepared in advance to take a certain action, he or she may enjoy the initiative regardless of the characters' initiative skill levels. However, circumstances don't always demand an obvious result, and usually skill checks are made to determine who has the initiative.

How to Determine Initiative

Initiative is a score that tells us who gets to act first in a combat turn. Whoever has the highest score may act first. Characters get high scores because of skill, luck, or a combination of the two. You can determine initiative scores in one of three ways, depending on how much work you want to do.

Most involved option: The most "involved" way to determine initiative scores is to make an initiative roll for each character at the start of every combat turn. That is, roll 2d6, add Combat Initiative skill, and add any applicable modifiers. (Characters who don't have the skill can still make the roll, adding zero for the skill level.) The result determines the initiative for that turn. Many players like this option when they can roll their own dice, and it adds an element of tension to combat because players never know if they'll win or lose the initiative next turn.

> *The better part of valor is* ***DISCRETION.***
> *Shakespeare, Henry IV, Part I.*

Middle option: If you don't want to roll every turn, just make one roll for each character at the beginning of an episode of combat. Use this initiative score until the GM decides new circumstances warrant a new roll. This saves time relative to the first option, though players may be frustrated if their characters are saddled with low initiative scores for a long time.

Simplest option: To worry as little about initiative as possible, don't bother rolling dice. Instead, just use the Combat Initiative ability, and add any applicable modifiers to find an initiative score.

Whichever method you prefer, the initiative score determines the order in which characters act during each combat turn. The main rule here is that *characters are allowed to act in descending order of their successes in initiative (from highest to lowest)*. Thus, the character with 12 initiative successes will act before 5, who will act before -1, and so on.

Initiative Modifiers

What about the modifiers to initiative? The modifiers most often applied to the initiative roll include those for fatigue, weapon bulk, and encumbrance. Other modifiers can be applied when the GM finds them appropriate. Fatigue imposes general penalties to actions (as described in the Fatigue section; page 61), and these apply to Initiative rolls just like anything else. Weapons have a bulk rating which impose a penalty to Initiative when a character uses the weapon. Encumbrance (i.e. carrying loads heavier than the character can comfortably bear) also penalizes initiative. Exceeding the character's carrying capacity results in a –2 modifier to initiative; for each multiple of carrying capacity that is borne, apply an additional –2 penalty.

Initiative may also be modified by three kinds of special actions: characters may take *continuous actions*, and characters may take *late hasty actions* or *early hasty actions*.

Continuous actions: If a character *continues* an action from one turn to the next he or she gets an initiative advantage relative to other characters who don't. Characters taking continuous actions get a +5 bonus to initiative.

Continuous actions allow for ambushes and sustained suppressive fire. For example, a character may aim at a target during one turn and continue aiming through the next turn. By doing so the aiming character will retain initiative over the target at which he or she is aiming. For example, if a character aims down a corridor, waiting for a target to appear in the sights, the aiming character will usually win initiative over a target who moves into view.

Hasty actions: Hasty actions are actions that are taken hurriedly to allow a character to act before his or her normal initiative point. Hasty actions may either occur late, as a second action during a turn, after the regular one, or early, as a single accelerated action that enjoys a +3 bonus to initiative. The negative consequences of an early action are that it is performed with a -3 success penalty and it prevents the character from taking any action later during the turn. The negative consequences of a late, second action are that it is performed at a -3 penalty and causes the actor suffer a –10 penalty to initiative in the next combat turn.

(As with all things, the GM must use common sense in allowing second actions. For example, it's okay for characters to fire their weapons and then open a door, but it's not okay for character to run their full movement distance for one turn and then run their full movement again. Also, note that hasty actions do not allow aimed fire; since characters are hurrying, they can't have a to-hit bonus for making deliberate, careful shots. This is made clear in the Aim section of this chapter, which describes the consequences of hasty shooting.)

Shooting at Things

"Anything worth shooting once is worth shooting ***MANY, MANY TIMES.****"*

Shooting a target with a firearm is an action resolved using the ARC. The Fire Combat results row on the ARC lists the number of rounds that must have been fired to achieve one hit for a given number of successes. For example, if 10 successes are rolled, the Fire Combat results row on the ARC indicates "1/16," which means that 1/16th of the shots fired actually hit (or, to put it another way, sixteen shots are needed to score one hit).

To resolve fire combat, the GM uses the skill of the shooter and the number of rounds fired to produce a result on the ARC. The GM then modifies this result as necessary for other variables such as the range to the target, the size of the target, relative motion between the target and shooter, impaired vision, impediments to the projectile or beam reaching the target (such as wind and rain) and so on, as deemed important in the situation. Suggested to-hit modifiers for situations are provided on the GM reference sheets.

Most of the time the GM can make one roll for all of the shots a character fires during a combat turn. For instance, if a machine gunner fires 50 rounds during a turn, the GM only needs to make one roll to find out how many shots were on target. Occasionally, however, the GM may find it convenient to roll separately for each shot. For instance, instead of saying that his or her character fires 6 times during the turn, a player may tell the GM, "I fire rapid single shots – a rate of six per turn – until I get a hit." The GM could resolve this in

one roll and then roll randomly to determine the order of hits and misses, but this seems more complicated than just making a separate to-hit roll for each shot. Rolling separately for each shot is as simple as it sounds: instead of rolling once for, say, eight shots (which requires at least a 1/8 result in the Fire Combat column of the ARC for a hit), you roll eight times for one shot (which requires a "ss hit" result for a hit). The two methods are statistically similar, so the GM can use whichever he or she finds more convenient. (Note, of course, that the number of successes required to get one hit when a character fires once is higher than the number of successes required to get a hit when many shots are fired; this is why the two methods of task resolution are roughly equivalent.)

Range

The range to the target is an important determinant of a shot's difficulty. The Vanguard system is tuned so that the default case is a shot taken in combat at a range of 3 to 10 meters. These shots involve no modifier for range, but shots at very close range (2 meters or less) get a bonus to hit, and shots beyond 10 meters suffer a penalty. The table below shows bonuses and penalties to hit with small arms (pistols, rifles, shotguns, etc.) based on range.

Range Modifiers

Distance to Target	*Success Modifier*	
	within weapon's Effective Range	*beyond weapon's Effective Range*
2m	+2	+1
10m	0	-1
25m	-1	-2
100m	-2	-4
300m	-3	-6
1km	-4	-8
2km	-5	-10
3km	-6	-12
4km	-7	-14

Effective Range

Each weapon on the Weapons List has an Effective Range. This is the range within which a weapon can reliably hit and damage a target. For targets within the effective range of the weapon being fired, use the column of success modifiers that says "within weapon's Effective Range." For targets beyond this distance, use the table's rightmost column of modifiers.

Beyond Effective Range, penetration and damage are halved for laser beams and kinetic energy projectiles. Explosive projectiles also have half penetration beyond Effective Range, but they do full damage at all ranges.

Aim

When firing small arms, characters can choose how carefully to aim, which affects the number of shots they can fire in a turn, how quickly they can start shooting, and how likely they are to hit their

"If at first you don't succeed, RELOAD."

targets.

There are five kinds of shots, summarized in the table below.

Shot type	*Effects on:* *Rate of Fire Allowed*	*Initiative*	*Chances To Hit*
Hasty (snap shot)	stable rate allowed	Allows a +3 bonus to initiative.	-3 penalty
Normal	stable rate allowed	none	no modifiers
Unstable rate	RoF may exceed weapon's stable rate of fire	none	-3 penalty; -6 if exceed stable rate by a factor of 2 or more
Aimed	limited to the weapon's aimed rate of fire.	none	Allows weapon's "aimed fire" to-hit bonus
Sniper shot	Only one shot allowed every two turns.	Aim a full turn and fire once the next turn.	Extra +1 to-hit bonus beyond weapon's "aimed fire" bonus

A Hasty shot (or snap shot) allows a character to act earlier than usual by conferring a +3 bonus to initiative. However, because the character acts before he or she is really ready to, there is a –3 penalty to hit. Rate of fire (explained in the next section, Rates of Fire) may be as high as the weapon's stable rate.

A character's initiative and chance to hit are not affected when shots are "normal." Rate of fire may be as high as the weapon's stable rate.

As explained in the Rates of Fire section, below, fire exceeding a weapon's "stable" rate is Unstable. Unstable-rate fire imposes a –3 or –6 penalty to hit, depending on how greatly the stable rate is exceeded. There are no effects on initiative when conducting Unstable rate fire.

Using aimed fire gives the character the "aimed" to-hit bonus listed for the weapon on the weapons list. The rate of fire is limited to the Aimed rate. Aimed fire does not affect initiative.

Sniper shots require two turns to complete. A full turn is spent aiming, and the shot is fired at the character's initiative point in the next turn. This allows an extra +1 bonus beyond the weapon's aimed fire to-hit bonus. (However, if the shooter sees that the target is about to move, he or she may opt to forego the extra +1 to-hit bonus and fire early.)

Combat Modifiers

Under typical combat conditions there will be no success modifiers except those for range and, where applicable, for weapon accuracy or rate of fire. "Typical combat conditions" means that the following conditions apply:

- the target is only briefly or partly exposed to fire, or is moving slightly
- the shooter does not have a comfortable firing position
- the shooter is under immense psychological stress, probably fearing that he or she may be about to be killed or that his or her friends are in similar peril

If circumstances are unusually difficult then the GM should apply penalties to hit. If circumstances are unusually favorable then the GM should apply bonuses to hit. Here are some guidelines:

- stationary target in clear view: +2

- non-combat conditions: +1
- supported firing position (e.g. bipod or weapon resting on a low wall): +1
- large (vehicle-sized) target: +1
- target running: -1
- poor visibility: -1
- small target (e.g. dinner-plate sized): -1

Rates of Fire

The weapons list (beginning after page 107) provides "aimed," "stable," and "maximum" rates of fire for each weapon. Each weapon has a to-hit bonus that applies when aimed fire is used. The stable rate is the number of shots that may be fired per turn without a to-hit penalty. Exceeding this number of shots per turn constitutes unstable-rate fire, which results in a –3 penalty to hit; firing more than twice this rate results in a –6 penalty to hit. These penalties reflect the effects of recoil on the character's ability to aim the weapon accurately.

The maximum rate of fire is an absolute limit on the number of shots that can be fired in one five second turn. (You will notice that lasers often have stable rates which equal their maximum rates, so they are stable all the way to their maximum rate of fire. This is because they have no recoil.)

Weapons are fired in two basic ways: single shots and automatic fire (or "autofire"). When firing single shots, one shot is discharged for each pull of the trigger. When conducting autofire, multiple shots are discharged for each pull of the trigger. The distinction between single shots and autofire is important because different skills (Pistol and/or Rifle vs. Autofire) are used for the different types of fire. Characters may fire as many as five shots per turn using Pistol (for handguns) or Rifle (for longarms) skills (provided their weapon can fire that fast, as indicated by the maximum rate of fire). Characters firing six to 20 shots per turn may elect to use Autofire skill if it is higher than their Pistol or Rifle skill. Characters firing more than 20 shots in a turn must use Autofire skill.

Weapon Damage Characteristics

The damage done by weapons is represented in Damage Points. These may be reduced by armor, as explained in the Armor section (page 49). The effects of damage are explained in the Wounds section (page 64). For reference, a 9mm Parabellum round (as is fired by many semi-automatic pistols or an Uzi) does 12 points of damage; a .50 caliber machine gun round does 90 points of damage.

Armor

To determine the effects of armor on an attack, compare the armor value to the penetration value of the striking weapon. If the armor value is greater than the penetration value, then no penetration occurs. (There may still be concussion damage; see below.) If the armor value is more than half the penetration value, but not greater than it, then the attack penetrates and does half the normal damage. If the armor value is less than half the penetration value, then the attack penetrates and does full damage.

(Expressed equivalently: If the penetration is less than the armor value, then the armor stops the attack. If the penetration is greater than or equal to the armor value, but less

than 2 AV, apply half the listed damage. If the penetration is greater than or equal to the twice the AV, apply full damage.)

These armor rules are summarized below:

If penetration < armor value (AV), no effect.*
If pen. ≥ AV and pen. < 2AV, the target suffers half damage.
If pen. ≥ 2AV, full damage.

Or, equivalently,

If AV > pen there is no effect.*
If AV > ½ pen and AV ≤ pen then half damage.
If 2AV ≤ pen then the target suffers full damage.

* *Concussion*: (Lasers do not cause concussion damage.) For hits which fail to penetrate armor, characters will sustain 1/10th listed damage if they are in non-rigid armor and 1/25th listed damage if they are in rigid armor. Thus, being hit with a 10 point bullet would cause one point of damage through non-rigid armor that stopped the round, and no damage for rigid armor which stopped the round. A bullet doing 50 points of damage would cause 5 damage points if it were stopped by non-rigid armor and 2 damage points if it were stopped by rigid armor.

Table of Material Armor Values

Material	*Armor Value (typical)*
water, per 7 cm	1
interior building wall	1 to 6, depending on construction
human body†	1d6
wood, per cm	1 to 3, depending on hardness
"Plexi" transparent plastic, per cm	1
concrete, brick, or stone, per cm	2 to 6, depending on hardness
aluminium, per cm	5
standard steel, per cm	15
Duralar rigid armor, per cm	40
hardest steel armor, per cm	60

† Do not confuse this armor value with an armor value applied to defend the target hit. It applies solely to the body's ability to stop bullets, and is relevant only to people standing behind the victim to see if they get hit by blowthrough.

Blowthrough

Blowthrough occurs when a shot passes through one target and then hits another. This usually applies only to inert kinetic energy projectiles because explosive projectiles demolish themselves upon impact with any object with an armor value of one or more. If explosive

projectiles perforate the objects they hit they are harmless beyond a range equal to twice their damage values in centimeters. Thus an 80 point explosive round is harmless beyond 1.6 meters.

When kinetic energy projectiles pass through targets the projectiles usually suffer severe damage and are destabilized, so they are much less dangerous to subsequent targets.

Treat the previously penetrated people/things as armor for the subsequent target. Also, add either one armor point or 10% of the round's original Pen, whichever is greater, for each penetration, to account for destabilization and keyholeing effects.

Example 1: A round with "pen,dam" equal to "30,75ke" is fired at a column of people. None are wearing armor. The first person takes 75 points of damage. The second person is treated as having 1d6 points of armor (because people have an armor value of 1d6, as indicated on the Material Armor Value table) plus 10% of the round's original Pen. On 1d6 the GM rolls 2 and 10% of the round's Pen is 3, so the person has a de facto armor value of 5. This is not enough to affect the damage of the round, so Person Two takes full damage (75 points). Person Three is treated as having the 5 armor points that Person Two was treated as having, plus 1d6 for Person Two's body (which is rolled as 4) plus another 10% of the original Pen, for a total armor value of 12. He too takes 75 points of damage. Person Four is treated as having 12 + 10%Pen plus 1d6 (rolled as 3) = 18 points of armor. Since 18 is greater than half the Pen of the round, Person Four takes half damage. Person Five has 18 + 1d6 (rolled as 1) plus 3 = 22 points of armor. She too takes half damage. Person Six has 22 + 1d6 (rolled as 5) +3 = 30 points of armor. He takes half damage as well. Since his effective armor value is equal to the penetration of the bullet, it stops in him and Person Seven is not hit.

Cover

Stuff that people hide behind when they're getting shot at is called cover. It's good for two things: concealment and armor. Since it's hard for enemies to shoot what they can't see, concealment is useful when characters try to avoid getting shot. Since the enemy can't hit targets behind good armor, cover is also useful because it's (hopefully) something hard between characters and incoming shots.

Murphy's Military Law #15:
Don't be conspicuous.
In the combat zone, it draws ***FIRE****. Out of the combat zone, it draws* ***SERGEANTS****.*

Cover's concealment function is represented by lowering the probability of hits attempted against targets behind cover. Moderate concealment is usually worth a -1 to-hit penalty. This penalty is appropriate when shooting at targets partially obscured, as by smoke or foliage. Good concealment is worth a –2 penalty, provided that the shooter still has a good idea of where the target is. If the shooter doesn't have a good idea of where the target is then this is blind fire and the penalty may be arbitrarily larger. Cover's armor function is represented simply by the requirement that hits to locations behind cover pass through the cover before they may hit the target.

When the general rules in the last paragraph (–1 for moderate concealment and –2 for good concealment; shots must pass through armor that protects a target) are not specific

enough to guide you through difficult circumstances, you'll want to use the detailed rules below for variability in the use of cover.

Make a COMBAT INITIATIVE skill check when characters try to use cover while exposing themselvs partly, or briefly, to look around or take a shot. Success (10 or more successes) indicates that the character used the cover to the full extent possible. If the check is failed, the character gets half the possible value of the cover, rounded down. Where cover would be worth –2 (as a to-hit penalty for attackers) if used to its full potential, succeeding at a Combat Initiative check would confer the –2, while failure would warrant a –1.

When characters behind partial cover are shot, any body part that was exposed during the turn is assumed to have been hit when it was exposed. Example: Sergeant Baer is crouching behind a low wall while a street punk is shooting at him. Baer decides to pop up over the top of the wall, deliver some quick return fire, and duck back. During this turn, the street punk shoots Baer twice. Rolling for hit location, the GM comes up with one hit to the left leg and one hit to the left shoulder. To hit Baer in the leg, the first shot would have to perforate the wall. The hit to the shoulder doesn't have to perforate the wall, since Baer's shoulder was exposed during this turn.

Even if a character does nothing but cower behind cover for a whole turn, a check against Combat Initiative is appropriate if the GM decides that a character's success is in doubt when he or she attempts to use cover. For instance, if the GM doubts that a character can effectively take cover in a particular street gutter, then the character could be required to pass (with 10 or more successes) a Combat Initiative check to earn a –1 modifier on the attacker's chance to hit. Alternatively, if the GM isn't sure whether attacks on a character should be made at –1 or –2, the GM could require that a Combat Initiative check be passed to earn the –2 modifier.

Hasty dive for cover

If a character is fired upon and wishes to dive for cover at a time other than his or her ordinary initiative point, this counts as a hasty action (as explained above in the Actions and Initiative section; page 44). When targets make hasty dives for cover while they are under fire, follow this checklist. (Note that a hasty dive for cover while under fire is different from seeking cover at one's ordinary initiative point, for which the Cover rules listed above apply.)

1. Does the character have time to react before he or she is hit? (This is a judgment call for the GM and might require an AGILITY check. If the character is hit before there is any time to react, the character's ability to dive for cover may be limited by resulting injury.)
2. If not hit and incapacitated with the first few shots, then a dive for cover counts as a hasty action, with the ordinary results. (An early haste imposes a –3 penalty to the action taken during the turn, and a late haste results in a –10 penalty to initiative during the next turn.)
3. Results of having taken a dive for cover: After the character has hastened to cover, the remainder of the shots fired at the target are treated as if they had been fired at a target behind cover. These effects depend on the kind of cover the target has available. If the view of the target is obscured, then penalties to hit apply, and if the cover is hard then it serves as armor for the target.

Special Cases

Shotguns

Shotguns are flexible weapons that can fire single slugs or shells consisting of many small balls or flechettes. When shells are fired, the balls will leave the barrel in a single mass and begin to spread out once they are a few meters downrange. This spread can make it easier to hit targets with shot than with ordinary bullets or slugs.

Shotguns firing shot get a +1 bonus to hit between the range of 10 meters and the Effective Range listed for the ammunition and the weapon on the Weapons List.

Called Shots

> *"What use are more accurate guns?*
> *The enemy would merely*
> *dodge them.*
> *With our present pieces*
> *they are in danger*
> ***EVERYWHERE.***"

In combat it is generally impossible to fix one's shots on specific parts of a target; combatants are happy to hit at all. However, occasionally characters want to be more specific about their target designations than simply saying who or what they shoot. When a character wants to shoot an opponent's gun hand, or knock an apple off the top of his head, or whatever, the following rules apply. They are based on the hit-location rules described in the Wounds section (page 64).

If he or she wishes to place a called shot, the player must declare that his or her character is firing at a specific body location before the to-hit roll is made. A called shot to a general area (left arm, head, etc.) results in a -1 penalty to hit. A called shot to a specific, small location (left wrist, nose, etc.) results in a -2 penalty.

If the to-hit roll is successful then roll for hit location; the hit location roll may be modified by ten times the shooter's skill level. For example, if the shooter has a skill level of 3 and hit the target after declaring that he or she wanted to hit in the left arm, he or she may modify the hit location roll by as much as 3x10 = 30 in the direction of the left arm. Thus, if the hit location roll were 15 (upper torso), the roll could be modified to anything from 01 to 45. Since the arms do not fall within this range, the called shot failed, and landed in the upper torso after all.

(Note that all shots are assumed aimed at the torso unless specified otherwise. These shots aimed at the torso require no modifiers.)

Only the first bullet in a burst of automatic fire will have an increased chance to hit the called shot location. Subsequent hits are resolved normally, with a separate hit location roll for each bullet that hits.

Firing Separately at Multiple Targets in One Turn

> *Murphy's Military Law #6:*
> *The buddy system*
> *is essential to your survival.*
> *It gives the enemy*
> ***SOMEONE ELSE*** *to shoot at.*

In the event that a character wishes fire at more than one target in one turn, the following rules apply:

A –1 modifier applies to every target engaged in excess of one. For example, if two targets are fired at, shots at both targets are at –1 to hit. If five targets are fired at, all five are at –4 to hit. Remember that weapon rate of fire restrictions apply to the turn, not to the target engaged.

Note that these rules do not apply to strafing multiple targets with autofire. See below for those rules.

An alternative means of engaging more than one target in a turn is possible using a combination of normal fire and hasty fire. As described in the Actions and Initiative section (page 44), characters who have already taken their action during a turn may opt to take a late action, effectively borrowing their action for the next turn and using it immediately. This results in a –3 penalty for the hasty action and a loss of initiative during the next turn. To use this method for firing at multiple targets in one turn, the character engages the first target normally, then engages a second target with a –3 penalty.

Area Fire Strafing

Murphy's Military Law #12:
The only time suppressive fire works is when it is directed at abandoned positions.

If a character is conducting automatic fire then the character may spray fire in a general direction, strafing all the targets in the area. Such strafing is conducted with a -1 success modifier. One roll is made for each target. The effective number of bullets directed at each target equals the number of shots fired divided by the sum of the number of meters strafed and the number of targets.

Example: Mr. Quigley fires 35 rounds over an arc of 4 meters, in which there are five enemies standing. The effective number of rounds fired at each target is 35 rounds/(5 targets + 4 meters) which is 35/9 ≅ 3.89, or 3. (Discard fractions in this calculation.) The GM uses a –1 modifier for each target, and makes a to-hit roll for each of the five targets, treating them as if they were fired at with three rounds. (Note: remember to include any applicable penalties for exceeding a weapon's stable rate of fire.)

Example: Mr. Qena fires 60 rounds over an arc of 20 meters in which there are 3 enemy targets. The effective number of rounds per target is thus 60/23, or 2. Each target is engaged with a –1 modifier to hit.

Fire Deviation Procedure

Murphy's Military Law #13:
The only thing more accurate than enemy fire is incoming friendly fire.

Sometimes a shot's landing location will be important even if it misses its target. To find out where shots do hit when they miss their intended targets, use the following system:

First roll 1d10 for the direction of deviation. As in the diagram below, a roll of 1 or 2 is long/high, a roll of 3 is long and right, 4 is right, 5 is short right, 6 and 7 are short/low, 8 is short left, 9 is left, and 10 is long left.

10	1,2	3
9	target	4
8	6,7	5

Next find the distance from the target:

For direct fire deviation distance: Roll a very easy (+2) skill check at the firer's skill level on the ARC. Multiply the time-based action success indicator by one half meter to find the distance of the deviation.

For indirect fire or guided weapon deviation distance: Roll a very easy (+2) skill check at the firer's skill level on the ARC. Multiply the time-based action success indicator by 1/100th the target range to find the distance of the deviation.

For thrown grenade deviation distance: Roll a very easy (+2) skill check at the thrower's skill level on the ARC. Multiply the time based action success indicator by 1/20th the target range to find the distance of the deviation.

Hand to Hand (Melee) Combat

The rules for hand to hand combat are based on the task resolution principles laid down in the Contested Action section of the Action Resolution rules (page 42). Each combatant gets an attack roll and a defense roll, and the number of successes achieved by each combatant is compared to find results.

Several skills are used for hand to hand combat. These skills, described in the skill list under MELEE, are Balanced Weapons, Unbalanced Weapons, Knives, Knife Throwing, Shields, Two-Weapon Fighting, and strike and supple varieties of Unarmed Combat.

The general procedure to resolve hand to hand combat is that, following a roll for initiative, an attack roll is made for the attacker, modified by the weapon's attack bonus, the character's fighting strategy, and any other applicable modifiers. The defender makes a defense roll, modified according to the same kinds of criteria. The number of successes for each combatant is then compared to find the results. Then the process is repeated (save for rolling initiative) so that the other character gets a counterattack.

Details of the hand to hand combat procedure:

First, each character involved rolls for initiative. Initiative in hand to hand combat is found in the same way as for fire combat: roll an ability check based on Combat Initiative skill and apply any applicable modifiers for fatigue, weapons used, etc. The character with the higher final value wins initiative. When characters are fighting with weapons, the character whose weapon has a longer reach should get an initiative bonus unless confined quarters make it difficult to take advantage of that extra reach.

Second, each character chooses a fighting strategy, such as to be primarily defensive, aggressive, or balanced, or to attempt to grapple an opponent. Choose from the list below.

Fighting Action/Strategy	*Attack Bonus*	*Defense Bonus*	*Notes*
Balanced	0	0	This is the default.
Aggressive	+2	–2	
Defensive	–2	+2	May need to yield ground.
Specific attack	–1	0	Use to specify a location to hit.
Grapple	no strike	0	Use to establish an advantageous hold on an opponent. –1 to succeed. Characters who are grappled suffer a –3 to defense and a –3 to attack so long as the grapple is maintained.
Specific Grapple	no strike	0	Use to grab gun, strangle, apply handcuffs, etc. –2 to succeed
Escape Grapple	no strike	–3 while grappled	–2 to escape grapple
Maintain Grapple	no strike	+2	+0 to maintain grapple.
Maintain Grapple and Attack	–1	+1	Only allowed after successful grapple.

Third, determine relative advantages in attack and defense. If weapons are being used, determine which characters, if any, are using weapons that give them a relative advantage in attack or defense. Look at the Table of Hand to Hand Weapons (below) and compare the attack values of the weapons being used. The character whose weapon has a higher attack value gets a +1 bonus on all attack rolls. Next, compare the defense values; the character whose weapon has a higher defense value gets a +1 bonus on all defense rolls. If weapons are not used, then where one character is stronger the stronger character gets +1 on both attack and defense if his or her skill level is equal or better than the opponent's.

Fourth, the character who won the initiative makes an attack roll using the appropriate melee combat skill, adjusted for any applicable modifiers. A character choosing a defensive strategy may choose to skip the attack, of course.

Fifth, the defender rolls for defense.

Sixth, compare the successes achieved in attack and defense and apply the results as indicated in the table below. When a hit is achieved, roll for hit location on the hit location chart. If the attacker wishes to call the location of his or her hit in advance, apply the modifiers for a specific strike in the table above and use the rules for Called Shots in the fire combat section (page 53) to determine hit location.

Hit effects:

Attacker successes ≤ Defender successes -2	No effect.
Attacker successes = Defender successes -1	If defender unarmed, take ½ damage. If parrying with a weapon, no damage to armed defender.
Attacker successes = Defender successes	One-half damage to defender.
Attacker successes = Defender successes +1	Normal damage to defender.
Attacker successes = Defender successes +2	Normal damage to defender.
Attacker successes = Defender successes +3	Double damage to defender.
Attacker successes ≥ Defender successes +4	Double damage to defender.

Last, repeat steps four through six with the roles reversed so that the defender gets an attack.

Modifiers

Defending against multiple attacks: When two or more characters attack another character, the target of the attacks suffers a –1 penalty to the defense rolls against all of the attacks.

Making multiple attacks: Characters are normally expected to make one attack per turn. Extra attacks may be made, but for each extra attack all attacks suffer -2 successes. Thus, if a character makes two attacks, all attacks suffer -2. If a character makes three attacks, all attacks suffer -4.

Relative character strength: When one character is stronger than another, the stronger character gets a +1 bonus in hand-to-hand tasks if his or her skill level is equal to or better than the opponent's.

Two-weapon fighting: Characters may fight with two weapons at once if they combine a weapon skill with two-weapon fighting skill. Determine the effective skill level by taking the average of the skills involved. If the character is fighting with two weapons that require two different skills, take the average of all three skills to determine the effective skill level. Two-weapon fighting confers a +1 bonus to attack and defense.

Table of Hand-to-Hand Weapons

Weapon	*attack value*	*defense value*	*length*	*Pen/dam **			*mass*
				weak,	*avg.,*	*strong*	
small knife	1	0	10cm	1/5	2/7	3/9	.2
large knife	1	1	25cm	2/12	3/15	3/18	.5
Baton	1	1	50cm	1/3	1/4	1/5	.5
mounted bayonet	1	1	+15cm	3/10	4/12	4/15	+.25
Machete	1	1	50cm	2/18	3/22	3/26	1
Staff	1	1	1.75m	1/4	1/5	1/6	1.5
brass knuckle	0	0	na	1/+1 to unarmed	1/+1 to unarmed	1/+1 to unarmed	.1
unbalanced club**	1	0	varies	1/4	1/5	1/6	2
balanced staff	1	1	1.4m	1/3	1/4	1/5	2
Axe	2	0	1m	4/25	5/35	6/40	3
Blackjack	0	0	10cm	1/+2 to unarmed	1/+2 to unarmed	1/+2 to unarmed	.2
riot shield	0	2	1m	0/2	0/3	0/4	5
unarmed strike	0	0	na	0/1	0/2	0/3	na

* Penetration and damage depend on how strong a fighter lands the blow. A weak fighter has a sum of strength and fighting skill less than 4. For an average fighter the sum is from 4 to 6. For a strong fighter it is 7 or more.

** Includes improvised clubs such as baseball bats, frying pans, pieces of pipe, large wrenches, etc.

Explosives

Explosives are rated for blast and fragmentation damage assuming that the target is in contact with the explosive device. For any given range, the formula for blast damage is (damage) = (contact damage)/(range+1)². Don't worry; there's a table so you don't have to do the math. Each part of the body facing the blast takes this damage, which has a penetration value of 1. The table below summarizes this relationship for common ranges; it also describes the effects of range on fragmentation attacks, which are explained following the table.

Ranged explosives effects table.

Range	*Blast damage / no. of frags*	*Range*	*Blast damage / no. of frags*
Contact	full	20 m	0.2%
0.5 meter	half	30 m	0.1%
1 meter	25%	50 m	0.04%
2 m	11%	100 m	0.01%
3 m	6%	250 m	0.0015%
4 m	4%	500 m	0.0004%
5 m	3%	1 km	one millionth
10 m	1%	5 km	one 25-millionth
15 m	0.4%	10 km	one 100-millionth

In addition to blast effects, many explosives also produce fragmentation. The number of fragments that would hit a target touching the explosive device is given for each weapon, and the number available to attack a target declines with range just as blast damage does, as indicated on the table. E.g. if a grenade has 200 fragments, then at 1 meter, 50 of them can attack each target, and at two meters 22 attack each target. Fragments have an effective range, a penetration value, and a damage value, just like projectiles from projectile weapons. They are treated as though they were projectiles fired from small arms by a shooter with a skill level of three.

Example: A fragmentation hand grenade goes off three meters from Private Nelson. This hand grenade does 40 points of blast damage and has 1000 fragments with an effective range of 3 meters and a penetration of 5 and damage of 8. At three meters, Nelson takes 6% blast damage, or about 3 points. This applies to the parts of his body directly exposed to the grenade. Nelson is also attacked by 60 fragments from the grenade (6% of 1000 fragments is 60). Rolling 8 on 2d6 and adding 3 results in 11 successes. This is modified by –2 since Nelson is at the maximum effective range of the grenade's fragments, leaving 9 successes. With 9 successes, one fragment in 32 will hit, so Nelson is hit by one fragment. The GM would roll for hit location and resolve damage for this fragment as with any projectile weapon.

Grenades

Murphy's Military Law #26:
A grenade with a seven second fuse will detonate in four seconds.

Grenades come in two basic types: hand grenades and launcher grenades. Hand grenades are thrown by hand at their targets, while launcher grenades are fired from a grenade launcher. Some launcher grenades can also be thrown by hand.

Grenades may be fused in a number of ways. For hand grenades, the most common fuses cause the grenade to explode a number of seconds (selectable from about 3 to 30) after the grenade pin has been pulled and the safety lever has been released. Launcher grenades are usually fused to explode when they hit something, but only after they have traveled far enough away from their launcher to avoid harming the firer when they explode. (They will usually be able to explode 10 to 20 meters from the launcher, but will not explode nearer than this because their fuse prevents it.) After clearing the minimum safety distance, they will explode upon impact with a target of armor value one or greater, including the ground. Some launcher grenades may also be fused to explode once they have flown a certain distance.

Specific grenade types are listed on the weapons list.

When grenades are thrown, treat ranges for thrown weapons the same as ranged projectile or directed energy weapons. The thrower will have an Effective Range for his or her throwing ability, calculated during character generation. The range-modified difficulty of the throw will be determined from these range abilities as in the case of projectile or directed energy weapons.

Apply damage from grenades according to the Explosives rules above, on page 59.

Deviation of thrown weapons is covered in the fire deviation rules on page 54.

Medical Rules

In this section you will find the rules pertaining to characters' health, including fatigue and the immediate and long-term effects of wounds, and the application of penalties to characters' actions to reflect their impairment.

Fatigue

"Fatigue" is an important concept in Vanguard because it is a catchall term for the results of any activity or condition that tends to impair a character's task performance by debilitating or exhausting the character. Exercise, wounds, sickness, lack of sleep, lack of food, or drug influence are all sources of fatigue. Characters accumulate *fatigue points* when they have experiences like these that can impair their performance. When the number of accumulated fatigue points exceeds certain levels, characters suffer penalties to their actions, or lose consciousness, or die. Characters' responses to fatigue depend upon their fatigue tolerance, which is a function of Stamina and Motivation, as will be detailed below.

Four effects of fatigue are recognized. After characters have accumulated as many fatigue points as their Impaired (-1) levels allow them to tolerate, they are Impaired, which means that the characters' actions are performed with a -1 success penalty. When a character reaches his or her Delirious (-3) level, a -3 success penalty is suffered. When the fatigue points equal the Incapacitation/Unconsciousness Level, a character is incapacitated or unconscious, at the GM's discretion, and may not act. When fatigue points equal the Death level the character is dead.

These levels are calculated as follows (discarding fractions):

Character's Fatigue Level	*Formula*	*Common Human Range*
Impaired (-1 action penalty)	(Stamina + Motivation)/2	2 to 5
Delirious (-3 action penalty)	Stamina + Motivation	4 to 10
Incapacitated/Unconscious	(Stamina + Motivation)x2	8 to 20
Dead	6 x Stamina, or the Incap/Unc. level + 1, whichever is higher	12 to 30

For example, Osano has a Stamina of 3 and a Strength of 4. He is impaired when he has taken 3 fatigue points. He is delirious from 7 or more points. He is incapacitated by 14 points, and if he takes 18 points he will die.

Once a character has accrued any fatigue points at all, he or she feels more than a little tired. When a character reaches the Impaired (-1) level, the character would be aptly described as quite weary, and will relish the opportunity to rest. At the Delirious (-3) level, the character is exhausted and feels near the brink of collapse. At the Incapacitated/Unconscious level, the character collapses, unable to act.

Kinds of Fatigue & How They Come and Go

While fatigue points from all sources have the same effects on a character, points of fatigue can be earned in innumerable different ways. Standouts among them include physical exertion, illness, wounds, sleep or food depravation, or drug influences. Obviously fatigue caused by such different sources will demand different remedies, and the fatigue will abate at different rates. The preferred remedy for fatigue caused by physical exertion is rest; the preferred remedy for fatigue caused by wounds is medical treatment; etc. Because of the different sources and rates of abatement of fatigue of different types, it is very important to note the source of all fatigue points that a character earns.

If a character passes out from fatigue he or she will not regain consciousness until the fatigue has abated to a level above the Incapacitation/Unconsciousness level; when the character has fewer fatigue points than this, the game master should make a Moderate (+0) time-based Stamina check, with a base time of 30 minutes, to see how long it takes the character to wake up spontaneously. Alternately, the character may be awakened by other characters or environmental stimuli such as loud noise.

Movement, Exercise, and Encumbrance

Physical exercise is perhaps the most common source of fatigue. Very light exercise will cause fatigue to accumulate slowly, at a rate of one point every couple of hours. Strenuous exertion could lead to fatigue points in minutes or less. Observe the following guidelines:

Activity	*Rate of exhaustion (carrying no load)*
Walking (1/4 base movement rate)*	1 fatigue point per hour
Brisk walk (1/3 base movement rate)*	1 fatigue point per ½ hour
Jogging (1/2 base movement rate)*	1 fatigue point per 10 minutes
Running (1 x base movement rate)*	1 fatigue point per minute
Sprinting (1.5 x base movement rate)*	1 fatigue point per (5 second) turn
Swimming	1 fatigue point per (2 min. x skill level)
Climbing	1 x (meters of ascent per turn) per minute
Active participant in a firefight	1 per minute
Working in a vacuum suit	rate of exhaustion for any activity increased by 15%

*Note: characters cannot walk with a load greater than four times their ordinary carrying capacity. The maximum load for a brisk walk is two times ordinary carrying capacity; jogging is limited to 1.5 times carrying capacity; running is limited to carrying capacity; sprinting is limited to one half carrying capacity.

Carrying a load increases the rate of fatigue accrual as a function of the percentage of carrying capacity used. Multiply this percentage (i.e. load carried/carrying capacity) by the rate of fatigue accumulation indicated on the table above and add this to the rate indicated. For example, a character carrying a load weighing half of his or her carrying capacity would accumulate fatigue points at a rate of 1.5 times the rate indicated on the table. We suggest that GMs ignore the extra fatigue caused by very small loads.

Fatigue from exercise should typically abate at a rate of about one point per 10 minutes of rest. However, characters will recover from the fatigue caused by brief spurts of intense activity somewhat faster than this.

Sleep Deprivation

Sleep deprivation fatigue is accumulated at a rate of one point for every three full hours that the character remains awake beyond 15 hours. Sleep deprivation fatigue is reduced at a rate of one point for every two hours slept, or eliminated entirely with twelve hours sleep, whichever is less.

Stun

Stun is a special kind of impairment produced by stun weapons such as chemical or sonic stunners. Weapons that produce stun damage can impair or incapacitate characters who take more stun points than their Impaired (-1), Delirious (-3), or Incapacitated/ Unconscious fatigue levels. Characters usually cannot be killed by stun fatigue.

Recovery from stun attacks can vary from weapon to weapon, but ordinarily the fatigue from stun attacks abates at a rate of one per turn. However, if a character is rendered unconscious by stun fatigue that equals or exceeds the Incapacitation/ Unconsciousness level, then the character will remain unconscious for a time even after the fatigue subsides to a number of stun points less than the Incap./Unc. level. Determine this time with a Moderate(+0) time-based Stamina check with a base time of one minute (12 combat turns).

Shock

Shock is a special kind of impairment produced by wounds. Shock indicates the immediate and transient effect of receiving a wound. The number of shock fatigue points suffered as a result of a wound is determined according to the Wounds rules below. These points abate immediately but cause special effects.

If the number of shock points caused by a single wound exceeds the character's Impaired (-1) fatigue level then the character's next action will be performed with a -1 success penalty. If the shock points exceed the character's Delirious (-3) fatigue level then the character's next action will be performed with a -3 success penalty. If the shock points exceed the character's Incapacitated/Unconscious level, then the character is in a temporary state of incapacitating shock and will remain unable to act for a time determined by a Moderate (+0) time-based Stamina check with a base time of one minute (12 combat turns). If the shock points exceed the character's fatigue Death level then the character dies.

As noted, shock fatigue abates instantly and each wound is treated separately (so shock points do not add up as wounds accumulate).

Wounds and Bleeding

Severe wounds will cause an accumulation of fatigue until medical treatment is successful or the wounds stabilize themselves spontaneously. Rules for this kind of fatigue are described in the Wounds section, below.

Wounds

*"If troops believe that the decimation of their unit is due to the incompetence of their commander, the probability of mutiny is tremendously increased. Therefore, it would help to have **GOOD EXCUSES** in mind before you publish the casualty list."*
Commodore Edfred's Reflection

Wound-causing damage is expressed in terms of damage points. The susceptibility of a character to wounds from these damage points is indicated by the character's fatigue tolerance, measured by the Impairment, Delirious, Incapacitation/Unconsciousness, and Death levels. When a character suffers damage points, the game master rolls on the hit location table to determine what part of the character's body was hurt. The number of damage points sustained at that location is multiplied by the location's damage multiplier to determine an effective damage for the location. Once effective damage has been established a d10 is rolled and the Wound Table is consulted to determine the specific characteristics of the wound.

This sounds more complicated than it actually is. Just follow these steps:

1. Roll d100 for hit location. You make this roll on the table called Hit Location, Damage, and Penetration Multipliers (Table 1, page 66). (You may also have to consider armor penetration, which is explained in the armor section of the combat rules; see page 49.)
2. Multiply the damage multiplier for the wounded body part by the number of points of damage caused by the weapon. This determines the effective damage (and thereby Wound Class).
   (If effective damage is less than one point, the injury is just a scratch. It may hurt, and it may deserve a band-aid, but it does not count as a wound.)
   If effective damage is 1 – 4 points then the wound class is *MINOR*.
   If effective damage is 5 – 9 points then the wound is *MODERATE*.
   If effective damage is 10 – 16 points then the wound is *SEVERE*.
   If effective damage is 17 – 26 points then the wound is *GRAVE*.
   If effective damage is 27 or more points then the wound is *CATASTROPHIC*.
3. Turn to the Wound Effects table (Table 2, page 66). Roll 1d10 for the severity of the wound under the appropriate Wound Class column (minor, moderate, etc.).
4. Apply the listed wound effects to the wounded character.

The wound effects listed on the wound table will be a combination of three kinds of effects: shock (which is a special type of fatigue), success penalties for tasks attempted with a damaged body part, and an accumulation of wound-based fatigue, caused primarily by blood loss and general cardiopulmonary system failure. Each is described below.

Shock: As explained in the Fatigue rules above, shock is a special kind of fatigue produced by wounds. Shock indicates the immediate and transient effect of receiving a wound. The number of shock points suffered as a result of a wound is indicated on the Wound Effects table. These points abate immediately but cause special effects.

If the number of shock points caused by a single wound exceeds the character's Impaired (-1) level then the character's next action will be performed with a -1 success penalty. If the shock points exceed the character's Delirious (-3) level then the character's

next action will be performed with a -3 success penalty. If the shock points exceed the character's Incapacitated/Unconscious level, then the character is stunned and will remain unable to act for a time determined by a Moderate (+0) time-based Stamina check with a base time of one minute (12 turns). If the shock points exceed the character's fatigue Death level then the character dies.

Shock to the head is doubled; shock to the limbs is halved. This represents the head's particular sensitivity to wounds and the limbs' relative insensitivity.

Success penalties to actions: The Wound Effects table may also indicate that the wounded character suffers penalties to the number of successes achieved when actions are taken involving the wounded body location. This represents the effects of pain and physical damage to the wounded location. (For wounds to the head and upper torso, these penalties apply to all actions.) These penalties are cumulative, so that if a location suffering a penalty takes another wound, the penalties of the old and new wounds are added together for subsequent actions. For instance, if Bob has a -2 wound to the arm and takes a second wound worth -3, Bob's arm is at -5.

A location which suffers a penalty of -10 is all but destroyed, and cannot be used. If a character's head, neck, or upper torso suffer a penalty of -10 then the character dies.

Wound Fatigue: When characters are severely injured, they require stabilization (emergency medical treatment) or they suffer increasing risk of death, usually from blood loss or cardiopulmonary system failure. The accumulation of wound-based fatigue represents this condition. (Stopping this accumulation of fatigue is a task explained in the Emergency Medical Treatment and Wound Stabilization section on page 67.) The result you obtain on the Wound Table (from rolling 1d10 for the appropriate wound class) may indicate a rate of fatigue accumulation, such as one point per five minutes. Simply add to the character's fatigue levels at the rate indicated on the wound table. (Remember to distinguish between sources of fatigue when recording levels on the character sheet, as different sources of fatigue are healed or otherwise abated in different ways.)

Dead characters continue to take fatigue for 30 seconds (six turns), whereupon they automatically stabilize at their calculated fatigue level or their Incap./Unc. level, whichever is lower. Of course this is moot unless the characters are revived; the additional fatigue accumulated after death makes resuscitation more difficult, if it is attempted.

Table 1: Hit Location, Damage, and Penetration Multipliers

Range: Close	Range: ≤ Eff	Range: > Eff	Hit Location (with damage multiplier)	Penetration Multiplier
01-02	01	01	upper head (3)	2
03	02-03	02	upper head (3)	1
04	04	03-04	upper head (3)	½
05-06	05	05	lower head (2)	2
07	06-07	06	lower head (2)	1
08	08	07-08	lower head (2)	½
09	09	09	neck (2)	2
10	10	10	neck (2)	1
11	11	11	neck (2)	½
12-19	12-16	12-14	upper torso (1)	2
20-35	17-33	15-30	upper torso (1)	1
36-38	34-38	31-38	upper torso (1)	½
39-44	39-42	39-40	lower torso (1)	2
45-56	43-54	41-52	lower torso (1)	1
57-58	55-58	53-58	lower torso (1)	½
59-61	59-60	59	shoulder/upper arm (¾)	2
62-68	61-67	60-66	shoulder/upper arm (¾)	1
69	68-69	67-69	shoulder/upper arm (¾)	½
70-72	70-71	70	forearm/hand (½)	2
73-76	72-76	71-75	forearm/hand (½)	1
77	77	76-77	forearm/hand (½)	½
78-80	78-79	78	upper leg (¾)	2
81-87	80-86	79-85	upper leg (¾)	1
88-89	87-89	86-89	upper leg (¾)	½
90-92	90-91	90	lower leg (½)	2
93-98	92-97	91-96	lower leg (½)	1
99	98-99	97-99	lower leg (½)	½
100	100	100	"skim;" re-roll for another location and use one-tenth of the listed damage and penetration	

If pen. < AV, no effect.*
If pen. ≥ AV, ½ damage
If pen. ≥ 2AV, 1x damage

** If armor is non-rigid, apply 1/10th damage for impact. If armor is rigid, apply 1/25th dam. for impact.*

Average Shock & Fatigue Values:

-1 impair: 3
-3 impair: 7
Incap/Unc: 14
Dead: 21

Table 2: Wound Effects

d10	*Minor* (1 – 4)			*Moderate* (5 – 9)			*Severe* (10 – 16)			*Grave* (17 – 26)			*Catastrophic* (27+)		
	shock	-*n*L	fatigue	shock	-*n*L	fatigue	shock	-*n*L	fatigue	shock	-*n*L	fatigue	shock	-*n*L	fatigue
1	3			6		2 hrs.	15	-3L	30 min	7	-5L	5 min	20	-10	1 min
2	4			2	-2L		6	-4L	30 min	11	-5L	5 min	40	-10	5 sec.
3	2	-1L		4	-3L	2 hrs.	8	-2L	5 min	12	-10	1 min	20	-5L	3/turn
4	1	-1L		5	-2L		7	-3L	1 min	8	-3L	5 sec.	15	-10	3/turn
5	4	-1L	2 hrs.	10	-1L	30 min	11	-5L	5 min	10	-5L	1 min	40	-10	3/turn
6		-1L		12	-2L	30 min	8	-6L	5 min	15	-10	5 min	30	-10	5 sec.
7	5	-1L	2 hrs.	4	-3L		12	-7L	1 min	20	-10	1 min	25	-10	3/turn
8	5	-1L	2 hrs.	14	-3L	2 hrs.	5	-9L	5 min	10	-5L	5 sec.	20	-10	3/turn
9	6	-1L		6	-4L	5 min	14	-10	1 min	22	-10	3/turn	50	-10	3/turn
10	5	-2L	30 min	15	-4L	30 min	15	-10	5 sec.	25	-10	5 sec.	30	-10	5 sec.

"Shock" is applied to the fatigue indices to determine immediate effects; shock to the head is doubled; shock to limbs is halved.
"-*n*L" indicates the number of penalties to success suffered when using the wounded location. Head and torso hits affect all locations and all tasks. A -10 to the head, neck, or upper torso causes death. Wound penalties per location are cumulative; a –2 wound followed by a –1 wound makes a –3 wound.
"fatigue" indicates the amount of time it takes to accumulate one fatigue point from the wound, until it is treated (stabilized). E.g. "1 min" indicates that fatigue is accumulated at a rate of one point per minute. "3/turn" indicates three fatigue points per combat turn (5 seconds).

Wound Stabilization, Recovery, and Permanent Effects

Wound treatment involves two stages. The first is stopping the accumulation of fatigue from bleeding, organ failure, and the like. This occurs as soon after injury as possible. The second stage involves care throughout the period of convalescence, which may take many days. Also, serious wounds can leave permanent injury.

> *"Your troops will be more loyal if you appear to make every effort to save the wounded."*
> *Commodore Edfred*

Emergency Medical Treatment and Wound Stabilization

Initial wound treatment is a First Aid or Emergency Medicine task. Note that the treatment of each wound is a separate task. The difficulty of wound treatment (stabilization: stopping the accumulation of fatigue) is based on the Wound Class and the rate at which fatigue is accumulated:

Table 3: Wound Stabilization Difficulty

Blood loss (fatigue) rate	MINOR	MODERATE	SEVERE	GRAVE	CATASTROPHIC
none	unnecessary	unnecessary	---	---	---
2 hours	+4	+4	---	---	---
30 minutes	+3	+3	+2	---	---
5 minutes	---	+2	+1	0	---
1 minute	---	---	0	-1	-2
5 sec. (1 turn)	---	---	---	-2	-2
3 per turn	---	---	---	-2	-3

Additionally, each three fatigue levels accumulated (from any source) cause a -1 penalty to success of treatment. Further, the treatment facilities or equipment available affect the treatment task as follows:

Emergency Treatment Facilities or Equipment	*success modifier*
Scrounged materials such as cloth, belt, stick, stylus, etc.	-4
Most basic first aid kit with bandages	-3
Standard first aid kit, with plenty of bandages, burn gauze, tweezers, scissors, etc.	-2
Advanced first aid kit, including basic drugs	-1
Doctor's Medical kit with good supply of drugs, IV fluid administration capacity, and instruments.	0
Doctor's Medical Kit, plus Medscanner. (This is the most advanced equipment that can be used with the First Aid skill.)	+1
Normal Ambulance, or Infirmary	+2
Advanced Ambulance or Aid Station	+3
Average Hospital Emergency Room	+5
Advanced Emergency Room	+6

Note: When equipment is obviously irrelevant to the treatment task, disregard these modifiers. For example, performing the Heimlich maneuver does not require any equipment, so the -5 modifier which ordinarily applies when no equipment is available would not apply in this case.

When stabilization (emergency medical treatment) is attempted, the GM resolves the action on the ARC, taking in account the modifiers to task difficulty described above. (If the amount of time required to complete an attempted wound stabilization is crucial, roll the same task check again as a time-based task with a base time of 1 minute.) The results of the treatment task are described as follows.

Successes	*Outcome*
5 or fewer (terrible)	Additional -1L to wounded location and blood loss (i.e. fatigue) rate doubles.
6 (poor)	Blood loss (wound fatigue accumulation) rate increases by 50%.
7–8 (poor)	Failure to stabilize wound; no other effects.
9 (marginal)	Fatigue accumulation (blood loss) rate cut in half.
10–11 (average)	Wound stabilized.
12–13 (good)	Wound stabilized.
14 (excellent)	Wound stabilized.
15+ (excellent)	Wound stabilized.

Spontaneous Wound Stabilization

Wound stabilization will sometimes occur spontaneously, without medical treatment. The task is based on Stamina instead of a medical skill, and the modifiers in the wound recovery table apply. Additionally, there is a -3 penalty. Check for spontaneous stabilization after every *hour* until stabilization or death occurs. Obviously characters with wounds serious enough to cause death within an hour do not have the potential for spontaneous stabilization.

Wound Recovery

If wounded characters receive successful initial stabilization (i.e. if their wounds are "stabilized" and they don't die immediately after their injury) characters are likely to recover eventually if they have bed rest and decent medical care.

Recovery is resolved on the ARC as a time based action. The base time to heal completely is based on Wound Class and the total amount of wound fatigue suffered before stabilization or the success penalty to the injured location, whichever is higher. This time is indicated in the table below.

Table 4: Wound Recovery Times

	MINOR	MODERATE	SEVERE	GRAVE	CATASTROPHIC
No fatigue; -1 to location	5 days	10 days	18 days	24 days	36 days
1 fatigue; -2 to location	6 days	12 days	20 days	28 days	40 days
2-4; -3 to location	6 days	14 days	22 days	32 days	44 days
5-8; -4 to location	7 days	18 days	24 days	36 days	48 days
9-14; -5 to location	9 days	20 days	28 days	40 days	52 days
15-20; -6 to location	14 days	22 days	32 days	44 days	56 days
21-25; -7 or -8 to loc.	20 days	24 days	36 days	48 days	60 days
26+ ; -9 or -10 to loc.	26 days	30 days	42 days	54 days	64 days
Died*	45 days*	55 days*	60 days*	65 days*	70 days*

* Recovery is only possible if resuscitation is successful.

The difficulty of treatment is Moderate (+0). This is modified by the type of medical facilities and equipment being used during the recovery period, as follows: unsanitary conditions result in a –3 penalty, while sanitary conditions cause no modifier; having no medical equipment results in a –1 penalty, while having simple medical equipment such as a doctor's medical kit results in no modifier and having good facilities such as a hospital results in a +2 modifier. The relevant skill is Internal Medicine. If no treatment is made, use the patient's Stamina with a –2 penalty.

Bed rest is required during the first 10% of the recovery period following a wound that resulted in fatigue. Failure to obtain bed rest puts the character's wound at risk of the resumption of the accumulation of fatigue. E.g. if the character moves about more than a trivial amount (at the GM's discretion), make a Stamina check using the Wound Recovery Table modifiers to see if the character resumes blood loss at the original blood loss rate.

If characters have several wounds they will all heal in parallel, rather than sequentially, so the total healing time will be that required for the most severe wound. Healing may be treated as a linear reduction in fatigue levels and location success penalties applied over the indicated healing time.

For example, Richard has two wounds. From a Severe wound on his arm he has suffered -3 to the location and five points of general fatigue. From a Moderate wound to his head he has suffered -2 to the location and four points of general fatigue. Since fatigue from different wounds is cumulative, Richard has suffered nine points of fatigue. Nine points of fatigue are more serious than the -3 to his arm or the -2 to his head, so look at the "9-14; -5 to location" row of the recovery table. Then cross to the more serious of his wounds, which is Severe, to find that his base healing time will be 28 days. Make a check for Richard's doctor's treatment of him to find how long recovery actually takes. The doctor's skill is 4, and Richard is in the hospital, offering a +2. Rolling 5 on the 2d6 with a skill of 4 and a +2 modifier results in 11 successes, which the Time row shows is 1x the nominal time, so Richard recovers in 28 days.

Permanent Injuries

Even after healing, wounds may lead to reduced functionality of limbs, paralysis, or loss of limbs or organs altogether. If a location reaches -10L then the damaged location is at risk of permanent damage (except the head, which is at risk at -8). Roll a Stamina check and consult the appropriate table below for permanent effects.

Table 5: Permanent Body Injuries

Successes	*Effects*
5 or less (terrible)	For limbs, loss of limb. For torso, loss of an internal organ. (GM's choice which organ is lost. A replacement will be required.)
6 (poor)	Permanent -3 to all tasks performed with the limb.
7–8 (poor)	Permanent -2 to all tasks performed with the limb.
9 (marginal)	Permanent -1 to all tasks performed with the limb.
10–11 (average)	Tissue scaring only.
12–13 (good)	Tissue scaring only.
14 (excellent)	Tissue scaring only.
15+ (excellent)	Tissue scaring only.

Table 6: Permanent Head Injuries

Successes	*Effects*
5 or less (terrible)	66% reduction in intelligence and intelligence-based skills.
6 (poor)	40% reduction in intelligence and intelligence-based skills.
7 (poor)	30% reduction in intelligence and intelligence-based skills.
8 (poor)	20% reduction in intelligence and intelligence-based skills.
9 (marginal)	10% reduction in intelligence and intelligence-based skills.
10 (average)	Personality shift. (Player and GM should develop this.)
11 (average)	Severe permanent amnesia.
12 (good)	Partial permanent amnesia.
13 (good)	Partial amnesia lasting a few days.
14 (excellent)	No effects.
15+ (excellent)	No effects.

Milestones: A Historical Timeline

This is a timeline of science, technology, and politics from the conclusion of the twentieth century to the time of the game setting, 2140.

Top ten social and technological innovations since the beginning of the 21st century:

1. FTL travel
2. nanomedicine
3. autoproducers
4. high-temperature superconductors
5. ubiquitous networked computing
6. multinational federations
7. city-states (microsovereignties)
8. high-strength molecular carbon fiber (nanotubes, buckyballs, etc.)
9. cheap, safe power from fusion reactors and solar power satellites
10. fusion plasma spaceship propulsion

Late Twentieth Century

Politics: Dissolution of the Soviet Union ends the Cold War and brings down the Iron Curtain. Germany is reunited. The US war machine shrinks. Beginnings of the European Union.

Science and Technology: Discovery of extra-solar planets. Human cloning becomes possible. Growth of global computer networks.

2001-2010

Politics: India, Pakistan, Afghanistan, and China take sides in the brewing discord among the former Soviet Tajik, Uzbek, and Kazakh republics. Sporadic minor skirmishes erupt into large scale conflict in 2008 in the Central Asian War in which China and Pakistan fight India, Afghanistan, and forces in the Tajik, Uzbek, and Kazakh Republics. Japan sends warships to the Indian Ocean as part of an international peacekeeping force.

Science and Technology: **Hypersonic space plane** and single-stage to orbit (SSTO) orbital launch vehicles are deployed for service. Small but permanent **space stations** are completed. A **CELSS** (Closed Environmental Life-Support System) is tested successfully by the Japanese; this is a milestone in space development because allows a station to be self-sufficient for very long periods of time. Japanese space agency lands a robot **prospector on a near-Earth asteroid** and reveals the presence of valuable minerals.

"It's been a long trip for us, but it's a great journey for humankind."
Keiko Yoshioka, Japanese National Aerospace Agency, upon arrival on Mars, 2020.

2011-2020

Politics: The Mitsukawa Corporation is founded in Japan. The US withdraws its troops from Japan. First woman president of the US. (2012). Beginning of the rise of multi-party politics in the US. Japan develops nuclear weapons, permanently souring Japanese-American relations. Mexican depression begins. The European Union solidifies into a confederation, essentially one country. North Korea is

peacefully absorbed by South Korea. The Chinese Communist government falls and is replaced by a marginally less malevolent authoritarian regime.

Science and Technology: Sales of electrically powered cars surpass sales of fuel-burning cars in the United States. Vectored thrust ducted fan aircraft generally replace helicopters. Genetically engineered pest and disease resistant crops greatly increase world food production capacities. A sea-floor mining station is constructed in the North Sea. The Japanese establish an **outpost on the Moon**. Americans construct a module for simulated gravity (induced by rotation) on space station. The first **privately funded space station** is completed (2018) by Mitsukawa corporation of Japan. France constructs the first useful commercial nuclear **fusion power plant** (2019). The first **humans land on Mars** (2020) in a multinational project to explore the remnants of life that once existed there.

> *"I am Martian."*
> *Early Mars colonist, 2029.*

2021-2030

Politics: First non-white (Hispanic) US president elected in 2024. The Mexican Civil War begins (2025). Mexican government dissolves. US Army begins policing the US border with Mexico to keep refugees out in Operation Weatherseal. Simon Industries founded in Canada. Canada, the European Union and the United States merge their currencies, making Euros and Canadian and American dollars interchangeable. Norway secedes from the EU and joins Sweden to form the Scandinavian Union of Norway and Sweden; they are later joined by Finland, Denmark, and Iceland. A Cold War begins to develop between Japan and the United States. Entrenchment of multi-party politics in the US. The International Covenant on Extraterrestrial Territory and Sovereignty is signed by most space-faring nations, laying the groundwork for the rise of **microsovereignties** in the coming decades. Countries with economies with a strong basis in oil production (Mexico, Russia, Venezuela, the United States, Middle Eastern countries, and others) begin suffering from the decline in use of oil as an energy source.

Science and Technology: The AIDS virus is eradicated. Human **hibernation** system developed, allowing extended periods of human hibernation. **Laser-launch** system for spacecraft in use. **Solar power satellites** send microwave power to receiving stations on Earth. An **outpost on Mars** is established. Mars mission locates **water ice on the Martian moon Phobos**. Japanese company Mitsukawa begins **mining near-Earth asteroid**. US, European, and Mitsukawan **stations constructed on the moon**. The number of humans in space at any given time regularly exceeds 200.

> *"We have pioneered*
> *the first commercially viable*
> *use of deep space.*
> *We are the only non-government*
> *entity with an outpost on the moon.*
> *We lead the world*
> *in the development of*
> *orbital lift systems.*
> *Aerospace development is the*
> *most promising field*
> *for this civilization,*
> *and our goal is to remain the*
> *dominant force in*
> *aerospace development*
> *for the foreseeable future."*
> *Mitsukawa Corporation, Annual Report, 2029.*

2031-2040

Politics: The United States invades Mexico (2032). Japanese investors in China control significant Chinese assets. Civil war begins in China, where factions of Communists and Democrats fight for regional control (2039). Japan commits troops to aid a faction in the Chinese civil war. Hostility between Japan and the United States develops into a bloc-system Cold War, with the USA and the EU opposing Brazil, India, and Japan. The Mitsukawa corporation is by far the largest company in the world, having grown twice as large as any other company, with revenue greater than the GNP of many countries.

"It matters not whether the British attempt food, fashion, or football. They are always losers."
French entertainer, 2038.

"The French are a bunch of tiresome, arrogant snots who would do well to just put on some deodorant and shut up."
British entertainer, 2038.

Science and Technology: The US and the EU begin near-Earth asteroid mining, following the footsteps of the Japanese. Manned ship sent by the ESA reaches Jupiter (2032). Large space station constructed by Mitsukawa Corporation in the Lagrange orbit. USA begins construction of **Island One**, a space station to house 2,000 people. Growth of Martian colonies. Off-Earth population exceeds 1000.

2041-2050

Politics: A coup in the Chinese government broadens the civil war already under way. Vietnam invades Kwangsi, in south China, while India invades Tibet and Kazakhstan sends troops in support of Sinkiang's declaration of independence from China. Australia and the United States send troops to Canton to deter further Vietnamese advancement into China. Japan sternly condemns American involvement in the war. India supports Vietnam in a coordinated occupation of southern China. Tibetan nationalists use a small tactical nuclear weapon in battle against Indian forces. India responds with a single nuclear attack of its own against Tibet before negotiating a truce.

Science and Technology: **Martian-LEO slow transfer system in place**, ferrying supplies to Mars and water and organic materials to LEO with a round trip time of 2.7 years. Island One space station completed by the United States. Mitsukawa expands its lunar station to a city of 2000 inhabitants. First generation of hypervelocity **fusion plasma spacecraft**. Manned missions to Saturn, Uranus, Neptune, and Pluto. Off-Earth population exceeds 10,000.

2051-2060

Politics: The civil war in China, already underway for 15 years, intensifies in 2054. With a Chinese faction rising to dominance that is very hostile to Japan and Japanese investment interests in China, Japan lands troops in Shanghai, allegedly at the request of Shanghai's mayor. In the face of advancing Chinese forces, Japanese troops proceed to capture the nearby cities of Songjiang and Suzhou, where many Japanese-owned businesses are located. In a rapid escalation, Japan delivers 600,000 troops and a large supply of equipment to aid the Chinese faction that it favors. Korea begins backing an opposing group waging a guerrilla war against the Japanese, and sends troops to support that faction. Japan occupies the Jiangsu and Shandong provinces of China and captures Korean military advisors in Shandong as prisoners of war. Korea sends a large force to occupy Jinan in an attempt to deter further Japanese troop advancement, but the Japanese and Korean forces battle over the city, destroying much of it and suffering heavy casualties in fierce, protracted fighting. Battles occur in near-Earth orbit between Japanese forces and American forces attempting to aid the Koreans by interdicting Japanese support lines. Meanwhile, on Japan's domestic scene, a scandal erupts as political corruption is revealed in which Japanese leaders accepted bribes from officials of Mitsukawa to conduct their military operations in China in pursuit of Mitsukawa's corporate interests. The Japanese

"The Goddamned Japanese
had better get it
through their heads
that we are not going to
let them have China.
We'll kick their asses from here to
THE MOON
if it takes them that long
to get the message."
General Calvin Janda, Chair of the Joint Chiefs of Staff, USA, 2055

*"**HOLY SHIT**, FTL works!"*
Mitsukawan research spokesperson, 2055.

"The problem with the Americans
is that, aside from being
preposterously belligerent,
they have the audacity to assume
that everyone
should care what they think.
WE DON'T.
We have mastery over space.
We don't need them,
and we will leave them behind."
President Hiro Korematsu, Republic of Mitsukawa, 2057.

military is revealed to have conducted strategic strikes against Chinese industrial targets upon Mitsukawan instructions. A punitive embargo against Japan is imposed by most nations, and the Japanese government falls after failing a parliamentary vote of confidence. The new government initiates anti-trust proceedings against Mitsukawa, seeking to break up the gigantic company and nationalize parts of it. Mitsukawa responds by declaring itself independent of Japan and transporting most of its operations to other countries, notably Brazil, India, and South Africa, where it is already a powerful economic and political force. The entity becomes a sovereign corporation, based initially in near-Earth orbit and the asteroids. The Chinese civil war ends in 2056 with the division of the country into four autonomous states of China, Tibet, Sinkiang, and Manchuria. Japan's economy collapses into depression following the imposition of the trade embargo and the loss of Mitsukawa.

Science and Technology: **FTL drive** tested successfully by Mitsukawa (2055). In violation of Mitsukawa's claimed patent on the technology, the Americans and Europeans build FTL ships of their own. Large space stations are constructed to facilitate construction of FTL ships. Second generation of fusion plasma spacecraft. The star-systems of Crossroads (2056), Mitsukawa (2057), Paradise (2057), Furehjelm (2058), and Elysium (2060) are discovered. The Mitsukawa Corporation declares itself the Republic of Mitsukawa. Off-Earth population exceeds 50,000. Number of FTL-capable vessels reaches 12.

2061-2070

Politics: The **Multi-Planetary Co-Prosperity Sphere** is established by Mitsukawa, Brazil, South Africa, and India. Mitsukawa's strategic position in the wormhole network allows it to build wealth rapidly as a center of trade, and the resources of the Mitsukawa star system afford the Mitsukawans an enviable position as suppliers of spacecraft fusion fuel.

Science and Technology: Off-Earth population exceeds 150,000. Number of FTL-capable vessels reaches 104.

2071-2080

Politics: East-Asian war (2074-2084, with cease-fire from 2076-81) reunites most of China. Tibet and Sinkiang remain independent. **Microsovereignties** begin proliferating rapidly as space colonization accelerates.

Science and Technology: Third generation of fusion plasma spacecraft. Off-Earth population exceeds 500,000. Number of FTL-capable vessels reaches 397.

> *"These pioneers have a kind of faith that rivals the strongest of religions. They know that the last, best destiny of humankind is to go out into space, and for them to be a part of it is the most fantastic and rewarding thing they can imagine. They've found* ***HEAVEN IN THE HEAVENS.****"*
> *Jesus M. Lightfoot, reporter for the Houston Gazette, 2075.*

2081-2090

Politics: **The Interruption**: Without warning, in 2081 the FTL jump corridor between Crossroads and Earth closes for a period of eight months, then resumes. This all but kills the interstellar tourist industry for the next several years, but is credited with

winning considerable political autonomy for the colonies. Independence of Furehjelm from EU; independence of Elysium from India. Pact of the **Interstellar Security and Development League** among Furehjelm, Elysium, China, and Indonesia.

Science and Technology: Off-Earth population exceeds 1,100,000. Number of FTL-capable vessels reaches 682.

"We shall put an end to evolution as a process of stochastic mutation and take charge of life itself. The notion that 'nature' should determine the path of our species is archaic. WE WILL CHOOSE our own destines."
Divija Kunwarjit, Minister of Technology, Empire of Furehjelm, 2092.

2091-2100

Politics: With a large population in the colonies and a large number of starships, piracy begins to take off in the more remote reaches of space. Some governments commission privateers to patrol shipping routes or escort transport vessels.

Science and Technology: Off-Earth population exceeds 2.9 million. Number of FTL-capable vessels reaches 1005.

2101-2110

Politics: Détente begins between the ISDL and Sphere as the two face a common foe in the UN.

Science and Technology: Mitsukawa completes the first Cybernetic Autoproduction Facility (**cyberprod**). Off-Earth population exceeds 7.5 million. Number of FTL-capable vessels reaches 1732.

2111-2120

Politics: The number of microsovereignties exceeds 400.

Science and Technology: EU, American, and Furehjelmian cyberprods are developed. Fourth generation of fusion plasma spacecraft. Off-Earth population exceeds 16 million. Number of FTL-capable vessels reaches 2956.

"The freewheeling, optimistic, entrepreneurial and adventuresome spirit that is pervasive in the colonies is sucking the Earth dry of creative talent. The conservative, the content, the timid, and the old are happy to stay put on an Earth that is, in many ways, better than it has ever been as a place for ordinary humans to live. But the restless, the ambitious, and the audacious are jumping forth into space at breakneck pace. There they have the freedom to create new societies, to build not just new countries but whole new worlds."
Ambassador Myriam Dorabji, Empire of Furehjelm, 2106.

"The opening frontier has an awesome effect on culture. Everywhere the language of opportunity rolls off people's lips. Even if they are convinced they live in the most pitiful backwater in the hemisphere, perhaps especially if they are so convinced, they speak of the opportunities "out there." The chance to strike it rich. The destiny to see things no one has seen before. Nothing compares to the personal satisfaction of building a new world; of being among the "founders" who will be remembered for all time; of testing your capabilities in an environment where you really know that your successes are your own doing and where the results are tangible and impressive. You can lay your palm on the plexiglass dome you've just erected to contain the first habitat of your colony, and as you feel the heat being leeched through your skin you know, 'this dome is here because I struggled for it, and it's going to stand here for lifetimes, to give generations of people the chance to add splendor to these modest beginnings.'"
Interview with Professor Kim Sturgeon, Utopia Planetia University, 2112.

2121-2130

Politics: The number of microsovereignties exceeds 600.

Science and Technology: With developments in **nanomedicine** it becomes possible to **resuscitate some dead people** whose bodies were previously frozen for preservation until medical science could treat their ailments (a process known as cryo-preservation). Off-Earth population exceeds 40 million. Number of FTL-capable vessels reaches 4310.

*"The dead have risen and walk the Earth. Who can doubt that the **APOCALYPSE** is near?"*
American fundamentalist preacher, 2123.

*"The dead have risen and they **WANT ALL THEIR STUFF** back! Who can doubt that the apocalypse is near?"*
American comedian, 2123.

2131-2140

Politics: Game setting. Space development continues to be driven by what has been driving it for over a century: space offers amazing things to see, important things to learn, military advantages to be had, opportunities for profitable business, and the prospect of jobs. All five of these factors push in the same direction, and these factors in concert produce an inexorable force for colonization and exploration.

Science and Technology: Off-Earth population exceeds 90 million. Number of FTL-capable vessels reaches 6470.

Politics and Economy

Microsovereignties

From the time shortly after World War II, when most of the European powers gave up their colonial possessions around the world, until about a hundred years later when the colonization of space began in earnest, there were about 150 to 200 countries, or nation-states, in the international community. In the middle to late 21st century, developments in technology and international law allowed this number to climb to over 250, and in 2140 the count has ballooned to over 1000, with almost all of the growth off Earth. This increase has occurred because of a political innovation: microsovereignties.

The microsovereignty is a city-state with a space age twist. Technology has made possible—and the international community has sanctioned—the growth of numerous small settlements, first on the moon, Mars, and in Earth orbit, and later in the rest of the Solar system and on planets near other stars. Many of these settlements have sprung up without the help or direction of any established government. Instead, as space technology matured, the costs of transportation, construction, and life in space came within the reach of relatively small groups of people with large but not outlandish amounts of money. For instance, it is now possible to buy a prefabricated dome habitat capable of housing 50 people and have it installed on Luna for about $3 million, or about $60,000 per resident. This is less than the median price of a house in the United States, and larger domes can bring the price as low as $40,000 per resident. Of course, construction costs on Luna are much higher than in the US, but there is one major advantage of building on Luna instead of America: American land is expensive, and Lunar land is free. Martian habitats cost about the same as Lunar habitats; orbital habitats cost somewhat more.

> *"Every succeeding scientific discovery makes greater* ***NONSENSE*** *of old-time conceptions of sovereignty."*
> *Sir Anthony Eden,*
> *British Prime Minister*

Because the international law governing extraterrestrial territory prohibits countries from claiming land that has not been settled, the majority of Luna and Mars are unowned and up for grabs. Furthermore, the international law of citizenship permits colonists to renounce their citizenship prior to staking a claim on new extraterrestrial territory. Such colonists are free to declare themselves a new country, and often do. Thus the proliferation of very small, new, independent countries in space. These new countries, many with village-sized populations, present unique opportunities and dilemmas to their residents.

"Don't like
the way things are going
in this country? Start your own!
It only takes $500,000
to stake your claim, build your
homestead, and move in. You can
use an off-the-shelf constitution,
contract with specialty companies
to provide your military defense,
and write your own laws.
Don't like taxes?
Don't have any!
Want to call your country the
Empire of Fred? Go ahead. When
YOU'RE A SOVEREIGN
you can do whatever you want.
Don't have half a million?
Recruit some followers
and the cost can drop as low as
forty grand per person.
What are you waiting for?"
Advertisement in the
Los Angeles Times, 2135

Several groups have started new countries. All are idealists in some sense, who seek to structure an environment that will make it possible to attain some version of Utopia. Many have immodest names like Valhalla, Shangri-La, El Dorado, Arcadia, Milagro, and Nirvana.

Many of the groups that have started new countries are not at all likable, and the name Lunatic for a resident of Luna sometimes has a negative connotation. However, by no means all of the new microsovereignties organized for distasteful or offensive purposes. There are gangs of misfits, outcasts, and hooligans to be sure, but the appeal of founding one's own nation cuts across ideologies. Except for the neo-Luddite technology-phobes and the most reactionary religious groups who view extraterrestrial development as against the will of god, virtually all political, religious, and social creeds are represented among the citizens of the micro-sovereignties.

Among the main classes of micro-sovereignties are those founded by groups like the following:

Religious groups and cults. Especially fundamentalist Christians and Muslims, Scientologists, and practitioners of witchcraft and other religions outside the mainstream that find the Terrestrial religious environment unwelcoming.

Ethnic separatists. Some seek to escape persecution, others seek to avoid "inferior" races. Almost all ethnic groups are represented among the separatists.

Communists. Groups seeking to avoid the lifestyle that comes with private capital and economic competition have established communes where property is held in common and economies are managed rather than market-based.

Libertarians. Libertarians desire a few, limited services from their government, but want most of all to be let alone and have their economic liberty unfettered by regulation.

Capitalists. Businesses that start their own countries enjoy the advantage of an unregulated environment.

Clans. Familial clans or tribes with blood-ties and a spirit of solidarity.

Liberal idealists. Groups pursuing a version of contemporary liberalism.

Communitarians. Distinguished from communists by their embrace of private property, communitarians emphasize the need for a sense of civic duty and the achievement of broadly participatory and inclusive democracy for both political and economic decision-making.

Refugees. Populations displaced from their homelands by war, economic failure, or natural disaster sometimes settle new city-states.

Hermits. The tiniest of microsovereignties, those founded by hermits usually consist of individuals or small families who seek isolation from society. They can usually achieve this in space, though they are sometimes imperiled by pirates if they have made no security arrangements.

A Brief History of International Politics in the Last Hundred Years

International relations in the 2140s feature a trilateral bloc-system cold war involving the United Nations, the Interstellar Security and Development League, and the Multi-Planetary Co-Prosperity Sphere. To set the stage for the larger conflicts in which PCs will find themselves, this section briefly traces the history of the development of this international system and outlines its contemporary dynamics.

The conclusion of the US-Soviet Cold War at the end of the twentieth century and the growing power and activism of the United Nations at the end of the twentieth century and the beginning of the twenty-first gave much promise of an international community of nations that would be able to govern itself peacefully. However, the breadth of the coalition in the United Nations meant that a divergence of interests often left the UN paralyzed in times of crisis, and the inequality of power among nations meant that the major industrial democracies were essentially immune to any threat from smaller states or developing nations. Discord brewed during the early 21st century as the industrial democracies dominated the UN and limited their actions in support of smaller nations to those cases where their own major economic interests were at stake. The demise of the UN influence began as the industrial democracies' interests diverged. Unilateral U.S. intervention in Mexico after that country's civil war began in 2025 marked the end of the UN's potency as a broad-based multinational institution.

The next era in international politics was that of the Cold War between Japan and the United States. Much like the US-Soviet Cold War, the Japanese-US cold war fueled a space race as both sides sought to build international and domestic prestige while gaining the upper hand in technologies vital to military supremacy. Meanwhile, US military involvement in Mexico

The Political Heavyweights

Three blocs, or alliances, dominate international politics now. They are:

- *United Nations* (UN): The UN consists of advanced post-industrial, pro-capitalist Earth governments united in a multi-national confederation. It is dominated by Europe and the United States.
- *Multi-Planetary Co-Prosperity Sphere* (The Sphere): The Sphere consists primarily of extra-Terrestrial governments weighted toward neo-mercantilism. On Earth it is dominated by India, Brazil, and South Africa. Its dominant extra-terrestrial partner is Mitsukawa.
- *Interstellar Security and Development League* (The League): The League consists primarily of Earth nations in an industrial (not yet post-industrial) stage of development. It is dominated by China and Furehjelm.

and Japanese involvement in China motivated further military developments. During the Chinese Civil War (2039-2056), the common ground among most of the member states of the UN shrank from its already atrophied state and the international system employing the United Nations as a vehicle for conflict resolution collapsed entirely. The UN continued to exist, but most of its members bowed out in the late 2030s and early '40s, recognizing that the institution was unresponsive to their interests. The UN soon came to be dominated by four powers: the United States, the European Union, Korea, and the Kazakh Republic. This coalition persists in 2140, and the UN is one of three blocs that dominate international relations.

The Japanese-American cold war ended explosively when the Japanese and American invasions of China precipitated a major regional war, spreading to include the extensive space combat and culminating in Japan's crippling loss of the Mitsukawa Corporation. A grave economic depression gripped Japan for a decade as Mitsukawa withdrew, the international community imposed a trade embargo, and the country was embroiled in domestic political turmoil after revelations of high-level corruption.

After the conclusion of the Chinese war and the decline of Japan from the international scene, a new order emerged rapidly. Replacing Japan as an important actor was the Mitsukawa Corporation. Originally founded in Japan in 2011, the company grew rapidly, thanks to the wise leadership of Mr. Mitsukawa, the hard work of brilliant teams of engineers, a flow of money from Japanese organized crime, and the effective use of bribery to obtain exclusive government contracts. Mitsukawa completed the first privately funded space station in 2018 and began mining a near-Earth asteroid in the '20s in one of the most profitable commercial ventures of all time. By 2055 Mitsukawa's multifarious commercial activities included the operation of several space-based manufacturing stations which took advantage of microgravity to allow fabrication of advanced computer processors and other products, making the company enormously wealthy. In 2055 it was the linchpin in the Japanese economy and by far the largest corporation in the world, with gross income greater than twice the gross national product of Australia.

When the Japanese government began its anti-trust attack on Mitsukawa in early 2055, the corporate leadership felt that the best course for Mitsukawa's shareholders and employees was to break the company free of the prosecutorial hold of the Japanese. The company was able to do so by virtue of its space-based stations and equipment and extensive international subsidiaries. Being the largest company in the world, as well as one of the most profitable, the loss of its mother country was not a killing blow, and Mitsukawa continued to operate. However, rather than relocating to another nation, it took the bold and unprecedented step of declaring itself a "free corporation," operating internationally but having no home country. Mitsukawa helped lead the way for the rise of microsovereignties by staking its own claims of independence, though it was rather larger than the small city-states that followed it.

The second of the three multinational blocs present in 2140 coalesced amid the confusion following the war with Japan and the conflicts with Mitsukawa. Mitsukawa's importance in the economies of India, Brazil, South Africa, and China in the '50s was great enough that those countries were ready to admit Mitsukawan operations in their territories with open arms, despite its unorthodox claim of national autonomy. Furthermore, as a coalition, India, Brazil, South Africa and Mitsukawa were strong enough to stand up to the

United Nations. Thus the second coalition was born, which established itself as the Multi-Planetary Co-Prosperity Sphere in 2060.

As exploration of space revealed the presence of habitable and biocompatible worlds within distances over which travel was made possible with the FTL drive, colonization proceeded apace. In 2057 the discovery of Paradise, a habitable, life-bearing planet orbiting a sun-like star, changed the face of humankind forever, and as countries and large corporations scrambled to get into the act of finding new planets the pace of discovery continued to be breathtaking. In 2058, Furehjelm (named in honor of the exploration project director), was discovered, and Elysium was discovered in 2059. In the next 25 years more than a half dozen other livable worlds were discovered. After surveys by teams of scientists, colonization of these planets proceeded rapidly. Elysium was settled by emigrants from India and the U.N. nations, and Furehjelm was settled primarily by people from India, Africa, and parts of the E.U. Furehjelm achieved independence in January 2081,and the self-styled Empire of Furehjelm was proclaimed.

Meanwhile on Earth, the Chinese were attempting to rebuild their country after the war with Japan. Civil disorder plagued the country until the 2050s when the Vietnamese, Indians, Japanese, and Americans finally withdrew and civil war produced four distinct countries: Tibet in the southeast, Sinkiang-Uigur in the northeast, Manchuria in the northwest, and China in the southwest. Inner Mongolia fell under the control of Mongolia. In 2074 a war erupted in which Manchuria and China set out to conquer Mongolia, with the intention of dividing it between themselves. Russia came to Mongolia's aid, and another general war ensued in the region involving the four Chinese nations, Russia, Mongolia, India, and Vietnam. This war raged until 2076, when a cease-fire was reached which lasted until 2081, when conflict began anew. In India the war toppled the incumbent government and led to rebellion in its primary off-world colony, Elysium.

Elysium had been discovered and colonized by India in 2059. The colony grew rapidly and prospered, but relations with the home country grew increasingly troubled over issues of local autonomy. When the Asian war began anew in 2081 the Elysians broke off ties with India, fought a brief war for independence, and prevailed with the aid of the newly independent Empire of Furehjelm and the absolute isolation of Earth caused by the eight-month Interruption in the FTL jump corridor to Crossroads. Mitsukawa offered belated help to its ally, India, in preserving control over the Elysium colony, and Furehjelmian and Mitsukawan forces met in a brief conflict that was to both start and seal the animosity between the two countries.

In 2084 the Chinese war was finally resolved, with Tibet and Sinkiang independent of the rest of China. Assistance from Indonesia and Furehjelm in uniting China brought about an alliance in 2088 known as the Interstellar Security and Development League.

Thus by 2088 three alliances or blocs had been formed from the complex disorder following the conclusion of the US-Japan Cold War. The Multi-Planetary Co-Prosperity Sphere (dominated by India, Mitsukawa, Brazil, and South Africa), the United Nations (composed of the United States, the European Union, and Korea, with Canada, Australia, Ecuador, and Vietnam), and the Interstellar Security and Development League (composed of Furehjelm, Elysium, China, and Indonesia, with Pakistan, Kenya, and the Southern African Confederation) face each other. Relations are increasingly strained over both Earth-bound and deep space issues ranging from trade restrictions to piracy to territorial claims to

ideology. Each bloc is wary of the other, but they have been dependent upon each other for trade since their inception.

Autoproduction: A New Industrial Revolution

A recent technological development is changing the economy and the dynamics of the bloc relationships, namely, the appearance of vertically integrated automated manufacturing systems. A "vertically integrated" company is one which controls the process of production for a product from mining the materials to designing the product to manufacturing the product to distributing it to purchasers. The new vertical integration of manufacturing facilities (rather than merely companies) is being made possible by autoproducers, also known as CyberProds.

Autoproducers are automated production systems which gather raw materials, refine them, and construct products, all with very minimal human intervention. Once an autoproducer has been constructed on a resource-rich planet it can, for example, churn out spacecraft at a rate of one per week or so with only a handful of human beings supervising the operation. The capital investment required to construct an autoproducer is mind-boggling, but once constructed the pace of construction is higher than conventional methods can achieve and the unit cost of the products is very low because there is so little labor required for product construction. Thus, autoproducers significantly increase a firm's competitiveness if it can afford the expense of constructing them. The mass production of starships, space stations, and other sophisticated machinery and installations has rapidly accelerated the colonization of space. However, this acceleration has not come without a social cost.

The first autoproducer was completed in 2107 by Mitsukawa and was important in permitting Mitsukawa to remain a dominant member of the Sphere. Mitsukawa used the facility to dramatically accelerate its starship construction, both commercial and military, to catch up with the EU and Americans. In 2111 the EU colonists on Paradise developed their own autoproducer, a facility named Sampo after a mythic wealth-producing machine from Finnish folk stories. This was followed shortly by an autoproducer from the American company Neodyne. In 2115 the League completed a collective autoproducer administered by Furehjelm, and competition in a CyberProd economy was underway.

Mitsukawa's four year head start in autoproducers gave it a significant advantage because it was able to use the new system to produce a substantial array of products for itself and for export. It also damaged relations between Mitsukawa and the members of the UN and the League, because Mitsukawa initially offered its wares at prices that significantly undercut its competitors. This prompted the erection of high tariffs against Mitsukawan goods to protect the domestic economies in the League and the UN, isolating the Sphere. This economic isolation was harmful, but with the autoproducers working the Sphere still managed to grow in prosperity.

"Deflation grips the advanced economies, brought on by the tremendous productive capacity of autoproducer/cyberprod technology. The oversupply of goods has caused prices to decline for years and has further reduced demand for labor by eroding business profitability. The labor surplus has led to levels of unemployment not seen in decades, particularly among unskilled and low-skilled workers, which places a massive welfare burden on governments. The only people who benefit from this state of affairs are those who can capitalize on the increased pace of immigration to the colonies that occurs as people move to places where labor is in greater demand."
The Economist, June 2129.

When the EU finished the Sampo facility in 2111 it immediately began producing military starships to counter the threat posed by the growing strength of Mitsukawa, as did the United States when Neodyne completed a second unit. By 2115 when the League finished its autoproducer it was significantly behind in the race, but through a strategy of marketing domestic goods at low prices to developing nations the Furehjelmers managed to expand their economy and catch up substantially by 2140.

A monumentally important unintended consequence of the autoproduction revolution has been to drive down the prices of manufactured goods and drive down the demand for workers in the industrial sector of the economy. Indeed, the autoproduction revolution is generally regarded as a mixed blessing, at least in the short term. In the long term the accelerated pace of colonization will yield great rewards, but in the short term it has created substantial unemployment and caused economic stagnation on Earth. With prices in free-fall, consumers tend to hold on to their money to wait for goods to get even cheaper, which pushes prices even lower in a cycle of deflation that drives established companies out of business and puts more and more people out of work.

Prices for Goods and Services

Prices in the table below assume purchase in the United States. Other terrestrial first-world countries usually have similar prices. In poor countries, staples like food and low-end housing cost about ¼ as much, as does labor, while luxuries and imports from prosperous countries are a little more expensive than they would be where they are made. Almost everything in the colonies costs more than it does on Earth; in the Sol system colonies, prices are increased by about 25%, and in other systems prices are usually about 50% higher. The exceptions to this rule are unclaimed land, which is usually free for the taking off Earth, and labor, which is rarely paid much more anywhere than in the first-world countries of Earth.

Assorted Retail Prices, USA, 2140

Food	*Price*
Dinner in expensive restaurant, for one, excluding wine	40
Dinner in average restaurant, for one, excluding wine	8-12
Meal in fast food restaurant	3
Can of soda (330mL)	0.3
Vending machine sandwich	1
Pre-packaged microwave dinner	1
Field rations (MRE), self-preparing, one serving	2
Loaf of bread	1
Liter of milk	0.5
Lodgings/Housing	
One night lodging in hostel	7
One night lodging in economy motel	25
One night lodging in comfortable hotel	75
One night lodging in luxury hotel	200
Cheap old house in the boondocks	20,000
Median home price	100,000
Luxury home	500,000+
Monthly rent, 2 bedroom urban apartment, middle class	600
Monthly rent, studio apartment, urban	350
Monthly rent, cheap room, bathroom, no kitchen	150
Transportation & Vehicles	
Taxi fare, per hour	2
Subway fare, day pass	0.5
Train fare, 50 km, round trip	10
Train fare, 500 km, round trip	40
Train fare, 3000 km, round trip	150
Intercontinental hypersonic airplane ticket, round trip	150
Orbital cargo lift, per 100 kg	100
Orbital passenger lift, per passenger with 30kg luggage	200
Descent from orbit, cargo, per 100 kg	25
Descent from orbit, passenger, per person	50
Interstellar cargo transport, per ton per FTL jump	≥ 70
Interstellar passenger transport, per person per jump	≥ 300
Automobile, used, low quality	500
Automobile, average new price	4,000
Automobile, new, top quality	20,000
Air (fan) car, average new price	25,000

Entertainment, Communications & Services	*Price*
Telecommunications service, per month, for one user	10
Data transmission via land line, 250,000 data units	1
Data transmission via airwaves, 100 du	1
Data transmission, interstellar, 100 du	≥ 1
Computer processor time rental, 5 CPP-years	1
Fiction book, network delivery	0.50
Feature film, network delivery	0.75
Entertainment video (TV style), 20 min.	0.25
Music recording, network delivery, 5 min.	0.05
Professional baseball ticket	25
Broadway show ticket	10-100
Wages	
Labor at minimum wage, per hour	5
Skilled labor, per hour	8-15
Professional labor, per hour	12-60
Money Rates	
Typical interest rate for home mortgage	3%
Historical average total return of Earth stock markets for the last 30 years	7%/year
Inflation rate, last 30 years, UN economies	-2%
Typical interest rate for FTL cargo ship mortgage	9%
Fuels & Energy	
Spaceship deuterium fusion fuel, per ton	200
Spaceship deuterium+helium-3 fuel, per ton	1000
Laser-launch fuel (ice-lattice reaction mass), per ton	25
Rocket fuel (chemical), per ton	100
Electricity, home delivery, 1 kilowatt-hour	0.005
Consumer Electronics	
Video monitor (flat screen, per square meter)	50
Home computer	35
Personal mobile telephone	30
Miscellaneous	
Custom tailored business suit	150
Gold, per troy ounce	200

Astronomy You Can Use

In a science-fiction role-playing game we often look to space for the settings of our adventures. In the context of a "hard" science-fiction role-playing game, as Vanguard generally purports to be, we look to astronomy to provide *realism* in our settings. This section provides a basic overview of astronomical concepts that will help players enjoy and develop hard sci-fi adventures.

The Space Environment

Some of the most exciting adventures to be played in Vanguard will take place in space. Thousands of people live and work there, on space stations and in vessels used for transport, mining, manufacturing, solar power collection, piracy, science, and military purposes. While technology and know-how enable people to cope with the space environment, its remarkable inhospitability presents unique challenges. The three distinguishing natural features of this environment are that it is a vacuum, that it is bathed in radiation, and that gravity is not felt. Additionally, near populated worlds there is the hazard of pollution in the form of fast-moving debris left by spacecraft.

Vacuum

Vacuum is a near-total absence of matter in space. Vacuum affects the ways spacecraft move and regulate their temperature, and poses challenges to the support of human life in space because people cannot survive in it.

Spacecraft movement: The most salient feature of vacuum from the point of view of a space traveller is that it removes friction from the dynamics of spacecraft maneuvers. This means that unlike airplanes, which can "push" on the air to change course, spacecraft have no environment to push on to get where they're going. In vacuum, spacecraft will simply drift forever, perturbed from their courses only by the gravitational influence of nearby objects (such as planets or stars) or by actual collisions. In order to speed up, slow down, or turn, spacecraft must expel "reaction mass" in the opposite direction of the way they want to go.

Heat insulation: It is often said that space is very cold. Indeed, the temperature of the occasional atoms that are drifting through deep space is typically very low. However, for spacecraft, the cold of space turns out not to be a problem. Rather, spacecraft must usually contend with the difficulty of becoming too hot. Space ships generate a lot of excess heat, and vacuum is a remarkably good thermal insulator, tending to trap that heat on board.

In ordinary terrestrial environments, hot objects shed most of their waste heat by conduction. That is, the heat flows out of hot objects into cooler objects that the hot objects are touching. For instance, hot coffee transfers heat into the mug that holds it and into the air, and automobile engines transfer heat to the air around them through their exhaust and their radiators. If they couldn't shed heat this way, engines would get very hot very fast and promptly break or melt.

Spacecraft can't shed heat this way because there is nothing for them to conduct heat to in vacuum. Thus, spacecraft can only shed heat by radiating it. It turns out that radiation is a much less efficient way to shed heat than conduction; this is why thermos bottles work so well. However, the only way that spacecraft can dump heat (without tossing overboard any object that gets hot) is to radiate it. This necessitates large radiator fins on spacecraft to help them shed their heat.

Health threat: Exposure to vacuum is quite dangerous but not immediately fatal or even incapacitating. (Contrary to various Hollywood-inspired misconceptions, people do not explode in a vacuum, although they can swell.) It is obviously impossible to breathe, and death arrives before long. The first turn of exposure to hard vacuum typically causes some moderate discomfort, but no wounds beyond a possible nose bleed or ruptured eardrum. The second turn results a Minor wound to the torso. In the third turn of exposure (i.e. after 10 seconds have passed), characters in vacuum take a second Minor wound to the torso. If not already unconscious, characters pass out after their third turn (i.e. 15 seconds) in vacuum. They will suffer another Moderate wound upper torso after 30 seconds have passed and yet another after a total of 90 seconds. A Severe wound arrives after two minutes, and a Catastrophic wound is suffered after three minutes. If not dead already, the character dies after four minutes. Note that no stabilization of these wounds can be accomplished until the character is returned to a pressurized environment. Upon returning to a pressurized environment, characters will gasp for air as they attempt to start using their lungs again.

What if your character is on a spaceship or station that gets a hole shot in the bulkhead or has both doors of an air lock jammed open to space? How fast does the air leak out? Assuming the ship is pressurized to one Earth atmosphere, follow the rule of thumb that for each square meter of hole, a hundred cubic meters of air will be lost to space every second. This is a very rough guide, but it beats the complicated math and physics you'd have to do to come up with the right answer. Even better, you can just look at the table below, which shows how long rooms of various sizes take to become a near-vacuum when they have holes of different sizes.

	Approximate evacuation times for		
Room size	*spot puncture (e.g. bullet hole)*	*small hole ($30cm^2$)*	*open portal (e.g. airlock door)*
Airlock	5-10 minutes	instant	instant
Small ($20m^3$)*	30 minutes	1 second	instant
Medium ($100m^3$)*	2-3 hours	5 seconds	instant
Large ($400m^3$)*	8-12 hours	15 seconds	2 seconds
Huge ($4000m^3$)*	4-5 days	3 minutes	20 seconds

**Small*: about 20 cubic meters, like a small bedroom. *Medium*: about 100 cubic meters, like a living room. *Large*: about 400 cubic meters, like a large classroom. *Huge*: about 4000 cubic meters, like an auditorium or cargo bay.

Radiation

Perhaps less obvious but certainly just as dangerous a feature of space as vacuum is the considerable wash of radiation which space travellers will encounter. Planets with magnetic fields gather belts of energetic electrons and ions, posing a perennial hazard. Stars emit flares several times per year which considerably increase the levels of radiation, and cosmic rays bathe planetary systems. Spacecraft must be shielded against this radiation. Characters

who are "spacewalking" in space suits, or who are travelling on the surfaces of planets not protected by atmospheres, must also take precautions or risk suffering doses of radiation which will be likely to produce sickness in the long term.

Microgravity

Third, when humans are in space they do not experience the effects of gravity. This can be very disorienting to flatlanders, as not only do objects fail to fall "down," but other features of a terrestrial environment which are taken for granted are absent in microgravity. Flames, carbonated beverages, convection currents, and one's hair all misbehave in microgravity. Specifically, flames are spherical, bubbles don't rise, the absence of convection currents means that heated liquids don't exhibit the churning associated with boiling on planets, and unrestrained hair sticks out in the most absurd ways. Also, microgravity tends to cause slight puffing of the face (since there's no gravity pulling blood out of it), muscle atrophy (since there's no gravity to constantly exercise against), slight weight loss (due to a reduction in fluid volume caused by changes in body chemistry) motion sickness, and bone decalcification. Face puffing and weight loss are of no real importance, but muscle atrophy needs to be combated with a regimen of exercise, or with a spin-habitat to simulate gravity. Effects of motion sickness vary from person to person, but usually wear off within a few days; for those who are sick, drugs can abate the sickness. Bone decalcification is corrected with special diet and drugs.

Orbital Debris

A final significant feature of space is pollution in the form of small particles of matter, mostly deposited by spacecraft, which orbit planets frequented by travellers. This pollution consists of seemingly innocuous items like grains of dust, chips of ceramic heat shielding, flakes of paint, and the occasional hand tool dropped by a spacewalker. Ordinarily they would be as harmless as they sound, but in planetary orbit where a collision between a spacecraft and a piece of junk is likely to occur at a speed of thousands of kilometers per hour, they are quite dangerous. To put this in perspective, at 3000km/h a fragment massing one gram (about the mass of a paper clip) hits with an impact energy roughly equivalent to that of a collision with a car on the highway. This is a problem which has necessitated the fitting of armored shields to the fronts of spacecraft, as well as a costly program of "sweeping" the orbital area of such debris.

Stars and Their Origins

Current theory states that the formation of the universe occurred in a "Big Bang," which cast all of the matter we observe in the universe into space, where it has been expanding ever since. Where did this matter come from? That remains a mystery. However, we do know that gravity has caused significant portions of this matter to accrete (that is, to grow together) into stars.

Stars are large spheres of plasma, held together by gravity. They're mostly made of hydrogen, which is the most abundant element in the universe. At their centers, gravitational compression results in enormous temperature and pressure. Under these conditions, nuclear fusion occurs, in which atoms hit each other so hard that they fuse and form new, heavier

elements, and produce a force—heat expansion—to counteract the star's gravitational contraction, so an equilibrium is reached. Gravity wants to make the star collapse into a much smaller ball, but the heat from nuclear fusion prevents this from happening.

In the process of fusion, part of the mass of the fused atoms is converted into radiant energy (radiation). This is described in Einstein's famous equation, $E = mc^2$, where E is the amount of energy released (expressed in Joules; one Joule for one second equals one Watt), m is the amount of mass converted (kilograms), and *c* is the speed of light in vacuum (meters per second). The radiation from this reaction heats the star and objects in the surrounding space, and, in the case of the Sun, supplies the energy which supports life on Earth.

Stars have life cycles; they are not static. The most important influence on the life cycle of a star is its mass. As bits of matter are gravitationally attracted to one another they eventually reach a mass sufficient to create the conditions for fusion of hydrogen in their cores. If they don't get too massive, they will "burn" slowly for billions of years. If they are very massive the increased heat and pressure at their cores accelerates the fusion process, and soon (a relative "soon," say, after hundreds of millions of years) all of the available hydrogen will have been fused. The star will then progress to fusion of helium into heavier elements. When the helium is gone another fusion process will start in the massive star, again and again, moving up the elements on the periodic table until iron is made. At this point the process of fusion does not eliminate any mass, and thus releases no energy. The star will die.

How a star dies depends upon how massive it is. Stars may explode and cast their matter into space, or form black holes, neutron stars, or pulsars, or less spectacularly contract and cool into dwarf stars.

Our Sun is of the smaller, less spectacular type. The Sun is, by all indications, quite average. In a few billion years, when it has used up its nuclear fuel, it will ultimately shrink and become a white dwarf—an extremely dense body almost the mass of the current Sun, but shrunken to the size of the Earth.

Stellar Nomenclature

To communicate information about stars effectively we must familiarize ourselves with some terms: Light year, Parsec, Astronomical Unit, Luminosity, and Spectral Class.

First things first: a light year is the *distance* that light travels in one year, which is a very long way (about 3.09×10^{13} km, or 30 trillion kilometers).

Next we come to the parsec, which is a distance of 3.26 light years. A parsec is defined as the distance an object would be from the Earth for its parallax angle to equal one second of arc. In case you're interested, there is a more detailed explanation of this in the glossary.

The astronomical unit, or A.U., is the distance from the Earth to the Sun, and is frequently used to measure distances of the solar-system scale.

Luminosity simply indicates the amount of energy radiated by a star. Luminosity is rated in Watts, just like light bulbs and other items whose power output or consumption is measured. (The Sun's luminosity is 3.90×10^{26} Watts, which is a lot.)

Stars are generally classified by spectral type, which corresponds with temperature; the types are O, B, A, F, G, K, M, from hottest to coolest. (The types may be easily remembered with the mnemonic, "Oh Be A Fine Girl/Guy Kiss Me.") Stars are further subdivided within each category according to temperature. For example, within the G class

are G0, G1, G2, G3, G4, G5, G6, G7, G8, G9. G0 is hottest and G9 is coolest. (The Sun is a type G2 star.)

Stars have a final subdivision into pressure classes, which amounts to size. These classes are Ia, Ib, II, III, IV, and V. Ia stars are the most luminous supergiant stars. Ib stars are less luminous supergiants. Class II are bright giants, class III are normal giants, class IV are subgiants, and class V (including the Sun) are *main-sequence* stars.

The main-sequence is a stage in a star's life. As mentioned above, stars fuse light elements into heavier ones in their cores. Main-sequence stars, unlike the giant stars of pressure classes Ia through IV, are at the stage of fusing hydrogen to helium in their cores. The giant stars are older, and tend to be relatively cooler and dimmer than the sun.

The table below indicates the approximate characteristics of stars of each spectral class:

Spectral Class	*Color*	*Surface Temperature (Kelvin)*	*Mass (M_{Sun})*	*Luminosity (L_{Sun})*	*Radius (R_{Sun})*	*Lifetime (Years)*
O	Bluish-white	30,000	40.0	500,000	20.0	$1x10^6$
B	Bluish-white	11,000-30,000	7.0	800	4.0	$8x10^7$
A	Bluish-white	7,500-11,000	2.0	20	2.0	$2x10^9$
F	Bluish-white to white	6,000-7,500	1.3	2.5	1.2	$5x10^9$
G	Yellow-white	5,000-6,000	1.0	1.0	1.0	$10x10^9$
K	Yellow-orange	3,500-6,000	0.78	0.16	0.7	$20x10^9$
M	Reddish	3,500	0.21	0.008	0.3	$50x10^9$

The Scale of the Universe

It is often helpful to construct imaginary models to appreciate the characteristics of our solar system and galaxy. The distances between stars are hard to visualize, but we can at least develop a proper respect for them by using models.

First consider the Earth. Without modern engineering the now trivial jaunts we so often make across town by car might be the better part of a day's journey, and trips around the world would be historic events. The planet is so big that, despite the fact that it is a globe, we cannot see its curvature from the surface. The Earth is, however, a tiny speck in comparison to the other astronomical objects we will consider.

Imagine the Earth reduced to the size of a big grain of salt about one millimeter in diameter. The Sun, on this scale, is a bit larger than your fist, and the salt orbits your fist at a distance of over eleven meters. The moon would be a tiny flake a little over two centimeters from Earth. Pluto would be an insignificant speck almost half a kilometer away. If you were located in California and attempted to include other stars in your model, Alpha Centauri, the nearest star to the Sun, would be a fist in Michigan. This makes interstellar travel quite a challenge.

Planets

As material coalesces gravitationally to form stars, some material often forms (relatively) small globules which become planets. In the Earth's Solar system there are Terrestrial

planets and Jovian, or gas giant, planets. The terrestrial planets are like Earth (Terra) in that they are close in size to Earth and share other characteristics, including material composition. Terrestrial planets are mostly rocks and metals. Jovian planets are like Jupiter in that they are massive, huge, and not very dense. Jovian planets are gaseous and have no "surface" on which a spacecraft could land, like Earth does. Saturn, in fact, is less dense than water, so it would float. For gaming purposes, terrestrial planets are of interest for their own sakes, while Jovians are of interest primarily because they may have useful moons and because they are potential sources of spacecraft fuel.

The atmosphere and temperature of a terrestrial planet are two distinguishing characteristics of import. Atmospheric composition and density help determine temperature. The composition of Terran atmospheres is usually primarily Carbon Dioxide (as is the case with Venus), or Oxygen-Nitrogen (as on Earth).

Terrestrial planets can be classified as Greenhouses, like Venus, Earthlike, like Earth, or Deserts, like Mars.

Earthlike terrestrial planets may be further classified as either "Biocompatible" or "habitable." Habitable planets are so much like Earth that the atmosphere and climate permit human habitation without the aid of any apparatus; people may live essentially normally. Biocompatible worlds are much less hospitable, with atmospheres that usually have at least one characteristic of pressure, temperature, or composition that is seriously harmful to human life. However, with some effort, people may inhabit such worlds.

Life

An important consequence of the short life span of massive stars of types O and B (and A, to some extent) is that they do not last long enough for advanced life to evolve on any planets they might have. Life on Earth didn't evolve at all until about a billion years after the formation of the planet, and especially massive stars don't last that long, leaving a small probability of life evolving on their planets. The very small stars of class M, on the other hand, have such a small "life-zone" (the area of space around a star where planets will be of a temperature likely to support life) that they rarely develop a biosphere. The regular supporters of life-bearing planets are the stars of type F, G, and K.

If conditions are right life will evolve on Terrestrial planets. The evolution progresses in stages. Mircoorganisms appear first, followed by plants, lower animals (with relatively simple biological structures, such as Earth's fish and insects), and higher animals (with more complex biology, such as Earth's mammals). On planets with chemical composition similar to Earth's several billion years ago, the existence of life will usually alter its atmosphere and an Oxygen-Nitrogen atmosphere will be produced after the plant stage is achieved.

Alien life forms are just that: alien. However, they still adhere to certain rules that Earth life adheres to. All alien life yet discovered is carbon based, passes genetic information from one generation to the next with genes of one sort or another, and evolves by natural selection. Usually their life cycles are birth-maturation-reproduction-parenting-death, but beyond this the similarities to Earth life often end. The characteristics of a life form are determined by the environment in which it evolved, and in cases where the situation is significantly different from Earth the life forms will be significantly alien, not only in appearance but in biochemistry.

One consequence of the profound differences between Terran and alien life forms stems from the aliens' use of genetic coding methods which can be quite different from Terrestrial genes. The result of this fact is that alien and Terrestrial life forms have little effect on one another at the microbiological level. On the good side, it means that terrestrial and alien life forms are generally not at risk from each other's diseases. On the down side, it means that many nutritional necessities, such as protein, are not available in alien life.

However, the lack of interaction between terrestrial and extraterrestrial life forms in the areas of disease and nutrition does not prevent immune system response. Alien life forms are prone to cause hypersensitive immune system reactions. That is, people sometimes react allergically to alien life.

Equipment

This list contains ten categories: Superconducting Power Cells, Medical Equipment, Communications and Navigation Equipment, Visionics, Scanners, Remote Vehicles, Hostile Environment Equipment, Body Armor and Combat Fittings, and Miniature Orbital Lift Systems. (Weapons are listed in a separate section following this chapter.) Even within these categories the list is far from comprehensive, and GMs should add to it as appropriate for their campaigns. This list is merely intended to communicate the flavor of available equipment.

Mundane items, such as clothing, pocket knives, and ear plugs, though useful, are not included in this list because GMs can make up their characteristics as necessary. Only items of special interest are presented here.

Superconducting Power Cells

Cell Type	*Dimensions**	*Energy Content*	*Mass***	*Cost*
AAA	4mm x 4mm	0.1 Watt hours	0.07g	1
AA	1cm x 3mm	2 Watt hrs	0.7g	1
A	1cm x 3cm	50 Wh	20g	1
B	2cm x 4cm	250 Wh	0.1kg	3
C	3cm x 5cm	700 Wh	0.2kg	5
D	5cm x 10cm	4000 Wh	1kg	10
E	5cm x 20cm	8000 Wh	2kg	15
F	10cm x 20cm	30,000 Wh	7.5kg	30
G	10cm x 25cm x 100cm	500,000 Wh	125kg	300

*All the cells except "G" type are cylindrical; the first dimension is the diameter and the second is the height.
**Note that power cells are heavy for their size.

Medical Supplies

Item	*E-Med/First Aid modifier*	*Mass*	*Cost*
Basic First Aid Kit	-3	0.25	$10
Standard First Aid Kit	-2	0.5	$15
Advanced First Aid Kit	-1	1	$25
Doctor's Medkit	0	2	$100
Doctor's Medkit + Medscanner	+1 (E-med skill only.)	3.5	$1800
Ambulance Gear	+2 (E-med skill only.)	300	$15,000
Advanced Ambulance Gear	+3 (E-med skill only.)	600	$75,000

Communications and Navigation Gear

Item	*Bandwidth (max.)*	*Range*	*Power*	*Mass*	*Cost*
Portaphone or WristCom	1 du/sec	10km	1	.1	$30
Advanced Hand Radio	5 du/sec	32	10	.5	$50
Backpack Radio	5 du/sec	160	250	5	$100
Portable Com Station	5 du/sec	320	1000	25	$200
Adv. Portable Com Station	400 du/sec	320	2000	40	$8000
Short Range Laser Comm	50 du/sec	20	1	0.5	$100
Long Range Laser Comm/Uplink	50 du/sec	500	5	5	$400

The listed range is the range at which the transmission can be picked up by a portable phone. Larger receiving antennas can pick up signals much farther away.

The laser communicators can only talk to other laser communicators; they cannot talk to radio/telephone equipment, although both types may be connected to a computer. However, the long range laser comm system can be used as a laser satellite uplink, weather permitting.

All of these devices can be linked to computers and may transmit computer data and be computer controlled. When used with computers with the right software, all are capable of frequency hopping, burst transmission, encryption, recording, delayed transmission, and direction finding.

Portable Phone/Radio

Available as small as a wristwatch, or as large as a regular phone. Operates as a satellite phone on planets with low-orbit satellite communications system; operates as a wireless phone in areas with wireless phone infrastructure (i.e. repeater stations every few kilometers); also operates as a radio transceiver with a phone-to-phone range of 10km. Can transmit bandwidth of 1 du/sec. *Power consumption*: when transmitting, 1 watt, usually from a type A power cell; a wristwatch-sized phone would use a smaller cell. On standby mode (waiting to receive a call), 0.1 watts. Typical phone offers 2-3 days talk time or three weeks on standby. *Mass*: .1kg or less. *Cost*: $30.

Bugs

Devices exist which can transmit a homing beacon or an audio transmission or a video transmission or monitor a computer's operation. When such devices are placed secretly they are generally called bugs. The GM may provide specifications as appropriate. Similar functions may also be performed by mobile remote sensors such as spy flies and reconnaissance drones, described below in the Remote Vehicles section.

Personal Data Transmitter

PDT is a general term for a device which transmits data to a central station or to partners or comrades. PDTs may include video cameras, info on the subject's medical condition (such as heart rate, respiration, etc.), or merely a homing beacon.

Navigation Assistant/ Global Positioning System

A navigation assistant contains a Global Positioning System receiver so that it can receive satellite transmissions to pinpoint the user's location to within a few centimeters anywhere on a planet with a network of global positioning satellites. It also contains an inertial navigation system which is much less accurate but serves as a back-up in case GPS is not available. (Note that GPS is only available on planets where a network of GPS satellites has been set up. Presently these are Earth, Mars, Luna, Mitsukawa, Furehjelm, and Paradise.) *Mass*: 0.25kg. *Power Consumption*: 0.5 Watts from Type B power cell. *Cost*: $25.

Simon Industries Walletlink

The walletlink is a wallet that combines a telephone and a 20 computing point computer with 6cm display screen and small data chip slot. *Mass*: 0.2kg. *Power Consumption*: 1 Watt when used as a computer, plus 1 Watt when used as a phone, from a type A power cell. *Cost*: $150.

Bug Jammer

Effectively jams signals from bugs and other very low power radios (with range <1km) when the jammer is within 500m of the receiver. Also stops portaphones from receiving within a radius of 50m. It has no appreciable effect on more powerful radios. This device is contraband. *Mass*: 300g. *Jamming radius*: 500m. *Power consumption*: 5 Watts from type A power cell. *Cost*: $100.

Phone Jammer

Effectively jams reception from portaphones (and lesser devices like bugs), as well as more powerful radios that are operating at their maximum range. Cuts bandwidth in half for all devices within twice its jamming radius. This device is contraband. *Jamming radius*: 3km. *Power consumption*: 10 Watts from type A power cell. *Cost*: $250.

Tactical Jammer

Disposable device that prevents reception from advanced hand radios (or lesser devices) within its jamming radius, and from more powerful radios operating beyond half their range. Cuts bandwidth in half for all devices operating beyond half their range. This device is contraband, capable of wreaking havoc on a city's communications; civilians using it would be hunted as terrorists and prosecuted for a felony. *Mass*: 1kg. *Jamming Radius*: 20km. *Operating endurance*: 2 hours. *Cost*: $2000.

Communications Rocket

A radio on a rocket, used to overcome jamming or avoid being found by radio direction finding or HARM strikes. This is a small, portable rocket that can be launched to a clear zone out of the effects of jamming. Record a message, launch the rocket in the direction of whomever you wish to communicate with, and hopefully it will get close enough to get a signal through. The transmission-only radio has a broadcast strength like an advanced hand radio. *Mass*: 1.5kg. *Flight range*: 4km. *Cost*: $100. (If used as a makeshift direct-fire weapon, use handgun skill. Apply –2 penalty to hit. Aimed fire accuracy +0. EffR: 60m. Pen/Dam: 8, 80. Bulk: -3.)

Visionics

Omni-Goggles

Omni-goggles combine the functions of Infra-Red (thermal) goggles and NVGs, and are switchable between the two modes. They may be used in conjunction with binoculars or other sighting equipment. In IR mode, they allow the wearer to see infra-red radiation, which is given off by all objects because of their heat. The goggles present a grayscale or false-color image with resolution adequate to recognize people and devices, but inadequate to read printed text in books without difficulty. In NVG mode, they gather light and amplify it. Under a cloudy sky with a new moon (i.e. in extreme darkness) the image is inferior to IR mode. In total darkness they deliver no image at all. With starlight they provide an image clear enough to read by, better than IR. They have automatic dampers for bright lights, so they are not subject to dazzle. *Mass*: 0.3kg. *Power Consumption*: 1 Watt from Type A power cell. *Cost*: $100.

Stabilized Binoculars

These binoculars offer the advantage of stabilization to suppress vibration so that the image remains clear and stable even when the binoculars are subjected to minor jarring, as when using an unsteady hand or observing from a moving vehicle. There is an integrated rangefinder. *Mass*: 1kg. *Power Consumption*: 0.5 Watt from Type A power cell. *Cost*: $75.

Scanners

Environmental Scanner

The Environmental Scanner is a handheld device with multi-spectrum sensors. It incorporates a metal detector, water analyzer to tell if water is potable, and atmospheric sensors to reveal pressure, temperature, chemical composition, humidity, biological hazards, and radiation. It also incorporates a scent detector, which will detect explosives and drugs which give off odors. It may also be used to track people or animals and does so with a Virtual Skill in Tracking of 9. No skill is required to use the device, though scientific skills may be required to interpret the significance of some of the data it generates. *Mass*: 1.5kg. *Power Consumption*: 1 Watt from Type A power cell. *Cost*: $1200.

Meteorology Attachment for Environmental Scanner

With the Meteorological Attachment, the Environmental Scanner can monitor local wind velocities and precipitation rates using a Doppler radar system with a range of about 3km. *Mass*: 5kg. *Power Consumption*: 5 Watts from Type A or B power cell. *Cost*: $200.

Geology Attachment for Environmental Scanner

With the Geology Attachment, the Environmental Scanner uses ground-penetrating radar and other technologies to identify materials under the surface of the ground, including water and mineral deposits. *Mass*: 5kg. *Power Consumption*: 20 Watts from Type A or B power cell. *Cost*: $800.

Forensics Scanner

The Forensics Scanner may be used by characters with Forensic Science skill to scan for and identify fingerprints, skin, paint flakes, and the like. *Mass*: 1kg. *Power Consumption*: 1 Watt from Type A power cell. *Cost*: $600.

Medscanner

The Medscanner provides a +1 success bonus for the performance of emergency medical treatment when used in conjunction with a Doctor's Medical Kit and Emergency Medicine skill. (First Aid skill does not allow use of the Medscanner.) It is an aid in tasks of diagnosis when used with Internal Medicine skill, and may be used for tissue analysis with Medical Lab Technician skill, Biology skill or Internal Medicine skill. It can also determine if water is potable and detect biologically hazardous materials when one of the above mentioned skills is used. *Mass*: 1.5kg. *Power Consumption*: 10 watts from Type A or Type B power cells. *Cost*: $1700.

Security/Sentry Scanner

The Security/Sentry combines auditory, infrared, seismic, and radar technologies to detect and track the movement of people, animals, and vehicles within a 1km radius, limited by obstructions such as hills and multiple walls. The radar function can penetrate one or two building walls to reveal people inside. The scanner is also a radar detector. When the radar is active it can be detected by other Security/Sentry Scanners at a range of 5km and by military ESM equipment at much longer ranges. *Mass*: 2.5kg. *Power Consumption*: 1 Watt with passive sensors, or 5 Watts when radar is activated, from Type A or B power cells. *Cost*: $400.

Range Enhancement Attachment for Security/Sentry Scanner

This attachment increases the radar range of the Security/Sentry Scanner to 5km. When activated, this attachment is detectable by other Security/Sentry Scanners at a range of 25km and by military ESM equipment at much longer ranges. *Mass*: 2kg. *Power Consumption*: 5 Watts from Type A or B power cells. *Cost*: $200.

Multiscanner

The Multiscanner combines in one unit the functions of all the scanners (but not the attachments) listed above, along with a video camera with thermal and light-amplification lenses. *Mass*: 3kg. *Power Consumption*: 5 Watts from Type A or Type B power cells. *Cost*: $4500.

Remote Vehicles

Spy Fly

A spy fly is a miniaturized aerial robot equipped with sensors to gather data, a radio receiver to allow telemetry to be returned to an operator and to allow the fly to receive operator instructions or to network with others of its kind. Spy Flies are available in three sizes.

Gnat size: About 3mm in diameter and nearly silent in operation, the smallest spy fly is the most stealthy. Its radio transciever has a maximum range of only 30 meters, but a network of gnats can relay signals over unlimited distances. The gnat can deliver a low quality audio signal and a poor video signal with an effective range of sight of only about 20 meters. Endurance is about 10 hours in standby mode, about 45 minutes when stationary and returning audio/video signals, or about 15 minutes in flight. The Gnat is sufficiently bouyant that it may float on air currents for some time or be blown about without exerting energy. Maximum flight speed is 1km/h. It has a sticky bottom that allows it to adhere to surfaces or pick up motes of dust. *Cost*: $500.

Fly size: The medium-size spy fly is about the size of a common house fly. It is equipped with low-quality video and audio sensors and a short-range (250m) radio transceiver. It flies with wings like a bumblebee (and makes a bit less noise), and is capable of aerial motion in any direction, and of hovering. Endurance is about a week in "standby" mode while it awaits and activation signal, about 6 hours when stationary and returning audio/video signals, or about 20 minutes in flight. Maximum flight speed is 5km/h. It has three grasping appendages that allow it to land on sheer surfaces or pick up objects no heavier than a postage stamp, but it cannot walk. Four gnat-sized flies may be carried. *Cost*: $350.

Bird sized: The spy bird is a device the size of a small bird which improves upon the performance features of the spy fly. It is a helicopter. Active noise cancellation keeps its noise to a low hum in flight. The spy bird can carry up to three spy flies on its back. Endurance is about three months in "standby" mode while it awaits an activation signal, about two days when stationary and transmitting radio signals (range 10km), 30 minutes in flight, or 90 minutes walking. Maximum flight speed is 10km/h. Maximum walking speed 2km/h. It can use its legs to carry a payload of 15g or less. *Cost*: $250.

Aerial Drones

Various aerial drones may be equipped for military or paramilitary reconnaissance missions, for planetary survey purposes, for surveillance operations, or for small package delivery missions, among others. The small aerial drone is a helicopter; the larger drones are tilt-rotor craft capable of fixed-wing or helicopter-style flight. They have built-in cameras, communication equipment, and flight control computers. They may be remotely operated or execute pre-programmed flights. Versions range in size and payload capacity from that of a small bird to an aircraft.

Hostile Environment Equipment

Condenser/Filter Canteen

This canteen condenses water vapor from the air and collects it at an hourly milliliter rate equal to twice the air's humidity percentage. In air of standard humidity (50%) it collects 100mL/hour; in humid air with 80% humidity it collects 160mL/hour, and in dry air of 20% humidity it collects 40mL/h. It also filters water to make it safe to drink. *Mass*: 0.5kg + water. *Power consumption*: 5 Watts from Type B power cell. *Cost*: $50.

Sealed Suit

A sealed suit is worn on planets with disagreeable atmospheres. It cannot survive vacuum, but is resistant to heat, cold, and mildly corrosive atmospheres. It also provides effective security against chemical and biological weapons. The suit requires a Rebreather, Life Support System, or SCAFID, all described below, or an umbilical cord connected to a fixed life support system. *Mass*: 4kg. *Cost*: $150.

Vacuum Suit

These suits can be worn in hard vacuum. The suits are form-fitting, keeping pressure against the skin, and obviously air-tight. They require a Life Support System, described below, or an umbilical cord connected to a fixed life support system. *Mass*: 5 kg. *Cost*: $400.

Heavy Vacuum Suit

This is a vacuum suit designed to be used in space, in hostile atmospheres, or in radioactive environments. It provides protection against radiation (up to 10 rem per day), temperatures as high as 100° C or as low as -100 C, corrosive atmospheres, and pressures up to 10 atmospheres. The high mass restricts use to low gravity environments. The suit requires a Life Support System or an umbilical cord connected to a fixed life support system. *Mass*: 50 kg. *Cost*: $950.

Vacuum Suit Maneuver Unit

The MU is essentially a rocket backpack that allows a person in a vac suit to behave like a very small spacecraft. It is useful for maneuvering around the exterior of space ships and space stations. It is of no great use on a planet's surface because it will not deliver enough thrust to get off the ground. Offers total delta-v of about 100 meters per second; less if attached to a payload heavier than a person in a space suit. *Mass*: 100kg. *Cost*: $5,000.

Rebreather

A rebreather is a breathing device for use under water or in non-breathable atmospheres. The hardware is strapped to the body and a regulator (mouthpiece) supplies air to the mouth. Exhaled air is filtered and oxygen is replenished from a small tank. The rebreather allows deeper diving and longer dives than SCUBA systems that supply compressed air from tanks. Unlike SCUBA gear and the SCAFID (below), the rebreather emits no bubbles under water, which enhances stealth and makes divers less scary for the fishes. Endurance: about 6 to 12 hours, depending on level of activity. *Mass*: 9kg. *Cost*: $400.

Life Support System

A life support system supplies breathable air to people in suits (sealed or vacuum) and regulates temperature and pressure. Standard endurance is 8 hours per power cell. *Mass*: 12kg. *Avg. Power Consumption*: 500 Watts from Type E power cell. *Cost*: $1000.

SCAFID: Self-Contained Atmospheric Filtration Device

The SCAFID will effectively remove almost all harmful chemical and biological agents from the atmosphere, and can act as an artificial gill to allow breathing under water. Under water, bubbles escape from the device. *Mass*: 3kg. *Power Consumption*: 50 Watts from Type C or D power cell. *Cost*: $500.

Vacuum Survival Ball

The survival ball is a self-contained, transportable piece of survival equipment to protect one or two people from the hazards of vacuum for a brief time while they await rescue. With a reflective exterior coating to make it highly visible to the eye or to radar, the survival ball is easy to spot. It also carries a multi-frequency radio distress beacon to attract help. The survival ball stores as a suitcase-sized object that will inflate to admit one or two passengers. Once sealed shut, the survival ball will maintain a breathable atmosphere and survivable temperature for one person for 50 hours, or for two people for 25 hours. *Mass*: 25kg. *Cost*: $1000.

Body Armor and Fittings

Armor protects targets from damage by absorbing or deflecting the energy of incoming bullets, laser pulses, or other attacks. Armor's effectiveness in doing this is represented by its "armor value." This is a number which, for body armor, usually falls in the range of 5 to 40, with higher numbers indicating greater protection. A material's armor value is compared to the "penetration value" of the attack to determine whether the attack will do all, half, or none of its ordinary damage on the target. As explained in the armor rules section, when armor value is greater than penetration, the target is shielded from all penetration damage. (Concussion damage remains possible.) If armor value is less than penetration but more than half of penetration, then the target will suffer half a weapon's ordinary damage. If armor value is less than half of the penetration value then the target will suffer full damage.

Armor camoflauge: Armor may be purchased in a variety of colors or camouflage patterns. An option for all armor is adaptive camouflage (or "chameleon armor"), which may be purchased for an additional $100 for arms, $200 for pants, $50 for boots, $50 for gloves, $200 for torso and neck, and $75 for helmet. Adaptive armor can be connected to a computer and can change its color scheme or camouflage pattern according to the computer's instructions. For instance, it can turn white in the snow, turn black at night, turn gray on concrete, adopt a variety of shades of green and brown for a forest camouflage pattern, and display polka dots when the wearer is feeling whimsical. Adaptive armor must be originally purchased as such; the option cannot be added to existing conventional armor. It also requires a power source; a whole-body color transformation requires about 1 watt of electricity and takes about a second.

Helmets and Helmet-Integrated Targeting Gear

Safety helmet

This type of helmet protects the upper head. It is suitable for use by heavy equipment operators, construction personnel, or rock climbers. *Armor value*: 3. *Mass*: 0.5kg. *Cost*: $10.

Combat helmet

This helmet protects the upper head. Although obsolete, these helmets still exist by the millions and remain in use in frugal or cash-strapped organizations. *Armor value*: 25. *Mass*: 1kg. *Cost*: $15.

Advanced combat helmet, partial

This helmet protects the upper head. It is suitable for use by combat troops or police. *Armor value*: 35. *Mass*: 1 kg. *Cost*: $50.

Advanced combat helmet, full, sealing

This helmet protects the upper and lower head, including facial protection with a transparent armored visor. It provides an air-tight seal and filtration system to defend against chemical weapons, though it will not maintain a seal in vacuum. *Armor value*: 40. *Mass*: 2kg. *Cost*: $350.

Armor Effectiveness

The table below describes the typical effectiveness of some armor values.

Armor Value	*Typical Effectiveness*
5	Stop very light handguns and some explosive fragments; reduce damage from many handguns and higher-velocity explosive fragments.
10	Stop light handguns and most explosive fragments; reduce damage from heavy handguns, shotgun flechettes, and some rifles.
15	Stop shotgun flechettes, explosive fragments, and most handguns; reduce damage from some rifles.
20-30	Stop shotgun flechettes, explosive fragments, most handguns; reduce damage from conventional rifles, shock rifles, and shotgun slugs.
40	Stop handguns, shotgun flechettes, many rifles, shotgun slugs; reduce damage from heavy rifles.

Basic HITS: Helmet Integrated Targeting System

A sighting device with a camera (a cylinder approximately 1cm in diameter and 5 cm long, most of which is a housing for a type A power cell) is attached to a weapon and connected by cable or infrared link to a set of goggles (which may be combined with other vision equipment such as omni-goggles) to give the user a constant update of where his or her shots will hit. The device can use the goggles superimpose a red dot in the user's view over the predicted hit location, but it can also feed a camera view to the goggles, allowing the user to see where the weapon is pointed, and where shots will hit, even if the weapon is dropped or if the user points the weapon around a corner. Also, the use of this device confers the weapon's Aimed Shot bonus for normally aimed shots. Data gathered by the HITS camera can also be uploaded to computers or communication equipment in real time. The device is also known as "WHITS," for Weapon-Helmet Integrated Targeting System. *Mass*: 0.1. *Power Consumption*: 1 Watt from a type A power cell. *Cost*: $150.

Advanced HITS

The advanced HITS provides the features of the basic system and adds omni-goggle type vision equipment attached to the wearer's head which provides a look-out in 360 degrees. This provides a bonus to Awareness tasks (typically +2). It includes a computer system to detect, track, and identify targets. It also includes an anti-noise system to defend the user against disorientation, fatigue, or ear damage from loud noises such as gunshots or grenade explosions. This system improves a user's initiative with a +3 modifier. *Mass*: 0.1. *Power Consumption*: 2 Watts from a type A power cell. *Cost*: $750.

Full-body armor suits

Light ballistic cloth bodysuit

This suit covers the entire body, save the head, in light ballistic cloth. Armored gloves and boots included. *Armor value*: 5. *Mass*: 9kg. *Cost*: $250.

Light Duralar rigid armor suit

Covers the entire body, save the head and hands, in light, rigid Duralar. Boots included. *Armor value*: 18. *Mass*: 11kg. *Cost*: $500.

Heavy sealed armor suit

This consists of rigid plate armor covering the entire body, sealed to protect against chemical or biological hazards (though not vacuum). Small perforations in the suit (6mm or less) will automatically re-seal. Requires additional full, sealing, advanced combat helmet. *Armor values*: Torso and neck: 40. Arms, legs, and feet: 30. Hands: 5. *Mass*: 22kg. *Cost*: $2000.

Vacuum combat suit

This is an armored, self-sealing vacuum suit. Helmet included. If sealed, a life-support system, rebreather, SCAFID, or similar device or umbilical cord is required to provide breathable air. *Armor values*: head and neck: 40, torso: 40, forearm/hand: 5, other locations: 30. *Mass*: 25kg. *Cost*: $2500.

Armor Pieces

Light ballistic cloth vest

Flexible armor vest that resists perforation and is fairly easy to conceal under clothing. *Armor value*: 5. *Mass*: 2kg. *Cost*: $35.

Heavy ballistic cloth vest

May be concealed under a heavy coat, but will be obvious under lighter clothing. *Armor value*: 10. *Mass*: 4kg. *Cost*: $60.

Light Insta-Hard vest

The light Insta-Hard vest is made of a flexible material about as thick as a heavy sweatshirt. It protects the torso and may be worn concealed under clothing. When hit by a high-velocity object such as a bullet, the area of the impact will instantly harden to provide

armor protection. Once hardened by an impact, the vest no longer affords any armor protection. *Armor value*: 6. *Mass*: 1.5kg. *Cost*: $250.

Light Insta-Hard shirt
This armor garment protects the torso and arms. *Armor value*: 6. *Mass*: 2kg. *Cost*: $300.

Medium Insta-Hard vest
Protects torso. Possible to conceal under loose clothing. *Armor value*: 16. *Mass*: 4kg. *Cost*: $500.

Heavy Insta-Hard vest
Too large and bulky to conceal, this vest protects the torso. *Armor value*: 20. *Mass*: 5kg. *Cost*: $600.

Light Duralar (rigid) torso armor
Duralar is a strong, light, carbon-nanotube armor material. Protects torso and neck. *Armor value*: 18. *Mass*: 3kg. *Cost*: $300.

Medium Duralar (rigid) torso armor
Protects torso and neck. *Armor value*: 30. *Mass*: 5kg. *Cost*: $400.

Heavy Duralar (rigid) torso armor
Protects torso and neck. *Armor value*: 40. *Mass*: 7kg. *Cost*: $500.

Armor pants, ballistic cloth
Protects legs. *Armor value*: 5. *Mass*: 3 kg. *Cost*: $100.

Armor pants, light Duralar
Protects legs. *Armor value*: 16. *Mass*: 4kg. *Cost*: $350.

Armor pants, medium Duralar
Protects legs. *Armor value*: 24. *Mass*: 6kg. *Cost*: $550.

Arm armor, light ballistic cloth
Designed to be used in conjunction with a vest or torso plate. *Armor value*: 5. *Mass*: 2kg. *Cost*: $200.

Arm armor, heavy ballistic cloth
Armor value: 8. *Mass*: 3kg. *Cost*: $250.

Arm armor, light Duralar
Armor value: 18. *Mass*: 4kg. *Cost*: $300.

Arm armor, medium Duralar
Armor value: 25. *Mass* 5kg. *Cost* $350.

Armored gloves
Armor value: 5. *Mass*: 0.5kg. *Cost*: $50.

Boots, light armor
Armor value: 10. *Mass*: 2kg. *Cost*: $150.

Boots, heavy armor
Armor value: 30. *Mass*: 4kg. *Cost*: $300.

Armor Plating

Duralar Plate
These plates of armor can be bolted onto existing structures or vehicles, or placed around fighting positions, for added protection. Pieces snap together and have tie-down loops and bolt holes for easy attachment to other objects. Plates may be layered for added protection. All plates have AV 40 and are about 1cm thick. They come in three sizes. Small plates are 50cm by 20cm. *Mass*: 1kg. *Cost*: $50. Standard plates are 1 meter square. *Mass*: 10kg. *Cost*: $300. Large plates are 1.5m by 2m. *Mass*: 30kg. *Cost*: $900.

Vuelar Plate
Vuelar is a transparent armor. These transparent armor plates can be attached to Duralar plates. They come only in the small size (50cm by 20cm). *Armor value*: 10. *Mass*: 1kg. *Cost*: $75.

Weapons List

The weapons list begins on the next page. Here is an explanation of the terms you will find on it.

Weapon and caliber: This column lists weapons by name and the caliber and type of ammunition they fire. In this column are also headings in bold print to indicate the type of weapon, such as **Conventional Pistols**. Ammunition noted as "*Ex*" is explosive. "ISG" indicates that the weapon includes an integral shotgun. A notation such as "180kJ pulse" indicates that a laser weapon fires a pulse of 180 kilojoules.

Aim: This is the bonus to the to-hit roll which the GM applies for characters who fire aimed shots. To earn this bonus, the rate of fire may not exceed the first number in the Rate of Fire column.

Effective Range: This is the effective range of the weapon in meters. Targets may be engaged out to twice this range, but at a penalty to hit. Targets significantly closer than this are engaged with a to-hit bonus. See page 47 for details.

Rate of Fire, Aim / Stable / Max.: The numbers in this column indicate the aimed, stable, and maximum rates of fire of the weapon. The aimed rate is the maximum number of rounds that may be fired while earning the Aim bonus (listed in the Aim column). The stable rate is the number of rounds that may be fired without penalty in a five second turn. As explained in the Rate of Fire rules (page 49), exceeding the stable rate results in a –3 penalty to hit; firing more than twice the stable rate results in a –6 penalty to hit. The maximum rate is an absolute limit on the number of times the weapon can fire in one turn.

Pen, Dam: These numbers are the armor penetration and damage values for the weapon. The letters "ke," "exp," "stun," or "lsr" following the damage value indicate that the weapon fires a kinetic energy projectile, an explosive projectile, a chemical stun projectile (doing only stun damage), or a laser beam, respectively.

Bulk, Mass, Length: These numbers indicate the bulk, mass, and length of the weapons. Bulk is a modifier to initiative during combat that applies when characters use the weapon; zero is best, and –9 is the worst on this list. Mass is listed in kilograms for the weapon without an ammunition magazine. Length is the length overall from the muzzle to the butt.

Sig.: The letter in this column indicates the relative signature of the weapon when fired; that is, it indicates how easily noticed the firing is.

Magazine Cap./Mass: This indicates the number of rounds held in a full magazine (the "capacity") and the mass of the loaded magazine.

Rel., Avl., Cost: These numbers indicate the weapon's reliability, availability, and cost, respectively. Reliability is indicated as poor, average, or good. Availability is a success modifier that applies to the difficulty of the task of obtaining such a weapon. Cost is indicated in dollars.

The most common weapons in the hands of street thugs are generic "Saturday Night Special" pistols and "Street Sub-Machine Guns." The most common police sidearm is a FedArms M70. Most standard-issue infantry weapons are shock rifles.

	Weapon and caliber	*Aim*	*Effective Range*	*Rate of Fire* *Aim, Stb., Max.*	*Pen, Dam*	*Bulk, Mass, Length*	*Sig.*	*Magazine Cap./ Mass*	*Rel., Avl., Cost.*
Semi-Automatic Handguns	**Conventional Pistols**								
	"Saturday Night Special" 7.*5mm*	+1	40m	2 /10 /20	4, 12 ke	-1, 1kg, 20cm	low	18/ 0.25kg	poor, +2, $40
	↳ with explosive round	"	"	"	4, 20 exp	"	"	"	"
	SimonArms Defender 7.*5mm*	+1	25m	2 /8 /15	4, 10 ke	0, .33kg, 11cm	low	12/ 0.1kg	good, +1, $60
	↳ with explosive round	"	"	"	4, 20 exp	"	"	"	"
	Monolith P-51 *5.1mm*	+1	60m	4 /12 /24	12, 20 ke	-1, .75kg, 18cm	low	20/ 0.25kg	good, +1, $95
	↳ with explosive round	"	"	"	12, 35 exp	"	"	"	"
	SimonArms Conqueror *5.1mm*	+1	35m	3 /9 /18	11, 20 ke	0, .33kg, 12cm	1ow	15/.1kg	good, -1, $140
	↳ with explosive round	"	"	"	12, 35 exp	"	"	"	"
	Daisho Type 23 *6mm*	+1	55m	4 /12 /22	13, 22 ke	-1, .75kg, 19cm	low	25/ 0.25kg	avg., -1, $140
	↳ on explosive setting	"	"	"	13, 40 exp	"	"	"	"
	FedArms P3 High Standard *6mm*	+1	40m	2 /8 /18	12, 22 ke	0, .4kg, 15cm	low	15/ .15kg	avg., -1, $180
	↳ on explosive setting	"	"	"	12, 40 exp	"	"	"	"
	Fed.Arms M70 *12.7mm*	+1	40m	3 /9 /18	40, 100 exp	-1, 1kg, 22cm	low	11/.25kg	avg., -1, $190
	↳ with stun round	"	30m	"	0, 14 stun	"	"	"	"
	Martel SledgeHammer M-30 *14.5mm*	+1	40m	2 /7 /15	50, 120 exp	-2, 1.25kg, 25cm	med.	8/.25kg	avg., -1, $200
	↳ with stun round	"	30m	"	0, 16 stun	"	"	"	"
	Pulse Laser Pistols								
	Neodyne Hand Laser *40kJ*	+3	50m	9 /12 /12	6, 15 lsr	-2, 1kg, 26cm	low	9/ 0.25kg	poor, -5, $1550
	Daisho Type 5A2L *20kJ*	+3	45m	24 /24 /24	3, 8 lsr	-2, 2kg, 30cm	low	20/.5kg	poor, -5, $1600
	Monolith PL-5000 *5kJ*	+3	40m	50/ 50 /50	1, 2 lsr	-2, 2kg, 28cm	low	50/.5kg	poor, -6, $1800
	Daisho Type 5L *20kJ*	+3	45m	12 /16 /16	3, 8 lsr	-2, 1kg, 27cm	low	15/ 0.25kg	poor, -4, $1450
	Chemical Stun Pistol								
	SimonArms ThugStopper	+1	35m	3 /7 /12	0, 16 stun	-2, 1kg, 25cm	mod.	10/.25kg	avg., 0, $95
Sub-Machine Guns and Machine Pistols	**Conventional MPs and SMGs**								
	"Street Subgun" *7.5mm*	+1	80m	6 /18 /50	5, 12 ke	-3, 2.5kg, 50cm	med.	40/ 0.5kg	poor, +1, $75
	↳ with explosive round	"	"	"	5, 20 exp	"	"	"	"
	Daisho Type 27 *6mm*	+2	160m	7 /20 /90	14, 40 exp	-3, 2kg, 45cm	med.	30/.25kg	good, -1, $300
	↳ on explosive setting	"	"	"	14, 40	"	"	"	"
	Martel M-28 *6mm*	+1	60m	5 /14 /50	12, 22 ke	-1, 1kg, 22cm	low	25/.2kg	good, 0, $95
	↳ on explosive setting	"	"	"	12, 40 exp	"	"	"	"
	Flechette MP and SMG								
	Daisho Type 31 MP *3mm*	+1	50m	10 /20 /100	5, 9 ke	-1, 1kg, 25cm	med.	100/.25kg	avg., -1, $170

	Daisho Type 32 SMG *3mm*	+2	80m	15 /30 /100	6, 9 ke	-2, 2kg, 40cm	1ow	200/ 0.5kg	avg., -2, $230

	Weapon and caliber	*Aim*	*Effective Range*	*Rate of Fire* *Aim, Stb., Max.*	*Pen, Dam*	*Bulk, Mass, Length*	*Sig.*	*Magazine Cap./ Mass*	*Rel., Avl., Cost.*
Shotguns	**Combat Shot Guns**		*as a mult. of ammo*						
	Vickers Dominator *18mm*	+1	x1	3 /9 /18	see ammo	-4, 4kg, 86cm	med.	10/ 1kg	good, +1, $450
	Martel S-11 *18mm*	+1	x1	2 /8 /45	see ammo	-4, 4kg, 90cm	med.	10/ 1kg	good, -1, $550
	Ultra Compact *18mm*	+1	x.5	1 /5 /10	see ammo	-2, 2kg, 50cm	med.	6/ 0.5kg	good, -1, $600
	Hunting Shot Gun								
	SimonArms FieldMaster *18mm*	+1	x1	1 /6 /12	only hunting ammo types	-4, 4kg, 120cm	med.	6/ 0.5kg	good, +2, $150
Rifles	**Conventional Assault Rifle**								
	Daisho Type 3 *5mm*	+2	400m	9 /18 /100	16, 45 ke	-3, 3kg, 65cm	med.	40/ 0.33kg	good, +2, $250
	Hunting & Sniper Rifles								
	Skoda Vz.71-67 *6.7mm*	+2	600m	4 /12 /24	26, 55 ke	-6, 4kg, 112cm	low	30/ 0.5kg	good, -1, $180
	Ultra GameGetter *.275 Magnum*	+3	750m	2 /5 /10	30, 75 ke	-5, 3kg, 110cm	med.	10/ 0.2kg	good, +1, $300
	Monolith Mega *9mm Hyper-Velocity*	+4	1000m	1 /2 /4	70, 100 ke	-7, 8kg, 150cm	high	10/ 0.5kg	good, -3, $600
	Shock Rifles								
	SimonArms M19 *4.1mm w/18mm ISG*	+2	400m	14 /22 /75	45, 100 exp	-4, 4.5kg, 76cm	low	170/ 0.5kg	good, -3, $550
	⇦ with inert round, with dual feed	"	"	"	45, 40 ke	"	"	"	"
	⇦ using 18mm ISG	+1	x ½	2 /8 /16	see ammo	"	med.	6/ 0.5kg	"
	Martel M-85a *4.4mm w/18mm ISG*	+3	400m	10 /24 /75	40, 110 exp	-5, 5kg, 82cm	low	150/ 0.5kg	good, -3, $600
	⇦ on inert setting	"	"	"	40, 40 ke	"	"	"	"
	⇦ using 18mm ISG	+1	x ½	2 /9 /18	see ammo	"	med.	4/ 0.33kg	"
	Smart Projectile Rifles								
	Krupp G-90 *12mm smart round*	+4	1000m	2 /3 /10	80, 90 exp	-5, 6kg, 102cm	high	15/ 1.5kg	good, -2, $750
	SimonArms Suiter *15mm beam rider*	+4	800m	2 /3 /6	80, 120 exp	-4, 5kg, 92cm	high	18/ 0.5kg	avg, -3, $750
	FedArms SM-9 *9mm smart THVR*	+4	1200m	15 /15 /15	75, 100 exp	-3, 3kg, 74cm	med.	30/ 0.5kg	avg., -4, $1100
	Pulse Laser Rifles								
	Neodyne SBS-35 *130kJ pulse*	+4	250m	18 /18 /18	18, 55 lsr	-2, 2.5kg, 60cm	low	60/ 1kg	avg., -4, $1200
	Daisho Type 33 *500 kJ pulse*	+4	400m	8 /8 /8	65, 110 lsr	-7, 7kg, 99cm	med.	40/ 1kg	avg, -4, $1800

	Weapon and caliber	*Aim*	*Effective Range*	*Rate of Fire* *Aim, Stb., Max.*	*Pen, Dam*	*Bulk, Mass, Length*	*Sig.*	*Magazine Cap./ Mass*	*Rel., Avl., Cost.*
Machine Guns	**Conventional Machine Guns**								
	Daisho Type-33 *5mm*	+2	400m	4 /12 /100	16, 45 ke	-4, 4kg, 80cm	med.	200/ 0.66kg	good, 0, $500
	SimonArms HMG-73 *8.5mm*	+2	850m	5 /16 /60	30, 90 exp	-6, 9kg, 140cm	high	100/ 2kg	good, -2, $800
	Enfield "Predator" rotary MG *6.7mm*	+1	650m	14 /30 /300	26, 55 ke	-9, 15kg, 150cm	high	300/ 4kg	avg., -4, $2000
	Shock Machine Guns								
	SimonArms MG200 *4.1mm*	+2	400m	15 /28 /200	45, 100 exp	-7, 8kg, 98cm	med.	300/ 1kg	avg., -3, $850
	↳ with inert round, dual feed	"	"	"	45, 40 ke	"	"	"	"
	Krupp MG-80 *4.4mm*	+2	400m	14 /24 /100	40, 110 exp	-9, 9kg, 107cm	med.	250/ 1kg	good, -3, $900
	↳ on inert setting	"	"	"	40, 40 ke	"	"	"	"
	Pulse Laser Machine Guns								
	Neodyne RBS-60 *130kJ pulse*	+3	300m	50 /50 /50	18, 55 lsr	-7, 7kg, 100cm	med.	100/ 2kg	avg., -4, $6000
	Monolith L-11 *250kJ pulse*	+3	400m	40 /40 /40	45, 90 lsr	-9, 13kg, 211cm	med.	120/ 3kg	avg., -4, $8500
Heavy Personal Weapons	**One-Shot Disposable Lasers**								
	Generic 1MJ disposable pulse laser	+4	1000m	1	100/200 lsr	-3, 3kg, 51cm	high	na	poor, -4, $750
	Generic 1.5MJ disposable pulse laser	+4	1500m	1	150/300 lsr	-4, 4kg, 56cm	high	na	poor, -4, $925
	Generic 2MJ disposable pulse laser	+4	2000m	1	200/400 lsr	-4, 4kg, 59cm	high	na	poor, -4, $1200
	Rocket & Grenade Launchers								
	Multipurpose Infantry Rocket (MIR) launcher, 55mm	+4	see ammo	1	see ammo	-3, 2.5kg, 51cm	high	na	avg., -4, $950
	Martel G-30 30mm grenade launcher	+2	300m	1	see ammo	-3, 3kg, 54cm	med.	1/ 0.2kg	good, -4, $400

Grenade/Rocket Type	*Effective Range*	*Contact pen., dam*	*Blast Damage*	*Fragment pen., dam.*	*Frag. Range*	*No. of frags.*	*Mass (kg)*	*Rel., Avl., Cost*
MIR Rockets								
55mm MIR APHE Rocket	600m	2000, 500	200	na	na	na	3	na, -4, $75
55mm MIR Fragmentation Rocket	600m	900, 900	100	50, 90	10m	1000	3	na, -4, $150
Hand Grenades								
HE hand grenade, offensive	thrown	na	100	na	na	na	0.5	na, -3, $2
Fragmentation hand grenade, offensive	thrown	na	60	4, 7	10m	2000	0.5	na, -3, $2
Stun hand grenade	thrown	na	30 stun	na	na	na	0.5	na, -2, $2
Shotgun Grenades								
18mm Fragmentation shotgun grenade	150m	8, 20	40	1, 4	4m	500	0.1	na, -3, $1
18mm APHE shotgun grenade	150m	90, 120	40	na	na	na	0.1	na, -3, $1
18mm HE shotgun grenade	150m	8, 120	80	na	na	na	0.1	na, -3, $1
18mm Stun shotgun grenade	150m	1, 1	20 stun	na	na	na	0.1	na, -2, $2
18mm Incendiary shotgun grenade *	150m	8, 20	20	1, 5	5m	100	0.1	na, -4, $2
Launcher Grenades								
30mm Fragmentation grenade	300m	8, 35	40	2, 5	5m	500	0.2	na, -4, $2
30mm APHE grenade	300m	350, 200	60	na	na	na	0.2	na, -4, $2
30mm HE grenade	300m	75, 200	120	1, 4	5m	1000	0.2	na, -4, $2
30mm Stun grenade	300m	1, 1	30 stun	na	na	na	0.2	na. -3, $2
30mm Incendiary grenade	300m	8, 20	30	1, 5	7m	200	0.2	na, -4, $1
30mm Aerofoil round, RoF 50 per**	60m	4, 10	0	0	0	0	0.2	na, -3, $1

*Fragments from incendiary grenades burn (and do damage) for three turns.

** 30mm Aerofoil rounds are similar to aerofoil shotgun shells; they give an effective rate of fire of 50 rounds with a penetration and damage of 4 and 10, respectively.

Weapon and caliber		*Aim*	*Effective Range*	*Rate of Fire* *Aim, Stb., Max.*	*Pen, Dam*	*Bulk, Mass, Length*	*Sig.*	*Magazine Cap./ Mass*	*Rel., Avl., Cost.*
Shotgun Ammo (also see grenades)	**Shotgun Ammunition**								
	Hunting bird shot 18mm	–	25m	30 per	2, 3 ke	–	–	–	--, +3, 10¢
	Hunting buckshot 18mm	–	35m	10 per	4, 10 ke	–	–	–	--, +3, 10¢
	Hunting slug 18mm	–	125m	1 per	20, 60 ke	–	–	–	--, +2, 10¢
	Aerofoil flechette 18mm	–	60m	30 per	4, 8 ke	–	–	–	--, +2, 10¢
	AP Flechette 18mm	–	80m	7 per	15, 10 ke	–	–	–	--, 0, 25¢
	APDS Slug 18mm (half weapon's RoF)	–	200m	1 per	30, 75 ke	–	–	–	--, -1, 50¢
	Stun round 18mm	–	100m	6 per	0, 15 stun	–	–	–	--, +1, $1

Ammunition List

Prices are per box of 100 rounds.

Pistol, Machine Pistol, and Submachine Gun Ammunition
5.1mm ke; $5.
5.1mm exp; $20
6mm selectable ke/exp; $60.
7.5mm ke; $6.
7.5mm exp; $12.
12.7mm exp; $30.
12.7mm stun; $85.
14.5mm exp; $16.
14.5mm stun; $100.
ThugStopper stun cartridges; $100.

Flechette Ammunition
3mm; $15.

Rifle Ammunition
4.1mm selectable ke/exp; $95.
4.4mm selectable ke/exp; $80.
5mm ke; $6
6.7mm ke; $7
.275 Magnum ke; $10
8mm exp; $20
8.5mm exp; $30
9mm Hyper-Velocity ke; $15
9mm smart THVR exp; $2900.
12mm smart exp; $1050.
13mm exp; $60.
13.5mm exp; $45.
15mm beam rider exp; $850.

Laser Cartridges
5kJ; $100.
20kJ; $100.
40kJ; $100.
130kJ; $100.
250kJ; $160.
500kJ; $300.
1MJ; $550.
1.5MJ; $700.
2MJ; $1000.

Adventuring

This chapter discusses the ingredients of successful adventures and shows you how to design and play adventures with interesting themes. General information is provided, followed by specialized information for campaigns involving law enforcement issues.

Designing Adventures

Designing an RPG adventure has something in common with writing a story, but it places unique demands on the designer because of one major difference between the stories in role playing and the stories in literature, film, or theater: in role-playing, the audience helps create the story. This audience consists of the players and the game master, whose interactions in the gaming process transform the adventure plan that exists in the game master's head into a full fledged story that is played out around the gaming table. Thus the author of a role-playing adventure is creating more of a story outline than a finished work, and that outline needs to be flexible enough to give the gaming group options in where they go with it. Thus we come to our first rule of adventure design:

Create Many Possibilities.

The best adventures have opportunities for the players to radically affect not only the final outcome of a story, but the path it takes to get there. The GM cannot plan a scenario in detail from start to finish, because the players must be free to take the adventure where they want to. However, an over-arching concept or vision is especially helpful in orienting an adventure, which leads to the second rule:

Develop a Theme, and Perhaps a Premise.

Most games are procedural. In billiards, you knock the colored balls into the pockets. Doing so with flair may be fun, but trick shots don't help you win the game. In role-playing, winning is an alien concept. Flair is all there is. Instead of trying to follow a procedure better than an opponent, we try to come up with a style that will be pleasing to us and our fellow players. This sort of thing—playing with style for aesthetic purposes—is the essence of art. As an art, role-playing is a cousin of literature. The focus of role-playing is on characters and stories, after all. Literature has two other features that improve role-playing adventures: a theme, and a premise.

A premise is a principle that is illustrated or proved by a story; it is the "point," if you will. In most episodes of Star Trek, for instance, the premise is that people who are honest and hard-working always triumph over evil. This is, of course, a premise so common that it is a cliché. Other common premises are that greed leads to downfall, that love blinds people to other desires, and that power leads to corruption. Premises are open to interpretation, but in Blade Runner it's that a biological definition of "human" is less satisfactory than one based on feelings. In Alien it's that a corporation concerned only with the bottom line is

inhumane. (In Alien 3 and 4 it's that Aliens should have been the final movie in that series, apparently.)

But does all fiction have a premise? Generally, yes, even the dumbest action flick has a premise. It's true that many stories are contrived to provide a vehicle for a series of scenes that are exciting, funny, or otherwise compelling, rather than to make some intellectual point to the audience. The movie Jurassic Park, for instance, is more a showcase of special effects than a social commentary. But it also has a pretty clear premise about the dangers of meddling with nature. Even movies that exist simply to attract audiences with their action scenes typically have characters and stories to make the action more interesting, and each one still has a premise, even if it's just the old cliché that a hard-working underdog can prevail over the bad guy. If it has a story, it has a premise.

A role-playing game, once played, has a premise too. The completed adventure will tend to show something or other about human experience, and it's the connection with human experience that makes the game interesting. But a design for an adventure is hard-put to have a premise. This is because of the first principle of adventure design that we laid down earlier: create many possibilities. A good adventure design usually has neither a rigidly set sequence of events nor a predetermined outcome. The bad guys (assuming there are bad guys) could get away, or they could make a pact with the good guys and form one team, or they could all die in a fire-fight with the player-characters. This is up to the game master and the players to determine over the course of the game. The designer should be uncertain about what will happen. The indeterminacy that characterizes an un-played adventure is precisely what makes the prospect of playing an attractive one, and it's also precisely what makes a premise hard to achieve. However, the designer can at least anticipate a premise and provide events and NPCs that encourage one.

Although it may not be possible to definitively map out a premise before an adventure is played, none of this precludes an adventure design having a theme. Indeed, a theme—a unifying element in the story that is present from start to finish—is an essential part of a good adventure plan. The focus of a theme is conflict; the conflict between good and evil, between duty and desire, between capitalist enterprise and communal ideals, between opposing visions fairness. This conflict can be centered on the characters, as when they form a team whose personal goals are opposed by a group of NPCs, or it may be centered on other actors, such as corporations or governments, who have dragged the player characters into their own dispute. But although characters are the focus of the adventure, they don't have to be the direct focus or origin of the theme. A story can also be centered on a dramatic event (such as contact with aliens, a natural disaster, or a war), an intriguing environment (like a new planet to be explored), or an idea for change (as in, "What if somebody invented a device that could…", which has been a staple of science fiction).

The theme should capture the attention of your players and involve their characters, which brings us to the last rule:

Hook the Characters—and the Players.

Campaigns can emphasize anything from storytelling to puzzle solving, from exploration to combat simulation, from dialogue to action. But all campaigns need to draw the players into the game, and to do that they need to have "hooks."

A hook is something to snare the attention of the players. It could be a mysterious surprise that they will feel compelled to try to explain, or a tantalizing opportunity to get rich

or accomplish something important, or a terrorizing threat they must escape. Whatever its nature, the hook draws the characters into the plot and ties them to the story. The essential idea is to get the characters—and the players—engaged in the setting.

One way to do this is to link the characters to each other. This could happen when players are creating characters, or it could happen after the characters are created. Players could decide, "Let's play a tramp merchant crew," and then work out details of how they met, how long they've known each other, and how they work together. Once they've designed the party and decided what sort of things they want to do, they present the situation to the GM. Alternatively, each player may generate a character independently, and the GM may have an adventure in mind that will thrust disparate characters together in a unifying plot. One way or the other, it usually works better if the player characters are somehow tied together early in the campaign. They may be cooperating or in conflict, but they need to be linked sufficiently that the adventure tells one story about all of them, not separate stories about each of them.

Another way to hook the players is to adapt your scenario to fit the characters. This means much more than designing an adventure that has use for a doctor when you notice that one of the characters specializes in medical skills. Make the adventure personal. Find out what matters to a character, and then tailor the adventure accordingly. Find out what a character cherishes and put it at risk, or find out what a character longs for and place it within (or just beyond) reach. Instead of treating a character as a cog in a larger story mechanism, try making the character a focus of at least part of the story.

Tips on Good Playing Style

Four pieces of golden advice for the GM:

- Play with the players, not against them. And don't have a power trip. Your seat in the GM's chair carries a responsibility to serve the players well, and is not a license to manipulate them for your amusement. Your job is to narrate the adventure, to manage what goes on beyond the player characters' view, and to coordinate the game so that everybody can enjoy themselves.
- Supply meaningful detail in your descriptions. As a narrator, it is especially important for the GM to use detailed descriptions to communicate the feel and flavor of the environment. These details should include both the sensory perceptions of the PCs and encounters with NPCs. Detail gives the players things to do, and interesting character encounters spawn dialogue and activity.
- Adapt the adventure to the player characters. Adventures work when the characters have a role in the scenario, so always give your PCs opportunities to make a difference. Characters and their distinguishing features are always important elements in a good story, so it is important to adjust the campaign to fit the characters so they can overcome their weaknesses and capitalize on their strengths.

GMs, Heed Strunk & White:
"If those who have studied the art of writing are in accord on any one point, it is this: the surest way to arouse and hold the attention of the reader is by being specific, definite and concrete. The greatest writers—Homer, Dante, Shakespeare—are effective largely because they deal in particulars and report the details that matter. Their words call up pictures."

- Know when to break the rules. In any RPG you need to strike a balance among the story, the simulation, and the rules. The rules are tools for you to use to the extent that they help you make the game more fun, and they are always subordinate to your judgment about what will make the story better or what is more realistic. The rules favor simulation over storytelling, so sometimes you may want to break the rules in the interest of telling a better story. This is fine, so long as you don't compromise the realism or credibility of your adventure. That's your call. Remember that the rules are here to help you, not to bind you, so you should never feel like you have to announce results you're uncomfortable with just because the rules tell you to.

Four pieces of golden advice for the player:

- Play *with* the GM and the other players, not against them. The game is fun when you collaborate and interact, not when you compete. Role-playing is no fun by yourself; it's fun when you build and share experiences with other people. Treat them well. Especially, don't fight with the GM about the rules. Discussion about points of confusion is fine, but rules-lawyering is no fun for anyone.
- Don't be a munchkin. A munchkin is an immature player who abuses or misses the point of the game. Instead of adventuring and role-playing, the munchkin sees the game as an exercise in building the most "powerful" character, in accumulating weapons or wealth, and/or in squeezing the rules to accrue every possible benefit for his or her character. The munchkin's basic problem is a fixation on his or her character's status relative to other characters. Ignore this status. Instead, pay attention to the role of your character in a story. It's fine to play a character who cares about his or her status, but it's self-defeating for players to behave as if their goals are to maximize the ability levels of their characters. Develop and play your character as a person, not as numbers on a page.
- Show, don't tell, the other players what your character thinks and feels. Telling is straightforward. Usually it is also much less interesting than showing. Instead of declaring that your character is nervous or restless, describe how he fidgets or looks around constantly. Instead of saying that your character is furious, describe the way her ears get red and she clenches her jaw and seethes.
- Play your character, not yourself, and don't base your character's behavior on things that you know but your character doesn't. In some sense, the characters we play are probably always autobiographical. Still, your character is not you unless you've decided, unusually, to deliberately play yourself. Keep your character's personality, drives, and knowledge in mind, and you'll find role-playing a more rewarding experience.

Law Enforcement Campaigns

Law enforcement involves a wide range of characters: police, bounty hunters, security firms, private detectives, criminals, news reporters, and lawyers are among the most central. When taken from the perspective of the "good guys," law enforcement campaigns generally center on criminal investigations. The gamut of criminal activities suitable for investigation in Vanguard adventures is wide: murder, terrorism, espionage, organized crime, and piracy are a few. This section provides tips to help players and game masters get the most out of such campaigns.

Criminal investigators try to piece together the pattern of facts that allow crimes to be explained so that justice can be done. When presented with a case, investigators must ask and answer a series of questions: Was there a law broken? What loss or injury resulted? How can any missing persons or property be recovered? What events led to the crime? What methods were used by the guilty party? Who is guilty or contributed to the crime?

Most of the time the investigators' primary objectives are to make an arrest and to provide enough evidence that the suspect can be convicted in court. When deciding whom to arrest, law enforcement investigators identify suspects who have motive, opportunity, and association with the crime. That is, they try to find people who had a reason to commit the crime, who were able to commit the crime, and who can be connected to the crime by their own statements or confession, by witnesses, or by other direct or circumstantial evidence.

Features of Criminal Activity and Investigations

The criminal element has several assets working to its advantage. Among them:

Availability of weapons. Firearms are easy to make and easy to buy illegally. The sale and manufacture of commercially produced firearms is regulated closely enough that such weapons do not typically fall into criminal hands. However, automated manufacturing equipment and readily available blueprints make it possible for black market suppliers to produce moderate-quality machine pistols in their basements at a rate of several per day, for sale at prices of less than $50. Such weapons do not match the quality and finish of most legitimate, commercially produced firearms, but they serve criminal purposes nicely.

Liberal courts and legally protected privacy. In countries where freedom is "high," the political and legal climate emphasizes liberty for citizens at the expense of the convenience of the police department and prosecutor's office. Searches of the persons or effects of criminal suspects can only be conducted if warrants are issued by a court or if police officers have a pressing and immediate need to conduct a search. See further details under the "networked computer databases" heading, below.

Reactive police. The police generally respond to crimes that have happened rather than anticipating and attempting to thwart crimes that are about to be committed. Criminals who plan ahead carefully and act intelligently can make police work extremely difficult.

Strong encryption. Communications and information used by criminals can be kept from the police through the use of encryption techniques that are very difficult to thwart. A cheap computer can almost instantaneously encode files and communications with such security that it would take an expensive and sophisticated computer months or years to break the criminals' codes, by which time the information is often of no value.

Untraceable digital cash. Physical cash in the form of coins and paper money no longer exists in all but the poorest, least developed countries. However, electronic money in most countries has deliberately been designed to allow untraceable transactions, should both involved parties prefer it. This makes it effectively impossible for police to monitor the finances of organized criminals who make their financial transactions in (digital) cash.

Infinite space and colonial freedom. The long arm of the law reaches out to the colonies, but its grip is rather loose there. Criminals in space enjoy the advantages of reduced police presence and an open frontier in which to hide. Space piracy, though impractical in the heavily trafficked and patrolled Solar system, can be profitably practiced in the more remote reaches of space because of the relatively low frequency ship traffic. Pirates who attack ships in remote systems can often get away without being caught. If they are lucky, they can even avoid notice.

Limited reliability of photographic evidence. In the age of photographic film, a photograph was hard to fake convincingly. In the digital age, unidentifiable fake photographs can be produced. Most synthesized photos (i.e. computer-generated images of photorealistic quality) can be distinguished from real photos by expert eyes, but photos synthesized deliberately to fool people into thinking they are real can be indistinguishable from the real thing. Thus, in court even a photo catching a criminal in the act is imperfect evidence if a plausible claim can be made that the image is a fabrication.

On the other hand, law enforcement officers have distinct advantages in several key areas.

Networked computer databases. Despite privacy laws, police have access to vast information in databases. Names, addresses, lists of criminal charges filed, records of civil litigation, marriage, date and place of birth, real estate deeds held (i.e. homes and land owned), and names of parents and children are publicly available and can be found by anyone using automated computer search engines, with almost no effort. Educational and employment histories are also often publicly available and can be found with some research. Criminal arrest records, police reports, lists of licenses held and property permits (such as automobile licenses and registration, firearms permits, etc.), driver's or other license photos, lists of legally owned firearms, past places of residence, and immigration records indicating the time and place of border crossings are not available to the general public, but are available in proprietary police databases. Credit history, military service records, and income tax records are available to the police upon filing an administrative request. Communications connection logs (i.e. the time of connection, time of disconnect, the communications address of the other party, and the amount of data transferred and received, but not the content of the communications), bank records, and medical records can be obtained if a judge is convinced that the police have a good reason (called "probable cause") to suspect their subject of wrongdoing and issues a search warrant. Further, warrants may be issued to allow electronic eavesdropping (such as a "wiretap") or physical search of a suspect's home, person, or property.

Common surveillance cameras. In cities, video cameras used for surveillance are all over the place. Cameras the size of a pen cap cost about $10 and are mounted in most taxis, buses, train cars, subway stations, and businesses, and on intersection signal lights and street lights. Most homes have a few cameras around the house covering the entrances and exits. All cars have cameras. Police wear them on their shoulders. Many of these cameras are

available to the police via the network, allowing searches for criminal suspects or missing persons to be conducted by computers. (See "Computerized image processing," below.)

The ubiquity of cameras in urban settings has a withering effect on random robberies and thefts. A person who commits a holdup in a business will be on camera not only while in the business, but on the street outside. The camera coverage of cities is far from complete, but it is extremely difficult for anyone to move around in public without coming into the view of a camera. Further, the ability of the police to compare these photos with computer records from driver's license, passport, and other photos means that establishing the identity of a suspect who has been photographed is not especially difficult. (See "Computerized image processing" below.)

Reconnaissance satellites. Since cameras, computers, and orbital lift are cheap, it is affordable for police departments to loft reconnaissance satellites into orbit. Basic observation satellites are available for about $50,000 and can monitor people and vehicles from space. They use cameras mounted on stabilized telescopes that can return pictures (in real time video) good enough to tell an adult from a child, for example. For prices closer to $1,000,000, pictures can be had that are good enough to not only recognize people but read ordinary printed text. (Note: in politically free countries it is illegal for corporations or individuals to use such satellites to track the movements of people without their permission, and the police can only do so when they have secured a search warrant. However, it can be next to impossible to know when such spying is under way illicitly.)

Computerized image processing. Images from surveillance cameras and satellites can be searched by computers at high speed. Video from many cameras at once can be processed by everyday palmtop computers. Computers can recognize faces and search through thousands of hours of video recordings to find them, alerting the investigating officers when a subject is located. Police can instruct their computers to compare faces photographed by security cameras with photographic records from driver's licenses, passports, or other government-issued forms of identification, thus identifying people in photographs.

Brilliant security systems. As described above, computers can be linked to video cameras and are capable of recognizing individual people. This means that computers can watch who shows up at the front door of a house and open the door only to the family and friends of the occupant. A computer can be instructed to alert the owner, the neighbors, and/or the police if anyone unknown prowls around the house. Such systems are inexpensive and common, though not ubiquitous.

Available backup. With rare exceptions, law enforcement officers enjoy membership in a closely knit, at least adequately equipped, government-backed organization. As such, even if they are under-staffed and under-budgeted, help will usually come when it is called. Crooks are usually not so lucky, and even if they are, the police can usually summon more and better help. Major metropolitan police forces keep SWAT teams on call, ready for deployment by fast, armored VTOL craft. (Occasionally governments are so incapacitated by corruption or incompetence, or so weak due to small size, that this advantage no longer obtains.)

Ground traffic control and smart cars. In urban areas and on major highways a ground traffic control system monitors the traffic status. Although the movements of ordinary cars are not tracked, stolen cars can often be located in seconds using these systems, taking advantage of the transponders installed in all cars. However, stealing a car in the first place is a very difficult proposition, because almost all cars are equipped with brilliant

security systems (see above) and cameras and will send a video feed to the police if anyone appears to be attempting to burglarize or steal the car.

Advanced forensic science. Law enforcement agencies typically have access to considerable scientific expertise and equipment, and they are quick to bring these resources into play to provide the best possible understanding of crime scenes and physical evidence. One of the most powerful techniques in the array of forensic resources is DNA analysis. This allows forensic scientists an excellent chance to positively identify any blood, hair, dandruff, or other body tissues found at a crime scene. Although DNA deteriorates over time, reducing the certainty of matches, it is an invaluable and unique marker of individual identity. Forensic science also allows the identification of traces of material left behind. Atomic microscopes can identify toolmarks, such as the small scrapes and dents that a crowbar will make on a door frame when a door is forced open. If a crowbar is found, forensic scientists can positively determine whether or not the bar is the one that was used to force the door. Forensic pathological examination can also be used to determine the time and cause of death of a murder victim, and examination of body chemistry can determine what environments a suspect has been exposed to (e.g. atmospheres breathed, or whether there has been recent exposure to weightlessness for any significant period of time) or what has been eaten.

Availability of informants. Criminals rarely get away with a crime without someone knowing about it, such as a neighbor, co-worker, employee, friend, family member, or passer-by on the street. Frequently those with information will be inclined to talk to the police. They have myriad reasons for doing so. Some are good citizens who want to see justice done. Some are frightened by criminals and want the protection of the police. Others provide information for mercenary reasons, seeking personal gain (such as reward money), information from the investigators, or revenge upon the suspects on whom they are informing. Others inform on their rivals to gain relative advantage. Some who are complicit in criminal acts will cooperate with the police to avoid punishment or out of a sense of repentance. Still others want to feel important. Whatever the reasons, the help of informants can help investigators break a case.

Despite all of these forces working against criminality, crime persists with a frequency high enough to cause distress to the law-abiding and satisfaction for the professional criminal element. Several of the more interesting kinds of crime are as follows:

Industrial espionage. Unscrupulous companies or employees of companies sometimes attempt to learn what their competition is up to by illicit means in order to gain a competitive edge. They may attempt to steal plans for a product, or to learn the details of a secret manufacturing process or recipe, or to obtain a client list, or to find the results of expensive market research. Such information may be gleaned by infiltrating the target company's employee ranks with a mole, or by breaking in to a company's facilities to observe or steal information or objects, or by bribing the employees of the target company.

Industrial sabotage. The companion to industrial espionage, sabotage is an illegal attempt to thwart the efforts of a competitor to operate its business. The straightforward approach of destroying the target's equipment may be taken, or more subtle strategies may be followed to mislead a target company's management into a disastrous decision. For example, a mining company might be misled into believing that a large ore deposit existed where there was in fact nothing valuable. The falsification of research or planting of

evidence are two key means of industrial sabotage, in addition to the more obvious "break their stuff" approach. Other kinds of industrial sabotage include false advertising about an opponent and the manufacture of low-quality goods labeled as an opponent's product. (See also "piracy of intellectual property," below.)

Pyramid and Ponzi schemes. These are illegitimate business formulae that depend upon the continual recruitment of ever-increasing numbers of people to an organization. Perhaps the most common form of pyramid scheme is the chain-letter "mailing list." In this type of pyramid scheme, targets are sent a letter exhorting them to send a sum of money to some number of people (say, five) named at the top of a list. The recipients are asked to make a new version of the list by removing the name at the person at the top and placing their own names at the bottom. They mail out many copies (usually thousands) of the new version of the list (with their own names on it) and wait for money to roll in. The ultimate failure of all pyramid schemes is a certainty, although it is possible for people who get in early to make money if enough people buy into the pitch.

A Ponzi scheme is a similar scam in which investors are continually recruited and early investors are paid off with the money supplied by later investors. It too is doomed to failure, as the population of prospective investors is limited. However, those who enter early may actually profit from the venture.

Traditional organized crime and gangs. The traditional activities of organized crime include dealing illegal drugs and other contraband, loan sharking (i.e. charging illegally high interest rates for loans, and applying physical force to recover bad debts), operating illegal gambling establishments, organizing prostitution, and running protection rackets (i.e. an extortion scheme in which a crime ring offers to provide security to protect local businesses from vandals and hoods, who are in fact associates of the ring). Gangs may consist of nothing more than a small group of adolescent hoodlums who commit crimes to get money to support drug habits, or they may involve large organizations operated according to business principles.

Organized crime rings may engage in turf wars to drive competing rings out of their geographical area. They often demand ritual demonstrations of loyalty from their members. Management authority is often hierarchical, with a chief or leader whose power depends upon his or her ability to dominate the others through physical intimidation and status.

Physical piracy. Piracy is the hijacking of goods during transport, often along with the vehicles in which they're being conveyed. Piracy is a problem for spacecraft in remote reaches of space and for land, sea, or air vehicles in areas where law enforcement is weak. Space piracy following the ancient seafaring model, where the pirate ship can fire on its victims to disable them before boarding, is often difficult because of the nature of space combat. To overcome this difficulty, pirates may try to trick their victims into allowing them to dock their ships, or they may arrange the sabotage of a vessel and then be conveniently on hand to salvage or "rescue" it, or they may attempt to stow away on board or place a saboteur among the crew.

Piracy of intellectual property. Intellectual property consists of plans for inventions, which are protected by patent, or the symbols used to identify a company or its products, which are protected by trademark, or expressions of intellectual creativity such as music, writings, computer programs, or video recordings, which are protected by copyright. Intellectual piracy is the appropriation of these forms of property by infringing on the owners' rights to credit, royalties, or control of the use of their creations, symbols, or ideas.

For instance, copyrights can be violated by selling duplicates of book or musical recording, patents can be violated by manufacturing goods that another person or company owns an exclusive right to produce, and trademarks can be violated by counterfeiting, placing another company's label on one's own product. Intellectual piracy is often facilitated by the ease with which computer networks allow information to be exchanged and by the ease with which automated manufacturing equipment allows goods to be produced.

Smuggling. The most common kinds of contraband that are smuggled are drugs, weapons, aliens (foreigners), extraterrestrial biological materials subject to quarantine, and stolen property. Goods are also smuggled to avoid the payment of taxes such as import duties.

Terrorism. Most forms of terrorism are politically motivated and are committed by people who are either in a state of mental anguish and desperation or who suffer a severe sense of social alienation and/or a failure to share the norms of civilized conduct. As a political act, terrorism is distinguished from mundane acts of violence motivated merely by psychosis or evil which may nonetheless have the effects of instilling terror in a population. Political terrorism is undertaken as a form of radical political protest, and as such its practitioners are usually associated with groups engaging in more traditional political participation such as political parties or interest groups. Terrorists act with goals in mind such as drawing attention to their cause, inflicting suffering on a target, or making a group of leaders reconsider a strategy or policy in light of the costs incurred because of terrorist acts. Their most frequent techniques include bombings, sabotage, assassination, and the kidnapping of public figures.

Glossary

We use some jargon in this rulebook. This glossary should help you sort out anything that's unfamiliar. If you're looking for something the glossary doesn't provide, feel free to email authors@vanguardrpg.com

Adventure. A linked set of events, involving PCs, that is the subject of game play. Compare "campaign."

Action. Something a character tries to do is an action. Frequently, actions are resolved using the ARC.

Active (sensors). A device which emits radiation (e.g. radar or a flashlight) in order to facilitate the detection of targets is said to be an active sensor. Antonym: passive.

Aerofoil. A type of antipersonnel munition (frequently a shotgun load) designed to spread high-velocity metal fragments over a large area, maximizing the probability of hitting a target but providing little armor penetration capability.

Aeropause. The upper edge of the atmosphere.

Aim. Aiming is the act of pointing a firearm at a target so that when a shot is fired the target will be hit. The Vanguard game system recognizes four categories of aim: "hasty" shots, "normal" shots, "aimed" shots, and "carefully aimed" shots. See the combat rules at page 47.

AP. Armor Piercing.

APC. Armored Personnel Carrier, a vehicle for transporting infantry. Some are tracked vehicles, some are wheeled, and some are fan vehicles.

APHE. Armor Piercing High Explosive (ammunition); the same as HEAP (high explosive armor piercing).

ARC. Action Result Chart. See page 33.

Arcology. An enormous enclosed living structure housing many tens of thousands of people.

Astrogation. Navigation in space.

Astronomical Unit (A.U.). The average distance from the Earth to the Sun = 1.4958×10^{11} meters = 150,000,000 km = 93,000,000 miles.

Attrition. The loss of materiel and personnel, generally as a result of enemy action.

AU. See Astronomical Unit.

Auto. Shortened form of "autofire."

Autofire. In firearms, firing continuously as long as the trigger is pulled is conducting autofire. This feature is usually illegal on civilian weapons. AUTOFIRE is a skill described on the skill list.

Automatic fire. See "autofire."

AVGM. Anti-vehicle guided missile.

Base. Frequently we refer to a "base" value which is modified according to circumstances. For instance, a "base time" is the default or average amount of time that a time-based action is expected to take. The actual time is determined by a roll on the ARC. Other base values may be adjusted by modifiers.

Binary star. Two stars close together, revolving around a point between them (the barycenter).

Caliber. On the weapons list, this is the type of ammunition used by a weapon. A simple number, like 8.5, is the diameter of the bore in millimeters. A decimal smaller than one, such as .357, indicates diameter of the bore in inches. For lasers we indicate power output in place of emitter diameter.

Campaign. A series of linked adventures, usually involving many of the same characters.

CBW. Chemical and biological weapons, or chemical and biological warfare.

CPP. Computer power point, a measure of the processing power of computers.

Cultural type. Culture is described on an individualist-collectivist dimension. Descriptive terms are highly individualist, moderately individualist, individualist-collectivist cross, moderately collectivist, and highly collectivist. In collectivist cultures people's identity centers around a relatively small number of groups to which they belong, such as family or clan. In contrast, people in individualist cultures have more self-focused personal identity. Individualist cultures have ideologies of achievement, self-reliance, and competition. Families tend to be small, and children usually leave home to live on their own as soon as they reach adulthood. Collectivist cultures have ideologies of harmony, family affiliation, and cooperation among members of the group. Extended families often live together and children are not as quick to strike out on their own.

D6, D10, D100. A six-sided, ten-sided, or hundred-sided die, respectively.

Data. Data are information. See also "data units."

Data units. In computer terminology in Vanguard, a data unit is the amount of information included in one minute of high-fidelity stereophonic sound, or one minute of fairly poor quality video, or about 15,000 pages of formatted text. Because the means of data storage and data compression in 2140 are different from those used in twentieth century computers it is difficult to provide a meaningful comparison of data units and bytes, but roughly speaking a data unit is somewhere in the range of 10 to 50 megabytes.

Delta-V. Change in velocity, properly written "ΔV." This is a good way of expressing the maneuver or velocity potential of a spacecraft. E.g. if a ship has a delta-v of 100km/s then it can change velocity by 100km/s. This could involve accelerating to 50km/s and then stopping, or accelerating to 90km/s, cruising for a time, and then imparting

velocity in another direction of 10km/s, or any other combination of maneuvers involving total velocity changes of no more than 100km/s.

Deuterium. "Heavy hydrogen," used in nuclear fusion reactors and bombs. Normal hydrogen has one proton and one electron. Deuterium is an isotope of hydrogen, with one neutron as well. If fused, one liter of liquid deuterium (0.26kg) has a theoretical maximum yield of about 39 kilotons; energy release is about 150 tonnes per gram.

DU. See "data units."

ECCM. Electronic counter-countermeasures; a counter to ECM.

Echelon. An arrangement or formation of troops or vehicles in which elements follow behind and to the side of the lead element.

ECM. Electronic countermeasures, designed to interfere with hostile sensors and other electronic equipment.

Economic type. A country's economy is described as falling into one of six general categories: *Laissez-faire capitalist*: Government regulates very few aspects of the economy. Although it maintains a monetary system, enforces contracts, and most likely has copyright and patent laws, it regulates almost no other aspects of business activity. Private enterprise is generally free to do what it likes. *Modern capitalist*: Also known as a mixed economy, this system combines government regulation and occasional government ownership of industries with a market economy. Private enterprise is encouraged but subject to considerable regulation. *Neo-mercantilist*: government actively tries to help certain favored sectors of the economy and may run industries with a profit motive. *State capitalist*: The state is viewed as a business that seeks profit. The state operates its industries with a profit motive, seeking success in an international marketplace. This is an extreme form of neo-mercantilism; it is very different from state socialism, below. *State socialist*: The state owns many or all industries, and private enterprise is discouraged or forbidden. The state operates nationalized industries for the common good. *Cooperative*: Most property is held in common, rather than privately, and people share their resources. This form of economy is rare and is usually considered impractical except for very small populations.

Electromagnetic pulse. Electromagnetic fields resulting from a nuclear explosion or other source which may interact with electrical and electronic equipment, producing damaging current and surges in voltage. It results from nuclear explosions when intense gamma radiation ionizes the atmosphere and blast then moves the atmosphere; when an electric charge is moved in a magnetic field (Earth's, for example) electromagnetic radiation results. There is no EMP in space.

EMP. See "electromagnetic pulse."

Escape velocity. The velocity at which a body will overcome the gravitational pull of a planet and will move out of the planet's gravitational field. The Earth's escape velocity is 11.2 km/sec. The formula for escape velocity is $V_e = 11.2\sqrt{g \cdot R}$ where *g* is the planet's gravity in Earth *g*s, R is the planet's radius in Earth radii, and V_e is velocity in km/sec.

EU. European Union.

Eukaryot. An organism with cells having true nuclei bounded by nuclear membranes. These include algae (except blue-green algae), animals, fungi, plants, and protozoa. Bacteria, by contrast, are not eukaryots but are procaryots.

EW. Electronic warfare, involving ECM and ECCM.

FAC. See "forward air controller."

Fallout. Fallout is the precipitation of radioactively contaminated debris after a nuclear explosion. The term also applies to the debris (particles) itself.

Fan vehicle, fan car. A flying vehicle, so-called because shrouded fan-like vanes are used for vectored thrust.

Fléchette. A small heavy dart designed to strike soft targets such as infantry.

Forward air controller. A person who relays instructions and information to combat aircraft from a forward position forward observer: a person who relays instructions to artillery units in the rear area of the battle.

FTL. Faster than light.

g. Acceleration due to Earth gravity, i.e. 9.8 meters per second per second; gravity.

g. Gram, a unit of mass; one one-thousandth of a kilogram.

Geostationary orbit. An orbit of a satellite around a planet in which the satellite completes one orbit each day while maintaining the same position relative to a point on the planet's surface. Such satellites orbit over the Earth's equator at an altitude of 38,500 kilometers.

Global positioning system. A navigation system using satellites which transmit telemetry data to receivers which use the transmitted information to calculate the position of the receiver.

GM. Game master; the person who narrates, administers, directs, referees, or runs a role-playing game.

Government type. Governments are described as falling in one of five categories: *Direct democracy*: Democracy means "rule by the people." In this form of government, people rule directly by means of plebiscites. This form of government is rare and is usually considered impractical except for very small populations. *Republic*: In a republican government the people choose their leaders in elections. In these elections, at least two viable candidates compete for support in a free and fair process. *Republican-authoritarian*: With too much popular influence to qualify as authoritarian, but too little to qualify as republican, this form of government straddles the territory between republican and authoritarian rule. Usually these are

authoritarian regimes that make some republican concessions, as by giving a parliament a small measure of power, or they are republics in which an elite group stifles competition for power. *Authoritarian*: In authoritarian governments, power is concentrated in a relatively small group (or even in one person) that is generally not accountable to the people. Such governments can include monarchies, military governments, and many forms of dictatorship. Authoritarian governments vary considerably in their malevolence or benevolence. *Totalitarian*: Authoritarian governments that recognize no practical limits on the extent of their power over their people are called totalitarian. Totalitarian governments assert the authority to, and frequently do, regulate virtually every aspect of their citizens' lives. These governments do not perceive the people as having any right to privacy, and people are generally treated as servants of the state rather than vice versa. Such governments frequently hold power by means of terrorism practiced against their own people and propagate racist, nationalist, or religious fundamentalist ideologies.

GPS. Global positioning system.

Gravity well. An area of space where there is a strong gravitational field, as on the surface of a planet.

Gross. Total.

Gross weight. Total weight.

Ground effect. The effect of having a solid, flat surface beneath a helicopter or hovercraft, which is to help create a plenum to increase the upward force acting on the vehicle.

Ground zero. In a ground burst of a nuclear weapon, the location of the weapon's detonation.

Hardpoint. A strengthened area on the exterior of a craft for carrying loads, such as ordnance.

HE. High explosive

HE FRAG. High explosive fragmentation (ammunition)

HEI. High explosive incendiary (ammo)

HITS. Helmet-integrated targeting system, an advanced sighting device for small arms.

HST. Hyper-sonic transport aircraft.

HVM. Hyper-velocity missile. A weapon usually used against vehicles.

IFF. Identification-friend or foe, a system of determining the origin/nationality of a craft.

IFFN. Identification-friend-foe-or-neutral.

IGE. In ground effect. See "ground effect".

Indirect fire. Indirect fire refers to launching ballistic projectiles (such as grenades or cannon rounds) on indirect paths to their targets, i.e. at firing at a high angle of elevation.

Infrared. That region of the electromagnetic spectrum which is of a somewhat longer wavelength than red light. Infrared radiation is emitted by all objects at temperatures greater than absolute zero.

Interruption. A nine month period during 2081 when the wormhole closed between Sol and Crossroads, precipitating greater autonomy for the colonies.

IR. See "infrared", above.

ISDL. Interstellar Security and Development League. The League is a military, economic, and political alliance composed of Furehjelm, Elysium, China, and Indonesia, with Pakistan, Kenya, and the Southern African Confederation.

ISG. An abbreviation for "integrated (or integral) shotgun." A weapon built with an ISG includes a shotgun, which can also be used to fire shotgun grenades.

Kilo. Prefix meaning one thousand; also, short for kilogram when pronounced "key-low."

Kilogram. One thousand grams, or approximately 2.2046 pounds.

Kilometer. One thousand meters, or about 0.6241 statute miles.

Kilowatt. 1000 Watts, roughly equal to 1.341 horsepower.

Kilowatt/hour. One kilowatt of power applied for one hour. See also "Watt/hour."

kt. Kilotons yield of a nuclear, thermonuclear, or matter-antimatter explosion, in terms of a comparable amount of TNT.

kw. Kilowatts. See also "Watt."

kw/h. See kilowatt/hour.

Laser. Light amplification by stimulated (or stimulation) emission of radiation. Lasers produce highly monochromatic radiation, which may or may not be within the visible spectrum, and which, if sufficiently powerful, will cut through or heat an object.

League. See "ISDL."

LEO. Low Earth orbit. An orbit with an apogee not greater than several hundred miles.

Light speed (c) = 2.99793×10^{10} cm/sec = 299,793 km/sec = 186,000 miles/sec = 669,600,000 mph = 1,079,900,000 km/h.

Light year. The distance light travels in one year = 9.4605×10^{15} meters = 9.5×10^{12} kilometers = 6×10^{12} miles.

Lobbying. Attempting to influence the opinion and behavior of policy-makers, especially in legislatures, through direct contact with the target.

LOS. Line of sight

ly. Light-year

m. Meter.

Mag. Short for magazine, a box from which a weapon is fed rounds. On the weapons list, this is the number of shots the weapon's magazine may hold.

Modifier. A modifier is a number upon which a mathematical operation (such as addition) is performed with another number due to special circumstances. For example, in action resolution, modifiers are applied to the outcomes generated on the ARC, based on the difficulty of the action performed. These modifiers are added to the number of successes generated by the ARC.

Mortar. A smoothbore, muzzle-loading, indirect fire weapon used to launch a bomb. Tube length is usually 10 to 20 calibers.

MRE. "Meal, ready to eat." A military ration.

Multi-Planetary Co-Prosperity Sphere. The Sphere is a military, economic, and political alliance dominated by India, Mitsukawa, Brazil, and South Africa, and including many of the extra-Solar microsovereignties.

Munitions. Ammunition, explosives, weapons, etc.

Napalm. Any flammable, sticky, jelly-like substance.

NBC. Nuclear, biological, and chemical weapons.

NPC. Non-player character. All the characters in a game who are run by the GM are NPCs. Also see PC.

NVG. Night vision goggles.

Objective. A goal. In military parlance the "objective" is often a location which is to be occupied.

Ordnance. Ammunition, bombs, chemical warfare agents, explosives, smoke, napalm, and similar items. Not to be confused with "ordinance."

Parallax. Parallax is the observed (but not real) shift in position of an object when it is observed from two different points. For example, hold your finger about six inches in front of your nose and move your head from side to side. When whatever happens to be beyond your finger appears to move while your finger remains stationary, that is parallax. The same thing happens when the Earth revolves around the Sun because the nearby stars (your finger) appear to remain stationary in relation to the far away stars (whatever's past your finger). When this parallax is observed, astronomers can measure the angle of an imaginary triangle drawn from the Earth's first position to the Earth's second position to the star. Using simple trigonometry, one may then calculate the distance to a star. Finding out how far away objects are is what parallax angles are used for in astronomy, photography, or other observations.

Parsec. Short for "parallax second," the distance at which a star would have a parallax angle of one second, which is 3.262 light years.

Passive. Non-energy emitting, in terms of EW.

PC. Player character. PCs are the characters run by the players. Also see "character" and "NPC."

Pen. Penetration, on the weapons list.

Personal data transmitter, PDT. See the description on the Equipment List.

Point defense. Weapons mounted on a ship that are used primarily to defend the ship from incoming missiles.

Planetfall. Arrival on a planet's surface after a journey through space.

Player. People (like you) who play an RPG are players. Often players are distinguished from the GM.

Plot. The plan or main story of a work of fiction.

Premise. The assumption(s) about some aspect of humanity that underlie a work of fiction. Through its consistency with this assumption, the work of fiction tends to show the premise to be true.

Pressure suit. A suit, fully enclosing the body, which is pressurized to a level sufficient to allow normal human function in a vacuum.

Radiation. Electromagnetic energy, in the form of particles or waves, ranging in frequency from radio waves through visible light to gamma rays.

rem. Roentgen equivalent, (hu)man; a dose of radiation.

Rentier economy. An economy in which the state pays its people, rather than the reverse in which people pay taxes to the government.

Rounding down. Ordinarily, we round 0.5 up to 1. Rounding down considers 0.5 a zero.

RPG. Role-playing game.

SAM. Surface to air missile, a weapon used to attack aircraft.

Semi-automatic. Semi-automatic action on a firearm indicates that, after firing, a weapon will chamber a new round and pull back the hammer automatically in preparation to fire another shot. This means that one shot is fired for each pull of the trigger. See also "autofire."

Signature. Signature represents the ease with which an object may be detected.

Skill point. Synonymous with "ability point," this is a point which may be spent to purchase skill levels for a character using the system described in the ability rules, according to the costs on the Ability Costs Chart. See the Character Creation chapter.

Small arms. Firearms carried by people, usually limited to pistols, rifles, shotguns, and the like.

Sol. The Earth's Sun; the star at the center of the Solar System.

Sphere. See "Multi-Planetary Co-Prosperity Sphere."

STL. Slower than light; not FTL.

Successes. The outcome of an attempt to perform an action is rated in terms of a number of successes. The more "successes" achieved, the more successful the outcome is. On the basis of the number of successes achieved, real-world descriptions of the action outcome are generated, such as "the task outcome is very good" or "the job is finished in half the expected time" or "one half of the bullets fired actually hit the target." See the Action Resolution chapter, page 33.

Task. Synonym for "action."

Telcom. Telecommunications, including computer network hook-ups.

Theme. A distinctive quality or recurring motif or subject in a work of fiction.

Watt. Watts are units of power, like horsepower. One British horsepower equals 746 Watts. Power is energy over time; a Watt is one Joule/second.

Watt/hour. A measure of power (the Watt) per unit time, which in this case is an hour. If a battery or power cell is said to be able to deliver 25 Watt/hours, for example, it will deliver 25 Watts for one hour, or 2.5 Watts for ten hours, or 250 Watts for six minutes, etc.

wt. Weight. All weights in this game are given in kilograms (despite the fact that kilograms are technically units of mass, not weight; apologies to the nit-pickers). A kilogram is 2.2 pounds.

Appendix: Metric Conversions

The key to the metric system's simplicity is that it works in multiples of ten. Basic units, like meters for distance and grams for mass, have prefixes attached to them to indicate orders of magnitude. (An order of magnitude is simply a multiple of ten. In scientific notation, 10^1 is just ten; 10^2 is 100, 10^3 is 1000, etc. In the other direction, 10^{-1} is 0.1, 10^{-2} is 0.01, and so on. Thus, a kilogram is a thousand grams, a millimeter is a thousandth of a meter, and a gigawatt is a billion watts.) The common prefixes, with their abbreviations, are as follows:

tera	T	10^{12}	trillion	centi	c	10^{-2}	hundredth
giga	G	10^9	billion	milli	m	10^{-3}	thousandth
mega	M	10^6	million	micro	μ	10^{-6}	millionth
kilo	k	10^3	thousand	nano	n	10^{-9}	billionth

Below we present the conversion factors to move from British measurement to the metric measurement:

Velocity

1 mi/h	= 1.47 ft/s	= 1.61 km/h	= 0.447 m/s
1 km/h	= 0.278 m/s	= 0.621 mi/h	
1 ft/s	= 0.305 m/s	= 0.682 mi/h	
1 m/s	= 3.28 ft/s	= 3.6 km/h	
1 knot	= 1 nautical mile/hour	= 1.151 mi/h	= 0.5144 m/s

Distance

1mm	= 1 millimeter	= 0.001m	= 0.03937 inches
1cm	= 1 centimeter	= 0.01m	= 0.3937 inches
1m	= 1 meter		= 39.37 inches
1km	= 1 kilometer	= 1000m	= 0.6214 miles

Mass/Weight

1 gram(g)	= 1.00g	= 0.0022046 lbs.	
1 kilogram(kg)	= 1kg	= 2.2046 lbs.	
1 metric ton	= 1000kg	= 2204.6 lbs	
	453.6g	= 1 lb	= 16oz.
	28.3495g		= 1 oz.

Fluid Volume

1 liter	= 0.265 gallons	
1 gallon	= 3.78 liters	
12 fl.oz.	= 0.344 liters	= 344mL

Vanguard Character Sheet

Character's Name		
Personal Information	**Body Armor Values**	**Wounds & Fatigue**
Age	Head	Fatigue Impaired Level (-1):
Sex	Neck	Fatigue Delirious Level (-3):
Height	Torso	Fatigue Incap./Unc. Level:
Mass	Arms	Fatigue Death Level:
Base Movement	Hands	Rec. of Wounds & Fatigue
Carrying Capacity	Legs	
Physical Description	Feet	
	Armor Notes	

Attributes and Skills

Ability	Difficulty	Points	Level	Ability	Difficulty	Points	Level
Agility	Avg.						
Attractiveness	Avg.						
Awareness	Avg.						
Empathy	Avg.						
Intelligence	Avg.						
Motivation	Avg.						
Stamina	Avg.						
Strength	Avg.						

Equipment & Notes

Weapons	Aim	Effective Range	*Rate of Fire Aim, Stb., Max.*	Penetration/ Damage	Magazine Cap./Wt.	Mass

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Conceive your character's personality.
Choose height in cm and mass in kg.
Invest **250** character points in attributes (*agility*, *attractiveness*, *awareness*, *empathy*, *intelligence*, *motivation*, *stamina*, *strength*), contacts, and skills.
Calculate:
Base movement: 15 + Strength + Agility.
Carrying capacity: Strength x 4.
Fatigue Impairment (-1) Level: (Stamina + Motivation) /2 .
Fatigue Delirious (-3) Level: (Stamina + Motivation).
Fatigue Incapacitation/Unconsciousness Level: (Stamina + Motivation) x 2.
Fatigue Death Level: Stamina x 6, or the Fatigue Incapacitation/Unconsciousness Level plus one, whichever is higher.

Skill level	*Easy*	*Average*	*Hard*
1	2	3	4
2	4	6	8
3	7	10	13
4	11	15	20
5	15	21	27
6	20	28	36
7	25	36	47
8	32	45	59
9	39	55	72
10	46	66	86

Skills (with difficulty):

ACCOUNTING (avg.)
ACTING (avg.)
A/C PILOT, FIXED-WING (avg.)
AIRCRAFT PILOT, VECTORED THRUST (avg.)
ANIMAL RIDING (easy)
ANTHROPOLOGY (avg.)
APPRAISAL (easy)
ARCHAEOLOGY (avg.)
ARCHERY (avg.)
ART (specify) (avg.)
ARTILLERY (easy)
ASTRONOMY (avg.)
AUTOFIRE (avg.)
BICYCLE RIDING (easy)
BIOLOGY (avg.)
BOAT/SHIP PILOT (avg.)
BUREAUCRACY (easy)
BUREAUCRACY, LAW ENFORCEMENT (easy)
BUREAUCRACY, MIL. (easy)
CHEMISTRY (avg.)
CLIMBING (avg.)
COMMUNICATIONS (avg.)
COMPUTER IMAGING (easy)
COMP. INT. THEORY (hard)
COMPUTER PROG. (avg.)
COMP. SECURITY THRY (hard)
COMPUTER TECH. (avg.)
CONSTRUCTION (avg.)
COOKING (easy)
DEMOLITIONS (avg.)
DISGUISE (easy)
ECONOMICS (avg.)
ELECTRONICS/ELECTRICAL TECHNICIAN (avg.)
ENGINEER – AEROSPACE (hard)
ENGINEER – CIVIL/STRUCTURAL/ARCHITECTURAL (hard)
ENG. – COMPUTER (hard)
ENG. – ELECTRICAL /ELECTRONICS (hard)
ENG. – MANUFACT. (hard)
ENGINEER – MARINE (hard)
ENG. – MATERIALS (hard)
ENG. – MECHANICAL (hard)
ENGINEER – NUCLEAR (hard)
ENGINEER – SPACESHIP DRIVE (hard)
ENGINEER – SPACESHIP FTL DRIVE (hard)
FARMING (avg.)
FIRE FIGHTING (avg.)
FIRST AID (easy)
FORENSIC PSYCHOLOGY (avg.)
FORENSIC SCIENCE (avg.)
FORGERY (avg.)
FORWARD OBS. & FAC (avg.)
GEOGRAPHY (specify planet) (avg.)
GUNSMITH (avg.)
HAND-TO-HAND COMBAT: See MELEE.
HISTORY (avg.)
HOVER VEHICLE PILOT (avg.)
INDIRECT FIRE (avg.)
COMBAT INITIATIVE (avg.)
INTERROGATION (avg.)
INVESTMENT (avg.)
INTEL. ANALYSIS (avg.)
LANGUAGE (specify) (avg.)
LAW – CIVIL (specific country) (avg.)
LAW – CRIMINAL (specific country) (avg.)
LAW – INTERNATIONAL (avg.)
LAW – MILITARY (specific country) (avg.)
LEADERSHIP (avg.)
LIGHTER THAN AIR VEHICLE PILOT (avg.)
LITERATURE (avg.)
LOCKSMITH (avg.)
MACHINIST (avg.)
MARKETING (avg.)
MATHEMATICS (avg.)
MECHANIC (specify equipment type) (avg.)
MEDICAL LAB TECH. (avg.)
MEDICINE – BIOMEDICAL/GENETIC ENGINEER (hard)
MEDICINE – EMERGENCY MEDICINE (hard)
MEDICINE – FORENSIC MEDICINE (hard)
MED. – INTERNAL (hard)
MED. – PHARM'Y (hard)
MEDICINE – PROSTHETICS/BIOMECHANICAL ENGINEER (hard)
MEDICINE – PSYCHIATRY (hard)
MEDICINE – SURGERY (hard)
MELEE – BALANCED WEAPONS (avg.)
MELEE – KNIFE THROWING (avg.)
MELEE – KNIVES (avg.)
MELEE – SHIELD (easy)
MELEE – TWO-WEAPON FIGHTING (hard)
MELEE – UNBALANCED (easy)
MELEE – UNARMED FIGHTING, STRIKE (avg.)
MELEE – UNARMED FIGHTING, SUPPLE (avg.)
MILITARY STRATEGY (avg.)
MISSILES, PORTABLE (easy)
MOTORCYCLE DRIVING (avg.)
MUSIC (composition and theory) (avg.)
MUSIC (instrument) (avg.)
NAVIGATION (avg.)
NBC DEFENSE (easy)
NEGOTIATION (avg.)
NUCLEAR TECHNICIAN (avg.)
PALEONTOLOGY (avg.)
PARACHUTE OPS (easy)
PHOTOGRAPHY – STILL IMAGE (easy)
PHOTOGRAPHY – VIDEO (avg.)
PHILOSOPHY (avg.)
PHYSICS (avg.)
PICKPOCKET (avg.)
PISTOL (avg.)
PLANETARY SCIENCE (avg.)
PLUMBING (avg.)
POLITICAL SCIENCE (avg.)
POWER ARMOR OPS (avg.)
POWER ARMOR TECH. (avg.)
PSYCHOLOGY (avg.)
RELIGION (avg.)
RIFLE (avg.)
SAILING (avg.)
SCUBA OPERATIONS (avg.)
SECURITY TECHNICIAN (avg.)
SENSORS OPERATION (easy)
SNOWMOBILE DRIVER (easy)
SPACE COMBAT TACTICS (avg.)
SPACE OPERATIONS (easy)
SPACESHIP DRIVE TECHNICIAN (avg.)
SPACESHIP FTL ASTROGATION (avg.)
SPACESHIP FTL DRIVE TECHNICIAN (avg.)
SPACESHIP LIFE-SUPPORT TECHNICIAN (avg.)
SPACESHIP NAV/HELM (avg.)
SPACESHIP SENSORS (avg.)
SPORT (avg.)
STEALTH (avg.)
STREETWISE (avg.)
SURVIVAL (avg.)
SWIMMING (easy)
TEACHING (avg.)
THROWN WEAPON, GRENADE (easy)
TRACKED VEH. DRIVE (easy)
TRACKING (avg.)
UNARMED COMBAT: See entries under MELEE.
VEH. COMBAT TACTIC (easy)
WEAPONS TECHNICIAN (avg.)
WHEELED VEH. DRIVE (easy)
WRITING (avg.)

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Success: 2d6 + ability + modifiers	*Qualitative Result*	*Fire Combat Result*	*Timed Result*
16 and up	divine	all shots hit	.25
15	excellent	3/4 (ss hit*)	.5
14	excellent	2/3 (ss hit*)	.5
13	very good	½	.75
12	good	¼	.75
11	high average	1/8	1
10	low average (succeeded)	1/16	1
9	marginal (barely failed)	1/32	1.5
8	poor	1/64	1.5
7	poor	1/128	2
6	poor	1/250	3
5	terrible	1/500	4
4	terrible	1/1000	5
3 or less	disaster	miss	10

success = ability level + difficulty modifier + 2d6

General Action Resolution

Difficulty	*Modifier*
Very easy	+2
Easy	+1
Moderate (Average)	+0
Hard	-1
Very hard	-2

Range Modifiers

Distance to Target	*Success Modifier*	
	within weapon's Effective Range	*beyond weapon's Effective Range*
2m	+2	+1
10m	0	-1
25m	-1	-2
100m	-2	-4
300m	-3	-6
1km	-4	-8
2km	-5	-10
3km	-6	-12
4km	-7	-14

Fire Combat Types and Effects

Shot type	*Effects on:* *Rate of Fire Allowed*	*Initiative*	*Chances To Hit*
Hasty (snap shot)	stable rate allowed	Allows a +3 bonus to initiative.	-3 penalty
Normal	stable rate allowed	none	no modifiers
Unstable rate	RoF may exceed weapon's stable rate of fire	none	-3 penalty; -6 if exceed stable rate by a factor of 2 or more
Aimed	limited to the weapon's aimed rate of fire.	none	Allows weapon's "aimed fire" to-hit bonus
Sniper shot	Only one shot allowed every two turns.	Aim a full turn and fire once the next turn.	Extra +1 to-hit bonus beyond weapon's "aimed fire" bonus

Initiative in a Nutshell

Each turn, characters act in descending order of their initiative scores, which can be determined by a Combat Initiative skill check.

Characters who continue an action from one turn to the next, such as aiming at a target and standing ready to fire, get a +5 bonus to their initiative.

Characters can take hasty actions, adding 3 to their ordinary initiative point; see rules text.

Hit Location, Damage, and Penetration Multipliers

Range: Close	Range: ≤ Eff	Range: > Eff	Hit Location (with damage multiplier)	Penetration Multiplier
01-02	01	01	upper head (3)	2
03	02-03	02	upper head (3)	1
04	04	03-04	upper head (3)	½
05-06	05	05	lower head (2)	2
07	06-07	06	lower head (2)	1
08	08	07-08	lower head (2)	½
09	09	09	neck (2)	2
10	10	10	neck (2)	1
11	11	11	neck (2)	½
12-19	12-16	12-14	upper torso (1)	2
20-35	17-33	15-30	upper torso (1)	1
36-38	34-38	31-38	upper torso (1)	½
39-44	39-42	39-40	lower torso (1)	2
45-56	43-54	41-52	lower torso (1)	1
57-58	55-58	53-58	lower torso (1)	½
59-61	59-60	59	shoulder/upper arm (¾)	2
62-68	61-67	60-66	shoulder/upper arm (¾)	1
69	68-69	67-69	shoulder/upper arm (¾)	½
70-72	70-71	70	forearm/hand (½)	2
73-76	72-76	71-75	forearm/hand (½)	1
77	77	76-77	forearm/hand (½)	½
78-80	78-79	78	upper leg (¾)	2
81-87	80-86	79-85	upper leg (¾)	1
88-89	87-89	86-89	upper leg (¾)	½
90-92	90-91	90	lower leg (½)	2
93-98	92-97	91-96	lower leg (½)	1
99	98-99	97-99	lower leg (½)	½
100	100	100	"skim;" re-roll for another location and use one-tenth of the listed damage and penetration	

If pen. < AV, no effect.*
If pen. ≥ AV, ½ damage
If pen. ≥ 2AV, 1x damage

** If armor is non-rigid, apply 1/10th damage for impact. If armor is rigid, apply 1/25th dam. for impact.*

Average Shock & Fatigue Values:

-1 impair: 3
-3 impair: 7
Incap/Unc: 14
Dead: 21

Wound Effects

d10	*Minor* (1 – 4)			*Moderate* (5 – 9)			*Severe* (10 – 16)			*Grave* (17 – 26)			*Catastrophic* (27+)		
	shock	-*n*L	fatigue	shock	-*n*L	fatigue	shock	-*n*L	fatigue	shock	-*n*L	fatigue	shock	-*n*L	fatigue
1	3			6		2 hrs.	15	-3L	30 min	7	-5L	5 min	20	-10	1 min
2	4			2	-2L		6	-4L	30 min	11	-5L	5 min	40	-10	5 sec.
3	2	-1L		4	-3L	2 hrs.	8	-2L	5 min	12	-10	1 min	20	-5L	3/turn
4	1	-1L		5	-2L		7	-3L	1 min	8	-3L	5 sec.	15	-10	3/turn
5	4	-1L	2 hrs.	10	-1L	30 min	11	-5L	5 min	10	-5L	1 min	40	-10	3/turn
6		-1L		12	-2L	30 min	8	-6L	5 min	15	-10	5 min	30	-10	5 sec.
7	5	-1L	2 hrs.	4	-3L		12	-7L	1 min	20	-10	1 min	25	-10	3/turn
8	5	-1L	2 hrs.	14	-3L	2 hrs.	5	-9L	5 min	10	-5L	5 sec.	20	-10	3/turn
9	6	-1L		6	-4L	5 min	14	-10	1 min	22	-10	3/turn	50	-10	3/turn
10	5	-2L	30 min	15	-4L	30 min	15	-10	5 sec.	25	-10	5 sec.	30	-10	5 sec.

"Shock" is applied to the fatigue indices to determine immediate effects; shock to the head is doubled; shock to limbs is halved.
"-*n*L" indicates the number of penalties to success suffered when using the wounded location. Head and torso hits affect all locations and all tasks. A -10 to the head, neck, or upper torso causes death. Wound penalties per location are cumulative; a –2 wound followed by a –1 wound makes a –3 wound.
"fatigue" indicates the amount of time it takes to accumulate one fatigue point from the wound, until it is treated (stabilized). E.g. "1 min" indicates that fatigue is accumulated at a rate of one point per minute. "3/turn" indicates three fatigue points per combat turn (5 seconds).