# Book 6
# Scouts

# TRAVELLER®

*Science-Fiction Adventure in the Far Future*

Game Designers' Workshop

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# *Scouts*

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# *TRAVELLER*®

*Science-Fiction Adventure*
*in the Far Future*

Game Designers' Workshop

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*Scouts*
**TRAVELLER**, Book 6



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This booklet is an additional volume in the rules to **Traveller**, GDW's science fiction role-playing game set in the far future.

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# Introduction

The Imperial Interstellar Scout Service is a major service within the Imperium, equal in stature to the Imperial Army and the Imperial Navy, although assigned a variety of unique, primarily non-military missions. Its duties include exploration of the Imperial frontiers, on-going mapping and surveying of Imperial territory, and the maintenance of interstellar communications through its express boat network.

*Scouts* deals with the interstellar scouts of the Imperium and with their original concern, the star systems of the galaxy.

## BACKGROUND

In the last century before the end of The Long Night, the Sylean Federation began its coalescence into a powerful empire. A major force in this move into interstellar space was the Sylean Federation Scout Service. The SFSS was established with two main missions: first, the exploration of neighboring regions for the consequent contact or recontact of their inhabitants; and second, the use of advanced Sylean technology to lure these contacted planets into the growing Federation.

Largely due to the efforts of the Scouts, the Sylean Federation rapidly turned into an empire — the Third Imperium. The Sylean Federation Scout Service became the Imperial Interstellar Scout Service: the IISS.

With the passage of time, however, the missions of the Scout Service have evolved into different pursuits. The original assignment of recontact soon turned to one of actual discovery and exploration of new, unknown worlds. With the maturity of the Imperium, that mission lost importance, and newer ones have taken its place. In any analysis, the Scout Service is a survivor, changing its missions and evolving its structure in order to maintain its numbers and (some cynically say) its budget.

## SCOUT SERVICE ORGANIZATION

In order to handle the great diversity of missions assigned to it, the Scout Service is organized into a variety of *offices.* These offices are themselves further divided into *branches* (or sometimes *services*), each responsible for a specific mission or duty. The Imperial Scout Service Organization diagram shows the basic structure of the Scout Service with its many offices and branches. Placed in authority over the several offices is a central command structure (called Headquarters) which provides overall control of the Scout Service. Because Headquarters controls the operations of the entire Scout Service throughout the Imperium, it is concerned primarily with policy and administrative detail, rather than the accomplishment of specific missions, and is rarely more than a distant office providing instructions and direction to the service.

The offices of the Scout Service are divided into the *Bureaucracy* (a standard, structured establishment), and the *Field* (an informally structured group of individuals who accomplish many of the goals of the service). The Bureaucracy is strict and governed by regulations; the Field is unconventional and flexible.

Because some of the missions of the Scout Service are best handled by the

individualistic type of person, the overall structure of the Scouts allows their inclusion in the service. Three offices in the Scout Service (the Exploration Office, the Communications Office, and the Survey Office) comprise the Field, and are loosely organized without formal rank or position for their members. Individuals hold temporary positions (such as ship captain, team leader, project head) based on their record and suitability for the job. These offices make use of the individual Scout without restricting his or her freedom of action. Where necessary, the Operations Office provides control and direction for these three Field offices.

The remainder of the Scout Service is the more traditionally organized Bureaucracy. The offices in the Bureaucracy provide the rigidly controlled supervision and structure that is necessary in any large organization.

## OFFICES AND BRANCHES

Within the various offices of the Scout Service, the branches are responsible for specific duties which accomplish the missions of the office.

The **Administration Office** contains the bureaucracy that keeps the IISS functioning smoothly. Its three branches are: *Personnel, Finance,* and *Procurement.*

*Personnel* is responsible for the service records of Scouts and ex-Scouts, for recruiting, hiring, and retirement, and for personnel transfers between branches. It manages the careers of the members of the Scout Service.

*Finance* is responsible for all fiscal matters, including payroll for Scouts (salaries, pensions, bonuses, and other rewards) and payment for goods and services procured for the service.

*Procurement* is responsible for purchasing the goods and services which the service requires. It establishes standards for material to be used by the service, and lets contracts to suppliers for material and equipment – everything from uniforms and microfilm readers to starships.

The **Detached Duty Office** was created to keep track of all retired and detached Scout personnel in order to be able to swiftly recontact them and return them to active service in an emergency. In addition, the Detached Duty Office controls all surplus IISS craft (scout ships and courier vessels), making them available to some ex-Scouts if that will help the IISS in its missions. The office is divided into two branches – *Records* and *Intelligence.*

The *Records Branch* maintains documentation on all Scouts serving on detached duty. Virtually all former Scouts fit this classification and are subject to recall for military servce or for specific scout missions. Normally, however, only those Scouts with surplus scout vessels on loan to them are actively monitored.

The *Intelligence Branch* is an information gathering agency for the Scouts. Its primary function is to debrief detached duty Scouts when they visit scout bases for refuelling or maintenance on their vessels. The Intelligence Branch also maintains active agents (spies) in areas where information is vitally needed.

The **Technical Services Office** is responsible for scientific and technical activity within the service. It is divided into the *Education Branch* and the *Research & Development Branch.*

The *Education Branch* provides information and data to offices, branches, and individual Scouts who need it. It maintains education and intelligence enhancement courses and treatments necessary for individuals to accomplish their missions. It is responsible for the development and dissemination of library data programs for

Scout Service vessels. In addition, the Education Branch maintains and administers standards for skills learned in the Service, and provides educational courses to Scouts in order to fill their time when on duty or on long voyages.

The *Research & Development Branch* is responsible for scientific inquiry into data obtained by the Scout Service, and is responsible for the development of equipment needed by the Service to accomplish its mission. This R&D Branch is also responsible for the design of specialized scout vessels used by the IISS.

The **Operations Office** is responsible for the activities of the Service in the establishment, maintenance, and operation of its bases and fleets. It is divided into *Maintenance, Security, Bases,* and *Scout Fleet* branches.

The *Maintenance Branch* is charged with preventive maintenance of the equipment used by the Scout Service and with repairs as neccessary. Maintenance is capable of repairing many Imperial Navy vessels as well.

The *Security Branch* is charged with providing security and law enforcement for the Scout Service. Security Branch Scouts serve as police enforcers on Scout property, as commandos or shipboard light troops, for special Scout activities, and as clandestine agents for Intelligence Branch. Agents of the IISS Security Branch have great authority to arrest, detain, or question individuals suspected of violations of Imperial law, and can demand cooperation from local authorities as the need arises.

The *Base Branch* is responsible for the operation of the Scout Service's bases, way stations, and other establishments.

The *Scout Fleet* consists of all of the vessels used by the Scout Service. Because the operation of space vessels requires a great deal of supervision, training, and control, the Scout Fleet is organized similar to a naval unit. Vessels used in the Field (for exploration or communications, for example) belong to the Scout Fleet, even if operated by individuals not specifically assigned to that office. The Scout Fleet supports the Communications Office and Exploration Office activities, and provides ships (as well as some personnel to crew them) to those offices.

The **Imperial Grand Survey** prefers to retain its original name rather than taking its proper name – the **Survey Office**. Regardless of what it is called, it is responsible for producing and maintaining maps and charts of the Imperium, and of areas outside the Imperium which are of importance to it. The office is divided into *Internal* and *External Mapping Branches*.

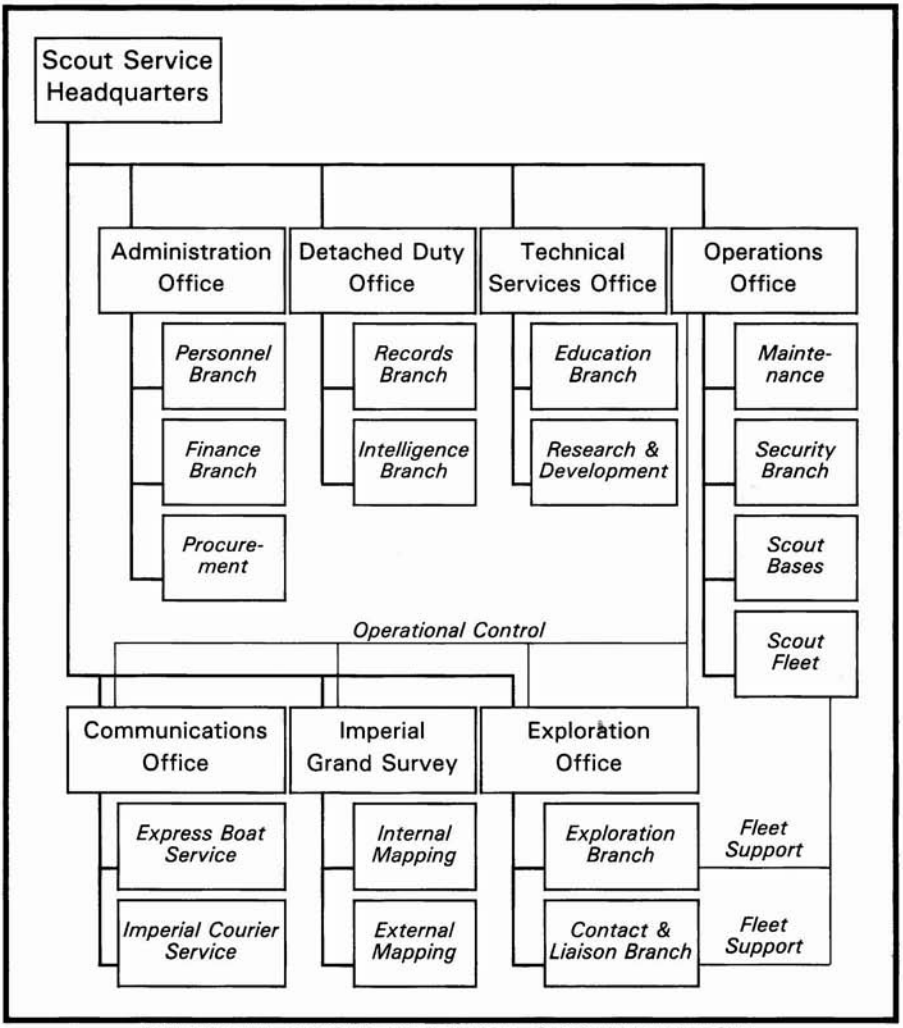
The *Internal Mapping Branch* is responsible for resurveying and updating the basic navigational charts of the Imperium, and for mapping world surfaces when necessary.

The *External Mapping Branch* is responsible for mapping areas outside the Imperium. Such maps may be used for navigation, settlement, or planning, and are essential in time of war. Generally, external mapping takes place in areas already explored by the Exploration Office.

The **Communications Office** is responsible for interstellar message and data transmission within the Imperium. It serves as a large scale Imperial Post Office and consists of the *Express Boat Service* and the *Imperial Courier Service.*

The *Express Boat Service* is responsible for operation of the express boats carrying xboat messages over the xboat routes of the Imperium. Service also extends to neighboring Imperial client states to which service and routes exist. The Service also staffs the various express boat tenders along the routes.

The *Imperial Courier Service* is responsible for carrying messages, small packages,




**IMPERIAL SCOUT SERVICE ORGANIZATION**

and important personnel to worlds off the main express boat routes, and operates small courier ships running unscheduled routes as the needs of the Service demand.

The **Exploration Office** is responsible for exploration of areas previously discovered but not explored, or incompletely charted. It is divided into the *Exploration Branch* and the *Contact & Liaison Branch*.

The *Exploration Branch* undertakes actual exploration of space and planets, compiling data on local flora and fauna, on planetological features, and on hazards to navigation or dangers to individuals.

The *Contact & Liaison Branch* was originally charged with locating, making first contact (and maintaining friendly relations) with non-human intelligent races. As the Imperium expanded, the C&L Branch was given the additional duty of acquain-

ting the various races of the Imperium with each other's cultures, and with smoothing over the inevitable conflicts that arise between cultures. Another function of the C&L Branch is the controlled dissemination of technological information to backward worlds within the Imperium, with a goal of bringing them up to Imperial standards slowly enough to minimize cultural shock effects.

Together, the many parts of the Imperial Interstellar Scout Service create a large, responsible organization within the Imperium capable of many diverse and important missions.

## REQUIRED MATERIALS

Much of the material in *Scouts* refers to rules and equipment found in **Traveller**. In addition to this book, the basic **Traveller** rules (whether *Basic* **Traveller**, *Deluxe* **Traveller**, *Starter* **Traveller**, or the **Traveller** Book) is essential, as are at least two six-sided dice, paper, and pencil.

The wide range of **Traveller** supplements, adventures, and books may prove useful in running adventures or organizing campaigns. They are not required, however, and any necessary explanations are contained in this book, or in the **Traveller** rules. Other useful materials include electronic calculators, miniature figures, hex grid or square grid graph paper, and colored markers.

**Technical Computing:** The complexity of the astronomical principles used in the world generation system in *Scouts* results in a great many mathematical formulae. Solution of these formulae by hand is a tedious process. For any extensive use of these formulae, an electronic calculator or home computer is recommended.

## DIE ROLLING CONVENTIONS

The same die rolling conventions used in previous volumes of **Traveller** are in force in *Scouts*. To briefly recapitulate:

**Throw:** That dice roll required to achieve a stated effect. If only a number is stated, it must be rolled exactly. A number followed by a plus (such as 7+) indicates that number or greater must be rolled. Similarly, a number followed by a minus (such as 3−) indicates that number or less must be rolled.

**Number of Dice:** Generally, a dice throw requires two six-sided dice. Throws requiring more (or fewer) dice are clearly stated. For example, a throw calling for one die would be stated 1D.

**Die Modifiers:** Die roll modifiers (abbreviated DM) are always preceded by either a plus or a minus. Thus, the notation DM +3 indicates that three is added to the dice roll before it is used.

# Scout Characters

The Scout Service began as an exploratory organization, but through the centuries it has grown to tackle many different missions. In addition to exploration and contact duties, it has taken on responsibility for mapping of the Imperium and its borders, for intelligence services, and for providing long-distance postal services. To perform these missions, the Scouts have two distinct needs for personnel—the highly independent and self-sufficient individual who can perform missions alone, without supervision, and the team-player who can work on a group effort within a rigid organization. The Scout Service must train and use both types of character.

Basic **Traveller** provides character generation for Scouts in the Field. For a more experienced Scout character, operating either in the Bureaucracy or in the Field, the following expanded character generation system is provided. It specifies assignments in a prior career down to specific office assignment level.

## CHARACTER GENERATION

A character is initially generated by rolling 2D for each of the six personal characteristics: strength, dexterity, endurance, intelligence, education, and social standing. This initial step is identical to that for standard character generation.

**College:** Any individual has the opportunity to attempt to obtain a college education. In the Scout Service, a college education is generally necessary for an individual to secure assignment to the Bureaucracy.

Any character may apply for admission to a college. The admission throw determines if the character is admitted and actually starts attending college; if the throw is not achieved, the character remains age 18 and may then directly attempt to enlist in the Scouts. Once admitted to college, the individual determines his or her success in college for the full four years; if the success throw is not achieved, the individual has aged one year (to age 19) and may now enlist in the Scouts (this first term of service is a short—three year—enlistment). The education throw determines the increased education that the student receives from attending college; a throw of less than one equals one. The result is added to the individual's education characteristic. Finally, the student throws for honors (to represent a high level of achievement in the education process): achieving the throw makes the individual an honors graduate and eligible for automatic administrator rank.

Once college is completed, the individual may enlist in the Scouts. He or she is 22 years of age.

## ENLISTMENT

Any character initiates a Scout career by enlisting. This procedure is initially identical to that for standard Scout character generation. Throw 7+ to enlist; allow DM +1 if intelligence is 6+, and DM +2 if strength is 8+. If an individual is unsuccessful in enlisting, he or she may submit to the draft. A throw of 4 (on 1D) will result in being drafted into the Scouts. Any other result prohibits the individual from Scout Service and a new character must be generated if Scout Service is desired.

**College Graduates:** Individuals who have attended and graduated from college may automatically enlist in the Scouts without an enlistment throw.

**Honors College Graduates:** Individuals who have attended and graduated from college with honors and who enlist in the Scouts are automatically granted Administrator Rank O1.

## OFFICE SELECTION

Individuals who join the Scouts are initially assigned to a specific office within the Scout Service structure, and then receive *initial training* from that office. College graduates already know that they are in the Bureaucracy; non-college graduates know that they are in the Field. The character should roll on the Scout office assignment table to determine his or her first office assignment. The result indicates the specific office the individual is initially assigned to.

**Office Reassignment:** An office assignment remains in effect for the remainder of the term of service for the individual. Individuals are allowed to apply for reassignment to another office (within the Bureaucracy or the Field) when they re-enlist. When re-enlistment occurs, the character may roll again on the Scout office assignment table: if the result is different, or if reassignment is not desired, the individual may choose to remain in the current office.

Members of the Bureaucracy are never reassigned to the Field; members in the Field are never reassigned to the Bureaucracy (but, see Transfers).

**Initial Training:** When a new Scout has been assigned an office (not reassigned to an office) he or she receives *initial training*. This results in an automatic skill as shown on the initial training table. Initial training takes one year. Upon the conclusion of initial training, the character begins duty with the Scouts.

## ACQUIRING SKILLS AND EXPERTISE

The process of resolving a Scout career involves continuing assignments (each lasting about one year) in which the individual receives a specific duty assignment, and then resolves it to determine survival, promotion, and skills learned.

**Terms of Service:** Scout enlistments are for four year terms of service. An individual has the opportunity to re-enlist every four years; he or she may not quit the Service except at the end of a term of service. In some cases (for example, being admitted to college, but not graduating) a term of service is allowed to be less than four years in order that the term end at a standard age.

**Duty Assignments:** At the beginning of each year (once initial training has been completed), the Scout character uses the duty assignment table to determine a specific duty assignment. The duty assignment is then resolved completely for survival, promotion (if possible), and skills received.

Possible assignments include training, base operations, routine, mission, special mission, and wartime mission. Scouts in the Field use one column; Scouts in the Bureaucracy use another. Scouts in the Bureaucracy who hold administrator rank are allowed a DM +2 on the duty assignment table which allows them to avoid some training (the DM is voluntary). However, a natural die roll of 2 always means a war mission, regardless of the DM.

*Special or War Missions:* When a special or war mission is assigned, the Scout character has been sent on a dangerous and important mission. The extra training and preparation for the assignment results in an extra skill taken from the special

or war mission column, in addition to any other skills received for the year.

**Transfers:** A Scout in the Field may receive *transfer* as a duty assignment. When this occurs, the individual permanently has been transferred to the Bureaucracy. Such a transfer may be declined, in which case the individual rolls again (if transfer is received on the re-roll, it must be taken).

A transfer places the individual in the transferred Scout Bureaucracy. The character rolls on the office assignment table under Bureaucracy to determine the office assignment. A roll on the duty assignment table then determines the specific duty to be undertaken.

Because the Bureaucracy has rank, and the Field does not, the Scout character immediately receives ordinary rank equal to the number of terms served (a Scout in the fourth term of service becomes rank E4).

**Assignment Resolution:** Each office within the Scouts is represented on the assignment resolution tables. The tables indicate office and duty assignment. In the proper column, throws are provided for survival, promotion (possible only for the Bureaucracy), and skills received.

**Survival:** A character always risks some danger of injury or death. To survive a duty assignment, the character must throw the indicated number or higher on two dice. If the throw is successful, the individual has survived and continues the procedure. If the throw is not successful, the character has died, and character generation stops. If desired, the *optional survival rule* may be used: the character leaves the Service immediately and does not count the current term of service toward mustering out benefits.

**Promotions:** Some characters may receive promotions reflecting their work quality and responsibility. Scouts serving in the Field do not receive promotions; those in the Bureaucracy can achieve promotions to a variety of ranks.

Two types of rank are possible: *ordinary rank* and *administrator rank*. Ordinary rank corresponds to enlisted rank; administrative rank corresponds to commissioned officer rank.

*Ordinary Rank:* Individuals who have not reached administrator status receive promotions in ordinary rank. It is possible to receive such a promotion once per year, up to a maximum ordinary rank of E9. Once a character reaches ordinary rank E9, no further promotions are possible unless the individual attends administrator school and receives administrator rank O1. However, the Scout Service maintains an up or out policy for ordinary rank. If an individual does not receive continuing promotions, the individual is not allowed to re-enlist. If a character's ordinary rank is not equal to or greater than his or her number of terms of service, re-enlistment is not permitted.

*Administrator Rank:* Characters may achieve administrator rank through administrator school, or through a direct grant for college honors graduates. Promotions in administrative rank are less common; only one promotion per term of service is allowed.

Each time a promotion is received, the individual is allowed to receive one new skill. Ordinary rank allows a skill from the appropriate office column or the scout life column of the skill tables. Administrator rank allows a skill from the administrator rank column.

**Ranks and Titles:** Rank is noted as an Imperial Service pay grade (abbreviated IS-), as well as by a rank title.

## SCOUT CHARACTER GENERATION TABLES

### INITIAL CHARACTERISTICS

Generate the character's six personal characteristics: throw 2D each for strength, dexterity, endurance, intelligence, education, and social standing. Initial age is 18 years old.

### COLLEGE EDUCATION

| | | |
|---|---|---|
| Admission | 9+ | DM +2 if educ 9+ |
| Success | 7+ | DM +2 if intel 8+ |
| Education | 1D-2 | DM +1 if intel 9+ |
| Honors | 10+ | DM +1 if educ 10+ |

College is a four-year process.

### ENLISTMENT

The Scouts are divided into two areas of endeavor: the Field, and the Bureaucracy.

**The Bureaucracy:** Only college graduates may join the bureaucracy.

**The Field:** Throw 7+ to enlist. DM +1 if intel 6+; DM +2 if stren 8+.

### INITIAL TRAINING

| *Office Assignment* | *Skill* |
|---|---|
| Survey | Pilot-1 |
| Exploration | Pilot-1 |
| Communications | Pilot-1 |
| Detached Duty | Admin-1 |
| Technical | Computer-1 |
| Operations | Leader-1 |
| Administration | Admin-1 |

### SCOUT OFFICE ASSIGNMENT

| *Die* | *Field* | *Bureaucracy* |
|---|---|---|
| 2 | Survey | Detached Duty |
| 3 | Survey | Detached Duty |
| 4 | Survey | Technical |
| 5 | Survey | Technical |
| 6 | Communications | Operations |
| 7 | Communications | Operations |
| 8 | Communications | Operations |
| 9 | Communications | Administration |
| 10 | Exploration | Administration |
| 11 | Exploration | Administration |
| 12 | Exploration | Administration |

**Note:** College honors graduates may select their office assignment.

### DUTY ASSIGNMENT

| *Die* | *Field* | *Bureaucracy* |
|---|---|---|
| 2 | Wartime Mission | Wartime Mission |
| 3 | Training | Training |
| 4 | Training | Base |
| 5 | Base | Training |
| 6 | Routine | Routine |
| 7 | Routine | Routine |
| 8 | Mission | Base |
| 9 | Mission | Mission |
| 10 | Special Mission | Mission |
| 11 | Special Mission | Mission |
| 12 | Transfer | Special Mission |

**Note:** For characters in the bureaucracy, administrator rank is allowed a DM +2 (but natural 2=2).

### TABLE OF RANKS

| *Rank* | *Pay Grade* | *Description* | *Rank* | *Pay Grade* | *Description* | *Traveller Rank* |
|---|---|---|---|---|---|---|
| E1 | IS-1 | Recruit | O1 | IS-10 | Admin Trainee | 1 |
| E2 | IS-2 | Apprentice, Clerk | O2 | IS-11 | Jr Administrator | 1 |
| E3 | IS-3 | Journeyman | O3 | IS-12 | Administrator | 2 |
| E4 | IS-4 | Skilled Worker | O4 | IS-13 | Gp Administrator | 3 |
| E5 | IS-5 | Asst Team Leader | O5 | IS-14 | Sr Administrator | 4 |
| E6 | IS-6 | Team Leader | O6 | IS-15 | Scout Commander | 5 |
| E7 | IS-7 | Asst Supervisor | O7 | IS-16 | Scout Leader | 5 |
| E8 | IS-8 | Supervisor | O8 | IS-17 | Senior Scout Ldr | 6 |
| E9 | IS-9 | Senior Supervisor | O9 | IS-18 | Sector Scout Ldr | 6 |

**Note:** Ordinary rank must equal or exceed the number of terms of service, or the Scouts will not allow re-enlistment.

## SCOUT CHARACTER GENERATION TABLES

### ASSIGNMENT RESOLUTION

| **Survey** | *Training* | *Base* | *Routine* | *Mission* | *Special Mission* | *War Mission* |
|---|---|---|---|---|---|---|
| Survival | 3+ | 3+ | 3+ | 4+ | 5+ | 6+ |
| Skills | school | 8+ | 7+ | 6+ | 6+ | 7+ |

**DMs:** For survival, DM +1 if endurance 9+. For skills, DM +1 if terms 3+.

| **Commo** | *Training* | *Base* | *Routine* | *Mission* | *Special Mission* | *War Mission* |
|---|---|---|---|---|---|---|
| Survival | 3+ | 4+ | 4+ | 5+ | 6+ | 6+ |
| Skills | school | none | 7+ | 7+ | 6+ | 6+ |

**DMs:** For survival, DM +1 if endurance 9+, DM +1 if pilot 3+.

| **Explore** | *Training* | *Base* | *Routine* | *Mission* | *Special Mission* | *War Mission* |
|---|---|---|---|---|---|---|
| Survival | 3+ | 3+ | 4+ | 5+ | 7+ | 6+ |
| Skills | school | none | 8+ | 7+ | 5+ | 6+ |

**DMs:** For survival, DM +1 if endurance 9+. For skills, DM +1 if intel 9+.

| **Admin** | *Training* | *Base* | *Routine* | *Mission* | *Special Mission* | *War Mission* |
|---|---|---|---|---|---|---|
| Survival | auto | auto | auto | 3+ | 3+ | 5+ |
| Promotion | no | 7+ | 7+ | 7+ | 6+ | 5+ |
| Skills | school | 7+ | 7+ | 7+ | 7+ | 7+ |

**DMs:** For survival, DM +1 if intel 9+.

| **Operations** | *Training* | *Base* | *Routine* | *Mission* | *Special Mission* | *War Mission* |
|---|---|---|---|---|---|---|
| Survival | auto | auto | auto | 3+ | 4+ | 5+ |
| Promotion | 8+ | 9+ | 8+ | 7+ | 6+ | 4+ |
| Skills | school | 8+ | 8+ | 6+ | 5+ | 4+ |

**DMs:** For survival, DM +1 if pilot-2+. For promotion, DM +1 if intel 9+.

| **Technical** | *Training* | *Base* | *Routine* | *Mission* | *Special Mission* | *War Mission* |
|---|---|---|---|---|---|---|
| Survival | auto | auto | auto | 3+ | 5+ | 6+ |
| Promotion | 10+ | 9+ | 9+ | 8+ | 7+ | 6+ |
| Skills | school | 7+ | 7+ | 6+ | 7+ | 6+ |

**DMs:** For promotion, DM +1 if education 10+.

| **Detached** | *Training* | *Base* | *Routine* | *Mission* | *Special Mission* | *War Mission* |
|---|---|---|---|---|---|---|
| Survival | auto | auto | auto | 4+ | 6+ | 7+ |
| Promotion | no | no | 8+ | 7+ | 5+ | 5+ |
| Skills | school | no | 7+ | 6+ | 6+ | 3+ |

**DMs:** For survival, DM +1 if rank O1+.

**Notes:** The following notes apply to the assignment resolution above. Auto means that survival is automatic; no throw is necessary. None means no skills are received. No means no promotion is possible. School indicates skills may be received if a school is successfully attended.

**Promotions:** Administrators may only receive one promotion per term of service; ordinary rank may be increased once per year.

## SCOUT CHARACTER GENERATION TABLES

### SCOUT SKILL TABLES

| *Die Roll* | *Scout Life* | *Exploration* | *Commo* | *Survey* | *Special or War Mission* | *Field Service* |
|---|---|---|---|---|---|---|
| 1 | +1 Stren | Air/Raft | Zero-G Cbt | Jack-o-T | Equestrian | Jack-o-T |
| 2 | Gambling | Vehicle | Pilot | Pilot | Bribery | +1 Educ |
| 3 | Gun Cbt | Gun Cbt | Ship's Boat | Vacc Suit | Equestrian | Gun Cbt |
| 4 | Carousing | Vacc Suit | Vacc Suit | Vacc Suit | Forgery | Carousing |
| 5 | Gun Cbt | Recon | Commo | Survey | Streetwise | Gun Cbt |
| 6 | Brawling | Space | Space | Space | Liaison | Gambling |
| 7 | +1 Educ | Survival | Survival | Survival | Survival | +1 Educ |
| 8 | +1 Stren | Jack-o-T | Pilot | Navigation | Gun Cbt | Jack-o-T |
| 9 | +1 Endur | Vehicle | Navigation | Engnrng | Space | Streetwise |
| 10 | +1 Dext | Gun Cbt | Navigation | Survey | +1 Social | +1 Intel |
| DM+4 | *if stren 9+* | *terms 3+* | *terms 3+* | *terms 3+* | *rank O1+* | *terms 3+* |

| *Die Roll* | *Admin* | *Operations* | *Technical* | *Detached Duty* | *Admin Rank* | *Bureaucracy* |
|---|---|---|---|---|---|---|
| 1 | Electronics | Mechanical | +1 Stren | Electronics | Admin | +1 Intel |
| 2 | Admin | Gun Cbt | Mechanical | Admin | Admin | Gambling |
| 3 | Commo | Vehicle | Vehicle | Commo | Computer | Carousing |
| 4 | Computer | Engnrng | Vacc Suit | Computer | Vacc Suit | +1 Educ |
| 5 | Computer | Computer | Electronic | Computer | Gun Cbt | Computer |
| 6 | Broker | Navigation | Gravitics | Gun Cbt | Space | Vehicle |
| 7 | +1 Intel | Pilot | Engnrng | Forgery | Liaison | +1 Intel |
| 8 | +1 Educ | Ship's Boat | +1 Educ | Brawling | +1 Educ | +1 Educ |
| 9 | Liaison | Gunnery | Computer | Streetwise | Leader | Streetwise |
| 10 | Admin | Ship Tactics | Medic | Brawling | +1 Social | +1 Intel |
| DM+4 | *rank O1+* | *rank O1+* | *educ 9+* | *rank O1+* | *rank O4+* | *rank O1+* |

### GUNS

| *Weapon* | *+DM* | *-DM* | *Wounds* |
|---|---|---|---|
| Body Pistol | 11+ | 7- | 2D |
| Auto Pistol | 10+ | 6- | 3D |
| Revolver | 9+ | 6- | 3D |
| Carbine | 9+ | 4- | 3D |
| Rifle | 8+ | 5- | 3D |
| Auto Rifle | 10+ | 6- | 3D |
| Shotgun | 9+ | 3- | 4D |
| SMG | 9+ | 5- | 3D |
| Laser Carbine | 10+ | 5- | 4D |
| Laser Rifle | 11+ | 6- | 5D |

Guns may be selected on the basis of DMs and wounds. The + and - DMs occur based on dexterity; wounds indicate the hits a gun inflicts.

### SKILL ELIGIBILITY

Scouts may receive skills under the following conditions:

**Automatic:** Provided from initial training.

**Skill Throw:** If the throw on the assignment resolution tables is successful (one per year) then roll for one skill from the appropriate office, scout life, admin rank, field or bureaucracy columns.

**Training:** Provided from the school tables.

**Rank:** One per promotion received from the administrator rank columns.

**Special or Wartime Mission:** Allows one skill from the special or war mission column, in addition to other normally allowed skills for the year.

## SCOUT CHARACTER GENERATION TABLES

### SCHOOL ASSIGNMENT TABLE

| *Die* | ———— *Office* ———— | | | | | | |
|---|---|---|---|---|---|---|---|
| *Roll* | *Admin* | *Operation* | *Technical* | *Det Duty* | *Survey* | *Explor* | *Commo* |
| 1 | Specialist | Specialist | Specialist | Specialist | Specialist | Specialist | Specialist |
| 2 | Specialist | Specialist | Specialist | Specialist | Specialist | Intel Sch | Specialist |
| 3 | Specialist | Ship | Technical | Specialist | Specialist | Contact | Ship |
| 4 | Ship | Ship | Technical | Intel Sch | Fld Trng | Contact | Ship |
| 5 | Fld Trng | Fld Trng | Technical | Intel Sch | Fld Trng | Fld Trng | Fld Trng |
| 6 | Adminis | Adminis | Adminis | Adminis | Fld Trng | Fld Trng | Fld Trng |

### SCHOOLS

| *Die Roll* | *Ship School* | *Intelligence School* | *Technical School* | *Specialist School* | *Field Training* | *Contact School* |
|---|---|---|---|---|---|---|
| 1 | Pilot | Forgery | Computer | Medical | Vehicle | Survey |
| 2 | Navigation | Streetwise | Electronics | Mechanical | Air/Raft | Liaison |
| 3 | Engnrng | Brawling | Gravitics | Computer | Recon | Streetwise |
| 4 | Gunnery | Bribery | Mechanical | Admin | Survival | Survival |
| 5 | Space | Gun Cbt | Naval Arch | +1 Stren | Navigation | Pilot |
| 6 | Space | Survival | +1 Educ | Gunnery | Survey | Gun Cbt |
| *Note:* | *Roll twice.* | *Roll twice.* | *Roll once.* | *Roll once.* | *Roll once.* | *Roll twice.* |

### CASCADE SKILLS

**Aircraft:** Select from Prop-driven Fixed Wing, Jet-driven Fixed Wing, or Helicopter.

**Gun Combat:** Select a gun from the gun list.

**Space Skill:** Select from Engineer, Gunnery, Navigator, Pilot, Ship's Boat, or Ship Tactics.

**Vehicle:** Select a vehicle from Aircraft,* Grav Vehicle, Tracked Vehicle, Watercraft,* or Wheeled Vehicle. *Aircraft and Watercraft require further selection by the character.

**Watercraft:** Immediately select from Large Watercraft, Hovercraft, Small Watercraft, or Submersible.

### RE-ENLISTMENT

Re-enlistment is allowed on 3+. A member of the scout bureaucracy with ordinary rank less than the number of terms served, may not re-enlist.

Re-enlistment after the 7th term is prohibited except on 12 exactly.

### ADMINISTRATOR SCHOOL

Graduates character with rank O1 (IS-10) and skill admin-1.

### TRANSFERS

A duty assignment of transfer moves a scout from the field to the bureaucracy. Immediately rolls for office assignment and continues service in that office.

Transferred scouts receive ordinary rank equal to total terms of service.

A first transfer may be declined; a second assignment of transfer must be taken.

**Reassignment:** At the end of each term of service, a scout may request reassignment to a new office by rolling on the office assignment table. That result is the new office assignment (when the result is the same, it indicates reassignment denied).

Initial training is not provided for individuals who are reassigned to an office.

Imperial Service pay grades range from 1 to 18; IS-1 to IS-9 correspond to enlisted pay grades in the armed forces (E1 to E9), while IS-10 to IS-18 correspond to commissioned officer pay grades (O1 to O9).

An individual may progress from IS-1 to IS-9 through ordinary promotions. An individual may not be promoted from IS-9 to IS-10. Instead, IS-10 is only available through administrator school, or through a direct grant for college honors graduates. Individuals with pay grade IS-10 may be promoted normally up to IS-18.

Scouts in the Bureaucracy must make the promotion throw (on two dice) in order to receive a promotion.

**Skills:** A character may receive skills as a result of the specific duty assignment. If the character rolls the indicated number or higher, then he or she becomes eligible for one skill, to be determined (at the character's option) from the appropriate office, scout life, Field, or Bureaucracy skill tables immediately.

The types of skills available depend on the characters' rank, the nature of the duty assignment performed, and other factors.

**Schools:** Individuals who receive training as an assignment are sent to a service school. The character should consult the school assignment table to determine which schools are available, and then roll one die. Once the school is determined, the individual may roll on the school table to determine the skills received by attendance. Certain schools confer two skills, while others confer only one, as noted below each column of the table.

It is possible to be assigned most schools more than once. Administrator school, however, may only be attended once, and subsequent receipt of an assignment to administrator school calls for a re-roll.

## RE-ENLISTMENT AND MUSTERING OUT

After completing a term of service, a character may attempt to re-enlist. Re-enlistment is allowed on a throw of 3+. However, an individual in the Bureaucracy who does not hold administrator rank, and whose ordinary rank is less than his or her total number of terms served may not re-enlist. An individual may not re-enlist after the seventh term unless the re-enlistment roll is 12 exactly.

**Short Terms:** If an individual began service at an age which conflicts with normal procedure, he or she must re-enlist or muster out at the next correct age. This most commonly occurs when a character is admitted to college, but does not make the success throw.

**Mustering Out:** The mustering out procedure is used as indicated in Basic **Traveller**. Basic **Traveller** equivalent ranks (necessary for mustering out) are shown on the table of ranks.

**Retirement:** Scouts are not eligible for retirement or pensions.

**Aging:** Aging is conducted in accordance with Basic **Traveller**.

**Term Skills:** Skill eligibility indicated in this book is in lieu of skill eligibility indicated in Basic **Traveller**.

## SKILLS

Many of the skills called for by this character generation system appear in the Basic **Traveller** character generation system. Each of the 13 skills presented here is either new, or has been defined in another part of **Traveller**, but does not appear in Basic **Traveller**.

**Broker:** The individual is skilled in commercial purchase and resale of goods.

Broker skill permits a character to act as broker, as provided in the trade and commerce rules. This skill may be applied as a DM on the actual value table.

**Carousing:** The individual is a gregarious and sociable individual, well-adapted to meeting and mingling with strangers in unfamiliar surroundings.

Characters with the social skill of carousing enjoy meeting and dealing with other people. Any level of skill allows a DM +1 on the roll for patron encounters; half of any carousing skill (round fractions upwards) serves as a DM on the reaction table when used initially by the patron. Carousing is also usable when meeting individuals as potential hirelings.

**Communications:** The individual is trained in the use, repair, and maintenance of communications devices.

While nearly everyone can press the button and make a communicator function, this skill is necessary to understand why the device does not work correctly, or to be awqare of the details of limitations on its use.

When an individual is using a communicator for contact with someone having similar skill, the chance that such communication will be detected by a third party is reduced by the average of the two skill levels (round fractions up). Communications skill also enhances the ability to jam transmissions, or to break through jamming. Communications skill allows DMs for the repair of malfunctioning communicators.

**Equestrian:** The individual is skilled in the use of animals for personal transport.

Animals remain a prime form of transportation on many worlds, and a properly trained individual knows the principles of animal control enough to ride them (if they are also properly broken and trained). Equestrian-1 is sufficient to ride most trained animals at a walk or in safe circumstances. Equestrian-2 allows guidance of the animal while running or in chases. Equestrian-4 allows attempts at breaking and training the animal; equestrian-6 indicates an extremely effective riding animal trainer.

**Hunting:** The individual is skilled in tracking and hunting animals.

In animal encounter situations, this skill is used to enhance the chance of any specific type of achieving surprise on such animals, and of surviving such encounters.

DMs based on specific situations should be generated, and hunting skill should be a favorable DM.

**Liaison:** The individual is trained in the art of dealing with others; this skill is usable in relations with members of military units, citizens in a community, and with alien or foreign cultures.

This individual is trained to subordinate his or her own views and prejudices where they may conflict with those held by the individuals being dealt with. As a result, greater cooperation may be achieved, and substantial progress in mutual projects made. Liaison is primarily used as a positive DM on the reaction table when dealing with other individuals.

*Referee:* Liaison is similar to both streetwise and admin skills. Streetwise tends to deal with unsavory aspects of society, while admin deals with the formal bureaucratic structure. Liaison is a formal training that spans both, but also extends to contact with alien cultures. Liaison may be used as the equivalent of the next lower level of either streetwise or admin where necessary; thus, liaison-2 is the equivalent of streetwise-1.

**Naval Architect:** The individual has been trained in the design of starships and small craft. Knowledge of the requirements for accurate, usable ship design plans and of the details of ship design are part of this skill.

The character is capable of acting as a naval architect, subject to the level of skill attained. Naval Architect-1 is sufficient to occasionally design ships, especially for personal or group use, but generally requiring three or four times the time called for by a professional (about 16 weeks). Naval Architect-2 allows design of a ship in 10-12 weeks. Naval Architect-3 indicates a level of skill approaching professional. Naval Architect-4+ allows the individual to function as a professional naval architect.

This skill operates in conjunction with the established starship design and construction rules, and does not allow the invention of new devices or equipment.

**Recon:** The individual is skilled in military scouting, and is capable of moving about in the wilderness without being detected.

In encounter situations, the referee will set the die roll needed for each side to spot the other. Players with recon skills should have a correspondingly lower chance of being seen and a higher chance of spotting the enemy in advance.

Additionally, players with recon skill will be able to determine the number of individuals that recently passed through an area by tracks, trampled vegetation, or other signs and clues, with higher levels of expertise being able to more narrowly bracket the number of persons or vehicles.

**Ship Tactics:** The individual has been trained in the operation of a starship or space ship in battle.

Ship Tactics is a skill used by individuals in command of individual ships in combat. It basically serves as a DM in space combat in individual engagements.

**Survey:** The individual is skilled in the art and science of mapping and charting star systems.

Survey is a skill conferring expertise in the various areas used to produce accurate maps and directories of Imperial territory and the frontiers. Survey allows an individual to accurately determine the characteristics of an unknown or unclassified world, and to compile its UPP. It allows an individual to correctly produce maps and information about star systems as well.

Survey as a skill is learned in the Scouts to enable accurate mapping and studies of worlds and systems. It is most useful when an individual is confronted with unknown worlds and must deal with them.

**Survival:** The individual is familiar with both the theory and practice of living off the land, or staying alive in situations where most individuals would have trouble finding food, water, or shelter.

Players with survival expertise are adept at locating food and water, constructing or finding natural weapons and shelter, and finding their way across country, in a wilderness. The referee should give favorable die rolls to such players for each of the above, based on the environment they are in. (The likelihood of survival skills, no matter how good, allowing a player to find breathable air in a vacuum are rather slight, but survival skills would allow an individual to use any tools at hand to build an adequate shelter, or to locate caves or natural features which could assist in survival.)

**Zero-G Combat:** The individual has been trained to fight in a zero-G environment.

Virtually all weapons involve some recoil, and in a zero-G environment this recoil

can disorient or render helpless individuals not trained to compensate for it. When fighting in a zero-G environment, any individual has a chance of losing control of his movement/position each combat round. Roll 10+ on two dice to avoid losing control. Apply the following DM's: Firing a weapon: −4. Firing a laser weapon; −2. Note that laser weapons have no recoil. Using a handhold: +5. Striking with a blade weapon, pole-arm, fist or similar: −6. For each level of zero-G combat expertise: +4. Dexterity of 9+: +2. Dexterity of 11+: +4. Using a handhold reduces dexterity for the purposes of weapon accuracy by -4.

Individuals who lose control may not fire until they have reoriented themselves and regained control. Roll 10+ each subsequent combat round to regain control, with all DM's above in use except that handholds may not be used nor may weapons be fired.

### CASCADE SKILLS

Certain skills call for an immediate selection of specific skills as a result (gun combat is an example of cascade skill). The following cascade skills are available in *Scouts*; the player should immediately select one of the skills listed as available.

**Aircraft:** The character selects from Propeller-driven Fixed Wing Aircraft, Jet-driven Fixed Wing Aircraft, or Helicopter.

**Gun Combat:** The character selects a gun from the list of guns available in Basic **Traveller**.

**Space Skill:** The character selects from Engineering, Gunnery, Navigation, Pilot, Ship's Boat, or Ship Tactics.

**Vehicle:** The character selects from Aircraft, Grav Vehicle, Tracked Vehicle, Watercraft, or Wheeled Vehicle. Aircraft and Watercraft are themselves cascade skills and call for further selection.

**Watercraft:** The character selects from Large Watercraft, Hovercraft, Small Watercraft, or Submersible.

## CHARACTER GENERATION CHECKLIST

The following checklist covers the main points of scout character generation.

1. Generate character. Generate six personal characteristics.
2. College. Apply for Admission.
   A. Resolve Success. If unsuccessful, age one year, and enlist (step 3).
   B. Resolve Education and Honors.
3. Enlistment in Scouts. Throw 7+ to enlist. DM +1 if intelligence 6+; DM +2 if strength 8+. If unsuccessful, draft allowed on 4 (on 1D).
   A. Non-college graduates enter the Field.
   B. College graduates enter the Bureaucracy.
   C. Honors graduates enter the Bureaucracy with rank O1 automatically
4. Office Selection. Determines office assigned to for full term of service.
5. Initial Training. Requires first year of service and provides one automatic skill from initial training table.
6. Duty Assignment and Resolution (one per year after first year).
   A. Survival. Failure causes death or (under optional survival rule) muster-out.
   B. Promotion. Possible only in the Bureaucracy.
      1). Limited to one per year, to a maximum E9, for ordinary rank.
      2). Limited to one per term of service for administrator rank.
   C. Skill Eligibility.
      1). Skill allowed if skill throw successful.
         a. One skill from office, Field or Bureaucracy, or scout life column.
         b. If special mission or wartime mission, one skill also allowed from special or war mission column.
         c. School result allows attendance at a school.
      2). Skill allowed if promotion ocurred.
         a. If ordinary rank promotion, skill allowed from office column, or from scout life column.
         b. If administrator rank, skill allowed from administrator rank column.
7. Upon completion of term, roll for re-enlistment.
   A. Determine if sufficient rank to re-enlist (Bureaucracy requires ordinary rank equal to number of terms of service; Field has no rank requirements).
   B. Throw 3+ to re-enlist. If 12 exactly, re-enlistment required.
   C. If successful, roll for reassignment (taking it is optional), and return to step 6.
8. Final Details.
   A. Muster out using procedures in Basic **Traveller**.
   B. Resolve aging as necessary.

# Star System Generation

The Scout Service has long been involved in the survey and mapping of the star systems of the Imperium. Their interest extends to all of the planets and satellites of the system, not simply to the main world which most trade, commerce, and travel deals with.

Standard **Traveller** subsector mapping concentrates on a single main world within a system. That world is the one most important planet or satellite; the one with the greatest population, the dominant local government type, and the star system's starport.

Naturally, most star systems have more than one world. This star system generation system provides the details of those additional worlds and satellites for use by **Traveller** referees and adventurers.

**Approaches:** These rules provide two distinct approaches to the task of star system generation. The *continuation approach* allows the referee to elaborate on the details of a system after the main world has been created. The *expanded approach* allows the referee to create an entire star system and determine the main world in the course of the process.

Because **Traveller** calls for the creation only of a main world, and for that main world to be cataloged in subsector maps, the continuation approach is designed to extend that procedure. Referees can use the continuation system to produce detailed star systems for existing **Traveller** subsectors with a minimum of difficulty. It also allows the referee to stop in the middle of the generation sequence and put off completing the complete task if the needs of an adventure or campaign so dictate.

The expanded approach is more time-consuming; it calls for the complete generation of a star system and its attendant planets and satellites, and for the selection of the main world after this material is generated. For extreme realism, this expanded method serves admirably, but it also requires a great deal of time.

**Checklists:** Two detailed checklists (the continuation checklist and the expanded checklist) cover the main details of the system, but the rules themselves should be consulted for absolute accuracy. A basic checklist repeats the procedure given in **Traveller**: and allows a main world to be produced quickly from the charts in this booklet as well.

The text of this chapter is oriented to the sequence of the expanded generation checklist, although it also covers the details of the continuation checklist.

**Charts:** The charts for this system have been printed at the center of this book. During any system generation process, these charts provide the details of the codes and results from the system.

**Conventions:** The following conventions apply specifically to the systems presented here.

Specified die rolls are on two dice unless otherwise noted. The abbreviation D is used to indicate die or dice. Thus, 1D mean one die; 3D means three dice.

Die rolls which are modified to less than zero (and for which no specific table reading or code is indicated) become zero.

## UNIVERSAL PLANETARY PROFILE

As in the basic **Traveller** rules, this system makes use of the Universal Planetary Profile (UPP) to code the qualities and characteristics of worlds. The UPP consists of single letters or digits to indicate starport or spaceport, six basic characteristics (size, atmosphere, hydrographics, population, government, and law level), and a technological index. Additional material such as trade classifications and remarks can be added to this UPP for elaboration or clarification.

Worlds other than the main world are also described using the UPP. Several new codes allow specification of special qualities such as small world (less than 1,600 km diameter) and several newly defined atmosphere types.

## STAR SYSTEM PRESENCE

The presence of a star system depends on a system density determined by the referee. The system presence table indicates various levels of probability for star systems. Once a system is determined to exist, its presence should be marked on the subsector grid map. Generally, the presence of all systems in a subsector is determined before proceding to the next steps.

## STAR SYSTEM FEATURES

The type of star system present in a system, as well as the star type and size, and the presence of gas giants and asteroid belts determines a great portion of the conditions within the system.

**System Nature:** Star systems may be solitary, having one central star, or multiple, having two or more stars. In an extreme situation, the star system may be quadruple, with two widely separated binary systems, each effectively a distinct system. Roll 2D on the basic nature column to determine system nature and the number of stars in the system. One will be the primary, and any others will be companions. The table only provides for solitairy, binary, and trinary star systems. Later developments may create a quadruple system.

**Primary Star Type:** Star types range through a variety of spectral types using the codes O B A F G K M. These letters indicate in descending order the temperature of the stars. (A mnemonic for remembering this sequence is "Oh, Be A Fine Girl Kiss Me".)

Spectral types O and B are extremely rare and will not normally be encountered. As a result, although they are on the column for generation, it is impossible to achieve these results. The referee would must decide to institute a DM in order for type O or B stars to occur. More acceptably, the referee may establish an O or B type star when and where necessary (although there should not be more than one or two type O or B stars in a sector).

**Spectral Decimal Classification:** The spectral type for stars is usually further specified by a decimal classification (using the digits 0 to 9). Thus, a type F1 star is one tenth of the way between F and G, while a type F9 is nine-tenths of the way to G. All stars are treated this way with the exception of type O, which ranges from 5 to 9 only, and dwarf stars, which do not have decimal classifications. Such a degree of detail for spectral decimal classifications is not necessary. Roll 1D: a result of 3− makes the decimal classification 0; a result of 4+ makes the decimal classification 5. For the referee who desires still more detail, 0 may be construed to mean any decimal classification from 0 to 4 (roll 1D − 1 for the decimal number;

ignore and re-roll a result of 6) and 5 may be construed to mean 5 to 9 (roll 1D + 4 for the decimal number; ignore and re-roll a result of 6).

Tables referring to spectral decimal classifications in this system deal only with 0 and 5, which may be taken to cover the range of decimal classifications available.

**Primary Star Size:** For the primary star, determine star size using the primary star size column of the table.

Size IV is not available for star types K5 through M9. If such a size is indicated, use size V. Size VI is not available for star types B0 to F4. If such size is indicated, use size V.

**Companion Star Types:** For each companion star, determine its type using the companion type column of the table. A DM of + primary star type roll should be applied to each roll.

**Companion Star Size:** For each companion star, determine its size using the companion size column of the table. A DM of + primary star size roll should be applied to each roll.

Size IV is not available for star types K5 through M9. If such a size is indicated, use size V. Star size VI is not available for star types B0 to F4. If such a size is indicated, use size V.

**Companion Orbit:** For each companion star, determine its orbit using the companion orbit column of the table. The first companion star uses the column without DMs. The second companion star uses a DM of + 4.

A result of close indicates that the companion star is effectively touching the primary star; its orbit is so very close to the primary that it has practically no effect on orbits of planets. Other results on the column indicate the planetary orbit which the companion star occupies. If the planetary orbit for a companion is coded as within the sphere of the primary star on the table of zones, then the companion orbit is changed to close.

Far indicates that the companion star is outside the realm of the primary star's system (generate an orbital distance of 1D times 1,000 AU).

If a companion is far, it may itself have a companion: roll again on the basic nature column for this far companion. If the result is binary, then the star has a companion— generate it as other companions are generated, but with a DM − 4 on companion orbit.

**Maximum Orbits:** Orbits for planets, gas giants, and planetoid belts are available around the primary star and certain eligible companion stars. The maximum orbits table indicates the highest numbered orbit available for the star. This column is open-ended, and allows orbits numbered higher than 12 if DMs create them. Apply DM + 4 if star size III; DM + 8 if star size Ia, Ib, or II. Apply DM − 4 if star type M; DM − 2 if star type K.

If a companion is present, certain restrictions on available orbits exist. Orbits closer to the primary than the companion's orbit must be numbered no more than half of the companion's orbit number (round fractions down). Orbits farther away than the companion must be numbered at least two greater than the companion's orbit number.

For example, in a system with a companion in orbit 2, orbit 0 is available, and orbits 4 and higher are available. In a system with a companion at orbit 5, orbits 0, 1 and 2 are available, and orbits 7 and higher are available.

Companion stars have orbits as determined by the maximum orbits column, but

## CONTINUATION STAR SYSTEM GENERATION CHECKLIST

This checklist governs the generation of star systems for which a main world already exists. It continues from the last step in the basic checklist.

10. Determine star system details.

A. System nature (solitary, binary, or trinary star system).

B. Primary star type and size. DM+4 if main world has population 8+ or atmosphere 4 - 9.

C. Companion star type and size.

D. Companion orbit.

E. Number of orbits available for each star.

F. Unavailable, inner, habitable, and outer zones within the system.

G. Captured planets and empty orbits.

H. Presence and quantity of gas giants.

I. Presence and quantity of planetoid belts.

11. Place known components.

A. Place gas giants.

B. Place planetoid belts.

C. Place main world in habitable zone.

12. Generate worlds within system.

A. Orbit Location.

B. Size: 2D-2. For orbit 0, DM-5; for orbit 1, DM-4; for orbit 2, DM-2. If type M star, DM-2 for all orbits. If size 0-, use S.

C. Atmosphere: 2D-7 + size. If inner zone, DM-2; if outer zone, DM-2. If size 0 or S, then atmosphere 0. If outer zone +2, throw 12 for A.

D. Hydrographics: 2D-7 + size. If inner zone, then 0; outer zone, DM-4. If size 1- or S, then hydrographics 0. If atmosphere 1- or A+, DM-4.

E. Population: 2D-2. If inner zone, DM-5; if outer zone, DM-5. If not atmosphere 0, 5, 6, or 8, DM-2. If equal to or greater than main world, then reduce to main world minus 1.

13. Determine number of satellites for each planet, or gas giant in the system. Disregard planetoid belts and size S worlds.

A. Planets: 1D-3.

B. Small gas giants: 2D-4.

C. Large gas giants: 2D.

14. Generate satellites within system.

A. Size: Planetary size -1D. For large gas giant, 2D-4. For small gas giant, 2D-6. If size 0, use R. If size less than 0, use S.

B. Orbit Location.

C. Atmosphere: 2D-7 + satellite size. If inner zone, DM -4. If outer zone, DM -4. If size 1-, then 0. If outer zone +2, throw 12 for A.

D. Hydrographics: 2D-7 + satellite size. If inner zone, then 0; if outer zone, DM-4. If size 0-, then 0. If atmosphere 1- or A+, DM-4.

E. Population: 2D-2. If inner zone, DM-5; if outer zone, DM -4. If atmosphere not 5, 6, or 8, DM-2. If ring, then 0. If equal to or greater than main world, then reduce to main world minus 1.

15. Determine additional planet and satellite characteristics.

A. Subordinate Government: 1D. DM +2 if main world government 7+. Equals 6 if main world government 6.

B. Subordinate Law Level: 1D-3 + main world law level.

C. Note subordinate facilities.

D. Subordinate Tech Level: Main world level -1. Equals main world level if research lab or military base present.

E. Spaceport Type.

16. Record statistics and data.

A. Map data on subsector grid.

B. Note main world data on subsector data form.

C. Note complete system data on system data form.

## BASIC STAR SYSTEM GENERATION CHECKLIST

This checklist governs generation of the main world in a star system.

1. Determine system presence.
2. Check system contents table.
   A. Find starport type.
   B. Check for naval base.
   C. Check for scout base.
   D. Check for gas giant.
3. Name main world.
4. Decide if travel zone coded.
5. Generate main world UPP.
   A. Note starport type.
   B. Main world size: 2D-2.
   C. Main world atmosphere: 2D-7 + size. If size 0, then atmosphere 0.
   D. Main world hydrographics: 2D-7 +size. If size 1-, then hydrographics 0; if atmosphere 1- or A+, DM -4. If less than 0, then 0; if greater than A, then A.
   E. Population: 2D-2.
   F. Government: 2D-7 + population.
   G. Law Level: 2D-7 + government.
   H. Technological level: 1D + DMs from the tech level table.
6. Note trade classifications.
7. Record statistics for reference.
8. Map system on subsector map grid.
9. Establish communications routes.

**Note:** For generation of the additional worlds within the star system, use the expanded star system generation checklist.

## SYSTEM PRESENCE

**Rift** *(density 4%):* Throw 12+ on 2D per hex in a subsector.

**Sparse** *(density 16%):* Throw 6+ on one die per hex in a subsector.

**Scattered** *(density 33%):* Throw 5+ on one die per hex in a subsector. The Spinward Marches has this density.

**Standard** *(density 50%):* Throw 4+ on one die per hex in a subsector.

**Dense** *(density 66%):* Throw 3+ on one die per hex in a subsector.

## SYSTEM CONTENTS TABLE

| *Die Roll* | *Star-port* | *Naval Base* | *Scout Base* | *Gas Giant* | *Plane-toids* |
|---|---|---|---|---|---|
| 2 | A | no | no | yes | yes |
| 3 | A | no | no | yes | yes |
| 4 | A | no | no | yes | yes |
| 5 | B | no | no | yes | yes |
| 6 | B | no | no | yes | yes |
| 7 | C | no | yes | yes | no |
| 8 | C | yes | yes | yes | no |
| 9 | D | yes | yes | yes | no |
| 10 | E | yes | yes | no | no |
| 11 | E | yes | yes | no | no |
| 12 | X | yes | yes | no | no |

Roll once for each column.

**Scout Base:** Apply DM -1 if starport C; -2 if starport B; and -3 if starport A. Do not roll if starport E or X.

**Naval Base:** Do not roll if starport C, D, E, or X.

## TECH LEVEL TABLE

| *Digit* | *Star-port* | *Size* | *Atm* | *Hyd* | *Pop* | *Govt* |
|---|---|---|---|---|---|---|
| 0 | | +2 | +1 | — | — | +1 |
| 1 | | +2 | +1 | — | +1 | — |
| 2 | | +1 | +1 | — | +1 | — |
| 3 | | +1 | +1 | — | +1 | — |
| 4 | | +1 | — | — | +1 | — |
| 5 | | — | — | — | +1 | +1 |
| 6 | | — | — | — | — | — |
| 7 | | — | — | — | — | — |
| 8 | | — | — | — | — | — |
| 9 | | — | — | +1 | +2 | — |
| A | +6 | — | +1 | +2 | +4 | — |
| B | +4 | | +1 | | | — |
| C | +2 | | +1 | | | — |
| D | — | | +1 | | | -2 |
| E | — | | +1 | | | — |
| F | — | | — | | | — |
| X | -4 | | | | | |

Determine DMs from this table and apply them to 1D to find tech level.

**Note:** Dashes indicate that there is no DM for the given digit; blanks indicate that there is no digit possible in that situation under this generation system.

## STARPORTS

*Type Description*

A Excellent quality with refined fuel, overhaul, shipyards.

B Good quality with refined fuel, overhaul, shipyards for non-starships.

C Routine quality with unrefined fuel, some repair facilities.

D Poor quality with unrefined fuel; no repair facilities.

E Frontier installation; no facilities.

X No starport. Generally a red travel zone.

Starports are established primarily to foster interstellar trade and commerce.

## SPACEPORTS

*Type Description*

F Good quality with unrefined fuel, minor repair facilities.

G Poor quality with unrefined fuel; no repair facilities.

H Primitive installation; no facilities.

Y No spaceport.

Spaceports are established primarily to foster in-system travel.

## TECHNOLOGICAL LEVELS

| *Digit* | *Description* |
|---|---|
| 0 | Stone Age. Primitive. |
| 1 | Bronze Age to Middle Ages. |
| 2 | circa 1400 to 1700. |
| 3 | circa 1700 to 1860. |
| 4 | circa 1860 to 1900. |
| 5 | circa 1900 to 1939. |
| 6 | circa 1940 to 1969. |
| 7 | circa 1970 to 1979. |
| 8 | circa 1980 to 1989. |
| 9 | circa 1990 to 2000. |
| A | Interstellar community. |
| B | Average Imperial. |
| C | Average Imperial. |
| D | Above average Imperial. |
| E | Above average Imperial. |
| F | Technical maximum Imperial. |
| G | Occasional non-Imperial. |

Tech level labels in terms of historical dating are intended as a guide only, and indicate normally expected capabilities.

## SIZE

| *Digit* | *Description* |
|---|---|
| 0 | Asteroid/Planetoid Belt |
| R | Ring (around a world) |
| S | Small World (200 km) |
| 1 | 1,000 miles (1,600 km) |
| 2 | 2,000 miles (3,200 km) |
| 3 | 3,000 miles (4,800 km) |
| 4 | 4,000 miles (6,400 km) |
| 5 | 5,000 miles (8,000 km) |
| 6 | 6,000 miles (9,600 km) |
| 7 | 7,000 miles (11,200 km) |
| 8 | 8,000 miles (12,800 km) |
| 9 | 9,000 miles (14,400 km) |
| A | 10,000 miles (16,000 km) |

## ATMOSPHERE

| *Digit* | *Description* |
|---|---|
| 0 | No atmosphere. |
| 1 | Trace. |
| 2 | Very thin, tainted. |
| 3 | Very thin. |
| 4 | Thin, tainted. |
| 5 | Thin. |
| 6 | Standard. |
| 7 | Standard, tainted. |
| 8 | Dense. |
| 9 | Dense, tainted. |
| A | Exotic. |
| B | Corrosive. |
| C | Insidious. |
| D | Dense, high. |
| E | Ellipsoid. |
| F | Thin, low. |

## HYDROGRAPHICS

| *Digit* | *Description* |
|---|---|
| 0 | No free standing water. |
| 1 | 10% water. |
| 2 | 20% water. |
| 3 | 30% water. |
| 4 | 40% water. |
| 5 | 50% water. |
| 6 | 60% water. |
| 7 | 70% water. |
| 8 | 80% water. |
| 9 | 90% water. |
| A | No land masses. |

## POPULATION

*Digit Description*

0 No inhabitants.
1 Tens of inhabitants.
2 Hundreds of inhabitants.
3 Thousands of inhabitants.
4 Tens of thousands.
5 Hundreds of thousands.
6 Millions of inhabitants.
7 Tens of millions.
8 Hundreds of millions.
9 Billions of inhabitants.
A Tens of billions.

The population digit is an exponent of 10 and refers to sophonts (intelligent beings; not necessarily human) on the world.

## LAW LEVEL

*Digit Description*

0 No prohibitions.

1 Body pistols undetectable by standard detectors, explosives (bombs, grenades), and poison gas prohibited.

2 Portable energy weapons (laser carbine, laser rifle) prohibited. Ship's gunnery not affected.

3 Weapons of a strict military nature (machine guns, automatic rifles) prohibited.

4 Light assault weapons (submachineguns) prohibited.

5 Personal concealable firearms (pistols, revolvers) prohibited.

6 Most firearms (all except shotguns) prohibited. The carrying of any type of weapon openly is discouraged.

7 Shotguns are prohibited.

8 Long bladed weapons (all but daggers) are controlled, and open possession is prohibited.

9 Possession of any weapon outside one's residence is prohibited.

A+ Weapon possession is prohibited.

**Note:** Law level is also the general throw to avoid harassment by police or other law enforcement agencies (usually throw once per day).

## GOVERNMENT

*Digit Description*

0 **No government structure.** In many cases, family bonds predominate.

1 **Company/Corporation.** Government by a company managerial elite; citizens are company employees.

2 **Participating Democracy.** Government by advice and consent of the citizen.

3 **Self-Perpetuating Oligarchy.** Rule by a restricted minority, with little or no input from the masses.

4 **Representative Democracy.** Rule by elected representatives.

5 **Feudal Technocracy.** Government by specific individuals for those who agree to be ruled. Relationships are based on the performance of technical activities which are mutually beneficial.

6 **Captive Government.** Government by a leadership answerable to an outside group; a colony or conquered area.

7 **Balkanization.** No central ruling authority exists; rival governments compete for control.

8 **Civil Service Bureaucracy.** Government by agencies employing individuals selected for their expertise.

9 **Impersonal Bureaucracy.** Government by agencies which are insulated from the governed.

A **Charismatic Dictator.** Government by a single leader enjoying the confidence of the citizens.

B **Non-Charismatic Leader.** A previous charismatic dictator has been replaced by a leader through normal channels.

C **Charismatic Oligarchy.** Government by a select group, organization, or class enjoying the overwhelming confidence of the citizenry.

D **Religious Dictatorship.** Government by a religious organization without regard to the needs of the citizenry.

**Note:** Additional subordinate types are in the subordinate government table.

## SYSTEM FEATURES

| Die | Basic | Primary | | — Companion — | | | Max | — Gas Giant— | | — Planetoid — | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Roll | Nature | Type | Size | Type | Size | Orbit | Orbits | Present | Qty | Present | Qty |
| 0 | Solo | B | Ia | — | Ia | Close | 0 | — | — | yes | 3 |
| 1 | Solo | B | Ib | B | Ib | Close | 1 | yes | 1 | yes | 2 |
| 2 | Solo | A | II | A | II | Close | 2 | yes | 1 | yes | 2 |
| 3 | Solo | M | III | F | III | Close | 3 | yes | 1 | yes | 2 |
| 4 | Solo | M | IV | F | IV | 1 | 4 | yes | 2 | yes | 2 |
| 5 | Solo | M | V | G | D | 2 | 5 | yes | 2 | yes | 2 |
| 6 | Solo | M | V | G | D | 3 | 6 | yes | 3 | yes | 2 |
| 7 | Solo | M | V | K | V | 4+ 1D | 7 | yes | 3 | no | 1 |
| 8 | Binary | K | V | K | V | 5+ 1D | 8 | yes | 4 | no | 1 |
| 9 | Binary | G | V | M | VI | 6+ 1D | 9 | yes | 4 | no | 1 |
| 10 | Binary | F | V | M | D | 7+ 1D | 10 | no | 4 | no | 1 |
| 11 | Binary | F | VI | M | D | 8+ 1D | 11 | no | 5 | no | 1 |
| 12 | Trinary | F | D | M | D | Far | 12 | no | 5 | no | 1 |

**Primary Star Type and Size:** If main world has already been generated, apply DM +4 if it has atmosphere 4 - 9 or population 8+.

**Companion Type and Size:** Apply the roll for primary star type as +DM on type, and the roll for primary star size as +DM on size.

**Companion Orbit:** A binary companion uses this column as shown; a trinary companion implements DM +4 on this column. If the orbit location given results in a position within the star, the orbit is close (just outside the primary).

**Maximum Orbits:** Apply DM +4 if star size III, DM +8 if star size is Ia, Ib, or II. DM -4 if star type M; DM -2 if star type K.

**Gas Giant:** The number present may not exceed the number of orbits in the system. For size, roll 1D: 3- is large gas giant; 4+ is small gas giant.

**Planetoid Belt Present and Quantity:** DM - number of gas giants in the system, but may not exceed the number of orbits remaining after gas giants are placed.

### PLANETARY ORBITS

| Orbit | Radius (000 km) | Radius (AU) |
|---|---|---|
| 0 | 29.9 | .2 |
| 1 | 59.8 | .4 |
| 2 | 104.7 | .7 |
| 3 | 149.6 | 1.0 |
| 4 | 239.3 | 1.6 |
| 5 | 418.9 | 2.8 |
| 6 | 777.9 | 5.2 |
| 7 | 1,495.9 | 10. |
| 8 | 2,932 | 19.6 |
| 9 | 5,804 | 38.8 |
| 10 | 11,548 | 77.2 |
| 11 | 23,038 | 154. |
| 12 | 46,016 | 307.4 |
| 13 | 91,972 | 614.8 |
| 14 | 183,885 | 1,229.2 |
| 15 | 367,711 | 2,458. |

### SATELLITE ORBITS

| Roll | Ring | Close | Far | Extreme |
|---|---|---|---|---|
| 1 | 1 | — | — | — |
| 2 | 1 | 3 | 15 | 75 |
| 3 | 1 | 4 | 20 | 100 |
| 4 | 2 | 5 | 25 | 125 |
| 5 | 2 | 6 | 30 | 150 |
| 6 | 3 | 7 | 35 | 175 |
| 7 | | 8 | 40 | 200 |
| 8 | | 9 | 45 | 225 |
| 9 | | 10 | 50 | 250 |
| 10 | | 11 | 55 | 275 |
| 11 | | 12 | 60 | 300 |
| 12 | | 13 | 65 | 325 |

Throw 2D for orbit type (7- is close, 8+ is far; if gas giant, 12+ is extreme). Then throw for orbit distance. Distance in central planet radii.

## TABLE OF ZONES

| *Orbit* | *Star Type (Sub Dwarf)* | | | | | | | | *Star Type (White Dwarf)* | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *No.* | F5 | G0 | G5 | K0 | K5 | M0 | M5 | M9 | DB | DA | DF | DG | DK | DM |
| 0 | I | I | I | I | O | O | O | O | H | O | O | O | O | O |
| 1 | I | I | H | H | O | O | O | O | O | O | O | O | O | O |
| 2 | I | H | O | O | O | O | O | O | O | O | O | O | O | O |
| 3 | H | O | O | O | O | O | O | O | O | O | O | O | O | O |
| 4 | O | O | O | O | O | O | O | O | O | O | O | O | O | O |

For all tables of zones, the following codes apply: O indicates outer zone. H indicates habitable zone. I indicates inner zone. – indicates unavailable orbit (due to heat from the star). - indicates an orbit within the sphere of the star.

## CAPTURED PLANETS AND EMPTY ORBITS

| | *Captured Planets* | | *Empty Orbits* | |
|---|---|---|---|---|
| *Die* | *Presence* | *Qty* | *Vacant* | *Qty* |
| 1 | no | 1 | no | 1 |
| 2 | no | 1 | no | 1 |
| 3 | no | 2 | no | 2 |
| 4 | no | 2 | no | 3 |
| 5 | yes | 3 | yes | 3 |
| 6 | yes | 3 | yes | 3 |

Apply DM +1 to all columns if the star is type B or A.

**Captured Planet Location:** Roll 2D for orbit number closest to its location. Roll 2D-7 and multiply by 10% for deviation from that orbit.

**Empty Orbit:** Roll 2D for the number of the empty orbit.

## SPACEPORT TABLE

| *Die* | *Spaceport Type* | |
|---|---|---|
| 1 | Y | No spaceport. |
| 2 | Y | No spaceport. |
| 3 | H | Primitive facilities. |
| 4 | G | Poor quality. |
| 5 | G | Poor quality. |
| 6 | F | Good quality. |

**Note:** If population 6+, DM +2. If population 1, DM -2. If population 0, DM -3.

## SUBORDINATE LAW LEVEL

Subordinate law level is based on main world law level. Throw 1D-3+ main world law level. Less than 0 is 0. If population 0, then 0.

## SUBORDINATE GOVERNMENT

| *Die* | *Code* | *Description* |
|---|---|---|
| 1 | 0 | No government |
| 2 | 1 | Company/Corporation |
| 3 | 2 | Participating Democracy |
| 4 | 3 | Self-Perpetuating Oligarchy |
| 5+ | 6 | Captive Government |

Roll 1D. If main world government 6, DM + population. If main world government 7+, DM +1. If population 0, then 0.

## SUBORDINATE TECH LEVEL

Subordinate tech level equals main world tech level minus 1. If research lab or military base present, subordinate tech level equals main world tech level. If subordinate tech level less than 7 and world atmosphere not 5, 6, or 8, then it make tech level 7.

## SUBORDINATE FACILITIES

Subordinate facilities furnish reasons for settlements on worlds other than the main world in the system.

**Farming:** In habitable zone, atmosphere 4 - 9, hydrographic 4 - 8, population 2+.

**Mining:** Main world classified industrial, local population 2+.

**Colony:** Government 6, population 5+.

**Research Laboratory:** Throw 11+. DM +2 if mainworld tech level 10+. If main world tech level 8- or no population, then no lab.

**Military Base:** Throw 12+. DM +1 if main world population 8+. DM +2 if atmosphere equals main world atmosphere. If scout or naval base in system, DM +1. If no population, or if main world is poor, then no base.

## TABLE OF ZONES

*Orbit* ———— *Star Type (Bright Supergiant)* ———— **Size Ia**

| *No.* | B0 | B5 | A0 | A5 | F0 | F5 | G0 | G5 | K0 | K5 | M0 | M5 | M9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | – | – | - | - | - | - | - | - | - | - | - | - | - |
| 2 | – | – | – | – | - | - | - | - | - | - | - | - | - |
| 3 | – | – | – | – | – | – | - | - | - | - | - | - | - |
| 4 | – | – | – | – | – | – | – | - | - | - | - | - | - |
| 5 | – | – | – | – | – | – | – | – | - | - | - | - | - |
| 6 | – | – | – | – | I | I | – | – | – | – | - | - | - |
| 7 | – | I | I | I | I | I | I | I | I | I | I | - | - |
| 8 | I | I | I | I | I | I | I | I | I | I | I | I | I |
| 9 | I | I | I | I | I | I | I | I | I | I | I | I | I |
| 10 | I | I | I | I | I | I | I | I | I | I | I | I | I |
| 11 | I | I | I | I | I | H | I | I | I | I | I | I | I |
| 12 | I | H | H | H | H | O | H | H | H | H | H | H | H |
| 13 | H | O | O | O | O | O | O | O | O | O | O | O | O |
| 14 | O | O | O | O | O | O | O | O | O | O | O | O | O |

*Orbit* ———— *Star Type (Weaker Supergiant)* ———— **Size Ib**

| *No.* | B0 | B5 | A0 | A5 | F0 | F5 | G0 | G5 | K0 | K5 | M0 | M5 | M9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | – | – | – | – | – | – | – | - | - | - | - | - | - |
| 2 | – | – | – | – | – | – | – | – | - | - | - | - | - |
| 3 | – | – | – | – | – | – | – | – | - | - | - | - | - |
| 4 | – | – | – | – | – | I | I | – | – | - | - | - | - |
| 5 | – | – | I | I | I | I | I | I | I | – | - | - | - |
| 6 | – | I | I | I | I | I | I | I | I | I | I | - | - |
| 7 | – | I | I | I | I | I | I | I | I | I | I | I | - |
| 8 | I | I | I | I | I | I | I | I | I | I | I | I | I |
| 9 | I | I | I | I | I | I | I | I | I | I | I | I | I |
| 10 | I | I | I | H | H | H | H | H | H | I | I | I | I |
| 11 | I | H | H | O | O | O | O | O | O | H | H | I | I |
| 12 | I | O | O | O | O | O | O | O | O | O | O | H | H |
| 13 | H | O | O | O | O | O | O | O | O | O | O | O | O |
| 14 | O | O | O | O | O | O | O | O | O | O | O | O | O |

*Orbit* ———— *Star Type (Bright Giant)* ———— **Size II**

| *No.* | B0 | B5 | A0 | A5 | F0 | F5 | G0 | G5 | K0 | K5 | M0 | M5 | M9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | – | – | – | – | – | – | – | – | – | - | - | - | - |
| 2 | – | – | – | I | I | I | I | I | I | – | - | - | - |
| 3 | – | – | I | I | I | I | I | I | I | I | - | - | - |
| 4 | – | – | I | I | I | I | I | I | I | I | I | - | - |
| 5 | – | I | I | I | I | I | I | I | I | I | I | - | - |
| 6 | – | I | I | I | I | I | I | I | I | I | I | I | I |
| 7 | I | I | I | I | I | I | I | I | I | I | I | I | I |
| 8 | I | I | I | H | H | H | H | H | I | I | I | I | I |
| 9 | I | I | H | O | O | O | O | O | H | H | I | I | I |
| 10 | I | I | O | O | O | O | O | O | O | O | H | I | I |
| 11 | I | H | O | O | O | O | O | O | O | O | O | H | H |
| 12 | H | O | O | O | O | O | O | O | O | O | O | O | O |
| 13 | O | O | O | O | O | O | O | O | O | O | O | O | O |

## TABLE OF ZONES

| Orbit No. | B0 | B5 | A0 | A5 | F0 | F5 | G0 | G5 | K0 | K5 | M0 | M5 | M9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Star Type (Giant)* — Size III | | | | | | | | | | | | | |
| 1 | – | – | I | I | I | I | I | I | I | I | – | - | - |
| 2 | – | – | I | I | I | I | I | I | I | I | I | - | - |
| 3 | – | – | I | I | I | I | I | I | I | I | I | - | - |
| 4 | – | – | I | I | I | I | I | I | I | I | I | I | - |
| 5 | – | I | I | I | I | I | I | I | I | I | I | I | I |
| 6 | – | I | I | I | H | H | H | I | I | I | I | I | I |
| 7 | I | I | I | H | O | O | O | H | H | I | I | I | I |
| 8 | I | I | H | O | O | O | O | O | O | H | H | I | I |
| 9 | I | I | O | O | O | O | O | O | O | O | O | H | H |
| 10 | I | H | O | O | O | O | O | O | O | O | O | O | O |
| 11 | I | O | O | O | O | O | O | O | O | O | O | O | O |
| 12 | H | O | O | O | O | O | O | O | O | O | O | O | O |
| 13 | O | O | O | O | O | O | O | O | O | O | O | O | O |

| Orbit No. | B0 | B5 | A0 | A5 | F0 | F5 | G0 | G5 | K0 |
|---|---|---|---|---|---|---|---|---|---|
| *Star Type (Subgiant)* — Size IV | | | | | | | | | |
| 0 | – | – | – | I | I | I | I | I | I |
| 1 | – | – | I | I | I | I | I | I | I |
| 2 | – | – | I | I | I | I | I | I | I |
| 3 | – | I | I | I | I | I | I | I | I |
| 4 | – | I | I | I | I | I | I | I | H |
| 5 | – | I | I | I | I | H | H | H | O |
| 6 | – | I | I | H | H | O | O | O | O |
| 7 | I | I | H | O | O | O | O | O | O |
| 8 | I | I | O | O | O | O | O | O | O |
| 9 | I | H | O | O | O | O | O | O | O |
| 10 | I | O | O | O | O | O | O | O | O |
| 11 | I | O | O | O | O | O | O | O | O |
| 12 | H | O | O | O | O | O | O | O | O |
| 13 | O | O | O | O | O | O | O | O | O |

| Orbit No. | B0 | B5 | A0 | A5 | F0 | F5 | G0 | G5 | K0 | K5 | M0 | M5 | M9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Star Type (Main Sequence)* — Size V | | | | | | | | | | | | | |
| 0 | – | – | I | I | I | I | I | I | I | H | H | O | O |
| 1 | – | – | I | I | I | I | I | I | I | O | O | O | O |
| 2 | – | – | I | I | I | I | I | H | H | O | O | O | O |
| 3 | – | I | I | I | I | I | H | O | O | O | O | O | O |
| 4 | – | I | I | I | I | H | O | O | O | O | O | O | O |
| 5 | – | I | I | I | H | O | O | O | O | O | O | O | O |
| 6 | I | I | I | H | O | O | O | O | O | O | O | O | O |
| 7 | I | I | H | O | O | O | O | O | O | O | O | O | O |
| 8 | I | I | O | O | O | O | O | O | O | O | O | O | O |
| 9 | I | H | O | O | O | O | O | O | O | O | O | O | O |
| 10 | I | O | O | O | O | O | O | O | O | O | O | O | O |
| 11 | I | O | O | O | O | O | O | O | O | O | O | O | O |
| 12 | H | O | O | O | O | O | O | O | O | O | O | O | O |
| 13 | O | O | O | O | O | O | O | O | O | O | O | O | O |

## TRAVEL ZONES

Individual systems are classified by their apparent danger to travellers.

**Green:** No particular danger or problem for travellers.

**Amber:** Caution advised for traveller; local conditions may pose some danger.

**Red:** Prohibited to travellers; local conditions can involve death or injury.

## COMMUNICATIONS ROUTES

Many areas are connected by a series of communications routes which provide channels for information and trade. While they do not necessarily connect every type A starport, they generally connect important political and commercial centers.

Communications routes must be determined by the referee; within the Imperium, they are approximately jump 2 or 3, and xboats which follow the routes are capable of jump-4.

## TRADE CLASSIFICATIONS

**Agricultural:** Atmosphere 4 - 9, hydrographic 4 - 8, population 5 - 7.

**Non-Agricultural:** Atmosphere 3-, hydrographic 3-, population 6+.

**Industrial:** Atmosphere 0, 1, 2, 4, 7, or 9 (vacuum, trace, or tainted), population 9+.

**Non-Industrial:** Population 6-.

**Rich:** Atmosphere 6 or 8, population 6 - 8, government 4 - 9.

**Poor:** Atmosphere 2 - 5, hydrographic 3-.

**Water World:** Hydrographic A.

**Desert World:** Hydrographic 0, atmosphere 2+.

**Vacuum World:** Atmosphere 0.

**Asteroid Belt:** Size 0 main world.

**Ice-capped:** Atmosphere 0 or 1, hydrographic 1+.

**Subsector Capital:** Single most important subsector world, especially if the entire subsector is under one interstellar government. Assigned by referee.

## BASES

Four elementary types of bases are common in most mapped areas: naval bases, scout bases, way stations, and naval depots.

**Naval Base:** Port facility for the support and maintenance of naval vessels. Includes administration sections, and some security personnel.

**Scout Base:** Port facility for support of scout vessels. Provides fuel and maintenance to detached duty scout ships.

**Naval Depot:** Major naval support and training facility. Generally occupies an entire star system, displacing other development of its worlds. No more than one depot per sector.

**Way Station:** Large scout base involved in repair and maintenance for ships in an xboat system. Must be situated on an expressboat route.

## FACILITIES

Several types of facility are possible. Facilities exist on worlds and satellites other than the main world, and are noted as remarks when recording system data. They are not mapped on the subsector grid.

**Farming:** Agriculture produces food or plant materials for the main world. This is similar to, but not identical to, the trade classification agricultural.

**Mining:** Mineral resource exploitation provides raw materials for the industry of the home world.

**Colony:** The world is a colony owned and governed by the system's main world.

**Research Laboratory:** Basic research, either into local phenomena, or into special interests of the main world, is carried on.

**Military Base:** Military forces (army and marine) are stationed at a base for training and maintenance. In addition, some naval operations may be supported from the base as well.

## EXPANDED STAR SYSTEM GENERATION CHECKLIST

This checklist governs the generation of star systems without first generating a main world.

1. Determine system presence.
2. Determine star system features.

A. System nature (solitary, binary, or trinary star system).

B. Primary star type and size.

C. Companion star type and size.

D. Companion orbit.

E. Number of orbits available.

F. Unavailable, inner, habitable, and outer zones within the system.

G. Captured planets and empty orbits.

H. Presence and quantity of gas giants.

I. Presence and quantity of planetoid belts.

3. Place known components.

A. Place gas giants.

B. Place planetoid belts.

4. Generate worlds within system.

A. Orbit Location.

B. Size: 2D-2. For orbit 0, DM-5; for orbit 1, DM-4; for orbit 2, DM-2. If type M star, DM-2 for all orbits. If size 0-, use S.

C. Atmosphere: 2D-7 + size. If inner zone, DM-2; if outer zone, DM-2. If size 0 or S, then atmosphere 0. If outer zone +2, throw 12 for A.

D. Hydrographics: 2D-7 + size. If inner zone, the 0; if outer zone, DM-4. If size 1- or S, then hydrographics 0. If atmosphere 1- or A+, DM-4.

E. Population: 2D-2. If inner zone, DM-5; if outer zone, DM-3. If not atmosphere 0, 5, 6, or 8, DM-2.

5. Determine number of satellites for each planet, or gas giant in the system. Disregard planetoid belts and size S worlds.

A. Planets: 1D-3.

B. Small gas giants: 2D-4.

C. Large gas giants: 2D.

6. Generate satellites within system.

A. Size: Planetary size -1D. For large gas giant, 2D-4. For small gas giant, 2D-6. If size 0, use R. If size less than 0, use S.

B. Orbit Location.

C. Atmosphere: 2D-7 + satellite size. If inner zone, then DM -4. If outer zone, DM -4. If size 1-, then 0. If outer zone +2, throw 12 for A.

D. Hydrographics: 2D-7 + satellite size. If inner zone, then 0; if outer zone, DM-4. If size 0-, then 0. If atmosphere 1- or A+, DM-4.

E. Population: 2D-2. If inner zone, DM-5; if outer zone, DM -4. If atmosphere not 5, 6, or 8, DM-2. If ring, then 0.

7. Designate main world and determine additional characteristics.

A. Government: 2D-7+population

B. Law Level: 2D-7+government.

C. Starport Type.

D. Tech Level: 1D + tech level table DMs.

E. Note trade classifications.

F. Note naval and scout bases.

G. Note communications routes connecting system to other worlds.

8. Determine additional planet and satellite characteristics.

A. Subordinate Government: 1D. DM +2 if main world government 7+. Equals 6 if main world government 6.

B. Subordinate Law Level: 1D-3 + main world law level.

C. Note subordinate facilities.

D. Subordinate Tech Level: Main world level -1. Equals main world level if research lab or military base present.

E. Spaceport Type.

9. Record statistics and data.

A. Map data on subsector grid.

B. Note main world data on subsector data form.

C. Note complete system data on system data form.

may not exceed one-half their own orbit number (round fractions down).

**Zones:** The orbits around a star are classified as inside star, unavailable, inner, habitable, and outer. The table of zones indicates (for each star type and size) the orbit number and its zone classification.

*Inside star* orbits are physically inside the sphere of the star. They cannot be occupied by planets.

*Unavailable* orbits are subject to intense heat from the star and have temperatures of greater than 2000 degrees. A planet in such an orbit would be converted to vapor and dissipated. Such orbits cannot be occupied by planets.

*Inner zone* orbits expose worlds to relatively large amounts of radiation, and such worlds are hot and inhospitable.

*Habitable zone* orbits are in a temperate region where stellar radiation is neither too much or too little. If other factors are right, life may exist on worlds in this region.

*Outer zone* orbits do not provide enough radiation for worlds, and they are cold and inhospitable.

**Empty Orbits:** Some orbits may be empty because of ancient collisions, or through other effects of worlds and stars. Roll on the empty column of the captured planets and empty orbits table. If the result is yes, then roll on the quantity column to determine the number of empty orbits. Determine the specific empty orbits by rolling 2D for the number of each empty orbit. If the roll exceeds the number available, or duplicates an empty orbit, roll again.

Empty orbits have no planets in them (although a companion star already placed in one remains there). Empty orbits are usually indicated as empty when describing a system, if only to show that no oversight was made in listing contents.

**Captured Planets:** It is also possible that some planets may be in non-standard orbits. Roll 1D on the captured planets column of the captured planets and empty orbits table. If yes, roll 2D for the orbit number to be used as a baseline. Then roll 2D – 7 and multiply by 10% for the deviation from that baseline. This percentage may be a positive number, which adds to the baseline, or a negative number which subtracts from the baseline.

Such orbits should be noted as decimal numbers. For example, a captured planet indicated by the table as 40% beyond orbit number 5 would be at orbit 5.4. A captured planet which is – 10% (minus 10%) of orbit 2 is 10% inward of orbit number 2, or at orbit 1.9.

**Gas Giants:** Gas giants are large planets composed primarily of gaseous hydrogen and hydrogen compounds.

Determine the presence of a gas giant by consulting the gas giant present column of the system features table. If yes, consult the quantity column for the number of gas giants present. The number present may not exceed the number of available and non-empty orbits in the habitable and outer zones in the system. However, if the table calls for a gas giant and there is no orbit available for it, create an orbit in the outer zone for it.

**Planetoids:** Planetoid belts (or asteroid belts) are accumulations of small chunks of rock or ice not large enough to be called planets. In the Basic **Traveller** world generation system, a world size 0 is used to designate an asteroid belt. For the purposes of distinction, an asteroid belt is used to describe a planetoid belt which is the main world in a system; a planetoid belt is any other group of planetoids in a system which otherwise has a main world.

Roll 2D on the planetoids present column of the system features table, DM minus the number of gas giants in the system. If the result is yes, roll on the quantity column for the number of planetoid belts present; DM minus the number of gas giants in the system. The number of planetoid belts in a system may not exceed the number of orbits remaining after gas giants are placed.

## PLACE KNOWN COMPONENTS

Known components of the system (gas giants and planetoid belts previously called for by the tables) must be placed within the system. If using the continuation system, the main world must also be placed in the system.

**Placement Procedure:** Gas giants are placed first; planetoid belts are placed after gas giants. An existing main world is placed last.

Orbits for placement are selected randomly within certain limits. For the random selection of an orbit, equal probability should be assigned to each available orbit, and a die rolled (several rolls may be necessary). If there are six or fewer candidate orbits, one number is assigned to each orbit; extra or unused numbers indicate a re-roll is required. If there are more than six candidate orbits, they should be divided evenly into two, three, or more groups (each of six or fewer candidate orbits), and a die roll used to determine which group the known component should be placed in. Then, the actual choice may be randomly made.

**Gas Giants:** Gas giants must be placed in available orbits in the habitable zone and in the outer system. While gas giants can be in inner orbits, they should not be placed starward of the habitable zone unless there are no other orbits available.

**Planetoid Belts:** Place planetoid belts in available orbits. If possible, planetoid belts should be placed in the next orbit inward from gas giants. For example, if a gas giant is in orbit number 8, then a preference should be made for placement of an asteroid belt in orbit 7.

**Main World:** If a main world already exists, then it should be placed in the habitable zone. If a gas giant is in that orbit, the main world will be a satellite of the gas giant. If the main world is an asteroid belt, then the belt may occupy any available orbit. If the main world has atmosphere 1−, or A+, then it is not required to be in the habitable zone.

Finally, if calculations based on greenhouse effect, albedo, and other factors discussed in later chapters indicate a placement in an orbit outside the stated habitable zone, then the world should be placed (at the referee's discretion) in some other orbit position.

## WORLD GENERATION

Worlds are produced in a fashion very similar to those produced in Basic **Traveller**, but various modifications are included for orbital position and other details. For each occupied orbit, world size, atmosphere, hydrographics, and population are determined. Starports, spaceports, government, law level and tech level are added later.

**Orbit Location:** Worlds should be generated beginning with the lowest numbered orbit in the star system. All available orbits around a specific star should be provided worlds before advancing to the next star.

**World Size:** For worlds (not gas giants or planetoids), roll 2D − 2 for size. If orbit 0, DM −5; if orbit 1, DM −4; if orbit 2, DM −3. Orbiting a type M star, DM −2.

The special size designator S is used for size 0 or less; 0 is reserved for main

worlds which are generated in basic **Traveller** and are asteroid belts, and for planetoid belts called for by these rules.

If the world is a gas giant, determine its size. Roll 1D; if 4+, the gas giant is small; if 3−, the gas giant is large. Gas giants have no further characteristics generated for them. Abbreviations for gas giants reflect their size: small GG or SGG for small gas giant; large GG or LGG for large gas giant.

**Atmosphere:** Determine world atmosphere with 2D−7+ size. If the world is in the inner zone, DM −2. If the world is in the outer zone, DM −4. If world size is 0 or S, then atmosphere is automatically 0. If the world is at least two orbits beyond the habitable zone, throw 2D for 12 exactly: if successful, use atmosphere type A instead.

Atmosphere codes D, E, and F (not covered in Basic **Traveller**) have been added to the tables and apply to the appropriate situations.

**Hydrographics:** Determine hydrographics with 2D−7+ size. If inner zone, then 0. If outer zone, DM −2. If size 1− (including S), then hydrographics 0. If atmosphere 1− or A+, then DM −4.

Hydrographics less than 0 is 0; hydrographics greater than A is A.

**Population:** Determine population by 2D−2. If inner zone, DM −5. If outer zone, DM −3. If not atmosphere 0, 5, 6, or 8, then DM −2. Population less than 0 is 0. If using the continuation system, then population which exceeds that of the main world must be reduced to one less than that of the main world.

## SATELLITES

Using the presently known characteristics of worlds, determine the presence and quantity of satellites for worlds in the system.

For each planet (size 1 or greater), the number of satellites is 1D−3.

For small gas giants, the number of satellites is 2D−4.

For large gas giants, the number of satellites is 2D.

In all cases, a result of 0 or less indicates no satellites.

Do not create satellites for type S planets or for planetoid or asteroid belts.

For the purposes of this system, satellites produced are at least 200 km in diameter; potentially any world may have one or more satellites (captured planetoids) less than 200 km in diameter.

## SATELLITE GENERATION

Satellites are generated in much the same manner as worlds. Size is determined, and following that, orbital location. Then atmosphere, hydrographics, and population are generated. Additional characteristics are generated later.

**Satellite Size:** Determine satellite size by subtracting 1D from planetary size. If the planet is a large gas giant, use 2D−4; if a small gas giant, use 2D−6. If the result is size 0, use R (for ring) instead. If the result is size less than 0, use S (for small world).

**Satellite Orbits:** Satellites orbit their planets at various radii. Place individual satellites into orbits using the satellite orbits table. Throw 2D for orbit type (7− is close, 8+ is far); apply a DM to each throw after the first equal to the throw number minus 1. Thus, the first throw is without a DM, the second has a DM −1, the third has a DM −2, etc. If the planet is a gas giant, then 12+ calls for use of the extreme column of the table.

If the satellite is type R, roll 1D instead on the ring column for orbital distance.

If a satellite is indicated to occupy the same orbit as another satellite, throw again.

**Atmosphere:** Determine atmosphere with 2D – 7 + satellite size. If inner zone, DM – 4; if outer zone, DM – 4. If size 1 –, (including S or R), then 0.

**Hydrographics:** Determine the percentage of water on the surface of the satellite with 2D – 7 + satellite size. If inner zone, DM – 4; if outer zone, DM – 2. If size 1 –, then 0. If atmosphere 1 – or A +, then DM – 4.

**Population:** Determine population with 2D – 2. If inner zone, DM – 6. If outer zone, DM – 5. If size 4 –, then DM – 2. If atmosphere not 5, 6, or 8, DM – 2. If size R, then 0.

## MAIN WORLD DETERMINATION

If the expanded system is being used, the main world in the star system must now be determined. If the continuation system is being used, the previously determined main world was placed in the known component placement step earlier.

The main world is the world in the system which has the greatest population. If more than one world has the same population, then select the world which is in the habitable zone, or failing that, which is the closest to the central star.

The main world need not be a planet; it can be a satellite or an asteroid belt, or a small world. It may not be a ring.

The main world need not orbit the central star in the system; it may be in orbit around the binary companion, or it may orbit a gas giant or other world.

Once the main world has been determined, its additional characteristics should be generated.

**Government:** Determine main world government by 2D – 7 + population.

**Law Level:** Determine main world law level by 2D – 7 + government.

**Starport Type:** The main world has the system's starport. Determine starport type using the starport column of the systems contents table.

**Tech Level:** Using the tech level table, determine all possible modifications based on main world characteristics and apply them to 1D to determine the world's tech level.

**Trade Classifications:** Note the applicability of any specific trade classification to this world.

**Bases:** Note scout and naval bases using the system contents table.

For scout base, DM – 1 if starport type C; DM – 2 if starport type B, and DM – 3 if starport type A. Do not roll if starport type E or X.

For naval base, no DMs apply, and do not roll if starport type C, D, E, or X.

The referee may decide to make the base a naval depot to support large-scale naval activities, but there should be no more than one naval depot per sector.

Both scout bases and naval bases are always assumed to have components at the major starport (the starport on the main world) in the system. However, when the entire star system is generated, the referee may elect to establish components of scout or naval bases throughout the system. Generally, the Navy will establish 1D – 3 additional naval establishments, scattered randomly among worlds and satellites having population of at least 3. The Scouts will establish 1D – 4 scout bases, scattered one per world or satellite with a population of at least 2.

Bases are noted in the base column of the system data listing, and generally use symbols to note their type. A naval base is N; a scout base is S. A naval depot

is D; a scout way station is W. A naval base and a scout base located on the same world calls for the symbol A; a naval base and a scout way station located on the same world calls for the symbol B. Scout bases or way stations are never co-located with naval depots. Military bases may be noted with the symbol M. If, however, naval or scout bases are already present on the world, then no symbol for the military base should be used, and it should be noted in the remarks instead.

**Communications Routes:** The referee should plot (on the subsector map) appropriate communications routes between systems. Typically, express boat communications routes connect, or pass within three hexes, worlds with type A or B starports.

The referee may also impose a scout way station at selected worlds along such routes.

## ADDITIONAL PLANET AND SATELLITE CHARACTERISTICS

For each planet, and for each satellite which is not type R, determine its local government, law level, and tech level and determine spaceport type.

**Subordinate Government:** Determine subordinate government by 1D. If main world government 6, then 6. If main world government 7+, then DM+2. If there is no population, then government is 0. Subordinate governments reflect the small, relatively powerless governments which can exist off the main world. Nevertheless, such subordinate governments may wield great power on their own territory.

**Subordinate Law Level:** Determine subordinate law level by 1D – 3 plus main world law level. If the world has no government, then law level 0.

**Subordinate Facility:** Determine what facilities are present on the world using the subordinate facilities classifications. Available facilities include farming, mining, colony, research laboratory, and military base.

*Farming* indicates that the world supports agriculture and is exploited to produce farm products. It requires that the world or satellite is in the habitable zone, has atmosphere 4 to 9, hydrographics 4 to 8, and population 2+.

*Mining* indicates the world or satellite has recoverable ores and is being exploited for industrial reasons. The main world in the system must be industrial, and local population must be 2+.

*Colony* indicates that a settlement has been established on the world or satellite. It requires a government 6 and population 5+. A colony may represent any of several types of establishment, including a model or demonstration settlement, a penal or deportation colony, or simply a group intent on settling and exploiting new territory.

*Research Laboratory* indicates that a scientific establishment has been located on the world or satellite. For a research laboratory to be present, throw 11+; DM +2 if main world tech level is 10+. If the main world has tech level 8–, or has no population, then there is no laboratory. A research lab may be operated under the control of the government, or it may be privately operated.

*Military Base* indicates that the world or satellite has a military force stationed on it. The military force is generally non-naval: it is an army or marine troop establishment. For a military base to be present, throw 12+; DM +1 if main world population 8+; DM +2 if atmosphere equals main world atmosphere. If no population, or if main world is poor, then no base is present. Often, a military base can be noted with the symbol M in the base column of the statistics for the system, as well as with a comment in the remarks area.

**Subordinate Tech Level:** Subordinate tech level is main world tech level minus

1. However, it is equal to main world tech level if the subordinate facility for the world is military base or research laboratory.

**Spaceport:** The major traffic center in the system is the *star*port; all others are called *space*ports. While it is possible for spaceports to accept starships, they are called (if only for convenience, and for terminology) spaceports. Determine spaceport type with 1D, and consult the spaceport table. If population for the world is 6+, DM +2. If population 1−, DM −2.

## STATISTICS RECORDING

The information generated in the course of system generation must be recorded for use by the players and referees. For this purpose, and in order to assist in consistent record-keeping, IS Form 11, *Star System Data* (a two-sided form), is provided. The form is photocopyable and can be used to note the details of star systems and of the worlds within the system. Its use is further explained later in this booklet.

## BACKGROUND MATERIAL

The following information is intended to explain or elaborate on various data presented in the generation system.

**Gas Giants:** A gas giant is a large planet composed primarily of gaseous hydrogen and hydrogen compounds. Such planets may or may not have a solid matter core. The most notable use for gas giants is in refuelling of spacecraft. The hydrogen atmosphere of gas giants may be skimmed by ships in order to fill their tanks and later use the material as fuel for their jump drives and powerplants.

Gas giants are generally divided into two sizes: large and small.

Large gas giants range in size from 60,000 kilometers in radius to perhaps 120,000 kilometers in radius. Small gas giants range from about 20,000 kilometers in radius to just under 60,000 kilometers in radius.

**Asteroid and Planetoid Belts:** The terms *asteroid* and *planetoid* are effectively synonymous; they mean small or minor planets. Each term refers to a belt of many similar small planets in orbit around the central star.

For the purposes of differentiation, the term asteroid refers to such a belt when it is the main world of a system. The term planetoid belt refers to such a group of minor planets when another belt or world is the main world in a system.

Asteroid and planetoid belts hold between 1,000 and 10,000 asteroids or planetoids each.

**Small Worlds:** Basic **Traveller** rules assume that any world with size 0 is an asteroid belt. The addition of the code S to refer to small worlds allows the existence of a world (planet or satellite) with a diameter less than 1600 kilometers, but as a single world occupying an orbit around a star or planet.

Small worlds are treated as size 0. They range in size from 500 to 1500 kilometers in diameter (2D + 3 times 100 kilometers) if investigating adventurers journey to one.

**Rings:** Planets may have rings occupying orbits around them. The size code R is used to specify a ring around a world. The individual components of the ring are small particles, averaging less than 500mm in diameter.

Rings have little practical use, and rarely have bases or settlements. In most cases, the UPP for a ring will be a series of zeroes following the R code. However, in exceptional circumstances, the referee may choose to establish a small population (probably miners, prospectors, or scientific researchers) on the ring.

**Atmospheres:** Three additional atmosphere types have been added to the atmosphere chart to cover possible results on the creation system not defined in Basic **Traveller**. These are:

*Dense, High Atmosphere (code D):* The air pressure at sea (or lower) levels is too great to support life, but at higher altitudes, the atmosphere is breathable.

*Ellipsoid (code E):* The world's surface is ellipsoidal, not spherical in shape. Because the atmosphere remains spherical, surface atmospheric pressure ranges from very high at the middle to very low at the ends. Breathable bands may exist at some point within the range of pressure.

*Thin, Low Atmosphere (code F):* The world is a large, masssive one with a thin atmosphere which settles to the lowest levels of the terrain. As a result, the atmosphere is unbreathable at most altitudes, but is breathable at very low altitudes (as in depressions or deep valleys).

**Naming Worlds:** In any system, the name used for identification is the name of the main world. Names for additional worlds, satellites, and planetoid belts can, and should, be produced for identification purposes.

If the name of the main world can serve as a boost to the imagination, then additional names may be derived from the main world name. For example, if the main world name deals with an important individual in history, the other worlds in the system might deal with that person's contemporaries. The Terra system has named planetary bodies for the Greek pantheon. Other contexts could be animals, plants, gems, nuclear particles, or elements.

It is also possible to name the system's star, and then to label all unimportant worlds with numbers or numerals. Thus, the second world out from Sol could be labelled Sol 2 or Sol II. Similarly, satellites of a planet could be numbered using the parent's name: for example, Jupiter V, or Jupiter 5.

# Astronomical Data

With only a small amount of data, it is possible to compute a great amount of additional data, if the proper formulae and relationships are known. It is on this foundation that modern science is built. Once the basic details of a star system have been generated, it is possible to then compute additional details about the system upon which adventures and situations can be constructed.

The material in this chapter is not die roll based as is previous material. Instead, this chapter presents basic information on the computation of such details as temperature, year length, orbital distance, and other items that may be of interest to both players and referees.

The facts and formulae in this chapter are not intended to be implemented in every **Traveller** situation. For many scenarios, local year length, average temperature, and stellar luminosity are of little importance, and can be ignored. Occasionally, however, the referee may find that a situation can be constructed based on local climate or orbit. In addition, the material in this chapter can provide rationales for such conditions as extremely cold climates, local temperature variations, and other events.

## DATA COVERAGE

The information and formulae presented cover three basic topics: stellar data, orbital data, and planetary data.

**Stellar data** include magnitude, luminosity, effective temperature, stellar radius, and stellar mass.

**Orbital data** include habitable zone distances, typical orbit distances, formulae for computing local year length and distance from the primary, and criteria for orbital zones.

**Planetary data** (which deals with gas giants and satellites as well) deal with albedo, cloudiness, greenhouse effects, orbital eccentricity effects, axial tilt effects, and computation of local temperature and distance from the star. In addition, basic data about world size, surface area, mass, gravity, and escape velocity is presented.

**Interpolation:** The data for stars has been presented to cover the spectral types with decimal classifications 0 and 5. The various decimal classifications between these points can be determined using interpolation.

Interpolation calls for determining the distance of the desired point from one of the points, determining a percentage, and applying that to the difference between the two known points.

For example, the radius of a B3 Ia star can be interpolated from the table. The radius of a B0 Ia star is 52, while the radius of a B5 Ia star is 75. A B3 star is 3/5 of the distance between B0 and B5. Its radius is equal to 52 minus 3/5 of the difference between 52 and 75. This calculates out to 52 minus -13.8, or 65.8 solar radii.

## STELLAR DATA

The tables with stellar data provide basic information about the size, mass, and

energy output of stars.

**Spectral Types:** Stars are classified by their spectral type, which gives clues as to temperature of the star, and to its internal processes. The most striking aspect of spectral type is its color. A star has a color which is determined by spectral type; this color is a tinge to the basic brightness of the star, and ranges from light blue (for type O, B, and A stars), through white (for type F stars), yellow (for type G stars), orange (for type K stars), to deep red (for type M stars).

The spectral types dealt with here cover the range O B A F G K M. Other spectral types also exist (for example, W, R, and S), but they are too rare to be dealt with in this system. Spectral type has been shown to have relationships with stellar mass and temperature.

**Stellar Sizes:** Stars are classified by their size as well as by their spectral class. For two stars of different brightnesses which appear to be at the same distance, and which have the same spectral type, the obvious explanation is that they differ in size. Eight size classifications have been established using roman numerals I (for the largest) through VII (for the smallest). The I size class has been divided into two classes: Ia and Ib to better cover the range of large sizes available. The VII size class is more commonly known as the white dwarf size.

**Stellar Bolometric Magnitude:** Magnitude is brightness; bolometric magnitude measures brightness at all wavelengths, and indicates total stellar energy output. It is used to compute luminosity, and is presented here to provide background data.

**Stellar Luminosity:** Luminosity is derived from magnitude, but expresses it in terms of Sol. Thus, a star which has luminosity 2 is twice as bright as the sun. Luminosity is used in later calculations concerning temperature for planets.

**Stellar Effective Temperature:** Effective temperature indicates the temperature (in degrees Kelvin) of the surface of a star. The interior of the star may have temperatures in the millions of degrees, but its surface temperature determines the rate at which it radiates its energy. Effective temperature is used in later calculations concerning temperature for worlds.

**Stellar Radii:** The size of a star can be measured, and is expressed in solar radii. A star with radius 1 is the same size as the sun.

Radius is used to determine if orbits are possible, or if they would be inside a specific star. Radius can also be used to determine minimum jump distance from a star (misjumps are more probable inside 20 radii and 200 radii from the star).

**Stellar Mass:** The mass of a star is expressed in solar masses. A star with a mass of 1 has the same mass as the sun. Mass is used in calculations which determine orbital period and year length.

**White Dwarf Stars:** Dwarf stars are extremely bright, and do not fit into the normal classification scheme for stellar size and spectral type. They are instead treated as exceptions. In actuality, they show little difference between spectral types, but have been classifed using spectra for consistency in this system.

**Binary Stars:** When more than one star serves as the source of energy for a world, then more complex calculations are called for. Using the data given for stars, it is possible to calculate much of the information required.

Assuming the two companion stars are close, and can be considered a single source of energy, then the following rules apply.Add the two luminosities together. Select the effective temperature of the more luminous of the stars. In many cases, it can be seen that there is no appreciable change in effects. For example, an A0

V star with a DA companion has luminosity increased by less than half of one percent.

When two or more widely separated stars affect a world, the temperature effects for each star must be calculated, and the greater temperature effects used.

## ORBITAL DATA

The tables for orbital data provide information for the calculation of zones, distances, and year lengths.

**Habitable Zone Distances:** Habitable zones in the table of zones were calculated for the various star types and expressed in terms of the standard orbits. Because of the great distances between orbits, however, the orbital statements in the table of zones cannot be exact. A specific calculation has been made for each spectral type and size to determine the distance of the habitable zone orbit from the star, and it is shown in the table (distance in AU). The calculations are based on a world albedo of .3 and a greenhouse effect of 10% (which corresponds to Terra). Differing albedo and greenhouse effect values will change the optimum distance for the habitable zones, but this table is a guide.

**Standard Orbital Distances:** The standard orbital radii used in star system generation are repeated in the table and have been calculated out to orbit 19. Values are shown in AUs, millions of kilometers, and in solar radii.

**Orbital Period:** It is possible, using the formula provided in the chart, to calculate the orbital period of a world if the mass of the star (in solar masses) is known and the distance of the world from the star (in AU) is known. The result is in Terran years. Multiply by 365.25 for the year length in days.

This formula also works for computation of satellite periods. Mass of the planet must be expressed in combined Terra-Luna masses (divide Earth masses by 1.0123 to find this value), and distance must be in Terra-Luna distances (units of 400,000 kilometers). The result is the period in Lunar months; convert it to standard days by multiplying by 28.

**Orbital Distance:** It is possible, using the formula provided in the chart, to compute the distance between a world and its star if the mass of the star (in solar masses), and the length of the local year (in Terran years) is known. The result is in astronomical units (multiply by 150 million for distance in kilometers).

The formula can be used to determine the distance of satellites from their worlds as well. Masses are in combined Terra-Luna masses (divide Earth masses by 1.0123 to find this value). Period must be in Lunar months (units of 28 days).

## PLANETARY DATA

Information about worlds makes defining them easier for the referee.

**World Size:** World size is based on the UPP characteristic as used in **Traveller**, and dealt with in the chart on page 26.

**World Volume:** World volume is computed from the formula for the volume of a sphere, and is expressed in terms of Earth volumes.

$V = 4.188(R/8)^3$. R is the UPP characteristic for world size.

**World Mass:** Mass is calculated using the formula for the volume of a sphere with a constant for density to express the result in Earth masses.

$M = 4.188K(R/8)^3$. K is a constant for density, and is assumed to be 1 for Terra. For gas giants, this constant is about .2. R is the UPP characteristic for world

## STELLAR MAGNITUDE (BOLOMETRIC)

| *Spectral* | *Size* | | | | | | |
|---|---|---|---|---|---|---|---|
| *Class* | Ia | Ib | II | III | IV | V | VI |
| B0 | -9.60 | -8.80 | -8.30 | -7.80 | -7.50 | -7.10 | — |
| B5 | -8.50 | -6.90 | -5.90 | -3.50 | -3.10 | -2.71 | — |
| A0 | -7.80 | -5.70 | -3.60 | -1.36 | - .70 | - .10 | — |
| A5 | -7.50 | -5.40 | -2.55 | - .10 | .85 | 1.80 | — |
| F0 | -7.20 | -4.90 | -2.18 | .45 | 1.58 | 2.50 | — |
| F5 | -7.00 | -4.50 | -2.00 | .70 | 2.10 | 3.40 | 4.80 |
| G0 | -7.30 | -4.70 | -2.10 | .52 | 2.74 | 4.57 | 5.97 |
| G5 | -7.60 | -5.00 | -2.40 | .08 | 3.04 | 5.20 | 6.60 |
| K0 | -7.70 | -5.40 | -2.60 | - .17 | 3.10 | 5.70 | 7.10 |
| K5 | -7.80 | -6.00 | -3.70 | -1.50 | — | 7.40 | 8.80 |
| M0 | -7.90 | -6.90 | -4.40 | -1.90 | — | 8.25 | 9.65 |
| M5 | -8.00 | -7.60 | -5.65 | -3.60 | — | 10.20 | 11.60 |
| M9 | -8.10 | -7.90 | -5.75 | -3.80 | — | 13.90 | 15.30 |

## STELLAR LUMINOSITY

| *Spectral* | *Size* | | | | | | |
|---|---|---|---|---|---|---|---|
| *Class* | Ia | Ib | II | III | IV | V | VI |
| B0 | 560,000 | 270,000 | 170,000 | 107,000 | 81,000 | 56,000 | — |
| B5 | 204,000 | 46,700 | 18,600 | 6,700 | 2,000 | 1,400 | — |
| A0 | 107,000 | 15,000 | 2,200 | 280 | 156 | 90 | — |
| A5 | 81,000 | 11,700 | 850 | 90 | 37 | 16 | — |
| F0 | 61,000 | 7,400 | 600 | 53 | 19 | 8.1 | — |
| F5 | 51,000 | 5,100 | 510 | 43 | 12 | 3.5 | .977 |
| G0 | 67,000 | 6,100 | 560 | 50 | 6.5 | 1.21 | .322 |
| G5 | 89,000 | 8,100 | 740 | 75 | 4.9 | .67 | .186 |
| K0 | 97,000 | 11,700 | 890 | 95 | 4.67 | .42 | .117 |
| K5 | 107,000 | 20,400 | 2,450 | 320 | — | .08 | .025 |
| M0 | 117,000 | 46,000 | 4,600 | 470 | — | .04 | .011 |
| M5 | 129,000 | 89,000 | 14,900 | 2,280 | — | .007 | .002 |
| M9 | 141,000 | 117,000 | 16,200 | 2,690 | — | .001 | .00006 |

## STELLAR EFFECTIVE TEMPERATURES

| *Spectral* | *Size* | | | | | | |
|---|---|---|---|---|---|---|---|
| *Class* | Ia | Ib | II | III | IV | V | VI |
| B0 | 22,000 | 24,000 | 25,000 | 26,000 | 27,000 | 28,000 | — |
| B5 | 14,200 | 14,500 | 15,100 | 15,200 | 15,400 | 15,500 | — |
| A0 | 9,000 | 9,100 | 9,300 | 9,500 | 9,700 | 9,900 | — |
| A5 | 8,000 | 8,100 | 8,200 | 8,300 | 8,400 | 8,500 | — |
| F0 | 6,900 | 7,000 | 7,100 | 7,200 | 7,300 | 7,400 | — |
| F5 | 6,100 | 6,300 | 6,400 | 6,500 | 6,600 | 6,700 | 6,800 |
| G0 | 5,400 | 5,600 | 5,700 | 5,800 | 5,900 | 6,000 | 6,100 |
| G5 | 4,700 | 4,850 | 5,000 | 5,100 | 5,200 | 5,500 | 5,600 |
| K0 | 4,000 | 4,100 | 4,300 | 4,500 | 4,700 | 4,900 | 5,000 |
| K5 | 3,300 | 3,500 | 3,650 | 3,800 | — | 4,100 | 4,200 |
| M0 | 2,800 | 2,900 | 3,100 | 3,400 | — | 3,500 | 3,600 |
| M5 | 2,000 | 2,200 | 2,400 | 2,650 | — | 2,800 | 2,900 |
| M9 | 1,900 | 2,000 | 2,100 | 2,200 | — | 2,300 | 2,400 |

## STELLAR RADII

| *Spectral* | *Size* | | | | | | |
|---|---|---|---|---|---|---|---|
| *Class* | Ia | Ib | II | III | IV | V | VI |
| B0 | 52 | 30 | 22 | 16 | 13 | 10 | – |
| B5 | 75 | 35 | 20 | 10 | 5.3 | 4.4 | – |
| A0 | 135 | 50 | 18 | 6.2 | 4.5 | 3.2 | – |
| A5 | 149 | 55 | 14 | 4.6 | 2.7 | 1.8 | – |
| F0 | 174 | 59 | 16 | 4.7 | 2.7 | 1.7 | – |
| F5 | 204 | 60 | 18 | 5.2 | 2.6 | 1.4 | 1.14 |
| G0 | 298 | 84 | 25 | 7.1 | 2.5 | 1.03 | 1.02 |
| G5 | 454 | 128 | 37 | 11 | 2.8 | .91 | .55 |
| K0 | 654 | 216 | 54 | 16 | 3.3 | .908 | .40 |
| K5 | 1010 | 392 | 124 | 42 | – | .566 | .308 |
| M0 | 1467 | 857 | 237 | 63 | – | .549 | .256 |
| M5 | 3020 | 2073 | 712 | 228 | – | .358 | .104 |
| M9 | 3499 | 2876 | 931 | 360 | – | .201 | .053 |

## STELLAR MASSES

| *Spectral* | *Size* | | | | | | |
|---|---|---|---|---|---|---|---|
| *Class* | Ia | Ib | II | III | IV | V | VI |
| B0 | 60 | 50 | 30 | 25 | 20 | 18 | – |
| B5 | 30 | 25 | 20 | 15 | 10 | 6.5 | – |
| A0 | 18 | 16 | 14 | 12 | 6 | 3.2 | – |
| A5 | 15 | 13 | 11 | 9 | 4 | 2.1 | – |
| F0 | 13 | 12 | 10 | 8 | 2.5 | 1.7 | – |
| F5 | 12 | 10 | 8.1 | 5 | 2 | 1.3 | .8 |
| G0 | 12 | 10 | 8.1 | 2.5 | 1.75 | 1.04 | .6 |
| G5 | 13 | 12 | 10 | 3.2 | 2 | .94 | .528 |
| K0 | 14 | 13 | 11 | 4 | 2.3 | .825 | .430 |
| K5 | 18 | 16 | 14 | 5 | – | .570 | .330 |
| M0 | 20 | 16 | 14 | 6.3 | – | .489 | .154 |
| M5 | 25 | 20 | 16 | 7.4 | – | .331 | .104 |
| M9 | 30 | 25 | 18 | 9.2 | – | .215 | .058 |

## SPECTRAL TYPES

Stars are classified by the spectral lines of their radiation in the sequence:

O B A F G K M

## STELLAR SIZES

| *Type* | *Description* |
|---|---|
| Ia | Brightest Supergiants |
| Ib | Weaker Supergiants |
| II | Bright Giants |
| III | Normal Giants |
| IV | Subgiants |
| V | Main Sequence Stars |
| VI | Subdwarfs |
| VII | White Dwarfs |

## WHITE DWARFS

| *Spec* | *Magn* | *Lum* | *Temp* | *Rad* | *Mass* |
|---|---|---|---|---|---|
| DB | 8.1 | .046 | 25,000 | .018 | .26 |
| DA | 10.5 | .005 | 14,000 | .017 | .36 |
| DF | 13.6 | .0003 | 6,600 | .013 | .42 |
| DG | 15.3 | .00006 | 4,500 | .012 | .63 |
| DK | 15.6 | .00004 | 3,500 | .009 | .83 |
| DM | 15.9 | .00003 | 2,700 | .006 | 1.11 |

White dwarf stars are not precisely definable by their spectra. This table shows the general types possible. Although small in radius and mass, they maintain a relatively high luminosity due to their high density.

White dwarfs have a maximum mass of 1.44 (solar masses); above this limit, the star becomes unstable.

## HABITABLE ZONE DISTANCE

| *Star* | *Spectral Type* | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Size* | **B0** | **B5** | **A0** | **A5** | **F0** | **F5** | **G0** | **G5** | **K0** | **K5** | **M0** | **M5** | **M9** |
| Ia | 748 | 451 | 327 | 284 | 246 | 225 | 258 | 298 | 311 | 327 | 342 | 359 | 375 |
| Ib | 519 | 216 | 122 | 108 | 86 | 71 | 78 | 90 | 108 | 142 | 214 | 298 | 342 |
| II | 412 | 136 | 47 | 29 | 24 | 22 | 23 | 27 | 30 | 49 | 67 | 122 | 127 |
| III | 327 | 81 | 16 | 9.4 | 7.3 | 6.6 | 7.1 | 8.7 | 9.7 | 17 | 21 | 48 | 52 |
| IV | 284 | 44 | 12 | 6.1 | 4.4 | 3.5 | 2.5 | 2.2 | 2.1 | | | | |
| V | 236 | 37 | 9.5 | 4.0 | 2.8 | 1.9 | 1.1 | .8 | .6 | .3 | .2 | .1 | .03 |
| VI | | | | | | 1.0 | .6 | .4 | .3 | .14 | .09 | .04 | – |
| VII | – .1 | – | – | – | – | – | – | – | – | – | – | – | – |

Table shows distance (in AU) for a world to have an average temperature of 15 degrees C, assuming albedo of .3 and greenhouse increase of 10% (as on Terra).

Blanks show size/spectral type combinations which do not occur. Dashes show star types which have no habitable zone.

The DB white dwarf conceivably has a habitable zone at .1 AU. Other white dwarf stars are too feeble to have a habitable zone.

## ORBITAL DISTANCES

| *Orbit No.* | *AU* | *Million Kilometers* | *Solar Radii* |
|---|---|---|---|
| 0 | .2 | 29.9 | 40 |
| 1 | .4 | 59.8 | 80 |
| 2 | .7 | 104.7 | 140 |
| 3 | 1 | 149.6 | 200 |
| 4 | 1.6 | 239.3 | 320 |
| 5 | 2.8 | 418.9 | 560 |
| 6 | 5.2 | 777.9 | 1040 |
| 7 | 10 | 1495.9 | 2000 |
| 8 | 19.6 | 2932 | 3920 |
| 9 | 38.8 | 5804 | 7760 |
| 10 | 77.2 | 11548 | 15440 |
| 11 | 154 | 23038 | 30800 |
| 12 | 307.6 | 46016 | 61520 |
| 13 | 614.8 | 91972 | 123498 |
| 14 | 1229.2 | 183885 | 245836 |
| 15 | 2458 | 367711 | 491594 |
| 16 | 4915.6 | 735363 | 983106 |
| 17 | 9830.8 | 1470666 | 1966132 |
| 18 | 19661.2 | 2941274 | 3932184 |
| 19 | 39322 | 5882488 | 7864290 |

**Note:** Orbit 3 corresponds to the orbit of Terra with a distance of 1 AU.

Solar radii is used in conjunction with the stellar radii table to determine if an orbit is within the surface of a star. Solar radii can also be used to determine if a location is more than 100 diameters out from the star for jump purposes.

## FORMULAE FOR ORBITAL PERIOD AND DISTANCE

$$P=\sqrt{MD^3}$$

$$D=(P^2/M)^{.33}$$

### Primary Units

Use primary units to find year length or distance for planets revolving around a star.

P= Period in years. Multiply years by 365.25 to find period in days.

M= Mass in solar masses.

D= Distance in astronomical units. Multiply by 150 million to find kilometers.

### Alternate Units

Use alternate units to find orbital period and distance for satellites of planets.

P= Period in lunar months. Multiply by 28 to find period in days.

M= Mass in combined Earth-Moon masses.

D= Distance in Earth-Moon distance. Multiply by 400,000 to find distance in kilometers.

## CRITERIA FOR ORBIT ZONES

Orbital zones are determined by the average temperature the central star creates, and are computed using the temperature and distance formulae.

The following temperatures determine the orbital zones.

2273 K is the upper limit for solid planets in a system. Above this value, the planet is vaporized and cannot occupy the orbit.

50 K is the upper limit of human habitability.

30 K is the upper limit of human comfort.

15 K is the optimum temperature for human settlement.

0 K is the lower limit for human comfort.

-20 K is the lower limit of human habitability.

## ALBEDO VALUES

Albedo is the fraction of incoming radiation reflected back into space by a body. It is expressed as a decimal fraction generally between .01 and .99. The amount of radiation absorbed by a body is given by one minus albedo (1-A).

| *Typical albedo values are:* | |
|---|---|
| Forest or Field | .10 |
| Desert | .20 |
| Open Water | .02 |
| Ice Caps, Snow | .85 |
| Dirty Ice | .55 |
| Clouds | .40 to .80 |

## ALBEDO COMPUTATION

The albedo for a world can be computed by determining what portion of the world is covered by various terrain types, and noting the average cloudiness of the atmosphere. Combining these values provides an overall albedo for the world.

## FORMULAE FOR WORLD TEMPERATURE AND DISTANCE

$$D=L^{.5}/T/(GK(1-A))^{.25}$$

$$T=KG(1-A)(L^{.25})/D^{.5}$$

Distance, world albedo, and stellar luminosity determine average local temperature.

Average world temperature, world albedo, and stellar luminosity determine distance from the star.

L= Luminosity in solar units.

A= Albedo of the world (in a range from 0.01 to 0.99).

D= Distance from the primary in AU.

T= Temperature in degrees Kelvin.

G= Greenhouse effect.

K= 374.025. Determined from average temperature of Terra (288 K.), divided by Earth's greenhouse effect (1.1) divided by energy absorption rate (1-albedo of .3).

Thus, 374.025=288/1.1/.7.

## CLOUDINESS

| *Hydrographics Factor* | *Cloudiness Percentage* |
|---|---|
| 0 | 0 |
| 1 | 0 |
| 2 | 10 |
| 3 | 10 |
| 4 | 20 |
| 5 | 30 |
| 6 | 40 |
| 7 | 50 |
| 8 | 60 |
| 9 | 70 |
| A | 70 |

Increase cloudiness by +40% (to a maximum of 100%) if atmosphere A+.

If atmosphere 3-, reduce cloudiness to a maximum of 20%.

If atmosphere E, use half the above table value.

## WORLD DATA

| World Size | Volume | Mass | Surface Area | Surface Gravity | Escape Velocity |
|---|---|---|---|---|---|
| S | .000015 | .000015 | .0006 | .024 | .26 |
| 1 | .0019 | .0019 | .015 | .122 | 1.35 |
| 2 | .015 | .015 | .063 | .240 | 2.69 |
| 3 | .053 | .053 | .141 | .377 | 4.13 |
| 4 | .125 | .125 | .250 | .500 | 5.49 |
| 5 | .244 | .244 | .391 | .625 | 6.87 |
| 6 | .472 | .472 | .563 | .840 | 8.72 |
| 7 | .670 | .670 | .766 | .875 | 9.62 |
| 8 | 1.000 | 1.000 | 1.000 | 1.000 | 11.00 |
| 9 | 1.420 | 1.420 | 1.266 | 1.120 | 12.35 |
| A | 1.950 | 1.950 | 1.563 | 1.250 | 13.73 |

Volume is stated in Earth volumes.

Mass is stated in Earth masses.

Surface Area is stated in Earth surfaces.

Surface Gravity is stated in Gs (Earth gravities).

Escape Velocity is stated in km/sec.

A size S world in this table is presumed to have a diameter of 200 km.

## ECCENTRICITY

| Eccentricity | % Temp Change – Periastron | % Temp Change – Apastron |
|---|---|---|
| 0.000 | 0.00 | 0.00 |
| .005 | 1.01 | .99 |
| .010 | 1.02 | .98 |
| .015 | 1.03 | .97 |
| .020 | 1.04 | .96 |
| .025 | 1.05 | .95 |
| .050 | 1.10 | .90 |
| .100 | 1.21 | .81 |
| .200 | 1.44 | .64 |
| .250 | 1.56 | .56 |

Temperature change due to eccentricity does not necessarily coincide with local seasons.

Apastron is farthest separation from the star; periastron is closest approach to the star.

## AXIAL TILT

| Tilt Angle | Temperature Change – Summer | Temperature Change – Winter |
|---|---|---|
| 0 | no effect | no effect |
| 10 | +17% | - 8% |
| 20 | +34% | -17% |
| 30 | +50% | -25% |
| 40 | +64% | -32% |
| 50 | +77% | -39% |
| 60 | +87% | -44% |
| 70 | +93% | -47% |
| 80 | +98% | -49% |
| 90 | +100% | -50% |

Temperature change is a percentage of the average world temperature.

## GREENHOUSE EFFECT

| Atmos Code | Atmosphere Type | Temperature % Increase |
|---|---|---|
| 0 | none | none |
| 1 | trace | none |
| 2 | very thin, taint | none |
| 3 | very thin | none |
| 4 | thin, tainted | + 5% |
| 5 | thin | + 5% |
| 6 | standard | +10% |
| 7 | standard, tainted | +10% |
| 8 | dense | +15% |
| 9 | dense, tainted | +15% |
| A | exotic | +20 to 70% |
| B | corrosive | +20 to 120% |
| C | insidious | +20 to 120% |
| D | dense, high | +15% |
| E | ellipsoid | +10% |
| F | thin, low | none |

Greenhouse effect increases atmosphere temperature. The percentages shown are applied to average world temperature before the effects of eccentricity and axial tilt. Greenhouse effect may allow habitable temperatures on a world in the outer zone.

## GAS GIANTS

Gas giants are large hydrogen atmosphere worlds used as refuelling points for many starships. Gas giants are classified into two categories based on size:

Large Gas Giants are at least 60,000 km in radius.

Small Gas Giants are less than 60,000 km, but at least 20,000 km in radius.

size (and is world diameter in thousands of miles or units of 1,600 kilometers).

**Surface Area:** Surface area is calculated from the formula for a sphere's surface. $A = (R/8)^2$. A is area in Earth surfaces (Earth = 1). R is the world size digit from the UPP. For more specific values, R can be made equal to the diameter of the world in thousands of miles (or multiples of 1,600 kilometers).

**Gravity:** Gravity for worlds can be calculated from mass and size of the world. $G = M(64/R^2)$. G is standard Gravities (Earth = 1). M is Earth masses. R is the world size digit from the UPP.

**Escape Velocity:** Escape velocity has been calculated based on mass and world size. For Terra, this value is 11 kilometers per second. Where needed, values for world sizes not on the world data table can be interpolated from the data.

**Cloudiness:** The degree of cloud cover for a world is established by the hydrographics for the world, and influences its albedo. The cloudiness table indicates cloudiness as a percentage. Cloudiness may not exceed 100%, nor may it be less than 0.

**Albedo:** Albedo is the fraction of incoming radiation reflected back into space by a body. The remaining energy is absorbed by the body and causes heating. There are four major components of albedo: land, water, snow (and ice), and clouds. If the general proportion of each of these components is known, it is possible to determine a world's albedo.

The albedo chart provides albedo values for major world surface components. The percentage of each component of the world surface is determined, and it is multiplied by the albedo value for the component given in the table. Water surface equals hydrographics percentage. Land surface equals 100% minus hydrographics percentage. A normal value for ice-caps is 10% of land surface, and it should reduce both water and land surface equally. Cold worlds may have larger ice-cap percentages. A world with the trade classification ice-capped has an ice-cap percentage equal to hydrographics percentage, and no water surface for the calculation. Cloudiness for a world can be determined from the cloudiness table.

Cloudiness obscures surface features beneath it; as a result, determine the percentage of unobscured surface area (100% minus cloudiness) and multiply that times water, land, and ice-cap percentages.

With the percentage contribution of each component determined, multiply each component by the albedo value given in the albedo table, and add all four together. The result is world albedo, and should fall between .01 and .99.

For example, Terra is A867A69-F. Water surface equals .70; land surface equals .30. Ice-caps equal .10, and reduce water and land equally, making them .65 and .25 respectively. The table indicates Terra has a cloudiness of .50; as a result, the portion of world surface unobscured by clouds is 1 – .50, or .50. Water, land, and ice are multiplied by .50 to determine their unobscured proportion, and provide results of .325 (water), .125 (land), and .05 (ice); clouds contribute .50 to surface components. Checking that .325, .125, .05, and .50 add up to 1.00 indicates that the calculation is correct so far.

Each component is multiplied by its albedo value, and the results summed: .325 times .02 equals .0065, .125 times .10 equals .0125, .05 times .85 equals .0425, and .50 times .50 equals .25. Thus, the albedo for Terra equals .0065 (water) plus .0125 (land) plus .0425 (ice-cap) plus .25 (clouds), or .3115. This value agrees closely with the accepted albedo range for Terra of .30 to .35.

**Greenhouse Effect:** The gases on some atmospheres can allow light to enter, but then retard the escape of the heat which the light generates. This greenhouse effect increases local temperature as a result. The greenhouse effect table shows the percentage temperature increase to be expected from different atmosphere types. The effect in exotic, corrosive, and insidious atmospheres varies depending on their specific gas composition; the referee should roll 1D or 2D to determine effect from the table.

**Local Temperature:** Local average temperature is based on the luminosity of the star, world albedo, distance seperating the world and the star, and local greenhouse effect. The formula is shown in the charts section.

**Distance From The Star:** Distance from the star can be determined based on stellar luminosity, albedo, greenhouse effect, and temperature. The formula is shown in the charts section.

**Axial Tilt:** If a world's axis is not exactly perpendicular to the plane of its orbit, then different areas of the world surface will receive different amounts of radiation during the course of the year. This change in available radiation creates local seasons.

The axial tilt table indicates the percent temperature change to the average temperature of the world, based on the axial tilt of the world. In effect, the table shows the average temperature for summer and winter.

Because of heat retention by a world surface, the temperature decrease in winter is less than the corresponding temperature in summer.

No provision is made for the generation of axial tilt for worlds. A referee can decide on the degree of axial tilt desired (from 0 to 90 degrees), but most worlds will have less than 40 degrees tilt.

**Orbital Eccentricity Effects:** If a planet orbit is not perfectly circular, then the planet will receive more radiation when closer to the star, and less when farther away.

The eccentricity table shows percent temperature change from local temperature when the planet is at apastron (farthest from the star) and at periastron (closest to the star).

Most world orbits have an eccentricity of less than .025, and (as the chart shows) the change in temperature is minimal. For example, Terra is actually closest to Sol during northern hemisphere winter, but the effects of axial tilt outweigh the effects of orbital eccentricity.

No provision is made for generation of eccentricity for a planetary orbit. If the referee desires, orbital eccentricity can be established based on circumstances, or for a desired effect. Most eccentricities will not exceed .250.

## USING THIS MATERIAL

There is no requirement that all of the formulae and tables be used by a referee when administering a world, just as there is no requirement that an entire star system be generated for every world that players encounter. Instead, the referee can select judiciously those details which are important to a specific adventure, and determine the specific values which the formulae call for. Or, the referee may select a specific world and compute appropriate values until there is sufficient detail to support an adventure. In either case, all of the material presented here need not be used unless needed.

In some cases (where the computations would be long, tedious, or simply impractical), it is possible to interpolate values given on the various tables.

# System Data Forms

In order to properly maintain records on the complete star systems that have been generated by a referee, an Imperial Scout Service Form (IS Form 11, *Star System Data*) has been produced for maintenance of the data. This form may be photocopied or locally printed as necessary.

The forms are designed for completion using either handwriting or typewriter. Basic information concerning the star establishes which system is being described, and columns of world names and UPPs describe the system. If the system has planets orbiting more than one star, then a separate page of the form should be completed for each star.

The reverse of the form allows additional worlds and satellites to be noted. As many form reverses as necessary should be appended to the primary form in order to completely list all components of the system.

**Planet and Satellite Orbits:** The two columns of boxes to the left of the form are intended to allow designation of planet and satellite orbits. The first column is for planetary orbits, which should correspond to the orbit numbers of the generation system. Depending on the referee's preference, empty orbits may be ignored, or the orbit number may be shown with the remark "empty." Captured planets can be shown with decimal fractions of whole orbit numbers; there is sufficient room in the orbit number box to show this value.

Satellite orbits are shown in the second column of boxes. As a result, they are naturally indented below their parent planets.

**EXAMPLE**

The example below shows how a typical IS Form 11 is filled out, and should be a guide to proper usage of the forms.

| **STAR SYSTEM DATA** | | 1. Date of Preparation: 217-1110 |
|---|---|---|
| 2. System Name (and Hex Location): REGINA (0312) | 3. Subsector and Sector: REGINA SPINWARD MARCHES | |
| 4. Star Name: LUSOR | 5. Spectrum and Size: F7V | 6. Magnitude: |

**WORLD AND SATELLITE DATA**

| | | | |
|---|---|---|---|
| 0 | | CLEMENT | Y100000 |
| 1 | | AUSUN | Y300169 |
| 2 | | BURGUND | SMALL GAS GIANT |
| | 3 | CENT | Y400369 |

## STAR SYSTEM DATA

| 1. Date of Preparation | |
|---|---|
| 2. System Name (and Hex Location) | 3. Subsector and Sector |
| 4. Star Name | 5. Spectrum and Size / 6. Magnitude |

## WORLD AND SATELLITE DATA

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**IS Form 7** **Star System Data**

## STAR SYSTEM DATA (Continuation)

7. Date of Preparation

| 8. Central Star Name | 9. Spectrum and Size | 10. Magnitude |
|---|---|---|
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**IS Form 7 (Reverse)** **Star System Data**

# Star System Examples

The complexity of the star system generation system calls for examples to allow referees and players alike an understanding of how to generate and present the data. For this reason, two examples have been produced using the star generation system in this book: the Terra system, and the Regina system.

In the case of the Terra system, known details of the system have been classified using the **Traveller** system. Suitable social information concerning populations and governments has been added, but the physical data corresponds to known data about the system. It is entirely possible to generate the Terra system using the star system generation system.

In the case of the Regina system, the entire stellar system has been generated in accordance with the continuation system presented in this book.

For convenience and ease of reference, the data on the star systems is shown in columnar form similar to the format for subsector data. Planetary orbit numbers occupy the first column; satellite orbits (expressed in increments of planetary radii) occupy the second column. World names and UPPs follow, as do codes for bases and remarks. For ease of reference, the habitable zone is marked with an asterisk.

Effective dates for the data in these examples is 001-1110.

### THE TERRA SYSTEM

Worlds in the Terra system are named for mythical gods. Names in parentheses have been given, but not approved as official; their approval is probable, but not certain.

Major settlements in the Terra system are located on Terra and Luna, on Mars, and in the Asteroid Belt (called Planetoid Belt here to follow word use conventions given in the rules). Smaller settlements exist on Mercury, Ganymede, Rhea, and Pluto. Various minor settlements on Venus and a few satellites have been established for commercial and scientific purposes.

Terra, as a result of the Imperial defeat of the Solomani in the Solomani Rim War, is under military rule (government type 6) by the Imperium. Consequently, all other settlements in the system are subordinate to the captive government of Terra, and to the Imperium. Once military rule is lifted, the other locations can be expected to develop more individual government types.

### THE REGINA SYSTEM

Worlds in the Regina system are named for a variety of topics. Most planets orbiting Lusor (the primary star, and dwarf companion Speck) are named for persons and places associated with St. Regina. Planets orbiting Darida (Lusor's far companion) are named in the vilani language for famous vilani authors.

Although Regina is boasts the highest population in the system, its companion satellites of Harcourt and Brumaire have been colonized, and the other satellites have been settled. Minor establishments exist on a few other worlds in the system, as well as in the relatively desolate Darida system.

# The Regina System

The Regina system is actually a triple star system— the primary Lusor and its dwarf companion Speck form the major system, while dim Darida orbits at about 5,000 AU distance. Regina is only one of seven worlds in the systems which boast a breathable atmosphere, and only one of four habitable planets in the life zone of Lusor, in orbit around the gas giant Assiniboia. With the best conditions of the group, it was settled first, and soon dominated the system.

The Darida system proved much less hospitable, and has been only minimally exploited. It does boast a military outpost, and a few small settlements devoted to prospecting and mining available ores.

Regina was originally settled in 75 by an expansion wave of the Third Imperium. It soon became a trade center within the Spinward Marches, and was established capital of its subsector when it joined the Imperium in 250.

There are three stars, eight planets and 17 satellites in the system.

| *Orbit* | *Name* | *UPP* | | *Remarks* |
|---|---|---|---|---|
| Primary | Lusor | F7 V | | DM companion in close orbit. |
| 0 | Clement | Y100000 | 0 | |
| 1 | Ausun | Y300169 | 9 | |
| 2 | Burgund | Small GG | | |
| 3 | Cent | Y400367 | 9 | |
| 7 | Thermidor | Y560000 | 0 | |
| 3 | Olybrius | F75022A | 9 | |
| 25 | Alise | Y20016C | 9 | |
| *4 | Assiniboia | Large GG | | |
| 3 | Redes | F595269 | 9 | Farming. |
| 6 | Printemps | F20036C | A N | |
| 7 | Brumaire | F564669 | 9 | Farming. Colony. |
| 30 | Harcourt | H43556C | A M | Research Lab. Military Base. Colony. |
| 55 | Regina | A788899 | A A | Rich World. Subsector Capital. |
| Companion | Darida | M6 V | | |
| *0 | Augur | YS00000 | 0 | |
| 1 | Kirunda | Y210000 | 0 | |
| 8 | Irkirka | YS00000 | 0 | |
| 11 | Arkurer | HS00137 | 9 | |
| 13 | Irgurkar | Y10046A | A | |
| 2 | Elazair | Small GG | | |
| 3 | Lashir | YS00000 | 0 | |
| 8 | Diuur Imar | G200269 | 9 | |
| 9 | Shamardae | Y500000 | 0 | |
| 20 | Arapan | Y200000 | 0 | |
| 50 | Edaku | Y210000 | 0 | |
| 125 | Gagamshir | F534328 | A M | Military Base. |

# The Terra System

In the early years of space exploration, colonies were established throughout the solar system. Every satellite was explored at least superficially, and expeditions even ventured into the depths of Jupiter's atmosphere. Although all colonies except Luna were abandoned during the Long Night, they have since been re-established.

| *Orbit* | *Name* | *UPP* | | | *Remarks* |
|---|---|---|---|---|---|
| Primary | Sol | G2 V | | | |
| 1 | Mercury | G30046A | E | | |
| 2 | Venus | G8B0168 | E | | |
| *3 | Terra | A867A69 | F | B | |
| 60 | Luna | F20076C | F | N | Research Lab. Colony. |
| 4 | Mars | F43056A | F | | Military Base. Colony. |
| 5 | Planetoid Belt | F00066B | E | | Colony. |
| 6 | Jupiter | Large GG | | | |
| 2 | Ring System | YR00000 | 0 | | |
| 6 | Io | Y210000 | 0 | | |
| 9 | Europa | H200000 | 0 | | |
| 15 | Ganymede | F300468 | F | | Military Base. |
| 25 | Callisto | Y30016A | F | | Research Lab. |
| 7 | Saturn | Large GG | | | |
| 2 | Ring System | YR00000 | 0 | | |
| 3 | Janus | YS00000 | 0 | | |
| 3 | Mimas | YS00000 | 0 | | |
| 4 | Enceladus | GS00268 | F | | Research Lab. |
| 5 | Tethys | YS00000 | 0 | | |
| 6 | Dione | YS00000 | 0 | | |
| 9 | Rhea | H10046B | E | S | |
| 20 | Titan | Y3A0168 | E | | |
| 25 | Hyperion | YS00000 | 0 | | |
| 60 | Iapetus | Y100000 | 0 | | |
| 225 | Phoebe | YS00000 | 0 | | |
| 8 | Uranus | Small GG | | | |
| 2 | Ring System | YR00000 | 0 | | |
| 5 | Miranda | YS00000 | 0 | | |
| 7 | Ariel | Y100000 | 0 | | |
| 10 | Umbriel | HS00269 | E | | |
| 15 | Titania | H100168 | E | | |
| 20 | Oberon | Y100000 | 0 | | |
| 8.5 | Neptune | Small GG | | | |
| 15 | Triton | Y210169 | E | | |
| 20 | Nereid | YS00000 | 0 | | |
| 9 | Pluto | F10046C | F | N | Research Lab. |
| 20 | Charon | YS00000 | 0 | | |

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