1705

Inner and Outer Systems

Oort Cloud

1805

Edge of Remote System

Inner System	Outer System	Remote System	One Light Year

Oort Cloud

= 1 parsec
= jump-1
= 3.26 light-years

1703
Yres

1903 ★ A
Pixie

2003

1703 C
MENORB

1804 ▲ A
Boughene

2004

2104

1705 ★ A ▲
EFATE

1805 B
Uakye

1906
Feri

2006 ▲ B

2205 C
ENOPE

E
Keng

1706 B
Alell

1806 E
Whanga

1907

2107
Pscias

2206
Shionthy

2406 C
Moughas

1707

1807 E
Knorbes

1908

2007 ▲ C
ROUP

2108

2207 E
Wochiers

2407

1708

1808 E
Forboldn

2008

2208

2408 E
ALGINE

1709

1809 C Na
RUIE

1909 ▲ C
Hefry

2009

2209

2309 E
Yurst

2409 E
RETHE

1710

1810 ▲ C ●
Regina

1910 ★ A ▲

2010

2110 B C
Yori

2210

2310

2410 ★ B ▲
Inthe

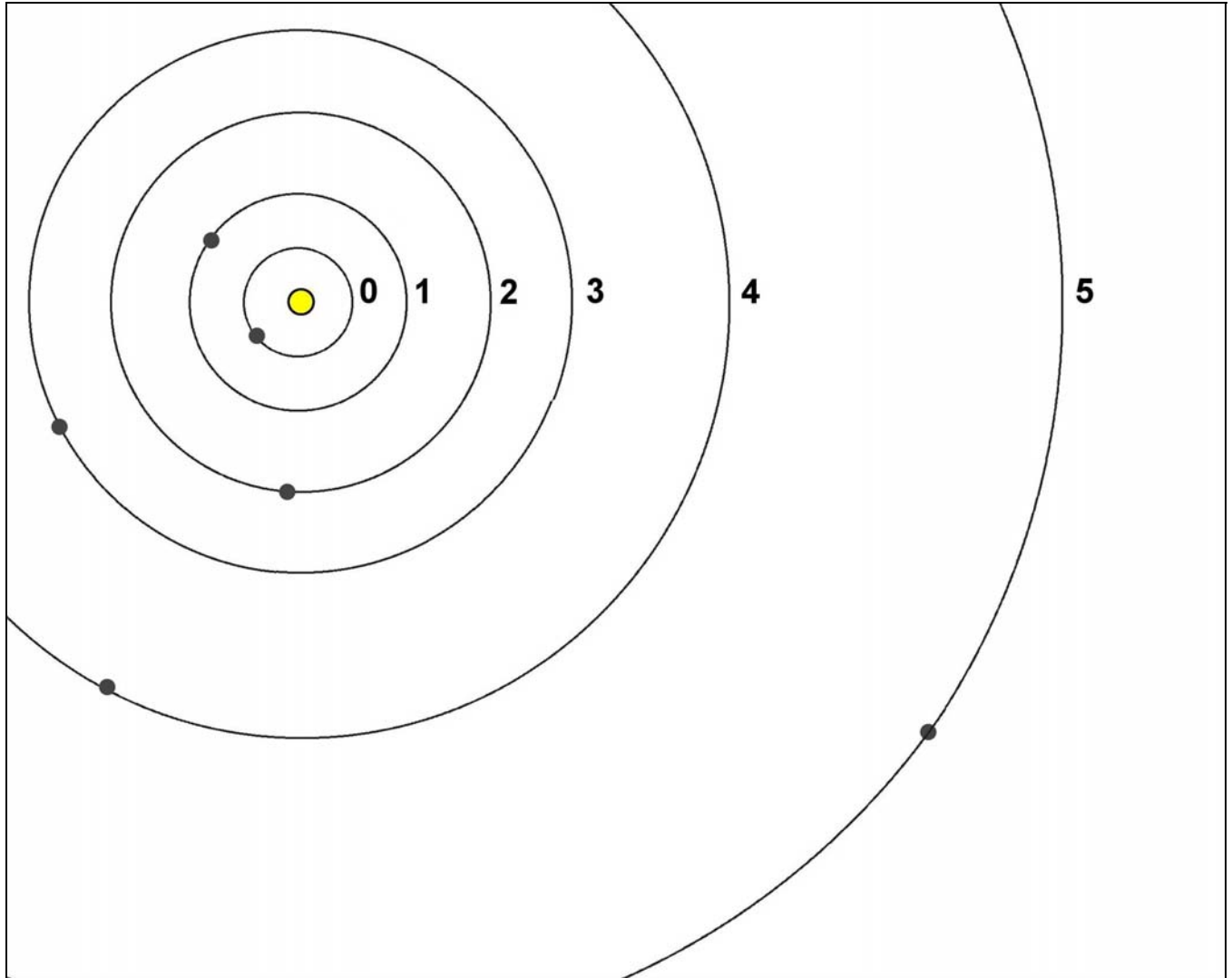1711 ★ B
Jenghe

1911

2311 D

Star Systems

Each system hex is the potential home to a central system and perhaps several subordinate systems.
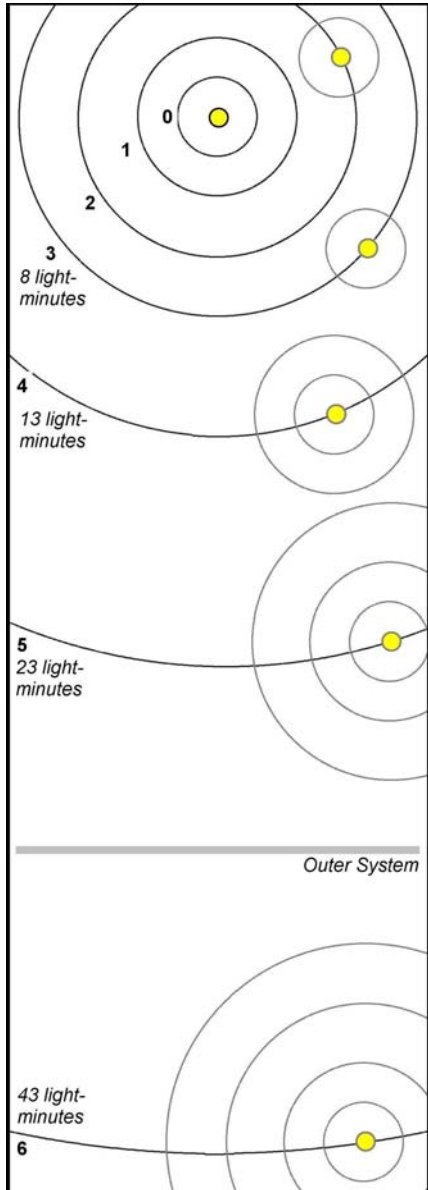
THE TYPICAL STAR SYSTEM

The Typical Star System Contains:
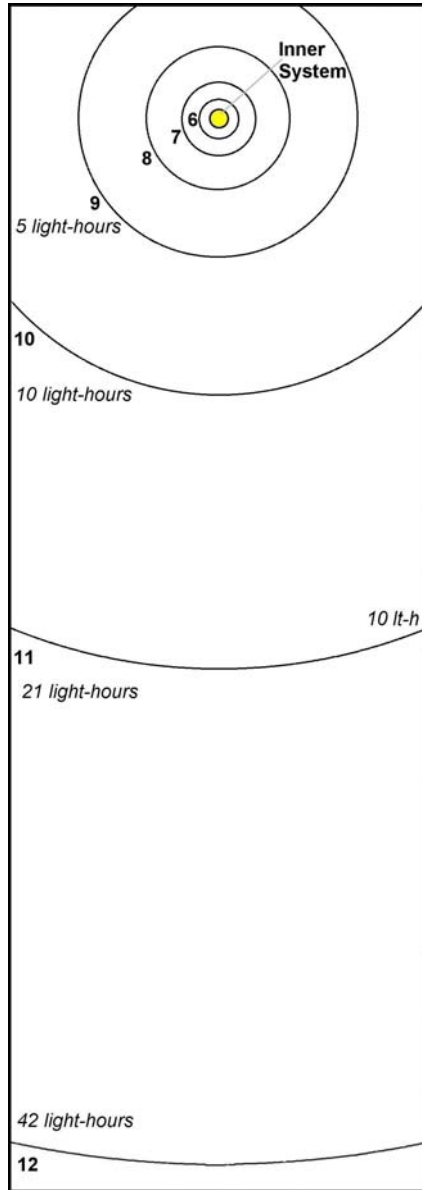 A Central Star
  Orbits numbered 0 (zero) upward
  Worlds (including planets, gas giants, and asteroids) occupying some (or all) of these orbits.
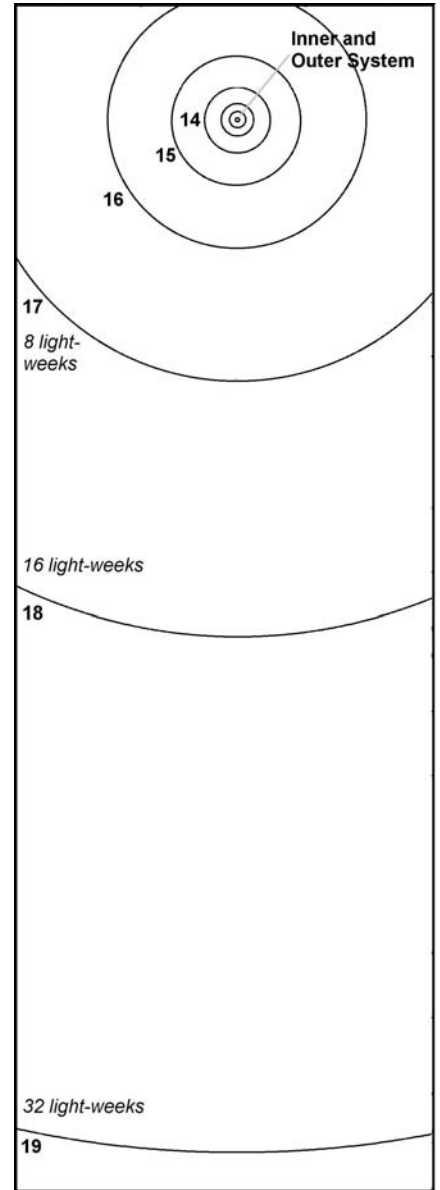
THE INNER SYSTEM

0
1
2
3
8 light-minutes
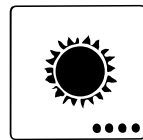
4
13 light-minutes

5
23 light-minutes

Outer System

43 light-minutes

6

Orbits 0-6

THE OUTER SYSTEM

Inner System

6
7
8
9
5 light-hours

10
10 light-hours

10 lt-h

11
21 light-hours

42 light-hours

12

Orbits 7-12

THE REMOTE SYSTEM

Inner and Outer System

14
15
16

17
8 light-weeks

16 light-weeks

18

32 light-weeks

19

Orbits 13-19

Star systems contain accumulations of stars, gas giants, and worlds.

Traveller System Generation is a process that provides increasing levels of detail and complexity as a Star System is explored.

MOARN Map Only As Really Necessary. Some journeys stop only momentarily in star systems; the information required about that is little more than the type of world present and perhaps the location of a gas giant for starship refueling. Other systems create a need for extensive information: details of several worlds, the location of companion stars, and even information about worlds in the remote or outer system.

Traveller System Generation is a hierarchical process which can be started and stopped as the situation requires. The referee need create only as much information as the players need; as more is required, more can be generated.

UNDERSTANDING STAR SYSTEMS

A star system consists of a central star and a family of planets.

Multiple Stars. Some systems have more than one star. The central star is the Primary. There may be other stars which are Close (Orbits 0-1-2-3-4-5), Near (6-7-8-9-10-11), or Far (Orbits 12-13-14-15-16-17). Each of these stars may have a Companion which is extremely close.

Orbits. Each star is encircled by a series of Orbits number beginning with 0 and extending as far as Orbit-19. Orbits are numbered to correspond to these in the Solar System (that is, 1= Mercury, 2= Venus, 3= Earth). An additional Orbit-0 is allowed inside the orbit of Mercury.

Worlds. Each star may have a variety of worlds: planets, gas giants, asteroid and planetoid belts, satellites, and worldlets.

The Mainworld

The focus of each system is its Mainworld: the single most important world in the system. If the Mainworld has a high population, other worlds in the system are probably explored and even settled. If the Mainworld has a low population, the other worlds in the system are likely barren.

The Mainworld is the world referenced in astrogation data bases and is generally the destination of most travelers entering the system (just as Terra is the likely destination of those visiting the Sol system).

DESCRIBING SYSTEMS

Star systems are recorded and described on a series of FillForms. Most systems can be described on the Inner System FillForm which covers the central star and orbits 0 through 6. Where necessary, additional Fillforms can be used for the Outer System and the Remote System.

CREATING STAR SYSTEMS AND THEIR WORLDS

The process of creating star is governed by the System Generation Checklist and Charts A through G.

A SYSTEM CHECKLIST

The System Checklist details the steps to be taken in creating star systems.

The Second Survey Format

When large data bases of system information are called for, they can be presented in the Second Survey Format: one line per star system showing the Mainworld of the system and other data appropriate for astrogation.

Sector Name

The Sector Name is known before the information is created, as is the hex location of the system.

B MAINWORLD

The Mainworld is the most important world in the system. The first step in system creation is generation of information about the Mainworld.

Starport. The starport is on the Mainworld. Other spaceports (for other worlds) can be created later in the process.

Mainworld Type. The Mainworld may be a Planet occupying an orbit, or it may be a Satellite orbiting a Gas Giant (or a larger planet). It is possible for a Planet Mainworld to be an Asteroid Belt (determined when World Size is generated).

If the Mainworld is a Satellite, Flux determines the Orbit name (a letter from Ay to Zee) and if it is Close or Far from its world.

The Habitable Zone

The Habitable Zone is that region in a star system which is hospitable to humans (and many similar sophonts).

Inner System Reference Chart H and Outer System Reference Chart J show the orbits which are in the Habitable Zone for various star types.

HZ is the abbreviation for Habitable Zone. An orbit is the HZ allows the world to have liquid water and climate hospitable to humans and similar sophonts.

HZ+1 is one orbit farther from the star; the resulting climate is Cold (at the lower edge of human endurance).

HZ-1 is on orbit closer to the star; the resulting climate is Hot (near the upper limits of human endurance).

Twilight Zone. A Planet in Orbit 0 or Orbit 1 is tidally locked to its star. Although the world may be in the HZ, hospitable conditions are present only in a narrow Twilight Zone.

Locked. A Satellite in Close Orbit to its planet is Locked to it; Satellites do not have Twilight Zones.

Gas Giants and Belts

The number of Gas Giants in the system and the number of Planetoid Belts can be generated.

Gas Giants in a system = 2D /2 -2 (ignore fractions and treat less-than-zero as zero) which produces a range from 0 to 4 with some chance of none at all. This value is for the entire stellar hex regardless of the number of subsystems.

Planetoid Belts in a system = 1D – 3 (ignore fractions and treat less-than-zero as zero) which produces a range from 0 to 3 with a fair chance of zero. This value does not include the Mainworld if it is an Asteroid Belt. For terminology purposes, an Asteroid Belt is a Mainworld; an Planetoid belt is not a Mainworld.
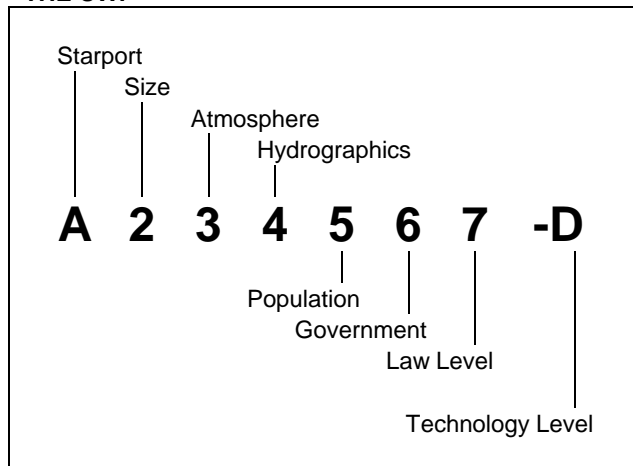
Using Chart B

Chart B provides basic information about the Mainworld. Ships can look up this information in data bases and can make decisions before setting course for the system. The presence of Gas Giants allows wilderness refueling.

C StSAHPGL-T

The basic information contained in the Universal World Profile can be created with the instructions on the Chart A Checklist.

THE UWP

```
        Starport
           Size
                 Atmosphere
                     Hydrographics

    A   2   3   4   5   6   7  -D

                 Population
                    Government
                        Law Level

                            Technology Level
```

Using Chart C

Chart C allows the information in the UWP to be decoded and understood.

The instructions for creating the elements of the UWP are appended to each table.

D TRADE CLASSIFICATIONS

The Trade Classifications reflect specific types of information about the Mainworld (and to a lesser extent, other locations in the system).

E THE EXTENSIONS

The Extensions provide additional information about the Mainworld.

The Importance Extension

The **Importance Extension (Ix)** ranks worlds within a region. It can range from +4 to -2. A world with +4 is Important; a world with 0 or less is Unimportant.

Trade Routes. Trade Routes within a sector connect Important Worlds with Jump-4 or less. If such a route is not possible, intermediate connections with less important worlds are possible.

Capitals. The most Important world in a subsector is the Subsector Capital; the most important world in a Sector is the Sector Capital.

When more than one world is of the highest Importance, the one with the most Trade Classifications is considered most Important.

The Economic Extension

The **Economic Extension (Ex)** is a measure of the strength of a world economy and provides basic insights into the economy's structure and capabilities.

The Economic Extension is useful in evaluating the budgets and outputs of a world, and for comparing the economics of different worlds.

By detailing the Resources (= 2D plus GG and Belts), Labor (= by Population), and Infrastructure (= 2D + Importance), a general picture of the economic strength of the World emerges.

Barriers add a handicap: legal, cultural, and social inefficiencies which may increase or reduce overall economic strength.

Resource Units. The Economic Extension can be used to compute the Resource Units of a world (in effect, its world budget).

RU

Resource Units = R * L * I * (5-B)

If any value = 0, use 1 instead (to avoid multiplying by zero).

Resource units can be negative: a world can be a net drain for Resource Units.

Barriers. All economies have barriers to total efficiency. In the Economic Extension, Barriers range from 0 to 10, with higher value values (because of the structure of the formula) being the most destructive to an economy.

In the RU formula, Barriers at 6 or more turn the RUs available negative: the Barriers are so destructive as to make the economy a net drain. Such barriers represent a welfare state; cultural influences which do not value wealth, even physical limitations.

On the other hand, since nearly all economies have barriers, lower-than-expected Barriers are a positive multiplier increasing available RU.

The Golden World. The theoretical (possibly apochryphal) world with maximum values under the Economic Extension would not only have an immense RU value, it would have virtually no Barriers to production: its citizens would value work, production, efficiency, and even customer satisfaction above all else.

Fractional Budgets. RU Resource Units are relative values: they are best understood in comparison to other

worlds. Assuming World Alpha produces RU= 100 and World Beta produces RU= 50, one can assume Alpha has an economy twice the size of Beta.

Similarly, if Alpha has a naval budget for ship production, Beta probably has half that budget.

The Cultural Extension

The **Cultural Extension (Cx)** is a broad insight into the expected social behaviors of the citizens of the world.

F NABZ Nil

Additional Information about the world is produced by Chart F.

Nobility. The Imperium assigns a representative to each mainworld; this imperial Noble interacts with the local government and population, serves as an ambassador, and promotes trade and commerce. This noble may be a local appointed by the Emperor, or may be an offworlder assigned to the post.

When a world has a significant non-human population, the Noble often has a local counterpart who deals with non-human locals.

Allegiance. Worlds within the Imperium owe their loyalty to the empire; worlds just beyond the Imperial borders may be Non-Aligned (carefully maintaining its neutrality), or Client-State (independent, but interacting with the empire at various levels).

Worlds may be members of interstellar groups and owe their allegiance to them.

Bases. Worlds may have bases for military, scout, or naval purposes.

Travel Zones

Some worlds pose a variety of dangers to travelers. The Travel Zone classification system assigns to worlds a basic warning level based on experience.

Most worlds are **Travel Zone Green**: safe (relatively safe) to visit. Green status is assumed within the Imperium unless otherwise posted.

Some worlds are **Travel Zone Red:** dangerous to visitors. The level of danger is severe enough that the world is Interdicted and travel to the world is prohibited (with Trade Classification Forbidden). The level of enforcement of Red Zones varies: some systems are patrolled by Quarantine fleets; others have merely a warning beacon.

Some worlds are **Travel Zone Amber**: visitors are advised to use caution. Travel Zone Amber has two levels: Dangerous and Puzzling, each reflected in a Trade Classification.

Amber worlds with low population (Pop= 6 or less) are labeled Amber if local conditions may prove to be dangerous (as reflected by the low population). Amber worlds with higher population (Pop= 7 or more) may require caution by visitors, but the fact that large numbers live on the world makes the classification less about danger and more about intriguing or exotic conditions.

Native Status

Most worlds capable of supporting native intelligent live have a (or had a now-extinct) population of sophonts. The chart identifies the status of such sophonts.

System Stars

The precise number of stars in a system and their spectral types can be created using the charts.

About half of all star systems will be single stars without companions.

It is possible for a system to have eight stars: A Primary and a Companion, a Close star in the inner system and its Companion, a Near star in the Outer System and its companion, and a Far star in the Remote system and its Companion (the chance of such a system is extremely small).

Stellar Spectral Type

The precise spectral identity of the stars in the system are generated using the Spectral Type chart.

The Size of Additional Star Systems

The number of available orbits for system stars is restricted.

The Primary Star may have orbits out to Orbit-19 (not all need be, or will be, filled).

Close, Near, and Far stars may fill orbits around them to their own Orbit minus 3. For example, a Close Star in orbit 3 around its Primary can have no (= 3 – 3) planet orbits. A Far star in Orbit 17 around its Primary can have planets in orbits around it out to Orbit 14 (= 17 – 3).

The Sub Orbit Column of the Orbital Distance Chart 5a (in the Ranges Chapter) shows available orbits.

G PLACING WORLDS

Chart G places the Mainworld in a specific Orbit and creates and places other worlds in the system. If the supply of worlds exceeds the available orbits, the excess worlds are ignored.

Placing Worlds

Worlds in a system must be places in orbits.

The Placing Worlds Chart provides priorities and deals with several exceptions.

The Mainworld is placed first. If it is a satellite, then a Gas Giant must be placed in that orbit to accommodate it. If there is no Gas Giant in the system, then a BigWorld (Size=-2D +7) must be placed in that orbit.

If the Mainworld is an Asteroid Belt, it is placed using the Belt Column of the Basic Placement Chart without regard to Habitable Zone.

Rotate Placement. The Placing Worlds Chart calls for Rotating Placement of various worlds in the system. If the system has more than one star (Close, Near, Far), place the first of the worlds concerned in orbit around the Primary, the second in orbit around the Close, the third in orbit around the Near, and the fourth in orbit around the Far (if possible). Repeat the process if necessary.

Precluded Orbits. Some stars re so large that they engulf some of the orbits in the system and preclude their availablility.

The Surface of the Star… Column of the Orbital Distance Chart 5a (in the Ranges Chapter) shows preculuded orbits.

Worlds other than the Mainworld are subject to restrictions: Maximum Population is Mainworld Population minus 1. All worlds other than the Mainworld have Spaceports rather than Starports.

Other Worlds

The creation of additional worlds uses a simplified procedure:

Inner Worlds are in orbits HZ minus 2 or more.

Hospitable Worlds are in orbits HZ – 1 to HZ +1.

Outer Worlds are in orbits HZ +2 or greater.

Consult the charts to determine the specific type of world and then create it using the information from the Other Worlds column.

Similar tables direct the creation of Satellites as necessary.

Hospitables are potentially habitable or exploitable worlds located in the Habitable Zone.

Planetoids are the worldlets of a Belt. The Population, Government, and Law Level represent the general level throughout the Belt.

Iceworlds are frozen worlds beyond the HZ.

RadWorlds are worlds with extreme levels of radiation. Local values for RadWorlds are provided in Range Table 3b Strangeworlds.

Infernos are worlds with extremes of temperature. Local values for Infernos are provided in Range Table 3b Strangeworlds.

BigWorlds are worlds with larger than expected Size. Occasionally, a satellite Mainworld in a system without Gas Giants requires a BigWorld as its primary. Bigworld may also occur throughout a system.

Worldlets are worlds with generally small Size.

Inner Worlds are located starward of the Habitable Zone.

Stormworlds are worlds wracked by constant atmospheric turbulence. Local values for Stormworld are provided in Range Table 3b Strangeworlds.

Satellites

When necessary, satellites for worlds and for gas giants can be generated.

Ring. The table may create one or more Rings.

Even More Worlds

This system does not create the many small chunks of rock and ice throughout most systems.

THE REGINA SYSTEM

Hex 1910 of the Spinward Marches sector was created as an example using charts.

A

The Sector Name is known: The Spinward Marches.
The Hex Location is already known: 1910.
The Mainworld Name is Regina.

B

Starport= 2D=4 = Type A. Excellent Quality.
Mainworld Type= Flux = - 4 = Far Satellite.
Satellite Orbit = Flux = -2 = Arr.
Habitable Zone Variance = Flux = 0 = no variance.
Climate (based on HZ=0) = Temperate.
Gas Giants = 2D / 2 - 2 = 10 / 2 – 2 = 3.
Planetoid Belts = 1D – 3 = 2 – 3 = 0.

C

Mainworld Size = 2D – 2 = 7 = 7,000 miles diameter.
Atmosphere = Flux + Size = +1 + 7 = 8 = Dense.
Hydrographics = Flux + Size = +1 + 7 = 8 = 80 of the world surface is covered by seas.
Population = 2D – 2 = 8. Hundreds of millions.
Government = Flux + Pop = +1 + 8 = 9 = Impersonal Bureaucracy.
Law Level = Flux + Gov = +0 + 9 = 9 = High Law.
Tech Level = 1D + Mods (Starport A = +6) = 4 + 6 = 10. TL-10 = approximately 2100 AD.

D

Trade Classifications =
    Rich (Atm=8, Pop=8).
    Pre-Agricultural (Atm=8, Hyd=8, Pop=8).
    Pre-High (Pop= 8).

E.

Importance Extension = { +4 } = Important.
= Starport A = +1, TL A = +1, Rich = +1, Pre-Ag = +1.
Economic Extension = (A8B6)
    Resources= 2D + GG + Belts = 7 + 3 + 0 = 10 = A.
    Labor = Pop = 8.
    Infrastructure = 2D + Importance = 7 + 4 = 11 = B.
    Barriers = 2D - 2 = 6
Cultural Extension = [6C5C]
    Homogeneity = Pop + Flux = 8 -2 = 6.
    Acceptance = Pop + Importance = 8 + 4 = 12 = C.
    Strangeness = 2D – 2 = 5.
    Symbols = TL + Flux = 10 + 2 = 12 = C.

F

Nobility = cCe = Baronet, a Baron, and a Viscount
    Based on Rich, Pre-Ag, Pre-High.
Allegiance = Im = a member world of the Imperium.
Bases = NS
    Naval Base from the table. 2D = 5 = Yes.
    Scout Base from the table. 2D = 3 = Yes.
    Travel Zones. Imposed by the Referee. = None.
    Native Status. Based on Pop 7 or greater and Atm 2 or greater, the world has a Native population.

System Stars

The system automatically has a Primary.
Primary Companion = Flux = +4 = Yes.
Close Star = Flux = 0 = No. Near Star = Flux = -2 = No.
Far Star = Flux = +4 = Yes.
Far Star Companion = Flux = +1 = No.
The Regina system has a Primary and a Companion, and a Far star in the remote system, and without a companion.

Stellar Data

Primary = F7 V. Primary Spectral Type = Flux = -1 = F. Primary Spectral Decimal = use the Even Distribution Table from Dice = 7. Primary Size = Flux = 0 and consult the Spectral F column = V.
Primary Companion = DM. Companion Spectral Type = -1 + 1D-1 = 4 = M. Companion Decimal = 4. Companion Size = Flux + 1D -1 +3 = +7 = D. Spectral decimal is ignored for Size= D.
Far Star = M6 V. Spectral Type = Flux + 1D -1 = 0 + 3 = M. Spectral Decimal = 6. Stellar Size = Flux + 1D -1 = 0 + 2 = 2 = V.
Place the Stars in orbits. The Primary is the central star of the system. Its Companion orbits it inside Orbit 0. The Far star is in orbit 11 + 1D = 11 + 5 = Orbit 16.

G

Total Worlds In The System = 1+ 3 + 0 + 2D = 1+ 3 + 0 + 8 = 12.
Mainworld. Regina is in the HZ. The Inner System Reference map shows the HZ for the Primary F7 V is Orbit 4. Because Regina is a Satellite, place a Gas Giant in Orbit 4. Regin orbits the Gas Giant.
Gas Giants. The system has three Gas Giants.
    The first Gas Giant has been placed in Orbit 4 of the Inner System. Consult the GG Table for its details = 2D = 7 = Siz S (80,000 miles diameter = about equal to Jupiter). It is a Large Gas Giant LGG.
    Place the second Gas Giant. HZ= 4. Consult the GG Table for its details = 2 = Siz M (30,000 miles diameter). It is a Small Gas Giant SGG. Consult the Basic Placement Chart for SGG location = 2D = 2 = HZ-2. Place the GG in Orbit 4 -2 = Orbit 2.
    Rotate placement of Gas Giants through the systems.
    Place the third Gas Giant orbiting the M6 V Far star (begin a new Inner System Fillform for the star). The HZ for an M6 V is Orbit 0. Consult the GG Table for its details = 5 = Siz Q (60,000 miles diameter). It is a Small Gas Giant SGG. Convert it to an ice Giant. Consult the Basic Placement Chart for IG location = 2D = 2 = HZ+2. Place the IG in Orbit 0 + 2 = Orbit 2.
The system has no Planetoid Belts.
Create world 5 of the system's 12. On World1 Column, 2D = 5 = Orbit 4 = which becomes a Satellite of the Gas Giant in Orbit 4. As a Satellite in Orbit 4, consult the HZ Hospitables Satellite table = 1D = 4 = Hospitable. Determine its orbit from the World and Orbits Table Chart B = Flux = -1 = Satellite Orbit Eff. Create the Spaceport = Mainworld Pop -2D + 5 = 8 – 2 + 6 = 0 = Starport F. Create World Size = 2D -2 = 5.
Continue the process of world creation Atm=6 Hyd=4 Pop= 6 Gov = 6 Law = 9. TL = 6.