

SPACE OPERA
PROBE
NCG 8436



A SURVEY & CONTACT MISSION

Stephen Kingsley



Fantasy Games Unlimited, Inc.

PROBE NCG 8436

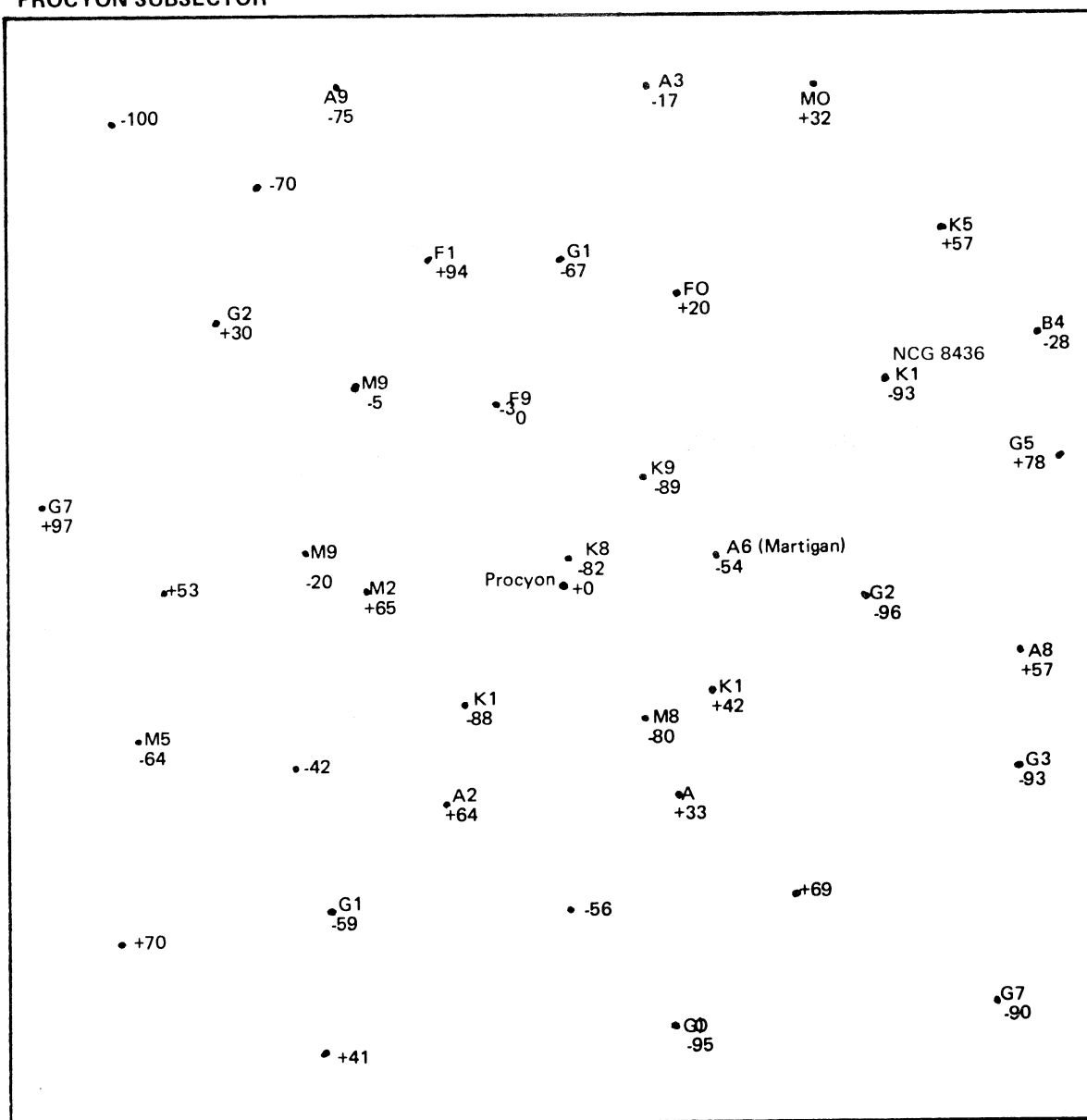
Stephen D. Kingsley



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PROCYON SUBSECTOR



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INTRODUCTION

Welcome to the universe of **Space Opera**, to both newcomers and old-timers alike **Space Opera** still has the most complete and accurate set of rules for science fiction role-playing in space that I've seen to this time. This tends to make things somewhat more complex than other SF role-playing games, but then life and nature are also complex.

Good StarMastering requires thorough familiarization with all of the material presented here, before guiding players through this adventure. Some information may be felt to be missing, but that is to allow for some personal touches to let this adventure better fit into your campaign universe.

DEDICATION AND THANKS

I'd like to thank Thomas C. Wilson, Jr. of the Marine Science Research Center and Marla Tanzman of the Chemistry Department, both located at the State University of New York at Stony Brook, for their assistance in obtaining information helpful to the creation of this adventure. Thanks also belong to my friends and fellow gamers at Waterloo Hobbies in Stony Brook for playtest assistance.

This adventure I'd like to dedicate to Arthur C. Clarke and many other authors for the ideas which helped in designing this adventure. To all of you, thanks.

Stephen D. Kingsley

BACKGROUND

The Interstellar Survey Cruiser, Outreach, is on a routine surveying tour beyond the frontier in the Procyon StarSector. Long range astronomical data estimates a 55% chance of a planet orbiting within the stellar ecosphere of a type K1 star designated NCG 8436.

Mission: Map out system, if there are planets. Determine habitability of any planets within ecosphere. Natural dangers and means of control should be checked. Contact with sentient natives, if any, arranged only with the approval of contact specialist personnel.

The Outreach left from the Martigan System after refueling. The sixth monthly maintenance check is to be performed enroute. The distance from Martigan to NCG 8436 is 57.3 light years.

Due to limited initial system information, conversion from hyperspace to normal space is to be programmed to occur at a distance of 50,000 LS from the star. Sensor range is for starship sized objects; a planet can be detected on sensors at ranges up to 300 times sensor range in light seconds; smaller objects (up to 100kg) might go undetected. Mass in kg is the percentage chance of detecting small objects.

Standard Survey Procedures include:

1. Close analysis of star to update astrogation tables and StarSector map.
2. Visual survey and planetary mapping.
3. Landing teams to determine suitability for colonization, local hazards, and methods of control.
4. Planet orbit mapping and typing for colonization potential.

Sentient Races: Decision on sentients, are they or aren't they? And whether or not an encounter with a starfaring culture will bring about social upheaval. Are problems to be handled by the contact service personnel. If indigenous sentient race(s) are discovered, the contact service personnel are authorized to assume control of the survey mission.

CHARACTER GENERATION GUIDELINES

Homeworld - Any is allowed; however, all are adapted to shipboard conditions of:

Gravity - 1.05 G
Air Pressure - 765 mm
IPP Oxygen - 160.2 mm
Temp. 19.5° C = 1.2° C (65° - 69° F)
Terran Standard Climate

Compute ht., wt., etc. by home planet statistics. Don't modify physique score for gravity; adjust physique only with regards for height tables usage and not weight.

Race - 85% will be Human (or Transhuman). No imperial prejudice intended, but most races work best with those who share a common language. Use minimum adjustments to PC scores for non-humans (if any are necessary).

Career Experience - All characters will belong to one of the following services:

1. Interstellar Survey - Remain on Board ship, except in emergency. Do preliminary survey from orbit.
2. Survey Scouts - Go down to planet to ascertain suitability for colonization, detailed survey-analysis.
3. Contact (and Diplomatic) - Determine native sentience, language and open trade - diplomatic relations.

Roll twice on the Initial Enlistment table and use the smaller (ignoring 1's) to indicate time spent in service to date.

Equipping the Character - Credits for equipment purchases are limited to PC Final (to date) Annual Salary x Intelligence x Years of Service x 0.03. Equipment purchases may be up to Tech/9. A wide range of equipment is encouraged as a wide variety of unknown conditions could be encountered. Equipment purchases are also limited to 1000 kg (1 tonne) by storage space available. Also, some sort of uniform should be purchased (CR 10 x rank grade for ship uniform and CR 25 x rank grade for surface expedition uniform). Uniforms mass 2 kg ship and 5 kg surface.

Note: All Non-Humans **Must** have expended skill points to learn linguistics and/or alien languages and customs to learn a common Human tongue.

ADDITIONAL CHARACTER CREATION GUIDELINES

Homeworld

Gravity - Various gravity fields don't change the mass of an object, but do change the weight. To reflect this change of weight from planet to planet of an object and on its effect on carrying capacity use the guidelines below.

Evaluate the PC's homeworld gravity to a specific value. The character's carrying capacity is what s/he can carry under a gravity equal to that of their planet of birth.

Add the PC's mass and carrying capacity. Then multiply by homeworld gravity to get an adjusted carrying capacity for 1 G (remembering to subtract body weight). Leave the body mass in the adjusted carrying capacity and divide by the local gravity to determine local adjusted (on occasions, some characters won't be able to carry their own mass/weight).

Atmosphere - Atmospheric pressure and oxygen partial pressure are important in this adventure, so evaluate them also.

OPTIONAL EQUIPMENT

Unarmored Powered Suit: A mesh body stocking of plastic, with 1.5 cm thick ribs along the extremities, to all hands and feet. It adds pressure to lower body to prevent hemostatic unconsciousness (blood rushing to feet) in high gravity conditions. A mini-comp/5 monitors the pressure/feedback controls. The mini-comp also gives off an audible tone when the suit power is low to allow the weaker time to remove the suit or replace/recharge the power cell.

	UPS/8	UPS/9
Tech Level	8	9
Strength Mult.	3x	4x
Powercell	48 hrs.	48 hrs.
Cost in CR	17,500*	25,000*
Mass	7.5 kg	9 kg

*Tailed suits cost 1500 - 5000 credits extra. Double all costs for installation in armor (both armor and powered suit).

The suit cannot be used with armor without extra cost (power armor tech/6+ can install the suit in armor in two days, no extra

cost). Unarmored powered suits may not be installed in PAPA combat armor (PAPA already has a power system).

The power suit runs out of power 15-20 (14+1d6) minutes after the tone sounds and then freezes in position. A 'frozen' suit may not be moved or removed by the wearer.

Use of the power suit requires a four week (80 hour) course or 2 (general) skill points expenditure prior to use. If learned rather than bought with SP, the skill is tested as if at Expertise Level 5.

Photographic Camera - 10 exposures to a film pack. Useful for gathering data on lifeforms and habitats to update ecosystem survey and library/5 computer programs, without having to trap specimens. Cost CR 350, Mass 1.5 kg, Film CR 10, Mass 0.25 kg. Film is self-developing, 10 cm x 10 cm.

Solar Energy Cell Recharger - Recharges a variety of standard energy cells used in sensors, electro-binoculars, power suits, etc. Time required to recharge is Duration/4 hours of daylight. An adaptor is available to recharge the energy cells of weapons. Time to charge is No. of Shots (charges)/2 Hours of Daylight, Tech/7.

SECR Cost = CR 50
Breakdown = 1/5
Mass = 2.5 kg

Adaptor Cost = CR 50
Breakdown = 1/2
Mass = 0.5 kg

The recharge unit may be collapsed for storage.

Survival Kit - Tech 4-7 (mixed). Four 1 liter cans of water, machete and belt sheath (610 mm, 1.5 kg as stabbing sword), nylon B hammock webbing (1 x 3 m), 100 m Synthelon A fish line (200 kg breaking strain), assorted fish hooks, insect netting (3 meters square), Personal Medipack, 1 parachute, 5 mm dia. flexible plastic tube 2 meters long, 3 magnesium flares, 5 x 2 m clear plastic sheet, wire saw, sharpening stone. Mass = 16 kg; Cost = CR 250.

Sensor Probe - A quasi-robotic device used to remotely gather data. A sensor probe is not self directed in its motions as a robot is, but requires a control board and an operator.

The sensor probe contains a wide range of sensory and telemetric equipment. Standard equipment includes science/engineering sensor/5, Com/TV video scanner (Color, IR and UV), vehicle communicator/5, (P) Mini-Computer 8.

The Mini-Computer provides local control for the scanner servos, manipulator servos, and does preliminary data analysis.

Mass = 30 kg
Powercell = 480 min.
Breakdown = 2/5
Cost = CR 35,000

The sensor probe is not capable of atmospheric re-entry. It does have a flying belt mechanism for propulsion inside or outside of an atmosphere (CG Harness 'AA' speeds).

Sensor Probe Controls - A briefcase sized panel incorporating 4 color TV monitors, 4 data printers and command control for up to 4 Sensor Probes. Can be connected to a larger computer to speed data entry and analysis. Required Com Tech Skills to operate.

Mass = 12.5 kg
Powercell = 960 min (also vehicle power)
Breakdown = 1/2
Cost = CR 50,000

Note: Sensor Probes and Controls are provided on the StarShip and are not listed in the Cargo Manifest.

CREW COMPLEMENT (ROSTER)

Vessel Name — Outreach
Registration No. 24693740-5-96
Type of Vessel — 20,000 tonnes
Interstellar Survey Cruiser

ASTRONAUTS (30)
Cruiser Captain (C.O)
Commander (X.O.)
Astrogation (N.O.)
Engineering (E.O.)
Pilot (9)
Astrogator (9)
Computers (4)
Communications, EW (4)

TECHNICIANS (95)
Medical (M.O.)
Physicians (3)
Medi-Techs (6)
Machinist
Com-Tech (6)
Computer Tech (15)
Power Tech (21)
Stardrive Tech (27)

SURVEY TEAM (380)

Scouts (240)
Expedition Leader (3)
Asst. Expedition Ldr. (6)
Sr. Group Leader (12)
Medi-Tech (6)
Computer Tech (18)
Mech Tech (18)
Com Tech (6)
Power Tech (24)
Armourer (24)
Armsmen Ratings (123)

PLANETARY SURVEY (140) (Interstellar Survey)

Scientists (Specializations) (63)
Planetology (21)
Biochemistry (21)
Xeno-Botany (7)
Xeno-Zoology (7)
Xeno-Ecology (7)
Historical Science (7)
Linguistics (21)
Comparative Cult. (14)

Engineers

Mechanical (14)
Power (7)
Electronic (7)
Armaments (7)

Physician (21)

Native Medicine (14) (Practical Physician)
Xeno-Medicine (7)
Psychology (7)
Armsmen Ratings (35)

Contact Team (20)

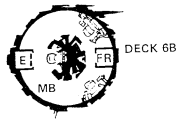
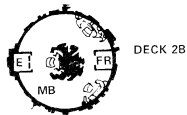
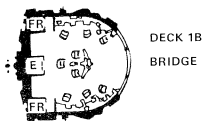
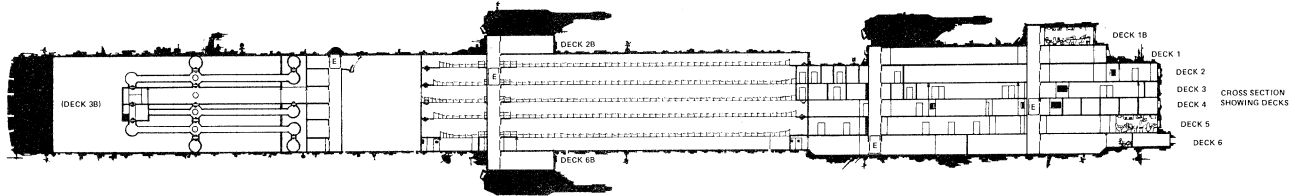
Total Crew Complement — 525

PROGRAMS LISTING

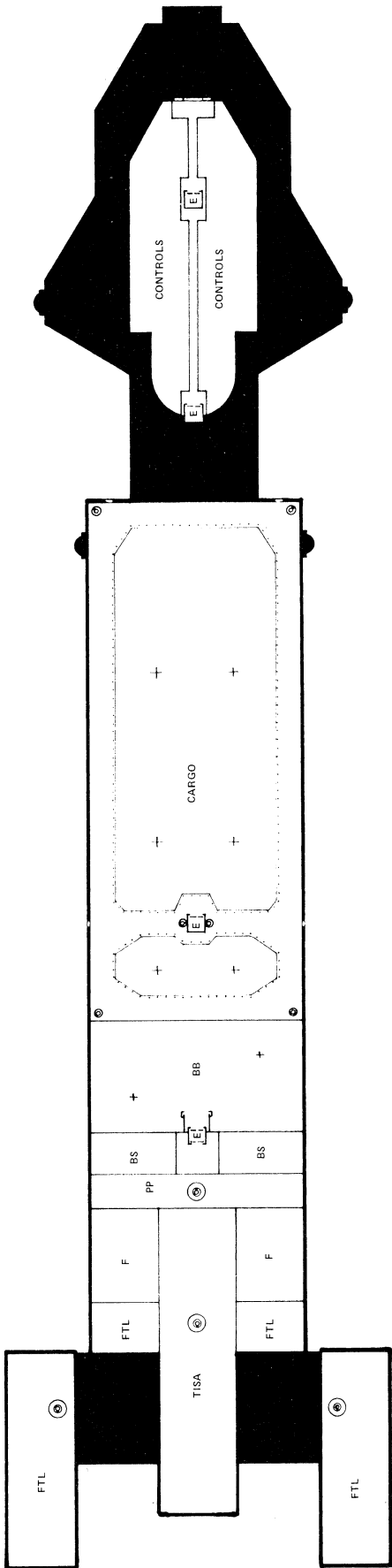
Vessel Name . . . . .	.Outreach
Registration No . . . . .	.24693740-5-96
Type of Vessel . . . . .	.20,000 tonnes Interstellar Survey Cruiser
Main Computer . . . . .	.Mk VIII CPU = 10,000 kdpu Data Bank = 50,000 kdpu
Secondary . . . . .	.Mk VI CPU = 5,000 kdpu Data Bank = 25,000 kdpu

OUTREACH

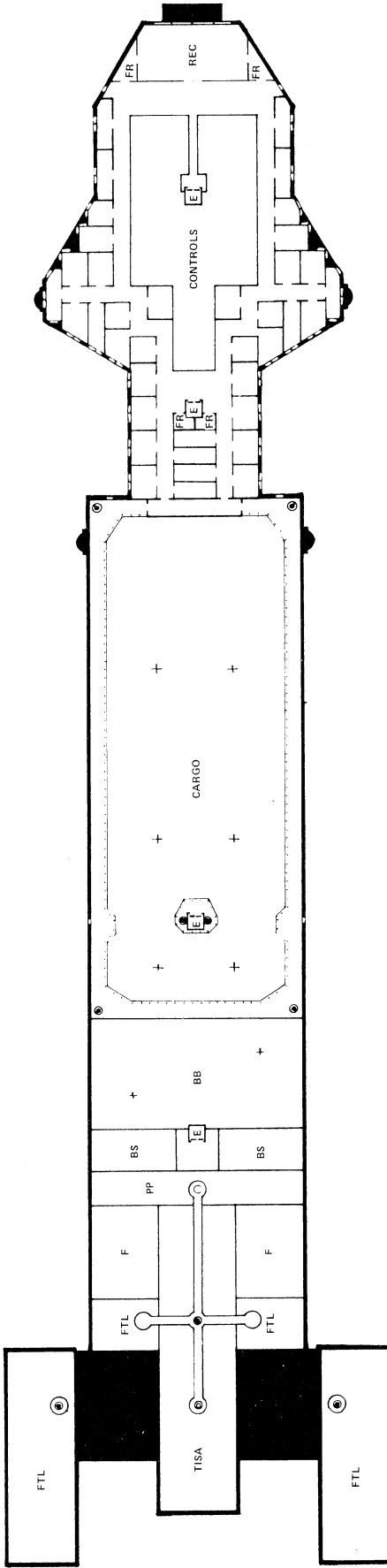
Specification	Mass (t)	Volume (m ³)	Deck Area	Comments
Hull	20,000t	60,000	30,000	6 decks
Controls	600t	1800	900	Computer Mk. VIII
Aux. Bridge	400t	1200	600	Computer Mk. Vi
Crew Quarters	600t	1800	900	125: 30 Astro; 95 Tech
Powerplant	400t	1200	600	AMC. 200 fuel units per 20 days
TISA Drive	1200t	3600	1800	Maximum = 60 LS. Acc. = +15 LS
FTL Warp Drive	2000t	6000	3000	Max. = 20 LY. Cruise = 12 LY
Fuel Capacity	700t	2100	1050	70,000 unit capacity. 200 units/100 LY
Middle Passage	2000t	6000	3000	400 passengers
Coldsleep	50t	150	75	50 berths
Sick Bay	245t	735	367.5	20 patient sick bay + 6 patient dispensary
Recreational	500t	1500	750	400 passengers awake
Cargo Hold	6133t	18,399	9199.5	Would be Cargo Manifest
Boat Bay	1334t	4002	2001	x2 Shuttle, x1 Lander
Damage Capacity				8000 damage points
BattleScreens	800t	2400	1200	+10/8000 screen damage points
BattleArmor	1300t	3900	1950	+4/+14 screened
Main Battery	600t	1800	900	3 x 2 NovaGun N*200
Hardpoints	8t	24	12	4 x 2 NovaGun N*50
StarTorpedoes	30t	90	45	2 x 3 StarTorp ST*257
EW/ECM	900t	2700	1350	Factor of 9
Sensors				4000 LS Range
Communications				SpaceCraft Com SSC/6
Workshops	200t	600	300	



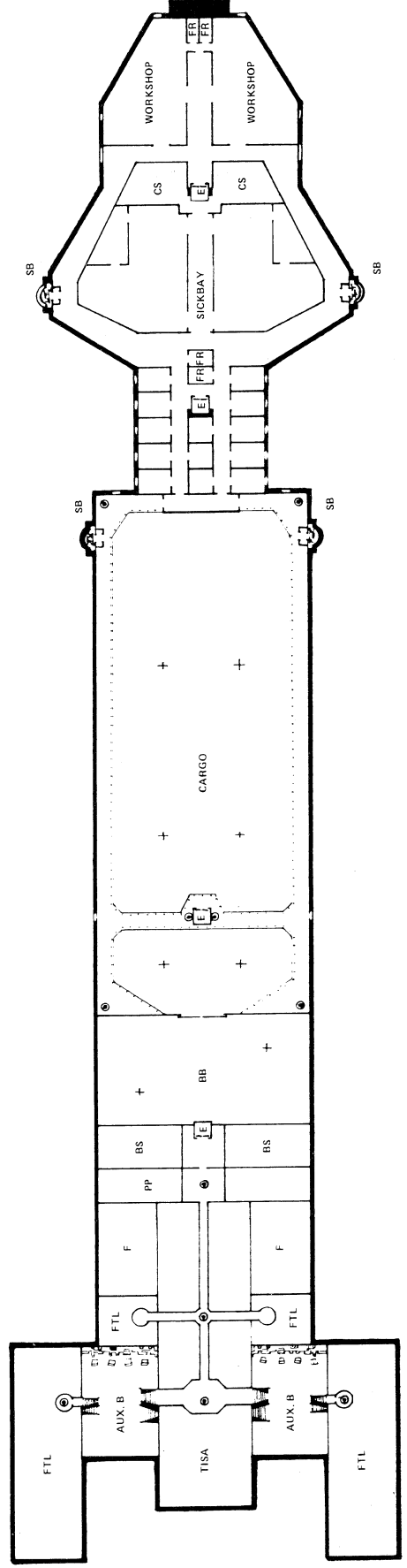
DECK 1



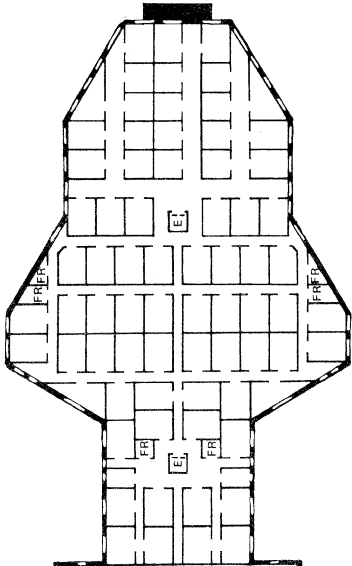
DECK 2



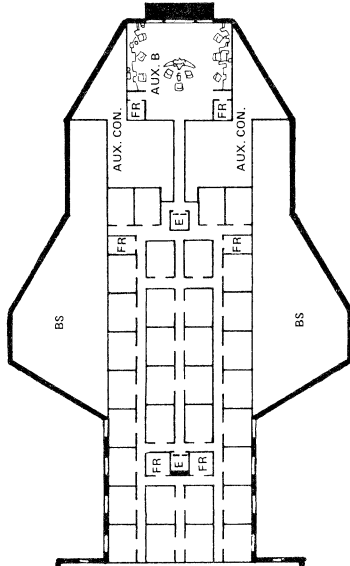
DECK 3



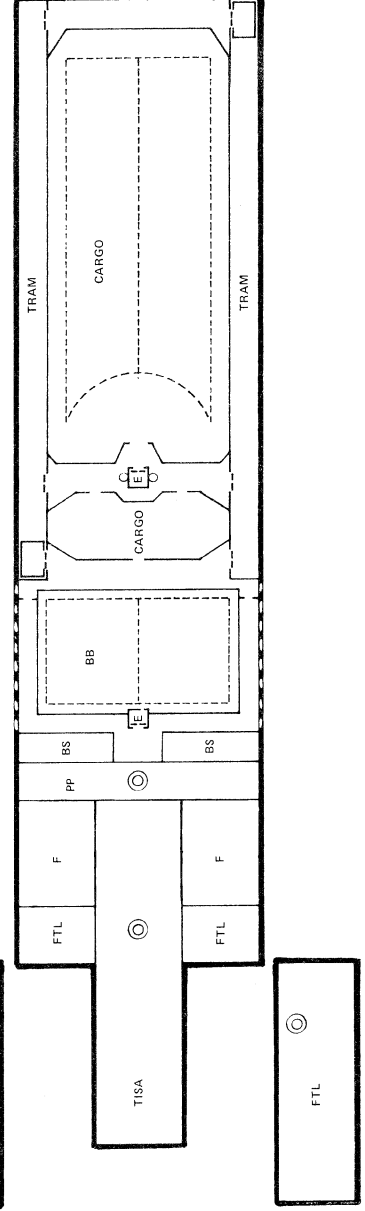
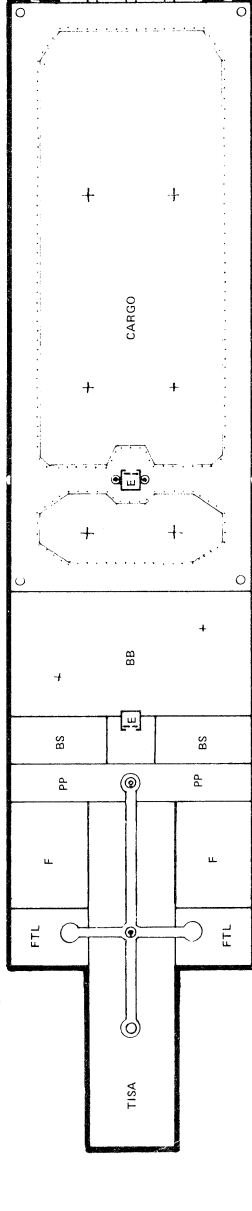
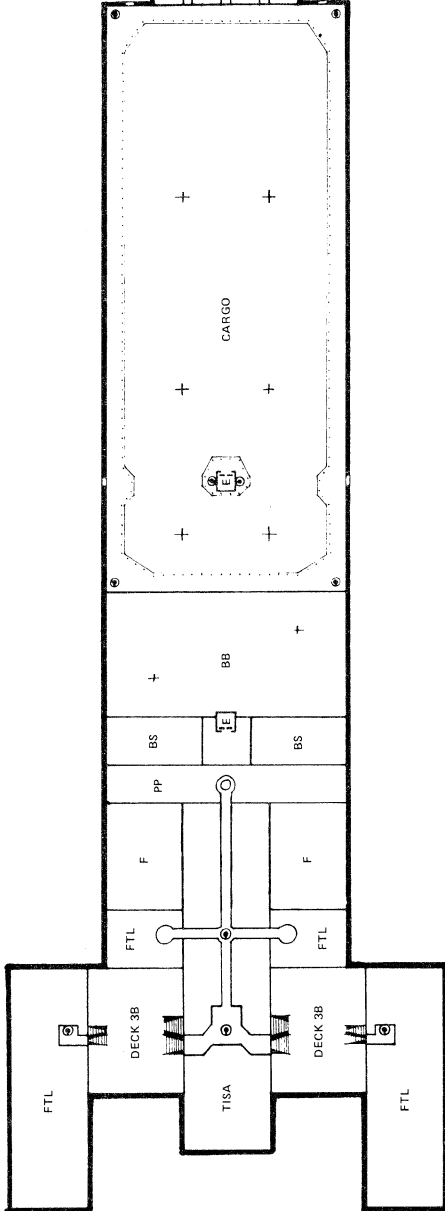
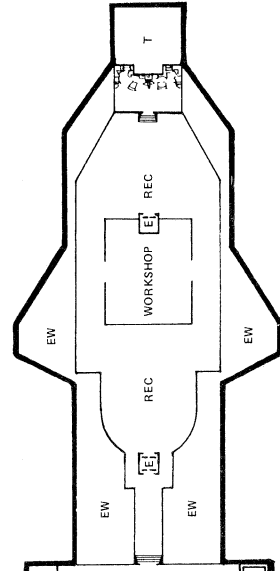
DECK 4



DECK 5



DECK 6



Programs	kdpu
Library 2 . . . . .	.10
Library 3 . . . . .	.1000
Library 4 . . . . .	.1500
Library 5 . . . . .	.5000
Ship's Systems . . . . .	.20
Life Support 3 . . . . .	.50
Galley 1 . . . . .	.3
Astrogation 1 . . . . .	.10
Astrogation 2 . . . . .	.50
Astrogation 3 . . . . .	.50
Hyperjump/250 . . . . .	.60
Damage Control . . . . .	.20
Engineering . . . . .	.200
Stellar Analysis . . . . .	.10
Planetary Survey . . . . .	.50
Astronomical Survey . . . . .	.50
Comparative Cultures . . . . .	.50
Linguistics . . . . .	.50
Ecosystem . . . . .	.50
Sensor Probe . . . . .	.30
Medical 1 . . . . .	.100
Medical 2 . . . . .	.100
Biomedical . . . . .	.500
Battle Display . . . . .	.25
Target Lock On 3 . . . . .	.30
Director . . . . .	.20
Target Selection . . . . .	.10
CyberLink . . . . .	.10
Auto Nav: Evasive 3 . . . . .	.50
Pilot Nav: Evasive 3 . . . . .	.75
Auto-Fire . . . . .	.25
Anti-missile 3 . . . . .	.50
(10) Force Screen . . . . .	.500
ECM 1 . . . . .	.50
ECM 3 . . . . .	.20
Total . . . . .	.9828

CARGO MANIFEST

Vessel Name . . . . .	.Outreach
Registration No . . . . .	.24693740-5-96
Type of Vessel . . . . .	.20,000 tonnes Interstellar Survey Cruiser
Cargo Tonnage . . . . .	.6133 tonnes

TONNAGE ALLOCATION:

Magazine . . . . .	.2100 tonnes	
NovaGun* 200 . . . . .	.420 tonnes . . . . .	.2100 rds.
NovaGun* 50 . . . . .	.120 tonnes . . . . .	.2400 rds.
StarTorp . . . . .	.1200 tonnes . . . . .	.1800 ST*257 1500 ST*157
Survey Gear . . . . .	.2500 tonnes	

Qty.	Description	Unit Mass	Total Mass
4	Cargo Trak	50t	200t
10	Hvy. Crawler	12t	120t
10	Hvy. Crawler Mod. for Land Clearing/No Cargo	15t	150t
10	Hvy. GravSled	10t	100t
3	MultiComp Mk. VI	2.5t	7.5t
40	Pre-Fab Cabin PFC(P)	10t	400t
1000	Coil, Duralon	1 kg	1t
12,000	Field Ration Packs	.5 kg	6t
40	Field Medikit	5 kg	0.2t
10	Hvy. Field Workshop	10t	100t
20	Vibrosaw	5 kg	0.1t
10	Mobile Workshop	1t	10t
2	Submersible	25t	50t
1	Cargo Sub	100t	100t
10	ATV Lt. Truck	5t	50t
10	Hvy. Helicopter	50t	500t
10	Lt. Plane	3t	30t
2	Hvy. Transport	150t	300t
Total Mass			2124.8t

Personal Gear525 tonnes
1t per passenger/crew member

Ships Stores & Spares.1008 tonnes

NCG 8436

Stellar Type — K1
Radius 778,982.4 km
FTL Conversion — 15,000 LS

PLANET I

Dia. — 8050 km
Orbital Radius — 62,318,592 km (208.I LS)
Period — 81.76 Standard Days
Surface Gravity — 0.875 G
Atmosphere — Trace

Hydrographic Rating — 7%
Surface Temp. — 25.5° - 57.6° C

PLANET II

Dia. — 25,760 km
Orbital Radius — 109,057,540 km (364.2 LS)
Period — 286.16 Standard Days
Surface Gravity — 2.0 G
Atmosphere — Dense

Hydrographic — 97%
Surface Temp. — 16.2° - 48.3° C

Moon I

Dia. — 2730.56 km
Surface Gravity — 0.19 G
Orbital Radius — 1,030,400 km
Orbital Period — 32.46 Days

Moon II

Dia. — 4,791.4 km
Surface Gravity — 0.56 G
Orbital Radius — 1,803,200 km
Orbital Period - 113.63 Days

PLANET III

Dia. — 67,620 km
Orbital Radius — 155,796,480 km (520.2 LS)
Period — 408.8 Standard Days
Surface Gravity — 4.2 G
Atmosphere — Dense (Exotic; non-breathable, ammonia, methane)
Planetary Type — (effectively) 8: Jovian
Hydrographic Rating — 93%
Surface Temp. — 55.4° - 83.7° C
13 Moons

PLANET IV

Dia. — 54,740 km
Orbital Radius — 249,274,370 km (832.4 LS)
Period — 654.1 Standard Days
Surface Gravity — 2..55 G
Atmosphere — Dense (Exotic; non-breathable, ammonia, methane,
hydrogen)
Planetary Type — 5: Jovian
Hydrographic Rating — 94%
Surface Temp. — 38.6° - 5.4° C
9 Moons



**UNITED FEDERATION OF PLANETS
DEPARTMENT OF INTERSTELLAR SURVEY**

Form 217/DIS.8JE

SURVEY EVALUATION, PLANET GRINTH I

STAR SYSTEM DESIGNATION GRINTH (tentative) **BEARING FROM MARKER STAR** 69.9 LY 33°
STELLAR PRIMARY TYPE K1 **DISTANCE FROM MARKER STAR** 69.9 LY
PLANETS IN STAR SYSTEM 8 **VERTICAL COORDINATE** -92 -93

PLANETARY TYPE Type 13/Low Pressure

ORBITAL DISTANCE 208 **LS** **PLANETARY DIAMETER** 89 8050 **km**
LENGTH OF YEAR 81.76 standard **days** **SURFACE GRAVITY FIELD** 0.875 **G**
LENGTH OF DAY 51.41 **hours** **HYDROSPHERIC RATING** 7 **%**
TEMPERATURE RANGE 25.5°-57.6°C

ATMOSPHERIC TYPE Low Pressure (382 mm)

COMMENTS ON ATMOSPHERE:

Composition (% by Volume)

Nitrogen 80.084	Oxygen 15.2674	Fluorine 2.32
Xenon 2.2742	Carbon Dioxide 0.0335	Water Vapor (Variable) 0.0209

Fluorine content makes atmosphere mildly corrosive.

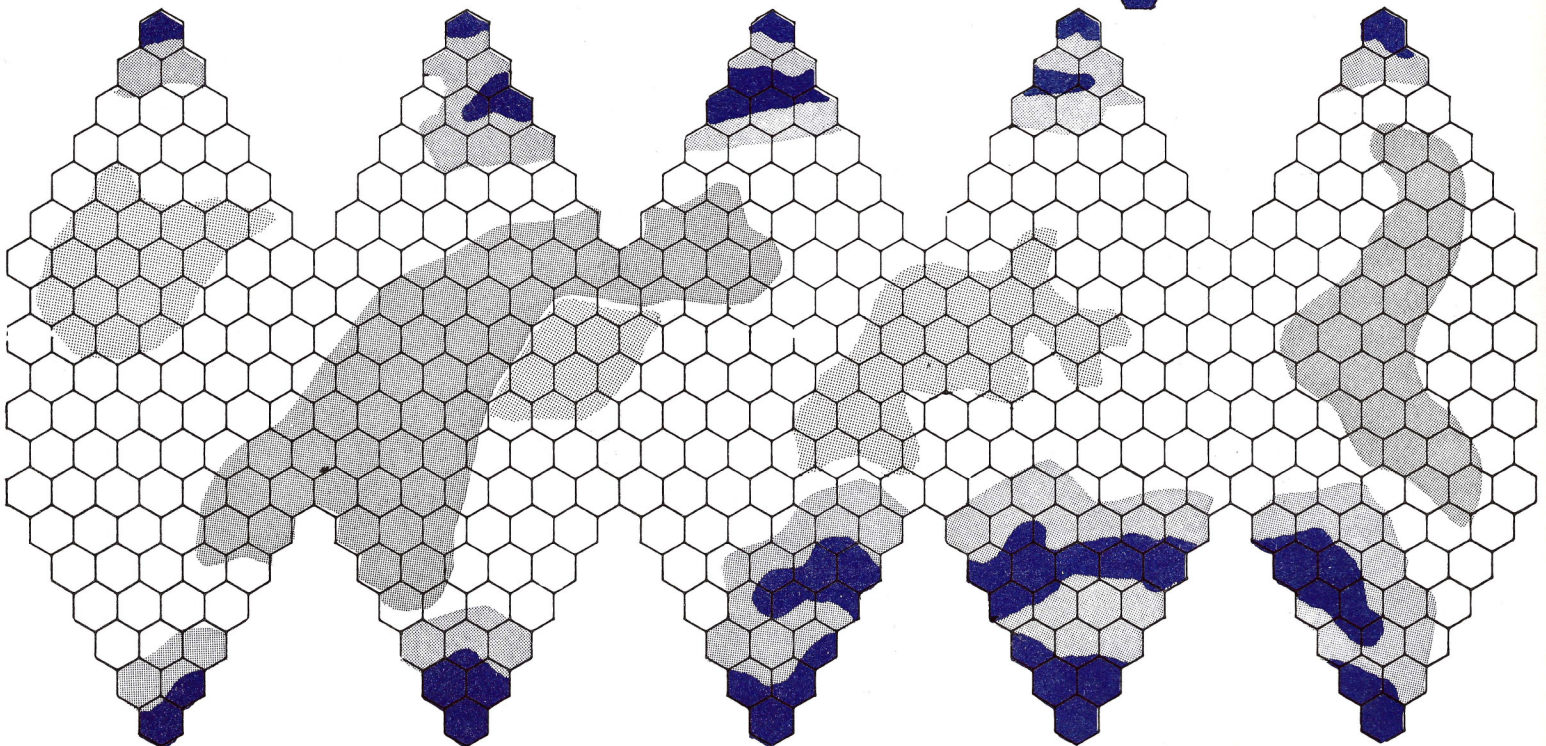
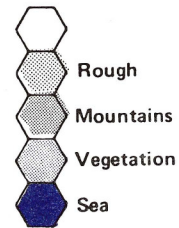
COMMENTS:

*Seas are of weak hydrofluoric acid. (approx. pH 5.4)

The bodies of water tend to be shallow and vary in size due to rapid evaporation (high temp, low pressure) and heavy localized storms.

Thunderstorms are of high frequency in the Polar Region and quite colorful due to atmospheric xenon.

Respirators and protective suits are strongly recommended.





UNITED FEDERATION OF PLANETS CONTACTS SERVICE

Form 550/CS.6MV

SENTIENT RACE REPORT, PLANET GRINTH II TECHNOLOGICAL LEVEL 4
SENTIENT RACE TYPE Saurian SOCIAL ORGANIZATION Caste
POPULATION LEVEL 100,000,000 SOCIETAL STRENGTH 5
POPULATION DENSITY 1.9/10 km^2 (land mass) XENO ACCEPTANCE INDEX 16% (100%)

Table with 4 columns: MAJOR CITIES, POPULATION, STARPORT FACILITIES, DOCKING CHARGES. Row 1: Heaven Stone, 5,800,000, -, -

GOVERNMENT:
TYPE OF GOVERNMENT Religious BUREAUCRACY LEVEL
SUPPORT INDEX 30% REPRESSION INDEX 10% LAW LEVEL 17
LOYALTY INDEX 74% CORRUPTION INDEX 15% TAX RATE
TOTAL TAX MCR

POLITICAL PARTIES & SIGNIFICANT POLICIES

- 1. Church of the Stone: God symbol is a black tetrahedron. God is a visit visitor from the stars and will come again.
2.
3.
4.
5.

CURRENT POLITICAL SITUATION:

PARTY IN GOVERNMENT STABILITY VOTE %
PARTY/PARTIES OPPOSING VOTE %

CURRENT FOREIGN ALLIANCES:

TRADE ALLIANCES:

MILITARY ALLIANCES:

OTHER ALLIANCES:

PLANETARY TRADE & COMMERCE:

INDUSTRIALIZATION INDEX AVERAGE INCOME CR
TECHNOLOGY & ANOMALIES

MAJOR IMPORTS

- 1
2
3
4
5

MAJOR EXPORTS

- 1
2
3
4
5

IMPORT/EXPORT RESTRICTIONS & DUTIES

TRADE ACCEPTANCE INDEX

GENERAL COMMENTS:



**UNITED FEDERATION OF PLANETS
DEPARTMENT OF INTERSTELLAR SURVEY**

Form 217/DIS.8JE

SURVEY EVALUATION, PLANET GRINTH II

STAR SYSTEM DESIGNATION GRINTH (tentative) **BEARING FROM MARKER STAR** 33°
STELLAR PRIMARY TYPE K1 **DISTANCE FROM MARKER STAR** 69.9 LY
PLANETS IN STAR SYSTEM 8 **VERTICAL COORDINATE** -93

PLANETARY TYPE 2/Ocean

ORBITAL DISTANCE 364.2 **LS** **PLANETARY DIAMETER** 25,760 **km**
LENGTH OF YEAR 286.16 standard **days** **SURFACE GRAVITY FIELD** 2.00 **G**
LENGTH OF DAY 31.5 **hours** **HYDROSPHERIC RATING** 97 **%**
TEMPERATURE RANGE 16.2°-48.3°C

ATMOSPHERIC TYPE High Pressure (3783 mm)

COMMENTS ON ATMOSPHERE:

Composition (% by Volume)

Nitrogen 62.8731
Argon 2.308

Oxygen 30.018
Neon 0.2107

Water Vapor 4.5337 (Var.)
Carbon Dioxide 0.0565

Partial pressure of oxygen could cause oxygen poisoning.

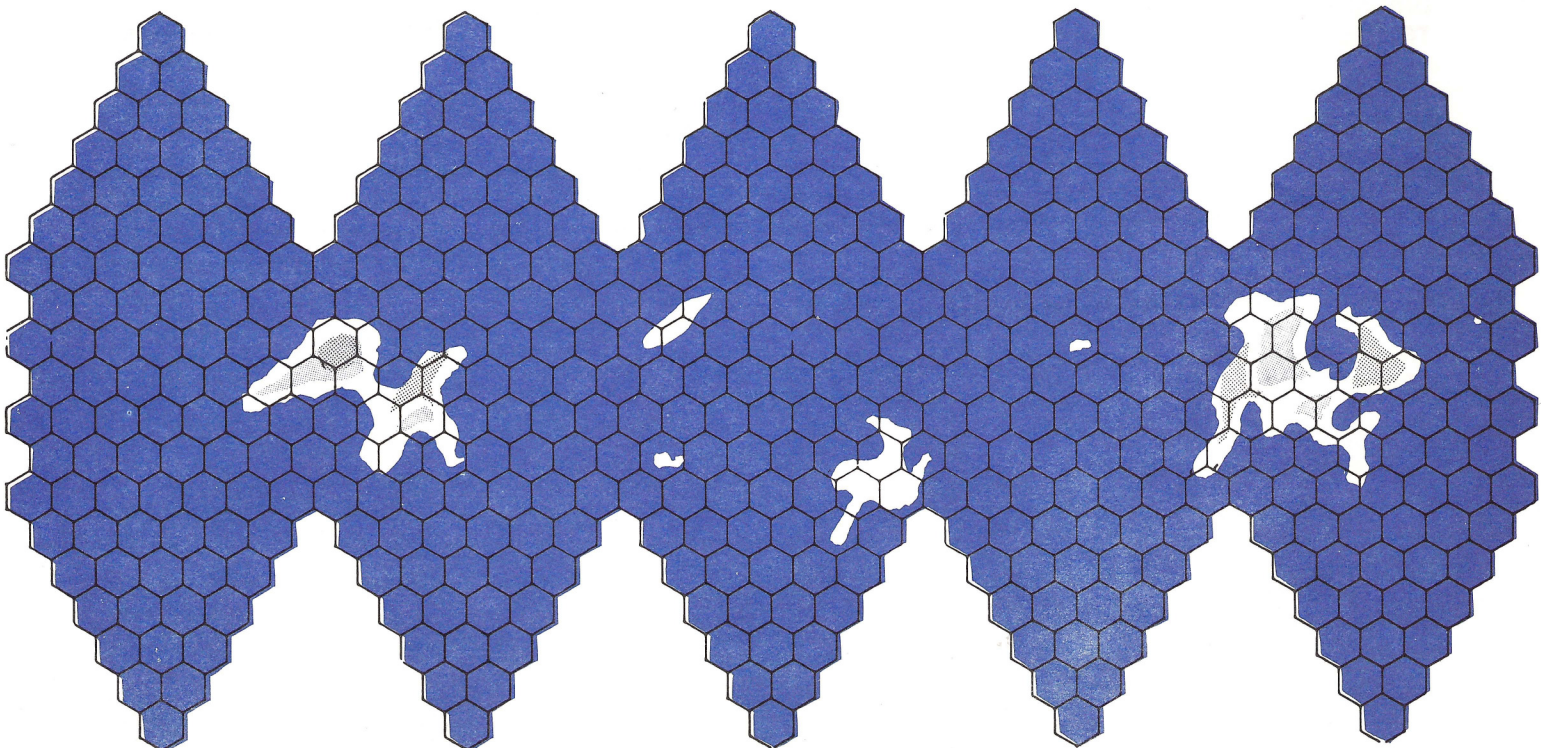
COMMENTS:

Mountain ranges are practically non-existent. The sea is basically shallow (rarely deeper than 100 meters).

Rainstorms are fairly common in occurrence, and tend to be of a severe nature.

Very little Tidal action.

Scale = 2312.2 km/hex



PLANET V

Dia. — 24,150 km
 Orbital Radius — 436,230,140 km (1,456.7 LS)
 Period — 2,289.3 Standard Days
 Surface Gravity - 1.875 G
 Atmosphere — Dense (Non-breathable)
 Planetary Type — 14/5
 Hydrographic Rating — 85%
 Surface Temp. — 145.5° - 123.1° C

Moon I

Dia. — 1255.8 km
 Surface Gravity — 0.12 G
 Orbital Radius — 966,000 km

Moon II

Dia. — 4,588.5 km
 Surface Gravity — 0.61 G
 Orbital Radius — 1,690,500 km
 Atmosphere — Very thin (Non-breathable)
 Planetary Type — 5
 Hydrographic Rating — 22%
 Surface Temp. — 15.8° - 5.4° C

Moon III

Dia. — 772.8 km
 Surface Gravity — 0.078 G
 Orbital Radius — 2,415,000 km

PLANET VI

Dia. — 24,150 km
 Orbital Radius — 810,171,700 km (2,705.3 LS)
 Period — 4,251.5 Standard Days
 Surface Gravity — 1.3125 G
 Atmosphere — Dense (Non-breathable, methane, ammonia, hydrogen)
 Planetary Type — 17
 Hydrographic Rating — 82%
 Surface Temp. — 193.9° - 178.8° C

PLANET VII

Dia. — 22,540 km
 Orbital Radius — 1,557,964,800 km (5,202.8 LS)
 Period — 12,264 Standard Days
 Surface Gravity — 2.1 G
 Atmosphere — Dense
 Planetary Type — 17
 Hydrographic Rating — 83%
 Surface Temp. — 208.7° - 191.6° C

Moon

Dia. — 2,885.1 km
 Surface Gravity — 0.3136 G
 Orbital Radius — 901,600 km

PLANET VIII

Dia — 19,320 km
 Orbital Radius — 3,053,611,000 km (10,197.1 LS)
 Period — 32,049.9 Standard Days
 Surface Gravity — 2.1 G
 Atmosphere — Standard
 Planetary Type — 18
 Hydrographic Rating — 86%
 Surface Temp. — 266.5° - 250.4° C

SYSTEM MAP AND PLANETARY MOTION

In the course of an extended visit to a stellar system, the planets are expected to move (in some fashion, hopefully in a somewhat circular orbit). Staying in orbit about one planet for a certain length of time can reduce travel time between planets, by waiting at the one currently orbited until closest approach of the target planet.

Locating a planet at any time is like staking a claim when mining in space. Three pieces of information are needed:

1. Initial Location — distance and direction from stellar primary with respect to a marker star.
2. Elapsed time from original sighting.
3. Orbital Velocity (or to simplify things a bit, orbital period).

Below is a system schematic (distances not to scale) of the Star System NCG 8436 at the time the survey vessel arrives in the vicinity. (Initial Location).

Elapsed time should be kept track of by the StarMaster (and the characters, because their lives depend on having fuel enough to return home).

Assuming a perfectly circular orbit (which is very rare but easier to work with), a planet changes position by (n x 360)/period degrees per number of days n (from the initial position n = 0).

The distance between planets can now be determined by the Pythagorean Formula (trigonometry; use of a calculator/Mini-Comp 2 strongly recommended).

$$d = \sqrt{a^2 + b^2 - 2 ab \cos c}$$

d is the distance between Planet A and Planet B.
 a(b) is the distance of Planet A (Planet B) from the sun.
 c is the angular measure (in degrees) between Planets A and B measured from the sun.

Examples - Planet III is a distance of

$$d^2 = (520.2)^2 + (832.4)^2 - (2) (520.2) (832.4) \cos 160^\circ$$

$$d = 1,333.15 \text{ LS}$$

from Planet IV at time of arrival. Twenty days later the angle has changed because Planet IV has progressed by (20 x 360)/654.1 degrees = 11 degrees, and Planet III by (20 x 360)/408.8 = 17.6 degrees. Now the distance between them is:

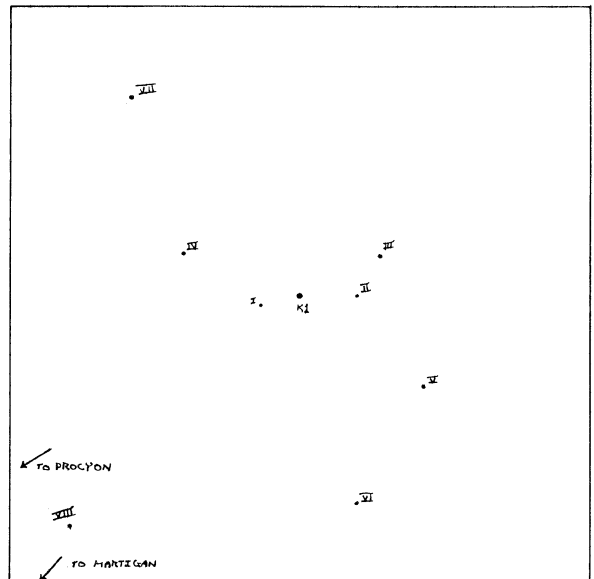
$$d^2 = (520.2)^2 + (832.4)^2 - (2) (520.2) (832.4) \cos 153.4^\circ$$

$$d = 1,318.28 \text{ LS}$$

Hey, they moved! But it does take a bit of time to work out with a bunch of planets involved.

Having planets that move is an optional 'rule'. It adds a little realism and a lot of time. As fast as StarShips travel between planets, travel time isn't affected much by the motion of planets.

System Schematic (distances not to scale)



ENCOUNTER TABLES

NCG 8436 GRINTH (Tentative)

PLANET I

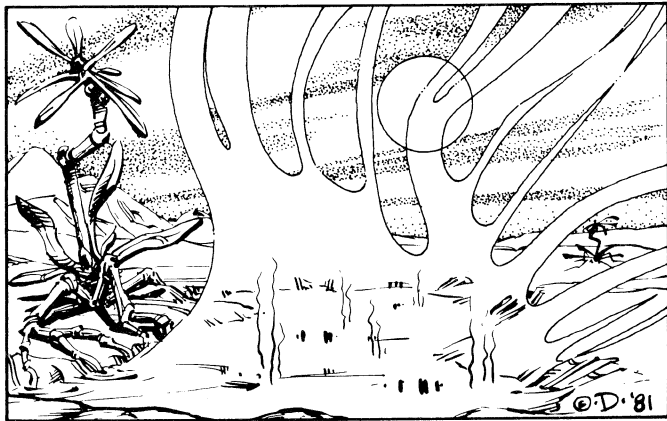
Polar Regions (1d100)

- 01-35 Event
- 36-90 Plant
- 91-(1)00 Animal

EVENT 1d10

1-5: **Thunderstorm:** Preceded by a rapid accumulation of cumulonimbus cloud formations. Storm lasts 1d3 (1-3) hours. Visibility is reduced to 15 m.

6-8: **Hot Springs:** The surveying party has found a steaming fumarole. Locally, within 2 km, the atmosphere will be even more noxious (everybody has a respirator on, I hope). Sulphur and sulfur hexafluorides are the new atmospheric compounds. On breakdown check (next, if not currently applicable), subtract 2 from the roll.



9-10: **Oasis:** Similar to above, except that the water is clear. Low pressure causes the steam. If the survey team spends any time at one location, roll intelligence or less (d20) to notice decreasing size of pond.

PLANT LIFE 1d100

01-98: Totally innocuous trees, grasses, shrubbery

99-100: Roll 1d6

1-2: **Fixatef** - collects atmospheric flourine depositing it in fluid filled bladders (hydrofluoric acid). Breaking (stepping on) the bladders releases the acid. Acid wound factor is +2. Armor penetration:

S	K	J	I	H	G	F	E	D	C	B	A	Screen
A	2	3	4	6	7	8	9	10	-	-	-	A

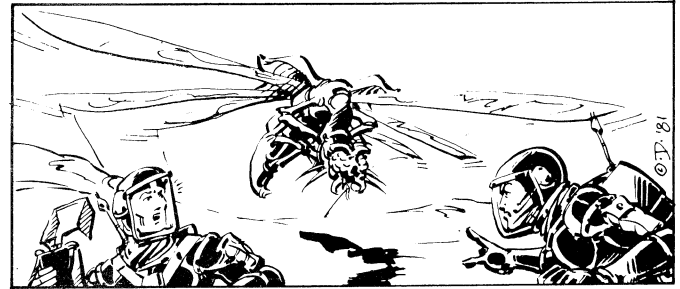
Grows to a height of 10 cm.

3-4: **Gum Fern:** Sticky excretion on fern-like leaves. Roll under strength on 1d20-5 to free self. Otherwise, roll 3 or less on 1d20 to breach clothing (armor, protective suit, etc.). Grows to a height of 6m.

5-6: **Spinder:** Cactus-like (Joshua Tree) plant with widespread root system. Ground pressure triggers the spines to eject as a full-auto dart rifle (360°, +1 penetration). It feeds through its root system (10 m radius), and grows to a height of 15 m.

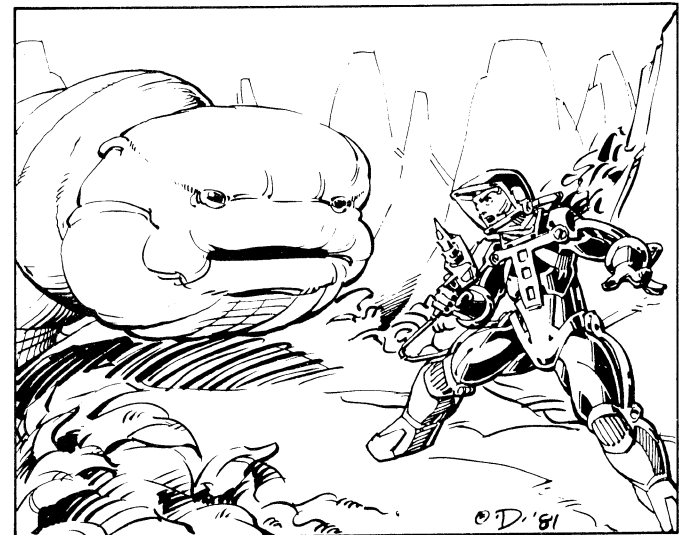
ANIMAL LIFE 1d10

1-3: **Furzy:** A multi-legged (42; 21 pairs) insect which eats vegetation voraciously for a period of 6 planetary days. In this time it grows from a length of 5 mm to a length of 2 meters. It then spins a sarcophagous of 'silk.' After 1 day in this sarcophagous, the Furzy re-emerges transformed into a **Lepido**. The Lepido does not eat. It has a lifespan of 3 days, in which it will mate and lay eggs which lay dormant for the rest of the year. A Lepido has 3 pairs of wings. Wing-span is 5 meters, length overall is 1.5 meters. Note: Furzy 'silk,' if woven into a garment, acts as combat body armor Type 5/C (armor ratings the same, no covering for the head) with a mass of 5 kg and cost of 8,000 CR.



	Animal Class	Movement Class
Furzy	0 - J	Very slow (no run or sprint)
Lepido	K	Very slow/fast

4-6: **Fluoroworm:** The predominant form of life is a form of worm. The natural habitat is located within 1,000 km of the bodies of water. Hermaphroditic, with live birth, they can grow to lengths of 75 m and 10 m in diameter. Their natural armor is effectively Class C. Animal Speed Class and Size Rating: Slow on the surface with trot (20 m/6 sec.) as the maximum burrowing speed; AAAA+. Senses: Very poor eyesight (human-size objects resolved out to 50 m). Smell (taste?) is fairly acute, capable of detecting a variety of chemical compositions (food?), at ranges of up to 14 km (if the wind is right, 5 km if no wind and 2 km if wind opposes). Auditory senses are concentrated in the skin, giving it excellent audible direction - finding capability (including ground vibration). Intelligence: Inquisitive, sentience is questionable. Learning capability is high. Vocal mimicry frequently occurs within a few minutes. Natural Weaponry: Class A hinged jaws. Diet: A wide variety of organic compounds with certain fluorocarbons and (sub-surface) minerals essential for health.



7-8: **Marsh Flea:** Massing under 3 grams, the marsh flea is quite easily overlooked (not seen). Due to its small size, the marsh flea can infiltrate armor (or clothing) through the smallest of openings. Even if there are no openings for the flea to get in through, with its powerful (relatively) claws it can make an opening in protective garments. The chance for the flea to do so vs. various armor is:

Armor	% Chance per Hour
S	.32
K	.30
J	.27
I	.25
H	.22
G	.20
F	.17
E	.15
D	.12
C	.10
B	.7
A	.5
Screen	.100
AFV	.01

Movement class - Slow Armor D 1 Hit

The flea is attracted to water, If a person is not sweating, it will try to penetrate the skin. Wound Factor is -70.

9: **Loonist:** A membrane sack semi-permeable to the trace amounts of atmospheric hydrogen. The Loonist trails a few tendrils for the absorption of pollen for food. It floats wherever the wind blows it. Any weapons hit is likely (95% chance) to kill the Loonist outright (with the exception of stunners). Diameters of 2 meters are very uncommon; it is usually smaller. Altitude can be controlled to a small extent, the permeability of the membrane is controllable.

10: **Gr'ant:** Social insect (akin to the terran honey bee or carpenter ant) massing under 15 grams. It is attracted to bright colors (local flora) which appear to be food. The 'colony' is detectable by the bodies of the dead which are removed. The colony is located underground (40%; bodies lying around the opening) or in a tree (60%; 90% hollow or dead). The colony protects itself from harm by 'posting sentries.' The sentries mass 28 grams and attack with pincers (mandibles) as Animal J going for exposed surfaces first (attracted by scent). Penetration indicates that Poison P8 was injected subcutaneously (Note: This is not lethal 95% of the time; check allergic reaction). Movement Class: Slow/flyer. Armor K. 1 Hit

PLANET I ENCOUNTERS

Equatorial Region 1d100

01-55 Event
56-95 Plant
96-(1)00 Animal

EVENT 1d20

1: **Meteoritic Impace:** Roll 1d6 to determine mass (in kg) of meteoric fragment. Mass equates to nuclear warhead blast strengths:

Kg	Warhead
1 . . . . .	.0.1 kiloton
3 . . . . .	.0.5 kiloton
5 . . . . .	.5.0 kiloton
2 . . . . .	.0.25 kiloton
4 . . . . .	.1.0 kiloton
6 . . . . .	.10.0 kiloton*

*Warhead blast strengths as given in **Space Opera: Ground and Air Equipment**, page 27.

Determine range from impact by rolling 10d100 meters. No radiation zones result.

2: **Canyon:** Created by wind (or ages ago - water erosion). 3d10 km long, blocking forward path, 2d100 meters deep.

3-4: **Sandstorm:** (Concurrent with a polar thunder storm), winds of 80-200 kph (visibility of 10d10 meters). 'Sand Blasting' increases chance of breakdown. Check every 10 minutes exposed with a DM of -2. A sandstorm lasts 1d3 hours.

5-6: **Dust Storm:** (As sandstorm above), winds of 50-100 kph. Visibility reduced to 20d20 meters. Breakdown DM is -1. A dust storm lasts 1d3 hours.

7-14: No unusual encounters: (Plant 01-98).

15-16: **Dust Storm:** (See 5-6 above).

17-18: **Sandstorm:** (See 3-4 above).

19: **Canyon:** (See 2 above).

20: **Artesian Well:** A natural upwelling pool of water 1d10 meters across. Various minerals are in solution ('hard' water). Atmospheric fluorine dissolved in water yields a pH of 6.3.

PLANT LIFE 1d100

01-98: Totally innocuous grasses, low lying shrubbery, cacti.

99-(1)00: Roll 1d6.

1-3: **Spinder:** (As polar region plant) 30 meter radius root system, 12 meters tall. No penetration modifier.

4-5: **Pyrotumble:** Grows as spindly, thorny, spheroid 1.5 meters in diameter. It absorbs and retains phosphorus compounds. When dead and dry, it breaks loose of its root system to roll about with the wind. Sharp impact, or spark, is sufficient (except under laboratory controlled conditions) to ignite as a thermal/flare warhead Type F.

6: **Gumfern:** (As polar region plant), Freeing roll DM of -7. Grows to a height of 3.5 meters.

ANIMAL LIFE 1d10

1-3: **Aqaba Gorbeh:** Subterranean carnivore massing 1/4 kilogram. It kicks the sand up and out to form a conical trap .3 meters deep. Prey wanders in and slides to the bottom, where it tires while trying to dig itself out. The Aqaba Gorbeh attacks as Animal I, moves slow, natural armor I.

4-5: **Loonist:** As found in the Polar Region.

6-7: **Gr'ant:** (similar to Polar Region) Massing 3-5 grams less than their Polar Region cousins. Residing underground at all times to avoid the heat of day.

8-10: **Sand Flea:** (similar to Polar Marsh Flea) Sandy coloration makes them harder to spot than their Polar relatives.

ADDITIONAL PLANETARY NOTES FOR THE STARMASTER

Human skin has a pH of 5.5; therefore, swimming in or drinking the local water isn't very hazardous.

Due to the stmospheric fluorine, check once every 12 hours exposed for protective suit leakage (breakdown 1 on 1d20) or vehicle malfunction.

Atmospheric fluorine only poses a health hazard on the failure of a constitution CR by 4 or more (V. Light Wound - chest). Check for an encounter every 1-3 hours.

Atmospheric pressures are in mm of mercury (Earth sea level norm 762 mm). To find the partial pressure (IPP), multiply the atmospheric pressure by the constituent percentage (IPP O₂ Earth normal is 159.61 mm).

The Fluoroworm is not sentient.

ENCOUNTER TABLES

NCG 8436 GRINTH (Tentative)

PLANET II

Land Masses (1d100)

01-25 Event
26-70 Plant
71-(1)00 Animal

EVENT 1d10

1-2: **'Animal' Trail:** This will always be a hard packed dirt path winding its way through the undergrowth. 65% of the time, it will be an animal trail leading to a watering hole from various animals' dens. The rest of the time, this is a road. A 10 or less on 1d100 indicates that it is currently being travelled. Roll for animal type (animal encounter table) or use the information given in the section on the Grinthi.

3: **Earth Tremor:** 1d6 and 1d10/10 (read 10 as 0) for Richter Scale intensity.

Magnitude	Effects
1+	Can only be detected by instruments.
2+	Can be felt, barely, by a few and only at the epicenter.
3+	May be felt by most near the epicenter as if a 3 ton vehicle passed nearby.

4+	Awakens many sleepers. Trees and bushes shake slightly.
5+	Frightens everyone. It is difficult to stand. Trees shake strongly. May cause mud or rock slide; 35% chance (see No. 7 below).
6+	Moderate - heavy damage.
Mud or Rock Slide	General Panic (Bravery CR).
65% of the Time	Ground cracks conspicuously.

All earthquake (tremor) effects reduce rapidly with distance from the epicenter (distance from epicenter and consequent effects on party are left for the StarMaster to determine).

4-6: **Thunderstorm**: Preceded by an increased build-up of clouds locally. Storm lasts 2d3 (2-6) hours. Visibility is reduced to 15 m. It may cause mud or rock slide 45% of the time (see No. 7 below).



7: **Rock or Mud Slide**: Intuition CR if the slide is not readily visible (thunder storm, night, etc.). The slide will move at a base rate of 54 kmh (90 m/6 sec. turn) and accelerate by half that amount (45 m/6 sec. turn) for 2d10 turns before slowing down at a rate of 90 m per turn. Agility rolls may be required. Damage is 5d10 to people in the open; 3d6 to vehicles and structures (pressurized cabins have a damage capacity of 15); people in protection (vehicle or cabin) 1d6. Roll on hit location tables as usual.

8-9: **River**: Swiftly flowing (white water) river across direction of travel. StarMaster determines actual direction of flow. If the party is following an 'Animal' trail (see No. 1 above), there is a 30% chance for there to be some form of crude bridge. 2% otherwise for just a downed tree spanning the river nearby. The flow is too swift for a ground vehicle to cross safely.

10: **Canyon**: Formed by river (8-9 above) 75% of the time, or earth tremor (3 above) 25% of the time. As 8-9 above if characters followed a trail for a chance of a bridge. 3d20 m wide.

PLANT LIFE 1d100

1-94: Totally innocuous trees, shrubbery, and grasses.

95-(1)00: Roll 2d6.

2-6: **Teslas**: Contact with the plant completes a circuit (of sorts). The Teslas plant stores solar energy in its stems as a capacitor. Contact releases this energy as a massive electric shock (acts as neuron whip). However, actual damage does occur. Wound factor +4 to chest and arm of contact. Grows 4.5 m tall.

7-8: **Foldor**: Wide-spreading ground cover. Contact induces temporary rapid growth (2 turns) of 60 cm per turn. This is growth similar to a pea plant (tendrils entwining, and wrapping tightly around the contacting object). Strength CR to pull free by self. Cutting the tendril frees one from the main plant, but the tendril retains its grip. Strangling or asphyxiation wound effect -2 per turn is penetrated (cut) as Armor E. Grows to 2 m tall.

9-12: **Sprair**: Ground pressure on root system (within 3 m of plant) triggers the expelling of a cloud (5 m radius of sticky seeds or pollen). Pollen will adhere to face masks. Block respirators (reducers), essentially blinding all personnel in this region. Exposed eyes will require immediate medical attention. It grows to a height of 1.5 m.

ANIMAL 1d100

1-65	Herbivore
66-90	Carnivore
91-(1)00	Omnivore

HERBIVORES 1d10 (DM Wooded -1, Coastal 31)

1-3: **Trimpaze**: Arboreal mammal, animal Class M. Spends most of its life in the trees. Eats leaves and fruit, coming down only to move to other trees. Slow moving troop (clan?) of 3d6 individuals.

4-5: **Folth**: Avian reptile, animal Class O, an intermittent grazer. It eats profusely of seeds, nuts and small fruit for a few hours before retiring a similar amount of time to digest its meal. A fast flyer but very slow if brought to the ground. The nest is located in root boles, small caverns, etc. Nests are subterranean in general. There are 2-3 eggs per clutch. It attacks to defend its nest by stooping (divebombing) with rocks (impact and wound effect as 5 mm gyrojet rifle).

6-7: **Moohk**: Bovine, animal Class AAA. Wild Moohk (70%) stampede easily and trample attack as Animal C. Domesticated Moohk are generally more difficult to stampede. All are herding animals of average speed.



8-10: **Flithrip**: Amphibian, Animal Class G. Having retained both lungs and gills, the Flithrip can remain comfortable, above or below the water's surface, for long periods of time. It comes ashore to eat certain nutrient bearing vegetation, spending most of its life at sea. At sea is where they give birth to live young (twins are rare, usually one at a time). Slow on land but fast in the water, these animals are prized for their fur. Value about 150 CR apiece. The thick fur of the Flithrip gives it an effective Armor I rating.

CARNIVORES 1d10 (DM Wooded -1, Coastal +1)

1-3: **Baszil**: A feline ambusher of Animal Class K. The Baszil waits up in trees for passing game. It pounces, attacking with fang and claws as Animal E. The initial attack is usually with surprise (Agility CR, DM -4). Average speed on the ground.

4-5: **Coulte**: A canine Animal Class J. Coulties hunt in packs of 4d6+6. The Coulte is a fast animal which attacks with fangs as Animal E.

6-8: **Franciv**: A reptilian animal of Class H. The Franciv is a lurker which lies in waiting for prey to pass its hiding place. When prey is spotted close by, the Franciv makes a concerted dash (hoping) to catch the prey off guard. It attacks with tooth and nail as Animal D. Even with the high average temperatures of the planet, Franciv are slow. Their tough hide acts as a natural Armor I.

9-10: **Yungo**: An ursoid animal of Class D. Above average stats for its class (largely due to planetary gravity and its mass). The Yungo has a Stamina Rating of 60+6d10 and a hand-to-hand factor of 50+4d10. It is a stalker with average speed. Attacks with claws as Animal B. Thick fur gives it an armor rating of K. The pelt is worth about CR 275.



OMNIVORES 1d10 (DM Coastal -1, Wooded +1)

1-2: **Grinithi**: An amphibious reptile; sentient. Complete details on the Grinithi in a separate section.



3-5: **Whinegot**: A rodent of Animal Class N. A classic omnivore. It usually eats vegetation, except for the rare occasions when it can find an unguarded nest or the remains of a larger kill. Teeth attack as Animal I. Its strong hind legs give it average speed.

6-8: **Ohnbap**: A porcine animal of Class H. A voracious omnivore that will attack almost anything that enters the Ohnbap's (perceived) territory. Family groups of 1d6+2 are not uncommon. It attacks with rooting tusks, bash and hooves as Animal C. Its size makes it slow.

9-10: **L'Selit**: An avian of Animal Class L. It makes its roost in the highest territory it can find (rocks or trees). L'Selit will scavenge the remains of a kill, or eat vegetation; whichever is more expedient. A clutch of 2-3 eggs may be found in the nest. It attacks with talons and beak as Animal G to protect its nest (or make its own kill 15%). A powerful flyer of average speed.

PLANET II ENCOUNTERS

Oceans 1d100

01-20	Event
21-75	Plant
76-(1)00	Animal

EVENTS 1d10 (DM Coastal -1, Mid-ocean +1)

1-2: **Coral Outgrowth**: Sharp rocky outcropping. It cuts like a knife if collided with. Grows at a very slow rate (animal colony dwellers calcium compound secretions form coral reef).

3: **Tsunami**: 'Tidal' wave 1d6+4 meters in height. Caused by earth tremors (see land encounters) of Richter magnitude 4.7+. It travels at a speed of 42 kmh (70 meters/6 sec. turn) and does 5d10 damage to people in the open, 3d6 to vehicles on the surface, 1d3 to vehicles submerged (between 20 and 50 meters, nothing below that depth) and 1d6 to people in surface (D) craft. Roll on hit location table.

4: **Undersea Rock Fall**: Portion of nearby rock (coral) formation breaks away. Caused by water pressure (Tsunami) or earth tremors of low magnitude. 1d6 damage for vehicles caught in fall, 3d10 for people.

5: **'Ruins'**: Appear to be the remains of a city or village that slid beneath the waves in years long past. Stone construction of high quality and reasonably good structural integrity, vaguely reminiscent of the architecture of the terran Holy Roman Empire or Medieval Europe. Inhabited by the Grinithi (see details in separate section).



6-8: **Thunderstorm**: Similar to land thunderstorm; no chance of rock or mud slide. Increased wave action (1-3 meter waves).

9: **Earth Tremor**: Same as for land earth tremor; substitute undersea rock fall for rock or mud slide. Unfelt unless resting on bottom or causes a Tsunami.

10: **Undersea Volcano**: Locally there will be an increase in the water temperature to a high of 110^D C (just below the boiling point). Sensors will be able to locate the disturbance at a range of 750 meters. Within 250 meters it is as an attack by heavy flamer wide beam (splatter) and narrow beam within 50 meters.

PLANTS

All underwater plants and plankton are harmless.

ANIMALS 1d100

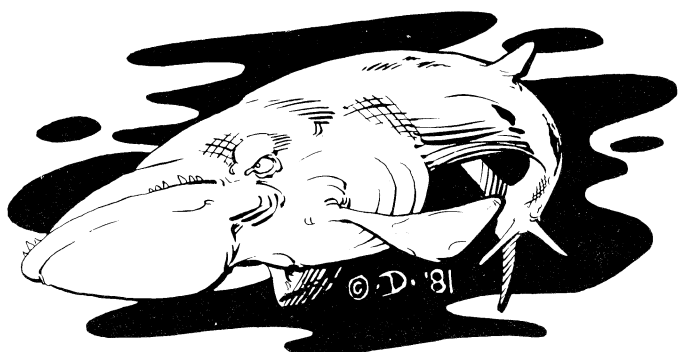
01-60	Herbivore
61-90	Carnivore
91-(1)00	Omnivore

CARNIVORE 1d10 (DM Coastal -1, 'Deep' Water +1)

1-2: **Siver**: Lurker of Animal Class J. It resides in coral reefs and other similar rock formations. The main body of the Siver lies concealed in shadows, while colorful 2 m 'cilia' wave in the open to attract prey. A slow moving fish that attacks as Animal E.

3-5: **Trocca**: An ambusher of Animal Class H. It travels slowly about coral and rock formations in search of prey. Fast on the attack, it is a match for most animals in the sea, attacking as Animal D.

6-7: **Jung'hee**: A killer animal of Class B. A 'perfect' killing machine that has not changed much in millions of years. It has no buoyancy sacs and so must constantly be moving or die. The Jung'hee has a very tough hide, as Armor F. It is fast and attacks as Animal A.



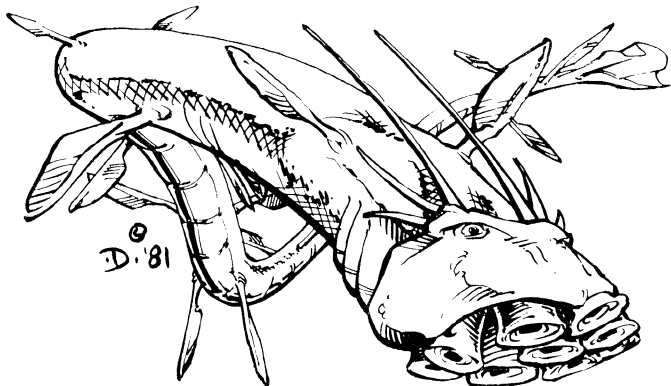
8-10: **Renraw**: A schooling animal of Class M. Not so much a hunting pack, as the use of numbers to overwhelm a victim. Schools number $20+3d10$. The school is very fast and organized well when it is time to attack. 30% actually attack at once, each as Animal G. 40% guard (milling about to confuse) the victim, and 30% prevent other predators from intruding.

OMNIVORES 1d10 (DM Coastal -1, 'Deep' Water +1)

1-2: **Grinthe**: Amphibious reptile. Sentient. Complete details on the Grinthe in a separate section.

3-5: **Dachow**: A classic omnivore of Animal Class K. It subsists on plants and small animals living in or around coral reefs. A reptilian fish of slow speed that attacks as Animal G. Dachow usually swim in groups of $10+1d10$.

6-7: **Rharis**: A scavenger (not omnivore) of Animal Class M. Frequently found in the company of a Jung'hee (see Aquatic Carnivores), usually hanging on with suckers. Very slow moving, it feeds on the remains of a kill, seldom attacking.



8-10: **Mantanz**: An aggressor, Animal Class I. Of average speed, the Mantanz is highly territorial, defending (attacking) as Animal F the territory from invaders.

ADDITIONAL PLANETARY NOTES FOR THE STARMASTER

Atmospheric pressures are expressed in mm of mercury (barometric pressure, earth sea level norm 762 mm). Partial pressure is found by multiplying atmospheric pressure by the constituent percentage expressed as a fraction.

Excessively high or low gas partial pressures may cause various health hazards (see Library Data for more information).

Check for an encounter every 1-3 hours.

Note: The entire planetary biosphere could not be recreated in its entirety, as to do so would require novel length. The given life forms are representatives of the various animal types. The StarMaster has permission to add to these encounter tables, but bearing in mind the natural habitats and dietary conditions (there are more herbivores than carnivores, and still more plants).

During thunderstorms on 'Grinthe II' wind velocities of 48.3 kph (30 mph) with gusts of up to 104.65 kph (65 mph) are not uncommon. This wind velocity when coupled with its density (approximately 5 terran atmospheres) results in fairly drastic conditions, such that even a 'mild' breeze can approach hurricane proportions.

GRINTHI

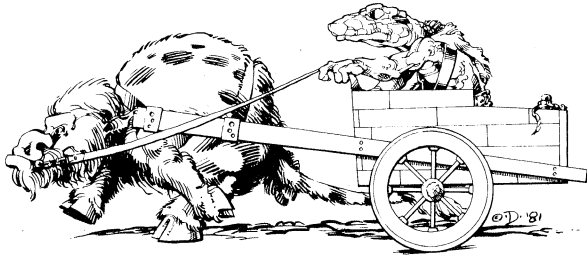
Grinthe society is organized around the home and duty to the church. Children are raised and cared for at home until their maturity at 14 planetary years. All citizens are required to make at least one pilgrimage to the Shrine of the Stone during their lifetime. The shrine is located in the city of Heavenstone (that small triangle east of the leftmost continent on the planetary map).

The city sank beneath the waves centuries in the past because of geological activity. All Grinthe have both lungs and gills granting the skills of Swimming/10 (10,000 m x sum of Strength and Constitution) and Scuba (effectively assuring unlimited Swimming), so the Grinthe followed the city as it sank.



Religion has it that God visited the prehistoric Grinthi, and in his favor raised the Grinthi above the common animals. As such, and as his symbol, he left behind a perfect tetrahedron (like a 4-sided die). Someday, it is believed, God will return for the faithful and his symbol.

The Grinthi have domesticated the Moohk (see Land Animal Encounters) to provide a handy supply of shere (a beverage) and meat, while the furs of the Flithrip and Yungo are prized for their splendid coloration (colors visible in infra-red).



'Ruins' encountered either above or below the waters' surface have a 70% chance of being inhabited by Grinthi. Inhabited structures are entered (when underwater) through an underground tunnel, or (above water) a doorway. All buildings are made of stone, well-fitted without mortar. Undersea dwellings are also airtight. Thermal-electric power operates lights, plants replenish the air.

'Grinthi' means 'People of God's Choosing' and Grinth, their name for the world means 'God's Chosen Place.' The language is similar to other Saurian tongues, so that a Linguist familiar with Saurian tongues may use his skill (**Space Opera**, Vol. I, page 46) to learn and translate the Grinthi speech. Saurians may also learn Grinthi speech as if they had Linguistics Skill (evaluate at expertise equal to zero unless learned to some higher level).

The Grinthi also travel by Moohk-cart and 16 meter sailboats when on a pilgrimage.

The Grinthi social caste system is an off-spring of the religion and is organized as shown below, along with the percentage chances of meeting certain types when encounters occur.

01-10	Clergy 'Man'	(Religious)
11-27	Soldier, Militia, Police	(Warrior Class)
28-76	'Peasant'	(Hunter - Farmer, Food Procurer)
77-99	Makers	(Manual Laborers, Builders)
(1)00	Outcast	(Infirm)

Each group is prejudiced 100% initially, in that most will prostrate themselves before, what is believed to be, God without any information other than the obvious (strange beings never seen before).

Starting with the lowest on the social ladder are the outcasts. The outcasts are the injured or ill that can't or won't travel to the stone for healing or those that have traveled to the stone and weren't healed. These obviously don't believe in the power of God vested in the stone. They may have come from any other status and are forbidden from having children by decree from the church.

Encounters with outcasts will almost always windup with them begging for God's mercy and forgiveness.

The Makers are the skilled workers who create the stone dwellings, tools, carts, weapons and the builders of thermal-electric power plants. Makers desire to aid the visiting Gods in any way possible, in hopes of going with the 'Gods' to learn more. Any Grinthi taken for training can learn at no disability if Intelligence is 14+, 11-13 takes twice the normal time and 10 or lower requires triple the normal time.

The peasants are effectively quite unskilled, but as scouts and marksmen, they are without parallel. To this group is entrusted the task of providing food and material for all who need it, except for the outcasts.

The warrior caste is not as powerful as it used to be, formerly highest caste until religion caught on. The warrior caste is now reduced to

peace-keeping functions and are used as messengers by the ruling religious group, to add weight to matters of religious importance. Warriors would like to see a change made to bring them back into power.

All of the above groups will kowtow before the 'Gods', and guide them on towards an audience with the holy leaders. Most will also try to see the visitors to the stone as well.

God is a Saurian, for God created the Grinthi in Its own image. Where the lower castes probably won't worry about this minor discrepancy, the religious leaders will.

When an exploring party meets with a member of the religious caste, the clergy 'man' will enter into this meeting with mixed feelings of confusion (Is not God a stellar wanderer; what are these alien beings?), awe for the explorer's obvious technological achievements and revulsion (such hideously alien things). Only if a Saurian is a member of the meeting party of explorers will the Grinthi prostrate itself, and only in the direction of the Saurian(s).

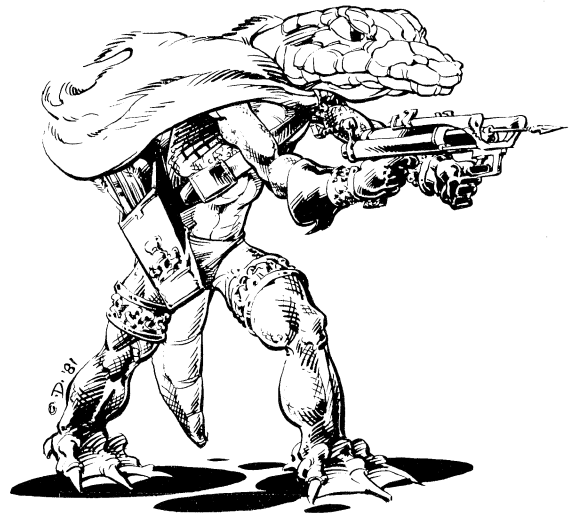
However, faith alone is not enough. Non-Saurians will be prohibited from entering the Shrine of the Stone. Even a Saurian must perform some 'miracle,' to 'prove' status of Godhood, before being permitted entrance to the shrine (with companions only if God permits them).

Grinths are aggressive omnivores, but seldom engage in warfare on one another (as God has so ordained it, also low population density aids in lowering combative drive).

Typical Grinthi Weapons

Due to the high relative humidity, firearms are totally unknown. However, Grinthi living conditions have had their effect on Grinthi weapon design.

Speargun: Similar to a Hvy. Crossbow, but it fires a heavier projectile for greater range and penetration when used underwater. The rate of fire is for a Grinthi, number in parenthesis for non-Grinth.



	ROF	AMMO	PB	SR	MR	LR	ER
In Air	1:4 (1:7)	1	15	35	65	150	350
In Water	1:5 (1:10)		5	15	25	50	100

Penetration									
K	J	I	H	G	F	E	D	C	Wound Factor
A	A	1	2	3	5	7	9	10	+2

All other direct fire and melee weapons common to Tech/4 are available. All metallic weapons are constructed of a titanium-copper-aluminum alloy.

Warrior caste Grinthi all carry a speargun (as do 40% of the 'peasants') and a sword or dagger.

GRINTHI As PC's

Grinths are cold-blooded Saurians of Amphibious ancestry. As is typical of Saurian races in other parts of the galaxy, the Grinths have exceptional strength. However, both males and females tend to be of the same height (use female Saurian height and average of male and female for weight).

The Grinths are warmer, Empathically than are warm-blooded Saurian races. Grinths also have reasonably high Dexterity and Agility as a result of the planet's geological activity.

PC Grinths must have Strength and Constitution 15+, Agility 14+, Dexterity 15+, Empathy no higher than 14 and GTA, MechA of 12+. No Intelligence limit.

Grinths do not do well in atmospheres of less than moderately high pressure or with oxygen partial pressures of less than 400 mm.

Grinths have a very thick hide, rated as Armor H and a radiation tolerance +75% over Human norms.

Grinths sight is 270° color vision into the infra-red but not into the violet or ultra-violet.

Grinths cc Factor = 0.12
Damage Factor Multiplier = 3.5
Stamina Factor Multiplier = 3.75

The above numbers are only for native Grinths on their homeworld or when born (hatched) and raised on a similar world; otherwise, use the values for a Saurian.

Grinths born Grinths grew up in a psionically active (non-awakening) environment; add +2 to Psionic PC score (limit 18).

Being cold-blooded, Grinths become lethargic at temperatures below 16 °C (60.8 °F) and comatose (hibernate) at 7 °C (44.6 °F) and below. Grinths will also become comatose (estivate) if the temperature goes above 41 °C (105.8 °F) for very long. In both cases use a Shock CR every hour that the Grinths experiences these temperature extremes to determine when becoming lethargic or comatose occurs.

Grinths Skin Coloration: Basically brown with small lighter brown or yellow patches and small dark brown or black patches distributed over the body.

ENCYCLOPEDIA INFORMATION

**SOURCE: LIBRARY 5
MEDICAL 2**

Nitrogen Narcosis: A reversible condition similar to alcohol intoxication. Condition is characterized by the following (in increasing order of severity):

1. Light-headedness and increasing self-confidence.
2. Loss of judgment and fine discrimination.
3. Joviality, dizziness possible.
4. Laughter and insensibility.
5. Depression, stupor, unconsciousness.

Condition is brought about by nitrogen partial pressures exceeding 2,280 mm. Check for symptoms every 5 minutes of exposure. Each failure results in an additional DM of +1, and a step towards next severe symptom. Passing CR indicates no change in condition.

Treatment: Decompression chamber (airlock). Reduce pressure **slowly** to avoid decompression sickness (see Bends). Check once every ten minutes (Shock CR, all + DM's to this point) partial pressure nitrogen is below 2,000 mm. Failure indicates no change, while passage reduces symptom severity level and incurs a DM of -1.

Note: Pressure suit is of no use in the prevention of nitrogen narcosis, except in cases where it is sealed exoskeletal with reduced internal air pressure or a low nitrogen (high helium) air mix is used.

Oxygen Poisoning: Not really oxygen that is the poison, but oxygen under high pressure (or partial pressure) saturating the cardiovascular system to the extent that carbon dioxide is blocked into the body's order of onset, severity) are as follows:

1. Intermittent nausea and dizziness.
2. Tunnel vision, hearing abnormality, ringing in the ears and difficulty in breathing, chest pains.
3. Anxiety, confusion, muscular uncoordination.
4. Convulsions, vision 'grey-out.'
5. Unconsciousness.

The condition is brought about by oxygen partial pressures in excess of 880 mm. Check every 5 minutes for the onset of symptoms, as with nitrogen narcosis.

Treatment: Reduce oxygen partial pressure by use of decompression chamber (airlock) or reduce suit oxygen intake. If a chamber is used, reduce overall pressure slowly to avoid decompression sickness (see Bends) or reduce oxygen intake. Recovery uses the same procedure as nitrogen narcosis.

Note: Oxygen poisoning can be avoided in any sealed pressure suit by reducing intake.

Nitrogen narcosis symptoms check and recovery die rolls are based on a Shock CR.

Homeworld Atmosphere Pressure	Initial DM
Under 500 mm	+7*
500-750 mm	+6
751-1000 mm	+5
1001-1250 mm	+4
1251-1500 mm	+3
1501-1750 mm	+2
1751-2000 mm	+1
2000+ mm	0

The worst CR is a 1, nothing lower is possible.

Oxygen Poisoning symptoms check and recovery die rolls are based on a Shock CR.

Oxygen Partial Pressure	Initial DM
Under 60 mm	+7*
61-100 mm	+5
101-250 mm	+3
251-550 mm	+1
551-800 mm	0

*Same note as above.

Respiratory Acidosis: Elevated cardiovascular carbon dioxide. Not harmful in itself, respiratory acidosis stimulates an increased respiratory rate. This increased rate aids in the removal of the carbon dioxide. In high oxygen conditions it could lead to oxygen poisoning and eventual death due to conflicting stimuli and respiratory arrest.

The condition can be brought about through exertion or carbon dioxide partial pressures greater than 0.26 mm.

Bends: Decompression sickness (see also Gas Embolism). A disorder characterized by joint pains, dizziness, shortness of breath, paralysis or unconsciousness.

Condition is caused by inadequate decompression following exposure to increased pressures. While under pressure nitrogen (or helium, argon, etc.) is passed in solution from the blood into the body's tissues. Rapid decompression enables the gas to come out of solution and form bubbles in the bloodstream and tissues.

Treatment: Recompression, to force bubbles back in solution, followed by slow controlled decompression. Controlled decompression enables the body to rid itself of the excess gas at a rate which is safe and keep the gas in solution until it is removed.

Gas Embolism: A more severe form of the Bends, gas bubbles form in the bloodstream and make their way upwards to the head and brain,

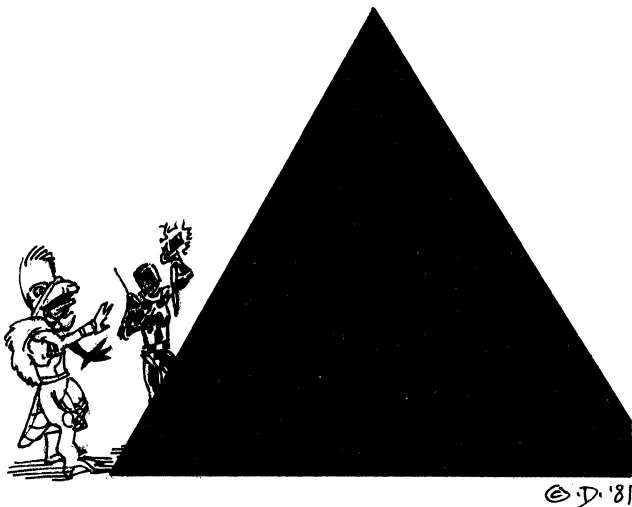
blocking blood flow. Characterized by weakness, dizziness, paralysis of extremities, blurred vision, collapse or unconsciousness, convulsions and cessation of breathing, leading to death.

Treatment: Immediate recompression, lower head and chest below feet. Continue as for the bends.

ARTIFACT

(The Religion and The Stone)

The Grinthe religion has as a symbol, The Stone. The Stone is a non-reflecting black tetrahedron, 4 meters on a side (2.65 meters high). Massing on the order of 150 tonnes, The Stone is interred in a particularly large and ornate structure. If scanned with a Science/Engineering Sensor, it will be revealed as not being made of rock -- composition, internal structure -- indeterminate.



The Stone is a device left behind by the ForeRunners to aid the development of the (at the time) fledgling Grinthe race. The device is Psionically active, guiding the Grinthe with the powers of Suggestion, Presence and Communicate, always directed outward. Received Psionic messages illicit no response from The Stone.

The Grinthe also believe in the miraculous curative powers of The Stone (as Psionic Power Cure). The Stone is capable of using any Psionic Power, as if it possessed a PK Crystal (which it does, internally). The Stone has an effective Stamina Factor of 304, and is considered to be always at rest.

The Stone is not alive but will defend itself if 'attacked' (physical attempts to determine composition). Offensive actions (Mental

Attack, DeathBolt, Grenade, etc.) have a 5% chance of occurring for every combat round under 'attack.' The Stone is naturally an effective armor of AFV quality. One penetrating hit will destroy it.

The Stone is a Teacher, Guardian, Watcher and Reporter for the ForeRunners to indicate when the Grinthe have risen to technological heights as to join them and other starfaring cultures (unfortunately, if you're reading this on a need to know basis, somebody has interfered with the ForeRunner planned development).

There is a second Stone, identical to the one enshrined by the Grinthe, on the face-locked outer moon, which will, if the first is destroyed, telekinetically bury itself and telepath a Suggestion II to all involved concerning the nature of the first (eg. 'Forget tetrahedron Stone. It is black granite, no powers.' The key in the Suggestion is 'Stone' and should cause all to forget any abnormalities. I've got to get my sensors recalibrated, etc.).

If the second should be found (on the moon's farside), it will use illusion.

ADDITIONAL SCENARIO IDEAS

1. **Asteroid Mining** (You'll need a different spaceship for this one): All of the planets have groups of asteroids in the trojan points of their orbits (120° ahead and behind). There are three basic types to be found:

1d100	Type Resulting
01-60	'Snow'ball with a ricky core
61-96	Rock with some metal
97-(1)00	Rock/Metal (roughly equal)

The biggest strikes will be among asteroids of the third type. Other more common metals are more likely to be found; the return is not as great, but it's better than nothing.

1d100	Ore	Amount	Concentration	Value
01-35	Iron	1d100 kg x dia/1d100	1d50 kg/tonne	10/kg
36-50	Titanium	1d100 kg x dia/1d100	1d20 kg/tonne	25/kg
51-70	Aluminum	1d100 kg x dia/1d100	1d20 kg/tonne	12/kg
71-75	Cobalt	1d50 kg x dia/1d100	1d20 kg/tonne	21/kg
76-85	Nickel	1d100 kg x dia/1d100	1d50 kg/tonne	8/kg
86-90	Zirconium	1d50 kg x dia/1d100	1d20 kg/tonne	23/kg

91-(1)00 Use Valuable Ore Mining Table **S.O.**, Vol. I.

2. **Pirates!** You were passengers and/or crew on a liner that was attacked by pirates 8,000 LS from the star (this is not a landing spot, just an astrogation check point). Somehow, you escaped in a ship's boat into an uncharted (effectively) system.

PROBE NCG 8436

The Interstellar Survey Cruiser Outreach is exploring an area beyond the frontier of the Procyon StarSector. It is in the system of a K1 star designated NCG 8436.

The mission is to map out and explore the system. Determine habitability of all planets within the stellar ecosphere. All new races encountered must be determined to be sentient or non-sentient. If sentient races are encountered, it must also be determined whether contact by a starfaring culture will bring about social upheaval. All such decisions are made by the Contact Service.

NCG 8436 is an adventure/scenario for use with the SPACE OPERA game system. This is not a game but a StarMaster's aid for use with SPACE OPERA .