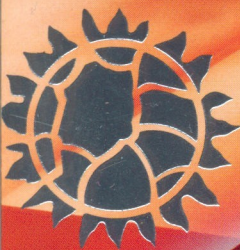# MegaTraveller

REFEREE'S COMPANION

Marc W. Miller

Science-Fiction Adventure in the Shattered Imperium

GDW

Marc W. Miller

MEGATRAVELLER™
REFEREE'S COMPANION

Science-Fiction Role-Playing
in the Shattered Imperium

Referee's Companion is a compilation of background information and rules for use with **MegaTraveller**.

GDW

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Table of Contents

"The Imperium is the greatest possible accomplishment of modern political science. It has withstood the test of time, dissent, and conflict to establish itself as the supreme authority over more territory, more population, and more technology than any other government ever.

"Yet achieving this goal was not an easy process. The Imperium has taken over a thousand years to reach the position it occupies today. Internal conflict (such as the Civil War more than 600 years ago) and external conflict (such as the wars with the Aslan, the Solomani, and the Zhodani) have all shaped the structure of the Imperial government and its armed forces. Territorial expansion driven by economic forces, population pressures, and natural scientific curiosity pushed the Imperial borders to the very limits a natural government can handle.

"The important fact about the Imperium is that it is stable. The legendary "1000-year Empire" that humanity dreams of is an accomplished fact in the Imperium, which today is well on its way to a second millenium.

"In the years to come, we can look forward to refining the structure of the Imperium, confident in the knowledge that its basic structure is sound and has withstood the tests of time. But the changes that can be foreseen are minimal, and they involve only...

"We interrupt our scheduled programming with an important announcement from Capital..."

—*From a broadcast lecture by Ignatz P. Yaonis,*
Professor of Political Science, University of Fornast, 119-1116.

MEGATRAVELLER™

R E F E R E E ' S   C O M P A N I O N

The **Referee's Companion** includes material that a **MegaTraveller** referee will find useful in any adventure situation. The articles in this book make it possible to map stellar sectors, star systems, and individual worlds, to conduct large-scale military operations with ease and efficiency, to understand (and convey background about) the alien races that dominate the borders of the Imperium, and to have interesting, exciting **MegaTraveller** adventures. This volume is intended for the referee; properly used, it can make any **MegaTraveller** activity easier and more enjoyable.

Large-Scale Combat

Large numbers of units in a combat engagement can strain the referee's ability to keep the adventure moving. This generally occurs if the referee must single-handedly run over 20 units, while the player characters each run their own characters (and perhaps one or two other characters) in the combat session The burden is definitely on the referee in such instances.

Large-scale combat addresses the problems of trying to fight large-scale battles by providing logical rules to extend personal combat so that it can easily handle combat involving dozens to hundreds of individual units.

This chapter covers additional special rules which apply especially to large-scale campaigns In fact, using large-scale combat to create entire armies in order to fight massive battles (complete with high-tech weapons, vehicles, unusual creatures, and robots) in fantastic alien environments can be a game unto itself.

THE CONGLOMERATE UNIT

The key to large-scale combat is the *conglomerate unit*: an averaged collection of independent units, combined into a single unit to simplify the management headaches associated with sheer numbers of units.

When creating conglomerate units, observe these limits:

150-Meter Scale:

Maximum Individuals: 150 per conglomerate unit.

Maximum Vehicles: 15 per conglomerate unit.

Maximum Small Craft 1 per conglomerate unit.

1500-Meter Scale:

Maximum Individuals 1500 per conglomerate unit.

Maximum Vehicles: 150 per conglomerate unit

Maximum Small Craft 15 per conglomerate unit.

In both cases, a starship-sized unit (100 displacement tons or more) is kept separate.

In practice, the goal in creating conglomerate units is to have no more than 20 units on a side. At this level of engagement, things are kept manageable, yet enough freedom of action remains for realism and flexibility

Once the combat session is over, the important conglomerate units (such as the ones including the player characters) can be subdivided back into their individual component units, and damage can be applied to the appropriate individual units.

DEFINITIONS

Large-scale combat provides alternate definitions for the following fundamental terms presented in personal combat.

Combat Round: A large-scale combat round can represent either one minute of elapsed time (10 personal combat rounds), or 10 minutes of elapsed time (100 personal combat rounds), depending on the distance scale selected.

Within a single round, each unit is allowed an opportunity to move and to conduct multiple attacks in a "firefight exchange." Each unit may be attacked by one or more enemy units. If the time scale is 10 minutes per round, the firefight exchange can continue until the attacker wants the exchange to end. Once the firefight exchange has ended, the combat round is over, and the next combat round begins.

Distance Scale: Two distance scales are used: 150 meters per square (or hex), and 1500 meters (1.5 kilometers) per square.

When using the 150-meter scale, combat is conducted in rounds, each lasting one minute. Since the 150-meter scale is 10 times the 15-meter personal combat scale, increasing the time scale by 10 as well provides identical movement rates in both personal combat and large-scale combat.

When using the 1500-meter scale, the combat round is 10 minutes (10 times the 150-meter combat round) Again, the same movement rates are used, since both distance and time are again both increased by 10.

CONDUCTING A LARGE-SCALE COMBAT SESSION

Most of the personal combat rules still apply, lending a tactical feel to large-scale combat engagements.

● Use of the tactical point pool is the same.

● Surprise is exactly the same.

● Movement is still conducted using movement points. A unit may evade just as in personal combat.

● Direct fire combat is identical Pinpoint hits, however, are not allowed, since conglomerate units are being used

● Conglomerate units are always treated as if they are *one target size* larger than their individual component units.

● Indirect fire has a few minor differences (covered below).

● Hand-to-hand combat is the same.

● Penetration and damage are the same, although vehicles no longer have power plant or locomotion hits, since conglomerate units are being used.

THE LARGE-SCALE COMBAT ROUND

When conducting a large-scale combat round, activities proceed somewhat differently than in personal combat.

Movement: The side with the largest tactical point pool selects which side goes first.

Once a side has been selected, one unit from that side may take its turn. The unit may move and make attacks, just as in personal combat. Any attacks take effect immediately. Once the unit's turn is finished, one unit from the other side may take a turn Turns alternate back and forth from side to side until all units on both sides have had an opportunity to take a turn.

The combat round is then over, and a new combat round begins.

As in personal combat, interrupts are allowed.

Firefight Exchange: A unit may shoot at another unit (just as in personal combat) However, when a unit opens fire on another unit, if the firing unit is spotted, a "firefight exchange" occurs The firing unit makes the first attack; then (if the firing unit is spotted) any single enemy unit may shoot at the active unit (also roll for spotting on the enemy unit) Once the enemy unit has conducted its attack, the first round of the firefight exchange ends

If the distance scale is 1500 meters, the active unit may continue firing indefinitely instead of moving. An interrupt may occur by either side during a firefight exchange—however, the interrupting unit is also subject to fire from an enemy unit if it attacks.

As in personal combat, each side is limited to one active interrupt at a time.

But, if an attack task gets exceptional failure, roll for determination using a fixed DM of 2. If the task becomes Impossible, end the fire exchange.

Damage to Conglomerate Units: When the inoperative hits value of a conglomerate unit reaches one-half its original value, reduce the damage points inflicted by the unit by one-half. For example, a unit has a hits value of 16/21 and has FGMP-15s that do 40 points of damage. When the hits value of 16/21 drops to 8/21 because of damage, reduce the 40 points of damage done by the FGMP-15s to 20 points

When the inoperative hits value of a unit reaches 0, the unit is out of the action: it cannot move or attack.

INDIRECT FIRE

In large-scale combat, indirect fire consists of many ammunition rounds hitting a location instead of a single round.

The concept of an indirect fire beaten zone simulates this effect. When an indirect fire unit fires, the area hit by its shells and their bursts is its beaten zone All units in a beaten zone must roll for explosive round hits using the round's full penetration (which differs from how a danger space works).

The beaten zone is defined as a square which is centered on the target point. The size of the beaten zone is determined by the number of rounds fired, the danger space of each round, and the type of beaten zone selected by the firing player.

Danger Space: The weapon tables indicate the size of the danger space of one round from each listed weapon. Danger space on the map is a square with sides the length given on the chart. A listed danger space of 15 meters produces a square burst area 15 meters by 15 meters in size. Airburst HE rounds have a danger space twice that listed; CBM rounds are four times that listed.

Number of Rounds: The beaten zone of an indirect fire attack is found by using the number of rounds fired by the unit in a turn. When a conglomerate unit is created, the number of rounds fired by indirect fire weapons is computed and recorded.

Beaten Zone: The size of the beaten zone square is a multiple of the danger space of a single round; the exact multiple depends on the number of rounds fired (as shown on the Beaten Zone Table). If the exact number of rounds fired is not shown on the table, use the next lower value on the table. The beaten zone is a square with each side equal to the multiplier times the danger space of a single round. For example, if a unit fires a total of 20 rounds per minute, the beaten zone round number used is 16, which provides a multiplier of 4. Thus, if the weapon's single-round danger space is 15 meters by 15 meters, the unit's beaten zone is 60 meters by 60 meters.

For simplicity, all beaten zones less than one square in size are one square in size.

Beaten Zone Type: Four beaten zone types are possible. In addition to the standard beaten zone, there are dispersed, converged, and shattered beaten zones. A dispersed zone represents fire by twice the standard number of rounds. A converged zone represents half the standard number of rounds. A fourth type of beaten zone, the scattered zone, occurs only as a result of point defense fire (see that section for details).

When determining if a unit is hit by an explosive round in a *dispersed* beaten zone, increase the "to hit" task difficulty by one level. Roll twice for hits on each unit in a converged beaten zone.

CREATING CONGLOMERATE UNITS

Individual units are combined and their attributes are averaged or totaled to arrive at new attributes for a single conglomerate unit. Because of the effects of averaging, the best conglomerate units consist of individual units with similar attributes. Producing a conglomerate unit involves a number of steps:

1. Group the Units: Some logical method of grouping the units must be selected. A particularly good way (but not the only way) is to use military organization Often a natural collection of units will suggest itself.

The best conglomerate units are those with similar attributes. The most limiting factor is usually locomotion. For example, combining a grav vehicle with foot soldiers limits the
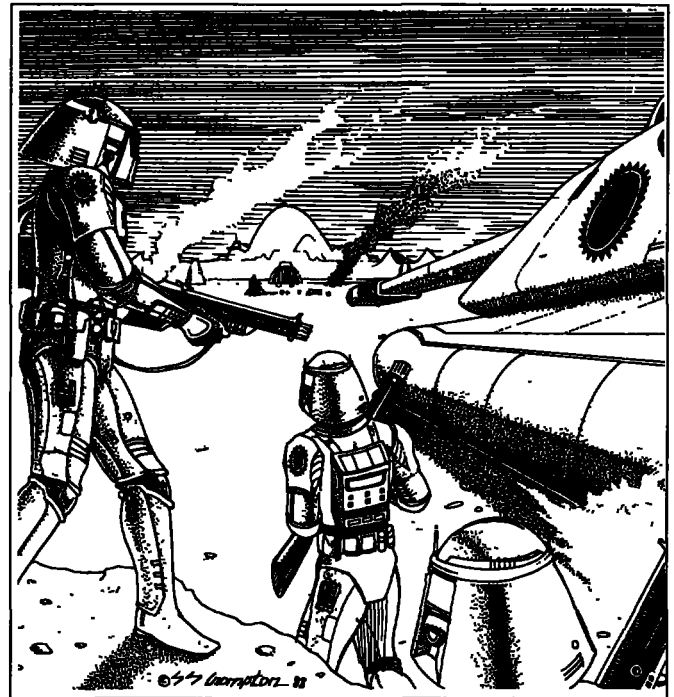
conglomerate unit to the speed of the foot soldiers. However, vehicles should be combined with other vehicles; characters should be combined with other characters. More specifically, a character in battle dress with a grav belt and an FGMP-15 is best combined with other characters also wearing battle dress and grav belts and carrying FGMP-15s, rather than combined with characters with no armor and wielding body pistols.

On the other hand, combining a single strong unit with several weak ones is a way to "up the average" and increase the survivability of the weaker units. There's a good and a bad side to everything: combining a single strong unit with several weaker ones is a way to lose the strong unit.

A conglomerate unit may only have three types of fire weapons listed for it, and three types of hand-to-hand weapons. If the individual units have more than three types of fire weapons between them, either some units should be swapped out and combined with other similar units; the least-desirable weapons must be ignored

2. Compute the Appropriate Totals: Depending on the attribute, the combined unit total is either a sum or an average The specific procedure for each total is given below.

3. Create the Conglomerate Unit: The computed totals are summarized for each grouping and listed as if the combined units were a single unit.

Once all the conglomerate units have been created, combat may begin.

COMPUTING CONGLOMERATE UNIT TOTALS

This section details the specific procedures used to create conglomerate units by using a simplified example. The end of this section gives a more complicated extended example to show insights into how these procedures are applied.

In all cases, when computing averages for conglomerate units, round 0 5 up to the next whole number.

Conglomerate Unit Example: The five units shown on the Conglomerate Unit Example are being combined into one conglomerate unit

Hits: Add up all the hits values of the individual units and use the total as the hits value for the combined unit

For vehicles or robots, use the lowest of the three values—structure hits, power plant hits, or locomotion hits—as the hits value.to be added, ignore the other two hits values

Example· The five characters each have hits of: 3/3, 3/4, 3/5, 3/4, and 4/5. The hits value of the conglomerate unit is the sum of all these values: 16/21.

Weapon Averaging: All weapons of a given type (and even mixed types, although that should be avoided if possible) can be combined into a single averaged weapon, as follows:

● Add all the weapon damage points together, and then divide by 2. This represents the average number of damage points inflicted by the conglomerate unit when it attacks.

Example: Five FGMP-15s are being combined into a single averaged weapon. The FGMP-15 does 16 points of damage, so $(16 \times 5) \div 2 = 40$. The conglomerate unit's FGMPs do 40 points of damage per combat round.

● Add all the weapon penetration values together and divide by the number of weapons. If the penetration has a range rating, average the range rating as well.

Example: As stated, five FGMP-15s are being combined in-

to a single averaged weapon. An FGMP-15's penetration rating is 34/2. Taking the penetration $(34 + 34 + 34 + 34 + 34) \div 5 = 34$. For the range rating, $(2 + 2 + 2 + 2 + 2) \div 5 = 2$. If the weapon mix was instead four FGMP-15s (pen = 34/2) and a PGMP-12 (pen = 20/1), then the computations would be: $(34 + 34 + 34 + 34 + 20) \div 5 = 31.2$ which rounds to 31, and $(2 + 2 + 2 + 2 + 1) \div 5 = 1.8$ which rounds to 2.

● Add all the weapon skill levels together and divide by the number of units.

Example: The five characters each have a high Energy Weapon skill level of: 4, 3, 5, 2, and 4. Computing the average gives $(4 + 3 + 5 + 2 + 4) \div 5 = 3.6$, which rounds to 4

● Add together all the Strength or Dexterity DMs and divide by the number of units.

Example: The five characters each have a Dexterity DM of: +0, +1, +1, +1, and +2. Computing the average gives $(0 + 1 + 1 + 1 + 2) \div 5 = 1.0$ exactly, or +1.

● Add the average skill level and the average Str/Dex DM to create a combined "task + " for the conglomerate unit when it attacks with that weapon.

Example: The combined skill level of the five characters is 4, and the combined dexterity DM is +1. The total "task + " DM is +5.

Armor: Add together all the armor values and divide by the number of units.

Example: The five characters are all in tech 15 battle dress, which has an armor value of 18. The computation is: $(18 + 18 + 18 + 18 + 18) \div 5 = 18.0$, so the armor value of the combined unit is 18. If instead one of the characters was wearing cloth armor, the computation would be: $(18 + 18 + 18 + 18 + 5) \div 5 = 15.4$. In this last case, the armor value of the combined unit would be 15.

Top Movement Speed: Use the movement speed of the slowest unit as the movement speed of the conglomerate unit.

Example. All five units have grav belts (top movement speed 22), so assume a speed of 2 (foot speed) unless otherwise indicated Note any special speed (i.e. grav belt) with that item. If four of the five characters had grav belts, the entire group would be limited to the movement speed of the slowest unit, which is 2 (in this case, it would be better not to combine the unit on foot with the four other units with grav belts).

Skill Levels: Use the highest skill level from among the individual units as the skill level of the conglomerate unit. If the skill doesn't seem to apply in the combat situation (steward skill, for example), then ignore it.

Example: One of the five characters has a skill level of Tactics-2, another has Tactics-1. Three of the five characters have Recon-1, and one character has Leader-3, while two others have Leader-1. The combined unit thus has Tactics-2, Recon-1 and Leader-3

Indirect Fire ROF: The number of rounds an indirect weapon uses is determined from the number of autofire targets the weapon may hit. If the weapon may hit 2 additional autofire targets, the weapon fires 40 rounds per minute; if 3 additional targets, the weapon fires 100 rounds per minute; if 4 additional targets, the weapon fires 200 rounds per minute. Weapons designed using the vehicle design system in the **Referee's Guide** have a specific rounds-per-minute rate already listed for them.

The total rate of fire (ROF) of a conglomerate unit is determined by multiplying the number of weapons firing by the rounds-per-minute rate of the weapon.

Example: A unit consisting of four guns, each with a rounds-per-minute rate of 40, would have an ROF of 160 rounds-per-minute.

Vehicle Capacity in Conglomerate Units: To compute the capacity of a vehicle in terms of the conglomerate units that it can carry, multiply the passenger capacity of the vehicle by the hits value of the average character hits of 3/5.

Example: An armored personnel carrier can carry 20 passengers. Its conglomerate personnel unit capacity is 60/100 (3/5 x 20).

CONVERTING BACK TO INDEPENDENT UNITS

When a conglomerate unit has not taken any damage, converting back to independent units is as simple as pulling out the original independent unit list However, if the conglomerate unit has taken damage during combat, and the component units are important to the adventure (usually this means they contain player characters), then the damage each independent unit has taken must be determined

To illustrate how this is done, consider the conglomerate unit consisting of five characters with FGMPs that was created previously

The unit has taken 11 points of damage.

Applying the damage to the component units of a conglomerate unit is typically done after the combat session is all over

Refer to the original individual component list and inflict the 11 points of damage randomly to the five component individuals. For vehicles and robots, consult the Hit Location Table when applying the hits.

MILITARY ORGANIZATION

If desired, when building conglomerate units, established military organization may be used. The basic building block of military unit organization is the infantry fire team, the weapons crew, or the individual vehicle. These can be organized into larger units, as outlined below.

Introduction to Grouping Units: A fire team contains four soldiers. Leaders, elite troops, veterans, and adventurer characters may be left as individuals. Vehicle crews (for use when outside their vehicles) and weapons crews of less than four men may be grouped into two- or three-man units. Weapons crews of more than four men should be broken up into two or more groups of about equal size.

Note that when it is stated below that soldiers may be left as individual units, they must be veterans or elites to do so.

Unit Organization: Troops, in addition to being grouped into conglomerate units, must be organized into military units. Where the line is drawn between forming a conglomerate unit grouping or using multiple unit organization (in other words, how big you make a conglomerate unit) is up to the players and referee. There is some flexibility in forming conglomerate units, within the following guidelines.

Units are made up of officers, NCOs (noncommissioned officers), and men. There are three types of units: infantry, weapons, and vehicle. It is possible to mix the three together in a single unit.

Team: A team (or fire team) is the smallest organizational unit. In the case of infantry, it consists of four men in a single conglomerate unit. In the case of a vehicle or crew-served weapon, the size of the crew varies. If the crew is four or fewer men, they are divided into as many teams as necessary to avoid having a team larger than four, all teams should be as close to the same size as possible. Thus a weapons crew with 10 men would be divided into two teams of three and one team of four. An infantry team may be formed by two soldiers plus a weapon with a crew of two

Vehicle Crews: Vehicle crews don't have to be represented as a unique conglomerate unit (unless the crew dismounts during combat), but personnel must be assigned from the player's available troops. The size of each vehicle's crew is determined using vehicle design in the **Referee's Guide**.

There are four crew positions defined: driver, gunner, loader, and commander. On some vehicles there are two gunners, and on others there is no loader. One soldier must be assigned to each crew position. A vehicle commander may also be an officer or NCO.

Squad: A squad consists of two or three teams A vehicle or weapons crew with two or three teams is automatically a squad. Types of teams may be mixed within a squad. For example, a squad might consist of one infantry team, one weapons crew (with four men), and one vehicle with a crew of two carrying the other two teams. There may be no more than one vehicle in any squad; in a vehicle unit, each vehicle is a squad even if it has only a crew of four or fewer.

Each squad has one NCO, who may be either an individual unit, separate from the squad, or may be a man from one of the teams in the squad.

Section A section consists of two squads A section has an NCO, who may be either one of the squad NCOs or a separate individual.
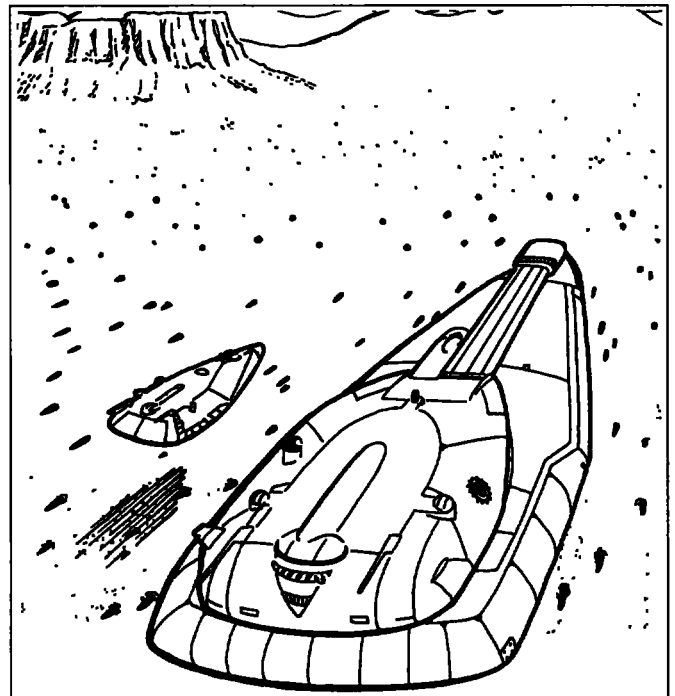
Platoon: A platoon consists of two to five squads. If the platoon has four or five squads, four of them may be grouped into two sections if desired. In addition to its squads (or sections), the platoon contains a command group of one to six men. One of these men is the platoon officer, another may be an NCO (the platoon sergeant), but this is not required. The rest are additional command group personnel: radio operators, runners, extra weapons teams, and so on.

In the command group, teams may consist of two, three, or four men (as always, elites and veterans may be separate). For instance, a platoon command group could have a platoon commander, a platoon sergeant, two radio operators, and the two-man crew of an antitank missile launcher. One radio operator could be assigned to the commander and one to the sergeant, making three teams in the command group.

In vehicle units, the platoon command group consists of the crew of a single vehicle (thus a platoon consists of a command vehicle and two to five other vehicles); the platoon officer is included in the crew.

Any weapons platoon capable of indirect fire may also include one individual forward observer in addition to the command group

Company: A company consists of two to five platoons and has a command group of from one to 10 men, grouped in the same manner as a platoon command group. One of these men is an officer (the company commander); another may be an NCO (the company senior sergeant), but this is not required.

In vehicle units, the company command group consists of the crews of one to three vehicles, totaling no more than 10 men. One vehicle contains the company officer; another may contain an NCO (the senior sergeant) but this is not required.

In weapons units, a company is usually referred to as a battery; in armored units, a company is sometimes referred to as a troop.

Battalion: It is unlikely that a full battalion will be employed in even a large-scale combat session, but a battalion headquarters may be present if two or more companies are present.

A battalion consists of two to five companies and has a command group of eight to 30 men, organized in the same manner as a platoon command group. One of these men is the battalion commanding officer, one is another officer (the battalion executive officer), and one is an NCO (the battalion senior sergeant).

In vehicle units, the command group may have as many vehicles as can be operated by its men. The commander, executive officer, and senior NCO each ride in a different vehicle.

In armored units, a battalion is sometimes referred to as a squadron.

Large Crews: Very large vehicle and weapons crews may have more than three teams; in such cases the crew must be organized as a section, a platoon, or even as a company, depending upon the number of men in the unit.

Marking Units: Each unit should be uniquely identified with a number and/or letter code. If the troops are part of a permanently organized unit, a combination of color and code can be used to identify each unit's place in its battalion organization. For example, B company of a battalion might be called blue battalion. One of its teams might have a code 31A, meaning third platoon, first squad, fire team A.

INITIATIVE AND MORALE FOR MILITARY UNITS

After a unit has been organized and grouped into conglomerate units, the morale and initiative levels of the various conglomerate units should be determined. Each unit is rated separately for its level of initiative and morale based upon the morale levels of the soldier or soldiers in the unit.

Morale: Morale levels of the four qualities of troops are given in the table below

MORALE VALUES

Recruit	4
Regular	7
Veteran	10
Elite	13

In the case of an individual soldier, his combat morale is his individual morale. In the case of a conglomerate unit, the unit's combat morale is the average of the individual morales of the soldiers making up the unit. Fractional results are rounded to the nearest whole number; in the case of a fractional result of exactly 0.5, round up.

For example, a fire team composed of one veteran (morale level 10) and three recruits (morale level 4) would have a team morale of 6 ((10 + 4 + 4 + 4) ÷ 4 = 5.5, rounded to 6) The morale of a vehicle crew is not determined by averaging the morale of its members; its morale is the morale of the vehicle commander

Initiative: The morale level of a unit determines its initiative level. There are three initiative levels in combat: low, average, and high.

All units with a morale of 6 through 10 have average initiative. All units with a morale of 11 or higher have high initiative. As an exception to this, any unit containing an officer has the initiative of the officer, although its morale is determined by the procedure above.

Thus a unit with an elite officer (morale 13) and three recruits (morale 4) would have high initiative, even though it only has a morale of 6.

No low-initiative unit may be used as an officer or NCO; all units containing officer or NCO figures must be organized so as to have at least average initiative

Initiative and morale are very important when using military organization See subsequent rules for their effect.

Example of Determining Initiative: The process of determining unit morale and initiative is fairly involved, and understanding it is essential to playing a military organized combat session. Therefore, the following example of a small unit's organization is provided to illustrate the process.

The referee informs a player that his force will consist of a 46-man infantry platoon consisting of 55 percent recruits, 25 percent regulars, 15 percent veterans, five percent elite Since the total of regulars, veterans, and elite does not come out to even numbers, the referee determines how they are rounded and gives the player a total of 25 recruits, 12 regulars, seven veterans, and two elite. The player organizes them into conglomerate units as a platoon headquarters, a weapon squad, and three rifle squads, as follows:

The platoon headquarters consists of four men: the platoon

commander (an officer), the platoon senior NCO, and two radio operators. The officer and senior NCO are elites; the two radio operators are regulars. The officer and senior NCO are each grouped with one of the radio operators, for two teams of two men each.

The weapons squad is composed of two light machinegun teams, each with one veteran and one recruit, and one tac missile team with one regular and one veteran serving as squad NCO.

All three rifle squads consist of three fire teams, each of four men grouped as a team (a total of nine rifle teams). Two of the teams consist of four recruits each. One of the teams has one regular and three recruits. Three of the teams consist of two regulars and two recruits. Two of the teams have one veteran and three recruits. The last team consists of two regulars and two veterans The last three listed fire teams each contain the NCO of one of the three squads.

The player now determines morale and initiative levels. The officer's team, with one elite and one regular, has a morale of $(13 + 7/2) =)10$, but has high initiative since it uses the officer's initiative. The senior NCO's team also has a morale of 10, but only average initiative. The weapons squad NCO's team has a morale of $(10 + 7/2 =)9$ and average initiative.

, The two machinegun teams each have a morale of $(10 + 4/2 =)7$ and average initiative. The two rifle teams consisting of four recruits have a morale of 4 and low initiative. The rifle team consisting of one regular and three recruits has a morale of 5, and low initiative. One of these three fire teams is assigned to each squad.

The three fire teams consisting of two regulars and two recruits have a morale of 6, and thus average initiative. One of these fire teams is assigned to each squad The two fire teams consisting of one veteran and three recruits have a morale of 6 and average initiative also. These two teams contain the squad NCOs for the first and second squads. Finally, the team consisting of two regulars and two veterans has a morale of 9 and average initiative, and contains the squad NCO for the third squad.

COMMANDING MILITARY UNITS

Before each combat round, both sides secretly decide what, if any, command functions their officers and NCOs will engage in during the turn. There are three command functions possible: **lead, order,** and **rally.** An officer/NCO may perform only one of these functions at a time.

Leading is the exercise of command by means of continuous direct personal supervision. Ordering is the exercise of command through orders to units or to other officers/NCOs, which are executed without direct supervision by the ordering officer/NCO. Rallying is the use of an officer/NCO's personal presence to return routed troops to combat.

Officers and NCOs: Differentiation is made in organization between officers and NCOs. The distinction is important, as their command abilities differ in several ways, as explained below. The abilities of officers/NCOs also differ, depending on their initiative levels, explained below as well.

Initiative: Troops of the three initiative classes respond differently to command. High-initiative troops do not require orders or leading: they will act independently and are directly controlled. Average-initiative troops must be ordered or led in order to perform most actions: they will not respond to orders alone.

If low-initiative troops are not being led, they may fire at any enemy troops that are adjacent and perform actions mandated by adverse morale check results. If average-initiative troops have no orders and are not being led, they may, in addition to the actions described above, fire at any enemy troops who have fired at their unit.

Leading: Units which are being led by a high-initiative officer/NCO may perform any action desired Troops who are being led by an average-initiative officer/NCO may perform any action consistent with the orders under which the officer/NCO is acting.

Who May Lead. Any officer may lead any soldiers Any high-initiative NCO may lead any soldiers. Any average-initiative NCO may led any soldiers normally under his leadership. (For example, a platoon senior NCO could lead any soldiers from his own platoon, but could not lead soldiers from another platoon.) While leading, an officer/NCO may freely move and engage in combat.

A single officer/NCO may lead any number of units at once; he may lead subordinate officer/NCOs, who may in turn be leading others.

Requirements. In order to lead, an officer/NCO must be able to see the soldiers being led and must be in constant communication with them.

Orders: Orders are given by officers/NCOs to average-initiative squads, teams, and officers/NCOs, and allow them to act without the direct leadership of a superior; orders must be written and must consist of simple instructions.

Orders must be fairly specific, as explained below Units following orders will perform the stated action; officer/NCOs following orders will lead their troops in performing the action or will issue appropriate orders to their subordinates Orders
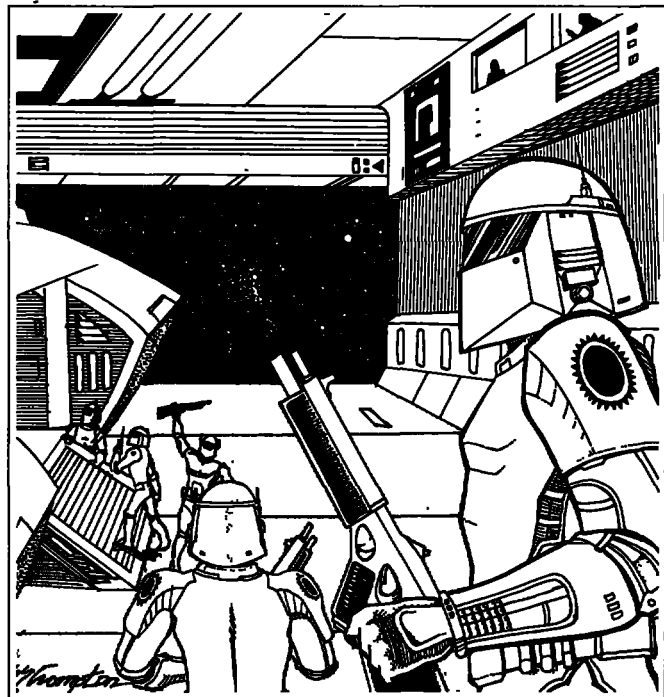
take time to give and receive, sometimes a great deal of time, for this reason, orders are often explained to troops before the beginning of the game and initiated by short code words· see below.

During a turn in which he gives or receives orders, an officer/NCO or squad/team may not perform any other action.

Who May Order: All officers may order anyone except an officer of superior rank (a company commander is superior to his executive officer and to all platoon commanders; a company executive officer is superior to all platoon commanders). A high-initiative NCO may order anyone normally under his leadership, but not others An average-initiative NCO may not give orders.

Requirements To give orders, an officer or NCO must be in communication with the unit he is ordering. The time required to receive an order varies according to the officer, NCO, or unit receiving it, as shown in the Order Time Required Table

Times apply to units in direct contact· The units must be adjacent. If stands are not in direct contact, the time is twice that stated If two units possess battle computers (or are in direct contact with a stand possessing a computer) they are also considered to be in direct contact. If all units concerned have map boxes (or are in direct contact with a stand possessing a map box), the time is halved.

These effects are cumulative; for example, if an officer gives an order to an NCO by radio, but both of them have map boxes, the time required is two turns, doubled and halved, or two turns.

Generally, an officer/NCO may give only one order at a time, to any one officer, NCO, or squad/team However, any number of officers in direct contact with the officer giving the orders may receive their orders at the same time. A single code word may also be given to several units at once: see below.

An officer/NCO or unit giving or receiving orders may interrupt the process at any time (and is required to if he suffers any adverse morale check result), in which case the order has not been received and all time spent giving the order up to that point is wasted

Orders to NCOs: These orders must be specific and allow little freedom of action. Orders given directly to a unit may be given to the NCO at the same time; the NCO performs his normal function, but the unit will be capable of operating under its orders without him.

A single order may consist of up to three components: a movement order, a fire order, and a rally point order

● *Movement:* A movement order must state an objective which is clearly definable on a map; it must list a route of travel (if other than a straight line), and it must state a speed of travel. For example, "move to the crest of hill 17, through the forest, at fastest speed" or "move to the northern village, through the valley, at NOE "

As an alternative, a unit may be ordered to maintain positions relative to another unit of the same platoon, which must be visible at all times; in this way, a platoon may assume a formation. For example, "three squares to the left of 1st squad" or "one square behind platoon commander."

The unit may also be ordered to move toward its objective and halt at a recognizable point. For example, "stop at the edge of the woods" or "stop when encountering friendly troops." To aid in writing orders, players may use a small map of the

area, with landmarks indicated by letter or number codes, as was done in the case of hill 17 above.

● *Fire:* A fire order must state the conditions under which a unit will fire; this must consist of a simple and unambiguous sentence. For example, "fire as soon as the enemy comes within two squares," "fire if enemy armored personnel carriers come within four squares," "fire at enemy units which are able to fire at 3rd platoon," or "fire at any enemy units within long range."

● *Rally Point:* A rally point order gives a location easily recognizable on a map, to which a unit will move, by a safe route if possible, if the code order to retreat to the rally point is given, or if they recover from a rout and receive no orders. For example, "rally point stone farmhouse."

Delays: An order may also contain a statement delaying its execution until a specific turn or until an order briefing is over. For example, "delay execution until turn 15" or "delay execution until completion of platoon briefing."

Attachment: Instead of the orders above, a squad or team may be attached to another squad or higher-level unit; it then becomes part of the other unit for all purposes. For example, "the platoon antitank team is attached to 3rd squad" or "1st squad is attached to 2nd platoon, B company "

Discretionary Actions· A unit or NCO under orders has some ability to make choices. If the unit is fired upon, or if an enemy is visible and adjacent, the unit may return fire, halt, and/or move to the nearest covered position, if there is one within one turn's movement, as soon as it is no longer receiving enemy fire, the unit must resume following its orders

The referee may decide that certain other minor demonstrations of initiative are reasonable, but should take care not to allow too much freedom

Orders to Officers and Higher NCOs: These orders are somewhat less restrictive than squad/team level orders.

An order to an officer or higher NCO may consist of one simple declarative sentence plus one simple conditional statement. All statements must be clear and unambiguous, as determined by the referee Locations mentioned must be easily identifiable on a map. Orders to platoon and company NCOs should also state what unit type they are to command. Here are a few examples of possible orders:

"Advance on hill 79, proceeding north of the forest. When hill 79 has been taken, give supporting fire to B company."

"Withdraw to point C. If point C is occupied by enemy, withdraw to point D."

"Defend the town. If casualties are suffered, withdraw to the edge of the woods."

"Move at half NOE speed to point 8. If enemy are sighted, execute code bravo."

When an officer/NCO has no other orders, he will defend his current position.

An officer/NCO may lead his troops, and an officer may give orders; troops may be ordered or led to perform any action relevant to the orders under which the officer/NCO is operating, but no others. For example, if a platoon commander were under the first sample order above, he could not make a detour to attack an enemy unit which was holding up the advance of another platoon; he could only engage enemy units which were directly preventing his platoon from taking and holding hill 79.

The referee's judgment is necessary in unclear cases.

An officer/NCO is allowed a certain degree of flexibility regarding the performance of his orders. An officer ordered to move his unit is not required to move each squad every turn; however, he must, over the course of several turns, keep the unit moving. If an officer is ordered to defend a position, he doesn't have to keep every squad stationary; however, every movement must contribute to the defense of that position.

When Orders Are Changed: Orders (of all types) remain in effect until the unit or officer/NCO is given a new order, has completed his current order, or a morale check results in "forced back" or "routed." Orders are not changed if a unit is led for a period, although they are suspended for that time. If a unit has a fire order it will continue to be in effect after its movement order has been completed

Code Words: An order (of any type) may be identified with an execution code, and will then only be performed when the code is given Giving a code word counts as an order, but is received immediately. Up to four code words may be defined for each officer/NCO or unit capable of receiving orders The same code word may be given to several units in one turn. For example, an officer might say, "2nd section and weapons squad, execute code alfa."

A single code may be defined as having different meanings for different units Note that orders to higher level officer/NCOs may contain code words as part of their conditional statements.

Automatic Orders: There are four simple orders which any unit (or several units at once) may be given in one turn.

● *Halt:* The unit will stop in its current position, and remain there until further orders are received

● *Resume:* This order is given to a unit previously ordered to halt, or which has ceased to follow its orders due to a "forced back" or "routed" morale check result. The unit will return to following its previous orders.

● *Retreat:* The unit will move to its rally point or, if it has none assigned, to the closest cover away from the enemy.

● *Flee:* This is a general order, given by a commander to all units under his command. It announces that the battle is lost and troops must attempt to save themselves however they can.

Rallying: During the course of the game, troops may become routed due to enemy action A capable officer or NCO may rally such units during the command segment. For an explanation of routing and rallying see Morale Checks.

Who May Rally: Any officer may rally any troop. High-initiative NCOs may rally troops normally under their leadership. Average-initiative NCOs may not rally any troops.

Requirement: In order to rally troops, an officer/NCO must be visible to them and adjacent to them during the beginning of a combat round. Neither the rallying officer/NCO nor the troops being rallied may move or fire during the turn.

MORALE CHECKS

As explained above, each unit has a basic morale value number representing its general ability to stand up under stress. At various points in combat, units are required to make morale checks.

The player rolls two dice and compares the sum to the unit's morale number The die roll must be less than or equal to the unit's morale number for the unit to pass the check. If the number rolled is greater than the unit's morale, it will suffer adverse results

Morale Modifiers: A unit's morale number may be modified, either instantaneously (for a specific morale check) or permanently (for the rest of the combat session) In either case, modifications are expressed in terms of plus or minus modifications to the checking unit's morale number

All morale modifiers are cumulative, but a unit's morale number may never go below 2.

Instantaneous Modifiers: These are dependent upon circumstances at the time of a specific morale check, and never permanently alter a unit's basic morale number Instantaneous modifiers include:
● NCO visible within one square, +1.
● Officer visible within one square, +2.
● Supreme commander visible within one square, +3.
● Per each hit taken by the unit this turn, – 1.
● Unit is under cover but visible, +1.
● Unit is under cover and not visible, +3.

Permanent Modifiers· These alter a unit's basic morale number, and should be recorded on the unit's stat record. A unit's morale is reduced by one each time it suffers a "forced back" or "routed" morale check result.

Conditions Under Which Morale Must Be Checked

Morale must be checked under the following conditions:

Proximity to the Enemy: Whenever a unit is adjacent to an enemy unit (and can see it), the unit must check morale This check is done at the end of the turn.

Casualties: Whenever casualties are suffered, friendly units which are adjacent (and can see the event) must check morale. A casualty is defined as any hit which has at least low penetration. Casualty checks are made at the end of each firefight exchange.
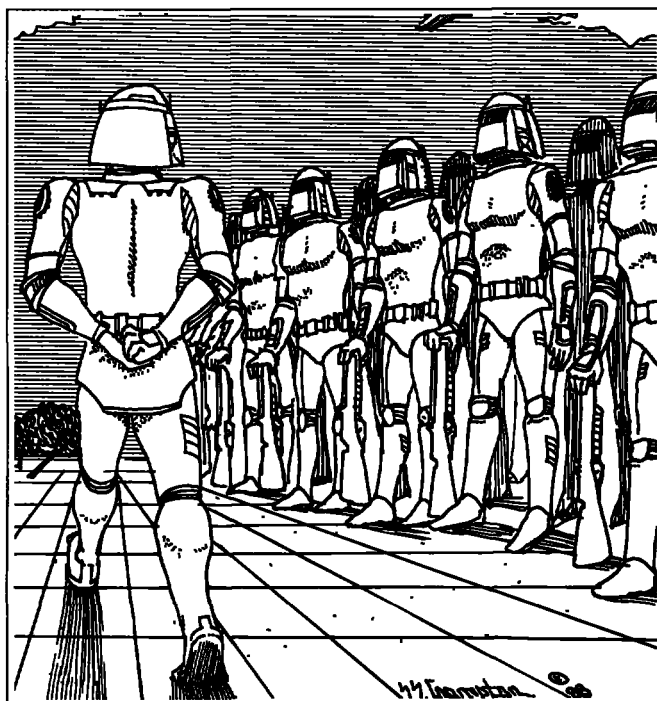
Panic: Often a unit will be influenced by events not directly affecting it, but having an effect on the overall course of the battle A unit must make a panic check (at the end of a combat round) under each of the following circumstances:

● If a unit at any time in a turn was adjacent to a friendly unit which routed, and which was of equal or higher initiative. Note that a unit which routs due to a panic check may cause other units to rout.

● If a personnel unit at any time was adjacent to a friendly combat vehicle which routed.

● If a unit during a firefight exchange was adjacent to a friendly vehicle which was rendered inoperative.

● If a unit was fired upon by friendly units.

Morale Results: Four results are possible if a unit fails its morale check, depending upon the type of check and the amount by which the die roll exceeds the unit's morale. See the Morale Check Table, below.

MORALE CHECK TABLE

Roll Exceeds	Type of Morale Check	
Morale By	Proximity to Enemy/Casualties	Panic
+1	Suppressed	Fall Back
+2	Fall Back	Forced Back
+3	Fall Back	Routed
+4	Forced Back	Routed
+5	Forced Back	Routed
+6	Routed	Routed

Results of Morale Check Table

Suppressed: The unit may not fire. If under cover, it may not move. If not under cover it must fall back in the direction of the closest cover, away from the enemy, at its fastest ground movement rate (running for infantry, NOE for grav vehicles). This effect lasts for one complete turn.

Fall Back: As above, but if already under cover, the unit will move in the direction of the next closest cover. The effect lasts for one complete turn.

Forced Back: As above, but if the unit does not reach cover in one turn, it will continue to move until it reaches such a position or rallies. The unit's morale is permanently reduced by one.

Routed: As above, but after the unit reaches cover it will continue to move away from the enemy until rallied.

Movement: If a unit is forced to retreat as a result of morale failure, it moves as soon as it fails the morale check.

Surrender: In some cases, a unit which routs will surrender Units which surrender are removed from the session. A routing unit will surrender under the following circumstances:

● If an enemy unit is visible and adjacent at the end of its rout move or at the end of a combat round.

● If it is fired upon by enemy direct fire while routed and there is no unrouted friendly officer/NCO adjacent.

● If it routs while in hand-to-hand combat with an enemy unit.

● If it routs while adjacent to an enemy unit and does not reach an undercover position during its rout move.

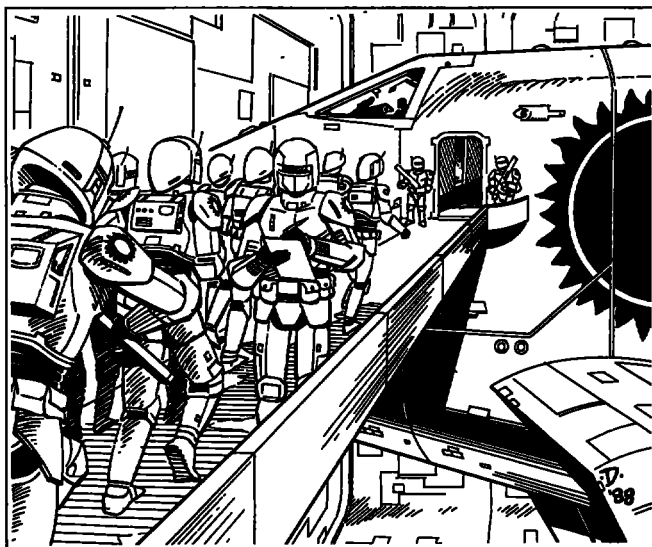**Rallying:** Units which rout or which are forced back and do not reach a covered position will continue to retreat until rallied.

Each combat round, the unit checks morale. If it passes the check, it has rallied; it may not move or fire in this turn, but returns to its normal capabilities in the next turn If it fails the check it remains in its current condition If an officer/NCO rallies a unit (as specified above) a morale check is required. An average initiative unit which rallies is without orders and will move toward its rally point or, if there is none assigned, the nearest cover.

Officers and NCOs: In addition to being required to check morale themselves, their ability to rally units is as stated above—officers and NCOs may influence the morale checks of others. Units grouped with (or in the same vehicle with) an officer/NCO are included in his morale check, and the effects stated below do not apply to them.

The list of morale modifiers notes that the presence of an adjacent, visible officer/NCO allows the checking unit a favorable morale modification of +1 for an NCO or +2 for an officer. An officer may provide this modification to any unit, but an NCO may provide it only to a unit normally under his leadership.

The highest ranking officer on a side (the supreme commander) provides a morale modifier of +3. Several officers/NCOs may influence a single unit's morale check, in which case their modifiers are cumulative.

Whenever an officer/NCO is required to check morale, that check is conducted before the checks of any unit he may be influencing. If he fails the check, his morale modifier becomes an unfavorable modifier (instead of favorable) for all units visible and adjacent

An officer/NCO may influence the morale check of a subordinate officer/NCO.

Routing Off the Battlefield: If a unit routs off the battlefield, it may return in a later turn. Low-initiative units will never rally, they are gone. The referee should roll for each other unit until it rallies, counting the number of rolls it takes. The unit will rally in that many turns. If an officer rallies, he is also assumed to have rallied any of his men who routed off with him. An average-initiative unit must then be ordered to return to combat; this is possible only if it has a radio. The number of turns a unit spent routing is also the time it will take to return to the battle.
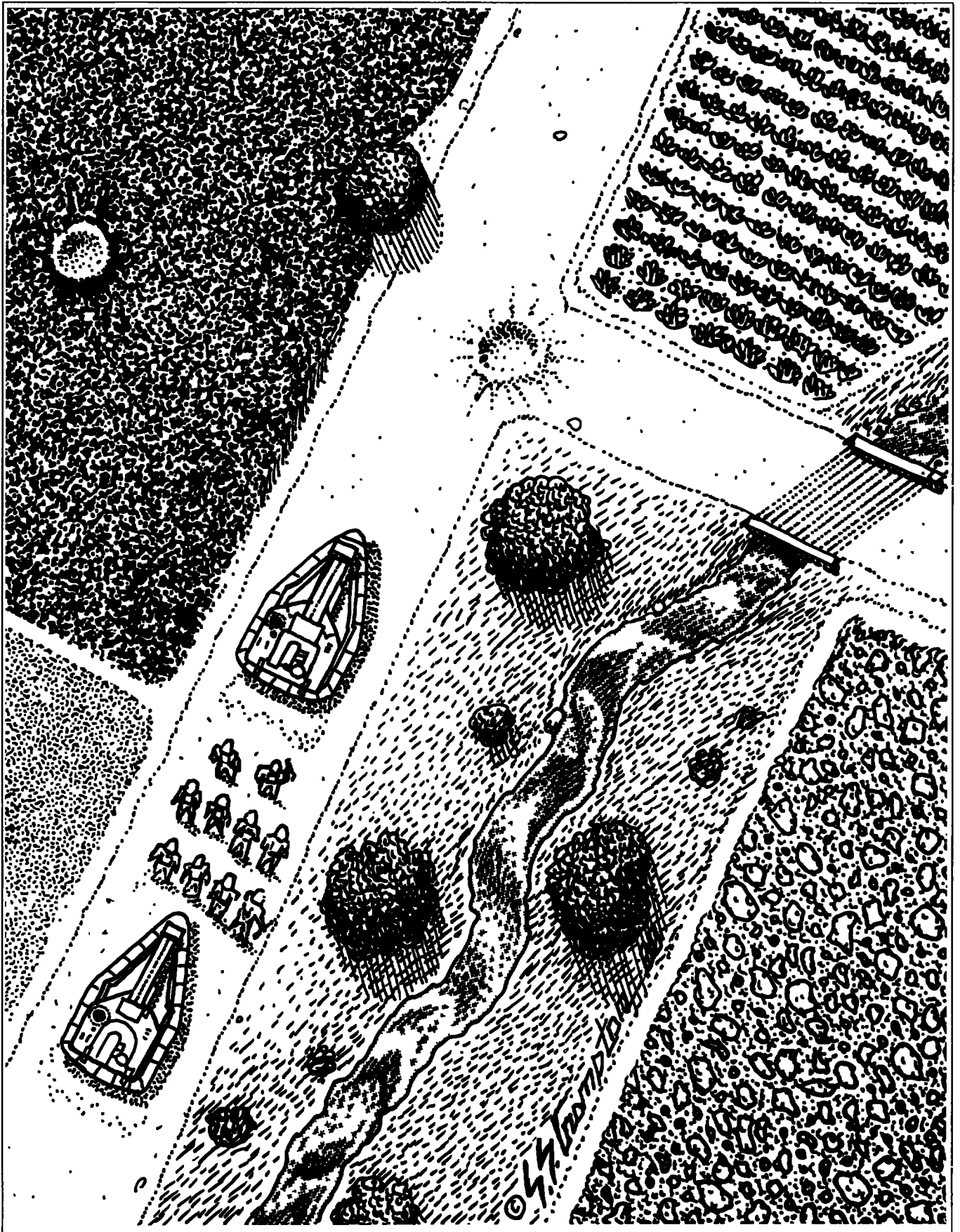
SMALL CONGLOMERATE UNIT EXAMPLE

These five units are being combined into one conglomerate unit:

INDEPENDENT UNITS

No	UPP	Life Force	Dex+	Hits	Skills and Weapons	Pen	DP	Armor Type	Armor Value
1	646	16	+0	3/3	High Energy Weapons-4 (FGMP-15) Leader-3, Tactics-2, Recon-1 Grav Belt	34/2	16	Battle Dress	18
2.	765	18	+1	3/4	High Energy Weapons-3 (FGMP-15) Recon-1 Grav Belt	34/2	16	Battle Dress	18
3	896	23	+1	3/5	High Energy Weapons-5 (FGMP-15) Leader-1, Tactics-1 Grav Belt	34/2	16	Battle Dress	18
4	676	19	+1	3/4	High Energy Weapons-2 (FGMP-15) Leader-1	34/2	16	Battle Dress	18
5	9B5	25	+2	4/5	High Energy Weapons-4 (FGMP-15) Recon-1 Grav Belt	34/2	16	Battle Dress	18

FINAL CONGLOMERATE UNIT

Task+	Hits	Description	Pen	DP	Armor	Speed
+5	16/21	FGMP-15 Tactics-3, Leader-3, Recon-1 Grav belt (Speed 22)	34/2	40	18	2

CONVERT BACK

CONVERTING FROM CONGLOMERATE UNITS TO INDEPENDENT UNITS

When a conglomerate unit has not taken any damage, converting back to independent units is as simple as pulling out the original independent unit list. However, if the conglomerate unit has taken damage during combat, and the component units are important to the adventure (usually this means they contain player characters), then the damage each independent unit has taken must be determined

To illustrate how this is done, here is the conglomerate unit consisting of the five characters with FGMPs that was created above. The unit is now shown as it stands after the battle.

FINAL CONGLOMERATE UNIT

Task +	Hits	Description	Pen	DP	Armor	Speed
+5	5/21	FGMP-15	34/2	20	18	2
		Tactics-3, Leader-3,				
		Recon-1				
		Grav belt (Speed 22)				
		**The unit has taken 11 points of damage **				

Applying the damage to the component units of a conglomerate unit is typically done after the combat session is all over. Apply all hits randomly to the individual components.

INDEPENDENT UNITS—AFTER APPLYING COMBAT RESULTS

No	UPP	Life Force	Dex +	Hits	Skills and Weapons	Pen	DP	Armor Type	Armor Value
1	646	16 **unconscious**	+0	0/3	High Energy Weapons-4 (FGMP-15) Leader-3, Tactics-2, Recon-1 Grav Belt	34/2	16	Battle Dress	18
2	765	18 **unconscious**	+1	0/3	High Energy Weapons-3 (FGMP-15) Recon-1 Grav Belt	34/2	16	Battle Dress	18
3	896	23 **wounded**	+1	2/5	High Energy Weapons-5 (FGMP-15) Leader-1, Tactics-1 Grav Belt	34/2	16	Battle Dress	18
4	676	19 **wounded**	+1	2/4	High Energy Weapons-2 (FGMP-15) Leader-1	34/2	16	Battle Dress	18
5	9B5	25 **wounded**	+2	3/5	High Energy Weapons-4 (FGMP-15) Recon-1 Grav Belt	34/2	16	Battle Dress	18

COMBAT CHARTS

MORALE VALUES

Recruit   4
Regular   7
Veteran 10
Elite   13

Morale: Morale levels of the four qualities of troops are given in the table above.

In the case of an individual soldier, his combat morale is his individual morale. In the case of a conglomerate unit, the unit's combat morale is the average of the individual morales of the soldiers making up the unit. Fractional results are rounded to the nearest whole number; in the case of a fractional result of exactly 0 5, round up.

BEATEN ZONE TABLE

Number of Rounds	Beaten Zone Size	Dispersed Zone	Converged Zone
1	1 x	1 x	1 x
4	2 x	2 x	1 x
9	3 x	4 x	2 x
16	4 x	5 x	2 x
25	5 x	6 x	3 x
36	6 x	8 x	4 x
49	7 x	· 9 x	4 x
64	8 x	11 x	4 x
81	9 x	12 x	6 x
100	10 x	14 x	7 x
121	11 x	15 x	7 x
144	12 x	16 x	8 x
169	13 x	18 x	9 x
196	14 x	19 x	9 x
225	15 x	20 x	10 x

Beaten Zone: The size of the beaten zone square is a multiple of the danger space of a single round; the exact multiple depends on the number of rounds fired, as shown on the Beaten Zone Table.

If the exact number of rounds fired is not shown on the table, use the next lower value on the table. The beaten zone is a square with each side equal to the multiplier times the danger space of a single round. For example, if a unit fires a total of 20 rounds per minute, the beaten zone multiplier used is 16, which provides a multiplier of 4. Thus, if the weapon's single-round danger space is 15 meters by 15 meters, the unit's beaten zone is 60 meters by 60 meters.

For simplicity's sake, all beaten zones less than one square in size are assumed to be one square in size.

A dispersed beaten zone increases the "to hit" task difficulty by one level.

A converged beaten zone allows rolling twice for hits.

MORALE CHECK TABLE

Roll Exceeds Morale By	Type of Morale Check	
	Proximity to Enemy/Casualties	Panic
+1	Suppressed	Fall Back
+2	Fall Back	Forced Back
+3	Fall Back	Routed
+4	Forced Back	Routed
+5	Forced Back	Routed
+6	Routed	Routed

Morale Results: Four results are possible if a unit fails its morale check, depending upon the type of check and the amount by which the die roll exceeds the unit's morale.

Suppressed: The unit may not fire If under cover, it may not move. If not under cover it must fall back in the direction of the closest cover, away from the enemy, at its fastest ground movement rate (running for infantry, NOE for grav vehicles). This effect lasts for one complete turn

Fall Back: As above, but if already under cover, the unit will move in the direction of the next closest cover. The effect lasts for one complete turn.

Forced Back: As above, but if the unit does not reach cover in one turn, it will continue to move until it reaches such a position or rallies. The unit's morale is permanently reduced by one.

Routed: As above, but after the unit reaches cover it will continue to move away from the enemy until rallied.

TURNS REQUIRED TO RECEIVE ORDERS

Unit	150m	1500m
Team/squad	2	1
Squad NCO or Platoon NCO	2	1
Section NCO or Company NCO	4	1
Platoon Officer	8	2
Company Officer	16	2

Requirements: To give orders, an officer or NCO must be in communication with the unit he is commanding.

The time required to receive an order varies according to the officer, NCO, or unit receiving it, as shown in the table above.

AUTOFIRE TARGETS TABLE

Additional Autofire Targets Available	Rate of Fire (Rounds per Minute)
2	40
3	100
4	200

CONGLOMERATE UNIT CREATION CHECKLIST

1. Produce a list of all units being conglomerated.
2. Group the units.
3. Compute the Appropriate Totals.
    A. Hits.
        1) Individuals. Total all hits
        2) Vehicles. Total all hits, use the lowest value produced for structure, power plant or locomotion, and ignore the others.
        3) Robots. Total all hits; use the lowest value produced for structure, power plant or locomotion, and ignore the others.
    B. Weapon Averaging. Combine all weapons of a given type into a single averaged weapon.
        1) Damage Points Add all weapon damage points and divide by 2.
        2) Penetration. Add all weapon penetration values and divide by the number of individuals.
        3) Range Rating Add all range ratings and divide by the number of weapons
        4) Skills. Add all skill levels together and divide by the number of individuals.
        5) Strength and Dexterity DMs. Add all Strength and Dexterity DMs and divide by the number of units.
        6) Task +. Add the Average Skill Level and Strength/Dexterity DM to produce a combined Task + for attacks with the specified weapon.
    C. Armor. Add all armor values and divide by the number of individuals.
    D. Top Speed. Use the slowest movement speed in the group.
    E. Skill Levels. Note the highest skill levels in the group, ignore obviously inappropriate skills.
    F. Indirect Fire ROF. ROF equals number of weapons times their rate of fire.
    G Vehicle Capacity. Multiply passenger capacity of a vehicle times an average character hits of 3/5.
4. Create the Conglomerate Unit

In-System Operations

Adventuring within a star system presents great potential for any group of **MegaTraveller** characters. A star system provides vast unexplored territories separated by vast distances—waiting for adventurers to come and investigate it.

A star system is composed of a number of stars and their associate planets and satellites. The world generation system in the **MegaTraveller Referee's Manual** handles the details of producing and interpreting the necessary information

Worlds: The general term *worlds* encompasses planets, gas giants, and satellites.

Planets: A world in orbit around a star is a planet The world generation procedure and the extended system generation procedures usually produce planets.

Gas Giants: A large hydrogen-atmosphere world is a gas giant. Such a world is almost always impossible to land on; it does serve as a source of fuel for starships

Satellites: A world in orbit around a gas giant or a planet is a satellite. Satellites tend to be smaller than planets, but they are occasionally large enough and developed enough to be classified as a mainworld.

Asteroids and Planetoids: Very small worlds are called asteroids or planetoids. They occur in belts in place of planets. For classification purposes, a belt is an Asteroid Belt if it is classified as the mainworld of a system; it is a Planetoid Belt if it is not the mainworld of a system.

LOCATIONS WITHIN A SYSTEM

In addition to the worlds which a system contains, a number of specific locations can be identified These include jump points, Trojan points, orbit, and dangerous lurking points

Jump Points: Jump points are locations at which it is possible to enter jump safely. By definition, a jump point is any point at least 100 diameters out from every star, planet, and satellite in the system.

In order to enter jump safely, a ship must leave a world and travel out at least 100 diameters. If the planet is within 100 stellar diameters of a star, the ship must also travel at least 100 stellar diameters out from the star. If the world is within 100 diameters of a gas giant, the ship must travel at least 100 diameters from the gas giant. For example, in the Sol system, Venus is within 100 stellar diameters of Sol; a ship leaving Venus for a jump point must travel not only 100 diameters out from Venus, but also 100 solar diameters out from Sol.

Trojan Points: Planetoids can assume a stable orbit at the Trojan points of a world's orbit. Those points occur along the orbit line of a world, but 60 degrees before or 60 degrees after the world These points are also called LaGrange Points.

Typically, a few planetoids will accumulate in the Trojan points before and after a gas giant or very large world in a star system. Orbital habitats may be built at the LaGrange points of a large satellite of a world.

Orbit: Many mainworlds (with sufficient technology levels) maintain orbital starports in orbit above the world; such starports service unstreamlined starships calling at the world, establish a transfer point for cargo and passengers, and provide shuttle service to the world surface.

Orbit may be close (with a period of about two hours) or geostationary (with a period equal to the local day length)

Lurking Points: There are a great many possible locations for starships, system defense boats, and other vessels to con-

ceal themselves within a system. The purpose of concealment is to allow defense forces to remain hidden from potential enemies or to allow illegal corsairs, pirates, or smugglers to hide from the authorities. Typical lurking points are within gas giant atmospheres, under the water of seas or lakes, on world surfaces, or in the untravelled outer reaches of a system.

Gas Giant Atmospheres: One of the most frequently travelled and most dangerous locations in a star system is the atmosphere of a gas giant. Because refueling procedures make skimming a gas giant cheap and easy, the atmospheres of gas giants are often crowded with small starships busy refueling their tanks. Furthermore, a gas giant becomes a strategic location for military starships exactly because it is a convenient source of free fuel In defense of a star system, system defense boats are routinely deployed deep in a gas giant's atmosphere, there to lie in wait for invading or intruding starships and to catch them at their most vulnerable—when they are themselves refueling at the gas giant.

System defense boats routinely lurk deep in a gas giant, undetected until they reveal themselves in a lightning attack Fortunately, attacks deep within a gas giant produce imploded hulls and unrecoverable hulks, so corsairs and pirates rarely ambush from such locations

Oceans, Seas, and Lakes: Streamlined starships can not only enter atmospheres and land on world surfaces, they can also enter bodies of water and float or submerge. Since water can be used to produce starship fuel, this capability proves extremely useful for the budget-minded or wilderness-travelling starship.

Because of the nature of water and the effects of water on sensors and detectors, ships which are submerged in water (at a depth at least three times their greatest dimension) are relatively difficult to detect. Ships trying to conceal themselves will often resort to hiding underwater. System defense boats ordered to run away (to fight again another day) find under-

IN-SYSTEM TRAVEL TIMES

(Travel times shown in days.)

AU	Million km	1G	2G	3G	4G	5G	6G	Remarks
0.01	1.5	.28	.20	.16	.14	.12	.11	Safe jump distance from size A world.
0.02	3.0	.40	.28	.23	.20	.18	.16	
0 03	4.5	.49	.34	.28	.24	22	.20	
0 04	6.0	.56	.40	.36	.31	.28	.23	
0.05	7.5	.63	.44	.36	31	.28	.25	
0.06	9.0	.69	.49	.40	.34	.31	.28	
0.07	10.5	.75	.53	.43	.37	.33	.30	Safe jump distance from gas giant.
0.08	12.0	.80	.56	.46	.40	.35	.32	
0.09	13.5	.85	.60	.49	.42	.38	.34	
0.1	15.0	.89	.63	51	.44	.40	.36	
0.2	30.0	1 2	.8	.7	.6	.5	.5	
0.3	45.0	1.5	1.0	.8	.7	.6	.6	Typical distance to neighbor world.
0.4	60 0	1.7	1.2	1.0	8	.8	.7	
0.5	75.0	2 0	1.4	1.1	1.0	.8	.8	
0.6	90.0	2.1	1.5	1.2	1.0	.9	.8	
0.7	105.0	2.3	1.6	1.3	1.1	1.0	.9	
0.8	120.0	2.5	1.7	1.4	1.2	1.1	1.0	
0.9	135.0	2.6	1.9	1.5	1.3	1.2	1.1	
1.0	150.0	2.8	2.0	1.6	1.4	1.2	1.1	
2.0	300.0	4.0	2.8	2.3	2.0	1.7	1.6	Typical distance to far neighbor world.
3.0	450.0	4.9	3.4	2.8	2.4	2.1	2.0	
4.0	600.0	5.6	4.0	3.2	2.8	2 5	2.3	
5.0	750.0	6.3	4.4	3.6	3.1	2.8	2.5	Typical distance to a far gas giant.
6.0	900.0	6.9	4.9	4.0	3.4	3.1	2.8	
7.0	1050.0	7.5	5.3	4.3	3.7	3.3	3.0	
8.0	1200.0	8.0	5.6	4 6	4.0	3.5	3.2	
9.0	1350.0	8.5	6.0	4.9	4.2	3.8	3.4	
10.0	1500 0	8.9	6 3	5.1	4.4	4.0	3.6	
20.0	3000.0	12.6	8.9	7.3	6.3	5 6	5.1	
30.0	4500.0	15.5	10.9	8.9	7.7	6.9	6.3	
40.0	6000.0	17.9	12.6	10.3	8.9	8.0	7.3	
50.0	7500.0	20.0	14.1	11.5	10.0	8.9	8.1	
60.0	9000.0	21.9	15 5	12.6	10.9	9.8	8.9	
70.0	10500.0	23.7	16.7	13.6	11.8	10.6	9.6	
80.0	12000.0	25.3	17.9	14.6	12.6	11.3	10.3	
90.0	13500.0	26.8	19.0	15.5	13.4	12.0	10.9	
100.0	15000.0	28.3	20.0	16.3	14.1	12.6	11.5	
200.0	30000.0	40 0	28.3	23.1	20.0	17.9	16.3	
300.0	45000.0	49.1	34.7	28.3	24.5	21.9	20.0	
400.0	60000.0	56.7	40.0	32.7	28.3	25.3	23.1	
500.0	75000.0	63.3	44.8	36.6	31.6	28.3	25.8	
600.0	90000.0	69.4	49.1	40.0	34.7	31.0	28.3	
700.0	105000.0	75.0	53.0	43.3	37.5	33 5	30.6	
800.0	120000.0	80.1	56.7	46.2	40.0	35.8	32.7	
900.0	135000.0	85.0	60.1	49.1	42.5	38.0	34.7	
1000 0	150000.0	89.6	63.3	51.7	44.8	40.0	36.6	
3000 0	450000.0	155.2	109.8	89.6	77.6	69.4	63.4	
5000.0	750000.0	200.4	141.7	115.7	100.2	89.6	81.8	
7000.0	1050000.0	237.1	167.7	136.9	118.5	106.0	96.8	
9000.0	1350000.0	268.9	190.1	155.2	134.4	120.2	109.8	
10000.0	1500000.0	283.5	200.4	163.6	141.7	126.7	115.7	
30000.0	4500000.0	491.0	347.2	283.5	245.5	219.6	200.4	
50000.0	7500000.0	633.9	448.2	366.0	316.9	283.5	258.8	

SYSTEM TRAVEL

Scale in AUs

| 0 | 5 | 10 | 15 | 20 |

Orbital Distances

Orbit	AUs	Million Kilometers
0	0 2	29 9
1	0 4	59 8
2	0 7	104 7
3	1 0	149 6
4	1.6	239 3
5	2 8	418 9
6	5 2	777 9
7	10 0	1495 9
8	19 6	2932.
9	38 8	5804

Scale in AUs

| 0 | 1 | 2 |

Typical Interstellar Journey

Typical Interplanetary Journey

The travel formula is designed to provide travel time for any ship beginning at a standing start, proceeding at constant acceleration toward its destination until it reaches the midway point, reversing thrust, and then proceeding at constant deceleration for the remainder of the journey.

In order to solve the equation, acceleration (in Gs) and distance (in thousands of kilometers) must be known; the travel time given is in hours.

The In-System Travel Times Table (page 21) provides typical travel times within a system; the information was computed using the travel formula.

TRAVEL FORMULA

$$T = \sqrt{D/A/32.4}$$

water concealment ideal; fugitives (pirates, corsairs, smugglers) also find this type of concealment fruitful.

The Outer Reaches: The fringes of a stellar system, far from any ordinary traffic, offer great potential for hiding starships and space vehicles. With little traffic, the hiding ships can detect anyone approaching at a great distance. And low volumes of traffic make the chance of being found slight. Smugglers especially find the outer reaches a safe haven.

Hiding Places: Scattered throughout any star system are a variety of places where starships can be hidden. A starship can use its power plant to melt a concealing cave in an icecap. Densitometers can help locate natural caves or caverns in which a ship can be hidden. Asteroid belts offer an opportunity for a ship to become lost in a scattering of nickel-iron planetoids. A common ship can even be hidden on a starport with judicious renaming and falsified papers.

PROCEDURES

Starships moving from one point to another use the following procedures to plan their actions and courses.

Moving From Point to Point: Ships usually begin travel with an effective velocity of zero—in orbit around a world. From that starting point, the ship begins accelerating toward its destination, and continues to build up speed until it reaches the midpoint in its journey, halfway to the destination. At that time, the ship begins to use reverse thrust to slow its speed toward the destination. By the time it arrives, it has slowed to an effective speed of zero again, and can enter orbit around the destination world.

Moving To Jump Point: A ship moving to a jump point does not have to slow down in order to make the jump, having an effective speed of zero just makes the process easier

A ship which enters jump retains its velocity and direction when it emerges from jump in the new system. By reducing its speed to zero, a ship is able to react quickly and move in any direction when it emerges; a ship which had retained its high velocity will be moving at high speed in an effectively random direction when it emerges from jump.

Careful Planning: A good navigator can carefully plan the course of his starship in order to make the best use of its speed and direction. Travel time to a jump point should be computed normally. For each level of Navigation skill above 1, reduce that computed time by 10 percent (Navigation-2 reduces travel time by 10 percent, Navigation-5 reduces travel time by 40 percent), the maximum reduction in travel time to the jump point is 50 percent; the actual time spent in jump cannot be reduced.

The reduction in travel time is possible only on interplanetary journeys to a jump point (and from a jump point to a world); it cannot be used on travel through jumpspace.

Computing Travel Times: The three travel formulae assume constant acceleration to a midpoint, turnaround, and constant deceleration to arrive at the destination at rest, as shown in the diagram There are three variables in the formulae; if any two are known, the third can be determined by using the correct formula. Two graphs are provided: one in hours, kilometers, and G; the other in days, au, and G. To use either one, two of the three variables must be known. For example, if G and days are known, distance travelled in kilometers can be found, if distance in kilometers and time in hours is known, G can be found

THE ACTIVITY CHECKLISTS

These checklists are provided to show typical operations and procedures when entering a star system. The merchant checklist concentrates on trade activity and making a profit. The scout checklist concentrates on exploring a star system using available sensors. It is equivalent to a Class II Survey (taking 2D days). The military checklist concentrates on entering a system which may be occupied by unfriendly forces.

MERCHANT

I. Prepare for Jump.
  A. Check charts for new system.
  B Plot course.
II. Jump to System.
III. Arrive in Star System
  A. Scan area for potential danger, problems, or other data.
  B. Access local communicator directory.
  C. Set course in system.
    1. Gas Giant (Go to IV).
    2 Mainworld (Go to V).
    3. Other world (Go to VI).
  D. Possible ship encounter.
IV Local Gas Giant.
  A. Move to orbit.
  B Refuel and return to orbit.
  C. Set course.
    1. Mainworld (Go to V).
    2 Other World (Go to VI).
    3. Jump Point (Go to VII).
V. Mainworld.
  A. Achieve orbit.
  B. Orbital starport (unstreamlined ships).
  C Surface starport
    1. Unload high passengers
    2. Unload mail.
    3. Unload middle passengers
    4. Unload cargo.
    5. Defrost and unload low passengers.
    6. Conclude low lottery.
  D. Refit and maintenance.
    1. Refuel from starport.
    2. Renew ship life support.
  E. Commodity activity.
    1. Sell speculative cargo.
    2. Buy speculative cargo.
  F. Ship's business.
    1. Pay berthing costs.
    2. Pay bank payment.
    3. Pay maintenance fund.
    4. Pay crew salaries.
  G. Miscellaneous activity.
    1 Patron encounters
    2 Planetary exploration.
  H. Prepare for Departure.
    1. Load cargo.
    2. Load low passengers.
    3. Load middle passengers.
    4. Load high passengers.
    5. Load mail.
    6. Collect income for all aspects of current trip.
  J. Departure
    1. Lift-off.
    2. Achieve orbit.
    3. Set course.
      a. Other World (Go to VI).
      b. Gas Giant (Go to IV).
      c. Jump Point (Go to VII).
    4. Possible ship encounter.
VI Other World.
  A. Achieve orbit.
    1. Scan and map surface.
    2. Investigate interesting details.
  B. Move to surface.
    1. Refuel.
    2. Explore.
  C. Departure.
    1. Lift-off.
    2. Achieve orbit.
    3. Set course.
      a. Other World (Go to VI).
      b. Gas Giant (Go to IV).
      c. Jump Point (Go to VII).
    4. Possible ship encounter
VII Jump Point.
  A. Approach jump point.
  B. Handle necessary calculations.
  C. Jump.

SCOUT

I. Prepare for Jump (range = InterStellar).
  A. Check charts for new system.
  B. Plot course.
  C. Scan (Densitometer) system for:
    1. Number of stars.
    2 Number of gas giants.
  D. Determine (EMS Passive) spectral types.
II Jump to System.
III. Arrive in Star System
  A. Scan area for potential danger, problems, or other data.
  B Proceed inward by ranges.
    1. Range = SubStellar.
    2. Range = System
    3. Range = Interplanetary.
  C. Use available instrumentation as made possible by ranges.
    1. EMS Passive.
      a. Refine spectral and size data for stars.
      b. Note radio transmission sources.
    2. Densitometer.
      a. Locate all possible planets.
      b. Determine size (UWP Size digit) and mass for each.
    3. Neutrino Detector.
      a. Note fission and fusion reaction sources.
      b. Determine stellar stability.
IV. Investigate World or Gas Giant.
  A. Proceed inward by ranges.
    1. Range = FarOrbit.

2. Range = Planetary

B. Use available instrumentation as made possible by ranges.

   1. EMS Passive.

     a. Determine climatic features.

      1) Icecaps

      2) Deserts.

      3) Air and ocean currents.

     b. Map magnetic field.

     c. Locate radiation belts.

     d. Determine atmosphere (UWP Atmosphere digit).

     e. Determine water coverage (UWP Hydrographics).

     f Pinpoint radio sources.

   2. Densitometer

     a. Map surface crust configurations.

     b. Map major mineral areas.

   3. Neutrino Detector

     a. Pinpoint fission and fusion reaction sources.

     b. Determine world stability.

C. Move to Surface

   1. Refuel.

   2. Explore.

D. Departure.

   1. Lift-off.

   2. Achieve orbit.

   3 Set course.

     a. Other World or Gas Giant (Go to IV)

     b. Jump Point (Go to V)

   4. Possible ship encounter.

V Jump Point.

A. Approach jump point

B. Handle necessary calculations.

C. Jump.

MILITARY

I. Prepare for jump (range = InterStellar).

A. Check charts of known system.

B. Scan (Densitometer) system for:

   1 Number of stars.

   2. Number of gas giants.

C. Determine (EMS Passive) spectral types.

D. Plan arrival point.

   1. Outer System.

   2. Gas Giant.

   3. Mainworld.

   4. Other World.

II Jump to System.

III. Arrive in Star System.

A. Outer System (range = Substellar).

B. Gas Giant (range = FarOrbit).

C World (range = FarOrbit).

IV. Outer System.

A. Proceed inward by ranges.

   1. Range = SubStellar.

   2. Range = System.

   3. Range = Interplanetary.

B. Use available instruments as made possible by ranges

   1. EMS Passive.

     a. Search for and locate all possible bases.

     b Search for and locate all possible ships.

     c. Note radio transmission sources.

   2. Neutrino Detector.

     a. Note fission and fusion reaction sources.

C. Approach Gas Giant or World.

V Gas Giant.

A. Proceed inward by ranges.

   1 Range = FarOrbit.

   2. Range = Planetary.

B Use available instruments as made possible by ranges.

   1. EMS Passive.

     a. Search for and locate all possible bases.

     b. Search for and locate all possible ships.

     c Note radio transmission sources.

   2 Neutrino Detector

     a Note fission and fusion reaction sources.

C. Set course in system.

   1. Gas Giant.

   2. Mainworld.

   3. Other World.

VI. World

A. Proceed inward by ranges.

   1. Range = FarOrbit.

   2. Range = Planetary.

B. Use available instruments as made possible by ranges.

   1. EMS Passive.

     a. Search for and locate all possible bases.

     b. Search for and locate all possible ships.

     c Note radio transmission sources.

   2. Neutrino Detector.

     a. Note fission and fusion reaction sources.

C. Set course in system.

   1. Gas Giant.

   2. World.

VII. Investigate World.

A. Proceed inward by ranges.

   1 Range = FarOrbit.

   2. Range = Planetary

B. Use available instruments as made possible by ranges.

   1. EMS Passive.

     a Pinpoint radio sources.

   2. Neutrino Detector.

     a Pinpoint fission and fusion reaction sources.

     b. Determine world stability.

C. Move to surface.

   1. Refuel.

   2. Explore.

D. Departure.

   1. Lift-off.

   2. Achieve orbit.

   3. Set course.

     a. Other World.

     b. Gas Giant

     c. Jump Point.

   4. Possible ship encounter.

VIII. Jump Point.

A. Approach jump point.

B. Handle necessary calculations.

C. Jump.

The Third Imperium records the level of technological achievement on each member world with a value called the tech level. The tech level, recorded in a world's Universal World Profile (UWP), indicates what level of technology one can expect to be available on the world.

The tech level represents the highest level of sophistication commonly available This is the tech level typically encountered near the starport and in the modern urban areas. Most forms of equipment the typical traveller might acquire will be of the UWP tech level.

It is important to note that a world's tech level does not necessarily represent the level of technology enjoyed by the majority of the world's population. The bulk of the population may sometimes possess a tech level significantly lower than the tech level of goods commonly available near the starport. If a traveller travels beyond the world's starport or large urban areas, he or she may encounter tech levels lower than that recorded in the world's UWP.

By way of illustration, consider Terra circa 1985. The world's tech level is marginally tech level 8, but the tech level enjoyed by most of Terra's population of five billion is actually tech level 6. Certain areas (mostly urban North America, Europe, and some parts of Asia) do possess the higher tech level of 8.

THE TECHNOLOGY CHART

The two-page technology chart provides the tech level breakdown for each major technological area. The chart lists **MegaTraveller** technology through tech level 21.

The maximum tech level commonly encountered in the Third Imperium is 15, with an occasional tech level 16. Tech levels over 16 are almost never encountered in the **MegaTraveller** universe except as artifact tech levels. There is only one exception to this in the entire Imperium: Sabmiqys (Antares 2117). Sabmiqys possesses an active, developing tech 17 culture, but because of social reasons the population of Sabmiqys is planetbound. Their space transport tech level is 8: They are without jump drive capability.

Each column on the chart is discussed below. The comments cover tech level 5 or above

Personal Military Technology: Indicates the advancements in personnel-carried weapons and armor. Personal military technology covers everything from clubs to disintegrator weapons.

Tech Level 5 (circa 1930): The standard small arm is the bolt action rifle. Explosive hand grenades come into wide use.

Tech Level 6 (circa 1950): The semiautomatic rifle gradually supersedes the bolt-action rifle, while the carbine, SMG, and automatic pistol achieve wide military use.

Tech Level 7 (circa 1970): The main personal military weapon becomes the assault rifle. Ballistic cloth armor is introduced during the period. Grenade launchers appear: they serve both as a general support weapon and as a limited antitank weapon.

Tech Level 8 (circa 1990): The assault gun remains the standard. Ballistic cloth armor (mainly in the form of flak jackets) comes into universal use. RAM grenade launchers replace earlier grenade launchers. Late in the period, a low-powered laser carbine appears, mainly for use as a rangefinder and target designator.

Tech Level 9 (circa 2010): Laser weapons with much greater lethality appear. Ablative clothing is introduced as a protection against these lasers.

Tech Level 10 (circa 2100): The advanced combat rifle, which fires a RAM grenade, becomes the personal military weapon of choice. Ablative armor enjoys widespread use as a protection against laser weapons, and reflec armor is introduced.

Tech Level 11: Combat armor appears. Essentially an armored vacc suit, combat armor can be pressurized for use in a vacuum. or hostile environment.

Tech Level 12: The Gauss rifle is introduced as a sniper weapon. The PGMP-12, the first man-portable plasma gun, often appears during this period.

Tech Level 13: Most armies at this tech level equip their military units with Gauss rifles and combat armor. A powered, highly sophisticated version of combat armor appears, unique enough in its own right to become a brand new type of armor: battle dress. High-gain, optimized plasma gun advancement also occurs, often with special versions of the PGMP weapon developed exclusively for use with the battle dress.

Tech Level 14: By this point, most armies have equipped their troops with battle dress and PGMP-13 type weapons Continuing development of the plasma weapons occurs, and new development produces the man-portable fusion gun. The plasma gun of this period typically incorporates a grav compensator to lighten the weapon and reduce its recoil. A fusion weapon contains the plasma bolt just long enough for a fusion reaction to begin.

Tech Level 15: Combining the PGMP-14 and FGMP-14 technology often yields the FGMP-15, an improved fusion weapon that also incorporates a grav compensator.

Above the Imperium's highest tech level:

Tech Level 16: Continued advancement usually results in dramatically smaller and more efficient fusion and plasma weapons. Advancements in remote neural activity sensing also result in neural weapons—weapons which remotely disrupt

brain activity. A concurrent development is the neural shield: generally designed as a belt, it provides a protective "field" around the wearer, jamming neural weapon fire. It is also an effective psionic shield.

Beyond Tech Level 16: Disintegrator weapons appear. They weaken the strong nuclear force in the atomic nucleus, causing the target's atoms to literally "fly apart," thereby disintegrating the target. The personal damper, when hit with disintegrator fire, strengthens the strong nuclear force and thus attempts to counteract the disintegrator's effect.

At very high tech levels the relativity rifle appears. This weapon's effect is controllable, allowing the attacker to slow down the passage of time by a selectable ratio for the target. At an extreme ratio, it is possible to put the target temporarily into a form of suspension. The higher the time distortion ratio, the greater the energy drain on the weapon

The white globe creates a one-way impenetrable field around the wearer. The wearer can see out, fire weapons, and so on; all the attacker sees is a shimmering white globe around the wearer. It protects against all previously developed weapons except the relativity rifle.

Heavy Military Technology: Indicates the culture's advancements in long-range, vehicle-oriented weapons and armor. Heavy weapon systems include such things as artillery, support weapons, and combat vehicles.

Tech Level 5 (circa 1930): Both the machinegun (a development of the earlier Gatling gun) and the trench mortar are introduced as support weapons. Breech-loading field artillery appears; armored vehicles (tanks) are introduced.

Tech Level 6 (circa 1950): The increase in the importance of armored vehicles leads to the introduction of a variety of antitank weapons. Tactical and strategic rocket-missiles appear as simple, self-propelled projectiles. Late in the period, strategic nuclear weapons are introduced

Tech Level 7 (circa 1970): Tanks now incorporate weapon stabilization allowing them to fire while moving. Composite-laminate armor appears. A wide variety of tactical and strategic guided missiles are introduced. Beam lasers appear on an experimental basis.

Tech Level 8 (circa 1990): Particle accelerators appear, although they are just barely practical at this stage, since they are nonmobile and quite large Computerized systems become the rule in all military vehicles.

Tech Level 9 (circa 2010). The mass driver gun is introduced as an alternative artillery weapon. A lighter-weight version of composite armor appears. Toward the end of the period, the first grav tanks are introduced. The first tank-mounted laser weapons appear.

Tech Level 10 (circa 2100): Tracked tanks are completely supplanted by grav tanks and light wheeled vehicles with crystaliron armor. The plasma gun appears as an artillery and space vessel weapon, and late in the period is mounted on ultraheavy grav tanks. Gravity repulsors appear for use on space vehicles operating outside a gravity well.

Tech Level 11: Large Gauss guns appear as infantry support weapons. All military vehicles are now grav-propelled and possess a pronounced free-flight capability; effectively merging with military aircraft. Meson guns are introduced as a nonmobile, deep-mounted planetary defense weapon and as a

space vessel weapon. Robotic missiles appear as an alternative to artillery.

Tech Level 12: Conventional artillery is almost completely supplanted by highly intelligent robotic missiles. Fusion guns appear as grav tank and space vessel weapons. Toward the end of the period, nuclear dampers and superdense armor are introduced.

Tech Level 13: Laser weapons are introduced which fire invisible X-rays, they greatly improve the laser's ability to penetrate obscuration devices. Gravitic compensators appear on vehicle-mounted plasma and fusion weapons, enabling these heavy weapons to be mounted on even very light vehicles. Heavy grav vehicles are virtually indistinguishable from orbital craft.

Tech Level 14: Bonded, superdense armor appears, making armored vehicles extremely formidable craft Sophisticated nuclear dampers enable virtually complete protection of entire operational areas against nuclear warheads.

Tech Level 15: The primary direct-fire weapon becomes the battlefield meson gun. Early black globes enable space vessels to gain complete protection against all forms of incoming enemy fire

Above the Imperium's highest tech level·

Tech Level 16: Short-range tractor beams appear for space vessels. An advancement of antigrav technology, the tractor also works as a form of jump damper as well by projecting a pseudogravity well into the vicinity of the target ship (only when the target's agility has been reduced to zero). Antimatter missile warheads appear, antimatter warheads are not affected by nuclear dampers.

Beyond Tech Level 16: The proton screen/proton beam appears, rendering antimatter missile warheads ineffective. At very high tech levels, the jump projector appears The projector induces a jump field around the target, forcing the target to immediately misjump The jump projector is found to be
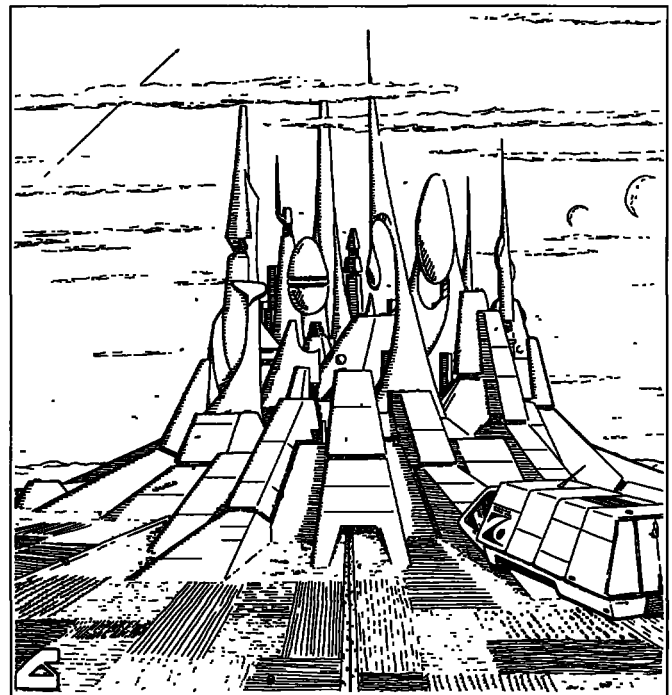
TECHNOLOGY CHART 1

TL	Personal Military	Heavy Military	Computers/Robotics	Communications	Environment	Medical
0	Club Spear, Cudgel	None	Primitive Math	Runners	Cave Dwellings Crude Huts	Mystical Medicine Herbal Medicine
1	Bow, Sling Sword, Jack Armor	Catapult	Abacus Geometry, Trig	Heliograph Smoke Signals	Settlements, Towns Irrigation	Diagnosis of Disease
2	Crude Firearms	Small Cannons	Algebra	Printing Press	Cities, Canals Bridges, Roads	Understanding of Internal Anatomy
3	Rifled Firearms Flintlock Weapons	Cannons	Calculus	Telegraph	Cement Structures	Crude Surgery
4	Cartridge Ammo Mesh Armor	Gatling Gun Steel Armor	Mech Add Machines	Telephone Audio Recorders	Cities in Rugged/Desert	Early Vaccination Antiseptics
5	Explosive Grenades Shotgun	Armored Vehicles Mortars	Electric Calculators Massive Model/1	Radio Radar	Sealed/Condtnd Cities Skyscrapers	Mass Vaccination X-ray Diagnosis
6	Automatic Weapons SMG, Autopistol	Nuclear Weapons Missiles	Electronic Computers Large Model/1 bis	Television	Cities in Jungles	Understand Viruses Crude Prosthetics
7	Grenade Launchers Cloth Armor	Beam Lasers CompLam Armor	Desktop Computers Model/2	Satellite Commo Video Recorders	Underground Cities	Organ Transplants Medical Slow Drugs
8	RAM Grenades Early Laser Carbine	Particle Accelerators	Massive Parallel Model/2 bis	Fiber Optics Optical Storage	Orbital Settlements Early Weather Control	Artificial Organs Slow Drugs
9	Laser Weapons Ablative Armor	LtWt CompLam Armor Mass Drivers	Nonvolatile Memory Vocal Input	Video Telephones Flat Video Screens	Orbital Cities Arcologies	Limb Regeneration Cryogenic Suspension
10	Adv Combat Rifle Reflec Armor	Plasma Guns Repulsors, Crystaliron	Voice Transcription Model/4	Voice Transcriber Holovideo	Undersea Cities Underice Cities	Antiviral Vaccinations Growth Quickening
11	Combat Armor	Meson Guns	Advanced Synaptics Model/5	Personal Datalinks	Gravitic Structures	Nerve Refusion Artificial Eyes
12	PGMP-12 Gauss Rifle	Fusion Guns, Dampers Superdense Armor	Semi-Int Robots Model/6	Advanced Translators	Major Terraforming Adv Weather Control	Broad Antitoxins Enhanced Prosthetics
13	PGMP-13 Battle Dress	X-ray Lasers	Holocrystal Storage Model/7	Holocrystal Storage Hand Holocameras	Gravitic Cities	Cloned Body Parts Reanimation
14	FGMP-14	Bnd Suprdnse Armor	Brain Implants Model/8	Early Meson Commo	Mobile Cities	Genetic Engineering Memory Erasure
15	FGMP-15	Early Black Globes	Pseudoreality Pseudobio Robots	Meson Commo Pseudoreality	Complex Terraforming	Anagathics Pseudobio Prosthetics

────────────────── **Above Average Imperial Technology** ──────────────────

TL	Personal Military	Heavy Military	Computers/Robotics	Communications	Environment	Medical
16	FGMP-16 Neural Gun/Shield	Short Range Tractors	Artificial Intelligence Robots Common	Hand Meson Commo Pocket Holovideo	Global Terraform	Brain Transplants Crude Memory Transfer
17	Fusion Rifle Plasma Pistol	Early Disintegrators Antimatter Missiles	Self-Aware Robots Self-Aware Computers	Pocket Meson Commo	Terraforming of Worlds to 800 km	Selective Mem Erase Intelligent Antibodies
18	Disintegrator Rifle Personal Damper	Adv Disintegrators Long Range Tractors		Pseudoreality Commonplace	Terraforming of Worlds to 4000 km	Partial Memory Transfer (Dupe)
19	Disintegrator Pistol	Proton Screen Plastic Metal Armor			Terraforming of Worlds to Any Size	Noncryo Suspend Adv Bioengineering
20	Disintegrator Wand	Relativity Beam White Globes		Matter Transport Global Commo	Mobile Worlds (Sublight Speeds)	Total Memory Transfer (Dupe)
21	Relativity Rifle Personal White Globe	Jump Projector Jump Damper		Matter Transport System Commo	Mobile Worlds (via Jumpspace) *Also* Dyson Spheres TL 23 Ringworlds TL 25 Solid Dyson Spheres TL 27	Total Rejuvenation

TECHNOLOGY CHART 2

TL	Land Transportation	Water Transportation	Air Transportation	Space Transportation	Energy
0	Foot Travel	Rafts and Canoes			Muscles
	Domesticated Animals	Dugouts, Rowboats			Domestic Animals, Slaves
1	Crude Wheel	Rowed Galleys			Water
	Carts, Wagons, Chariots	Small Sailing Vessels			Water Wheels
2	Advanced Wheel	Multimast Sailing Ships			Wind
	Movable Axle	Crude Navigation			Windmills
3	Extensive Road System	Clipper Sailing Ships	Hot Air Balloons		Electricity
	Stagecoaches	Advanced Navigation			Primitive Storage Batteries
4	Self-Propelled Vehicles	Self-Propelled Ships	Dirigibles		Coal
	Trains	Ironclads, Steamships	Experimental Gliders		Steam Engines
5	Ground Cars	Steel Hulls	Airplanes	Early Rockets	Petrochemicals
	Tracked Vehicles	Early Submersibles	Seaplanes	Satellites	Internal Combustion Engines
6	Amphibian Vehicles	Advanced Submersibles	Early Jet Aircraft	Early Manned Rockets	Nuclear Fission
	Advanced ATVs/AFVs	Scuba Gear	Helicopters	Satellites Common	
7	Hovercraft	Hydrofoils	Supersonic Jet Aircraft	Unmanned Space Probes	Solar
	High Speed Trains	Hovercraft	Ultralights		Primitive Fuel Cells
8	Triphibian Vehicles	Triphibian Vehicles	Triphibian Vehicles	Orbital Shuttles	Geothermal
		Crude Artificial Gills	Hypersonic Jet Aircraft	Space Stations	
9	Early Grav Vehicles	Early Grav Vehicles	Early Grav Vehicles	Jump1 Invented	Superconductors
	Ultra HS Trains	Advanced Artificial Gills	Suborbital Shuttles	Sublight Stellar Travel	Primitive Fusion Plants
10	——————— Land/Water Transport Merge ———————		Advanced Grav Vehicles	Interstellar Travel Common	Fusion Plants 2000-Liter Min
			UH Grav Modules	Gravitic Maneuver Drives	Fusion Supredes Geothermal
11	——————————— Land/Water/Air Transport Merge ———————————			Jump2	Fusion Plants 1000-Liter Min
		HV Grav Modules		Thruster Technology	
12		Personal Grav Belts		Jump3	Fusion Plants 250-Liter Min
		LT Grav Modules			Advanced Fuel Cells
13	————————————— Land/Water/Air/Orbital Spacecraft Merge —————————————				Fusion Output 3 kw per Liter
				Jump4	Miniaturized Super-Batteries
14				Jump5	Fusion Plants 100-Liter Min
15				Jump6	Fusion Output 6 kw per Liter

——————————————————————— **Above Average Imperial Technology** ———————————————————————

TL	Land Transportation	Water Transportation	Air Transportation	Space Transportation	Energy
16		Experimntl Matter Transprt		Fusion Output 7 kw per Liter	
		(Raw Materials Only)			Fusion Plants 80-Liter Min
17		Experimntl Matter Transprt		Primitive Antimatter Plants	
		(Matter Transmutation)			
18		Experimntl Matter Transprt	Self-Aware Starships	Antimatter 1 Mw/Liter	
		(Portal Technology)			Fuel Pods 750-Liter Min
19		Portal Technology			Antimatter 2 5 Mw/Liter
		Regional Range			Fuel Pods 200-Liter Min
20		Crude Energy Sink			Antimatter 15 Mw/Liter
		Continental Range			Fuel Pods 40-Liter Minimum
21		Starship-Sized Portals		Starship-Sized Matter	Antimatter 50 Mw/Liter
				Trans Portals	Fuel Pods 5-Liter Minimum

unreliable in a gravity well at less than 100 diameters and non-functional at less than 10 diameters .

The jump damper also appears at very high tech levels. Two versions exist· first, as a ship screen to protect against jump projectors, and later developed as a bay weapon and used to restrict the enemy's ability to enter-jumpspace.

Computer/Robotics Technology: Indicates the culture's progress in the creation and use of high-tech computer circuitry and robots.

Tech Level 5 (circa 1930): Slow and bulky mechanical calculators give way to slow and bulky electric calculators.

Tech Level 6 (circa 1950): The advent of miniature electronics makes a new generation of computers possible. Reduced cost makes computers more common, and results in a mushrooming of their applications. Improved programming languages make programming much easier, and give birth to the dream of a practical artificial intelligence. ·

Tech Level 7 (circa 1970): Computers that once filled entire rooms are reduced to desktop size. Processing speeds and offline data storage capacity increases dramatically. While some great strides have been made in AI research, it is conceded that truly inductive, self-learning, self-aware machine artificial intelligence is still but a dream.

Tech Level 8 (circa 1990): "Massively parallel" computer architectures become common. The benefits to language understanding, expert systems, visual recognition systems, and other aspects of artificial intelligence are immediate, as machines can finally consider hundreds of facts at once to make their decisions. Data storage capacity increases by an order of magnitude with the introduction of optical storage devices.

Tech Level 9 (circa 2010): Nonvolatile computer memories become common, so that no power supply is needed to preserve data contained in a computer when the computer is shut off. Computers can now be stored powerless for years, and yet pick up where they left off as soon as power is resumed Practical superconductors allow a significant increase in processing speeds.

Computers at this tech level can follow basic commands when given vocally. These consist of one-word commands from a vocabulary of a few hundred words. No pretraining on the part of the machine is required, but careful enunciation is necessary.

Tech Level 10 (circa 2100): Voice transcription devices become widespread, allowing computers to produce written text directly from spoken words. The use of voders (speech synthesizers) to produce "spoken" computer output becomes common.

Tech Level 11: Prior to this tech level, computers are strictly deterministic; that is, given a certain set of data as input, a computer will always produce the same output. Synaptic processing, an attempt to model computer operation after sophontic brains, is found to introduce a measure of nondeterminism into the computer CPU.

A purely synaptic computer is not functional at all, because of the unreliability caused by the overloaded synaptic circuits. A large percentage of traditional deterministic processors can be used to reduce the number of false matches picked up by the synaptic circuit. .

Tech Level 12 More reliable synaptic processors allow true self-programming (heuristic or self-teaching) AI software to be developed, but cost and size continue to be limiting factors.

The self-mobile computer brain with developed manipulative appendages (i.e., a robot) finally becomes an economic and commercial reality. ·

Tech Level 13: Holographic crystal data storage, first widely available at tech level 13, increases the capacity of-computer memory banks by another factor of 10 over optical storage. The most advanced AI software requires the use of synaptic processors, as well as heavy parallelism

Tech Level 14: Experiments with lesser animals make a direct brain implant possible, allowing a computer to exchange massive amounts of data at rates of mere microseconds with a living brain

While robot brains can now include up to 25-percent synaptic processing, the most reliable traditional computers (such as starship computers) still rely on deterministic, massive-parallel processing.

Tech Level 15· Computers become "alive," thanks to sophisticated programming and remarkable visual imaging devices. "Pseudoreality" machines can artificially produce the illusion of existence in whatever they are programmed to produce, with the help of holographic (3D) displays. For example, the personality of a dead individual can be programmed into a computer, allowing one to "converse" with the dead individual (via the computer) as if that individual were still alive.

Above the Imperium's highest tech level

Tech Level 16: Reliable synaptic processing crosses the 50-percent boundary; true creativity and unprogrammed inspiration spring from these fantastic computer brains

Beyond Tech Level 16· Computers with synaptic "brains" can program themselves through their hardware, with no outside software influence. Computers beyond tech level 16 are "self-aware" in every sense of the word. Robots and computers essentially free their creators to pursue higher interests of their choice, while the robots and computers perform the mundane tasks of running society

Communications Technology: Indicates the culture's use of long-range communication devices.

Tech Level 5 (circa 1930). Wireless voice communication (radio) appears in use. Later in the period, a spinoff of radio, known as radar, is developed for detecting far-off metallic objects.

Tech Level 6 (circa 1950): Miniature electronics makes a new generation of communication devices possible Wireless communication expands along new frontiers to include video images (television).

Tech Level 7 (circa 1970)· Communication satellite networks remove all barriers to global communication. Advanced electronics makes video recording commonplace.

Tech Level 8 (circa 1990): Optical methods of transmission and data storage are introduced. Fiber optic networks begin to replace older-style metallic wire ones. The fiber optics provide substantially improved transmission quality as well as a much higher quantity of transmissions in the same cable volume. .

Tech Level 9 (circa 2010): Personal video communicators (video telephones) appear. Flat video screens only a few

millimeters thick appear, making it possible to mount a video screen on a wall just as one might do with a still picture. Practical superconductors make way for significant advancements in communication transmission volumes and data transfer rates

Tech Level 10 (circa 2100): Voice transcription devices become widespread, allowing spoken words to be stored or transmitted as written text. Holographic (three-dimensional) video appears, although at this point, producing or viewing such videos requires an extensive array of costly equipment.

Tech Level 11 The total personal datalink is introduced, allowing one individual to communicate with any other individual anywhere on a world, any time, using any desired mode of communication: text, voice, or video in any combination The personal datalink (often implemented using a hand computer) device allows the user to record, send, receive, and store message data in any form. Holovideo, however, is still beyond the realm of the personal datalink.

Tech Level 12: Advanced multilingual translation devices come on the scene. These small devices can translate a multitude of spoken languages directly in real-time, with remarkable accuracy and reliability. Language barriers disappear when these devices are linked with all modern forms of communication.

Tech Level 13: Holographic crystal data storage appears, increasing storage capacities tenfold. The first consumer holovideo cameras are developed.

Tech Level 14: Early meson communication is used in specialized applications Meson communication allows transmitting in a straight line to the destination with no consideration necessary for any intervening mass. Thus, it becomes possible to send and receive messages directly through the center of a world to the other side, rather than using communication satellite networks to bounce the signal around the globe

Tech Level 15: Meson communications become the communication method of choice for most commercial applications. Pseudoreality communications appear, allowing the computer to query you extensively on a subject, and to act as your stand-in when delivering the message The receiver of the message can discuss the message with your computer image just as if you were there.

Above the Imperium's highest tech level:

Tech Level 16: Meson communications supersede orbital communication satellites, rendering them obsolete Handheld meson communicators and pocket holovideo cameras appear.

Beyond Tech Level 16: Pseudoreality communications become cheaper and more reliable as the tech levels increase. By tech level 18, pseudoreality communications become infallible when acting as the sender's stand-in.

Starting at tech level 20, matter transport becomes so powerful that transportation ceases to be a communication barrier on a global level. By tech level 21, matter transport eliminates all transportation barriers to intrasolar system communications.

Environmental Engineering Technology: Indicates the ability of the culture to manipulate their environment. It establishes the chance of local terraforming projects being underway, and dictates the ways in which cities and other large civil engineering works are constructed.

Tech Level 5 (circa 1930): Sealed and conditioned cities become possible. While at tech level 4 sealed and conditioned dwellings are possible, this technology has expanded to include an entire city as a unit. Multistory structures over 100 meters in height appear (skyscrapers).

Tech Level 6 (circa 1950): Building an entire city in a jungle becomes feasible. Skyscrapers become commonplace.

Tech Level 7 (circa 1970): Civil engineering advances enough to make entire underground cities possible.

Tech Level 8 (circa 1990): Orbital settlements (an orbital station (not closed-cycle)) with a permanent population of up to 100 become possible. An early form of wide-scale weather control is introduced. Semireliable seismic quake prediction appears.

Tech Level 9 (circa 2010): Orbital cities (a closed-cycle orbital station) with a permanent population of 1000 or more are introduced. Large, totally self-contained cities (arcologies) become possible

Tech Level 10 (circa 2100). Undersea and underice cities become practical Early seismic quake control appears

Tech Level 11: Structures whose design relies upon a gravitic supplement appear. These structures would collapse without the permanent aid of their gravitic support

Tech Level 12: Major terraforming projects covering thousands of square kilometers become commonplace Significant advances in global weather control help make such terraforming projects possible Massive gravitic structures that can freely move about appear.

Tech Level 13: Entire cities supported by gravitics appear (populations in excess of one million). Athough such cities are stationary (i.e., nonmobile), they can be suspended in the sky at altitudes of up to one kilometer.

Tech Level 14 Gravitic-supported cities that can move about are introduced. Such cities can now reach altitudes of over 10 kilometers.

Tech Level 15: Gravitic cities can now reach orbit on their own. Complex terraforming involving an entire hemisphere becomes commonplace Reliable seismic quake control is also common.

Above the Imperium's highest tech level:

Tech Level 16: Global terraforming becomes commonplace, allowing substantial improvements in a world with an unfavorable global environment For example, transforming a world with an insidious atmosphere to a world with a standard atmosphere is global terraforming

Beyond Tech Level 16: Total terraforming appears at tech level 17 and beyond. Total terraforming involves complete transformation of a world's basic environment to a radically different basic environment of one's choosing For example, transforming a barren vacuum world to a lush, rich world with a dense atmosphere is total terraforming. At extremely high tech levels, moving entire planets about, even through jump space, becomes possible.

Medical Technology: Indicates the quality of biological research and medical care available.

Tech Level 5 (circa 1930). Vaccination of the masses is introduced X-rays are used to view a being's internals and to aid in the diagnosing of illness.

Tech Level 6 (circa 1950): An understanding of viral diseases is developed during this period Crude prosthetic limbs (limbs that are a facsimile of the real thing) appear

Tech Level 7 (circa 1970): Organ transplants become common Medical slow drug is introduced as a method of aiding the healing process.

Tech Level 8 (circa 1990): Nonbiological artificial organs are introduced, as an alternative to organ transplants in some cases Rapid-acting slow drugs are developed

Tech Level 9 (circa 2010)· Advances in genetics lead to the development of practical limb regeneration techniques Late in the period, cryogenic suspension appears (low berth) as a way to buy time in medical emergencies

Tech Level 10 (circa 2100): Genetic manipulation advances produce broad-spectrum antiviral vaccinations (e.g , finally curing the common cold in humans) Early growth-quickening methods are introduced, allowing the accelerated growth of biological tissues.

Tech Level 11. True nerve refusion techniques appear, allowing major neural damage (such as a severed spinal cord) to be surgically repaired Artificial eyes are developed, thus providing a practical means for those who cannot see to regain their sight

Tech Level 12: The broad-spectrum antitoxin is introduced into use This "wonder drug" greatly hastens the recovery of the patient against literally hundreds of diseases. The first totally functional, inexpensive prosthetic body part replacements appear

Tech Level 13. Further advancements in genetics allow selective cloning of replacement body parts to be developed Under certain conditions, a person who has just died can be brought back to life (reanimation)

Tech Level 14. Genetic engineering techniques culminate in the creation of altered, "improved" life forms, including sentients. Deliberate memory erasure becomes possible, and is often first used on criminals.

Tech Level 15: True anagathics and antianagathics appear: convenient drugs which allow aging to be retarded or accelerated. True pseudobionic prosthetic replacements, indistinguishable from the biological original, appear during this period.

Above the Imperium's highest tech level:

Tech Level 16· Successful brain transplants become possible. Memory transfer is developed, although it is not as yet totally reliable.

Beyond Tech Level 16: Intelligent antibodies, ultraminiaturized computer devices that can track down and kill with extreme precision even a single foreign body in an organism, appear at higher tech levels. Advanced bioengineering is developed, allowing living organisms to be directly manipulated into variant life forms.

Total Rejuvenation begins at tech level 21. It is a combination of many techniques which allow a being to get an entirely new body. The technique is tremendously expensive and somewhat risky, but this improves with subsequent tech levels beyond 21.

Land Transport Technology: Indicates the population's methods of land transport Waterworlds may not always possess land transport technology.

Tech Level 5 (circa 1930): Self-propelled personal vehicles (ground cars) are developed Practical tracked vehicles appear, allowing the self-propelled vehicle to traverse some very uneven and difficult terrain.

Tech Level 6 (circa 1950): Ground vehicles are introduced that have a limited ability to travel in water as well (amphibious vehicles). Further advancements in ground vehicles during the period lead to some effective all-terrain vehicle and armored-fighting vehicle designs

Tech Level 7 (circa 1970): Air-cushion hovercraft appear. High-speed trains capable of sustained speeds of over 500 kph are introduced.

Tech Level 8 (circa 1990): Ground vehicles capable of limited water and air travel appear, resulting in the advent of triphibian vehicles

Tech Level 9 (circa 2010): Crude gravitic vehicles are developed as a result of advances in the understanding of subatomic forces. Ultrahigh speed trains capable of speeds in excess of 1000 kph appear

Tech Level 10 (circa 2100): Advances in gravitic vehicles lead to the merging of land and water transport Gravitic vehicles capable of altitudes of several hundred meters appear late in the period.

Tech Level 11· Gravitic vehicles merge with aircraft. Ground transport is still used where atmospheric conditions are a problem.

Tech Level 12· Advances in grav module construction lead to a practical personal grav belt.

Tech Level 13: Grav vehicles become indistinguishable from orbital spacecraft.

Tech Level 14: See space transport.

Tech Level 15: See space transport.

Above the Imperium's highest tech level·

Tech Level 16: The first successes with matter transport as energy occur, but the transport results in considerable randomization of molecular patterns and is thus limited to raw

materials only.

Beyond Tech Level 16: Matter transport using matter transmutation appears at tech level 17, but it is limited to solely inanimate objects Practical matter transport for life forms (using portal/circumvention techniques) does not occur until tech level 18.

Access to the circumvention transport pocket universe is a tech level 25 development The ability to deliberately pinch off a pocket universe does not occur until tech level 35

Water Transport Technology: Indicates the population's achievements with regard to transport over oceans and seas. On worlds where gravitic vehicles are present, grav locomotion blends the land, sea, and air transport into a unified whole.

Tech Level 5 (circa 1930): Steel-hulled vessels and early submersibles appear during this period

Tech Level 6 (circa 1950): Advanced submersibles able to stay submerged for extended periods of time are developed. The advent of scuba gear makes personal underwater excursions practical

Tech Level 7 (circa 1970): Hydrofoil designs allow watercraft to reach speeds in excess of 80 kph. The development of the air cushion hovercraft allows a "ground vehicle" also to traverse water with relative ease.

Tech Level 8 (circa 1990): Triphibian vehicle design results in vehicle designs capable of traversing land, water, and also air. However, such vehicle designs are imperfect: They always prefer one mode (land, water, or air) over the other two, and are but mediocre performers in even the best of their three modes

Tech Level 9 (circa 2010): Artifical gills allow divers to live underwater and "breathe" the water directly for extensive periods. Late in the period, the gravitic vehicle is also developed.

Tech Level 10 (circa 2100): Land and water transport merge.

For all subsequent tech levels, see land transport.

Air Transport Technology: Represents the availability of various forms of air transportation. Vacuum worlds have no air transport until gravitics are invented.

Tech Level 5 (circa 1930): Self-powered airplanes appear. Developments in landing and takeoff techniques lead to the "seaplane," an aircraft design capable of landing and taking off from water.

Tech Level 6 (circa 1950): Advancements in rotary airfoil techniques lead to the development of the helicopter. Further developments in aircraft propulsion techniques result in the jet aircraft.

Tech Level 7 (circa 1970) Further refinements in jet aircraft propulsion occur, leading to the supersonic jet aircraft capable of travelling in excess of 2000 kph. The personal ultralight aircraft appears, due mainly to advancements in lightweight material construction.

Tech Level 8 (circa 1990): Hypersonic aircraft are developed, which are capable of travelling over 5000 kph. Triphibian vehicles appear.

Tech Level 9 (circa 2010): Suborbital shuttle aircraft become common, allowing speeds of more than 10,000 kph. Late in the period, the gravitic vehicle is developed, although at this point such vehicles are only capable of altitudes of less than 10 meters

Tech Level 10 (circa 2100): Gravitic vehicles are now capable of altitudes of several hundred meters, and thus qualify marginally as aircraft.

Tech Level 11: Gravitic vehicles blend the various transportation technologies (air, land, and water) into a single technology.

For all subsequent tech levels, see land transport.

Space Transport Technology: Indicates the world's local achievements in space travel.

Tech Level 5 (circa 1930): Space travel is not possible at this tech level.

Tech Level 6 (circa 1950): Rockets capable of carrying inanimate payloads are developed, often primarily for military applications. Late in the period, rockets capable of carrying life forms (including sentients) into orbit appear.

Tech Level 7 (circa 1970): Space vessels capable of going beyond world orbit are introduced. Early in the period, this capability is often used to launch space probes with inanimate payloads (typically sensors and communications equipment). Later in the period, animate payloads become possible, which opens the door for the world's inhabitants to explore personally their local star system.

Tech Level 8 (circa 1990): Interplanetary exploration by the world's inhabitants begins in earnest. Orbital shuttles and space stations appear.

Tech Level 9 (circa 2010): Interplanetary travel becomes relatively common. Some cultures launch sublight interstellar missions. Late in the period, the fundamentals of interstellar travel are discovered, leading to the introduction of Jump1 drive.

Tech Level 10 (circa 2100): The availability of Jump1 drive makes interstellar travel common during this period. Gravitic maneuver drives replace older chemical thrust maneuver drives. However, gravitic maneuver drives have difficulty operating away from large masses (they need the strong gravity
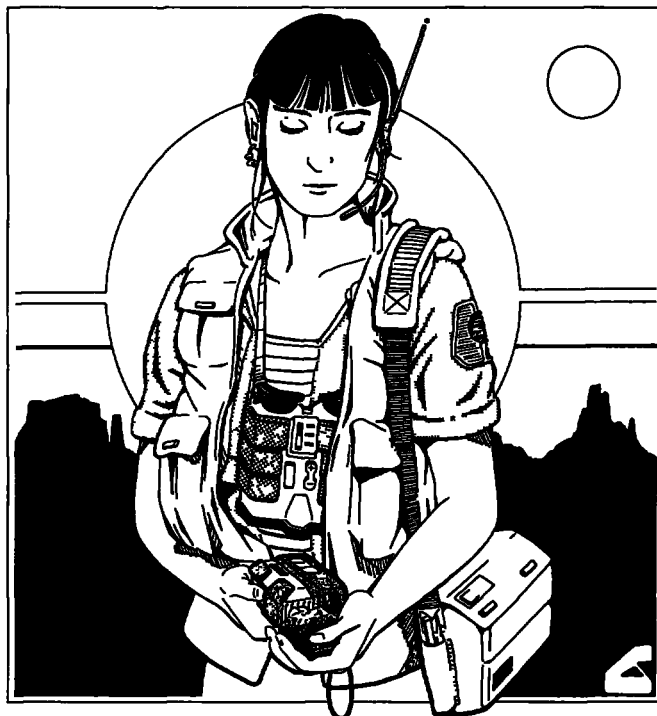
field to push against).

Tech Level 11: Jump2 drive is invented. Research into the problems of gravitic drives leads to the introduction of thruster technology. Thruster technology, a combined spin-off of gravitic and damper technology, uses a strong molecular repelling force to produce reactionless thrusters which push against large plates mounted on the space vessel Thrusters do not require the presence of a large gravity field to operate effectively, but instead are highly localized with virtually none of the projection ability of gravitics.

Tech Level 12: Jump3 drive appears.

Tech Level 13: Grav vehicles merge with orbital spacecraft. Jump4 drive appears.

Tech Level 14: Jump5 drive appears.

Tech Level 15: Jump6 drive appears

Above the Imperium's highest tech level:

Tech Level 16: Jump drive efficiency is improved, making the drive require less of the vessel for drive and for fuel. Research fails to create a drive capable of going beyond a controlled Jump6.

Beyond Tech Level 16: Going beyond a controlled Jump6 (to Jump7 and beyond) is, in fact, impossible with the physics of primitive jump technology. At tech level 21, the Jump6 barrier is finally breached with the appearance of starship-sized matter transport portals.

At higher tech levels, self-aware starships appear, making most of the normal crew requirements obsolete. The occupants become mere passengers at this point.

Energy Production Technology: Indicates the culture's ability to make use of energy.

Tech Level 5 (circa 1930): Petrochemical fuel and internal combustion engines become common.

Tech Level 6 (circa 1950): Nuclear fission power plants are introduced. However, their sheer mass and their hazardous waste often preclude widespread use

Tech Level 7 (circa 1970). Efficient photoelectric solar power cells appear. Primitive fuel cells are also introduced during this period. None of these alternative power sources are yet capable of competing with an equivalent volume of internal combustion engines.

Tech Level 8 (circa 1990): Methods for tapping geothermal sources are developed during this period. Solar cells and fuel cells gain in efficiency, but typically do not yet supersede internal combustion.

Tech Level 9 (circa 2010): Advances in superconductor technology leads to the first primitive fusion power plants. Superbatteries are also a typical development of this period.

Tech Level 10 (circa 2100): Cheap fusion power plants (2000-liter minimum size) come on the scene, and supersede all other forms of energy production in use. Where fusion plant size becomes a problem, superbatteries or fuel cells are employed, finally making the internal combustion engine largely extinct.

Tech Level 11: Fusion power plant minimum size drops to 1000 liters.

Tech Level 12: Fusion power plant minimum size drops to 250-liter minimum. Improved fuel cells appear which dispose of by-products automatically.

Tech Level 13: Fusion power plant output jumps from an average 2 kilowatts per liter to 3 kilowatts per liter Miniaturized superbatteries are introduced.

Tech Level 14: Fusion power plant minimum size drops to 100 liters

Tech Level 15: Fusion power plant output jumps to an average of 6 kilowatts per liter.

Above the Imperium's highest tech level:

Tech Level 16: Fusion power plant minimum size drops to 80 liters and power plant output jumps to an average of seven kilowatts per liter

Beyond Tech Level 16: Antimatter power plants come on the scene. Antimatter fuel pods contain a measured quantity of antimatter enclosed in a strong artificial gravity "bottle." The bottle's gravity fields are maintained by an array of superbatteries. Fuel pods are the heart of an antimatter power plant, and they typically provide "fuel" for up to a year before needing to be replaced.

Antimatter power plant output per hour climbs dramatically at higher tech levels as the capability to contain safely a progressively larger annihilation mass is increased. This means that a given fuel pod is "burned up" at a correspondingly faster rate.

OTHER TECH LEVEL NOTES

Worlds with a tech level of 10 or less often contain some areas on the world that have only been superficially explored. In cases where the tech level is 11 or more, then if the world's population code is less than 6, the world usually has some superficially explored areas. Worlds with a tech level of 7 or less generally have several large unexplored regions on their surfaces.

Below is a chart of the tech levels achieved by the major interstellar powers.

THE FIRST IMPERIUM

Imperial	TL	Comments
−9235	9	Vilani discover Jump1
−8900	10	Vilani sphere reaches about 10 parsecs in size
−5430	11	Vilani discover Jump2

THE SECOND IMPERIUM
(Originally the Terran Confederation)

Imperial	TL	Comments
−2431	9	Terrans discover Jump1
−2408	10	First Terran/Vilani interstellar war ends
−2398	11	Terrans discover Jump2
−2210	12	Terrans discover Jump3

THE THIRD IMPERIUM
(Originally the Sylean Federation)

Imperial	TL	Comments
−1776	10	Syleans maintain minimal interstellar trade
−650	11	Sylean Federation established
−150	12	Robot manufacturing reestablished
300	13	Vargr Campaigns taking place (210-348)
700	14	Xboat system being built (624-718)
1000	15	Solomani Rim War taking place (998-1002)

Robots in the Imperium

Most worlds of tech level 12 or greater use robots to augment or even replace biological beings in uncreative, menial, or hazardous tasks that require little intelligence. The technological challenge is to build a cheap, reliable robot able to replace completely a being with intelligence. Relatively mindless robotic machines and appliances appear about tech level 8, and reliable speech recognition occurs at tech level 10. The reliability of primitive (noncreative) true artificial intelligence often follows at tech 11, making the way for widespread introduction of primitive artificially intelligent robots at tech 12.

One factor of overriding concern governs all robots in the Imperium: economics. Robots are possible at lower tech levels, but they are not generally practical until tech level 12. (A few industrial, high-population worlds have expensive yet primitive robots as low as tech level 10.)

At the higher tech levels, robots are a cheap and reliable alternative to human labor, particularly in dull or dangerous jobs. Consider the typical tech 15 starport. Ships arrive and depart sporadically around the clock, so staff levels must be kept high enough to service any vessel at any time, even though there may be long intervals during which no ships need to be loaded or unloaded. Robots are an efficient solution to this problem.

A standard cargo robot costs about Cr75,000, and can be financed over 40 years for Cr4500 per year. If maintained regularly (at an additional cost of Cr750 per year), the robot should last as long as 85 years. Obviously, using robots in this situation can cut costs significantly

Pseudobiological robots are rare in the Third Imperium. Tech level 15 is the first tech level at which a convincing pseudobiological robot can be constructed. The majority of the worlds in the Imperium are below tech 15 in local manufacturing capability. Besides this, pseudobiological robots are not particularly cost effective in design (the experimental robot described later would cost 12 million credits to construct). Pseudobio robots also tend to be more fragile and less reliable than traditional robots.

Another reason that pseudobiological robots have been slow to catch on is the bias some have against them. Many people, even from high-tech worlds, are unsure of how to react to a human that turns out to be a machine. Some human-populated worlds harbor a general antirobotic bias, even though robots are technologically feasible there. On such worlds, items advertised as "Human-Made" often bring a premium price.

A famous example of this philosophy is the popular quasireligious Society for the Sovereignty of Man over Machine (SSMM) in the Solomani Confederation.

For these reasons, few researchers spend their time trying to reinvent man in machine form. Much more energy is spent on related pursuits that obviously help humanity, such as prosthetics.

A HISTORY OF ROBOTS IN IMPERIAL SPACE

The age of modern robots was thrust upon the First Imperium by the events of the First Interstellar War. In −2389, the Terran Confederation Navy commissioned a line of mass-produced tech level 12 robots as support staff for military personnel. These were not warbots as we know them today. A few of the robots were expert medical robots or served as administrative support, but most were heavy-duty, hard-working construction robots, used to build temporary installations for advanced bases.

Beginning in −2204, the ambitious Solomani carried their higher technology with them as they established the Rule of Man over the dominions of the defeated Vilani Empire. The Vilani, still at tech level 11, had not yet developed true robots.

Less than 200 years later, Naasirka introduced the first line of robots for private, nonmilitary use. Dubbed "Rashush," these housekeeping and valet robots spread rapidly, thanks to a powerful, high-prestige advertising campaign. Although expensive, ownership of these useful robots was within the reach of many rich citizens of the Second Imperium. The Rashush line is still marketed today.

At the time, the future of robots and robotic appliances looked promising

But in −1776, the Rule of Man crumbled, and the Long Night began.

During these 17 centuries of regression and decay, interstellar communication and trade slowed to a standstill. Progress in robotic science screeched to a halt as many worlds dropped to lower tech levels.

In −650, the Sylean Federation began to reestablish trade between certain worlds. As the Federation grew, technology saw a rebirth, and robots became practical again. In −143, Dover-Gabe, a Sylean manufacturing and mining concern, was awarded a large contract for courier robots.

These robots provided an efficient and secure means of transporting secret military communications from place to place. No one at the time realized the critical historic effect one of these devices would play in the future of robots.

THE SHUDUSHAM CONCORDS

A tragic attack against the Sylean Federation, which occurred in −112 in Core sector, helped shape the Third Imperium's current attitudes about robots. A terrorist group rigged one of

the Dover-Gabe courier robots to self-destruct, and managed to sneak it aboard a 90,000-ton Sylean battleship. *The Empire's Banner* was on a goodwill mission in orbit around the world Fornol (Core 1715) when the robot's hydrogen/oxygen fuel cell exploded. Fornol's premier, two ambassadors, and the Sylean vice-minister were killed, along with a host of ship's officers and crewmen. The repercussions from this event were so far-reaching that the Sylean Federation was nearly thrown into a civil war

This disaster prompted 12 worlds of the Sylean Federation to meet on the neutral world of Shudusham to draft an agreement dealing with the issue of weaponry carried by robots. After much deliberation, all 12 worlds finally signed the completed Shudusham Concords in −110. A hardcopy is on display in the Museum of Sylean History on Capital.
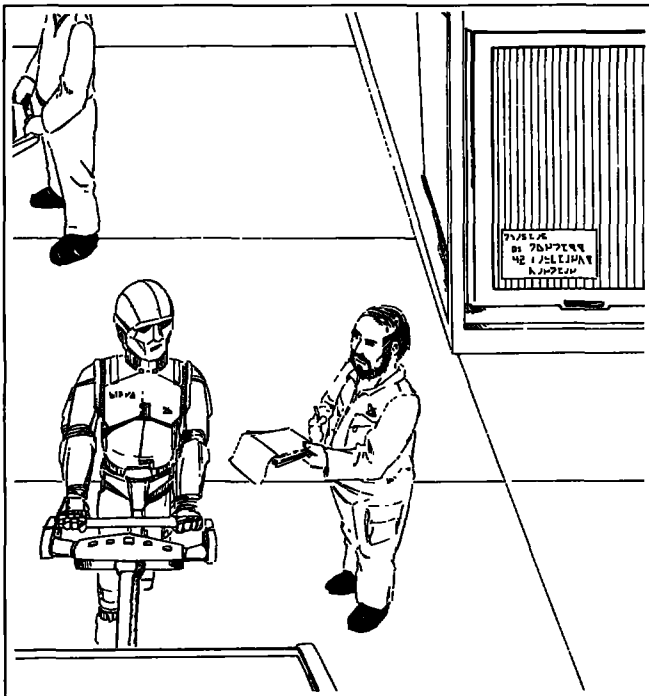
The Concords have no legal force in the Third Imperium, but they have served as a model for many high-tech worlds' documents governing the manufacture and use of robots.

Many worlds still use parts of the pre-Imperial Shudusham Concords as a model for their own laws to keep sabotages with robots in check.

Most worlds declare an owner to be responsible for the actions of his robot, even if the owner did not directly order the action For example, if an owner orders his robot to protect his home, and in so doing the robot kills someone approaching the home, the owner can be charged with accidental murder.

ROBOTS IN THE THIRD IMPERIUM

In the 17th year of the Imperium, Cleon Zhunastu declared, "Any sentient life form within the Imperial borders, regardless of its origin, is a protected being, and thus a citizen of the Third Imperium." Cleon went on to say that robots are not citizens of the Imperium "One may argue that an intelligent robot might be sentient," stated Cleon, "but it is definitely not a life form." In taking this stand, Cleon clearly sided with the industrial in-

terests in the Imperium by declaring robots to be property, not citizens.

In 298, Makhidkarun marketed the first line of robots with tech level-13 brains. These robots, using "high autonomous" software, were more intelligent than earlier robots, so they could be operated by ordinary individuals without special skills or training. By making robots usable by every citizen, Makhidkarun revolutionized the popularity of robots within the Third Imperium.

About 100 years later, in 404, a group of roboticists met at Shudusham to share their latest technological breakthroughs. Shudusham was chosen as the site because of its historical significance and central location. The conference was a success; so much so, in fact, that the Shudusham Robotics Conference has continued to meet every 10 years. Roboticists, manufacturers, heavy robot users, journalists, and other interested parties are drawn from all over explored space to attend a portion of the one-year conference.

Makhidkarun announced another breakthrough in 711: roboticists working in cooperation with the Imperial Navy Research Lab had produced a reliable robot brain with 25-percent synaptic processing. Robots with more synaptic units are more intelligent, so these machines were capable of more powerful programming. Expert robots with higher skill levels appeared more often in the marketplace.

A few years ago, SURD received the Shudusham Conference Medal of Merit for the first convincing "human" pseudobiological robot. The robot, nicknamed Telku, was the main attraction of the meeting. Pseudobios are not mass-produced yet by any Imperial manufacturer, but technology has reached the stage at which such robots can fool real humans.

ROBOTS IN THE SHATTERED IMPERIUM

Not all factions in the shattered Imperium hold to the original precepts of the United Third Imperium. Most namely, some factions consider robots to be citizens instead of property. This is not an unusual view: it is known that Strephon himself was sympathetic to this point of view.

The "Real" Strephon faction and the Antares faction—both factions known to be pro-Strephon—consider robots to be citizens. Several of the worlds in these regions have held this view for the last century or so. As a citizen, many of these worlds believe a robot has the right of individual freedom, the right to vote, and is responsible for its own actions. This means, of course, a robot can be prosecuted for a crime, put in prison, and even terminated.

As an interesting twist to this whole topic, other factions consider a cyborg to be a noncitizen, that is, a cyborg is mere property. A cyborg (coined from "cybernetic organism") is a being with a high percentage of robotic body parts. Views vary on what constitutes a "high percentage."

The Society for the Sovereignty of Man over Machine (SSMM) in Solomani space considers any robotic body part to be a "high percentage," and looks upon its owner with great disdain. Many Solomani, although not professed members of the SSMM, are sympathetic to the view of cyborgs being property rather than citizens.

Margaret's faction is not an overly vocal one, but it is known that Margaret herself has stated on more than one occasion

that "any being willing to let more than 25 percent of their body be replaced by hardware should be treated as such." In fact, as an aside, Margaret is also rumored to have said "no artificial being, biological or otherwise, should be allowed to hold any government office." Margaret's supporters are thus of the view that cyborgs are property rather than citizens, although the robotic percentage needed to make one a cyborg varies from world to world in the region controlled by Margaret.

ROBOT BUILDERS

Several of the Imperial megacorporations make robots.

Naasirka: Naasirka is the largest manufacturer of robots in the Imperium. Naasirka's robots rarely use innovative technology, but their aggressive marketing staff has placed more robots than either Makhidkarun or LSP, Naasirka's two largest competitors.

Makhidkarun: This old Vilani corporation is not the largest manufacturer of robots, but it is the most innovative The company's research staff is responsible for many of the Imperium's significant breakthroughs in synaptic processing.

Ling Standard Products (LSP): Ling Standard Products' expert med-robots are used in a variety of medical applications throughout the Imperium. Ling Standard is also a popular producer of robotic body parts.

Other prominent manufacturers include:

SURD: One of the principal robot manufacturers in Core sector is SURD, the Shinku University Research Directorate SURD was founded about 400 years ago by a group of academic roboticists who agreed to pool their patents together, to make robots and to make money at the same time.

Today, the marketing and fiscal management are left in the hands of corporate officers trained in business matters. No research is actually conducted by SURD itself. Many university robotics departments, however, are patron members of SURD, which provides generous research grants in exchange for the right to exploit commercially useful discoveries.

Star Servants: A significant manufacturer of a wide assortment of low-intelligence robots in the Vland sector. Produces everything from cheap deskbots to expensive valets.

Hedron, LIC: Manufacturers large, massive robots for various heavy operations such as cargo handling and construction. Hedron, LIC is located on Glisten in the Spinward Marches

Spinward Specialties: In the past two centuries a number of firms have sprung up in Deneb and the Spinward Marches. Spinward Specialties, only six years old, is one of the newest. It specializes in contoured chassis courier robots, unarmed but heavily armored against attack

Intect: This firm, located in Deneb Sector, produces various models of environmental-control, cargo-handling, and animal-care robots.

SOLOMANI

Several Solomani companies also produce robots.

Panstellar: Specializing in high technology, Panstellar sells expert robots capable of designing and safely erecting a building in any environment. Panstellar, founded on old Terra, also markets spaceships throughout the Solomani Rim.

Odyssey: An agricultural firm founded during the Long Night in an attempt to save dying colonies in the Solomani Rim region, this firm is a renowned producer of automated agricultural hardware of all types.

Myran Technologies: Specializes in high-tech recreational gear. Renowned for the innovation and quality of its products.

Nichols Manufacturing: A recent entrant into robot manufacture, Nichols has distinguished itself in the Solomani Rim region for its inexpensive orbital station construction.

ZHODANI

The Zhodani have long used mobile robots as part of their armed forces. These robots are not independently intelligent, and are by no means a replacement for humans as warriors. They are, however, a cheap substitute for humans, and they are used in conjunction with humans to provide greater firepower

Zhodani combat robots (usually called warbots) come in a wide variety of models; their specific configurations depend on the environment they will work in and the mission they will perform.

Most warbots are roughly (very roughly) equivalent in size and configuration. They resemble a human torso in shape and size. A grav module serves as the base, eliminating the need for legs while providing greater mobility. A sensor cluster replaces the head, although vaguely resembling it. In between, the torso houses a computer controller, a power source, several sensor processors, and the warbot's weaponry. Two articulated arms are mounted at the shoulders and allow the warbot to interact with the environment without shooting at it; the graspers can pick up objects or manipulate knobs or handles. The two arms also allow the warbot limited walking ability in the event that the unit's grav module is knocked out. Brackets on the back of the warbot allow a variety of additional sensors, weapons, or other useful devices to be mounted for specific missions.
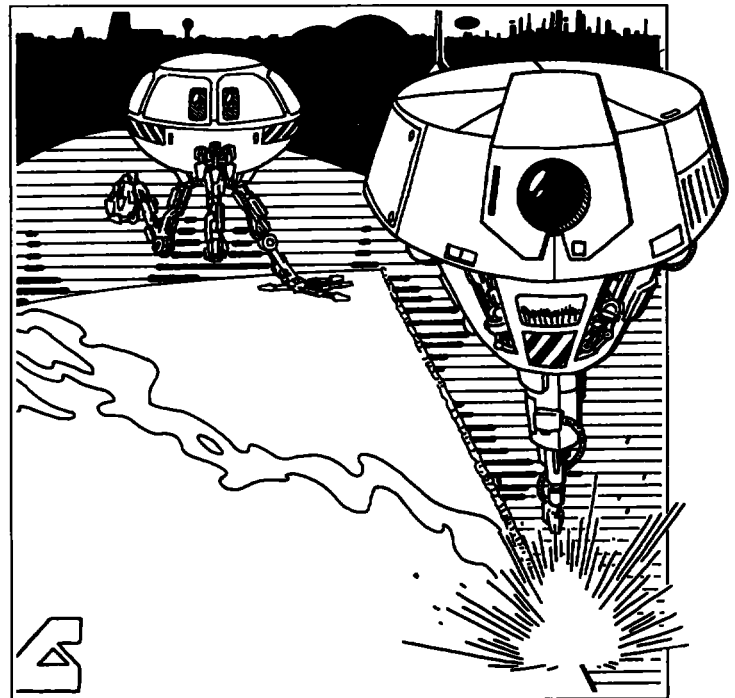
Communications

Communications are an essential part of travel within the **MegaTraveller** universe. The procedures used for communication help make it easy and efficient.

Starships can have four basic types of communicators: radio, laser, maser (microwave), and meson. Each type of communicator has its own strengths and weaknesses.

BRIEF DESCRIPTIONS

The following descriptions provide a basic understanding of the types of communicators available and their strengths and weaknesses.

Radio: Radio communicators send and receive information using radio waves. The information is broadcast (it goes out in all directions, and can be detected by any radio receiver within range). The radio communicator is the only *broadcast* communicator available.

Laser: Laser communicators send and receive information using laser light. Information is beamcast (directed at a specific receiver, and can only be received by that receiver). Laser communicators are adversely affected by poor visibility, smoke, or cloud cover. When used in a Thin or greater atmosphere, range is limited to Continental or less.

Before a laser communicator can be used, the location of the receiver must be known (located visually, by radar or ladar, by prior arrangement, or by other sensors) Once contact is established, the communicator will maintain contact.

Maser: Maser communicators send and receive information using microwaves. The information is beamcast (directed at a specific receiver, and can only be received by that receiver). A maser communicator is a directional beamcast version of the radio communicator. Maser communicators are not adversely affected by atmosphere.

Before a maser communicator can be used, the location of the receiver must be known (located visually, by radar or ladar, by prior arrangement, or by other sensors). Once contact is established, the communicator will maintain contact.

Meson: Meson communicators send and receive information using coded packets of mesons. The information is beamcast (directed at and received by only a specific receiver). By a meson packet's nature, it cannot be intercepted between transmitter and receiver. Nothing obstructs a meson communicator's beam (not even planets or stars).

Before a meson communicator can be used, the location of the receiver must be known (located visually, by radar or ladar, by prior arrangement, or by other sensors). Once contact is established, the communicator will maintain contact for the duration of a transmission.

NOMENCLATURE

In order to uniquely identify communicators, the following standard format is used:

TypeComm Range-TL

Type is the specific communications system (Radio, Laser, Maser, Meson). The suffix *Comm* indicates a communicator. *Range* is the word description of the range of the device; *TL* is the tech level of the device. For example, RadioComm Planetary-5, LaserComm FarOrbit-10, MaserComm System-14, or MesonComm Planetary-15.

COMMUNICATIONS PROCEDURES

Without organization, communicator use would be chaotic. Users would not know how to contact the specific party they wanted, interference between users sharing channels would make them unusable. Consequently, standard communicator procedures have been developed to reduce confusion

Standard communicator procedures apply to radio transmissions and cover two things: channels and directories

Channels: A wide variety of named channels (sometimes called frequencies) is used for radio communications. Channels are named by their use or user: Navy channels, Scout channels, traffic control channels, and others.

TYPICAL COMMUNICATOR CHANNELS

Name	Type	For Communication:
Traffic Control	Voice	with space traffic control facility
Tactical	Voice	between small craft in combat
Subtactical	Data	between small craft in combat
Supertactical	Image	between small craft in combat
Hailing	Voice	between ships first meeting
Xboat	Data	receive/transmit xmail from xboats
Navy	Voice	between naval vessels
Distress	Voice	by vessels in distress
Scout	Voice	between scout vessels
Company	Voice	between company vessels
Passages	Data	commercial passage reservations
Markets	Data	commodity prices
Entertainment	Image	recreational programming
News	Image	current events

These channels represent the minimum available. More sophisticated levels may be available at higher tech levels, especially at TL 10+ (e.g., hailing with image, as well as voice).

For example, normal communications between three Imperial Navy close escorts travelling in formation would use a Navy channel. When the ships entered a star system, they would communicate with system traffic control using the Traffic

Control channel. When they encountered a nonnavy ship, they would open communications using the Hailing channel. If they became involved in combat, they would switch to a Tactical channel. All of them would routinely monitor the Distress channel, and their group commander would probably assign specific ships to monitor various other channels.

Lines: Although communications take place over channels, a communicator handles operations over lines (the term is taken from the archaic "telephone line" concept). Lines represent the transmission/reception processing ability of the communicator, its connections to antennae, and the data load placed on the various processors involved. For example, the relatively simple task of transmitting voice information can be handled by a single line; a second line is required to handle receiving voice information. Some channels require more lines than others. For example, a simple voice communication channel requires two lines: one for the voice information going out and one for the voice information coming in.

LINES PER CHANNEL

Type	Receive	Send	Send/Receive
Voice Simplex	1/2	1/2	1
Voice Duplex	1	1	2
Computer Data/Telemetry	1	1	2
Image (includes Voice)	2	5	7
Computer Control	2	2	4

Voice Simplex means that the user can send or receive, but not both at the same time (the user must stop sending in order to receive an answer). *Voice Duplex* means that sending and receiving is possible at the same time (as in a telephone conversation).

Channel Capacity: The total number of lines available to a communicator equals the square of the device's tech level. All available lines may be used for reception; the number of lines used for transmission is limited to the tech level of the device. Each channel in use (whether transmitting or receiving, or both) requires one control panel dedicated to it.

For example, the theoretical maximum capacity for a RadioComm System-14 is 196 lines received and 14 lines transmitted. This capacity is sufficient for transmissions on two image channels (at five lines each), one computer control channel (two lines), one computer data channel (one line), and one voice channel (one line) at the same time. Reception on several channels at the same time is possible (Distress channel and Traffic Control channel at a minimum). Using the configuration presented here, at least seven control panels are required.

Computer Monitoring of Channels: Channels can be monitored by the ship's computer. Data and computer control channels are automatically operated by the computer. Voice and image channels can be monitored by the computer, and a live crew person notified when there is activity

For example, the computer normally monitors the Distress channel. When there is a transmission on that channel, the computer notifies a crewmember on the bridge and replays the portion of the transmission previously received.

Directories: Directories are automated lists of available channels within a star system accessible on demand from communicators within the system.

One major problem that communicator users encounter is determining what channels are being used for what purposes. In a static environment (for example, users permanently assigned to a specific world) it is easy to assign channels for a variety of uses and to publish that information Within the Imperium, systems with a tech level of 8 or higher maintain a standard *directory.* Directories are always on the same standard channel within the Imperium; accessing the system's directory (using the RadioCommunicator) inputs a complete list of standard channels within the system into a ship's computer.

For example, upon entering the Regina system, a ship has information about standard channels such as Navy, Scout, Distress, and Hailing It doesn't know system-specific channels such as Market Prices, Passage Reservations, Entertainment Once the Directory has been accessed, the ship's computer knows what channels are available.

DETECTION LIABILITY

Communicators can be detected by some sensors. The Detection of Communicators table shows communicator types and what sensors will detect and jam them.

DETECTION OF COMMUNICATORS

Type	Detected By	Jammed By
Radio	Radio, Radar Direction Finder, EMS Passive Array	Radio Jammer
Laser	Laser Sensor, EMS Passive Array	Aerosol, Smoke, Sand
Maser	EMS Passive Array	Not
Meson	Not	Not

Communicators can be detected out to the limit of their own ranges. Lasers and masers can only be detected if the detector is in beam
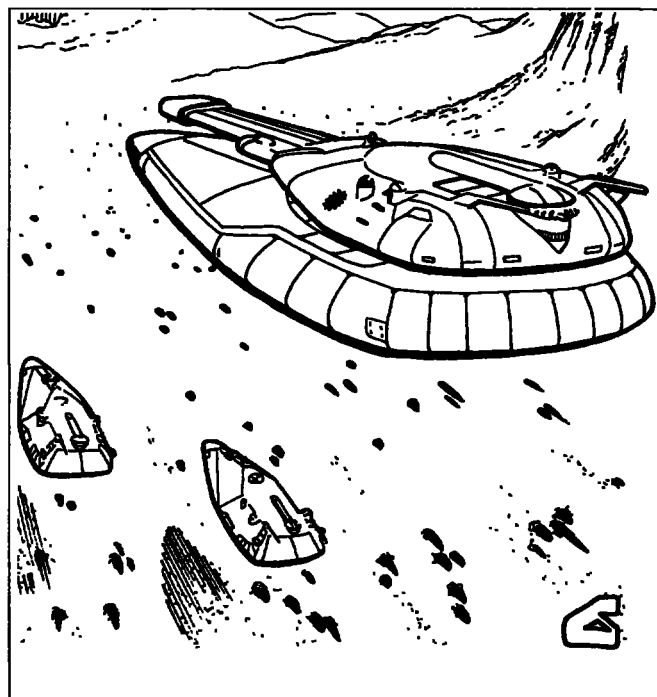
Megacorporations

Of the millions of organizations which do business inside and outside the Imperium, most are limited to one or two worlds. A few thousand corporations trade over one or more subsectors, a few hundred cover one or more sectors.

Only a few firms (a total of 13) are truly Imperial in scope; they are megacorporations. Staggering in size, these organizations are so large that no one person can know everything they are concerned with at any given moment. Total shares of stock, annual profits, number of employees are all astronomical. Many organizations are so large that different divisions of the same megacorporation may actually be working at cross-purposes. In most regions, megacorporations merely own the land their installations are on, but in some areas they control entire planets, either directly or indirectly.

Most megacorporations are organized very much like smaller companies (with a board of directors, a president, and vice-presidents), but the board and the higher level executive officers of the company are largely out of contact with the day-to-day (or even year-to-year) functioning of the company. These upper-level executives plan only general policy and a few long-distance actions. The most important executives, in terms of personal power, are the various regional managers (by whatever name they may be called) A regional manager may control only a small portion of a megacorporation's total assets, but many hold more power in some regions than the local representatives of the Imperial government.

A small number of Imperial regulatory agencies have power over megacorporations, and the businesses are subject to any applicable local taxes, but, provided they do not blatantly violate Imperial sovereignty, regional managers can usually conduct their company's business as they see fit. Because a direct confrontation with the Imperium would be bad for business, intentional violation of Imperial laws occurs only on a covert basis.

Titles: All corporations engaging in interstellar commerce are required to possess an Imperial charter, usually indicated by the letters LIC following the company name (LIC stands for Limited liability Imperial Charter).

A few Vilani megacorporations are still in business under their Vilani titles (Makhidkarun, Naasirka, Sharurshid, and Zirunkariish).

IMPERIAL MEGACORPORATIONS

There are 13 Imperial megacorporations:

Delgado Trading, LIC: Widely known for its work in miniaturization, Delgado also has extensive holdings in heavy mineral mining and refining, publishing, and antiquities trading. Founded in 997, Delgado is the youngest of the megacorporations.

Stock Ownership: Imperial family, 5 percent; Delgado family, 47 percent, noble families, 27 percent, private ownership, 21 percent.

General Products, LIC: General manufacturers starships, nonstarships, and heavy machinery of all sorts. General is known for inexpensive products of adequate quality, but of late its starship division has been plagued with disaster. The corporation was formed by the merger of a number of smaller manufacturing concerns shortly after the end of the Civil War

Stock Ownership. Imperial family, 5 percent; Hortalez et Cie, 26 percent, noble families, 35 percent; private ownership, 12 percent; Antares Holdings, LIC, 12 percent, other, 10 percent.

GSbAG: GSbAG (popularly known as Gas-bag) has restricted itself almost exclusively to the manufacture of starships

GSbAG is one of two firms charged with the manufacture of the personal vessels of the Imperial family and is a major contractor for the Imperial military. Their products command extremely high prices, but it is generally conceded that the quality makes them well worth it.

Stock Ownership: Hortalez et Cie, 19 percent, Imperial fami-

ly, 4 percent, noble families (includes the families of the legendary founders), 44 percent; Sharurshid, 4 percent; Instellarms, 3 percent; Tukera Lines, 3 percent; SuSAG, 3 percent; private investors, 4 percent; other, 16 percent.

Hortalez et Cie, LIC: Primarily a banking and investment house, Hortalez specializes in loans to planetary governments, underwriting of large-scale projects, and other fiscal activities. Hortalez is one of the major insurance houses in the Imperium.

Stock Ownership: Hortalez family, 74 percent; Zirunkarish, 5 percent; Naasirka, 7 percent; Makhidkarun, 3 percent; Imperial family, 5 percent; other, 6 percent

Instellarms, LIC: Manufacturing, buying, and selling military equipment of all sorts, Instellarms is a specialty supplier of private and public military units of all sizes and types. Agents of the firm can often be found on a battlefield, negotiating the purchase of the equipment of the losing side before the battle is completely over The company does not deal in interstellar vessels or chemical, bacteriological, or nuclear weaponry.

Stock Ownership: Murdoch Holdings, LIC, 32 percent; Hortalez et Cie, 30 percent; noble families, 8 percent; Ling Standard Products, 6 percent, Ichiban Interstellar, LIC, 5 percent; GSbAG, 5 percent; Sternmetal Horizons, LIC, 8 percent; other, 6 percent.

Ling Standard Products: Originally a mining firm, LSP currently engages in manufacture of electronic equipment, ground and air vehicles, starships and starship armaments systems, drive systems, power systems, computer systems and software, and small arms. LSP maintains mining and manufacturing facilities throughout the Imperium and beyond

Stock Ownership: Imperial family, 8 percent; Hortalez et Cie, 26 percent, GSbAG, 23 percent, noble families, 8 percent; Murdoch Holdings, LIC, 8 percent; other, 27 percent

Makhidkarun: Makhidkarun specializes in the communications, entertainment, and software industries. The firm produces fine musical recordings of all types, two- and three-dimensional motion pictures, books, magazines, and art reproductions of all sorts. Its communications division produces data processing, storage, and retrieval equipment and the requisite software A gourmet foods division trades in all manner of rare and expensive foods, wines, and delicacies. Its software division has pioneered many of the significant advances in artificially intelligent robots using synaptic brains.

Stock Ownership: Imperial family, 5 percent, noble families, 28 percent; Hortalez et Cie, 28 percent; investment trusts, 25 percent; private ownership, 14 percent

Naasirka: Naasirka specializes in the manufacture of information storage and processing equipment and software, computers, robots, and other complex electronic devices. Naasirka is the primary supplier of communications equipment to the Imperial Interstellar Scout Service's xboat branch, and the leading manufacturer of robots in the Imperium.

Stock Ownership: Imperial family, 4 percent; investment trusts, 24 percent, noble families, 23 percent; Hortalez et Cie, 11 percent; Sternmetal Horizons, 6 percent, LSP, 4 percent; General Products, 3 percent; Igsiirdi family, 13 percent, private ownership, 11 percent.

SuSAG, LIC (Schunamann und Sohn AG, LIC): SuSAG engages in a wide range of chemical, pharmaceutical, and gene engineering activities SuSAG is the primary manufacturer of anagathics for the Imperium, and maintains psi drug manufacturing plants in client states outside Imperial borders.

Stock Ownership: Schunamann family, 52 percent; Imperial family, 2.5 percent; Hortalez et Cie, 9 percent; other corporations, 23.5 percent; private ownership, 7 percent; other, 6 percent.

Sharurshid: A Vilani trade and speculation corporation (with very little manufacturing capability), Sharurshid trades in luxury goods from all parts of the Imperium and many areas beyond. Most rare wines and spirits are carried on the starships of Sharurshid.

Stock Ownership· Sharurshid trust, 46 percent; Imperial family, 3 percent; other corporations, 14 percent; Zirunkariish, 13 percent, Hortalez et Cie, 14 percent; private ownership, 10 percent.

Sternmetal Horizons, LIC: Sternmetal is primarily engaged in mining and manufacturing. It produces power generation equipment of all types (including power plants for starships, air and ground vehicles, cities, and industrial installations). Sternmetal is the largest manufacturer of food synthesis equipment in the Imperium.

Stock Ownership: Imperial family, 2 percent; Hortalez et Cie, 29 percent; investment trusts, 32 percent; noble families, 18 percent; Antares Holdings, LIC, 19 percent.

Tukera Lines, LIC: Tukera Lines operates a vast fleet of passenger and freight vessels throughout the Imperium, following the xboat lines In some areas (particularly the older, more established central regions of the Imperium), Tukera Lines has a virtual monopoly on long-distance shipping and travel.

The oldest record of the firm is a charter from the government of the Sylean Federation, but family tradition holds the company to be several centuries older.

Stock Ownership: Tukera family, 29 percent; Imperial family, 3 percent; Sternmetal Horizons, 2 percent; SuSAG, 5 percent; General Products, 2 percent, private ownership, 31 percent; investment trusts, 28 percent

Zirunkariish: A Vilani banking and investment company unlike most other Vilani megacorporations, whose origins are shrouded in mystery. Zirunkariish was founded by the noble Vilani family of Shiishuginsa (a member of which, Antiama, married the Emperor Zhakirov in 679) in the year −425 Zirunkariish is one of the largest insurance underwriters in the Imperium, and while its capital reserves are gigantic, it usually chooses to invest them in various trusts rather than in other megacorporations.

Stock Ownership: Shiishuginsa family, 29 percent; Imperial family, 18 percent; Sharurshid trust, 17 percent; Hortalez et Cie, 7 percent; noble families, 12 percent; investment trusts, 8 percent; private ownership, 9 percent.

NONIMPERIAL MEGACORPORATIONS

It is difficult for a company to grow to the size of a megacorporation unless it has the protection of a suitably-sized government. Because the Imperium controlled space and an economy that could support megacorporations, they almost naturally sprang up.

Some of the interstellar empires that border the Imperium have grown to the size that they can also support megacorporations Besides the 13 Imperial megacorporations, there another 13 megacorporations operating in the territories adjoining the Imperium. In comparison, the largest of these non-Imperial megacorporations is perhaps median-sized when compared with an Imperial megacorporation; the smallest is smaller than any of the Imperial companies.
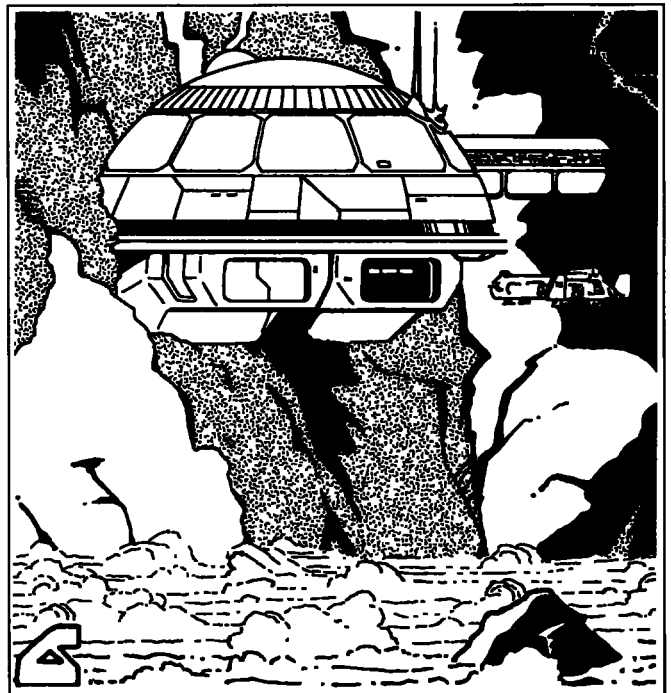
Keeping Time

Counting time is an essential part of any activity. Naturally enough, many different ways of counting time have been established throughout the regions of space explored by man and by the races that man has encountered. The major time-counting systems known to the Imperium and its neighbors include: the Imperial calendar, the Aslan calendar, the Solomani calendar, the Vilani calendar, and the Zhodani calendar.

THE IMPERIAL CALENDAR

If only for the purpose of consistency within the Imperium, it would have been necessary for that vast interstellar empire to produce a standard time-keeping system. Cleon I used the calendar as just one part of a wide-ranging campaign to establish the power of the Imperium throughout its territory. Within a hundred years, the Imperial calendar was the standard by which history, trade, and bureaucracy were measured.

Basic Units: Imperial timekeeping is based on the time units of the Terran Confederation. During the Rule of Man, the basic units of the Terran day (24 hours) and the Terran year (365 days) were imposed on First Imperium territories by the Terran conquerors. During the Long Night, the day and year remained in place in what interstellar trade remained, and by the time the Third Imperium was established, the use of these particular spans for day and year was easily accepted.

The time periods were simplified: The day was made exactly 24 hours, and the year was made exactly 365 days.

Base Point: Imperial dates count from the year of the founding of the Third Imperium: the year 0. Dates before that are negative; dates after that are positive (with the sign usually suppressed). For example, the First Interstellar War began in −2408 (and ended in −2400); the Third Imperium was founded in 0; the Imperial Second Survey was published in 1065.

Date Format: Within each year, the Imperial dating system uses a modified Julian system which consecutively numbers the days of the year from 001 to 365. Weeks of seven days and months of 28 days are used to indicate periods of time, but they are not named and are not used to indicate dates. The first day of the year is 001; the 100th day is 100.

A complete day and year is provided by the date group: a three-digit day and a three- or four-digit year, separated by a hyphen. For example, the centennial of the Third Imperium was celebrated on 001-100; the millenium of the Third Imperium was celebrated on 001-1000.

Imperial Format: ddd-yyyy (ddd = day; yyyy = year)

Each year begins with a special day called Holiday· day 001. According to the Imperial calendar, Holiday is not a part of any week, but stands alone as a special day.

The Standard Calendar: Because the Imperial year does not vary in length, it is possible to reuse the calendar from year to year. Days always fall on the same date (008 is always a Senday).

The adoption of the standard calendar produced a require-ment for names for the days of the week. The decision was made to scrap the traditional Anglic day names and instead a series of numbered day names were established: Oneday, Twoday, Threeday, Fourday, Fiveday, Sixday, and Sevenday. Over the course of the centuries, these names became archaic as they were supplanted by names which were easier to pronounce or spell: Wonday, Tuday, Thirday, Fourday, Fiday, Sixday, and Senday. The commonly accepted abbreviations for these day names (1day, 2day, 3day, 4day, 5day, 6day, and 7day) recall their original names

THE ASLAN CALENDAR

The Aslan base their calendar and timekeeping units on the period of Kusyu, the Aslan homeworld, around Tyeyo, its star.

Basic Units: The Aslan year is the ftahea, 212.2 eakhau (Aslan days) long. A ftahea is 320 days long; an eakhau is 36 hours long. Each eakhau has a unique name; for convenience, they are numbered from one to 212 and referred to by number. To every fifth ftahea, a 213th eakhau is added to keep the calendar in sync with Kusyu.

The Aslan also divide their ftahea into three raohfokh (seasons): Aihros, Tralrea, and Ktaho. Aihros (Beginnings) is the equivalent of spring· the mating season for many animals and the time when annual plant life grows from seed. Tralrea (Growth) is the long season of mild weather on Kusyu; it is the growing season (although in this sense it refers to the growing of herd animals) and lasts 100 eakheau. Ktaho (Harvest) is the hunting season; it is short (only 30 eakheau) and a traditional time of Aslan hunts

Base Point: The Aslan calendar began counting time when the first Tlaukhu was established. The current date of 3653 corresponds to the Imperial date of 1120.

Date Format: An Aslan date is stated in the same format as an Imperial date. A three-digit eakhau number is followed by a hyphen and a four-digit ftahea number. For proper identification, the date is usually followed by the word Aslan. For example, 201-3644 Aslan is the 201st day of the 3644th year of the Aslan calendar; it is equivalent to 000-0000.

Aslan Format: ddd-yyyy (ddd = day [eakhau]; yyyy = year ([ftahea])

Seasons: The planet Kusyu has only minimal axial tilt and orbital eccentricity. There is little in the way of astronomical cause for seasons on the world, and the Aslan calendar has no seasons because there is so little in its climate to cause them.

THE IMPERIAL CALENDAR

Holiday	Wonday	Tuday	Thirday	Forday	Fiday	Sixday	Senday	Wonday	Tuday	Thirday	Forday	Fiday	Sixday	Senday
001	002	003	004	005	006	007	008	009	010	011	012	013	014	015
	016	017	018	019	020	021	022	023	024	025	026	027	028	029
	030	031	032	033	034	035	036	037	038	039	040	041	042	043
	044	045	046	047	048	049	050	051	052	053	054	055	056	057
	058	059	060	061	062	063	064	065	066	067	068	069	070	071
	072	073	074	075	076	077	078	079	080	081	082	083	084	085
	086	087	088	089	090	091	092	093	094	095	096	097	098	099
	100	101	102	103	104	105	106	107	108	109	110	111	112	113
	114	115	116	117	118	119	120	121	122	123	124	125	126	127
	128	129	130	131	132	133	134	135	136	137	138	139	140	141
	142	143	144	145	146	147	148	149	150	151	152	153	154	155
	156	157	158	159	160	161	162	163	164	165	166	167	168	169
	170	171	172	173	174	175	176	177	178	179	180	181	182	183
	184	185	186	187	188	189	190	191	192	193	194	195	196	197
	198	199	200	201	202	203	204	205	206	207	208	209	210	211
	212	213	214	215	216	217	218	219	220	221	222	223	224	225
	226	227	228	229	230	231	232	233	234	235	236	237	238	239
	240	241	242	243	244	245	246	247	248	249	250	251	252	253
	254	255	256	257	258	259	260	261	262	263	264	265	266	267
	268	269	270	271	272	273	274	275	276	277	278	279	280	281
	282	283	284	285	286	287	288	289	290	281	292	293	294	295
	296	297	298	299	300	301	302	303	304	305	306	307	308	309
	310	311	312	313	314	315	316	317	318	319	320	321	322	323
	324	325	326	327	328	329	330	331	332	333	334	335	336	337
	338	339	340	341	342	343	344	345	346	347	348	349	350	351
	352	353	354	355	356	357	358	359	360	361	362	363	364	365

THE UNIVERSAL CALENDAR

The Imperial calendar printed here is the standard one distributed throughout the Imperium. It can be used to determine dates for any year, and can be used as a record to denote the passage of time or to plan for upcoming situations. It is a useful reference for noting dates for required ship maintenance, when starship payments are due, when birthdays will fall, and other timekeeping requirements.

Using the Calendar for Starship Travel: The typical starship voyage spends one week in jumpspace between star systems. Most commercial ships spend the next week in their destination star system: travelling to the destination world, unloading cargo, finding new cargo and passengers, and then travelling away from the destination world to the jump point again. All of these activities can be tracked using the Imperial calendar.

COMPARATIVE YEARS

THE ASLAN YEAR

The Aslan year (ftahea) is divided into 212 individually named days (eakhau).	Aihros
	Tralrea
	Ktaho

Seasons range in length from 30 eakheau to 100 eakheau.

THE IMPERIAL YEAR

The Imperial Year
is divided into
365
individually
numbered
days.

Although common practice recognizes weeks of seven days and months of four weeks, they are not usually used in expressing dates.

THE ZHODANI YEAR

Dranzhrin
Atrint (Raining)
Viepchaklstial
Vrienstial (Heat)
Atchafser (Waning)
Dranzhrinatch
Ataniebl (Harvest)
Kazdievlstial
Atshiavl (Chill)
Thequzastial
Atpiapr (Thaw)

Seasons are 40 days each. Holidays (each one day long) are between and outside the seasons.

THE VILANI YEAR

The Vilani year
is divided into
500 drandrin.

THE SOLOMANI YEAR

Month	Season
January	Winter
February	
March	
April	Spring
May	
June	
July	Summer
August	
September	
October	Autumn
November	
December	

Months range in length from 28 to 31 days.

THE SOLOMANI CALENDAR

The Solomani calendar is based on the Terran western calendar Its year is the period of revolution of Terra, the human homeworld, around Sol. The year is divided into 365 days, with every fourth year having 366.

Basic Units: The Solomani year is 365.25 days long. Each day is 24 hours long Ten years make a decade, 100 years make a century Years are divided into named months with an arbitrary number of days in each. For convenience, the months are numbered from one to 12, and the days of the month numbered from one to 31 (months have between 28 and 31 days).

Base Point: The Solomani calendar uses as its base point an arbitrary date computed to be the birth year of Christ.

Date Format: A date is expressed as month/day/year. For example, 1-1-5500 is the first day of the first month of the year 5500. The month name, when known, can be substituted for the month number. The Solomani year 5641 corresponds to the Imperial date 1120.

Solomani Format: mm-dd-yyyy (mm = month, dd = day; yyyy = year)

THE VILANI CALENDAR

The Vilani calendar has its basis in the depths of antiquity; its units were dictated by the period and rotation of Vland.

Basic Units: The Vilani distinguish between days and nights when they count time. A drandir is one complete rotation of Vland and is equal to about 23.35 standard hours A drandir consists of a dran (day) and a dir (night) Since the Vilani year is 500 drandir long, there are a total of 1000 dran and dir in the year. The Vilani year is approximately 1.33 standard years in length.

Base Point: The Vilani calendar uses as its base point the founding of the Vilani Empire in – 4045, that year is treated as year 1. The Vilani date 3882 corresponds to the Imperial date 1120

Date Format: Vilani dates are entirely decimal. Vilani count both dran and dir when noting dates Dran are odd; dir are even. Dates are expressed in the format year.drandir. For example, 3870.000 is the first half-day of the year 3870; since 000 is even, it refers to the dir (night) 3876.999 is the last half-day of the year 3876; since 999 is odd, it refers to the dran (day).

COMPARABLE TIME UNITS

Type	Period	Equivalent	Translation	Imperial Value
Aslan	ftahea	212 2 eakhau	year	320 days
	eakhau	—	day	36 hours
Solomani	year	365 days	year	365 25 days
	day	—	day	24 hours
Vilani	lani	500 drandir	year	486 days
	drandir	1 dran + 1 dir	full day	23 35 hours
	dran	—	day	11 6 hours
	dir	—	night	11 6 hours
Zhodani	thequzdij	3 chten	Olympiad	825 days
	chten	244 4 zhdanstial	year	275 2 days
	zhdanstial	—	day	27 hours

Vilani Format: yyy.ddd

The extremely rational system of Vilani date format makes each date refer to the fraction of the year when specifying a date. For example, 3766 500 is exactly halfway through the year 3766.

THE ZHODANI CALENDAR

The Zhodani base their calendar on the period of Zhdant, the Zhodani homeworld, around Pliebr, its star.

Basic Units: The basis for Zhodani time-keeping is the thequzdij (olympiad). A thequzdij equals three chten (Zhodani year); the chten is 244.44 zhdanstial (Zhodani days) long. A thequzdij is 825.6 standard days long; a chten is 275.2 standard days long, a zhdanstial is 27 02 hours long Three chten make a thequzdij and total 733 zhdanstial; every third thequzdij is 734 zhdanstial long. Each chten is divided into six shidr (seasons) of 40 zhdanstial each. Between the seasons are distinct holidays which celebrate the transition from one to the other

Base Point: The Zhodani calendar counts time from the first Olympiad, held in – 6741. The Zhodani date 3474.3 corresponds to the Imperial date 1120

Date Format: A Zhodani date is expressed as thequzdij.chten shidr/zhdanstial. For example, 3471.1 Atrint/28 is the 28th day of the season of Raining in the first year of the 3471st olympiad. The date 3473.1 Viepchakistial is Moon Day (the 41st day of the year) of the first year of the 3473st Olympiad.

Zhodani Format: oooo.y sssssss/dd (oooo = olympiad [thequzdij]; y = year [chten]; sssssss = season [shidr], dd = day number. A holiday name may be substituted for sssss/dd).

Zhodani Seasons and Holidays: The Zhodani chten is divided into a sequence of seasons and holidays:

Dranzhrin (Sunbright): The vernal equinox, when days and nights are of equal length. Dranzhrin is New Year's Day.

Atrint (Raining): The season of spring rains and crop planting.

Viepchakistial (Moon Day): Originally a religious holiday associated with Viepchakl; now a festival of wild abandon.

Vrienstial (Heat): The hot summer season.

Dranzhrinatch (Sunflight): The autumnal equinox; the point when days and nights are of equal length.

Atchafser (Waning): The seaon when the heat of midyear breaks and tempers.

Ataniebl (Harvest): The season of harvesting mature crops.

Kazdievistial (Thanksgiving): A traditional harvest festival.

Atshtiavl (Chill): The season of freezing winter.

Thequzastial (Olympiad Day): A special holiday every third year; consul elections results are announced, as are winners of the Psionic Games. Every third Olympiad, Atlthequzastial (a second Olympiad Day) is held immediately after Thequzastial; it serves as a leap year day.

Atpaipr (Thaw): The season of melting ice.

THE VARGR CALENDAR

Like other Vargr institutions, the Vargr calendar is in disarray. With no central authority to promulgate a calendar, many competing calendar systems have appeared; none have gained wide acceptance. The most widely accepted dating system in use by the Vargr is the Imperial calendar, because it is a universal standard which can be constantly checked.

There are times when an individual player character needs to know information about a subject, and he or she finds that that information is not available or is not known. It is natural that the character is then moved to research that information. The following are typical subjects which might be subjects of research:

Market Data: Information about markets or other aspects of trade and commerce The information helps the individual better understand the workings of the markets in order to predict better profitable enterprises, which goods to buy, which goods to sell, and which goods are unpredictable. Market data may be used to determine who will buy goods and what prices they will pay for them.

Scientific Data: Information about the physical world and how it can be manipulated. Inventions are the result of research. Chemical formulae are the result of research.

Computer Programs: Computer instructions which dictate to the computer how to process data and how to present reports of the results. Research is involved because of the complexity of the programming needed, and because first efforts at programming are rarely totally successful.

Historical Data: Information about the history of people, governments, markets, and scientific inquiries Research into historical data allows individuals to have greater insights into how results have been obtained in the past, how members of certain groups will react to specific stimuli, and what mistakes to avoid in the future.

Personal Data: Information on people and how they respond. Research into personal data allows individuals to understand and possibly predict what a specific person will do in a specific situation. This information can be helpful in determining what course of action to take when dealing with the individual.

THE PROCESS OF RESEARCH

Research involves a basic process or procedure regardless of the subject matter. In any research process, the investigator establishes a basic subject and then undertakes a circular process to create a hypothesis, test it for validity, and rethink the hypothesis in light of the test results.

The process steps are:

1. Creating (initially) or altering (subsequently) a hypothesis.

2. Testing the hypothesis.

3. Evaluating the test results. At this point, the research returns to step 1 or decides that the research is complete.

A *hypothesis* is a basic statement which can be proven or disproven by testing it against evidence or information. The process may be simple or complex. A chemical experiment might use available information to create the hypothesis: If this liquid turns the indicator blue, it is an acid. A trial might create the hypothesis: If a reliable person saw him rob the store, then he is guilty.

In **MegaTraveller** research, the referee may participate or assist in creating the hypothesis (since a player may not necessarily have the expertise in the field that the character has). A hypothesis does not have to be specific: a chemical research hypothesis might simply be a statement that "this substance can strengthen concrete," or "this chemical is an acid."

Testing the hypothesis consists of a series of tasks established by the referee. These tasks are always uncertain; they do not represent truth so much as the results of tests that are trying to determine truth. When the appropriate testing task

is complete, the results are provided to the researcher. The research task is:

To test Hypothesis X.X:
Difficulty, Skill and Characteristic, Time (uncertain).
Referee This task may be hazardous. Difficulty, Skill and Characteristic, and Time must be determined. Total truth allows minor revision of the hypothesis; exceptional success allows major revision of the hypothesis. Some equipment, supplies, or subjects may be required.

Evaluating the test results is distinctly a player function. The player makes decisions concerning how many times to test the hypothesis, and what those results mean. The player determines what revisions to the hypothesis are possible and what revisions to make. The ultimate success of the research process depends on the decisions the player makes.

CREATING A HYPOTHESIS

When a player character creates a hypothesis, he makes a basic statement that needs to be tested and proved or disproved

For simplicity, a hypothesis is numbered as a decimal number. For example, the initial hypothesis (regardless of its nature) should be numbered Hypothesis 1.0.

A minor revision of a hypothesis increases the decimal portion by 1 (from 1.0 to 1.1 to 1.2, etc). A major revision of the hypothesis creates a new whole number (2.0, 3.0, 4.0, etc).

The Target Hypothesis: When the referee assists in creating the hypothesis, he also determines the target hypothesis which should be the end result of a successful

THE RESEARCH PROJECT

Begin Process

Modify or Create Hypothesis

Test

Conclusion

Evaluate
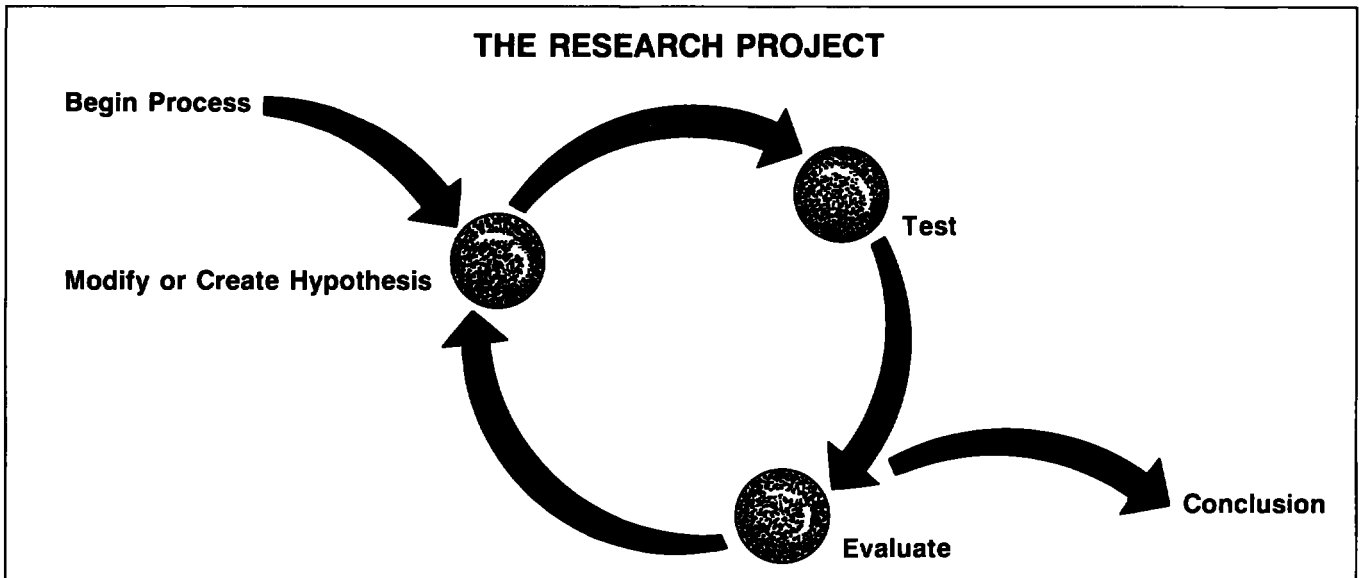
series of research tasks. He should establish and note that target hypothesis: for example, it might be Hypothesis 2.3.

Referee-Determined Hypotheses: The referee can determine what the target hypothesis is by careful thought and planning. Within the context of the current adventure situation, the target hypothesis can be specified.

Chance-Determined Hypotheses: At times, the specific target hypothesis does not really matter, or those involved find it difficult to decide what to specify. The target hypothesis can be determined by chance by using the dice. A relatively easy hypothesis can be specified by 1D.1D (use 1D to determine the major revision and 1D to determine the minor revision). A more difficult hypothesis can be specified by 2D.2D (use 2D to determine the major revision and 2D to determine the minor revision).

For example, to specify a relatively difficult target hypothesis, roll 2D for the major revision (throwing 7) and roll 2D for the minor revision (throwing 7 again). The target hypothesis is 7.7.

TESTING A HYPOTHESIS

Each test of a hypothesis is an uncertain task. Undertaking the task is the way in which a researcher generates evidence which will help prove or disprove the hypothesis. The result of the task may be exceptional failure, failure, success, or exceptional success.

Exceptional Failure: When the research receives exceptional failure, he must follow the procedure to stay determined before retrying the task. Exceptional failure makes it harder to continue the line of research.

Failure: If the researcher fails the task, he receives no information. For example, a chemist who does not finish an experiment has no data to use to make a report. Failure primarily consumes time.

Success: If the researcher succeeds in the task, he receives some information about the hypothesis. Success provides information about whether the current hypothesis is true or not.

Exceptional Success: If the researcher achieves exceptional success, he receives some information about the hypothesis.

The Research Results Table shows the results of each research task result

RESEARCH RESULTS

Researcher	Referee	Result	Comment
Ex Failure	Failure	No information	Stay Det
Ex Failure	Success	Inconclusive	Stay Det
Failure	Failure	Inconclusive	
Failure	Success	Inconclusive	
Success	Failure	Improper result	
Success	Success	Proper result	
Ex Success	Failure	Improper result	
Ex. Success	Success	Insight	

When using this table, results indicate· *No information:* Experiment not completed; no data is available. *Inconclusive·* There is not enough information to allow a conclusion to be drawn. *Improper result·* Referee incorrectly tells researcher that the current hypothesis is true or false. *Proper result.* Referee correctly tells researcher that the current hypothesis is true or false *Insight:* Referee correctly tells researcher that the current major hypothesis is true or false.

EVALUATING RESULTS

The researching character is solely responsible for evaluating the results of research. If, on the basis of one or two research tasks, he wants to conclude that a certain hypothesis is true, then that evaluation must be permitted. If the hypothesis, in reality, is false, the consequences will ultimately show up

AN EXAMPLE

John's player character is Dr. Ishuggi. The doctor is helping fight a virulent plague sweeping the continent. It is essential that he determine the manner in which it is transmitted from person to person.

John discusses the basic hypothesis with the referee, and they agree that it should be Hypothesis 1.0 (the plague is spread by rats). At the same time, the referee decides that the target hypothesis is Hypothesis 1.3.

Dr. Ishuggi begins his research by testing the hypothesis. The experiment is a Difficult, Uncertain task which takes days to complete. At its conclusion, he receives a result of "some truth." Some truth in this case might be "the hypothesis appears to be true."

After several tries, the task result is "total truth" and John is told to revise to Hypothesis 1.1 (the plague is spread by the fleas on rats). He immediately achieves total truth on the research task and is told to revise to Hypothesis 1.2 (the plague is spread by the scales of the wings of the fleas on rats).

After several research tasks, each of which produces "some truth," John decides that there is not enough time to continue research and that he must go with what he has. Dr Ishuggi submits a report concluding that Hypothesis 1.2 is the answer to the plague's spread.

In reality, Hypothesis 1.2 is not the answer. A method of treating the plague based on Hypothesis 1.2 might be partially effective, but it might also be partially ineffective. The results of the incomplete research may then have implications and ramifications that will produce future consequences and adventures

RIGOROUS RESEARCH

Research is not easy. Working quickly is often at odds with working carefully. This research system clearly pits these two characteristics against each other.

Strategies: Some strategies can be helpful in obtaining good research results

1. Duplication of results. Each hypothesis should be tested many times. Testing a hypothesis once gives a result. Testing it 10 times gives a range of results that can show what the probable value of the hypothesis is. Only after many tests have been made should the hypothesis be revised Depending on the test results, that revision may be major or minor.

2 Cautious work. Where practical, the researcher can specify a cautious task in order to reduce the risk of failure.

3. Hasty work At times, a researcher may be willing to risk the possible failure of hasty work in order to repeat an evaluation several times

Problems: Conducting research typically involves the problems of time (or lack of time), skill (or lack of skill), equipment, and subjects. Each presents its own unique problem to be solved.

REFEREE CONSIDERATIONS

Research is not meant to give magic answers to individuals. Rarely will a researcher discover a major new technical advance or a decided change from accepted technology. Instead, research allows the individual to find out information in a systematic way and be able to use it for his own purposes.

Research is full of false leads, dead ends, and attractive mistakes. The process of research, however, can be an interesting way of leading adventurers into new situations and scenarios. A researcher may need specimens, samples, or equipment that is not available locally, adventures must be mounted in order to find and procure it.

Research can be a lifetime process. Beginning from Hypothesis 1.0, a major research project may be aimed at (and only the referee knows this) Hypothesis 12.3. The researcher is seaching for that single target hypothesis that will always produce total truth when tested enough times. Until then, the research must continue.

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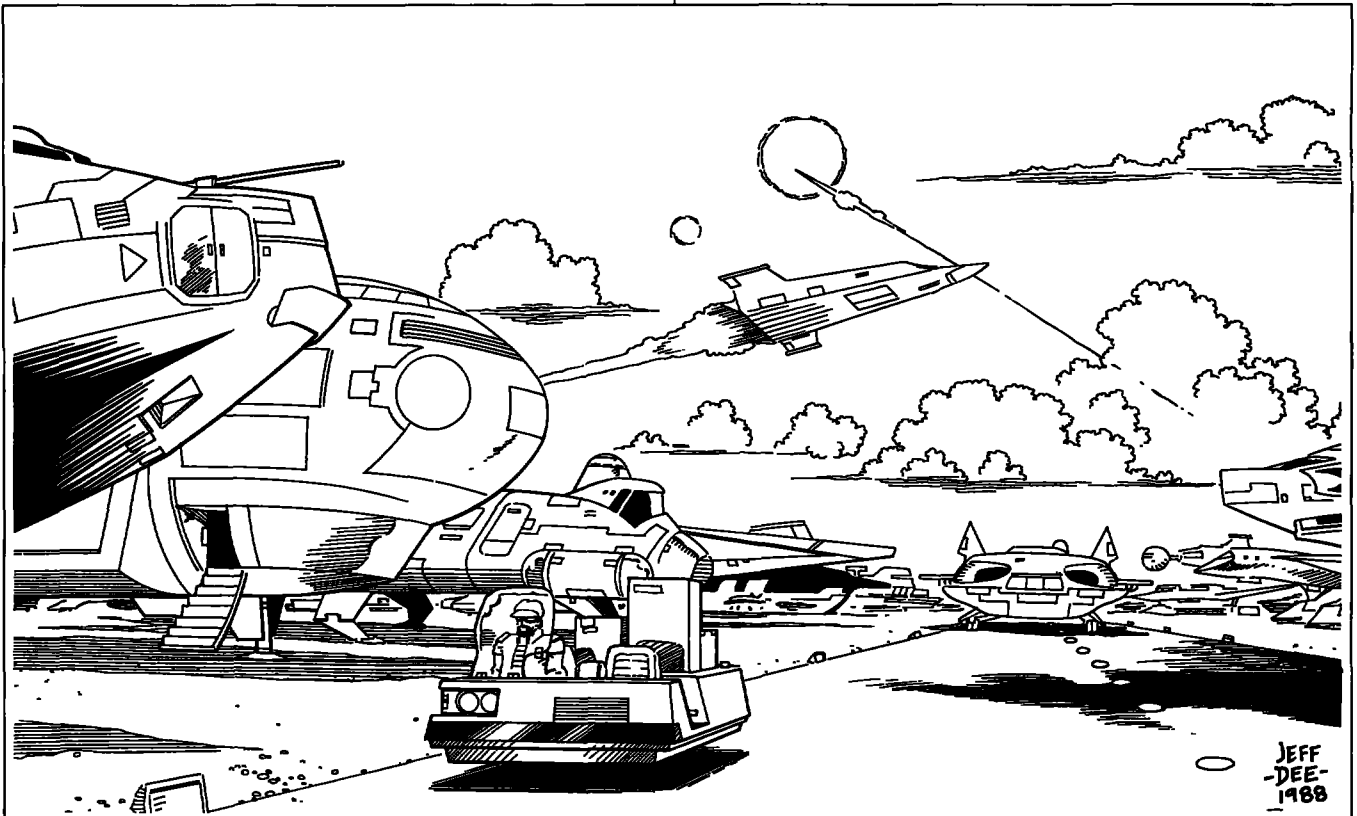
Aliens

There is a wide diversity of intelligent races within the Imperium and in the territories which adjoin it. Intelligence expresses itself in many different ways, and most of them are demonstrated by an existing intelligent race. A few intelligent races have risen to the top, and they dominate most of explored space because their drives and psychologies have taken them off their homeworlds and out to the stars.

In addition to the humans who dominate the Third Imperium, four intelligent races have achieved high profiles and need to be considered when dealing with interstellar society. Each has its own peculiar qualities and characteristics and must be studied in depth in order to be understood. The following detailed essays show much of what is known about these races: the Aslan, the Vargr, the Zhodani, and the Droyne.

The Aslan: The fierce warrior race of the Aslan is driven by deep instinctual needs for land and territory; as individuals they show intelligence and understand that they are driven by their instincts.

The Vargr: The genetically manipulated Vargr were produced by experiments conducted by Yaskoydray, the legendary Ancient figure who brought such changes to the universe. They themselves know that they are a kind of Terran; that their genetic heritage is the Terran dog. Vargr are characteristically torn by dual drives: toward gregarious groups and away to independence. The dual drives are shown by the Vargr reaction to humans: Some feel great resentment and anger at Terrans—at men; others are drawn to them by the same natural instincts that created man's best friend on Earth.

The Droyne: The multicaste Droyne now live quiet pastoral lives, much like the lives they led before the spectacular Yaskoydray appeared and led them on a campaign that changed the face of the universe. The Droyne were once the Ancients, although they no longer possess the spectacular technology that was the Ancients' hallmark. Some Droyne are Chirpers, a primitive race which has lost much of the Droyne culture. Some Droyne retain great portions of their culture. Somewhere there may still be Ancients, even Yaskoydray, waiting to reappear and again influence the universe.

The Zhodani: The psionic culture of the otherwise ordinary human Zhodani indicates the potential for human society (for better or for worse) that is possible when psionics are incorporated into everyday life.

ALIEN RACES

The overviews of the Aslan, Vargr, Droyne, and Zhodani provided here are intended to furnish background information and basic understanding to the **MegaTraveller** referee. The information is not sufficient for players to handle player characters, but a referee can at least provide non-player characters and successfully manipulate them in basic situations.

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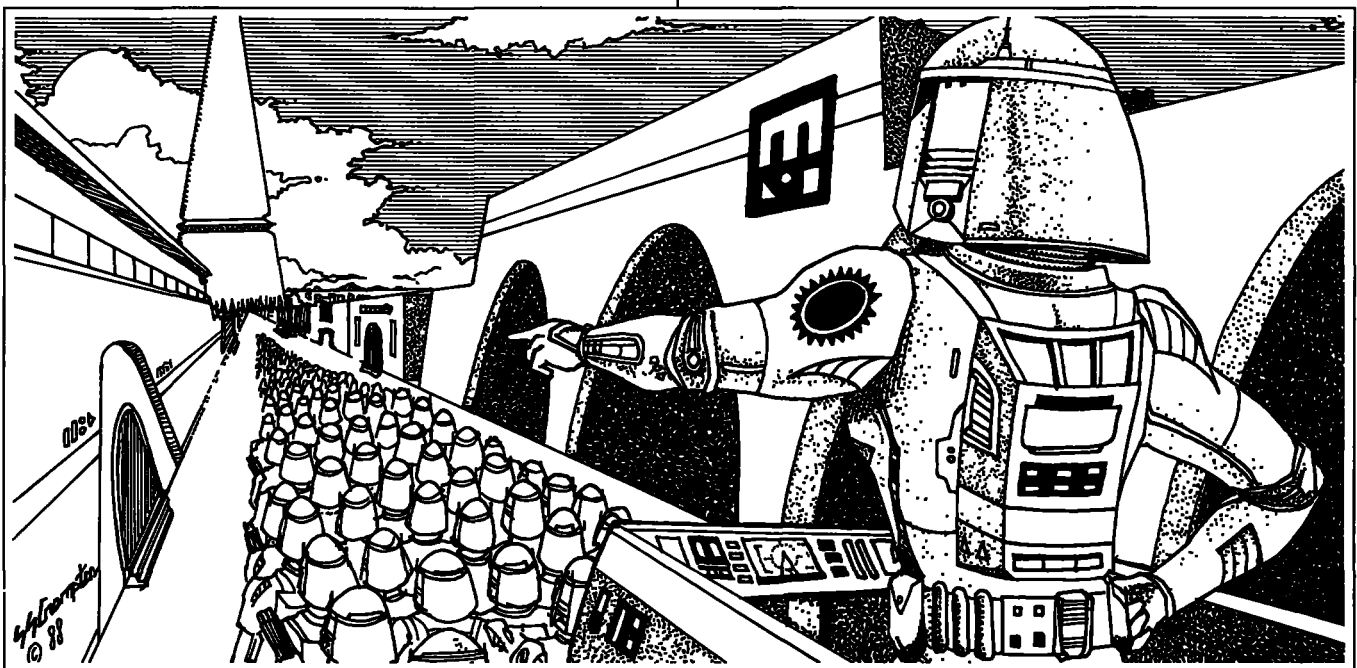
Droyne

Rules are made to be broken. Scientists and academicians produced the term "major race" to describe any intelligent race that had independently discovered and implemented the principles of the jump drive. Politicians and bureaucrats (specifically those of races which had developed jump drive) made the term widespread, using it as *de facto* evidence that major races were superior to minor races. Since jump drive technology gave the major races an obvious and powerful advantage, the minor races found it difficult to dispute the classification.

Thus it came as a shock when researchers found (and proved) that the Droyne were a major race. The Droyne seem to have none of the drive that characterizes a major race, they seem content to live placid lives on pastoral planets. By all appearances, they are a minor race. But the fact remains that they have jump drive, and they have had jump drives longer than any other race, including the Vilani. When the Droyne were discovered and identified, a basic scientific and political definition was destroyed.

THE DROYNE HOMEWORLD

Although the Droyne homeworld is no longer known, scientists, historians and other scholars have established a few facts and a large number of theories concerning the nature of that world.

The location of the world is, of course, unknown, but it is believed to have been in the Spinward Marches, the Deneb Sector, or the Trojan Reaches, these being the regions in which the largest number of Droyne worlds and Ancients sites have been discovered.

Casual observers call the Droyne homeworld Droynia; more properly, it is Eskayloyt (meaning Lost Home). This name appears independently in myths and legends on Andor, Zeen, and Auitawry, three scattered Droyne worlds, and is accepted by the majority of scientists researching Droyne origins.

Characteristics of the homeworld are difficult to determine, but some facts are clear. It is predicted to be a small world with a standard or dense atmosphere and a significant hydrosphere; the range of statistics most frequently given are Size 3 to 6, Atmosphere 6 or 8 (probably 8), and Hydrosphere 3 +. The data was assembled from an analysis of the Droyne themselves: their flying ability relies on a fairly weak gravity and a reasonably high pressure, thus dictating the size and atmosphere requirements. Hydrographics are required for the development of life as we know it.

Eskayloyt probably orbited an F2 V to F7 V star; Droyne seem to prefer that particular spectral range. Assuming the available data has been interpreted correctly, the Droyne homeworld is a pleasant, Earthlike planet, slightly warmer than Terra, but not significantly so.

The data and assumptions about Eskayloyt have led to many theories about its location and possibly its fate. No known world provides the fossil evidence that it was Eskayloyt; active searches and excavations are currently in progress on several worlds that show promise. There is the possibility that the Droyne evolved on a world thousands of parsecs away and then travelled to our part of the galaxy; in such a case, locating Eskayloyt would be impossible. Some scholars have proposed that the homeworld was destroyed in the Final War

and is now an asteroid belt. However, even an asteroid belt might be expected to yield fossil evidence of some sort, and none thus far have done so.

DROYNE PHYSIOLOGY

The Droyne evolved from hexopedal omnivore/gatherers on the unknown world designated Eskayloyt, a small world where low gravity and high atmospheric pressure combined to permit the development of large fliers. Scientists have theorized that Eskayloyt may have been subject to a high level of radiation, and hence that life forms there had a higher mutation rate than those who evolved in systems like Sol. This is considered vital to any image of Droyne evolution for a number of reasons. Of greatest importance is the simple fact that several aspects of Droyne physiology seem to be unlikely enough to absolutely require such an agency for development. Neither intelligence nor Droyne psionic abilities seem adequately justified in evolutionary terms; Droyne seem to lack the drive to use their intelligence to dominate their environment (generally considered to be an essential tenet of sophontology), and their development of psionics talents seems equally improbable in light of what we know about them.

Whatever their evolution, Droyne are unique among the major races. Adult Droyne belong to one of six esorde (castes) which, unlike K'kree and human castes, are not social groupings: They are biologically distinct categories. There is far more difference between Droyne castes than between human sexes, for example.

The Iskyar: Castes seem to be triggered by differences of environment and diet, the effects of which are awakened in the individual during a ceremony, the Iskyar. At the Iskyar, Droyne young are assigned a caste as psionic aspects of the ceremony trigger and reinforce existing genetic programs within the youth and cause caste development. Details remain unknown outside of Droyne society, due to the repugnance with which psionic disciplines are regarded. All Droyne have the potential to develop into members of any caste; there is no hereditary predisposition known in caste development.

Physical Description: All Droyne, regardless of caste, share certain key features in common. Each has six limbs, the middle

pair being developed into extensive wings spanning three or more meters. Size varies with caste: between one and two meters. Mass varies from 25 to 50 kilograms.

Skin color is a greyish tone, marked with black patterns that vary from one caste to another. The skin itself is tough and scaled; the wings are black and batlike. Hands and feet have four digits apiece. Fingers are long and flexible, and each is fully opposable to all others on the hand Only three toes are fully developed; the fourth has degenerated into a bony spur or talon which is very effective in combat. The rear limbs are digitigrade.

Droyne have large compound eyes, granting them a wide field of vision. Arrangement of limbs and features is basically quite humanlike, overall. Their bone structure, though, is more analogous to that of Terrestrial birds: bones are hollow and brittle, making even the largest Droyne much lighter and weaker than humans of comparable size.

Droyne Gender: Droyne have three sexes, designated alpha male, beta male, and female. Gender develops only after casting. Drones are female; leaders, sports, and warriors are alpha males; workers and technicians are beta males. Reproduction is complex; pheromones generated by beta males are necessary before a female can ovulate and be fertilized by the alpha male.

The drones lay clutches of fertilized eggs, and nurture them after they hatch. They are fed predigested food reduced to manageable consistency in a mouth pouch; the young are weaned at the age of about one standard year.

Chirpers: If Droyne do not caste, they do continue some development, though much more slowly Sexual differences eventually emerge, but casteless Droyne tend to remain small and semi-intelligent, and continue to resemble immature Droyne in appearance Those Droyne groups which have lost the ability to caste (and these are fairly common) generally live as primitives.

Psionics: It has been demonstrated that the Droyne have extensive psionic talents. For this reason they are largely despised, feared, or ignored by Imperial citizens conditioned to hate all psionics powers. Luckily for the Droyne, their abilities in the area of psionics are not widely publicized, and many Imperials of lower education or social level are unaware of their powers.

All Droyne, even casteless and immature individuals, have a defense mechanism which gives them effective invisibility through psionics, and a homing instinct which guides them to large groups of their own kind. Some castes display additional powers, sometimes quite sophisticated ones, and a few unique to the Droyne race.

Droyne Castes: There are six primary castes in the Droyne sociobiological structure: workers, warriors, technicians, drones, leaders and sports. Before casting occurs, all immature Droyne appear similar; it is only after the casting ceremony that the genetic potential within each individual is unlocked. The castes develop sharp differences from one another in the first year after casting, and thereafter remain distinct physically, mentally and in many facets of behavior.

The castes have further divisions, but these are more social than biological. The six primary castes are defined below.

Worker (Aydin): Manual labor and mundane activity are the province of the worker. They are the least intelligent of the castes and are temperamentally the most placid and contented of all Droyne. Size varies from one to two meters, according to the exact nature of the worker's function

Warrior (Aydih): Trained for combat and possessing comparatively well-developed muscles and reflexes, the warrior is the enforcer and protector of Droyne society. Warriors are more involved with tactics than with strategies, and more with accomplishing missions than with defining what missions are Warriors are larger and stronger than other Droyne castes, sometimes reaching two meters and 60 kilograms in size.

Technician (Ayssath): The science-oriented portion of Droyne society concerned with both research and practical implementation of technology. They are small but dexterous and intelligent, outside of their own area of expertise, they possess little in the way of initiative or decisiveness. Technicians are very capable of fixing, repairing, or assembling mechanisms; when inventing, they usually do so under the intelligent guidance of a leader.

Drone (Aydirsoth). Drones have a variety of roles in Droyne society Their reproductive and family jobs have been noted, and they also play an important part in the casting ceremony. Further, they constitute a sort of middle management caste, responsible for many of the routine functions of business, trade, and administration. Drones can handle routine work and make good managers so long as they have an effective leader to whom they can bring problems.

Leader (Aykrusk): Leaders are required to manage and direct society They are the most intelligent of all Droyne and the most capable of initiative and intuitive thought. In size, they resemble drones and technicians, but they tend towards significantly larger brain cases.

Leaders always take jobs which enable them to lead. Some may be forced to take roles as advisers to other leaders, but leaders are always struggling to personally make decisions
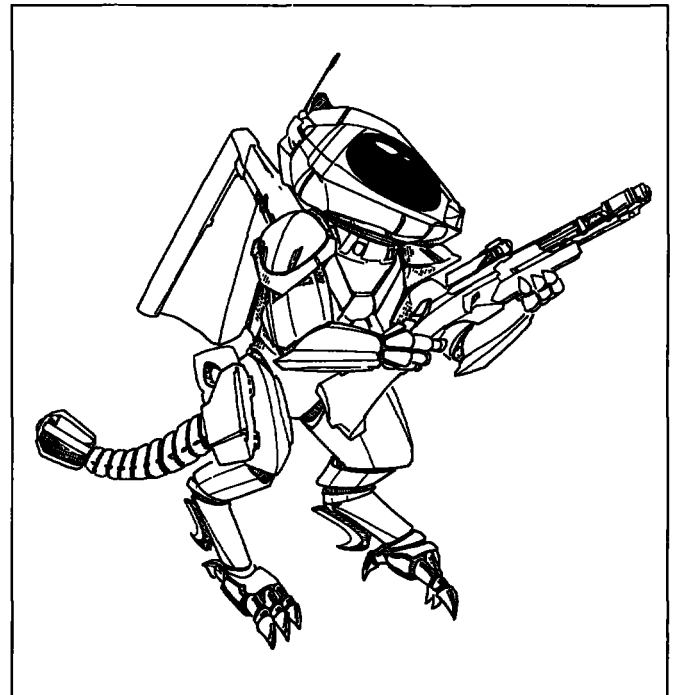
and be responsible for them. Leaders accept the authority of those above them, but are always striving to rise in power within the system. Typical jobs for leaders include: starship captain (leaders tend to be navigators rather than pilots), military or naval officer, company or corporate officer, or family patriarch

Sport (Praytsirv): Although the caste system of the Droyne is rigid, the sport is the deliberately accepted exception to the caste structure Sports are special individuals who are capable of being alone or away from their family for long periods of time. They can show initiative and self-reliance Sports average around 1 5 meters in height and are about equivalent to drones in intelligence Sports are similar to Vargr emissaries.

Typical jobs for sports include: messenger, prospector, scout, representative, explorer, or driver. Sports make good pilots.

THE EVOLUTION OF THE DROYNE

Along the evolutionary path that all life on Eskayloyt followed, the appearance of natural castes was a recurring biological mechanism; members of the group differentiated according to function. Even though many of the specialized types did not participate directly in the reproduction process, their contribution to the survival of the group enhanced the propagation of their traits. The process paralleled that of Terran bees or ants: even though worker bees do not participate directly in reproduction, the workers make the hive successful, and successful hives survive. Life on Eskayloyt developed many types of castes over the millennia. In the seas, schools of swimmers were composed of distinct members hunters, decoys, and breeders. Later on the continents, herds of grazers roamed the plains, differentiated into leaders, fighters, breeders, and scouts

Somewhere in the course of evolution, genetic interaction produced intelligence. The prehistoric or proto-Droyne had originally evolved into an ecological niche in the forests of their homeworld. Their amphibian ancestors had moved into the forest floors, some of those forest dwellers eventually took up nesting in the tops of trees. Along the way, Eskayloyt underwent dramatic climatic change When the forests thinned out and became plains, the proto-Droyne were soon isolated into small colonies wherever the trees remained, along rivers and in small groves. The triune nature of these proto-Droyne was especially adapted to this life the alpha male was a hunter; the beta male was the nest-builder; the female was the mother

The proto-Droyne proved especially adaptable when local conditions called for it. Genetic drift constantly produced offspring which became new castes Some of those castes survived, many others died out Vanished castes include an aquatic form (evolved from hunters), an *idiot savant* information processor/memory bank (an evolutionary dead end with some similarities to the technician), and a communicator (evolved as a specialized worker).

New Castes: Evolutionary pressures on the proto-Droyne forced the emergence of new castes. The first new caste to appear was the leader; a small but growing percentage of hunters took on leadership roles in the family groups, and as leaders, they provided direction for the groups. From their positions of dominance, they took a greater share of the food, lived longer, and gained experience which was also beneficial to the

leader group. The leader caste obviously had survival benefits for itself and for the Droyne, it survived. New castes developed from old castes as specialized needs arose. The hunter caste gave rise to sports (independent scouts, trackers, messengers, and emissaries) and warriors (defenders of the group) in addition to leaders. Along the way, the hunter caste proved unnecessary and died out; leaders took over the position of the alpha male. The nest-builder caste gave rise to workers (who served as builders, farm labor after agriculture was developed, herders, and servants). After technology was achieved, the technician caste arose (naturally enough, from the nest-builders; the nest-builders themselves died out). The female, the original mother creature of the Droyne, slowly transformed into the drone, with responsibilities for procreation and for management of the family unit.

Important Points: The evolution of the Droyne from their proto-Droyne ancestors took millions of years. The evolution of their present caste structure, to include such a specialized caste as Technician, means that they have had intelligence for hundreds of thousands of years.

Yet, over those hundreds of thousands of years, the Droyne (except for the brief Ancient period) were apparently content to remain on their homeworld There is no evidence that they left it using sublight drives, there is no evidence that they pursued anything other than a simple life on their homeworld, raising enough food to feed themselves, mining metals to meet their basic needs, content to remain as they were.

THE HISTORY OF THE DROYNE

All knowledge about the Droyne can be assigned to three eras: the Prehistoric Period, the Ancient Period, and the Modern Period. Each period has a different, distinct character.

There are many mysteries about the Droyne. Most of them will probably never be solved. But some basic information is known about them, gathered from surviving records, pieced together from fragments of video presentations, bookfilms, holographs, and writings The following is a presentation of what is known about the Droyne—what most individuals have learned in the course of an ordinary education, or what they can find out in ordinary researches.

The Prehistoric Period: The period before the rise of Ancient technology is considered Droyne prehistory. Conventional wisdom includes in this era all Droyne activity prior to − 350,000.

Sources: Available information sources about the Droyne Prehistoric Period are rare The primary reference is the work of Zhodani researchers investigating surviving Droyne materials on Viepchakl, the satellite of Zhdant.

First Intelligence: The Droyne showed first evidence of intelligence three million years ago, primarily in the use of tools and the production of elementary decorative clothing. Later advances included agriculture, the use of hunters as scouts and guards, a division of labor, and expansion into fishing and seafaring.

The Rise of the Cities: By about − 500,000 the Droyne had established cities which served as trading centers along rivers and coasts Large agricultural areas were worked, often under irrigation Typically, these large cities (actually city-states) had populations of about one million and controlled an area of about

10,000 square kilometers Buffer regions between the cities were under the control of no one.

Differences in available resources naturally led to conflict. At the same time, the appearance of the Warrior caste helped to promote and continue the conflict. Technology advanced under pressure from the continuing warfare, but over a much longer time span than is considered normal for other races. After perhaps 10,000 years, the Droyne advanced to a solid tech level 5.

Much of the incentive for technological advance was the constant warfare between cities. That warfare evolved (by −470,000) into a form of ritualized combat involving only the Warrior and Worker castes. With the ritualization of warfare between cities, the advance of technology stopped, and the Droyne were effectively frozen at tech level 5.

The Long Plateau: From −470,000 to about −350,000, Droyne society remained at a technological plateau To an outside observer, the civilization was static (or stable, depending on the outlook) The Droyne could be seen as clever, extremely intelligent animals, much like bees or ants or termites. They built, communicated, had writing and machines; but they were also satisfied with their idyllic, pastoral lives. They lacked, as a race, the drive upward.

Without some sort of stimulus, the Long Plateau could have lasted forever.

The Ancient Period: The Ancients appeared on the scene suddenly, and at a time when there was effectively no starfaring in the galaxy. They burst into space and expanded to hundreds of worlds, creating colonies, bases, and settlements. Then they destroyed themselves.

Early Vilani researchers who discovered these ruined sites thought each to be representative of a different race, but excavations and further investigation soon showed that this was not so—common factors demonstrated that all were examples of the same civilization. The age of these sites has been established at around −300,000 by Imperial reckoning. The allowance for error in the dating methods is about 10,000 years; it has been concluded that the civilization lasted for a total of less than 50,000 years. The term Ancients has been generally adopted in recognition of the antiquity of the culture.

Extent: The Ancient civilization was wide-ranging. Confirmed Ancient sites have been found in every sector of the Imperium, as well as throughout Vargr and Aslan territory It is reported that there is a high frequency of such sites within the Zhodani Consulate. It is almost certain that the Ancients ranged beyond the limits of explored space, and that evidence of their travels lies beyond the borders of existing human empires

The total number of confirmed Ancient sites visited by the Imperium is in excess of 200. Imperial studies of the reported locations of these sites have produced some statistical data, not necessarily complete, but pointing towards certain conclusions. The frequency of Ancient sites appears to decline with distance from a central point; that point lies somewhere in the Spinward Marches.

The Ancients would appear to have had a relatively small population. The planets they settled, according to available evidence, usually had only one or, at most, a handful of bases. Estimates of population vary, but do not exceed one million per world. Some investigators believe that their high-population

worlds held billions, but were reduced to asteroid belts in the war which shattered their civilization. These scholars say that the worlds that are still intact were the low-population planets of the Ancient Empire. Others, however, hold that none of the evidence found in any asteroid belt confirms this.

If the asteroid belts created by the Ancients were worlds with populations in the billions or tens of billions, then the Ancients at their heights may have had a population in the trillions. Had these planets been no more heavily populated than the confirmed sites known today, then the total Ancients population can be estimated at less than one billion.

Ancient Technology: The most striking aspect of the Ancient technology is not its high level (though this is certainly dramatic), but its diversity. Of the hundreds of Ancient sites which have been excavated and analyzed, each appears to express a different approach to the problems solved by technology. It would be easy to take each site as originating from a different cultural or technological background, as the first Vilani spacefarers theorized them to be.

It appears that each site involved the near total reinvention of the most basic building blocks of technology. One site might use familiar screw fasteners, while another would depend on adhesives for the same task; still others could use rivets, or interlocking ellipsoids, or simple plastic clasps. Where one site's computers and electronics show evidence of depending on silicon chip circuits, another performed the same functions with fiber optics, still another used fluid dynamics, and yet another channeled heat transfer.

Once the Solomani Hypothesis (which theorized that all humanity came originally from Terra) was accepted, it was a simple matter to analyze the gene pools available to each of the distinct human races found on worlds other than Terra. Those studies have concluded that the Ancients visited Terra many times, taking groups of between 1000 and 10,000 humans to each of perhaps a hundred worlds. A few indications
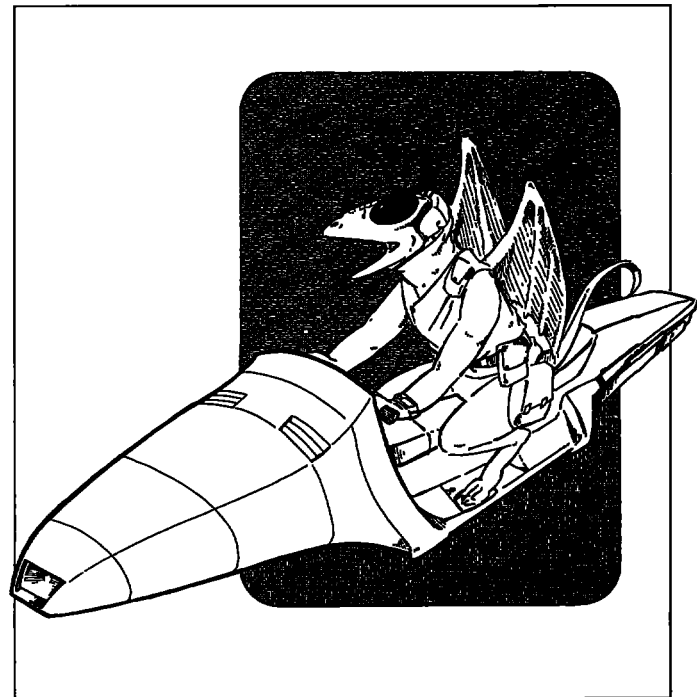
have been discovered which suggest that genetic engineering was used on some of these transplanted groups to encourage rapid adaptation to their new environments, but the vast majority of human races were not so tampered with.

The reason for Ancient interest in humanity is unknown. Theories involving humans as slaves, assistants, workers and even as pets have all been advanced, but there is insufficient evidence now available to support any specific conjecture.

Vargr: At approximately the same time as human samples were removed from Terra, the Ancients took samples of the family *Canidae*. This dog stock was manipulated through genetic engineering techniques to produce an upright stance, an opposed thumb, and intelligence.

Just as the interest in humanity remains unexplained, so too is the reason for Ancient creation of the Vargr race.

The Final War: The Ancients' civilization was destroyed in a cataclysmic war. Over a period of about 2000 years, they fought with such ferocity that hardly any traces of their existence now remain. Archaeologists today work under a severe handicap in attempting to piece together those elements which survived to arrive at any coherent picture of the Ancients, their way of life, or their works.

The Final War was fought with technology far beyond that available to the Imperium, or to any civilization which has existed since the days of the Ancients. Estimates place the resources used at tech level 25 or greater, a level virtually incomprehensible to any contemporary mind.

The weapons of the Final War were brutal in their power. They were capable of great destruction; entire planets were reduced to asteroid belts by what must have been planet-buster bombs. In other cases, planetoids and small moons were seized, moved and directed toward planets to obliterate what must have been bases, cities and installations. Many planets still bear the marks of such attacks.

The weapons of the Final War were also quite sophisticated,

capable of fine control. Entire worlds appear to have escaped the war unscathed, except for the actual sites themselves Frequently, it is only when a site is discovered that it becomes evident that it was the target of an attack. There is no evidence of misses, no pattern bombing, no random attack. What was attacked was hit; high technology coordinated the attacks, which were seemingly impossible to stop, even given Ancient technology. There are, again, various inconsistencies, not always explainable, which could be taken as evidence of a great diversity in technologies and abilities involved in the way war was waged

Puzzles and Puzzles: Despite the Final War, the Ancients appeared to have other interests beyond warfare Their bases and settlements were not built as fortifications; their cities included complexes that were probably entertainment centers, concert halls, theaters, and parks. There were libraries and museums. There were facilities for the raising of children. If the Ancients were so good at warfare, what must they have done in peace before they destroyed themselves?

The Modern Period: With the end of the Final War, the Ancients ceased to exist. Until recently (the last 300 years), the fact that the Droyne were the Ancients was unknown. Once the connection between the Droyne and the Ancients was made, research into the individual Droyne races on many different worlds produced a history of the Droyne since −300,000.

Sources: The history of the Droyne race after the era of the Ancients is virtually nonexistent, if one assumes history to be a chronicle of dates and battles. Droyne history on each of the scattered worlds where they survived after the Final War ran its course is generally lacking in noteworthy events

Modern Droyne History. Archaeologists and historians have found a common pattern in the history of most Droyne worlds that have been investigated. Their history tends to fall into four broad phases: Decline, Recovery, Stagnation, and Contact.

Decline: Evidence shows that the Droyne who survived the Final War were few in number. Fossil remains from this period show the Droyne to have had a prolonged period of barbarism and decivilization. Almost all the scattered Droyne worlds seem to have lost all higher technology, and most were so badly shattered as to have lost the ability to caste (which is known to have been a characteristic of Ancient Droyne, based on a variety of recovered works of art). It was during this period that a large number of Droyne worlds faded into extinction.

Archaeological records put the low point of the post-war Droyne societies at roughly −75,000, nearly 225,000 years after the war. By this time, according to the finds investigated, the race was close to extinction. Virtually all Droyne cultures had lost all ability to caste, their numbers were diminishing and, by all known principles of science, they should have died out

Recovery: On about 20 worlds, however, this did not happen. Around −75,000, the Droyne on these worlds seem to have almost simultaneously undergone a "renaissance." The key to this recovery was a revival of the ability to caste; this, in turn, seems to have been based on the introduction of a set of small gold disks, called coyns, which became the basis for many aspects of Droyne culture. The nature of the coyns is poorly understood, but recent discoveries have begun to provide certain explanations (which are summed up in a later section) concerning the use of the coyns in Droyne ceremonies.

The biggest mystery that remains, however, is how the coyns originated and how they spread to 20 Droyne worlds (or appeared spontaneously on each—a theory that is beyond the realm of rational belief). The most commonly accepted hypothesis, that one Droyne culture developed the coyns and rediscovered the secret of interstellar travel, is not supported by any other evidence available to scientists today. Nonetheless, it is the only truly acceptable explanation and is the grounds for classification of the Droyne as a major race separate and apart from their ancestors, the Ancients. (A rival theory, that the Droyne of a particular world merely used Ancient artifacts to revive space travel, is dismissed because of the universal, pseudoreligious awe and fear with which Droyne are known to regard artifacts of this kind. Still, as some have pointed out, this theory isn't completely impossible: 75,000 years is a long time, and superstitions change even in a race as stable and constant as the Droyne appear to have been.)

Strangely, the Recovery period seems not to have been characterized by widespread interstellar travel. Except for the evidence of the coyns themselves, archaeologists have detected nothing that indicates a major jump in either the sophistication or the spread of Droyne culture or technology The recovery of the caste system led to a halt in declining populations (for reproduction is strongly, though not solely, linked to caste) and a revival of culture and primitive technology. No archaeological evidence exists for the presence of any Droyne group at this time with more than a tech level of 1 or 2, space travel simply doesn't seem to have been possible.

Yet such contact must have occurred. The coyns are not the only element pointing to this conclusion. Droyne culture on each of 20 worlds evolved during the recovery period on parallel lines. At the time Imperial explorers determined that the Droyne were indeed a major race, with multiple-inhabited worlds, the difference between Droyne civilizations were those of technological variation, adaptation to local conditions, and other minor factors. Culturally, they were and are more alike than any two human-settled worlds cut off from one another during the Long Night—a mere 1800 years in length.

The final, most mysterious enigma concerns the coyns themselves. Six of those coyns contain pictorial representations of the major races: Humaniti, Droyne, Vargr, Aslan, K'kree and Hivers. While the Ancients could have left traditions of the three, the others did not exist at the time of the Ancients, and at the time the coyns were introduced, there was little to mark them as particularly exceptional species How then came these six races to be portrayed on the coyns? No reasonable explanation for this has ever been produced.

Droyne traditions are of little use in the development of theories accounting for this period, either. A common myth in each society is that the coyns were introduced by a godlike figure, known as Yaskoydray (usually translated as Grandfather), who appears as a savior figure bringing the coyns to his people, and teaching them the crucial elements of their culture.

DROYNE SOCIETY

The nature of Droyne society stems from the caste system, which dictates much of the interaction between individuals and groups, and reaches out to embrace such matters as government, warfare and a variety of other factors

Social Groupings: Family structure (where a family is part of a race's society) determines a great many details of an individual's character and background. Among the Droyne, there are two basic types of families the dreskay, or extended family, and the tyafelm, or basic family. Families are themselves grouped into an oytrip, or community

Tyafelm: The basic family is a group of at least six Droyne, with one drawn from each caste. Basic families may be balanced, with equal numbers of each caste included, or they may be specialized, with a predominance of one specific caste in the group

Each tyafelm selects as its emblem one of the 36 coyn symbols; that symbol is used to refer to that specific tyafelm

Dreskay: The Droyne extended family is a grouping of several (between three and 18) tyafelmin. The association of many tyafelmin provides a larger gene pool and allows the offspring from the component tyafelmin to come together and form new tyafelmin.

Occasionally, dreskayin esivoy (schism). They split and become two or more dreskayin, dividing the acquired assets between them and then going their own ways. Such splits may be due to local economic pressures, famine or drought, or growth of the family to excessive size. Split families may or may not maintain connections and communications with each other.

As families grow in size, they may also send out iyuksimin (tendrils), small groups to explore, investigate, engage in trade,

A DROYNE TIMELINE

The following table shows several key events in the history of the Droyne.

Imperial	Event
−3,000,000	Nest-builders
−2,200,000	First intelligence.
−2,000,000	Agriculture. Hunters.
−1,900,000	Fishing. Seafaring
−1,800,000	First communities.
−1,750,000	Raiding between communities.
−1,600,000	Metal-working
−1,500,000	Ritualized conflict. Warrior caste.
−1,400,000	Leader caste emerges.
−1,000,000	Sport caste.
−900,000	Technician caste
−800,000	Elementary space travel.
−750,000	Interstellar voyages.
−400,000	Grandfather appears.
−400,000	Grandfather creates his children.
−400,000	Immortality.
−390,000	Rosette worlds built.
−380,000	Ringworld at Tireen built.
−350,000	Grand tour of children's worlds.
−300,000	Grandfather visits Terra.
−300,000	The grandchildren rebel.
−300,000	The Final War.

or just travel. Such small groups (usually balanced to include one member of each caste) give the young experience, provide an opportunity for profit or earnings, and sometimes relieve the family of the requirement to support the wanderers

The dreskay is a family, but it is also part school and part grouping of friends; it probably most closely represents the original social unit of precivilized Droyne on their lost homeworld.

Oytrip: The oytrip is a collection of dreskayin, usually geographic. The oytrip is communal in nature, sharing resources for the common good, each caste contributing its abilities and services to the overall community's needs.

Most oytripin are simple, pastoral communities devoted to agriculture, hunting and gathering, or similar functions. On more sophisticated Droyne worlds, or in integrated settings with mixed racial habitation, an oytrip may specialize in manufacturing, trade or even in a military role.

Within a single oytrip, social relations are quite smooth and well regulated. Natural leaders emerge to deal with each specific problem that comes up. The dreskayin within the oytrip are answerable to the Leader-of-Leaders. Drones within the oytrip constitute a separate advisory council, as well as being responsible for the casting of the young Droynes

The leaders have absolute and unquestioned authority, but would no more think of misusing that authority than they would consider destroying the entire oytrip for no reason.

Kroyloss: Droyne society also has a special social institution: the kroyloss, or fraternity. The kroyloss fills a special need for Droyne to set off into the world, but without losing the companionship of other Droyne.

When a young Droyne reaches maturity, it leaves its tyafelm to join or form another, usually within the same dreskay, almost always within the same oytrip Finding another family, however, is sometimes a difficult proposition. For many youths, existing agreements with other families provide an automatic opportunity to join another extended family. But many Droyne are driven by conflicting motivations The young are curious, inquiring, anxious to learn more about their world and their universe. At the same time, they feel incomplete when apart from their family, when separated from other Droyne. The answer, arrived at over the course of millennia, is the institution known as the fraternity. The kroyloss is a voluntary association of Droyne—a brotherhood, a fraternity. The purpose of the brotherhood is to provide companionship and mutual support during adulthood, but without the commitment required of a family.

After a period of wandering or mutual endeavor, a fraternity may break up (with its members leaving to join other families), or it may transform into a family as the individuals grow older. Thus, the fraternity is a sort of prefamily But fraternities have few of the responsibilities of families They can wander in search of adventure, or they may build a business or enterprise. A fraternity may be a kind of partnership which operates a starship in merchant trading, or may form a small military unit for hire. Although one particular caste may predominate in a fraternity, there is at least one of each caste represented. Fraternities have a minimum size of six (one of each caste), and may range in size as large as 20 or more. They may break up as the individuals mature and leave to join families, but more

often, they convert into families themselves, occasionally recruiting additional members of the necessary castes. Excess caste members linger as informal family members (auxiliaries), or break off to be on their own (forming broken fraternities) Droyne fraternities can be thought of as semifamilies The members are held less strongly than they are in families; the lack of children, the relative youth of the members themselves, and even tradition all affect perceptions of the fraternity. In some ways, the fraternity is a practice at being a family. But fraternities are also less bound by the standards of society. They can pursue interests that families might not. They can explore, prospect, innovate They allow wandering and adventuring and excitement. But fraternities also provide something that Droyne need: companionship Except for the Sport caste, Droyne need the companionship of others in their daily lives.

Ceremonies: Safety valves are, of course, necessary, and there are formal channels of suggestion and of appeal within the Droyne community. The other major safety valve for the Droyne is embedded in ritual and ceremony Ritual is a crucial element in the activity of the oytrip. Castes are assigned by ceremony. Individuals join and leave dreskayin by ceremony. Success and failure are predicted through ceremony.

Droyne culture has a strong mystical slant, and the emphasis on ceremonial ritual to regulate and reaffirm the whole direction of an oytrip is central to their mystic natures. Many respectable scientists scoff at Droyne mysticism, but others do not discount it as a real factor in the Droyne perception of the universe. Since it was proved that many aspects of Droyne ritual are based on their various psionic talents, the possibility that their ceremonies are more than empty motions has been widely admitted, if not embraced, by the academic community.

Leaders and drones participate in the ceremonial aspects of a community; each oytrip has a number of individuals whose only function is to regulate the ceremonial life of the people. Also of crucial importance to these rituals are the 36 coyns (Droyne: *koynisin*; singular *koynis*) which play a vital part in Droyne life

Coyns: Coyns are the best known and most important of all Droyne rituals. Researchers were long baffled by the apparently random draw of coyns, under the direction of a leader and several drones, which ended in the choice of a caste for an immature individual. Recent research, though, has proven that the coyns that are drawn are used as focuses for concentration. The leader and drones use psionics to open the young Droyne's mind and awaken the appropriate genetic programming latent within its make-up. It has even been suggested that the draw of the caste coyn is not so random as it may appear to outsiders, being selected by clairvoyance or telekinesis to match the potential discovered while probing the young candidate's mind.

Periodically, the coyns are also consulted in a ceremony which determines whether or not an individual can continue to serve the oytrip. The coyns are believed to reveal the future—of an individual, a task or voyage, a battle, and so forth—and are hence ritually consulted on a variety of matters. What has been frequently dismissed as "random fortune-telling" has proven to be surprisingly accurate in many instances. This has been explained as everything from coincidence to luck to some form of precognitive ability, but the truth

remains unknown even to the Droyne. Certainly they believe strongly in the validity of their rituals; the coyns dictate not only life, but death as well, for in most circumstances the failure of an individual to pass the favorable scrutiny of the coyns in a Ceremony of Continuation leads to one of the most unusual facets of Droyne culture—krinaytsyu.

Krinaytsyu: It is a central facet of Droyne society and behavior that the individual exists for the good of the community, rather than the more customary human view to the contrary For this reason, an individual deemed to be no longer worthwhile to the oytrip customarily undergoes krinaytsyu (voluntary death). The individual spends several hours in meditation, making use of the Droyne mastery of psionic self-awareness to turn off the body and mind. The individual dies painlessly and entirely by the force of its own will

Krinaytsyu is expected of all Droyne, but there have always been a small number who resist the self-destructive urge which accompanies the decision of society to withdraw its mantle from them. A few Droyne find some other goal or drive supplanting the basic need to serve the oytrip, and this new desire becomes the new driving force in their lives. They postpone or ignore the calling of krinaytsyu, possibly for years, to pursue their new goal. Such Droyne become known as krinaytsoyni (the deathless), a term of scorn among the Droyne still bound to the oytrip.

Krinaytsoyni live outside the bounds of Droyne society. They are loners, without the support of dreskay or oytrip Leaders, Sports and Drones are most often able to make the transition; lower castes have too strong a need for leadership and direction to comfortably leave their family or community. Such individuals may wander for some time in pursuit of their personal goals. They are characteristically melancholy, lonely, and obsessed by their needs, and ever prone in the face of failure or disappointment to go through with the krinaytsyu they passed up before.

Krinaytsyu is the fate of most of those whose useful service to the community has ended (through age, or through the prediction of the coyns). It is also chosen by those Droyne who are cut off from their oytripin or dreskayin. It is also customary for those who challenge a leader's judgment and are proven wrong to commit krinaytsyu. Leaders and other individuals in positions of great responsibility choose voluntary death when decisions turn out to be disastrous, thus clearing the way for new individuals to take their positions and solve the problems arising from the bad decision.

Krinaytsyu requires one to six hours of meditation and concentration. It cannot be undertaken when concentration is impossible, and can be halted at any time before the end of the period if the individual finds new reason to live.

Leaders among the Droyne are an exception to the general statement that Droyne are not possessive; they are possessive for themselves and their group, be it dreskay or oytrip. The bonds of caste are such that all the leaders work together for the common good of the oytrip But such cooperation rarely extends from one oytrip to another, for their leaders are unable to recognize the concept of themselves answering to another. The oytrip's needs come first; if a resource is in short supply, a leader will do what it can to secure that resource for its people This has led to far more wars than were strictly necessary,

for no ready channel for negotiation and compromise between oytripin existed. However, over the millennia, this need was filled by a subcaste of sports, speakers, who emerged as professional diplomats. Sports could present their oytrip's needs to their opposite numbers, who in turn could use the normal processes of appeal to convey those needs upward to the leadership.

Ritual War: Wars are still sometimes fought between oytripin. Warfare is the province of the Warrior caste, though in fact, the entire oytrip contributes to success in war as it does to everything else In war among the Droyne, warriors do the actual fighting, they are not clerks or medics (those jobs are filled by drones); they are not seabees or trench-diggers (workers do these jobs). A warrior is not expected to build, maintain, or repair weaponry—technicians perform that function. Sports act as spies, scouts, couriers, and the like. Leaders make the strategic plans and decisions. As in other aspects of life, the oytrip at war is a smooth, well-oiled machine in which every individual has a role, and crossovers between roles are rare.

Ritual war for the Droyne has specific goals—the capture of the necessary materials, food, weapons; control of strategic transportation or territory. But warriors really die in ritual war. The balance between loss of a cadre of warriors and accomplishment of some specific goal is a decision which the leader must make.

Real War: The difference between Droyne ritual warfare and real warfare is that all castes of Droyne can die in real war. When Droyne come in conflict with non-Droyne, the ordinary rules of ritual warfare no longer apply; the leader mobilizes the entire oytrip toward victory.

A DROYNE GLOSSARY

aydih: warrior
aydin: worker.
aydirsoth: drone.
aykrusk: leader.
ayssath: technician.
dreskay: Extended family of three to 18 tyafelmin.
Droynia: Casual term for the Droyne homeworld.
esivoy: Schism of dreskayin into two or more units.
Eskayloyt: Lost home. The original Droyne homeworld.
esorde: caste.
iskyar: Droyne caste assignment ceremony.
iyuksim: tendril. Exploratory party.
koynis: Medallion used to help assign castes. Coyn.
krinaytsyu: voluntary death. Expected of those no long valuable to the oytrip.
kroyloss: fraternity. Voluntary prefamily or semifamily.
oynprith: Droyne language.
oytrip: Geographic or professional community of extended families.
praytsirv sport.
tyafelm: Family of six Droyne (one from each caste).
Yaskoydray: Grandfather.

A TYPICAL DROYNE LIFE

The following description of the life that a typical Droyne leads provides some insight into their society and culture.

The Droyne egg, one of a clutch of six laid by the drone, hatches some 60 days later Young Droyne have a relatively long adolescence. The hatchlings develop rapidly; by one year, they can walk; by two years they have an elementary vocabulary; by four years, they can begin an elementary education.

Education: Between age four and age 12, the young Droyne undergoes an extensive education, but not in the sense that humans do. Formal schooling in the classroom sense is minimal. Instead, each Droyne is provided with a program of individualized education which builds on what has already been learned. New learning builds on success; when the Droyne fails some educational area, additional instruction directly addresses the problem area. Droyne with high Sense include psionic training in their education.

Socialization: Socialization ranks equal with education to the Droyne. During the formative years, young Droyne are constantly exposed to social situations and, in the process, learn what is expected of any individual in any situation This socialization is valuable in Droyne caste society: the young learn what is expected and allowed from each caste member. Individuals learn to work and play together, to realize the benefits each gives the other, and to understand the responsibilities each has to the whole.

Preparation For Adulthood: At age 10, the young Droyne begins a two-year preparation for the casting ceremony and the transition to adulthood. The drones, in their capacity as priests and administrators of the casting ceremony, conduct formal and informal examinations and evaluations. Deficiencies are addressed and remedied; the drones form well-informed opinions of the qualities and failings of their charges.

In addition, it is traditional for small groups of young Droyne to make short expeditions out of the community, collecting specimens, visiting archaeological sites, hunting, or just exploring. These juvenile expeditions give the youths practical experience in working together without adult guidance or control Reports and debriefings after such expeditions provide additional information to the drones in preparation for the casting ceremony

Determining Castes: At some time during a Droyne's 12th year, the drones of the community meet and make arrangements for a casting ceremony for the eligible youth of the community The rites of passage for Droyne youth are controlled by the casting of the coyns. Theoretically, the coyns are drawn randomly; in practice, the drones are a major influence on their outcome, and the presence of the entire community reinforces their outcome and its effects on the individual

Each drone participating in the ceremony has arrived at her own conclusion as to the best caste assignment for the individual, and the greatest caste needs of the community. All of the drones sit in a circle, focusing their psionic energies on the coyns as the young Droyne casts them. Each tries to influence them in their vibrating container as the Droyne reaches in; each tries to force a specific coyn highest and into the Droyne's hand The result is an election—the majority will, weighted by psionic power, determines the caste of the young. Even the Droyne being casted can use its own psionic powers to try to influence the coyns being selected.

Once the ceremony has produced a caste decision for an individual, the assembled community reinforces that decision immediately and continuously. The present members of the caste welcome their new comrade into their ranks immediately; the members of other castes find their perceptions of the youth change in view of the new caste

Fraternities (Kroyloss): Those Droyne who do participate in the formation of a fraternity are expected to do so within a year of casting. For some, the fraternity will be the association of choice for all their lives. For most, the fraternity is a phase that leads naturally into a family, either through conversion of the fraternity into a family, through the establishment of a new family, or (by invitation) through joining an already existing family.

Families (Dreskay and Tyafelm): The primary difference between a family and a fraternity is that the family is committed to reproduction Families have children, while fraternities do not (sometimes a fraternity turns into a family because of this definition rather than through any conscious decision on the members' parts).

The Droyne family is essential to procreation. The presence of the different castes helps to make the drone lay eggs and to allow them to be fertilized. Each of the caste members secretes a variety of pheromones which, in combination, makes the drone fertile.

But families, like fraternities, provide a structure to support the individuals and to which the individuals contribute.

Old Age: Old age is a luxury available primarily to sports and leaders When the other castes begin to age, they become less efficient, and soon see their duty to the community is to open new positions for the young; they accomplish it by voluntary suicide.

Zhodani

Human beings have evolved and developed on Terra over the past several million years It thus came as a surprise to Terrans when they travelled to the stars and found that humans were already out there, ruling vast empires among the stars. It took many centuries before it could be established that all of those humans had indeed originated on Terra, and had been transported to many different worlds by another starfaring race many thousands of years ago

Of the three major starfaring human races, the Zhodani are the most alien. Their culture early on developed the science of psionics and integrated it into their society The result was radical differences between what Terrans consider normal and what Zhodani consider normal.

The Zhodani, who are physiologically quite human, are culturally quite different. For all their (reasonably) familiar appearance, the Zhodani are not familiar in their patterns of thought, their behavior, or their culture.

ZHDANT—THE ZHODANI HOMEWORLD

The star system that holds Zhdant (as the Zhodani call their homeworld) lies far spinward of the Imperium in the center of their own empire.

Stellar Data: Zhdant orbits Pliebr, a solitary star. Pliebr is a K0 V star which is smaller and dimmer than Sol. Luminosity is 0 42. Effective temperature is 4900 degrees K. Radius is 0.908 of Sol Mass is 0.811 of Sol

World Orbital Data: Zhdant orbits Pliebr at 0.769 au (orbit number 2) with a period of 273.44 standard days. It rotates on its axis once every 27.02 standard hours.

World Physical Data: Zhdant is 9620 kilometers in diameter and has a thin atmosphere. Forty percent of the world is covered by water, primarily in two seas which divide the world into a large and a small continent. Polar icecaps are minimal, amounting to about two percent of the world's surface

Zhdant has an axial tilt of 18 degrees and an orbital eccentricity of 0.05. Neither creates any appreciable extremes of climate or temperature. The average temperature for Zhdant is 15.9 degrees C.

World Social Data: Zhdant has a population of 83 million, of whom more than 90 percent are racial Zhodani. Significant non-Zhodani population is primarily Addaxur.

Zhdant is governed by a charismatic oligarchy, the supreme council of the Zhodani Consulate, elected from Zhodani nobility throughout the Consulate The world has a law level banning guns in public. The tech level of Zhdant is F (nearly all other worlds do not exceed E).

Zhdant has a type A starport with excellent facilities and a naval base.

Viepchakl: Zhdant has one satellite, a large tidally locked moon with a very thin atmosphere and no water. Viepchakl orbits Zhdant with a period of 40.7 local days at a distance of about 379,500 kilometers. There are no other natural satellites.

Viepchakl is a large and dominating satellite. Natural coloration makes the moon a reddish pink with dark shadows across its face. Windblown dust storms rage across its face from time to time, a phenomenon which was often perceived as portending future events

ZHODANI PHYSIOLOGY

Though human in all respects, the Zhodani differ slightly in appearance from humans of the more commonly encountered Solomani or Vilani ancestry. They tend to be tall and lithe, averaging close to two meters in height, and massing roughly 90 kilograms Complexions are predominantly swarthy and hair color is usually black or brown. Blonde hair is uncommon; a mutation which occurred on Zhdant in the last 10,000 years has made prematurely grey hair twice as common as red hair

Zhodani have 28 teeth (as opposed to the Solomani and Vilani 32), and the teeth tend to be marginally larger.

All of the physiological characteristics of Zhodani are the result of two factors: the original gene pool of the humans who first inhabited Zhdant, and minor mutations or developments which have taken place during the 300,000 years that they have lived on their planet. Their height and physical build are both consequences of Zhdant's 0.85G surface gravity. Basic complexion has been shaped by environmental factors which selected specific traits during evolution while on Zhdant. The ability to digest certain proteins which are native to Zhdant but undigestible to off-world humans is likewise an evolutionary adaptation. There is little doubt that conditions on Zhdant were responsible for much of the physical evolution which took place on precivilized Zhodane.

ZHODANI HISTORY

The history of the Zhodani people begins with their arrival on Zhdant in approximately – 302,000. Reconstructed details of Zhodani history are the work of Zhodani archeologists and represent the best hypothesis available for events lost in the mists of prehistory

In – 302,000, a fleet of Droyne starships arrived in the Zhdant system and within the space of a year or two established two settlements or bases. One sprawled along the western coast of Qiknavra (the smaller of Zhdant's two continents), creating large networks of rail-guided grav transports, skyscrapers in the western mountain ranges, and undersea dome cities offshore The other settlement occupied a wind-swept desert plain

on the eastern limb of Zhdant's tidally locked moon, Viepchakl.

Over the next century, the two bases grew into cities. Each city created a thriving economy, and they traded goods between them Zhdant City bred humans until the local human population approached 500,000. The uses they were put to remain unclear, although evidence indicates that they were a sort of trained servant or pet. Known Ancient robots or automatons could have been better servants, but the Ancients are not known for their understandable or reasonable behavior.

Viepchakl City underwent a similar development. The foundations of that city burrowed kilometers into the crust of Zhdant's moon, its towers reached heights of 10 kilometers Familiar activities on Viepchakl included the construction of many identical buildings, probably for housing, and a vast tunnel network to carry utility service to the buildings. There was also less understandable activity. Arrow-straight roads tunnelled through intervening rock faces without flinching, but stopped and were abandoned when confronted with crevasses or chasms more than a few meters deep Desert sands were sorted into stockpiles based on color or granular size.

Viepchakl City, on the other hand, shows no evidence of ever having bred or kept humans.

Ancient sites are always different, and the two cities reflected that difference in every aspect They did have one common feature, however: in both cities, road intersections were marked with a stone stanchion topped with a polished crystal octahedron. Zhodani archeologists differ in their assessment of the stanchions' meaning. Some theorize that the columns are decoration, while others assign a practical use: perhaps traffic direction, signposts, or even centralized data processing.

The Final War: Elsewhere in known space, evidence exists that a devastating final war of destruction against the Ancients began in about – 300,000 and continued for about 2000 years. The war was late in touching Zhdant Radioactive dating methods place the first nuclear detonation on Zhdant at – 299,700. Unfortunately, that first detonation was swiftly followed by a rain of nearly 500 megatons within the space of a few days. Zhdant City and Viepchakl City were both destroyed: their structures were flattened, their landscaping crushed and burned, their mechanisms destroyed. The orbiting asteroid station was knocked from orbit, to crash into the ocean and bury itself in the sea floor.

Zhdant was devastated. Dust thrown into the atmosphere by the megatons of nuclear detonations gave rise to the well-known phenomenon of nuclear winter, which in turn triggered a Zhdant-wide ice age.

Viepchakl was also devastated; its city was destroyed. Its buildings were cut off even with the ground and allowed to shatter when they fell The center of the city became one big crater kilometers across—although the bombs used left no radiation

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A ZHODANI TIMELINE

This table shows key events in the history of the Zhodani

Imperial	Event
– 302,000	Ancients arrive at Zhdant with humans.
– 300,000	Extensive development of Qiknavra
– 300,000	Final War begins. First Raids.
– 300,000	Zhdant devastated.
– 300,000	Nuclear Winter. Ice Age begins.
– 280,000	Ice Age ends.
– 275,000	Nomadic hunter-gatherers reach Dleqiats.
– 260,000	Huts. Fishing.
– 250,000	*Homo Zhdatl* emerges on northern Dleqiats.
– 220,000	*Homo Vlastebr* emerges on Dleqiats
– 200,000	Races clash Mixing creates *Homo Zhdotlas*
– 100,000	Second Ice Age begins
– 80,000	Second Ice Age ends.
– 40,000	Animal herding. Breeding
– 30,000	Special domesticated breeds
– 24,000	Agriculture Grains
– 18,000	Moon-worship. Brick buildings Boats.
– 18,000	Elementary mathematics
– 17,000	Moon-worship Empire at its peak.
– 15,000	Moon-worship Empire collapses.
– 15,000	Beginning of First Dark Age
– 13,000	Rise of noble classes. Feudalism.
– 10,000	Encouragement of science and exploration.
– 9000	Printing press
– 8590	Discovery of Qiknavra.
– 8550	Ocean trade. Novel trade goods.

Imperial	Event
– 8450	Contact with Qiknavrats.
– 8400	Elementary psionic techniques.
– 8203	Industrial revolution.
– 8042	First orbital flights.
– 8029	First expedition to Viepchakl.
– 8018	Viepchakl base. Discovery of Viepchaklts.
– 8009	First Qiknavrats-Viepchaklts meetings
– 8005	Extinction of Qiknavrats and Viepchaklts.
– 8003	Plague spreads. Human die-back.
– 8000	Second Dark Age.
– 7000	Recovery Ascendance of psionics.
– 6400	Reacquisition of space travel.
– 6300	First planetary missions
– 6200	Planetary colonies.
– 6000	Interstellar expeditions (sublight).
– 5415	Jump drive discovered.
– 5120	Contact with Addaxurs.
– 5000	Outward Expansion.
– 3000	Contact with Vargr.
– 2000	Contact with First Imperium traders.
– 300	Conflict with Imperials in the Spinward Marches.
– 50	Contact with Imperium in Spinward Marches.
589	1st Frontier War.
615	2nd Frontier War.
620	Uneasy peace with Imperium.
950	3rd Frontier War.
1082	4th Frontier War.
1107	5th Frontier War.

contamination which archeologists have been able to measure.

The attacking fleets left within a few weeks. There is no evidence that there were any further attacks in the system The Final War brushed the Zhdant system for slightly less than 21 standard days

Yet even in the face of this destruction, there were survivors. The humans in the city scattered, taking to the wild. Gene analysis performed in modern times indicates that the total number of human refugees who survived was on the order of 50,000. Some Ancients also survived, likewise fleeing the city for the wilds of the forest and the jungle.

Primitive Man on Zhdant: In the ice age which followed the Final War, the primitive humans on Zhdant scattered to the far corners of their world By – 250,000, a primitive human which the Zhodani call Zhdatl (*Homo Zhdatl*; Learning Man) had established himself in the northern mid-latitudes of Dleqiats Shortly thereafter, a rival race of primitive man called Vlastebr (*Homo Vlastebr*, Superior Man) emerged in the southern mid-latitudes of the same continent

In about – 200,000, the two distinct human races clashed as each expanded under population pressure into the other's domain. The mixing of the races created (over the next 40,000 years) Zhdotlas (*Homo Zhdotlas*, Supreme Man). Zhdotlas spent a long time in a period of very slow evolution. The prevalent theory is that nearly 120,000 years were spent evolving basic abilities to communicate vocally, establishing social customs which favored survival and later ascendance

In any event, Zhdotlas weathered another ice age and survived while making minor improvements in the chipped stone tools he used. In – 40,000, the first major breakthrough came with the herding of animals. Deliberate breeding of herd animals soon followed. By – 30,000, Zhdotlas had created several domestic breeds: *kredl* (an analog of Terran cattle), *abrstia* (an analog of Terran chickens, but providing a fibrous feather that can be woven into cloth), and *noql* (an amphibious crawler raised in dammed streams) Fast on the heels of animal herding came agriculture, the raising of grains, and even the planting of orchards. By – 24,000, Zhdotlas was well-established as a farmer and had created a growing culture.

Because native animals and plants on Zhdant come from an alien evolutionary line, many (if not most) of them are inedible or undigestible by humans. Zhdant was a hospitable world in one sense, however, in that some of its native life was digestible by humans. Trial and error over the millennia showed which plants and which animals were edible and which were not. In addition, the farming projects of Zhdant City had produced large numbers of crops which naturally propagated after the Final War. Some of these plants and animals displaced local forms and became widespread. The abrstia is known from fossil records and genetic studies to be a native Zhdant life form, the noql is not native to Zhdant, and may be either a naturally occurring life form or one specially tailored by the Ancients

Primitive Chirpers on Zhdant: While humans developed in Dleqiats, the few surviving Ancients in Qiknavra remained on that continent. The devastation of the war was enough to drive them back to the stone age. Without their technological marvels, they were even more helpless than the humans, but some of them did manage to survive.

The Ancients were Droyne—a small race of winged reptiles. Their society included a series of six castes, with membership deciding when an individual reached maturity. The Ancients who fled the devastation of the Final War quickly lost the traditions that established and maintained castes, and became Chirpers (uncasted Droyne). The phenomenon has been observed on many worlds where Droyne survived the destruction of the Final War

Within 50,000 years, the Chirpers had regained agriculture, and within 100,000 years they had created two large Empires: one in the south in the mountain ranges, the other in the lowlands of the north.

Both empires were static— they made little progress beyond providing food and shelter. The Chirpers seemed unable to regain their former glory.

They did, however, retain their natural psionic abilities. Psionic talents provided limited transportation through teleportation and communications over distance through telepathy Their empires were at least partially maintained through their psionic talents.

The Viepchakliashtie Empire: The first major empire on Zhdant began with the agricultural communities on the western coastal plains of Dleqiats. The lowlands were fertile, rich areas well-suited to farming. Over the course of several centuries, population grew and the land under cultivation expanded

As farmers, they had a natural interest in the seasons. Along the coast, they made the connection between the ocean tides and the phases of Viepchakl overhead. A priesthood capable of predicting seasons and tides grew up, and over the course of the centuries established a religion of Viepchakl worship. Viepchakl's power grew, eventually replacing Pliebr as the most powerful of gods.

By – 18,000, the Viepchakliashtie, or Moon-Worshipping Empire, had gained sovereignty over coastal strips for 500 kilometers north and south, and influenced the coasts for
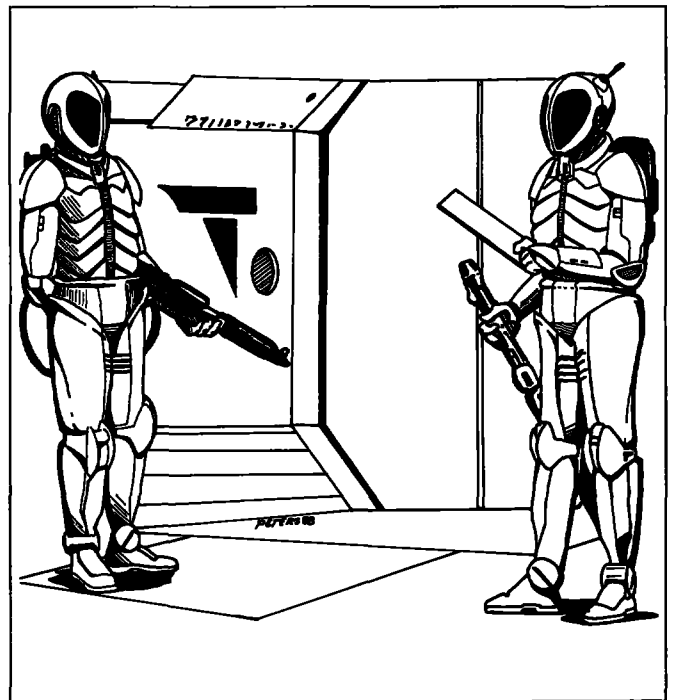
another 1000 kilometers beyond.

Coast-hugging boats were developed. Brick buildings were invented. Mathematics, originally for computing tides, was raised and refined as a science. The art of war, necessary to maintain the strength of the Empire, was also developed. A capital city, Dlolprikl, arose astride a major river flowing from the interior of the continent, and reached a population of more than one million.

The Viepchakliastie Empire reached its height in about 17,000 when it established total control over the archipelago of some 200 islands within 2000 kilometers of Dlolprikl. Soon after, rivalry between factions of the priesthood split the empire into coastal and offshore states, and they went into decline

The Discovery of Qiknavra: The small successor states to the Viepchakliastie Empire at first maintained their own individual priesthoods, each with a slightly different doctrine. Some states found that a military force was more important to defend territory, to wage war, to maintain a deterrent strength, and to keep the common folk in line. About 13,000, feudalism took hold in force and swept the many small nations of northwestern Dleqiats. This rise of the noble class created a pattern of wars and entangling alliances that characterized the next 3000 years.

Toward the end of that 3000 years, the value of science and a systematic search for answers had its effects on Zhodani culture. In about −9000, the beginnings of true science were being seen in the idle pursuits of the noble classes

The key period can be pinpointed to about a hundred years: −8590 to −8490. In −8590, the printing press was invented (movable type followed in −8530). In −8550, an ocean expedition discovered the continent of Qiknavra. In −8540, explorers in Qiknavra discovered the civilization that ruled parts of that continent: the Chirpers. The Zhodani named them Qiknavratspeople of Qiknavra

Different explorers discovered different groups of Qiknavrats,

different trade goods, different minerals. But all found that the Qiknavrats had psionic powers. Within 10 years, it was a proven fact that humans could learn to use psionics as well Within 20 years, organized human groups were teaching psionics to others. Some Qiknavrats were taken to Dleqiats to serve as teachers of this new science of psionics

Qiknavra was opened up for settlement and exploitation, and large numbers of humans migrated to Qiknavra in search of easy wealth

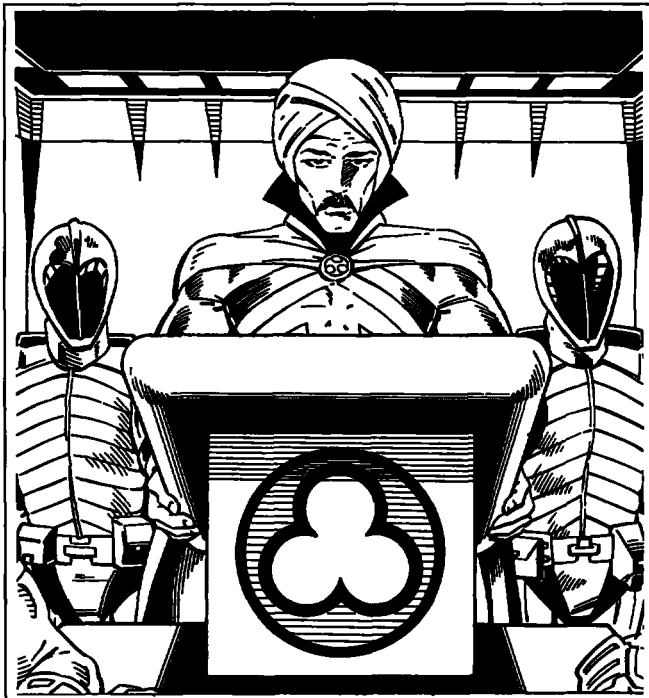Psionics was an important factor in the next 200 years Those who found psionics easiest to learn seemed naturally predisposed to it. We now know that those individuals had naturally high psionic strength indicators. Other individuals, equally intelligent, but without a natural ability in psionics, tried to achieve the same results mechanically or technologically. Technological improvements in wagons, ships, signal devices, and printing were all tried in an effort to equal the effects of psionics Since only a small portion of the population could use psionics, the efforts met with some success Within 200 years, Zhdant was undergoing an Industrial Revolution.

Eastern Dleqiats: The Industrial Revolution produced railroads which opened up eastern Dleqiats to a wave of settlement similar to that which had swept Qiknavra some 200 years before. The expansion led to vast farming and ranching concerns on the plains of Dleqiats, expanded shipping along the coasts, and mining in the mountain ranges

Through much of this expansion, the noble classes of the many small states in western Dleqiats maintained their power, claiming the new territories in their own names, and maintaining tax and legal bases of power. When those taxes became too heavy, both Qiknavra and eastern Dleqiats revolted, forming an alliance against the old countries The strife led to war after war in the period −8200 to −8000, with the resultant rapid advances in technology. Aircraft, jets, rockets, plastics, food preservation techniques, radio, submersibles; all the advances associated with warfare were made, but by −8000 the warring countries finally agreed to disagree: Eastern Dleqiats and Qiknavra were democracies (although Qiknavra included Qiknavrats in their government, while eastern Dleqiats did not), and western Dleqiats retained its nobility in a slightly weakened form.

In the period of uneasy peace that began in −8000, all three nations turned their attention to space Limited teleportation to orbit had been commonplace for nearly 100 years, but the technique could never be a practical one, and development of technological methods seemed to be the answer.

The Exploration of Viepchakl: In −7980, the first orbital flights were made by the air force of eastern Dleqiats, followed quickly by flights from Qiknavra. By −7959 the first expedition to Viepchakl was mounted by eastern Dleqiats, and a base was permanently established on the moon by −7950.

In some ways, the exploration of Viepchakl was a replay of the exploration of Qiknavra. There were Chirpers already there.

These Chirpers (called Viepchaklts—people of Viepchakl) were the remnants of the Droyne who had inhabited Viepchakl City and somehow survived in the underground tunnels. Some had been in cold sleep for thousands of years, while others simply wandered the tunnels, tending hydroponics troughs, or eating from automated food producers.

Initially, it was human astronauts from eastern Dleqiats that contacted the Viepchaklts, but within a year, Qiknavra had launched its own expedition, one which included Chirpers.

The Chirpers from each world met in the depths of the ruined Viepchakl City, and within a few days the Qiknavra Chirpers fell ill and died. Reacting quickly, the humans determined that the cause was a bacteriological weapon lying dormant since the Final War. An agent specific to Qiknavrats was carried by the Viepchaklts; and an agent specific to the Viepchaklts was carried by the Qiknavrats. When they met, the biological agents went to work. Although an immediate quarantine was ordered, samples from Viepchaklts had already been sent to Zhdant (months before) and it was only a matter of time before the plague spread to Qiknavrats Apparently, biological agents specific to each type of Droyne were drop-launched during the Final War, but each went to the wrong world; they then waited as a bacteriological time bomb waiting for the two branches of the same race to make contact.

The plague also affected humans On Viepchakl, most humans died within two weeks. Within a year, the plague's first effects were being felt on humans on Zhdant Within two years, the human population was reduced by a third. Within 10 years, population had been reduced by two-thirds The human die-back ruined many of the gains of the past centuries. Vast areas of the plains of eastern Dleqiats were abandoned, as were the Qiknavrats settlements in Qiknavra. Cities were abandoned. Attention turned to survival. By – 7940, Zhdant had entered a second Dark Age.

Embracing Psionics: Through the 1000 years of the Second Dark Age, the population of Zhdant slowly recovered Strides in medicine reduced the plague (over hundreds of years) to just another serious illness. Some knowledge was lost, but enough was retained to allow advances in science once they were needed.

The lessons of history were not ignored either. The nobles of western Dleqiats instituted limited democratic principles while retaining most power for themselves. By – 6800, the nobles of western Dleqiats were not only firmly in charge of their own countries, but also establishing colonies and expansion territories in eastern Dleqiats and in Qiknavra.

From its earliest time, the noble classes had held the right to raise a limited number of lower-ranked individuals to the next higher noble rank. For example, a viestlas (highborn; Social Standing 13) could elevate a pranatl (aspirant; Social Standing 11) to jdistebr (wellborn; Social Standing 12) It was also possible to raise nonnobles to noble rank. Abuses of this power had created an overabundance of nobles as well as dissention among the commoners. Several revolutions had to be put down with great force, but the basic problem remained. At the same time, psionically trained nobles had gained the upper hand over technologically oriented nobles and moved to maintain their superiority.

In – 6731, the first Psionic Games were held, in Dlolprikl, at the start of Atkazdievl. The first games were poorly organized and poorly attended, but they did give participants an opportunity to win a place in the nobility. Successor games were held every three local years (2.25 standard years), and by – 6650 they were an established institution.

The psionic nobles' plan resolved many problems. It defused the problem of favoritism in granting new nobilities (now Psionic Games winners entered the ranks of the nobility along with hereditary nobles, and those elevated for service) It also increased the ranks of the psionic nobles, and guaranteed that they would have the majority in any struggle against technologically oriented nobles Finally, it established an event for the public that entertained them, and defused any latent jealousy or fear; it made psionics part of public life.

At the same time, the nonpsionic nobles could not be ignored. Technology provided many of the same things that psionics could, and technology was accessible to the entire population An emphasis on technology could provide jobs, an expanding economy, and a better life for everyone; it also would help assure that the psionic nobles would stay in power. Technology marched forward hand-in-hand with psionics.

Eastern Dleqiats was again settled. A transcontinental railroad was laid, in many places on the same roadbed which had crossed the continent more than 1000 years before. Qiknavra was resettled. Expeditions were mounted to find surviving Chirpers, but they were definitely extinct.

By – 6400, the Zhodani had reacquired space travel, and with suitable precautions ventured to Viepchakl, where the Chirpers were also definitely extinct. Planetary missions followed, with several colonies in the Pliebr system (the asteroid belt, a few outer planets) by – 6200

The lure of the stars was as great as the lure of the planets. Between – 6200 and – 5415 some 50 interstellar missions were mounted, colonies were established in six star systems within four parsecs, and trade in research, information, and very valuable or novel goods was carried on. Sublight ships travelled established routes, calling at each colony and returning to Zhodane over a 50-year period. Exploratory missions went farther out, often on 20- or 30-year expeditions. In – 5823, a union of all Zhodani was established as the Zhodani Consulate, formalizing a *de facto* union which had existed for some time. During all of their explorations, no intelligent races were encountered, and the universe seemed to be empty except for the Zhodani

In – 5415, a breakthrough changed everything. A development company working on fusion power sources in the asteroid belt had chanced on the principles of jump drive and produced a working protoype. Within 10 years, Zhdant was operating a fleet of jump ships and exploring space within 50 parsecs.

Expansion into Space: With jump drive, the Zhodani could

A SHORT ZHODANI GLOSSARY

The following terms are in *Zhdant*

Dleqiats: Major continent on Zhodane.

Dleqiatsz: Native of Dleqiats.

Qiknavra: Minor continent on Zhodane.

Qiknavrats: Native of Qiknavra

Viepchakl: Satellite of Zhodane.

Viepchaklts: Native of Viepchaklts

Vlastebr: Superior person.

Zhdant: The language of the Zhodani.

Zhdatl: Rising person

Zhdotlas: Ruling person.

see a truer picture of the universe. Just beyond their previous limits were systems harboring intelligent life, although still at a rather low technological level. On other worlds, exotic native life provided improved drugs, flavors, and fibers. Minerals from new worlds helped shape better structures, better vehicles, and better communications

In –5120, Zhodani ships encountered the Addaxur, an intelligent race of six-legged carnivores from a high gravity world about 40 parsecs from Zhodane. The Addaxur had established their own interstellar empire of 37 systems with communications maintained by sublight ships. The Zhodani observed the fringes of the Addaxur Empire for about 10 years before making open contact Carefully planned overtures established friendly relations and reserved 10 of the Addaxur's 37 worlds for the Addaxur without restricting Zhodani expansion.

Zhodani expansion was the result of a natural curiosity and of economic forces within Zhodani society; expansion and production made for a better standard of living Worlds were explored, colonies established, industries created. Expeditions were mounted to explore the core of the galaxy, to reach other spiral arms, and even to explore the edges of the galaxy. Zhodani traders travelled the frontiers of the Consulate. They encountered Vargr in Gvurrdon sector in – 2800 They traded with the Vilani in Provence and Corridor sectors in around – 2000. They traded with Aslan in the Trojan Reach around – 460

The Frontier Wars: The Consulate first came into solid contact with the expanding Third Imperium in the sixth century of Imperial expansion. The First Frontier War followed almost immediately (589-604 Imperial). Lasting for 15 years, the war involved all eight of the coreward subsectors of the Spinward Marches The Zhodani rallied to their side certain Vargr of the neighboring Gvurrdon Sector, forming the First Outworld Coalition. The initial attacks caught the Imperium largely unprepared, quickly expelling Imperial settlements from the Chiqrdians Sector The continued fighting was characterized by raids against high-population worlds in the Marches by Outworld forces. A massive defeat of such an incursion at the battle of Zivije/Rhylanor crippled the Zhodani war effort, though at tremendous cost to the fleet of Grand Admiral Olav hault-Plankwell, the Imperial commander. The negotiated armistice left the Zhodani in control of the Cronor subsector of the Marches, but established extensive Imperial claims elsewhere in the sector, and was acclaimed an Imperial victory by the Imperium.

Admiral hault-Plankwell followed his victory by launching an expedition against the Imperial Core, where he assassinated the Empress Jacqueline and proclaimed himself Emperor. This ignited a series of Civil Wars within the Imperium; in the midst of this turmoil, the Zhodani formed the Second Outworld Coalition and renewed their attack in the Second Frontier War (615-620 Imperial). After a long holding action, the Imperium assembled large forces and again forced a stalemate situation The Imperial Admiral on the spot, Arbellatra Alkhalikoi, (later Empress Arbellatra, whose actions ended the Civil Wars), ceded more territory but won a shaky peace that lasted nearly 350 years

The Third Frontier War (979-986) was characterized more by commerce raiding than by great planetary sieges, and led

to severe public sentiment against the high command and the Imperial government An armistice, heavily favoring the Zhodani, was agreed to; the political repercussions forced the abdication of the Emperor Styryx

One hundred years later, the Fourth Frontier War (1082-1084) broke out. Sometimes called the False War, this conflict involved a series of naval battles triggered by a border incident. An armistice was concluded before either side actually got word from the capital with instructions, plans, or reinforcements. The Imperium lost some ground, but the war was, for the most part, a stalemate

The Fifth Frontier War erupted in 1107, when Zhodani forces launched a sneak attack on Regina/Regina in the Spinward Marches. Like the previous wars, initial Outworld Coalition success faded as Imperial resistance stiffened, and, by the end of the war less than a year ago (1111), the situation bogged down into a stalemate with a negotiated settlement

The Zhodani have been at odds with the Imperium since initial contact was established, largely because of the radical dissimilarities in culture between these two branches of humanity. Zhodani morality is repelled by the deviousness of nonpsionic human minds, while Imperial distrust of the Zhodani is bound up in the general antipsionic prejudice that has long characterized the Imperium (The prejudice against psionics feeds opposition to the Zhodani, and vice-versa.) Thus, recent Zhodani history has been dominated by their enmity towards the Imperium, with personal distaste reinforced by a feeling that the Imperium seeks to hamper Zhodane's slow, conservative expansion by preempting the best planets and otherwise limiting growth.

The Core Expeditions: Most cultures around the Imperium (and including the Imperium) have had their hands full exploring and exploiting the worlds and systems in space within or near their own territories The Zhodani, however, are driven by a variety of circumstances and stimuli which have made the galactic core (and the route to the core) of extreme interest. Two basic data produce this effect: Ancient artifacts, and certain rare but recurring psionic effects

The Ancient artifacts were the initial key to curiosity about the galactic core. In the ruins of Zhdant City, explorers found a small device which could project a three-dimensional starmap, a starmap which extended along a corridor 30 parsecs in diameter and more than 8000 parsecs long aimed at the galactic core Initial investigation of the artifact's map showed it to be accurate, even to showing stellar spectra, gas giants, and worlds. The artifact also proved to be a powerful psionic focus; most psionically talented individuals found the device to produce an undefined and unexplained sense of hilarity (possibly caused by differences between human and Ancient brain thought path connections). A very few (fewer than one in 10,000) found that the device produced clear, readable images, usually of ships and star patterns somewhere along the route of the map.

For more than 200 years, the images remained unexplained. In – 4074, the Zhodani Heavy Cruiser *Lienjqiets (Swift Wind)* misjumped and was presumed lost; 40 years later, it returned to Consulate space. It had spent 38 years on a tech level 3 world fabricating an important component of its jump drive. The story of its exploits were filed as routine reports and would have

been ignored but for a few interesting facts. First, someone had used the Ancient projector decades before: His vision had been recorded Second, the clear image from the projector proved to be fact during the voyage.

The Ancient device was transformed from a museum piece to a state secret overnight, to be used and examined only under very strictly controlled circumstances All of its visions or premonitions were carefully noted and recorded.

The Zhodani supreme council was faced with a dilemma. The Ancient map device clearly had the ability to foretell the future, although, apparently, only under limited circumstances. It had also been proven a reliable map of the star systems coreward (at least by expeditions which had reached the first 100 parsecs of the route) They could ignore the device, hiding it away in the archives and never investigating its potential. Or, they could analyze its map and use its potential to explore coreward

They chose to use the projector Seven major core expeditions were mounted to travel and explore the route shown in the projector, hundreds of minor expeditions checking out systems off the main route, or even beyond the map's data, were also mounted.

The Third Expedition met armed resistance: a xenophobic culture encompassing seven systems (but without jump drive) reacted violently when the Zhodani arrived. The Zhodani were prepared; the projector's images had included space battles. The xenophobes' resistance was crushed and their worlds bypassed.

The most recent major expedition was 350 years ago (in 750). The supreme council has been planning a new expedition.

ZHODANI PSYCHOLOGY

The fact that psionics makes up a major part of everyday life within the Consulate has had a profound effect upon the mental and emotional make-up of its people. Their way of looking at life is quite at variance with that found in nonpsionic human cultures. It has been said that psionics has made the Zhodani Consulate the most powerful, effective, and absolute tyranny in human history—and also the happiest and most stable. Both statements are quite true

Many motivations and circumstances affect the psychology of the Zhodani, but three are of special interest when trying to understand the Zhodani ambition, respect, and conformity

Ambition: The advanced educational tools available to the Zhodani make it possible for nearly all members of their society to discover their own potential and to see the paths they can take toward its realization. Ambition exists in varying degrees; some individuals might pursue physical conditioning, while others can form long-range plans for the advancement of their careers. The individual ambition differs for each person, but ambition is more commonly accepted as part of Zhodani society.

Ambition is accepted in all areas of society except one: major social advancement. Advancement in Social Standing depends on psionic strength, and without it, advancement to Intendant or Noble status is impossible Consequently, ambition for Social Standing is transferred by parents to their children Because psionic strength is not inherited (it seems to be random within the population), it is possible for two

parents with low psionic strength to have a child with high psionic strength. Much of the social ambition of Proles is sublimated into ambition for their children—hopes that their children will have a high enough Psionic Strength to warrant training and elevation into the Intendant class.

Intendants' ambition centers around elevation to the Noble class, through participation in the Psionic Games (about one Intendant in seven is elevated to the Nobility through this method), or as a reward for faithful service in later life (about two Intendants in seven are elevated at the end of their careers)

Nobles are already at the high end of the social ladder, but ambition is a cultural norm and is common in the Nobility as well as in the other social classes. Some channel their ambition into seeking further increases in Social Standing; others seek positions in which they can wield their power. as consuls, government officials, or military officers. Some Nobles, however, are discouraged. Some hereditary Nobles have low psionic strengths and (even though they have psionic training) low abilities. Others see the actual workings of Zhodani government and become disillusioned with the compromises that are constantly made, or the discrepancy between theory and reality For these individuals, ambition is not enough. The weary disillusionment that pervades their outlook sabotages their effectiveness as members of the government, and they turn their attention to other areas: exploration, research, teaching, a search for purpose in life

Respect: Respect for social superiors is a natural part of Zhodani society. It is ingrained into everyone in the schools and the community. Required respect can remain for a while, but for true respect to exist, the Nobles must earn it. They earn it in a roundabout way, their Intendants make sure that they receive credit for a great many worthy activities.

The hard-working Intendant class does almost everything in the name of the Nobility. Nobles receive credit for a great many

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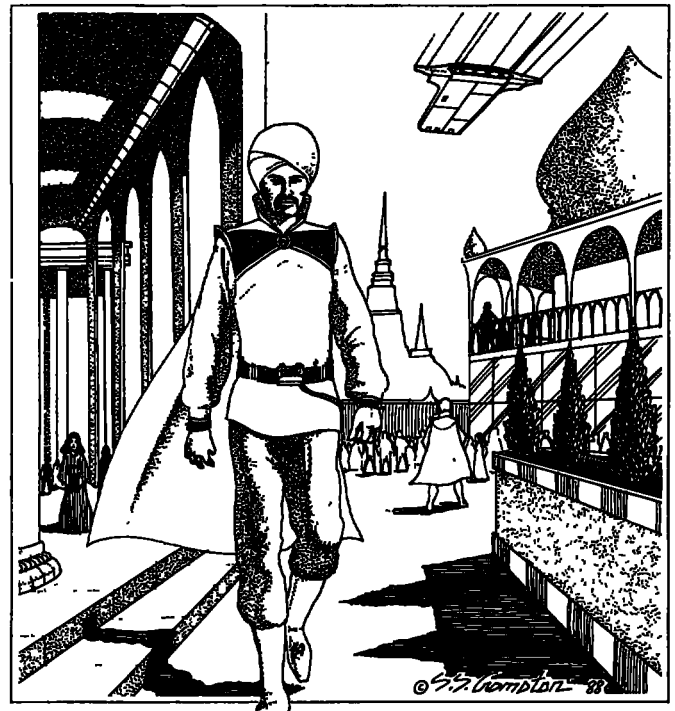
efforts and deeds, some of which they are personally responsible for, but many more of which are handled by Intendants with little or no supervision. It is in the best interest of an Intendant to make his or her superior Noble look good, because that Noble is responsible for promotions and advancement. But the credit to the Nobility helps ensure that the Nobility is perceived as hard-working and worthy of their positions.

Conformity: Zhodani are conformists. The relatively narrow band of activities which all members of society understand and approve of is known to everyone, and everyone strives to act within that range. The range of acceptable dress (while wide) is rarely exceeded. Interests rarely involve strange or unsuitable subjects. Too much deviation from the norm is considered an aberration and subject to reeducation.

ZHODANI SOCIETY

Zhodani society instills its values in its members. One of the foremost values (the one that humans from the Imperium notice most quickly) is the basic honesty that pervades everything. Trust is an assumption. Locks are rare, and more likely to be safety devices protecting children than antitheft devices. Walls protect from the elements rather than from intruders. Laws deal more with appropriate action than with crimes.

Zhodani society also helps direct individuals to the most productive and satisfying pursuit available. Psionically based techniques help each person understand his or her needs and motivations and place that person where ability and aptitude can contribute most to personal well-being and to the community as a whole.

The Zhodani Legal System: The character of crime in the Consulate is markedly different from that of other human societies. Three broad categories of crime are recognized among the Zhodani: inadvertent, incited, and insane offenses. The concept of premeditated crime for personal gain fits under the insane heading.

Inadvertent crime is an unintentional violation or infraction of the law. It results from inattention or distraction and generally calls for a small monetary penalty. Violations of traffic or parking regulations, failure to return borrowed materials to a lender, and forgetting an appointment with a Noble are all inadvertent violations which people try to avoid, but are not very serious if they occur.

Incited crime is an infraction of a law brought about by another. When an individual is led to believe that an action is acceptable, the violation is reduced in severity in the eyes of the law. The solution is reeducational retraining of the individual to recognize potentially criminal situations and to avoid or properly handle them. Often, the incited individual is seen as weak-willed, someone who is vulnerable to being incited to crime because of a character flaw or subconscious fault. Reeducation uses psychological and psionic techniques to remedy the flaw.

Insane crime is a general heading for most major crimes against property or individuals, including theft, robbery, or murder. The general concept is that any individual who commits such a crime must be insane.

Justice: Technically, all Nobles are empowered to sit in judgment of any accused criminal. In practice, Nobles who do not know telepathy will usually refuse to judge a case, deferring judgment to a telepath.

Procedures are informal; the Noble listens to the basic case and considers the facts presented by both sides Additional facts are gathered by reading the minds of those individuals involved. A judgment is made and the decision recorded (usually being sent telepathically to a local record center)

Most sentences for insane crimes call for reeducation until the insanity has been cured. Occasionally, an execution can be ordered if the individual appears incurable. Prison sentences simply for confinement are not used. Incited crimes are dealt with by quick reeducation to avoid being incited again; inadvertent crimes are usually dealt with by fines or forfeitures.

Crimes by Nobles and Intendants are a special case, since they must be judged by a Noble higher in rank than any of the accused. Inadvertent crimes are handled with a warning or an admonition to the perpetrator; Nobles are believed under the law to be incapable of incited crimes Insane crimes reflect a breakdown in a Noble's personality (commonly portrayed to the Proles as a result of overwork and the demands of responsibility), minor violations are let off with a warning, while major crimes call for reeducation. For the good of all concerned, a convicted Noble is usually transferred to another location or world rather than returned to his or her original position after reeducation. Intendants are also reeducated, but usually lose their Intendant status and are reduced to Social Standing 6 or less.

Bargaining: At first glance, the idea of bargaining in a psionic society would appear impossible Looking deeper shows the practice is alive and well. Bargaining occurs when market pressures produce varying prices for goods, and each side in a bargaining encounter tries to obtain the most advantageous price for the transaction.

A bargainer with psionics might be able to read the mind of the other bargainer, determine the best price he will accept, and then offer that. Obviously, a psionic bargainer has a tremendous advantage. But this model is simplistic Any bargainer whose mind is read is being taken advantage of, and in the face of such mind reading, a bargainer can easily change his mind and ask for a higher price, if only as a penalty for the other's unfair advantage.

Bargaining is, in any case, not a case of two people trying to find out the real price for goods, but an adversarial situation where each side is trying to achieve the best price for himself. As a result, the use of psionics in a bargaining situation is considered unfair, much like reading a teacher's mind for answers to test questions.

The Thought Police: Perhaps the most misunderstood of Zhodani institutions is what Imperials call the infamous Zhodani Thought Police, the Tavrchedl'. The Thought Police are a branch of the government charged with maintaining right thought by the population. To non-Zhodani, they are seen as a secret police constantly spying on the population with psionics Their mission is to catch anyone who is discontented with the system, their lot in life, or their superiors, and to brainwash them into acceptance of the system.

To the Zhodani, the view is completely different The term Tavrchedl' literally means Guardians of Our Morality; the organization is seen as filling a role much closer to fireman than policeman

Zhodani society is a happy one, but even in a happy society, individual members can fall prey to depression, frustration, or disillusionment. They can still suffer from mental illness or imbalances. Individuals can find themselves losing trust or confidence in the system. And it is for these people that the Tavrchedl' exist.

Thought Police monitor all of Zhodani society, conducting periodic examinations of individuals in order to ensure that everyone's mental health is at acceptable levels. But the Thought Police also conduct random sweeps of the community, looking for signs of unacceptable behavior or deviant thought patterns. When they find such patterns, they seek them out, find their source, and remedy the situation.

Reeducation: The cure for any aberrant behavior is reeducation The Zhodani psionic society is excellent at this, psionics has facilitated extremely efficient reeducation Long ago, psionics made possible studies which confirmed what educational techniques worked, and how efficiently. They allowed academics to plan out lessons which could be learned to any degree of efficiency. Psionics also makes possible tests and examinations which can confirm that learning has actually taken place.

The result is excellent diagnosis and careful treatment in reeducation centers. When treatment is completed, the individual rejoins society without any stigma or blot on his record; the period of reeducation is much like a period of recovery from an illness.

THE ZHODANI CONSULATE

The Zhodani give the name Driantia Zhdantia to their interstellar community. The name is commonly translated in Anglic as the Zhodani Consulate. The term Driantia means government by consuls; it is sometimes translated as government by elected leaders, and even just as government.

Within the scope of Driantia Zhdantia are all worlds colonized by the Zhodani and all worlds effectively administered by the Zhodani government (even though the local population is not Zhodani). They total approximately 6500 systems spread through more than 175 subsectors. More than 70 percent of the worlds lie within 100 parsecs of Zhdant, the Zhodani homeworld.

The Zhodani Consulate is a democracy. Representatives (called consuls) are elected to ruling councils for a specific period of time, with those councils responsible for specific responsibilities within the government. Members of the councils are also given the authority to carry out their programs and orders.

Citizenship (and thus the right to vote) in Zhodani society is restricted to the Nobility. Proles and Intendants cannot vote, although they can express their opinions to the Nobility and attempt to lobby or persuade consuls to specific courses of action.

Councils are established at every level of Zhodani society, and all are linked in terms of input and authority. The lowest council is established at the community level within a municipality of 50,000 or fewer citizens; a council of 10 members is elected by the approximately 2800 Nobles who are part of the community. Consuls are each elected for a term of one olympiad.

Each of the lowest councils elects two of its members to the next highest council, usually conducting the election at the end of a term. Consuls thus elected begin a new term serving on that next highest council.

A hierarchy of councils extends all the way from the local community council to the Supreme Council responsible for ultimately shaping Consulate policy. Local community councils elect members to higher councils; depending on the population of a world, there may be one, two, five, 10, or more intermediate councils before the ultimate world council is elected. World councils each elect two consuls to a subsector council. Subsector councils each elect two consuls to a province council (sectors are not a part of the hierarchy of councils). Province councils each elect two consuls to the Supreme Council which meets on Zhdant.

Councils may elect any of their number to the next higher council. Any member who is elected to a higher council technically remains a member of the original council as well. Consequently, a council can in this manner continue to reelect the same member to the higher council for extended periods of time.

Intendants: The Intendant class is approximately three times the size of the Noble class (the actual ratio is eight Intendants to three Nobles). The distribution of Intendants, however, is not carried out in a direct ratio. Typically, each Noble has one Intendant who is specifically assigned to him, this direct relationship provides the Intendant with a mentor and advisor, and provides the Noble with a capable secretary and assistant. Such positions are avidly sought after by ambitious Intendants, since much of the fame and power of a strong Noble rubs off on his personal Intendant.

Each council, when it approves an order, implements it through its Intendant administrative staff. Intendants are frequently the source of recommendations to the council, they are equally often the individuals who see that the order is carried out.

Taking Office: At the lowest level of councils, consuls take office almost immediately after being elected. At the higher levels of councils, a problem arises by way of travel time; often a year or more may be spent just travelling to the site where the council meets. As a result, the accepted convention is that a consul serves until his or her replacement arrives

The Supreme Council: The ultimate ruling authority of the Zhodani Consulate is the Qlomdlabr, the Supreme Council. Unlike the other councils, where newly elected members replace incumbents, the Supreme Council consists of two groups: the standing council (composed of conventionally elected consuls), and senior members (composed automatically of all former members of the standing council).

Senior members of the council are an advisory body: They provide experience and advise to the standing council. Senior members are often offered specific projects to oversee to completion. They originate projects for presentation to the council; sometimes they shepherd the project to completion after approval by the council.

One reason for the existence of the senior members of the council is that wide-ranging projects, of importance to the entire Consulate, sometimes need the authority of a Noble to help ensure their completion

The Aslan are the youngest of all the major races, having had starflight for less than 3200 standard years. Despite their youth, the drives of their males for territory and their females for markets has pushed them into space and out to the stars with alarming speed.

KUSYU—THE ASLAN HOMEWORLD

The Aslan homeworld is Kusyu/Kilrai' (I'aheako 0309 A8769H6-E) in what the Imperials call the Dark Nebula sector. Humans often spell Kusyu as Kuzu in Anglic; Kilrai' is often spelled Kilane

Stellar Data: Kusyu orbits a close binary consisting of Tyeyo and its companion Saietaie Saietaie orbits Tyeyo at 4 2 million kilometers with a period of about one eakhau.

Tyeyo is a G4 V star somewhat dimmer than, and fractionally smaller than, Sol Luminosity is 0.77. Effective temperature is 5600 degrees K Radius is 0.93 of Sol Mass is 0.96 of Sol.

Saietaie is a DA dwarf star barely visible against the face of Tyeyo, but becomes noticeable when its orbit swings it up to two stellar diameters to either side of its companion. Luminosity is 0.0003. Effective temperature is 14,000 degrees K Radius is 0 01 of Sol Mass is 0 36 of Sol.

World Orbital Data: Kusyu orbits Tyeyo at 1 au with a period of 320 standard days It rotates on its axis once every 36 standard hours (one eakhau)

World Physical Data: Kusyu is 12,980 kilometers in diameter, and has a standard atmosphere tainted with industrial pollutants Sixty percent of the world is covered with water oceans. Kusyu has two major continents, both in the same hemisphere, and both straddling the equator. Several large archipelagoes lie off the continents' shores. North and south polar icecaps, anchored by island groups, cover about 15 percent of the total world surface

Kusyu has minimal axial tilt and orbital eccentricity Average temperature for the world is about 9 degrees C.

Kusyu has two natural satellites, each about 400 kilometers in diameter, orbiting at 51,000 kilometers and 96,000 kilometers respectively. Several artificial satellites, including two LaGrange stations, are also present

World Social Data: Kusyu has a population of 4.6 billion, which includes the population of the artificial satellites and of several undersea colonies There are less than 600,000 non-Aslan on Kusyu

Humans classify the government of Kusyu as civil service bureaucracy, but Aslan classify the nature of the government as split control, similar in nature to a "balkanized" government for humans. All of the 29 Tlaukhu clans (and about 300 others) have landholds on Kusyu. Weapons restrictions are about equivalent to human law level 4 (military weapons prohibited). Technological level is E, and is about the maximum to be encountered in the Hierate.

ASLAN PHYSIOLOGY

Aslan are descended from four-limbed, carnivorous pouncers originally near the top of the food chain in the forests of Kusyu. About 1 8 million years ago, Kusyu's climate shifted, with the result that the extensive forests of Tafohti (Kusyu's largest continent) almost completely disappeared. As the forests dwindled, so did the small fauna upon which the Aslan had preyed, forcing them to venture out into the expanding grassland plains. The large grazing animals in these regions were too much for a lone Aslan to kill, and they began hunting in ahriy (prides) of several families. The strongest male became the leader, and his family received the best parts of kills, choice sleeping places, and first drink at any waterhole.

The Aslan which has evolved from those beginnings is, like humankind, an upright biped averaging two meters in height and 100 kilograms in weight. There are two sexes: male and female, of which the most notable external difference is the male's increased size and more impressive mane. Females outnumber males by a ratio of 3:1.

The Aslan hand has three fingers opposing one medially placed thumb, and all have retractable claws. In addition, Aslan have a single, highly specialized claw under each thumb; this dewclaw folds back jackknife fashion into a horny covering in the base of the thumb and palm. The presence of these claws and the general nature of their body structure make the Aslan somewhat clumsy by comparison with humans, but what they lack in dexterity they make up for in strength and endurance.

True to their pouncer ancestry, Aslan are capable of short bursts of speed somewhat greater than that manageable by humans and slightly superior hearing and night vision

ASLAN HISTORY

From their earliest days as hunters on Kusyu's grassland plains, the Aslan have had a curious dichotomy in their social organization. Females were traditionally responsible for provisions and improvement of life, while males existed largely for defense and war. The early hunts were conducted by females, and females are generally credited as the innovators in the areas of toolmaking, animal husbandry, and eventually agriculture (developed to support herds of livestock, not for direct consumption). Males adopted female innovations reluctantly, but it was the female of the species who strived always to improve the Aslan way of life.

The Aslan eventually hunted to virtual extinction most of the large carnivores which threatened them on Tafohti. At this

point, fire, metalworking, agriculture, and many other developments had brought the Aslan to the verge of civilization, and the security they now enjoy permitted development of a number of civilized communities on Tafohti.

The territorial instincts of the Aslan male made the general trend of Aslan social development a feudal one. Families formed into prides, and prides formed into clans under the leadership of a dominant pride. Clans practiced a variety of semifeudal procedures of fiefdom and vassalage which led to the development of a few very powerful clans, but this was generally the limit of social organization in most Aslan civilizations. Although tradition and ritual gradually evolved to curb the aggressive male character, wars were common as clans sought greater power or greater territory, and as population pressure increased on Kusyu, wars grew both more common and more intense. Kusyu barely escaped a global conflict of devastating proportions, saved by two developments which took place at about the same time. First, the Aslan instituted their Hierate, an agreement on the part of the 29 preeminent clans to meet and discuss their differences on a regular basis, replacing the previous procedures which dealt with each problem on a case-by-case emergency basis. This helped ease rivalries and pressures, although it did not eliminate them, and under the new Hierate system there grew up an increasing formality in warfare (the concept of highly limited wars with outside referees was introduced at this time).

The quasi-government was clumsy at best, and probably would not have withstood the test of time if not for the second great innovation—the invention of jump drive. About 96 Aslan (–1999 Imperial), barely a century after the Tlaukhu came into being (the exact date and circumstances of the discovery remain shrouded in mystery), the two most powerful clans (the Yerlyaruiwo and the Khaukheairl) cooperated to an unprecedented degree to produce a star drive. It opened the stars to the Aslan race.

Star travel was the ideal way to satisfy the territorial drives of the race. At first expansion was slow, limited by the gradual development of jump technology. But every new planet discovered opened new territories for colonization. The era of 96 to 2100 Aslan (approximately –1999 to –242 Imperial) was an era of expansion and cultural flowering not unlike Earth's Ages of Discovery (A.D. 1450 to 1600, and A.D. 2100 to 2300).

Luckily, the Aslan had come on the scene during the Long Night (342 to 2323 Aslan, –1776 to –30 Imperial) in human space: the era between the Second and Third Imperiums in which humanity was splintered into many rival states. As a result, the Aslan never confronted any human state at a time when it was significantly stronger than an Aslan clan. This was important, for the clans of the Hierate were never (and are not now) capable of acting in concert as a human empire could; clans each conduct wars on their own, sometimes with assistance of others, sometimes without, but never with a sense of central purpose or unity. Some human worlds accepted Aslan domination as a superior alternative to the chaos of the Long Night, and now remain within the Hierate with human or mixed human and Aslan population embracing Aslan culture and society. Other worlds resisted, and sporadic warfare characterized the Aslan Border Wars (1100 to 2810 Aslan, –1120 to –380 Imperial) which lasted until the Third Imperium

appeared on the scene. The Peace of Ftahalr (2810 Aslan) established much of Aeitle Sakh (Reaver's Deep) sector as a buffer zone between Aslan and Imperial spheres of influence; the population in the buffer zone was left independent of both interstellar communities.

ASLAN PSYCHOLOGY

Aslan are shaped by their physical and social surroundings. Aslan psychology is dominated by two concerns: gender and land.

Gender: The sexes have very different roles in Aslan society. Males (in all but the lowest classes) are concerned mostly with military operations, acquisition of territory, and political affairs. Females, on the other hand, are concerned more with industry, trade and commerce, and with the accumulation of wealth and knowledge. Females always own and control corporations.

Upper-class males have little concept of money, and are literally incapable of functioning in a technological society without aid. They are seldom encountered away from the supervision of a wife, mother, or some other female relative or employer. For instance, a typical Aslan mercenary unit will be organized by a wealthy married female, who will then assign its operation, for a share of the profits, to an unmarried female relative. The battle commander and most of the troops will be unmarried males (many of them also relatives, hired with promises of land grants and the opportunity to gain honor, glory, and reputation in combat). These males are capable of operating most forms of high-tech equipment by rote as black boxes, but their expertise is limited to bravery, tactical skill, and button-pushing. Tasks which require more than this must be entrusted to males of very low social level or to females. Females of high social level fill all staff, operations, supply, and intelligence positions, and handle the administration of the unit.' This example holds true for most aspects of Aslan society.

AN ASLAN TIMELINE

The following table shows several key events in the history of the Aslan

ASLAN HISTORY

Aslan	Imperial	Event
-123	-2190	First World War.
-88	-2160	Second World War (Nuclear).
-60	-2136	Aslan space travel
-22	-2102	Orbital bases.
-18	-2098	Third World War.
0	-2083	Formation of the Tlaukhu.
94	-1999	Aslan invention of jump drive
117	-1980	First contact with humans (Hisol'i).
350	-1776	The Long Night begins for humanity.
1100	-1118	Aslan Border Wars begin
1185	-1044	First crossing of Great Rift.
2810	380	Peace of Ftahalr; Border Wars end.
2902	461	First contact with Zhodani
3077	614	Yerlyaruiwo-Tralyeaeawi War.
3120	652	Hlyueawi clan joins Tlaukhu.
3167	693	Yerlyaruiwo-Tralyeaeawi War ends.
3610	1082	Fourth Frontier War begins.
3644	1111	Current date

Aslan tend to place great emphasis (generally unconsciously) on the gender of those they deal with, whether Aslan or alien. They also tend to make their evaluation of gender based on a cultural rather than a biological basis. As a result, an Aslan can see a human as having a perceived gender of male because she is a gunner, even though she is biologically female. An Aslan might also classify a human male navigator as female (because he considers navigation to be a female oc-

cupation). Such judgments have strange ramifications, because an Aslan will accept discourteous behavior from the opposite sex, while challenging to a duel a human believed to be of the same sex Aslan will also refuse to hire individuals of a gender inappropriate to the job (qualified females will not be hired as pilots; qualified males will not be hired as brokers), yet if the human's gender is not directly pointed out, an Aslan will often assume correct gender based on skill qualifications.
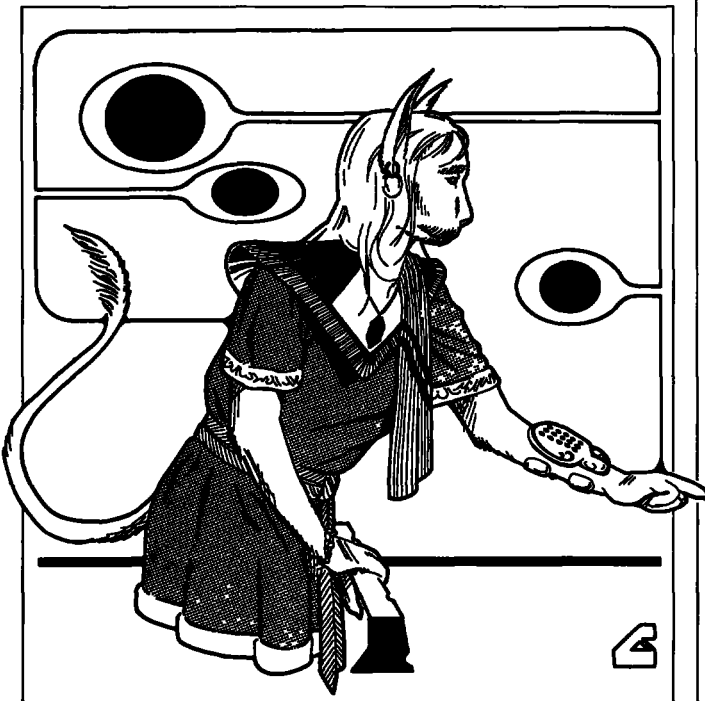
Because the ratio of females to males in Aslan society is roughly 3:1, Aslan society tends towards polygamy (which tendency can be traced to Aslan prehistory, when populations were small and a male stood a greater chance of survival with more hunting females in his family). However, a high proportion of females remains unmarried, preferring to devote themselves to business, science, or other matters to the exclusion of marriage. Unmarried females remain part of their father's or brother's families, and in most corporations it is the females who pledge to remain unmarried who get the top positions (since marriage would transfer the wife—and the wife's holdings—to a new family, often outside the clan, to the detriment of the clan's interest in that company).

Land: A deep-seated territorial instinct causes male Aslan to have an inordinate (from the human point of view) concern for the acquisition and control of land. The ownership of land is a major goal in the lives of most Aslan males. An Aslan's stature is determined by the amount of land she (or her husband) controls, and the amount of land controlled by his family, pride, or clan. The lowest classes in Aslan society are landless, providing the farmers, laborers, craftsmen, and workers essential to the society.

The largest landholds are in the hands of the Tlaukhu, and consist of many worlds and parts of worlds Since holding such an extensive territory is beyond the ability of one Aslan, an extensive network of vassals (usually sons, brothers, or male relatives by marriage) administer it in the clan head's name

Landholds are passed on from father to son. Originally, sons fought for the right to inherit their father's landholdings, the losers became subordinate to the winner, or left to seek new landholds for themselves. On large landholds, the losers became vassals to the winner and administered part of the landhold as their own. Primogeniture (the automatic passing of landholds to the eldest son) is a recent cultural innovation, having come into favor about 2300 to 2400 Aslan Sons who do not inherit are ihatei (literally, second sons) With the development of starflight, ihatei became the vanguard of Aslan exploration and conquest of space.

Landholds have always been difficult to come by. Early explorations on Kusyu opened up new territory and made more land available. Periodic warfare has redistributed landholds to the stronger males, and conquering clans redistributed land to particularly brave, resourceful, or deserving males With the advent of starflight, vast new territories became available.

Landholds are frequently granted as rewards for military excellence or other superlative service to the clan. An individual clan will include prides and families of all social levels, the most important of these will be of high Social Level (9+), with extensive landholds (usually all held in fief as vassals of the clan's leader); middle-class prides and families will have smaller landholds, while the lowest classes own no land at all,

but live and work on land belonging to their lords.

ASLAN SOCIETY

The Aslan have long been a warrior race, they are noble and proud, devoted to those in authority above them and responsible for those who owe fealty from below. Aslan society is based on the family and its relationships.

Family Structures: An individual Aslan is usually a member of a family (ekho) of from two to 12 persons under a patriarchal leader. This family will generally include the male family head, one or more wives, plus children and various blood relatives of the leader (unmarried brothers and sisters, aged surviving parents no longer maintaining separate families, adopted orphans of blood relatives). Several families combine into a pride (ahriy), with one family dominant. The leader of that family is also the leader of the pride Other families owe him and his family their fealty. A number of prides form a clan (huiha), with one pride dominant. Again, prides in the clan owe fealty to the clan's leader. The clan's leader is expected, in turn, to protect and provide for members of the clan, and administer his holdings wisely and well

Clans may, in turn, owe fealty to more powerful clans, particularly where blood relationships exist The Tlaukhu consists of the 29 preeminent Aslan clans, the strongest within the Hierate; many other clans owe them fealty, either directly or through a chain of other clans Overall, however, clans owing fealty to one of the Tlaukhu are in the minority, most clans are independent and function accordingly

Dueling: Aslan pride makes them a touchy race, and it is quite easy for Aslan to give or take offense (this behavior originated in the past struggles for dominance within families and prides, and remains a basic part of the Aslan personality). Over the centuries, Aslan touchiness has grown formal and extremely ritualized, this rigid pattern of behavior has been necessary to reduce conflict and injury in the settlement of personal disputes Non-Aslan who do not understand these ritual forms of conduct often find it difficult to get along with individual Aslan.

AN ASLAN GLOSSARY

The following terms are in *Trokh*.

ahryi: pride; several families

aisai: dewclaw.

Akhailrau: Clan ranked number 340

Akhuaeuhrekhyeh· rite of passage.

alr: one.

aokhaor: honor.

areiaao: sprint; Aslan period of time between the uealaao and the khtauaao; approximately 15 9 standard seconds.

Arlaeaha: Vargr.

Aroaye'i: Clan ranked number 397.

ayloi. artificial dewclaw used by humans and other intelligent races which participate in Aslan culture

eakh: suffix for world. Hlyueawikoeakh means Hlyueawiko's World

eakhau: Aslan day of 16 tekhaao; 36 standard hours.

eal: gun.

earleatrais: referee; judge.

eikhoi: dusk.

ekho: family.

fiy: vassal of.

Fiyfiyalr: the Imperium.

fiyrukhte: insults and provocation intended to demean another party. Similar to the human game of "Chicken."

ftahea: Aslan year of 212 2 eakhau, 320 standard days.

Fteirle: Aslan, people.

Hisol'i: Solomani.

hlai: two.

Hlyueawi: Clan ranked number six.

Hrirohrytukhyelreah: the Ancients.

hryeh: four.

hryo: six

htatei: first son

htoi: green.

ihatei: second son.

Istoiuaei: Zhodani

iyrl: twenty (base 8); equals 16 in base 10

Kaukheairl: Clan ranked number two, one of the 29.

khaulear: one hundred (base 8), equals 64 in base 10.

kheh: three

khoiaya: armor

khtauaao: Aslan time period of eight areiaao; 17.96 standard minutes.

khte: zero.

khtyei: holding; landhold

khu: five

ko himself.

koih: seven.

Kusyu: Aslan homeworld; usually spelled Kuzu in anglic

layeau: valley

Loakhtarl: Clan ranked number 730.

Raohkeil: Clan ranked number 450

siya: unmarried

Siyreakhaotoior· Classic Aslan literature; myths and legends of old.

soistsea: unknown lands.

starl: forty (base 8), equals 32 in base 10

Syoisuis: Clan ranked number three, one of the 29.

tahiwihteakhtau: barbarians.

tea: ten (base 8), equals eight in base 10

tekhaao: Aslan hour of eight khtauaao, 135.7 standard minutes

Tlasayerlahel: large Aslan trading corporation.

tlau: thirty (base 8); equals 24 in base 10.

Tlaukhu: the 29.

Tralyeaeawi: Clan ranked number four.

Tyeyo· Kusyu's star, the Aslan sun

uealaao: One Aslan second; smallest commonly used unit of time; approximately 1.988 standard seconds

ukhtai: hero.

ya'uiya: dishonor

Yerlyaruiwo: Clan ranked number one, one of the 29.

Aslan society generally categorizes abrasive, uncultured, or offensive behavior into three classes: familiarity, impoliteness, and discourtesy Familiarity is the treatment of social superiors as equals; it involves social interaction, extreme friendliness, or condescending treatment by a lower-class Aslan toward an upper-class Aslan. Impoliteness stems from a lack of proper education or upbringing; it might include failure to address a social superior by the correct honorifics, failure to respond promptly when one is addressed, or losing one's temper in public. Discourtesy is a deliberate insult, and springs from contempt, a lack of respect, or malice; outward actions may often be perceived by Aslan as discourtesy although they are not meant to be so by someone alien to Aslan culture. Any of these three behaviors can give offense, and an offended Aslan becomes an enemy. Discourtesy, however, is also grounds for dueling.

Dueling is a common way by which insults and slights are resolved, especially if rituals and other tension-relieving forms fail to defuse the problem. Duels follow well-established rituals and are fought to the death only rarely. The rules of conduct and protocols which govern them clearly state what is allowed and not allowed.

A challenge to duel is never made lightly. At the same time, reluctance to challenge is seen in Aslan culture as weakness, a trait few Aslan wish to exhibit. Properly, anyone may challenge at any time. Most challenges are issued in response to discourtesy; elaborate but informal rituals have evolved wherein one party is discourteous and actually gains stature if the other does not reply with a challenge. Much of this behavior seems incomprehensible to individuals not steeped in Aslan culture.

The rituals for dueling, however, are strictly segregated by gender Males and females never duel; insults and slights by the opposite sex are dismissed with the excuse that males (or females) don't understand female (or male) honor. When a transgression becomes too blatant, too extreme, or too unacceptable, then a member of the insulted Aslan's immediate family (and of the correct sex) will respond to the discourtesy with a challenge.

The barriers against certain duels within a family are almost as strong as those for cross-gender dueling. Children never duel with their parents (which socially includes any adults in their family of the previous generation, not just their biological parents)

Duels between Aslan take place as personal combat. Combatants use only their hands (and dewclaws), combat continues until one side receives a wound. In the case of grave insult, the fight may continue to unconsciousness for one participant. The winner has his or her honor satisfied; the loser is required by social and ritual standards to apologize (even if he or she was the one originally insulted).

For non-Aslan, one way to gain an Aslan's respect is to be willing to challenge to duel when required, and to duel if challenged. Aslan consider those who do not embrace their culture to be tahiwihteakhtau (barbarians). Willingness to behave in the honorable fashion is one indication that one is not a completely ignorant barbarian. Since Aslan especially respect prowess in battle, upholding one's honor in a duel is especially respected.

Feuds: Disputes between families, or between prides, usually take place because of slights, insults, mistreatments, or problems which have not been resolved to both parties' satisfaction The families may back different scientific theories; one family member may have won a competition which the other family had traditionally won; a family may have rejected a proposed marriage between it and the other family.

Feuds are an intermediate step between duels and wars. Strangely for Aslan society, they are unstructured and lack rituals to control them. If kept at a low level, a feud is a pretext for discourteous behavior and sparks many duels. If allowed to get out of hand, it involves the vassal prides and families of each side and can erupt into war.

Wars: Disputes between clans (usually over ownership, control, or access to land) are, like duels, also highly ritualized. They are resolved through formal clan wars. Like duels, such wars are given highly specific rules (agreed upon by all parties in advance). There are many modes, from ordinary military conflicts to wars of assassins to capture-the-flag games in which some token must be removed from an enemy stronghold in order for victory to be won. Unlike duels, most (but not all) clan wars do involve the death of enemy personnel. In some cases (particularly wars of assassins), the war may be bloodless, akin to the counting coup practices of certain Indian tribes from early Earth history.

Aslan Governments: Government in the human sense does not exist in Aslan space. There is no central authority for the Aslan as a race, and Aslan have little concept of racial unity, purpose, or pride They do have a fierce pride in their culture; a human who adheres to the culture and traditions which Aslan consider proper is considered closer in spirit than an Aslan who has, for some reason, abandoned those traditions and that culture. Aslan have no racial prejudice, but do have cultural prejudice, with non-Aslan looked upon as tahiwihteakhtau (barbarians) unless they embrace Aslan culture and behave as the Aslan do.

The Aslan equivalent of government is best equated with social structure. The head of the family settles disputes between family members. The head of the pride or a delegated male member of his clan or a delegated vassal settles disputes between prides.

Disputes between clans are settled by clan wars, highly ritualized affairs which will function using specific rules, restrictions in locale, tech level of equipment, combatants, and many other aspects of the conflict. Such disputes are overseen by an earleatrais (referee) from a neutral clan. Such an appointment is an enormous honor for the clan receiving it, and the referee acts with scrupulous objectivity; moreover, especially good referees will be able to produce not only fair decisions, but ones which will salvage honor and pride for both sides of the conflict.

At the top of the chain of family, pride, and clan heads stands the Tlaukhu. The term is used synonymously for the 29 clan heads who meet on Kusyu, and for the 29 clans which are the most powerful in the Hierate. When the Tlaukhu was originally established on Kusyu, it was an alliance of the largest and strongest of the Aslan clans. Since then, the criteria for the composition of the 29 have been strength and land; population, military strength, industrial power, and landholdings are

together considered when evaluating relative rankings of clans. Of the original 29, 19 of the original clans remain in it today; the remaining 10 positions have been occupied (some by a succession of clans) by new clans which have risen in strength, power and population to replace the others. Replacement of clans on the Tlaukhu occurs as the result of clan war, or when a clan falls in power and prestige to the point that it must become vassal to another clan

Representatives of the Tlaukhu meet continuously on Kusyu to arbitrate disputes, settle matters of common interest, and otherwise interact with one another in the interests of their individual clans. It naturally follows that their decisions affect the other clans of the Hierate as well. A decision to cooperate in the development of a new technology affects other clans when the technology becomes available; a decision to settle a clan war affects other clans by creating or removing trade barriers. Regardless of the effects of the decisions of the Tlaukhu, it is in no way to be considered a ruling council. The Tlaukhu makes no laws, decides no issues affecting the Hierate as a whole, owns no collective bases, military forces, or other centralized institutions, and has no power over any clan (except for the power each individual clan in the 29 has over vassal clans). The closest analogy that might be found in human history is the League of Nations, a body with no real authority in which important issues and disputes can be debated, but not necessarily resolved, save by the agreement of all concerned

Each clan is an independent entity (but may also be vassal to another clan). It controls space within each system in which a world is owned; when control of a world is split among several clans, there is a balance of power in the system as well. Each clan in such a case might maintain its own base, its own colonies, its own space station, its own outposts. Each would enforce such regulations regarding interplanetary flight as it saw fit, with local law level serving as a good guide to its stringency of enforcement.

Representatives of other clans (powerful allies, vassals, or overlords) exert some influence on any given world, as do large corporations. These agents or envoys are most often found at the local starport, watching out for the interests of their clan or corporation.

Starports are for the most part extraterritorial enclaves which are not owned by any clan. The facilities are built, operated, and maintained by corporations which lease the land from a local clan. If a clan base is present, this will be located at the starport, but is under the control of the owning clan. Representatives of clans and companies can be found at the starport and other major transport and trade terminals, from whom such permission must be sought.

Justice: Criminal acts are rare, but not completely unheard of in Aslan society. Crimes are different from the insults or slurs that provoke duels, and are classified into three categories: crimes of passion, crimes with victims, and crimes of honor. Crimes of passion involve misbehavior prompted by temper, anger, or provocation (assault other than dueling, intoxication, or rioting). Crimes with victims involve taking of money or items of value (theft, stealing, burglary, fraud, forgery, extortion), violating the person of another for profit (kidnapping, terrorism, piracy). Crimes of honor involve failure to observe rituals

established for behavior (ambush, failure to obey the earleatrais in a duel, abandoning responsibilities, lying in a clan council, perfidy).

Originally, all accusations of crime were judged by the head of the family, pride, or clan involved. Through time, other methods have evolved.

For crimes of passion, the accused is judged by the head of the family, pride, or clan involved. Who judges the accused is determined by elaborate protocols which consider the ramifications of the crime and the notoriety which it has received. Appeals may be made to the next higher head. Punishments are minimal for first offenses, with escalating penalties for continued violations. Generally, a contrite apology is sufficient atonement for a first offense. A fine, or perhaps donated labor for the family involved, is called for in later offenses

For crimes with victims, current practice is to find an impartial earleatrais to consider the case and present findings; appeals can be made to a panel composed of the heads of the families of the accused, the victim, and the earleatrais. Penalties call for restitution at the very least, and often doubled or tripled penalties as punishments. Clans vary in their treatment of cases where the victim is physically injured or killed, some inflict a similar fate on the guilty party, while others require restitution and punitive damages, or terms of forced labor. Judgments in cases involving money and males are often very lenient, taking into account the lack of understanding most males have of money.

For crimes of honor, judgment is made by the pride or clan head, depending on the severity of the crime. Crimes of honor are the most serious of crimes in Aslan society, and penalties range from banishment (at a minimum) through mutilation or branding to forfeiture of all property and death. In practice, most crimes of honor are never tried: A duel to the death disposes of the accused before a trial can take place.

The Vargr Extents are the coreward regions of space settled by and under the control of various Vargr governments and factions. As a rule, Vargr governments fragment rapidly, and nothing like a unified government has ever been established over the Extents. Many Vargr worlds are still highly balkanized as a result.

For many years the Vargr were a puzzle to Imperial xenologists. Their biochemistry and genetic make-up is almost identical with a number of terrestrial animals, but differs radically from most flora and fauna indigenous to Lair, the purported Vargr homeworld Researchers during the early years of the Third Imperium concluded them to be the result of genetic manipulation of a transplanted species, undoubtedly of Terran origin, and most closely related to Terran canines. A tremendous body of data indicates that the race known as the Ancients were probably responsible This background makes the Vargr unique among the Major Races, and indeed among the majority of sophont races of all kinds, in that they are not the product of natural selection, but rather represent, seemingly, an "experiment" in artificial evolution for purposes unknown to contemporary science.

LAIR—THE VARGR HOMEWORLD

The Vargr "homeworld" and "capital" is a planet called Lair (Provence 0802 A8859B9-F). The world has never been accorded any particular status in the hearts and minds of the Vargr race, unlike such worlds as Terra, Vland, Zhodani, and Kusyu. Of 12 empires which have included Lair (or parts thereof) over the last 800 years, seven of them have been ruled from a different world entirely, and Lair was given no special privileges because of its place in the history of the race. Indeed, Lair was only recently united; several sections of the planet still boasted independence until only a few years ago (this is another unique and noteworthy distinction, for most worlds are united long before their citizens spread out to the stars).

The name Lair is a human one, applied in the absence of any single recognized Vargr name for the world. Use of the name, or any other word indicative of the relationship of the Vargr to nonsentient terrestrial carnivores, is an insult which frequently provokes Vargr to violence. (A human who wishes to avoid an incident is wise to learn proper terminology in the language or dialect of whatever Vargr he happens to be speaking to, and use such terms in preference to the often sarcastic human labels most frequently applied.)

Occasionally, someone forgets that the true homeworld of the Vargr is Terra. Attention instead focuses on Lair, the world where the Ancients deposited their genetically altered experiments about 300,000 years ago.

Stellar Data: Lair orbits Kneng, a solitary star.

Kneng is a G5 V star, dimmer and smaller than Sol. Luminosity is 0.67. Effective temperature is 5500 K. Radius is 0.91 of Sol. Mass is 0.94 of Sol.

World Orbital Data: Lair orbits Kneng at 1 au with a period of 376.72 days. It rotates on its axis once every 26 hours.

World Physical Data: Lair is 12,740 kilometers in diameter and has a dense atmosphere. Half of the world's surface is ocean, dividing the land into five major continents. Approximately five percent of the world surface is icecap.

Lair has no orbital eccentricity, but its axial tilt equals that of Terra: 23.5 degrees (there is some evidence that this tilt was induced approximately 300,000 years ago). Average temperature for the world is 16 degrees C.

Lair has three natural satellites. The largest, orbiting at 150,000 kilometers, is tidally locked to Lair; the others orbit at 2000 kilometers and 9000 kilometers respectively. All have been used for space stations and stepping-off points in space exploration.

World Social Data: Lair has a population of 2.3 billion. Humans classify the local government as a noncharismatic leadership (a term at which the current leader would take offense). Law level is relatively high and reflects the relative instability of the current government. Local technology is equivalent to that of the Imperium.

VARGR PHYSIOLOGY

The Vargr are descended from Terran carnivore/chasers transplanted to Lair by the Ancients, approximately 300,000 years ago. These transplanted carnivores were of the family *Canidae*, and almost certainly of the genus *Canis*. The development of intelligence and of manipulation was thus artificially introduced, and not the result of natural mutations or other environmental factors. Considerable adaptation took place (although exact knowledge of the nature of this manipulation is scant, and thus the evidence for this information is somewhat unreliable). Certainly the Vargr were never fully fitted for the environment of Lair. This has produced rigorous conditions which have made the natural selection and adaptation essential to the survival of the race, and may have resulted in developments not introduced by the Ancients in their original genetic experimentation on Vargr ancestral stock.

Physically, contemporary Vargr are not very impressive. The typical Vargr is about 1.6 meters in height and weighs approximately 60 kilograms. They are upright, bipedal carnivores, rear limbs digitigrade, and still bear a considerable resemblance to their ancestral canine stock externally, though internally there are many important differences.

Vargr hands are very similar in size and appearance to human hands, though with significant internal dissimilarities.

74

They have approximately the same physical parameters as humans', and are able to use the same equipment without modification or additional instruction. The hands tend to be somewhat more slender and dexterous than human hands (on the average; there is still considerable variation among individual Vargr). Their fingers retain sharp, pointed, nonretractable nails which can function as claws in some close-combat situations.

The Vargr retain many of the characteristics of their canine ancestors, far more so than humans do their primate forefathers. They are covered with a short fur, generally brown, black, or rust colored, though frequently combining shadings of these and other colors. Their tails are fairly long and generally end in a flaring brush. The muzzle is much shorter and less pronounced than in Terran canines, but still is quite evident.

On the average, Vargr reactions are somewhat faster than those of the typical human, but there are still wide variations between individuals. Vargr eyesight is much sharper than human sight, but responds somewhat differently to colors; by human standards, Vargr color patterns frequently seem extremely unusual, sometimes rather muddy, at other times garish and clashing. Their hearing is excellent, but again slightly out of phase with human standards. Sounds which are generally too high-pitched for human ears can be detected, but the lower ranges are often inaudible or only vaguely sensed, rather than heard. The Vargr also possess keen noses, as befits their ancestry, but their sense of smell cannot in any respect be considered the equal of the K'kree, the acknowledged masters of olfactory stimuli.

VARGR HISTORY

There is little in the way of accurately established history known on the development of the Vargr from the time of their original transplantation to the point when they first began to make their presence known to other spacefaring cultures. As with so many elements of Vargr society and background, the truth is frequently obscured in a welter of contradictory claims and historical interpretations among Vargr writers; few human scholars have ever been able to sift through the contradictory material of rival Vargr historians to arrive at any concrete determination of what actually happened. Nor have the Vargr been particularly cooperative in permitting first-hand research by non-Vargr groups. Their normally touchy racial pride has been compounded by a vested interest in keeping information obscure, for many Vargr governments and organizations have founded major portions of their ideology or philosophy on various "accepted" interpretations of history and archaeology which they are reluctant to have examined by outsiders.

It is known that the development of civilization among the Vargr was turbulent and chaotic Their foster homeworld (generally called Lair by Imperials, in preference to any of the four most widely accepted names used by the Vargr for the planet, all of which, according to one humorist, can only be pronounced "by an asthmatic dog with severe bronchitis"), the third planet of a G5 star in the Provence sector, was and is a cool world with broad, shallow seas and a number of small continents. No one is sure which continent marked the original home of the first Vargr transplantees (evidence has been advanced for all of them, and some theories have even held that

settlements were made on more than one)

It is certain that the first Vargr bore only distant resemblance to the contemporary Vargr—possibly even less so than the ancestral human stock of the same era (300,000 years ago) does to any of the modern branches of humaniti The manipulation performed by the Ancients would appear to have been directed at developing the potential of the race, as opposed to directly producing a desired result This has convinced several scholars who specialize in Ancients' studies to speculate that the enigmatic race took an incredibly long view of things. They could actually contemplate watching the evolution of a species like the Vargr over countless millennia, as early Terran geneticists could experiment with generations of fruit-flies. It is not known with any degree of certainty whether the Ancients meddled only once with the proto-Vargr stock, or made return visits to guide the continuing evolution of the developing race in the direction they most desired to see taken. Most evidence suggests that only a single intervention was made, though the Church of the Chosen Ones (a rather influential Vargr movement of two centuries ago) postulated—and proceeded to prove, albeit not very convincingly—that the Vargr were carefully brought along a particular course, as they were "intended" to take their place as the leaders of all sophont societies in the Ancients' sphere of influence. The Church of the Chosen Ones has enjoyed periodic revivals and declines, but is currently not a particularly viable movement, and its findings are now usually discredited.

Vargr society seems to have evolved fairly readily from the social groupings of the precivilized Vargr hunting packs. The pack or group seems always to have remained the central focus of Vargr society; the Vargr as a rule seem incapable of accepting authority more remote than the number of people a single charismatic individual can personally sway and command. As the Vargr came to dominate Lair, governments rose and fell, but on the whole, Vargr governments were smaller in scope

PETERS 88

than even the most divisive periods of Terran history could give rise to Much of early Vargr history has been likened to the Classical Greek period on Earth—numerous small enclaves, each fiercely independent, rarely unified for more than the most urgent of common causes, were the rule rather than the exception Periodically a charismatic and talented leader would unite a number of these mutually hostile groups by persuasiveness or by force, but such a union would last no longer than the individual's own lifetime (and usually not that long) before disintegrating again

As technology and civilization advanced, the number of individuals who could be directly exposed to a leader's dominion increased, and thus larger states could form. Even these states, however, were far from the human concept of a "nation," for groups supposedly within the sphere of that "nation's" territory could and did act completely without the sanction of the "established government " To a human, most of Vargr history tends to look like uninterrupted anarchy, though of course to the Vargr these problems were accepted as perfectly normal and reasonable.

The period following the discovery of the jump drive in – 3810 has also been likened by human historians to certain events in terrestrial history—specifically, to the barbarian migrations which destroyed the Roman Empire and to the heyday of the viking raiders These similarities are apt. Jump drive was first discovered by Vargr researchers looking for a method of winning an edge in the Colonial Rebellion of – 3815 to – 3790. The colonies set up on two of Lair's sister worlds declared independence from the nation which had originally established them, leading to a three-way struggle (as other nations stepped in) for dominance in the system Jump drive was quickly acquired by every major government on the planet, and Vargr began spreading to the stars.

The Diaspora of the Vargr race was incredibly swift; the natural Vargr tendency to move on when things weren't to their liking (if a fight were impractical, that is) led them to spread quickly, though in the early days colonies were small and spread thin On most colony worlds, the history of Lair tended to replay itself time after time In all their time in space, the Vargr never have (and perhaps never will) come to terms with the concept of a true interstellar state. Time and distance reinforce the basic lack of acceptance accorded to remote authority. Interstellar states have been established, some of them quite large, but the degree of control exercised by the central government is far more tenuous even than that of the Imperium (which exercises minimal control in local affairs, anyway) Then, too, half or more of the worlds which may be within the "boundaries" of a given interstellar state may in fact be not only independent, but actively hostile to that state, while, as always, bands functioning quite independently of any government operate in complete autonomy, even on planets nominally answerable to that government. It has always been a confusing state of affairs, to say the least

Vargr expansion was stopped in the trailing direction by the Windhorn Rift, a region where stellar density is insufficient to permit easy travel. This was probably a lucky thing for the Vargr, for, beyond the Windhorn, the Vilani Imperium held sway at this time Dedicated to maintaining the status quo of the Pax Vilanica, the Vilani emperors would most likely have attemp-

ted to subdue the Vargr had they been aware of their existence, for it was accepted Imperial policy at that time that no race possessing the secret of the jump drive should be allowed to exist independently.

As the First Imperium declined, various provincial governors with ambitions of personal advancement took to arming and outfitting "barbarian" mercenaries from beyond the boundaries. One such governor, who controlled the area now comprising portions of Deneb, Corridor, and Provence sectors, is believed to have been the first human to have had dealings with the Vargr, probably after Vargr corsairs raided a world at the edge of his province. This governor supplied arms and equipment to a large corsair group who were employed in his bid for power. Though he was defeated, he had set a precedent; the Vargr knew about the First Imperium and were interested in the wealth of that decadent civilization; by this point in time, Vilani troubles were such that there was no question of imposing the Pax Vilanica over these "barbarians" from beyond the Windhorn.

It will never be known just how much impact the Vargr had on the decline and fall of the First Imperium; the more obvious military victories of the Terran Confederation are generally considered to be the main force in bringing down the Vilani Empire, but inroads by the Vargr surely accounted for much of the collapse It was during this period, in the era of – 2400 through – 1700, when Vargr migrations around either end of the Windhorn became common. Bands following some charismatic leader would set off to raid and plunder, settle on some inviting world, and found a new colony. Dissidents would inevitably spin off new groups and travel onward. When the Second Imperium, that outgrowth of the victorious Terran Confederation which filled the vacuum left by the Vilani collapse, tottered to its own end with the fall of the Long Night (– 1776), much of human space was no better organized than the Vargr had ever been, and Vargr raids and colonization around the Windhorn became even more common.

It was at this time that Vargr corsairs became a byword for pillage and violence, as the Sack of Gashikan (– 1658) demonstrated Those Vargr who reached into the human-dominated reaches of Gashikan and Mendan moved onward, and ultimately settled in areas trailing out these human worlds—in the Vargr Enclaves near K'kree space. These enclaves have continued to exist in isolation to this day, though few Vargr are left in the Second Empire of Gashikan, after the fierce wars which accompanied the unification of the region several hundred years ago.

Unfortunately, few specifics can be given on Vargr history, even comparatively recent history, since in fact, it is impossible to talk of "Vargr" history and speak of any single group or body. For instance, Imperials often speak of the Vargr who joined in the Outworld Coalitions against the Imperium, and think of "the Vargr" as Zhodani allies or clients. In actual fact, of course, some Vargr have done just that. Other Vargr states and groups have worked with the Imperium...and still others are completely neutral, or opposed to both states, or hostile to one without necessarily feeling any friendship for the other. In discussing Vargr history, it is evident that no generalizations can be characterized as true. .a statement which, in fact, sums up the Vargr as a race rather well.

VARGR PSYCHOLOGY

Just as they physically continue to exhibit many of the features which are derived from their ancestral stock, so, too, do Vargr show a number of mental and behavioral traits which bear a fairly obvious relationship to the instinctive behavior of the social carnivores of Earth. Although sentient, the Vargr are still very much like the pack-oriented canines who are their Terrestrial cousins.

Vargr are frequently characterized as "inconsistent" by outsiders, who see many of their behavior patterns as contradictory and strange. In actual fact, this seeming inconsistency is no more pervasive than in human cultures, but because these "contradictory" actions and ways of thought crop up in areas where humans are accustomed to a greater degree of uniformity of thought and behavior, the label has stuck. In many parts of the Imperium, humor based on the perceived Vargr traits of inconsistency, confusion, mercurial temperament, and disloyalty is common, and has often led to bad feelings on both sides when this humor becomes a symptom of prejudice (as is all too often the case).

These contradictions are, in fact, based upon the most basic instincts of the Vargr race. For example, the Vargr are a gregarious people, taking joy in the company of one another and seeking the security and comfort of fellowship with others of their own kind This is a natural offshoot of the instincts which kept the hunting packs of presentient Vargr canines together. Yet at the same time Vargr within a group are engaged in nearly constant struggles to achieve prestige and dominance, which frequently gives the appearance of a quarrelsome, sometimes even treacherous nature. Indeed, Vargr move from one group or association to another with great regularity, and seemingly have no loyalty to any specific institution or purpose.

This, too, is a function of the pack mentality. Dominance and prestige play important parts in Vargr society, and a Vargr is rarely content with the status quo for long His chief driving motivation is generally to achieve a higher place in the structure of the social group, or to find a group in which such a higher position can be achieved. Much of this is tied in with the concept of charisma, a general, human-applied term often used to characterize the individual Vargr's ability to dominate others of his kind. The social group is generally united in respect for a single individual whose charisma is higher than theirs. Such an individual means much, much more to Vargr than does a distant, impersonal government or similar institution. Thus, though gregarious, Vargr tend to be united on a low level, in bands or small groups (the equivalent of packs in the society of sentient Vargr).

For the same reasons, these groups tend to be unstable. Though a Vargr may give his loyalty to a charismatic leader, and be willing to follow that leader over the dictates of higher authority if necessary, each Vargr in the group will seek to improve his own position within the group, or will be susceptible to the attractions of some other group where advancement looks faster or the charisma of the leader is superior. It is this aspect of Vargr psychology which has given rise to the notion of disloyalty and indecision as characteristics of the race. To a Vargr, loyalties are temporary, but no less strong for all of that. A Vargr will do his best for the group for as long as he

remains with that group, but does not expect to remain in that group forever—nor do others expect him to do so. In time, that Vargr may move on to join another group, possibly with diametrically opposed objectives and ideals; or the Vargr might become a loner for a time. Always, however, he is seeking to improve his own lot by moving on to a position which enhances his own charisma and dominance.

VARGR SOCIETY

As with other facets of the Vargr, it is very difficult to characterize any one social order as "typical." Knowledge of Vargr social institutions is limited, based solely on intercourse with the Vargr states and groups found along the Imperial frontiers, but it can generally be said that the Vargr have a society, or more properly a group of societies, characterized by endemic and rapid social change.

The key elements in shaping Vargr societies are very strong centrifugal forces resulting from an emphasis on consensus and informal lines of authority, and an equally strong centripetal force resulting from ingrained family-clan-tribe-nation loyalty.

Centralized authority is extremely limited at the upper levels of Vargr society, and actions are based on broad coalitional concerns, with a constant splitting and rejoining of dissident factions. Traditionally, this has made it very difficult for more centralized and organized societies (such as the Imperium) to deal on a meaningful basis with what passes for Vargr states.

The Vargr have little respect for formal authority; what respect they do have decreases as that authority becomes more remote Vargr generally have greater respect for more informal authority figures, and are more likely to obey superiors who are better known to them.

Although they are gregarious, the group behavior of Vargr is characterized by a constant struggle for dominance within the group. The ability to exert personal authority over others derives from an individual's prestige and force of personality.
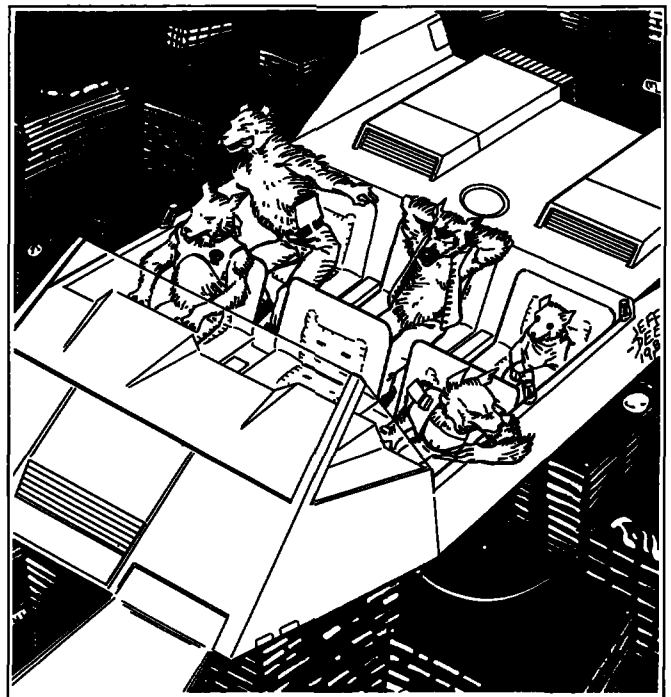
The Vargr have various words to describe this important personal characteristic, but humans call it charisma. Individuals with high charisma are likely to become leaders in groups, even if they do not have the talent or skill to lead properly. The result is often a charismatic leader who is not truly suited to lead, and a constant splintering of groups as rivals exert their influence over parts of the group and draw them away from the larger whole

Charisma and the struggle for dominance play an important, indeed a crucial, role in Vargr society. Although charisma is in part an integral characteristic of individual Vargr—some have it, some don't—this native talent for exerting dominance over others does fluctuate. Success and failure in various endeavors will add to or subtract from an individual's charisma, not only as a leader's reputation waxes or wanes, but also in that leader's whole bearing. A successful Vargr radiates confidence and ability, and naturally attracts others. Failure has a profound negative impact on the individual's bearing and conduct, and so tells others that he has failed.

Because of this, Vargr are never content to rest upon their laurels. Much of Vargr behavior is based upon a need continually to reaffirm one's abilities, to win the approval and support of others, to prove, over and over, that one is indeed the dominant member of the group. Those with lower abilities, aware of their own lack of the qualities they see in charismatic leaders, attach themselves to such a leader in the hopes that a little bit of his or her reflected glory will help them. By extension from the basic struggle to prove that he is better than everyone around him, the Vargr follower tends to transfer his attention to proving that his group is better than other groups. This is one of the strongest forces in Vargr society; it has allowed what little social cooperation exists among Vargr.

But the transference of individual- to group-dominance is inherently unstable, of course. Individuals within the group are each seeking their own niche, and will always be striving to achieve more and better things to improve their own charisma. As leaders make mistakes or go off in a direction others disagree with, factions emerge and cause considerable upheaval as members of the original group are drawn in different directions. Often factions are just individuals who want to go a different way; without enough charisma to sway others in the group, they end up on their own, either by deserting their erstwhile comrades, or by being driven out for refusing to recognize the authority of the group's accepted leader.

Social interactions are understandably complex as a result of these many factors. In fact, the problems of obtaining a consensus of opinion between disparate groups has given rise to a vast body of Vargr—known as Emissaries—whose whole function is to mediate between various parties and help groups come to terms enough to permit mutual action for mutual benefit. Emissaries bear a resemblance not only to the diplomatic services of other races, but also, most vividly, to the Heralds of medieval Earth; they are go-betweens who arrange all manner of agreements, in politics, business, and other areas of life, thus enabling the society to function despite the inherent instability of the system.

Another important characteristic which binds the Vargr together is a fierce racial pride. Vargr are easily insulted, and are prone to enter into fights without regard for possible consequences This strong feeling of pride finds many outlets; for many Vargr, there is an outspoken attitude that they alone, of the sophont races in known space, have been chosen for a special place in the scheme of things. They see the genetic manipulation of the Ancients as being an essentially selective attempt to develop a special, superior breed—the Vargr.

Some xenologists, however, tend to discount this feeling as stemming from a massive racial inferiority complex—an apologia aimed at disarming those who might say that they are somewhat less worthy of their sentience and their civilization because of their unique origins. Like so many aspects of Vargr culture, this question is one which evokes no consensus of opinion whatsoever; attitudes and opinions vary widely among individual Vargr.

VARGR GOVERNMENT

There is no central Vargr government; indeed, there is no governmental type that can be said to be "typically Vargr." Every conceivable form of governmental organization can be found somewhere in the Vargr Extents; oftentimes several radically different governments can be found on the same world. The only cohesive force in the Extents is the fierce feeling of racial pride, which, on occasion, does bring about a slight tendency towards racial cooperation. Such tendencies, however, usually break down quickly in the wake of struggles for dominance among the cooperating groups.

The higher the level of government, the more unstable it usually becomes, because of the impossibility of gaining consent from all Vargr involved Since there is little respect given to formal authority figures who do not derive their authority from a high charisma, respect decreases rapidly as authority becomes more remote It can basically be said that Vargr attach little importance to a title, office, or position, and a great deal of importance to the essential character of the individual occupying that position. A distant leader, no matter how personally able or charismatic, cannot exercise his charisma to win others to his standard, and thus is considered less worthy of respect than someone on the spot who has the charisma to influence his neighbors directly.

Of course, some governments and institutions are more stable than others, within the overall limits of what Vargr consider to be governments. Governments, to the Vargr, are institutions which provide services and protection to a large number of people who accept that government's assistance, and follow, to some degree, the leaders appointed by that government—when those leaders have the necessary charisma to retain government support. Those governments which are capable of appointing individuals who can retain the confidence of the governed are successful; those which cannot forfeit that confidence and are unstable in the subsequent struggles for dominance. Yet governments can be somewhat unlikely from the human standpoint; there are numerous cases of several governments coexisting in the same physical territory. Land has little meaning to Vargr—only group consensus and personal prestige.

Even the most stable Vargr governments exercise little effective control over the common citizen. Laws are followed only in proportion to the government's ability to enforce them. A highly charismatic leader can attract followers for almost

anything—"legal" or "illegal." The neighbors of the Vargr are constantly the subject of impromptu raids and scattered piracy by bands of Vargr (totally without government sanction, of course) who have been talked into a raid, battle, or war by a charismatic leader. The inability of Vargr governments to deal with these situations (or even to comprehend the concept of dealing with them) led to many frequent misunderstandings with neighboring human cultures throughout the history of Vargr-human contact.

Military: Once again, it is extraordinarily difficult to discuss Vargr military institutions in any but the broadest terms, since there is so much room for variation from one Vargr organization to another. Few, if any, "standard" conventions exist governing the composition, use, or organization of Vargr military units; even among the Gvegh cultures of the Imperial frontiers (which are generally the standard upon which Imperial discussions of typical Vargr groups are based) there is a wide variation in the military aspects of Vargr culture.

Most Vargr governments maintain planetary armies in one form or another. There is a certain degree of instability in the structure of most armies; since the characteristic Vargr emphasis on charisma over formal authority causes individuals to rise to officer positions based more on their ability to sway a crowd than on their ability to plan a battle. Vargr officers tend to rise and fall in the ranks according to their success or failure in the field, with new officers coming up from the ranks often completely unprepared for the needs of military leadership.

The result is a general tendency among the Vargr to have a higher but rather more brittle morale than comparable human units. A unit may go into battle with enormous confidence and determination, inspired by a charismatic leader, but, if that leader proves less capable in battle than he appeared off the field (or if the leader is killed), morale tends to fall apart quickly. Some groups of soldiers may fight quite tenaciously in defeat, should they include among them another charismatic individual capable of swaying the soldiers to fight on. Others will break quickly in the absence of direct inspiration.

Vargr military units are, like any Vargr institution, prone to divisive and disruptive influences at even the best of times. There is a disturbing tendency for individual, charismatic soldiers to become the centers of movements that resist higher authority for one reason or another, giving rise to conditions that humans would describe as mutinies, and on occasion to outright treachery on or off the battlefield.

Actually, Vargr mutinies are frequently more in the nature of strikes or protest meetings. Good parallels in Terran history would include such incidents as the various army mutinies in the late Republic/early Empire period of Rome, or the Great Mutiny of the British Navy in A.D. 1798. In both cases, these mutinies were characterized by a refusal to continue duty until certain demands were met (often including requests for the replacement of unpopular officers), but no real change in the basic loyalties of the personnel involved. This is generally the case with Vargr army units as well, though incidents in which leaders have acted entirely on their own initiative in mounting a raid or starting a battle, contrary to the plans and instructions of higher military authority, are also quite common. And, on occasions, desertions (even in the midst of a major battle) have been organized by charismatic individuals who sense an

opportunity to gain status by joining the opposition. The worst of these offenses are discouraged by severe penalties exacted against such traitors.

Military organization varies enormously from one group of Vargr to the next. Imperial observers tend to "humanize" Vargr military organizations by applying familiar names to ranks and units, though often the correspondence is stretched rather thin in the process.

Vargr space navies are generally equivalent to the armies as described above. Again, they are generally organized on a strictly local level, led by popular rather than trained officers, and subject to frequent disciplinary problems. There are no specific Marine units in most Vargr states (though a few do maintain them); units of the army are often assigned to shipboard duty directly, with little distinction made for special training or organization.

In addition to the government-employed armed forces, corsair bands continue to flourish throughout the Vargr Extents. Corsairs can grow to wield considerable power (sometimes more than the government), depending on the charisma and prestige of their leadership. By and large, Vargr corsair bands contain integral space transport and skilled combat forces, with experience in all aspects of fighting. They carry out piratical raids on neighbors (both governments and one another), and can also be found hiring out as mercenaries either in whole or in part to raise additional money. Corsair mercenaries frequently hire out at much more reasonable prices than an equivalent human unit would establish, with the stipulation that they be permitted to loot, and retain a certain percentage of the booty thus gained, in the course of the campaign. Vargr mercenary bands sometimes operate within the Imperium, but under rather close scrutiny by Imperial authorities, who prefer not to encourage the kinds of major economic dislocations that result from a policy of widespread, indiscriminate pillaging of this sort.
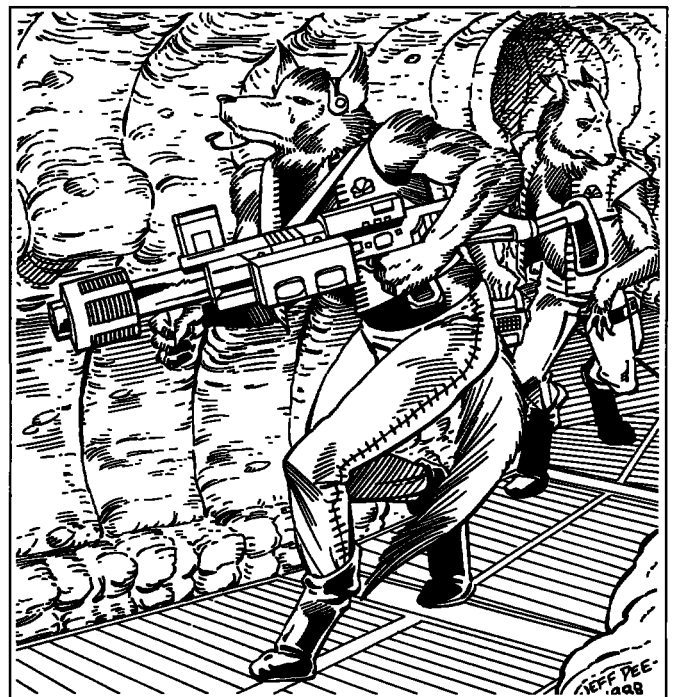
Large-Scale Campaigns

"To begin [playing **Traveller**], start out small, especially if you are also new. Don't try to run something of breathtaking scope the first time out; the record-keeping alone will overwhelm you, and your players will rapidly lose interest."

But now you've played those smaller campaigns. Both you as the referee and your players have learned the basic **Traveller** rules, and they feel comfortable within the game. They're ready for a big challenge, and you want to give it to them.

It isn't easy. Large-scale campaigns have different problems than do smaller gaming sessions, or adventures that begin and end in a few sessions. Record-keeping is one of the biggest headaches in bigger games, but there are other problems, too. They can be handled, and if handled correctly, the results can be engrossing.

If large-scale campaigns are so much work, are they worth the trouble?

Definitely! While shorter "one-shot" adventures are fun, they don't equal the satisfaction you and your players can derive from a well-orchestrated campaign that spans a wider range of space and time in a consistent fashion.

Traveller is a big enough game to keep learning more rules (which are more ways to keep excitement high for the players). The players themselves keep learning, and as they mature in terms of the game, they make the referee's life both easier and more challenging, as he strives to keep them interested and as they think up new responses to scenarios.

And the "real world" keeps growing, providing new ideas for adventures, personalities, and technology.

TRAVELLER MATERIALS

Don't cheat yourself. A wide-ranging campaign is difficult and there is no reason for you to make it harder than it needs to be. Make use of any supporting products you can find If you have plenty of free time, certainly use it to generate rules or background, but don't forget that your own time is valuable If it would be cheaper to buy the supporting material than to do it yourself, then buy it. On the other hand, if you enjoy the die rolling and personal creative activity associated with producing background, don't let the availability of information stop you from rolling up your own personal universe.

If you or a friend can program a computer, let it do much of your generating "grunt work." It's fun to hand generate worlds and characters, of course, but in a large-scale campaign you might need so many that you'll wear all the spots off your dice if you don't have some help. A computer can kick out hundreds of worlds instantly, letting you pick the good ones. Most importantly, this assistance leaves you the time and mental energy to do the real creative work of the campaign, fleshing out the numbers to come up with a consistent world.

HELP FROM YOUR PLAYERS

Nor do you have to do all the work yourself Let your players help out if you are short on time. They can each roll up a world's basic library data stats You can then take up where they leave off to create the bells and whistles that the players will discover only as you lead their characters through the adventure

This method also adds extra color just because your players will do things a little differently than you would have Variety is the spice of life, whether that life is genuine or played in a game Remember that **Traveller** has this solitaire playabili-

ty When the whole group can not get together, you or some of your players can still play the game by doing such things as generating worlds and characters, conducting trade, and designing ships.

A FEW WORDS OF WARNING

I can't tell you how to successfully run a large-scale campaign in five words, but I can tell you how to wreck a large-scale campaign using that many: "Let It Grow Too Fast." Don't lose control of your game. When a player character becomes a sector duke, or when they each have personal Ancient artifacts that disintegrate opponents with a thought, you'll find it harder and harder to think up challenging scenarios.

Keep things a manageable size. Naturally, a large-scale campaign has more in it than a short adventure, but that's no excuse to let things get away from you. Stay on top of the situation with advance organization, and you'll find life a lot simpler.

Take your time in developing your campaign, and you'll find that it grows naturally by itself. Sure, it will need regular watering and fertilizer, but if you're spending all your resources pruning the overgrowth, neither you nor your players will find time to enjoy the game

SIZE AND SPACE

The primary necessity for a large-scale campaign is a large area of space. The easiest way to get this is to pick two locations some distance apart. The first is the beginning and the second is the destination. This seems easy enough, but more important is a motive for the travel between the two locations. There are several approaches that can be used to develop these motives

One of these approaches is the "courier" method. If the characters need to deliver a person or a package to the destination the entire problem is solved. By making sure that there are

plenty of interferences between the two locations, the adventure keeps moving.

A second technique is the "historical" or "tourist" approach. With this method, the referee presents a situation so that the characters are interested in travelling to the destination by virtue of its historical importance.

Since such travel must be made through the Imperium and the chaos of its rebellion, to be a wide-range adventure it is necessary to use a "rebellion" reason for travel, something that involves more than one location. A local affair will not work for this.

Trade: An obvious source of interworld travel is *trade*. If the characters have a ship, you can manipulate the markets in such a way that their most lucrative profits can be made by continuing to travel farther and farther in one direction. This works in a campaign only when there is no hurried timetable that the characters must meet. Trade also has the advantage of providing a means of travel as well as a motive.

The Wheel: A simple way to run a far-ranging campaign is what I call the "wheel method." Start the player characters at a certain world and then let them radiate out into surrounding areas like the spokes of a wheel from a central axle. This allows you the pleasure of developing one world in more detail, since the characters will be returning to it again and again.

Back and Forth: Sometimes twice as much work is easier. That is, when planning a long-range campaign, start it at both ends with two groups of characters (played by the same players, of course). They can work toward each other, meeting in the middle or retracing steps to get back to one of the original endpoints. This has several advantages. One is that the referee can use the two different locations to develop two different types of overall environment and culture, perhaps crossing an Imperial border to get two different "flavors" at the two ends.

■

Don't cheat yourself....Make use of any supporting materials you can find.

■

By playing back and forth between the two locations, this method also gives the referee time to develop more intricate plots at one end while the characters are busy at the other. The players themselves are happy because of the variety of playing multiple characters. At the same time, less experienced players will learn good habits in playing more than one character. One common problem is that newer players have an improper tendency to share possessions between their characters. If the characters are far enough away from each other that they don't even know each other, this possiblity is eliminated.

This technique also makes it easier to use more than one race in the campaign, since different groups of characters at different locations would be more likely to be from different races. It would be easy, for example, to have a campaign span the border between the Imperium and Vargr space. Vargr player characters could start at one location and humans could start at the other.

Very intricate plots can be developed by working both ends

against the middle. It is difficult even for a good referee to think of all the ins and outs of a situation immediately. But if there are "vacations" from the campaign the referee has an opportunity to develop events that will stimulate the players.

Remember that everyone is active, not only the player characters. Political groups will continue to grow (or shrink, as the case may be). Trade will go on. Battles and disagreements will not disappear just because the players are busy with a different part of the campaign. To handle this, keep in mind that absent characters are still active, then think logically what their actions would be. While the player characters battle the intricacies of one adventure, you have time to invent new characters and new situations at another location, giving the illusion that all of these events were preplanned. Small acorns can grow into large oaks this way.

Themes and More Themes: Where can the referee get these themes? The answer is: almost anywhere, as long as he knows how to look. Newspapers are an excellent source. We saw an article once about the problem of space debris becoming a hazard to satellites orbiting the earth. This became the basis of a piece of library data mentioning the destruction of a Vargr vessel that collided with just such debris—just more local color in that case, but it was food for thought for players, reminding them again that **Traveller** was different than their daily lives.

Another article on the possibility of new fruits and vegetables through the use of cloning is clipped and filed away. Some day we will use it in an adventure as flavor. It could end up as a library data entry, or as part of a continuing look at how life at high tech levels is different, by showing such advances in the course of an adventure. Such a description of a product would also add interest to a ship's cargo.

Any newspaper can fill the bill for this purpose, particularly if it is one that your players do not read. Go to the public library and find the *Christian Science Monitor* or the Sunday *New York*
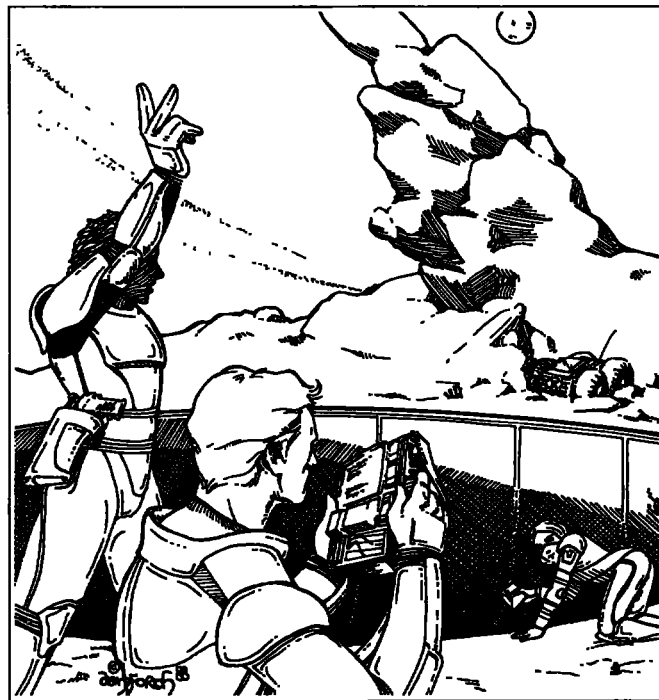
Times (this won't work if you live in New York) or another large newspaper with regular science and human interest sections. Find the science magazines and read them with an eye to how you can use new discoveries in an adventure setting. Almanacs and trivia books can serve the same purpose. Seek and you shall find.

PEOPLE AND OTHER LIVING THINGS

Personalities can make or break a campaign. No, I don't mean the personality of the referee or of the players, I refer to the personalities of the NPCs. If a campaign is wide-ranging, characters will meet more NPCs than otherwise, and this means more work for the referee.

Fortunately, there are ways to make this effort easier and more worthwhile. As discussed before, reuse characters if possible to fit in with the theme of the campaign. Since the player characters are "travellers" by definition of the game, the individuals they meet are more likely to be travellers also.

If your player characters meet a certain trader in a spaceport on Junidy, it should not be too surprising if they see him again at the Regina spaceport. Don't overdo this or you will have an entourage tailing your characters, but an occasional "chance" meeting (you decide if the meeting was really accidental, of course) gives a sense of continuity to the campaign. If your characters go through Vland customs once and must deal with a pesky official, the next time they arrive at Vland, you can use that official again.

MORE NPC ADVICE

Where can you get NPCs and how can you make them seem real to your players? Read a lot. Meet a lot of different people yourself. Learn the diversity present in your fellow man. Then draw upon this well in your campaign. If you have the time and the inclination, take a cultural anthropology class at a local university. Plutarch's *Lives of the Ancient Greeks and Romans* is a beautiful book for different personalities and motivations, and I guarantee you will be able to find it in your library.

One of my favorite techniques for "instant" personalities is to use a real person. When the characters question the clerk of the local TAS hostel, I think of a friend I knew in high school or college, or one of the teachers. I saw these people day in and day out for years, so it's pretty easy to guess their reactions, and to mimic their personality traits. This will take a little practice if you're not used to it, but your players will then always encounter three-dimensional characters instead of cardboard cutouts. Since everyone seems "real," your players won't know which of these encounters is important and which is "just some guy in the starport."

WAKING UP FROM THE BOOKKEEPING NIGHTMARE

How can you best organize all of this material? Get a three-ring binder with divider tabs. Label one tab for each world.

Then put in your information. Create more world detail and put that in the book. Develop important NPCs ahead of time and put them in the book. Maps of the world and its important cities should also go in. If you can, put the gist of the information on a separate page which you can show to the players for library data. They should never see the material straight from your notebook because it contains too much information

for their tender eyes.

If an NPC moves from one world to another, then move the page with his information to that section of the book. Keep a table of contents at the front of the book with each NPC's name in alphabetical order. When you move the pages for that NPC to another world, make sure that you update the table of contents so you can find that information later.

Physically moving these pages automatically makes sure that NPCs are "real." That is, you must not move a page more often than once every week since travel time must be kept in account. When you move a page for a certain date, jot down the details of the trip: time and means of passage, so that you can refer to it later on. In effect, each NPC has his own diary page. If you keep these up to date, when the characters arrive at another world you can flip to that section of the notebook and instantly tell which NPCs they might run across while there.

LIFE AND DEATH

Health in a long-term campaign is an important issue. If a character dies or is otherwise unable to actively participate, another character must be introduced for the player who has lost that character. If you use the wheel method, your players may play several different characters from a particular world (naturally, they play only one in any game session, while their other characters are "busy" with other activities of their own).

In this case, if a character is out of the action, the player can use one of his other characters from the same locale. You as referee must make sure that the introduction of the character to the rest of the group is believable. You cannot just pick up a character and drop him somewhere else. If a player does not have another character already available in the same area, then a new one must be generated, and you must again make sure that the addition of this character into the campaign makes sense.

There are other methods that can be used to help characters continue in the campaign as long as these methods are not overused. If your players enjoy "puzzle" adventures that depend mostly on thought rather than gunplay, then the characters may live a long time without ever finding themselves in life-threatening situations.

This does not mean that you should "make life easy on the players." When combat happens, it happens, and you must not interfere with it when it does. If characters are hurt, they are hurt, and the players can only hope that medical science can bring them back up to full health. If you fudge rolls or give characters rewards that they have not earned, you will find your campaign becoming weaker rather than stronger. Anything worth having is worth waiting for.

In the field of medical science, there are some things that can be done to save a favorite character from the jaws of death. At higher tech levels, doctors can revive "dead" patients in some circumstances, and working toward a successful "rebirth" could form an adventure scenario in itself. Naturally, the player involved would have to run a different character for these sessions.

KEEP IT SMALL

The secret to having a successful wide-range campaign is to not let it grow larger than you can handle it. The key is to start

small. Begin with one or two worlds worked out to some degree of detail. Give your players characters on each of these worlds, then let them loose. If you have not decided on a theme or two you will probably find that your players come up with a few by themselves. A character that steals something precious may be chased halfway across the galaxy. The reoccurrence of his pursuers gives a (pleasant?) feeling of continuity to the campaign, while with each new world reached for refuge, your campaign gets bigger. This step-by-step growth is easy to handle and you are not swamped with work by a sudden deluge of worlds.

If your characters move too fast for you, erect barriers to them. Make sure these barriers are genuine by thinking them up ahead of time. A high-law-level world can help by locking up part of the group. Once thought up, these barriers can be used whenever appropriate—just keep a list of simple ideas in the back of your notebook.

Plots can come from a variety of sources. There are a few books which claim to provide a number of plots or guidelines on how to construct plots One of these books which I have used is *Steal This Plot: A Writer's Guide to Story Structure and Plagiarism*, by June and William Noble, published by Eriksson. It lists a number of possible motives for characters, many of which can be adapted to adventure situations.

WHEELS WITHIN WHEELS

One thing to remember in a large-scale campaign is the tip "wheels within wheels." You should have several plots going at once if only because your characters are playing in several different areas. But you should also see to it that your plots interrelate somehow so that there is a sense of continuity to the campaign.

The simplest way to accomplish this is to think it up later— you should never be in a hurry in a large-scale campaign. When the valuable museum piece is stolen and the characters must look for it, let them spend some time. As the item is moved from world to world, they must chase after it, and in so doing you already have a bigger campaign. Just introduce smaller scenarios on the in-between worlds.

You should have a general idea ahead of time concerning who made off with this thing, but you can change this later as long as it fits with the facts so far. If this is too difficult, but you want to connect the incident to some other group some distance away, let the second group swipe it from the original thieves. Just remember to have a motive.

THE MAGIC QUESTION

Before any NPC does anything important, make sure you can reasonably answer "Why?" Practice this, and you'll soon find yourself with a multitude of usable ideas. In the incident just mentioned, think of five reasons for stealing something before reading on.

Got 'em? Compare yours to mine:
1) the obvious cash value;
2) its religious or cultural importance;
3) desire to get someone else in trouble by leaving false clues that point to them;
4) the item is part of a set, and the thief owns the rest of the set;

5) the museum personnel were rude, and the thief is performing a quick snatch-and-run "revenge."

If yours don't match, then that means you have more than five ideas now, and two or three of them already sound like the basis for a mystery adventure Pick the one you like best, and then leave clues for one of the other motivations. Let your characters loose, and—presto—instant scenario.

Why is it so important to be able to come up with these "instant" scenarios? Because in a large-scale campaign, you need a lot of things going on at once Even if you aren't running a "solve-the-theft" adventure, you can still broadcast the loss over the evening news and leave your players wondering whether it's important or not

RED HERRINGS

These false leads go by the general name of "red herrings." Over the course of time, you'll need hundreds of these in a large-scale campaign. NPCs need interesting motivations; worlds must have their interesting features; events take place. Any of these not directly germane to the main adventure theme is a red herring. The fun of a large-scale campaign is that you and your characters have the time for some real fishing. You'll find that some of these red herrings become important themes that later recur. You don't have to tell the players that this wasn't what you had in mind from the very beginning. Red herrings mislead and misdirect. They become more attractive than the real goal or become confused with the real goal. Best of all, for the imaginative referee, red herrings can be converted to real clues if they are truly more interesting.

YOU'RE ON YOUR OWN

Perhaps you've played **Traveller** for years, and you've run a few big adventures already. If you've read this far, you must have learned something you can inject into your campaign to give it some extra spice.

An essential element of the referee's activities in **MegaTraveller** is mapping. It falls to the referee to know the details of the territories in which his players are adventuring, regardless of whether that territory is a sector, a star system, or a world. Mapping is the way for the referee to maintain information about those territories.

Mapping is also an essential element of the player's activities in **MegaTraveller**. Players need to know where they are, and they need to plan their journeys from one point to the next. The decisions they make are extremely dependent on maps.

Different types of maps are called for by different situations in **MegaTraveller**. Each map presents a specific type of information and makes it possible for players to make specific decisions about their travels. The basic map types to be expected include:
- Sector maps.
- Subsector maps.
- Star system maps.
- World maps
- Continental (or similar scale) maps.
- Local maps.

Each type of map has its own attractions and its own usefulness. All of the map types help an individual referee to better control and coordinate different parts of an adventuring campaign.

SECTOR MAPS

A sector map is a broad planning map which lays out (for easy visual reference) the locations of important worlds and the trade routes that connect them

A sector is an appropriate size of territory for most continuing **MegaTraveller** adventures and campaigns. Its size provides enough worlds for many, many interesting situations without confining the referee or the players. A typical sector is capable of holding the attention of a band of players for many adventures

SUBSECTOR MAPS

At first glance, a subsector map seems to be a recapitulation of a sector map. It shows the same material with only slightly greater resolution. Virtually everything that the subsector map shows is also shown on the sector map. The advantage of the subsector map, however, is *focus*.

The smaller size of the subsector map and its greater concentration on a confined area allows the referee to focus on a restricted number of worlds and on their interactions. With fewer worlds to consider, the referee can spend more time defining their relationships One or two worlds will tend to dominate the small region (due to population, trade classifications, position on the trade routes, or technology level); those dominant worlds become the starting place for a number of adventures into the subsector.

For the players, it becomes easier to focus on having adventures Rather than considering all 400 or more worlds in a sector, their attention is focused on the 40 or so worlds of the single subsector. Using a subsector map is a way for the referee to tell the players (indirectly, of course) that *this* region is where the action is

Subsector Names: Subsectors are named by the in-habitants or the bureaucracy of the larger sector which surrounds them. In addition, subsectors are lettered A to P to show their position within the sector. Either the name or the letter is usually sufficient to identify the subsector.

STAR SYSTEM MAPS

The star system map shows the general relationship of the worlds within a star system to the central star. Because of the size of a star system, the map is necessarily schematic. Its purpose is to show players adventuring in a system what worlds are present and where they are.

Procedure: The black scale bar on the left of the map form is graduated in orbits numbered 0 to 15. For each orbit which has a world present, draw a short line to the right of the graduation and add a dot to show the presence of a world. Leave empty orbits blank

If a second or third star is present in the star system, add it at the appropriate orbit and draw a line from the star's symbol to one of the other black scale bars on the form. Note the worlds orbiting that star on its scale bar.

Satellites of any world can be added by showing small dots around the world dot

Appropriate information about worlds can be written in near each world dot: name, UWP, trade codes, and remarks.

WORLD MAPS

World maps are a convenient way of showing an entire planet or satellite in one presentation. The standard method of rendering world maps in **MegaTraveller** uses a geodesic grid which divides the entire world surface into 20 triangles. Each triangle is divided into 15 full hexagons and 18 half-hexagons; the three points of the triangle each share a pentagon with four other triangles.

The elegance of the geodesic map approach is shown in the

relationship of the triangles and the hexagons. Distance can be traced by counting hexagons (and multiplying the total number of hexes by the hex size in kilometers). When a path moves out of a large triangle, it can be traced into a half-hexagon of the adjacent triangle. Paths can be traced over the poles, along the equator, or by any meandering route. Distances are computed by counting hexagons. Areas can be approximated by also counting hexagons.

It is especially important to notice that the locations where the vertices of the triangles meet are pentagons rather than hexagons. They each have a slice taken out of their area, but each has only five sides.

The Equator: The dashed line through the center of the geodesic map represents the world's equator. In some cases, and for special mapping purposes, the equator marking can be ignored. For example, the poles are normally considered to be in the fractional pentagons at the top and bottom of the map. The poles could be moved to other pentagons in order to better show polar land or sea territory. In that case, the equator would be traced by a strange path through the triangles.

Computing Hex Size: The equator on the map is 35 hexes long. Using the UWP, it is easy to determine the diameter of the world; multiply the diameter of the world by pi (3.14 is a good approximation) to determine the length of the equator; divide the equator length by 35 for the size of each hexagon on the map.

For example, Terra has a UWP of A867A69-F; its diameter digit is 8 and its diameter is 12,800 kilometers. Multiplying its diameter by pi gives an equatorial length of (12,800 × 3 14 =) 40,192 Dividing the equatorial length by 35 produces a hex size of (40,192/35 =) 1148 kilometers. Each hex on a geodesic map used to show Terra would be about 1150 kilometers across.

CONTINENTAL MAPS

The continental map shows a hemisphere of a world—half of the world shown on the world map. Its primary purpose is to allow greater detail to be shown on a restricted area.

In addition, (like the subsector map,) it allows the referee to focus the attention of the players on a specific part of a specific world.

LOCAL MAPS

The local map is provided to allow the referee to map specific locations in great detail. The hexagon grid of the world map and the continental map is repeated on the local map as a very large hexagon which is itself divided into a smaller hexagon pattern. The smaller hexes on the local map are one-tenth the size of the large hexagon; the scale of the small hexes is one-tenth the scale of the large hex. For example, if Terra is mapped on the world map grid, the hex scale is 1150 kilometers per hex; when mapping on the local map, the small hexes are each 115 kilometers across.

The local map can also be used to provide greater detail for other local maps. If a local map has been produced for a specific area at a scale of 115 kilometers per hex, one of those hexes could be mapped in greater detail using a new local map. Since each hex is one-tenth the size of the larger hex, the scale

for this new local map is 11.5 kilometers per hex.

TERRAIN SYMBOLS

Whenever a hex grid is used to map terrain, a variety of symbols are called for. Simple symbols are often self-explanatory: blue shading for water, jagged peaks for mountains, dots for cities, lines for roads. If the symbols are not completely obvious, the map should carry a notation which states the symbol and what it means.

Photocopiable Symbols: Carefully done maps can be works of art, and careful referees pay attention to detail when they prepare their maps. One detail which should always be considered, however, is photocopiability. Some detailed symbols, some colors, and some pencil markings do not copy well on photocopy machines. When symbols and markers are chosen, attention should be paid to whether they will reproduce well since photocopies of maps can be extremely useful to the players in their adventures

PLAYERS AND MAPPING

The responsibility of players in the mapping process is greatly reduced when compared to the responsibility of the referee. **MegaTraveller** is a science-fiction role-playing game, and it must be assumed that the player characters have access to cheap, easily reproduced maps of the territories they are travelling in. A starship will have starcharts of subsectors and sectors, and its sensors can provide a map of any system it enters within a few days at most. Any populated world usually has for sale detailed maps of its surface. A starship's sensors can provide at least a continental outline map of a world it is orbiting.

Unless the player characters are exploring uncharted territory, they should be provided with maps of the regions they are in. The responsibility of the players is to use their maps to decide on what options they have, what course they will take, and how they will prepare for it.

SUBSECTORS WITHIN A SECTOR

A	B	C	D
E	F	G	H
I	J	K	L
M	N	O	P

MAP LEGEND

Starport Type
Bases — Gas Giant
World Type — X-Boat Route
World Name
Travel Zone Code (Red) — No Gas Giant
border — Quantity

WORLD CHARACTERISTICS
● No Water Present
◉ Water Present
⊹ Asteroid Belt

BASES
★ Imperial Naval Base
▲ Imperial Scout Base
* Zhodani Base
● Independent Base
Γ Research Station
★ Scout Way Station
R Imperial Reserve
P Imperial Prison
X Exile Camp

TRAVEL ZONES
— Amber Zone
— Red Zone

POPULATION

Secundus	under one billion
PRIMUS	over one billion

World names in red are subsector capitals

Sector Name

SUBSECTOR GRID

A	B	C	D
E	F	G	H
I	J	K	L
M	N	O	P

Subsector Grid hexes:

0101, 0301, 0501, 0701
0201, 0401, 0601, 0801
0102, 0302, 0502, 0702
0202, 0402, 0602, 0802
0103, 0303, 0503, 0703
0203, 0403, 0603, 0803
0104, 0304, 0504, 0704
0204, 0404, 0604, 0804
0105, 0305, 0505, 0705
0205, 0405, 0605, 0805
0106, 0306, 0506, 0706
0206, 0406, 0606, 0806
0107, 0307, 0507, 0707
0207, 0407, 0607, 0807
0108, 0308, 0508, 0708
0208, 0408, 0608, 0808
0109, 0309, 0509, 0709
0209, 0409, 0609, 0809
0110, 0310, 0510, 0710
0210, 0410, 0610, 0810
0111, 0311, 0511, 0711

SUBSECTOR OF THE SECTOR	
A	I
B	J
C	K
D	L
E	M
F	N
G	O
H	P

SYSTEM MAP

Mainworld Name

System Hex Location

0	0	0
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10
11	11	
12	12	
13	13	
14	14	
15	15	
16	16	
17	17	

ORBITAL DISTANCES

Orbit	AUs	Million Kilometers
0	0.2	29 9
1	0 4	59.8
2	0 7	104.7
3	1.0	149 6
4	1.6	239.3
5	2.8	418.9
6	5.2	777.9
7	10.0	1495.9
8	19.6	2932
9	38.8	5804.
10	77.2	11,548.
11	154.0	23,038.
12	307.6	46,016.
13	614.8	91,972.
14	1229 2	183,885
15	2548 0	367,711
16	4915.6	735,363
17	9830.8	1,470,666.

LOCAL MAP

World Name	UWP	Hex Scale in km	Location
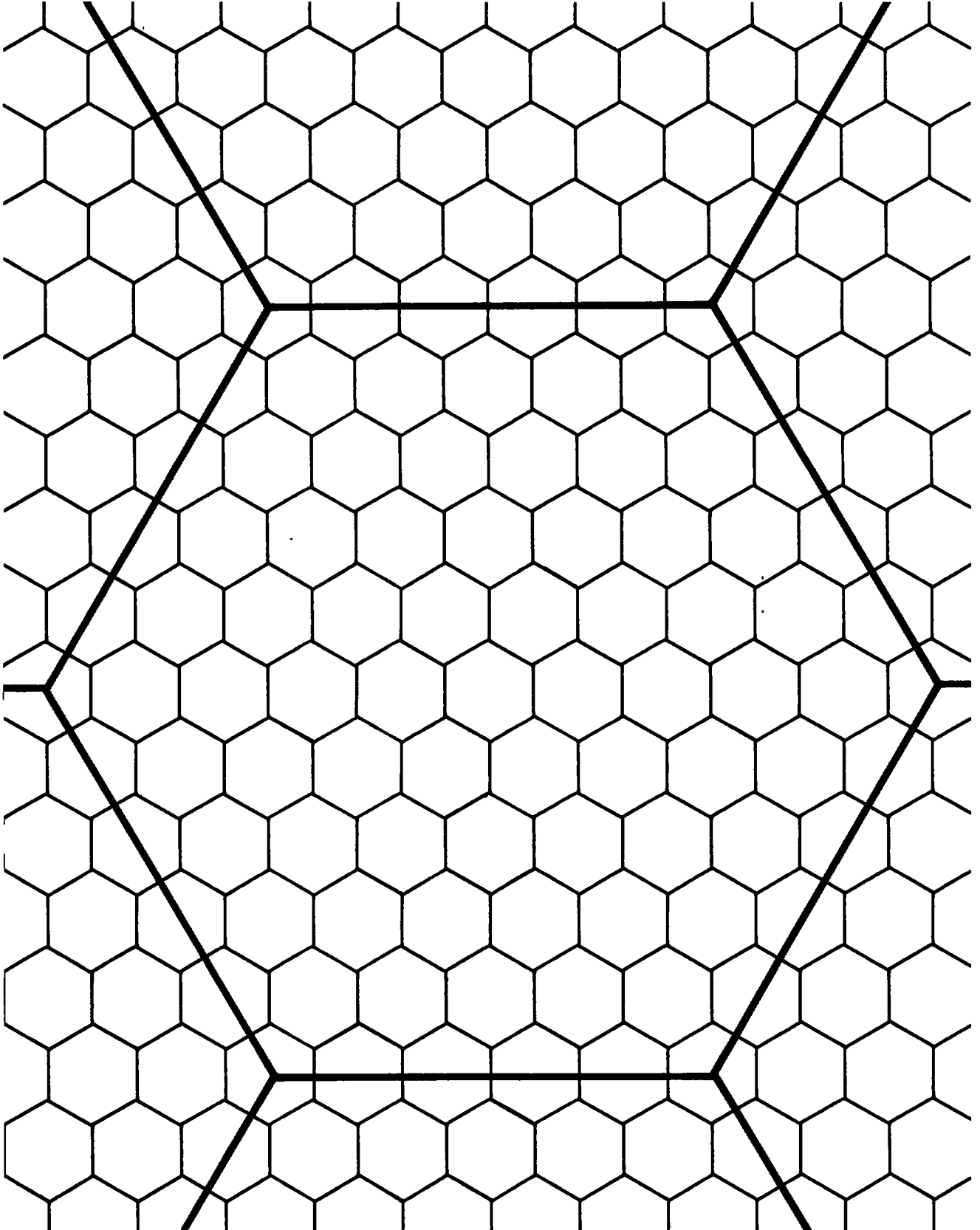
Alien Languages

Regardless of the information conveyed by words in a language, the words themselves (as groupings of sounds) obey certain rules of frequency and pattern. An analysis of this pattern allows words which carry the correct linguistic feel to be generated randomly for use as player and non-player character names, world names, names and descriptive terms applying to equipment, occasional words that are dropped in conversation, and elements which figure prominently in adventure plots.

Languages Covered: Word Generation Tables have been created for Aslan, Droyne, Vargr, Vilani, and Zhodani languages. All of the tables are used in essentially the same way.

WORD GENERATION PROCEDURE

Words in other languages, as in English, have definite letter frequencies and syllable patterns and it is possible to generate words in those languages using their letter frequencies and patterns

Sounds: Sounds in languages may be vowels (simple sounds unimpeded by the mouth, lips, or teeth) or consonants (the alterations to vowels performed by the mouth, lips, or teeth). While a vowel can be spoken without consonants (for example, the vowel o), a consonant cannot be pronounced without a vowel (for example, the consonant m is really pronounced em).

Syllables: Syllables are formed from up to three elements: an initial consonant, a vowel, and a trailing consonant. These three elements can produce up to four types of syllables. vowels (V), initial consonant plus vowel (CV), vowel plus trailing consonant (VC), and initial consonant plus vowel plus trailing consonant (CVC). The frequency with which each type of syllable appears in the language helps determine its character.

The Word Generation Table used 2D6 (of two different colors; here they are described as red and white) to generate words in three steps:

- Determining word length (in number of syllables).
- Determining syllable types (V, VC, CV, or CVC).
- Determining syllable components (consonants and vowels).

Word Length: Words may be any length The table provides for words from one to six syllables long Roll 1D6 for the length of the word in syllables. A referee may instead specify a word length in syllables (common words tend to be shorter; esoteric words tend to be longer)

Syllable Type: For each syllable, the syllable type must be determined from the Basic and Alternate Tables (instructions for when to use each are given beneath the tables).The Basic Table is always used for the word's initial syllable; the Basic and Alternate Tables are used for other syllables, according to the type of syllable which precedes them.

At this point, it is possible to produce a syllable map of the word For example, CVC-VC-V. The English word syllable could be mapped as CVC-V-CV.

Syllable Components: For each component (initial consonant, vowel, and trailing consonant) in each syllable, the

specific sound for that component must be determined from the appropriate table.

An initial consonant is determined from the Initial Consonant column of tables; a vowel is determined from the Vowel column of tables; a trailing consonant is determined from the Final Consonant column of tables.

In each case, select the proper column of tables and throw 1D6: the result shows which of the six tables in the column should be used. Then make two distinct 1D6 throws and compare the results to the rows and columns within the table to determine the specific sound (shown as a letter or combination of letters) which is the specific syllable component required.

The ultimate result of the procedure is a randomly generated word of one or more syllables which can be used as a name or fragment of speech within the selected language.

LANGUAGE NOTES

The following notes indicate some of the distinctive qualities of the various languages addressed.

Anglic: The standard language of the Imperium is Anglic (sometimes called Galanglic, for Galactic Anglic). The language is a derivation of English (liberally spiced with loan words from a variety of languages) disseminated throughout the territory of the Imperium during the Rule of Man.

Aslan: The Aslan, with the exception of a few isolated lost colonies, share a common language and culture. The Aslan call their language *Trokh*.

A single-letter vowel in *Trokh* cannot be followed directly by the same single letter vowel. For example, A followed by A becomes simply A; on the other hand, AE followed by AE becomes AEAE, and even AE followed by EI becomes AEEI. Be sure to understand and make this change when generating Aslan words.

Droyne: Although the many distinct and scattered Droyne worlds each have their own language, they all share a common heritage: their coyn-casting ceremony. As the Droyne ventured into interstellar commerce and met others of their kind, they discovered their common bond, and the fact that the language of the coyn-casting ceremony was the same everywhere. For centuries, outsiders (that is, non-Droyne) were unaware that this common language existed.

The common Droyne language (they call it *Oynprith*) was originally rarely used in public; it had the status of a ritual or

ceremonial language, much like Latin on Terra. Over the past several hundred years, Oynprith has proven especially useful to the Droyne as a language of trade, and it has finally reached the status of the universal Droyne language.

When a vowel letter (even in a dipthong—a multiple letter vowel) follows the same letter, the two letters are combined into just one letter. For example, when O and OY occur in succession, they are combined into OY; on the other hand, when OY and OY occur in succession, they remain OYOY. Be sure to understand and make this change when generating Droyne words.

Vargr: There are hundreds of Vargr languages spoken on the thousands of worlds which have been settled by the Vargr. The most commonly encountered Vargr language in the Domain of Deneb and its neighboring sectors is Gvegh. More than 60 percent of all Vargr in the region speak languages in the Gvegh language group (Gvegh, Gvegh-Aek, Knithnour, Uedhu, and Taeksu). The Vargr Word Generation Table produces Gvegh words.

Vilani: The Ziru Sirka (the Grand Empire of Stars; the First Imperium) was a Vilani Empire and it spoke Vilani. The language lost its primary language status when the empire fell to the Rule of Man; but the language has never completely died out. Large populations on worlds within 10 parsecs of Vland speak Vilani as a primary or secondary language. Many Vilani words and names have been incorporated into Anglic, and Vilani is taught in many schools in order to provide a greater understanding of common word origins.

Vilani is especially important to the Vilani megacorporations (Naasirka, Makhidkarun, and Sharurshid) where it is as widely used as Anglic.

Zhodani: The Zhodani call their language *Zdetl*; the present form of *Zdetl* was formally proclaimed the official language of the Zhodani Consulate on the occasion of the 300th Olympiad. Some dialects of the language exist, but they tend to be the jargon of specific occupations rather than true differences in language.

GENERATING OTHER LANGUAGES

The blank Word Generation Table is provided to assist the referee in producing Word Generation Tables for other major and minor languages throughout the universe. To use the table, the referee selects the sounds (from the Consolidated Sounds List) that he or she considers appropriate for the language and creates a separate list. One list each should be created for initial consonants, vowels, and final consonants. A total of 216 occurrences for each separate list is required; specific sounds may repeat some or many times. The sounds are then entered in a photocopy of the blank Word Generation Table, which can be used with the standard procedures.

USING THE TABLES

The Word Generation Tables can be used to produce a variety of interesting words A few options include:

Place Names: Used to convey local atmosphere and flavor.
Personal Names: Used to show a character's alien nature.
Enigmas: Used in passing where they can be overheard and acted upon by the player characters: "Beware of the Achtiabr."

AN AID TO THE IMAGINATION

If standard English sound frequencies were inserted into the Word Generation Table, the table would produce many nonsense words and an occasional true English word. The Word Generation Tables work the same way in other languages: They produce many nonsense words and a few gems. The tables are intended as a convenience to the referee, to relieve him of the tedium of rote (no one likes to make up 100 random words without some help or inspiration). The referee then uses his or her imagination to see and choose the intriguing and interesting words.
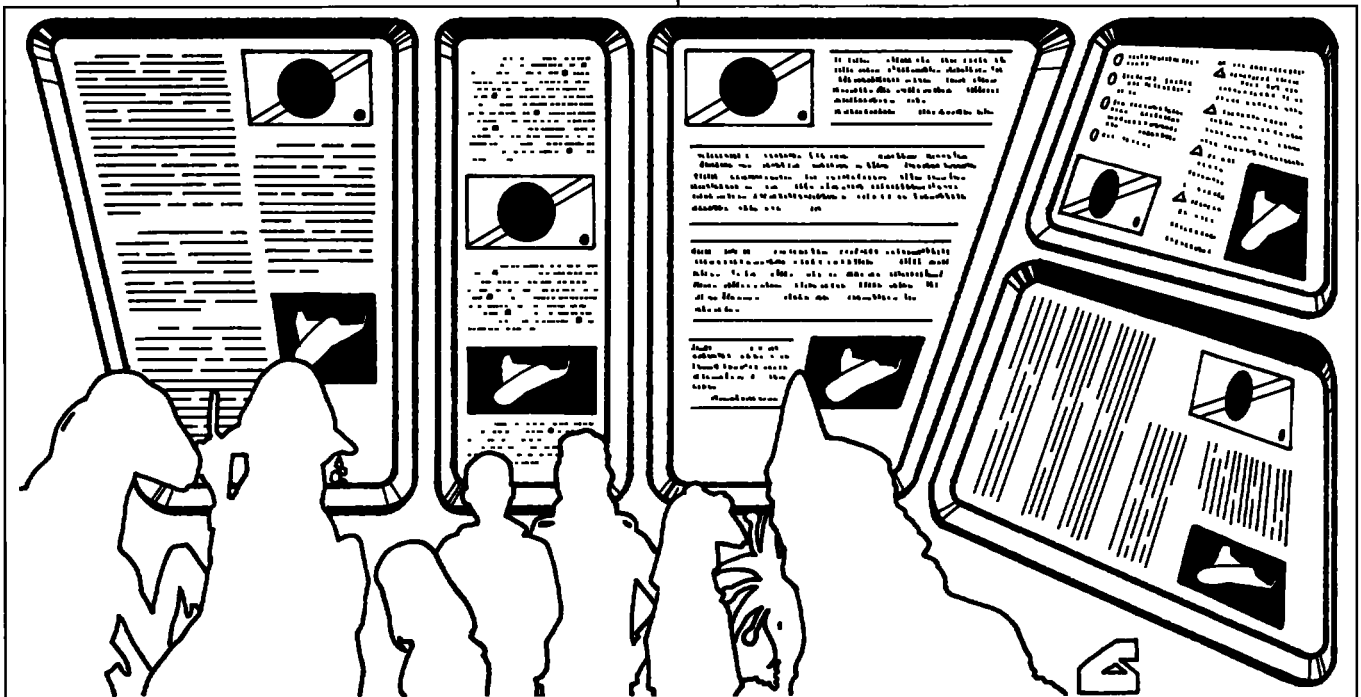
VILANI WORD GENERATION

Red Basic —— White Die ——

Die	1	2	3	4	5	6
1	V	V	V	V	V	V
2	CV	CV	CV	CV	CV	CV
3	CV	CV	CV	CV	CV	CV
4	CV	CV	CV	VC	VC	VC
5	VC	VC	VC	VC	VC	CVC
6	CVC	CVC	CVC	CVC	CVC	CVC

VILANI WORD GENERATION

1 Determine word length (1D syllables)
2 Determine syllable structure Use the **Basic** syllable type table if first syllable in word, or if otherwise instructed Otherwise, use the **Alternate** syllable type table.
3 Determine initial consonants from column 1, vowels from column 2; final consonants from column 3

Red Alternate —— White Die ——

Die	1	2	3	4	5	6
1	CV	CV	CV	CV	CV	CV
2	CV	CV	CV	CV	CV	CV
3	CV	CV	CV	CV	CV	CV
4	CV	CV	CV	CVC	CVC	CVC
5	CVC	CVC	CVC	CVC	CVC	CVC
6	CVC	CVC	CVC	CVC	CVC	CVC

INITIAL CONSONANT

1

	1	2	3	4	5	6
1	K	K	K	K	K	K
2	K	K	K	K	K	K
3	K	K	K	K	K	K
4	K	K	K	K	K	K
5	K	K	K	K	K	K
6	K	K	K	K	K	K

2

	1	2	3	4	5	6
1	K	K	K	G	G	G
2	G	G	G	G	G	G
3	G	G	G	G	G	G
4	G	G	G	G	G	G
5	G	G	G	G	G	G
6	G	G	G	G	G	G

3

	1	2	3	4	5	6
1	G	G	G	G	G	G
2	M	M	M	M	M	M
3	M	M	M	M	M	M
4	M	M	M	M	M	M
5	M	M	M	D	D	D
6	D	D	D	D	D	D

4

	1	2	3	4	5	6
1	D	D	D	D	D	D
2	D	D	D	D	D	D
3	L	L	L	L	L	L
4	L	L	L	L	L	L
5	L	L	L	L	L	L
6	L	L	L	SH	SH	SH

5

	1	2	3	4	5	6
1	SH	SH	SH	SH	SH	SH
2	SH	SH	SH	SH	SH	SH
3	SH	SH	SH	SH	SH	SH
4	KH	KH	KH	KH	KH	KH
5	KH	KH	KH	KH	KH	KH
6	KH	KH	KH	KH	KH	KH

6

	1	2	3	4	5	6
1	N	N	N	N	N	N
2	N	N	N	N	S	S
3	S	S	S	S	S	S
4	S	S	P	P	P	P
5	B	B	B	B	Z	Z
6	Z	Z	R	R	R	R

VOWEL

1

	1	2	3	4	5	6
1	A	A	A	A	A	A
2	A	A	A	A	A	A
3	A	A	A	A	A	A
4	A	A	A	A	A	A
5	A	A	A	A	A	A
6	A	A	A	A	A	A

2

	1	2	3	4	5	6
1	A	A	A	A	A	A
2	A	A	A	A	A	A
3	A	A	A	A	A	A
4	A	A	A	A	A	A
5	A	A	A	A	A	A
6	A	E	E	E	E	E

3

	1	2	3	4	5	6
1	E	E	E	E	E	E
2	E	E	E	E	E	E
3	I	I	I	I	I	I
4	I	I	I	I	I	I
5	I	I	I	I	I	I
6	I	I	I	I	I	I

4

	1	2	3	4	5	6
1	I	I	I	I	I	I
2	I	I	I	I	I	I
3	I	I	I	I	I	I
4	I	I	I	I	I	I
5	I	I	I	I	I	I
6	I	I	I	I	I	U

5

	1	2	3	4	5	6
1	U	U	U	U	U	U
2	U	U	U	U	U	U
3	U	U	U	U	U	U
4	U	U	U	U	U	U
5	U	U	U	U	U	U
6	U	U	U	U	U	U

6

	1	2	3	4	5	6
1	U	U	U	U	AA	AA
2	AA	AA	AA	AA	AA	AA
3	II	II	II	II	II	II
4	II	II	II	II	II	II
5	II	II	II	II	UU	UU
6	UU	UU	UU	UU	UU	UU

FINAL CONSONANT

1

	1	2	3	4	5	6
1	R	R	R	R	R	R
2	R	R	R	R	R	R
3	R	R	R	R	R	R
4	R	R	R	R	R	R
5	R	R	R	R	R	R
6	R	R	R	R	R	R

2

	1	2	3	4	5	6
1	R	R	R	R	R	R
2	R	R	R	R	R	R
3	R	R	R	R	R	R
4	R	R	R	R	R	R
5	R	R	R	R	R	R
6	R	R	R	R	R	R

3

	1	2	3	4	5	6
1	R	R	R	R	N	N
2	N	N	N	N	N	N
3	N	N	N	N	N	N
4	N	N	N	N	N	N
5	N	N	N	N	N	M
6	M	M	M	M	M	M

4

	1	2	3	4	5	6
1	M	M	M	M	M	M
2	M	M	M	M	M	M
3	M	M	M	M	M	M
4	M	M	M	M	M	M
5	M	M	M	M	M	M
6	M	SH	SH	SH	SH	SH

5

	1	2	3	4	5	6
1	SH	SH	SH	SH	SH	SH
2	SH	SH	SH	SH	SH	SH
3	SH	SH	SH	SH	SH	SH
4	SH	SH	SH	G	G	G
5	G	G	G	G	G	G
6	G	G	G	G	S	S

6

	1	2	3	4	5	6
1	S	S	S	S	S	S
2	S	S	S	S	S	D
3	D	D	D	D	D	D
4	D	D	D	D	D	D
5	P	P	P	P	P	P
6	K	K	K	K	K	K

ASLAN WORD GENERATION

Red Basic — White Die —

Die	1	2	3	4	5	6
1	V	V	V	V	V	V
2	V	V	V	V	V	V
3	V	CV	CV	CV	CV	CV
4	CV	CV	CV	VC	VC	VC
5	VC	VC	VC	VC	VC	VC
6	CVC	CVC	CVC	CVC	CVC	CVC

For initial syllables, or after CV or V

1 Determine word length (1D syllables)
2 Determine syllable structure. Use the Basic syllable type table if first syllable in word or if previous syllable ended in a vowel. Otherwise use the Alternate syllable type table.
3 Determine initial consonants from column 1 vowels from column 2 final consonants from column 3

Red Alternate — White Die —

Die	1	2	3	4	5	6
1	V	V	V	V	V	V
2	V	V	V	V	V	V
3	V	V	VC	VC	VC	VC
4	VC	VC	VC	VC	VC	VC
5	VC	VC	VC	VC	VC	VC
6	CVC	CVC	CVC	CVC	CVC	CVC

For syllables after VC or CVC

DROYNE WORD GENERATION

Red Basic___ White Die___

Die	1	2	3	4	5	6
1	V	V	V	V	V	V
2	CV	CV	CV	CV	CV	CV
3	CV	CV	CV	CV	CV	CV
4	VC	VC	VC	VC	VC	VC
5	VC	VC	VC	VC	VC	VC
6	CVC	CVC	CVC	CVC	CVC	CVC

For most syllables, or after CV or V

1 Determine word length (1D syllables)
2 Determine syllable structure. Use the Basic syllable type table if first syllable in word or if previous syllable ended in a vowel. Otherwise use the Alternate syllable type table.
3 Determine initial consonants from column 1 vowels from column 2 final consonants from column 3

Red Alternate _ White Die _

Die	1	2	3	4	5	6
1	V	V	V	V	V	V
2	CV	CV	CV	CV	CV	CV
3	VC	VC	VC	VC	VC	VC
4	CVC	CVC	CVC	CVC	CVC	CVC
5	CVC	CVC	CVC	CVC	CVC	CVC
6	CVC	CVC	CVC	CVC	CVC	CVC

For syllables after VC or CVC

VARGR WORD GENERATION

Red Basic — White Die —

Die	1	2	3	4	5	6
1	V	V	V	V	VC	VC
2	VC	VC	VC	VC	VC	VC
3	VC	VC	VC	VC	VC	VC
4	CV	CV	CV	CV	CVC	CVC
5	CVC	CVC	CVC	CVC	CVC	CVC
6	CVC	CVC	CVC	CVC	CVC	CVC

For initial syllables, or after VC or CVC

1 Determine word length (1D syllables)
2 Determine syllable structure. Use the Basic syllable type table if first syllable in word or if previous syllable ended in a vowel. Otherwise use the Alternate syllable type table.
3 Determine initial consonants from column 1 vowels from column 2 final consonants from column 3

Red Alternate — White Die —

Die	1	2	3	4	5	6
1	CV	CV	CV	CV	CV	CV
2	CV	CV	CV	CV	CV	CV
3	CV	CV	CV	CV	CV	CV
4	CVC	CVC	CVC	CVC	CVC	CVC
5	CVC	CVC	CVC	CVC	CVC	CVC
6	CVC	CVC	CVC	CVC	CVC	CVC

For syllables after V or CV

ZHODANI WORD GENERATION

Red Basic — White Die —

Die	1	2	3	4	5	6
1	V	V	V	CV	CV	V
2	VC	VC	VC	VC	VC	VC
3	VC	VC	VC	VC	VC	VC
4	CVC	CVC	CVC	CVC	CVC	CVC
5	CVC	CVC	CVC	CVC	CVC	CVC
6	CVC	CVC	CVC	CVC	CVC	CVC

For initial syllables, or after CV or V

1 Determine word length (1D syllables)
2 Determine syllable structure. Use the Basic syllable type table if first syllable in word or if previous syllable ended in a vowel. Otherwise use the Alternate syllable type table.
3 Determine initial consonants from column 1 vowels from column 2 final consonants from column 3

Red Alternate — White Die —

Die	1	2	3	4	5	6
1	V	V	V	V	V	V
2	CV	CV	CV	CV	CV	CV
3	CV	CV	VC	VC	VC	VC
4	CVC	CVC	CVC	CVC	CVC	CVC
5	CVC	CVC	CVC	CVC	CVC	CVC
6	CVC	CVC	CVC	CVC	CVC	CVC

For syllables after VC or CVC

[The page contains extensive dice-roll lookup tables for Initial Consonant, Vowel, and Final Consonant generation for Aslan, Droyne, Vargr, and Zhodani languages. Each table is a 6×6 grid of letter combinations indexed by red die (rows 1–6) and white die (columns 1–6), grouped into blocks numbered 1 through 6.]

SOUNDS LIST

The Consolidated Sounds List shows the approximate pronunciations of the sounds shown in the Word Generation Tables. Individuals should keep in mind that the sounds are approximations. In some cases, different sound symbols are shown for the same sound approximations; in such cases, they are identified for the languages to which they apply.

The Word Generation Tables and the Consolidated Sounds List show sounds in Anglic. The individual languages use their own symbols and alphabets (sometimes more than one alphabet) to represent the sounds shown. In many cases, a language alphabet may have one symbol for a sound represented by several Anglic letters here, or it may represent the sound by a grouping of two or more letters.

CONSOLIDATED SOUNDS LIST
(Aslan, Droyne, Vargr, Vilani, Zhodani)

INITIAL CONSONANTS

Symbol	Pronounced	Symbol	Pronounced
B	bee	N	name
BL	blade	NG	thing
BR	bright	P	poor
CH	chest	PL	play
CHT	watched	PR	prey
D	doll	Q	king
DH	this	QL	cling
DL	paddle	QR	crown
DR	drain	R	run
DZ	suds	RR	perro (trilled)
F	fang	S	sun
F	like whew (Aslan)	SH	shield
		SHT	Ishtar
FL	flood	SS	hiss
FR	frown	ST	stop
FT	rift	T	ton
G	gang	TH	think
GH	ach (voiced)	TL	Tlaloc (Aztec)
GN	hag night	TR	trip
GV	hag view	TS	tsar
GZ	hag zebra	TW	twin
H	hit	V	vine
HF	hfang	VL	Vland
HK	hkang	VR	vroom
HL	hlang	W	win
HR	hrang	Y	yellow
HT	htang	Z	zebra
HW	what	ZD	mazda
J	joy	ZH	measure
JD	charged	ZHD	—
K	kite		
KF	lock fist		
KH	ach (German)		
KHT	Nachte (German)		
KL	heckle		
KN	lock night		
KR	crown		
KS	locks		
KT	locked		
L	long		
LL	miller		
M	more		

VOWELS

Symbol	Pronounced
A	lock
AE	kite
AI	kite (Aslan)
AO	Mao (Chinese)
AU	house
AY	lake
E	men
EA	(separately)
EI	bay
I	kit
IA	yank
IE	layer
IY	feet
O	on
O	go (Droyne)
OA	(separately)
OE	doe
OI	noise
OU	loud
OU	(separately) (Aslan)
OY	ahoy
U	fun
U	lute (Aslan)
UA	(separately)
UE	feud
UI	(separately)
R	Przemysl
YA	yard
YO	yo-yo
YU	feud

FINAL CONSONANTS

Symbol	Pronounced	Symbol	Pronounced
B	crab	NT	cant
BL	able	NTS	cants
BR	labor	NZ	lens
CH	which	NZH	n + zh
D	had	P	cap
DH	with	PL	apple
DL	paddle	PR	tapper
DR	badder	Q	pick
DZ	sudz	QL	pickle
F	cliff	QR	picker
FL	waffle	R	her
FR	afraid	RD	card
FT	rift	RF	wharf
G	hog	RK	work
GH	ach (voiced)	RL	curl
GHZ	ach zebra	RM	worm
GZ	hog zebra	RN	worn
H	how	RP	warp
J	age	RR	perro (trilled)
K	pick	RRG	rr + g
KH	loch (Scottish)	RRGH	rr + gh
KHS	ach so	RS	cars
KL	pickle	RT	wart
KR	cracker	RV	Harvard
KS	locks	RZ	car zebra
L	doll	S	vase
LB	call back	S	hiss (Aslan)
LD	held	SH	wish
LK	milk	SK	disk
LL	miller	SS	hiss
LM	helmet	ST	list
LN	call now	T	hit
LP	help	TH	with
LR	all right	TS	hits
LS	calls	TL	Tlaloc (Aztec)
LT	hilt	V	have
M	dam	VL	Vland
N	can	VR	vroom
NCH	branch	W	wow
NG	thing	X	ax
NJ	ninja	Z	fez
NS	cans	ZH	measure
NSH	n + sh	'	(glottal stop)

MEGATRAVELLER™

REFEREE'S COMPANION

Expand the rebellious universe of **MegaTraveller** with more rules, background, information, and materials for the dedicated referee. Materials that simply would not fit into the grand, three-volume **MegaTraveller** rules set have been brought together into one volume as the **MegaTraveller Referee's Companion**. This compendium helps provide detail to science-fiction campaigns, adds scope to **MegaTraveller** projects, and sparks interest in any adventure. The **MegaTraveller Referee's Companion** includes:

● **The Alien Races.** Coverage of the major alien races that travellers are bound to meet: the fierce warrior Aslan; the psionic Zhodani; the fragmented, canine Vargr; and the puzzling Droyne. Essays deal with the races' homeworlds, physical appearance and abilities, mental make-up, and interstellar territories. Coverage of their histories helps referees understand their backgrounds, making it easier to use alien individuals as non-player characters. Tables for word generation in alien languages make it possible for referees to add spice and mystery to everyday activities, and glossaries provide translations for known words in the alien languages.

● **Large-Scale Combat.** Rules for a simple system of converting characters into conglomerate units, resolving battles between those larger units, and reconverting the units back into individual characters. The system makes large-scale battles possible, without losing the detail of individual player characters.

● **Timekeeping.** A simple, direct system of tracking time for adventurers using the Imperial Calendar. Use it to make the proper date always available. Plus, details on alien timekeeping systems for when the adventure strays into foreign territory.

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● **In-System Operations.** Details of what a starship is expected to do, and how it does it as the ship moves from jump point to a world and back again.

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● **Megacorporations.** Names, ownerships, and commercial interests of the 13 star-spanning Imperial megacorporations.

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MegaTraveller Referee's Companion. Intended for **MegaTraveller** referees. Intermediate complexity. Requires use of the **MegaTraveller Referee's Manual** and the **MegaTraveller Players' Manual.**

Design: Marc W. Miller

Our 15th Year

GDW