Starship Design and Construction

Starships are designed and constructed for specific missions: naval, exploratory, trade, research. The process of design and construction (Naval Architecture) carries the architect through a series of steps which identify ship component requirements and address them.

Ship design is a continuous feedback process: each step seems to mandate changes in what had been decided before. Eventually, however, the ship design appears complete and can be finalized with a ship name.

ACS ADVENTURE CLASS SHIPS

Adventure Class ships are starships and spacecraft suitable for use by groups of player characters. The ships are large enough to carry profitable cargos but small enough that the activities of the individual characters matter.

Tonnages. Adventure Class Ships are built using standard hulls between 100 tons and 2400 ton displacement.

Ships smaller than 100 tons are Small Craft; ships larger than 2400 tons are BCS Battle Class Ships.

Drag And Drop Components. The components for ACS ships are standardized for selection from tables (as opposed to created by formulas or percentages as in BCS ships).

THE NAVAL ARCHITECTURE PROCESS

Starships are designed based on a mission: the specific need for the ship, whether it be commercial, military, scientific, or recreational.

Designed in Tons. Ships are designed in Tons which then easily translate into deck plan squares and into volumetric cubes.

Costs in MegaCredits. Ship component costs are expressed in MegaCredits, Design decisions with considerably smaller costs (the fabrics for interior upholstery) are ignored.

An Interactive Process. The design charts are an interactive process: changing one parameter may require other changes throughout the design.

The process also interacts with other systems within **Traveller:** the combat system, the trade system, and various environmental details may influence the system.

THE COMPONENTS OF A STARSHIP

A starship consists of a variety of components, each with its own particular benefit and requirements.

The Hull. The starship hull is the container into which all other components must be fitted. The hull has a size (in tons) and is further defined by its Configuration (shape and streamlining).

Drives. Every ship has a variety of drives providing power and the ability to move both between planets and between star systems.

Sensors. Each ship has a set of technological eyes and ears for exploring systems and detecting other ships.

Weapons. Ships may be armed for their own protection and to accomplish their missions.

Defenses. Ships may be equipped with a variety of defensive capabilities.

Armor. Even unarmed ships may be equipped with armor to protect them against attack, and against their environment.

Vehicles and Small Craft. It is inefficient for ships to travel to every possible destination within a system; they carry vehicles and small craft to carry crew on excursions and expeditions.

Computers. Ships cannot fulfill all their functions if crew were required to manage each set of controls constantly; each ship is equipped with a set of computers to handle the detail, tedium, and complexity of ship operation.

Software. The computers on a ship require software to actually perform the required functions.

Quarters. The crew and passengers on a ship require living and recreational accommodations.

Fittings. Miscellaneous details of ship operation must be handled with various fittings to allow landing and improve performance.

Describing A Ship

The goal of Naval Architecture is the creation of a starship which can be described by:

The Quick Ship Profile QSP. A short coded description of the mission and capabilities of the ship. The QSP may be elaborated upon by the Crew Extension (detailed the various crew members for the ship) and the Vehicle Extension (detailing the vehicles and small craft carried by the ship).

The ShipSheet. A form showing the components of the ship and which is used to record malfunctions or battle damage.

The FillForm. A form used to record the components as they are assigned to the ship.

DESIGNING A SHIP

The Design Charts 01 to 16 manage the Naval Architecture Process. Begin with Chart 01 (and its Checklist) and proceed through the process.

Ship Design Tech Levels. Ship design is based on common Tech Levels across most of interstellar society; the usual maximum is TL 15.

It is possible to encounter worlds with Tech Levels as high as 21; encountering such a world is an opportunity to acquire higher TL equipment.

01 THE CHECKLIST

The Starship Design Checklist provides an overview of the charts managing ship design.

Arv Dinsha is designing a Scout Ship. His decisions will illuminate the design process as it proceeds.

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02 THE FILLFORM

The Starship FillForm is the document which records the details of every component as it is chosen. The goal is a completed Fillform in which the total component tonnages fits into the hull and the costs do not exceed the ship budget (if any).

Ship Data. Information about the ship, including name, its home port, and its mission may be deferred until the design is complete.

Building Shipyard. Ships are built at Shipyards. The capabilities of the shipyard constrain the design decisions for ship construction.

The most important constraint is the shipyard Tech Level. Components for the ship are available at or less than the shipyard TL.

The FillForm Sections

The Fillform is divided into sections corresponding to each of the Design Charts. They may be completed in any order, but many of the sections depend on others, making the design process highly interactive.

Arv Dinsha will have his ship built at the General Shipyard at Regina A788899-C. The Tech Level of the ship will be C = 12.

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03 STARSHIP MISSIONS

Select the intended mission for the starship. This selection may be revisited based on the final results of the design.

Arv Dinsha has selected the mission for his ship as Type S Scout/Courier.

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04 THE HULL

The foundation of the starship is the hull. Select a hull of appropriate tonnage and configuration. The challenge is to fit all of the desired components into the selected hull.

Configuration. Select a Configuration. Configuration determines many of the capabilities of the ship, including the ability to enter atmosphere.

Jump Readiness. Determine whether the ship's interstellar drive uses a jump bubble or a jump grid.

Configuration and Jump Readiness both play roles in the creation of the Hit Table later in this process.

The Bridge

Select the Bridge to install on the ship. The Bridge must be large enough to hold the command crew, sensors, and Ship's Computer.

Half of the Bridge tonnage must remain empty (for crew positions). The remaining half must be sufficient to hold a one-ton console for each installed sensor, and to hold the Ship's Computer.

Arv Dinsha selects a 100-ton hull. He wants to be able to enter atmospheres, but remain cost effective.

He selects Configuration-S Streamlined.

He selects Jump Readiness= Jump Bubble. This will require that he place Drives at Hit Location 0.

He selects the minimum available Half Bridge B1.

Hull-A Config-S = MCr3

Half Bridge B1 = MCr1, 10 tons.

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05 DRIVES AND POWER PLANTS

Starship Hulls are just immobile shells unless they have proper drives.

Select an Interstellar (Jump) Drive.

Select an Interplanetary (Maneuver) Drive. In light of technology restrictions, a Gravitic Drive may be a better choice.

Select a Power Plant.

Drive Potential

Each Drive and Power Plant interacts with the Hull to process a Drive Potential Number which then dictates Drive Performance.

The Drive Potential for the Power Plant must equal or exceed the Drive Potential for the Jump Drive and for the Maneuver Drive.

Tech Level Restrictions. Drives availability is governed by Tech Level.

Arv Dinsha wants a high Jump capability. He reviews the Drive Potential Table and selects Jump-B; it has Drive Potential 4 (thus Jump-4) when installed in a Hull-A. The Power Plant needs to be at least Drive Potential-4 so he selects PPlant-B. Finally, he selects Maneuver-Drive-B.

But there's a potential problem. He consults Drive TL Two, which shows a PPlant-B in this hull is TL 11; an M-Drive is TL 9; and a J-Drive-B is TL 13.

He buys the Early Jump-B (one TL lower; QREBS 1 of 5; double cost). He could have selected J-Drive-A, but he wants the greater jump distance.

Jump Drive-B. MCr30. 15 tons.

Maneuver Drive-B. MCr6. 3 tons.

Power Plant-B. MCr

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06 SENSORS

Select Sensors for the ship.

The number of available sensors is limited to the number of sensor consoles on the Bridge.

One option is to select a standard pre-designed Sensor Package.

Arv selects the Standard TL-12 Sensor Package. It requires three sensor consoles on the Bridge, but no additional tonnage.

A specific sensor can be designed.

Arv wants a Densitometer. His ship is TL 12. He selects Densitometer-10. The Stage Effects table shows he can upgrade it to Improved or Advanced, and the World Sensor Range Effects table shows he can increase its Range. He elects a bit of both: he increases Range from R=7 to R=8, and he selects the Improved Model. He keeps it as a Surface installation. His Densitometer is:

Imp Orbit Surf Densitomer-12

07 WEAPONS

Select the weapons for the ship. Since hulls have one weapons Hardpoint per 100 tons, this 100-ton hull has one Hardpoint and allows the installation of one weapon mount.

The options available for low tonnage hulls are few. Arv selects the Advanced Triple Turret Y hybrid mounting one each of L Beam Laser, S Sandcaster, and M Missile Launcher.

08 DEFENSES

Select defenses for the ship.

Although Arv will install Armor, he elects not to install any specific defenses (although the Sandcaster in his turret has some defensive capability).

09 ARMOR

Install Armor on the ship. Designate the first layer of Armor (which has no additional cost).

Armor can be installed in layers. Armor layers need not be all the same type.

Arv analyzes the available options at Tech Level. He selects the standard Charged-6 and installs two layers.

10 VEHICLES

Determine if the ship will carry any vehicles and how they will be transported.

Arv wants to carry a 4-ton Grav Flyer. For convenience and maximum flexibility, he installs 4 tons of cargo space to hold it.

11 COMPUTER

Determine the size and model of the Ship's Computer.

Arv analyzes the ship design to this point. Each Major Component has a Local Computer (= J-Drive, M-Drive, P-Plant), as does the weaponry (= Turret) and three Sensors (= Comm, Visor, Scanner). There are seven Local Model/2 computers distributed throughout the ship. For the Ship's Computer he selects another Model/2 and installs it in one of the two empty consoles on the Bridge.

It's a standard Imperial model with Architecture-4.

12 SOFTWARE

Select and install software for the ship.

Each Local and Ship's Computer requires a System process.

Each Local Computer requires an appropriate Component Process.

Finally, Service Processes must be selected and installed.

Arv installs Console XP in each Computer. It's cheap and fulfills his basic needs. The Local Computers come with the appropriate Component Processes; he leaves them as is.

He has seven Model/2 Local Computers, each with a System process and a Component process and two free cells. His Ship's Computer has three free cells, for a total 17 free cells.

He selects a variety of Service Processes: Life Support, Astrogation (he'll need that!), Medical, Entertainment, Maintenance, Damage Control, Accounting, Security, and Library Data, for a total of seven Service Processes. Since they won't all fit into the Ship's Computer, he distributes them one to each Local Computer.

Each of the Local Computers will be sluggish.

Processes in a Computer may provide it with the ability to resolve Tasks on its own.

13 QUARTERS

Determine the crew requirements for the ship and install quarters for them.

Arv's small ship requires a Pilot, and Astrogator, and an Engineer. He anticipates carrying more people at times, so he allocates tonnage for 8 people ((at 4 tons each = 32 tons). He allocates half the tonnage as staterooms and half as common areas.

14 FITTINGS

Allocate fittings for the ship.

Configuration-S provides Lifters and Landing legs automatically. Arv makes no changes.

Arv selects Flotation Hull.

Arv intends to venture beyond the borders of civilization; he selects Fuel Scoops and Fuel Purifier.

Arv notes the fuel tankage for the ship.

15 QUICK SHIP PROFILE

Create the Quick Ship Profile for basic identification of the ship's capabilities.

If the ship carries any vehicles, create a Vehicle Extension.

Create the Crew Extension to identify the required crew members.

16 THE SHIPSHEET

Create the ShipSheet for this ship. The ShipSheet records the location of the Major Components for use in combat or malfunction situations.