STARFLEET

PROMETHEUS CLASS STARSHIP

TECHNICAL MANUAL

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STARFLEET COMMAND

UNITED FEDERATION OF PLANETS

FEDERATION CLASSIFIED

STARFLEET COMMAND

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About this Document

This document was created to provide fans of the Star Trek franchise a detailed technical insight into the Prometheus class starships in the Star Trek universe. It is purely fanfiction. The majority of details in this document are purely fiction of the author.

Class Introduction

Mission Objectives

By Order of the United Federation of Planets Starfleet has been tasked with a variety of missions and services for the security and wellbeing of its citizen and other lifeforms at large.

The Prometheus class represents Starfleet's continued effort to satisfy the increased demand of the growing Federation for security. The Prometheus has been designed and tasked to defensive, and tactical missions.

Pursuant to Starfleet Exploration and Perimeter Defense Directive, and Federation Security Council General Policy, the following objectives have been established for a Prometheus-class Starship:

1. Perform security and tactical missions.
2. Incorporate recent advancements and improved weaponry.
3. Easy and fast to build.
4. Easy to maintain and repaired for a small crew.

To execute these objectives, the Starfleet Spacecraft Design Advisory Commission recommended to the Advanced Starship Design Bureau (ASDB) Development team on Antares IV, to meet or exceed design goals in the following categories:

Propulsion

- Sustainable cruise velocity in excess of Warp Factor 9.0
- Fifth-phase dilithium controlled matter/antimatter reaction primary power system
- The impulse propulsion systems (IPS) is to be simplified and minimized for easy maintenance, replacement, and production while retaining or exceeding in relative performance. The IPS is to provide sublight propulsion up to and including 0.92 light speed (c) with integrated subspace driver accelerators. All reactor modules to be field-replaceable.

Mission

- Sufficient sensory capacity to conduct minimum scientific research.
- Deter threat forces

Design Life

- Spaceframe design life of approximately 100 years for an expected service life of 60 years with service life allowance of 20 percent. Major system overhaul or replacement is expected to be done for every 20 years. Continued upgrades are to be within intervals of 5 years.

General Overview

Since the past century Federation starships have been designed to be able to separate in dire situations. Usually the saucer, the main crew habitat, would separate from the engineering section or star drive. This arrangement poses a dilemma as the important life-saving section was left without means of interstellar travel capacity or worst without any means of propulsion. The crew could be marooned in space forever or even suffer a crash.

The idea of making the separate sections independent was counter to efficiency and the concept of a starship as a whole. Therefore, solution could not be a ship put together from independent ships. The separate sections must not have completely independent systems. The systems had to be able to combine to a bigger system and work as whole as a bigger system.

This was not a problem for most ship systems, but for the most important systems: the warp drive and the warp core. For a century a solution could not be found until advancement in micro-warp engine technologies appeared.

For a long time, micro-warp engine technologies had been developed for shuttle crafts, but were far too inefficient. In 2359, micro-warp engine technology matured enough to allow the creation of SW-21 long-range shuttles. A small research team was put together in 2359 to begin work on a warp core design able to separate as well as the technology demonstrator ship, which was given the NX-59650 designation. Part of the findings will eventually flow into the Danube (NX-72003) project.

Early project risk assessment and cost projection of an ideal design showed unacceptable conditions. The team decided to base the design on current ship designs. To further increase success and viable results, the project aimed to demonstrate a separate-able warp core and an alternative independent warp core and drive for the saucer section.

The project stumbled on many problems with the warp core until the late 2360's when success began to show with the Danube class project. To keep cost low and save ship design development, the team selected an existing spacecraft design, and began modification work.

In the same year (2365), the Borg encounter caused Starfleet command to issue modernization requests for quick short term development of advanced ship designs. Among these were the Defiant (NX-74205) project, and the Nova project.

The project team decided to use the opportunity to integrate advanced technology and system designs coming from those projects into their own, since they started out using the same ship design. The only difference was that their design had been resized to a light cruiser in order to incorporate necessary systems and to demonstrate a viable sized ship. The crew was to be a skeleton crew to lower risk of a lost. Soon the Borg threat seemed to have vanished in 2367, and work returned to a normal pace.

Ship construction began in early 2370 at Starbase 12. When the Dominion threat became serious at the end of the year, the team was expanded and ordered to turn the ship system design

into a full design and not just a demonstration design. Starfleet Command wanted to use any new design as soon as possible. The ship frame was finish and redesign for the internal system didn't take long as there was only the weaponry to be added.

When the Dominion War broke out in late 2373 and Dominion forces bristly laid waste to Federation forces and began to conquer core worlds. Starfleet Command was distressed. Starfleet Command now saw in the project a potential to temporarily increase ship numbers and fire power with one single ship. It was obvious that the separate sections would be weak and suffer from low battle endurance. In order to lessen these weaknesses, Starfleet Command gathered the latest technology development for integration and put the project under secrecy because of the new technologies.

System design modification and production of system components were rushed to finish. Starfleet diverted all available resources in producing the completely new system components. The reconfigured ship received the new NX-74913 registry. In mid June the ship went on a shakedown cruise only to be hijacked by Romulan operatives.

The ship was recovered before any technology transfer could be made. It was towed back for repairs and safety modifications. After two months of intensive tests and crew training the ship was commissioned at the end September. Days later Betazed fell, and the ship was ordered to the Vulcanis front line.

The ship would be part of a small group of ships left behind as a precaution when the invasion of Cardassia was mounted by allied forces in 2375. After the end of the Dominion War, Starfleet began to build another four ships, one for each founding member world, and named after each one's legendary heroes.

Construction Chronology

Starfleet Command initiated a research project in 2359 for an advanced ship able to separate into independent sections for increased survivability.

The experimental hull was laid in early 2370 at the Beta Antares Ship Yards. In mid 2372 saw the installation of the compact impulse drive and the prototype separate-able warp core. The computer cores followed soon allowing a warp core test at the end of the year. The Dominion War in late 2373 forced a reconfiguration to receive new weapons and shield components which were the still missing last system components. Within a month the modifications were finalized and the ship made ready for the new components. Integration proved easier than the availability of those components. It would take another five months until the ship was finished. Complete system tests were conducted for the following two weeks. After another week of adjustment it was taken for a shakedown cruise. Months after an incident with the Romulans, it was finally commissioned in September.

Hull Layers

Standard Federation tritanium-duranium alloy hull with ablative armor.

Structural Integrity Fields

The tremendous torque and stress loads during flight which the hull must sustain against are impossible without substantial reinforcement. This reinforcement is provided by the Structural Integrity Field System (SIF). The SIF applies forcefield energy directly to the spaceframe to absorb load forces on the structure.

Field generation is provided by a total of nine main and backup SIF generators. Each generator consists of a cluster of sixteen 8 MW graviton polarity generators that feed a triple of 250 millicochrane subspace field distortion amplifiers. Heat dissipation for each generator is provided by a pair of 200000 megajoules per hour continuous-duty liquid helium coolant loops.

Inertial Damping System

As with loads on the spaceframe, inertial forces act on any objects within the ship. For their protection another system had to be operated together with the SIF. This system is the Inertial Damping System (IDF). This system generates a controlled series of variable-symmetry forcefields that serves to absorb the inertial forces before affecting the crew. The IDF is a separate system from the SIF, but is fed by a parallel series of waveguides that are conducted through synthetic gravity plates.

Flux generation is provided by a total of nine main and backup field generators. Each generator consists of a cluster of twelve 300 kW graviton polarity sources feeding a triple of 150 millicochrane field distortion amplifiers. Heat dissipation for each generator is provided by a pair of 70000 megajoules per hour continuous-duty liquid helium coolant loops.

Multi-Vector Assault mode

multi-vector assault mode The Prometheus-Class cannot separate its saucer hull from its engineering sections.

Ablative Armor Systems

The ablative armor system was developed by Starfleet R&D, Tokyo. This armor is the second generation based on war lessons learned from the Dominion War. The armor is 2cm thick in a hexagon structure. It consists of destructible material that dissipates, absorbs, and sublimes when exposed to high phased energy. Incoming energy is first dissipated over the hull armor surface. When the classified capacity threshold is reached, the molecular matrix bakes off at a controlled rate. The resulting cloud may scatter incoming beams disrupting their coherence.

In 2374 Starfleet Command approved application of ablative armor on Prometheus class ships. It is placed around the bridge, nacelle mounts, and aft-sail torpedo mount.

Author's note: Scattering clouds are a favorite in SciFi but are not realistically effective as they are thin and size-distances too small for any significant changes to weapons fire. Not to mention they are already saturated with energy.

Command Systems

Bridge

Bridge Layout

At the very front of the bridge chamber is a large display panel. The central area of the Main Bridge provides seating and information displays for the Captain.

Directly fore of the command area is the helm and operations station, which faces the main viewer.

The aft wall of the bridge contains a large master systems display monitor.

Against the side walls of the main bridge are the consoles for Science, Tactical, and system control.

Access to the bridge is provided by two turbolifts. The bridge module (deck 1) cannot be ejected as a whole like other Federation ships.

Main Engineering

Main Engineering is located and divided on decks 8 and 7. Access to main engineering is provided by a two blast doors, one each on decks 8 and 7.

Computer Systems

Computer System

The computer system onboard the Prometheus class ship is one of the most automated in Starfleet, only rivaled by the Oberth class.

Number of computer cores

There is one main core in the saucer section and two small cores in the two star drive section.

Type of computer cores

The computer cores found on the Prometheus class ships are standard versions used in the Intrepid class. The processors are 60% faster than on the Galaxy class. Total processing power is 42% compared to the Galaxy class.

Core Memory

Main memory storage for the primary computer core is provided by 512 dedicated modules of 144 isolinear optical storage chips. Under LCARS software control, these modules provide access to memory averaging around 6200 kiloquads/second. Total storage capacity of each module is about 725000 kiloquads, depending on the current LCARS software configuration.

Warp Propulsion System

Matter/Antimatter Reaction Assembly

The Warp Propulsion System is the heart of any Federation deep space starship, and at the core of the Warp Propulsion System is the matter/antimatter reaction assembly (M/ARA). The core used by the Prometheus-Class is a separable system.

Warp Field Nacelles

The warp drive of the Prometheus class is a simple design, but builds from recent components. Each nacelle consists of a set warp field coils from the Sovereign and Nova class.

Warp Field Coils

The warp coils of the Prometheus class are the warp coils used the Sovereign and Nova class. These are only need the mid range of both set sizes. Higher warp velocities and limited endurance are available.

Antimatter Storage and Transfer

All antimatter is kept contained by magnetic conduits and in compartmentalized tanks. The Prometheus class has 7 standard 100 cubic meter tanks. One is located in the saucer, and tow in the top engineering section. Four are in the bottom engineering section.

Warp Propulsion Fuel Supply

The fuel supply for the warp propulsion system, or WPS, is contained within several deuterium tanks. Three tanks are in the saucer section. Four tanks are in the top engineering section. Six tanks are in the bottom engineering section. The total useable volume, which is compartmentalized against losses due to structural damage, is 9100 cubic meters (97.8%).

Impulse Propulsion Systems

Impulse Drive

The Prometheus class employs a compact Impulse Propulsion System (IPS) derived from the Intrepid class project. The main two IPS are located in the saucer section. The two engineering

section have each two auxiliary impulse engines consisting of shuttle craft systems. Only the main IPS is active if the sections are combined. All are located aft of the saucer end rim.

Exterior Connect Hard points

The Prometheus class ship has twenty dorsal supply ports on the top engineering section

Reaction Control System

Normal flight steering control is realized by the Reaction Control System (RCS). The Prometheus class has 4 main RCS on the saucer section and 2 small RCS each on the engineering sections.

Navigational Deflector

Federation ships employ a main deflector dish for navigation and protection from collisions along the path. The Prometheus class uses a simple dish system on the bottom engineering section. One small forward fixed-focus deflector each is on the saucer and top engineering section.

Long Range Sensors

As the main deflector is a major emitter of both subspace and electromagnetic radiation, it can interfere with many sensors. To minimize this, the long-range sensor array is located directly behind the main deflector. This arrangement permits the long-range sensors to "look" directly through the axis of the fields.

Operational Considerations

During normal sublight operation, the navigational deflector output is at 2.6 MW. All three generators have to be used from Warp 9.2 on.

Tractor Beams

Grabbing, taking-in, towing or throwing is an important task in space for work. The tractor beam is all that. It performs all these tasks with the ease of a graviton beam.

The Prometheus class has one forward and one aft tractor beam emitter on the bottom engineering section.

Replication Systems

Transporter technology has permitted the creation of the replication system. The Prometheus class employs a limited number of food replicators. Sickbay employs a specially modified food replicator. The replicator system is suspended for the duration of separated flight as the main system is located in the bottom engineering section only.

Replicators are located in the crew lounge, crew mess, sickbay, engineering, and bridge.

Communications

All Starfleet communications are normally encrypted. Encryption algorithms are rotated and updated on a random schedule. Away team communication may use individual starship codes. Layered encryption or combination may be used as needed in certain communication cases.

Intraship Communications

Communications aboard Federation starships occur over the optical data network (ODN) through dedicated communications subprocessors and peripheral hardware nodes. The data stream is purely holographic and based on transfer protocol (TP) decoded back into voice transmission when necessary.

Author's Note: There are no true sound only dedicated communications network on the ship. Everything is in holographic or digital form.

Personal Communicator

Starfleet employs personal communicators for direct communication with or through onboard network systems and as small subspace radio devices offboard. These also provide identification and location for transporter operations.

Ship-to-Ground Communications

External communications can be routed by the main computer system to the radio frequency (RF) system or subspace radio as required.

Communications Hardware

The RF equipment consists of an array of ten triply redundant transceiver assemblies. These are interconnected by the ODN and electric lines. They are hull embedded, and distributed throughout the starship hull. Three each are on the saucer, and the two engineering sections.

Each assembly is a standard hexagonal casing about three meters across and one-half meter in thickness. Each one can identify and process analog or digital data and can sent them over all known radio bands. Data transfer is supported by eight six-stage variable amplifiers, signal cleaning circuits, relativistic compensator, passive ranging, and up to 400 GHz transfer rate. They are supplied by type III EPS taps. Communication range is up to 5.2 Astronomical Units (AU). The deflector dish can extend the range to 300 AU.

Ten triply redundant medium-powered subspace transceivers are available in the same arrangement as the RF array. Each device is contained within a standard trapezoidal casing measuring 1.5 x 2 x 1 meters. They are supplied by type II EPS taps with a maximum total load

of 71.5 MW. The devices have additionally subspace specific components. These are electro plasma conditioners for the subspace coils, and AI controlled data switching and synchronization. Communication range is up to 60000km.

Applications

Typical external communication distances range from 38000 km to 60000 km. The subspace transceiver network is linked to the transporter system for targeting. A minimum of three transceivers are necessary for a reliable transporter lock. Transporter lock distance is limited by transporter arc resolution and local subspace.

Ship-to-Ship Communications

In most cases communication between Starfleet vessels and or installations are the most powerful when used over great distances.

This is achieved by ten standard ultra-high power subspace transceivers. Each device is contained within a standard trapezoidal casing measuring 6 x 4 x 3 meters arranged throughout the hull. A direct field energy waveguide connects the device with its antenna. In addition, the system includes warp velocity signal compensation preprocessors. Data transfer rate is at 53.45 kquads/s.

Universal Translator

Communication with unknown people requires translation. This is mostly achieved by a complex computer program called the Universal Translator. It performs pattern analysis on an unknown language and empirical interpretation to create a translation matrix. The translator is included in all Starfleet personal communication badges and small receivers are implanted in the ear canal. A certain matrix can be uploaded from the ship database as required.

The Universal Translator has a standard database consisting of well over 100000 languages.

Transporter Systems

Transporter System Overview

Number of Systems: 1

Personnel Transporters: 4-person
Max Bio-Mass Payload: 733kg (1615 lbs)
Max Range: 40000 km
Max. Beam Up/Out Rate: Approx. 86 persons per hour per Transporter
Average Safe Medical Evacuation Beam Up/Out Rate: Approx. 40 persons per hour per Transporter

The bottom engineering section is the only ship section which has transporter system support. It has 2 dorsal and 4 ventral transporter emitters. An additional two dorsal emitters are hidden.

Limitations of Use

As powerful as the Transporters are, they do have several limitations.

- **Range:** Range is limited to 40000km by the median matter stream blooming tolerance of 0.005 arc-seconds, interstellar conditions, payload mass, and relative velocity. Emergency transporters are limited to 15000km.
- **Deflector Shield Interference:** When deflector shields are raised in their standard configuration, it is impossible to conduct transporter operations off-ship.
- **Duty Cycle:** Due to power cycling, pattern buffer cool down and reset, each system can average 1.9 complete transports per minute.
- **Transports while at Warp Speeds:** Differential warp velocities cause severe spatial distortion, making a full transporter cycle impossible. A transport is only possible at synchronized warp velocities.
- **Replication:** The Transporter holds all personnel images in a quantum-level matrix, using analog image data. Replicator technology uses molecular-level matrices, and image data is digital - much more precise, compressed, and at lower resolution. Therefore, transporters cannot use replicator data to replicate living beings.

Tactical Systems

Phasers

The Prometheus class employs Type-XII phaser emitters developed for the Sovereign class.

Each of the large arrays consists of numerous emitters in a dense, linear arrangement for optimal control, firing order, thermal effects, fields of fire and target impact. Each group of emitters is supplied by several EPS connections, and is interconnected through both primary and secondary fire control systems, as well as thermal management systems and primary internal sensor lines.

Phaser array arrangement:

Saucer section: 4 dorsal arrays; 2 ventral arrays

Top engineering section: 2 hidden dorsal arrays; 2 hidden ventral arrays

Bottom engineering section: 2 hidden dorsal arrays; 6 ventral arrays

Phaser Array Output: Each Type X emitter discharges at maximum 7.2 MW. However, any numbers of emitters can fire at once in the array to combine their powers.

Phaser Array Range: Maximum effective range is 300000 kilometers. Further distances are ineffective due to time-lag during which an enemy vessel can evade.

Phaser Operations

Federation phaser arrays can be adjusted to a variety of power levels and beam types for a wide range of options. An array can fire in any number of beams up to the maximum number of emitters. Multi beams are usually used for defense against attack crafts.

Low energy beams can be used to transfer energy or as flashlight for scanning or communicating.

High energy beams are typically for tactical purposes as well as planetary surgery.

Photon Torpedoes

During the Dominion War, the standard torpedo turned out to be inadequate against Dominion vessels. The photon torpedo design was subsequently updated in the form of the Type XXV with in more space for fuel and warhead. The warhead yield rose to 18.5 isotons, although a maximum theoretical yield of 25 isotons could be achieved in the current configuration.

The standard capabilities include multi targeting and guidance, pattern spread, impact or proximity detonation, timed or self-destruct detonation, dormant mine mode, search mode or any of the mentioned in combination.

As Photon Torpedoes are semi-active weapons, the firing vector may vary within 10 degrees in any direction of the bore sight, allowing the torpedo to change the approach vector to target as necessary. If required, the torpedo may conduct immediate target tracking or acceleration as verified by sensors. For targets within 25 km, the weapon will automatically change into active mode, and accelerate away to prevent damage to the firing ship. Otherwise, active targeting will be activated 0.01 seconds or 10 km before interception point whichever is first. Should the target be elsewhere the torpedo will intercept accordingly or begin a search pattern until fuel exhaustion, upon which it will self-destruct.

With their high yield photon torpedoes are effective against attack craft formations (to a certain degree). In this case proximity detonation is recommended.

Photon Torpedo MARK XXV

Maximum Range: 4050000 Km
Current Maximum Explosive Yield: 18.5 Isotons
Theoretical Maximum Yield: 25 Isotons
Dimensions: 2.1 x 0.76 x 0.45 m
Mass: 186.7 kg

Torpedo Launcher

The Prometheus class ships use small launchers derived from the Defiant project which can fire photon and quantum torpedoes. Their measurements are a third that of the original Galaxy class. Complete reload cycle time is 15.3 seconds. Loading takes 2.3 seconds.

Arrangement:

Saucer section: 2 forward launchers

Top engineering section: 2 hidden forward launchers

Bottom engineering section: 2 hidden forward launchers (in front of fore turbolifts; embedded and angled up)

Bottom engineering section: none

Payload: Approximately 25 torpedoes per launcher. The ship can carry a maximum of 150 torpedoes.

Standard launcher firing modes:

- **Single shot:** 2.3 seconds reload-time.
- **3 shot salvo:** 3 shots are fired within 0.5 seconds with a reload time of 2 second for next two torpedoes; 15.3 next batch.

Deflector Shields

The tactical deflector shield system is the primary defensive system aboard all Federation Civilian and Starfleet Starships.

The Prometheus class ship has regenerative shields. New technologies allow the shields to recover after a certain period after a surge in power and depletion of which.

Output: There are fifteen shield grids on the Prometheus Class. These are supplied by nine main and backup generators of 45 MW, resulting in total shield strength of 270 MW.

Auto-Destruct Sequence

It is a fact of serving in Starfleet that the possibility may occur that the crew may have to make the ultimate sacrifice and destroy the vessel rather than having the technology, systems, or materials to fall into threat forces possession. This process, by its very nature, is an absolute last resort for the crew to consider when all other options are exhausted. As such, Starfleet has spent a considerable amount of time, effort and energy to use computer simulations to predict any and every possible situation where the need to destroy the vessel would occur.

Environmental Systems

Life Support and Environmental Control

The most important systems for manned flight are the Life Support and Environmental Controls.

These systems maintain habitable atmospheric M-class conditions, but not limited to following characteristics:

- Concentration of atmospheric gasses
- lighting
- temperature
- humidity
- gravity

Although, the Environmental Controls keep the entire biosphere under the same conditions, the crew members can modify locally any of the variables within operational standards for that compartment.

Atmospheric System

The Prometheus class ships employ only the standard chemical systems in maintaining the ships atmosphere. The systems is triple redundant and can maintain a habitable atmosphere by itself. This system relies on perishable chemical components and must be regularly replenished.

Gravity Generation

The Prometheus class ships include standard gravity generation designs which create normal terran gravity throughout the ship. The ship is divided into two regions with its own small network of gravity generators. Each ship section has one region supported by a total of 60 generators.

Emergency Environmental Systems

A number of cryogenic oxygen storage tanks are available in addition to stored chemical batteries of various purposes and life-support.

Crew Support Systems

Crew Support

The core of the each and every starship is the crew. The success or failure of any starship falls more on the abilities of the crew than any powerful, new technology. As a result, Starfleet has a long standing tradition of attempting to provide as useful and capable amenities for their crews.

Medical Systems

Sickbay: There is one compact sickbay facility with a little intensive-care ward, a small laboratory, one surgical suite. Holo-emitters allow the usage of the Emergency Medical Holograph System. There were initially no plans for a medical officer. Later ships will have at least one.

Crew Quarters System

General Overview: Except for the captain and first officer, every crew member has to share a small double room. All quarters have a chair, a table, and one computer access terminal. The bunks are arranged in a pair. Personal storage is kept below the bunk and in two small storage spaces.

Turbolift Personnel Transport System

The turbolift system consists of five vertical shafts and several horizontal lines.

Recreation Facilities

There are no recreation facilities except the crew lounge and crew mess.

Auxiliary Spacecraft Systems

Shuttlecraft

Type-9 Personnel Shuttle

Type: Medium short-range warp shuttle.
Accommodation: Two flight crew, four passengers.
Propulsion: Two 1350 millicochrane warp engines, two 800 millicochrane impulse engines, four RCS thrusters.
Dimensions: Length 8.5 m; beam 3.8 m; height 2.8 m.
Mass: 3.2 metric tons.
Performance: Sustained Warp 3.4.
Armament: Two Type-IV phaser emitters.
Overview: With the ever increasing need of sophisticated shuttles for medium-ranged missions it became clear that a new design was needed to fill the gap between shuttle pods and shuttles. This was realized in the type-9 shuttle design. It is able to support independently a small team on medium-range missions not requiring bigger shuttles. With warp capability it also freed the need to use bigger shuttle for medium-range transfer.

Captain's Yacht

The Prometheus-class vessel has no yacht for the Captain.

Flight Operations

Introduction to Flight Operations

Operations aboard a Federation vessel fall under these categories: flight operations, primary mission operations, secondary mission operations, and shuttle bay operations.

Flight operations are all tasks directly related to the operation or readiness of the vessel itself.

Primary mission operations are all tasks given and supervised from the Main Bridge.

Secondary mission operations are all task not under the supervision of the Main Bridge, or just independent work.

Shuttle operations are necessary tasks which typically fall under secondary mission operations. In missions where auxiliary crafts are needed, shuttle operation has to communicate and operate to primary mission operation needs.

Mission Types

Unlike most Federation capital ships the Prometheus class has not been designed to offer a any multi-role ability.

- **Tactical/Defensive Operations:** Typical missions include patrolling the borders and important Federation worlds. Deployment to hostile or conflicts areas.

- **Emergency/Search and Rescue:** Aside from standard rescue missions, its primary transport ability makes it the primary responder for small-scale planetary evacuation, disaster or crisis.

Operating Modes

The normal flight and mission operations of the Prometheus-class starship are conducted in accordance with a variety of Starfleet standard operating rules, determined by the current operational state of the starship. These operational states are determined by the Commanding Officer, although in certain specific cases, the Computer can automatically adjust to a higher alert status.

The major operating modes are:

1. **Cruise Mode:** The normal operating condition of the ship.
2. **Yellow Alert:** This is a state of increased readiness for possible crisis situations.
3. **Red Alert:** This is a state of emergency, imminent danger or combat situations.
4. **Multi-Vector Assault Mode**: This is the separation mode used for an attack on one target.
5. **External Support Mode:** State of reduced activity when docked at a starbase or other support facility.

6. **Reduced Power Mode:** Approved procedures which reduce the power usage of the ship significantly.

Cruise Mode

Cruise Mode is the standard operating condition for all starfleet vessels. During Cruise Mode, all ship's primary operational personnel are organized into three distinct working shifts of 8 hours.

Cruise Mode operational rules include:

- Level 4 automated diagnostic series are run on all primary and tactical systems at the beginning of each shift. Some systems may have more frequent diagnostics, but that is at the discretion of the Engineering Staff.

- At least one major power system is to remain active and on operational status at all time. At least one additional power system must be maintained on hot-standby.

- Long-range navigational sensors to be active if the ship is travelling and superluminal speeds. Lateral and forward sensor arrays to be maintained at ready status, although these systems can be made available to secondary scientific mission use at the discretion of the OPS manager.

- Navigational deflector to be active as needed for protection from unanticipated debris or drag from interstellar media.

Yellow Alert

Yellow alert designates a ship wide state of increased readiness for possible crisis situations. During yellow alert, all on-duty personnel and attached personnel are informed of the alert by panel display and are directed, according to their training, prepare for emergency action. The next shift personnel are directed to prepare for duty on five minutes' notice. Cross-trained second shift personnel are directed to prepare for possible duty in their secondary assignments.

Red Alert

Red alert designates a shipwide state of emergency readiness for crisis situations. During red alert, all on-duty personnel and attached personnel are informed of the alert by panel display All personnel have to report to predetermined post.

Blue Alert

The Prometheus class has not been designed for landing within a gravity well, but could maintain hull integrity for transatmospheric operations.

Multi-Vector Assault Mode

This is the separation mode used for an attack. The ship will automatically separate into its three sections and ask for a target and the attack pattern. The ship then automatically executes the command. The crew can manually override at anytime and direct an attack.

After completion of the task, the computer can join the ship sections automatically if requested.

External Support Mode

While docked at a starbase or other support facilities with umbilical support systems the ship may go into limited activity. Systems not necessary to stay active at all times shall be deactivated. These will permit the repair, maintenance, or upgrade of all systems.

Reduced Power Mode

This mode is designed for maximum energy conservation in time of crisis, while maintaining a certain level of operational status. This is typically necessary when resources are low or when avoiding energy detection.

During Reduced Power Mode, all systems other than necessary to maintain life are shutdown completely. Life-support will be run at minimum. All non-essential areas are abandoned. Only medical replicators may be active. Emergency rations will be used. Any other systems may be reactivated periodically if necessary.

Separated Flight Mode

The Prometheus class can separate into its three section at any time. Each section can then seek out a separate action.

Emergency Operations

Introduction to Emergency Operations

As on any Star Fleet ship the safety of the crew comes first. All key systems are triple redundant with critical systems having an additional backup. These system layers are physically separated to increase damage resilience. All safety systems offer several different technically based solutions, and offer manual operation options for each. These are also powered by an independent power source.

Fire Suppresion

The entire internal structure is augmented with fire-resistant materials pursuant to SFRA-standard 528.1(b) for inflammability in a nitrogen-oxygen atmosphere. All shipboard equipment and furnishings *must* conform to SFRA 528(c-f) classifications. Equipment and things not conforming to the requirement must be stored in specially designated storage. The Chief Engineer is ultimately responsible for the observance of these policies by all personnel.

Fire detection sensors are incorporated into the environmental sensor systems, any critical systems, and any room and stores throughout the spacecraft. These sensors are programmed to detect airborne particles or gasses typical of combustion or combustion byproducts. In the event that these sensors do not react fast enough, any crew member with a communicator or access to a communication panel can activate the fire suppression system.

In the event of a small fire, a containment force field would be erected around the fire, depriving the fire of oxygen. The computer will keep the field up until all combustible material within the field until temperatures within the field fall below combustible levels.

Larger fires may require whole compartments to be isolated through emergency bulkheads. Force fields and manned firefighting equipment would need to be used to contain the fire and prevent the spread of the fire throughout the ship.

In extreme emergencies, whole compartments can be vented to vacuum. Since this procedure would be lethal to anyone within the compartment, such venting cannot be performed until these areas are evacuated. The only exceptions to this protocol are if the Commanding Officer certifies that the fire poses an imminent danger to the whole of the spacecraft and crew.

Emergency Medical Operations

All Starfleet personnel are required to refresh their medics' skill every six month and to take part in emergency drills every month. At least one third of the crew in any department is to be trained to serve temporary as Emergency Medical Technicians, triage specialists, and other emergency medical functions. This arrangement was established due to the wide variety of emergencies at any given time.

The Prometheus class has holographic projectors on every deck and in every important area for the use of the Emergency Medical Hologram (EMH).

Lifeboats

Aside from the escape options of shuttlecraft, fighter, or transporters, the primary survival craft of the Prometheus-class is the escape pod or lifeboat. The Prometheus class has 22 escape pods.

Saucer section: 14 dorsal escape pods

Bottom engineering section: 8 escape pods

Each escape pods has a capacity for 2 persons. At full capacity each Lifeboat has a food supply of 14 person-days and life-support for 14 person-days.

Rescue and Evacuation Operations

Rescue and Evacuation Operations for a Prometheus class starship will fall into one of two categories - abandoning the starship, or rescue marooned starfleet personnel in shuttle or escape pods.

Abandon-Ship Scenarios

Resources available for abandon-ship scenarios from a Prometheus class starship include:

- The ability to transport 86 persons per hour from the ship via personnel transporter.
- The availability of all shuttlecrafts and pods with a round trip of one hour to allow the evacuation of 12 persons per hour.
- Protocols also include the use of Lifeboats. Each Lifeboat can support a full compliment for 1 weeks with food for 1 weeks.
- Environmental Suits are available for evacuation directly into a vacuum. In such a scenario, personnel can evacuate via airlocks, the shuttle bay.

Conclusion

Projected Upgrades

Mission Background

Appendix A - Technical Specifications

PERSONNEL COMPLEMENT

- Officers and Crew: 4; regular assignment may range from 40-50
- Evacuation Limit: 100

POWER PLANT

- 1500+ Cochrane warp core

DIMENSIONS

- Overall Length 411.7 meters
- Overall Draft 64 meters
- Overall Beam 163 meters

Note: The measured size CGI varies between 386 and 390 m; the numbers given comes from Draft and Beam supposedly given by Star Trek : The Magazine.

WEIGTHS

- 900000 metric tons

PERFORMANCE

- Normal Efficiency Cruise Velocity: Warp 8
- Maximum Cruise Velocity: Warp 9.5
- Maximum Velocity: Warp 9.95 (12 hours)

ARMAMENT

- 18 Type-XII phaser arrays (6 hidden)
- 6 Forward Firing torpedo launchers (4 hidden)

TRANSPORT

Cargo capacity: 1000 metric tons nominal;

Shuttlecraft and support craft complement (standard)

- 3 Type 9 Personnel Shuttles
- 2 workbees

Transporters

- 4-person

Appendix B - Deck Layout

Deck 1: Main Bridge, Briefing Room, Captain's Ready Room, Emergency Stores, Life support

Deck 2: Waste water recycling, Solid waste disposal, Life support, Bridge crew lounge, 1 airlock, emergency lockers, space suit lockers, System monitoring, Memory banks

Deck 3:

Deck 4:

Deck 5:

Deck 6:

Deck 7:

Deck 8: Main engineering

Deck 9: Main engineering, transporter room, transport support systems, main replicator system

Deck 10:

Deck 11:

Deck 12:

Deck 13:

Deck 14:

Appendix C –Analysis

As the Federation requires at least triple redundancy, the combined ship has 50% more redundancy than any other Federation ship at the cost of the crew.

As the ship was designed for separation and weapon system test, only the necessary considerations were given to the crew and other generic capabilities. The ship has very limited capabilities other than combat, of which the EMH is probably the most extensive.

Shield, SIF, and IDF system are probably integrated on the same scale for each ship section. Gravity generation systems are about equal for the saucer section and top engineering section, while the bottom engineering section has more (up to double). All other systems are as follows:

As it appears the saucer section has the most crew facilities and the least machinery. It can be safely considered to have less than the top engineering section, probably half as much. The top engineering section obviously has much less space than the bottom engineering section. It has all the supply handling system, holds, and shuttle bay. Here, it can also be concluded to have half the vital systems as the bottom engineering section. As it appears the bottom engineering section has the most machinery, including those not integrated into the other sections (primary and secondary molecular matter matrix replicators, workshops, maintenance, transporters, main fusion generator, tractor beams etc.).

Conclusion general systems and system resources are about:
Saucer section: 1
Top engineering section: 2
Bottom engineering section: 4

If the combined ship has 100% system reserve energy then in separation mode it will shrink to half for the bottom engineering section while much less for the others. In separation mode the ship can keep peak performance for at least 1/8 times of the total combined ship. Phaser fire will drop after that significantly.

If the combined ship has 100% shield strength and 100% shield density then in separation mode it will shrink to 1/3 shield strength and

Saucer section: 2/9 shield density (6 sides instead of 4)
Top engineering section: 2/9 shield density (6 sides instead of 4)
Bottom engineering section: 2/9 shield density (6 sides instead of 4)

If it takes 100% time for a threat force to penetrate the shield of the combined ship then it will take 2/9 time to do that for each section. In separation mode it would take 8/9 time to destroy the ship compared to the combined ship.

If the ship has as many torpedoes as the Defiant class has for each forward launcher then it would take about triple as long to deplete in combined mode or as long in separation mode.

If the small torpedo launchers are be able to fire up to five torpedoes at a time. This would give it equal forward fire power to the Galaxy class in combined mode and triple in separation mode.

If the total number of volleys is 5 for each launcher then the inventory will last at least 64 seconds in separation mode if all fire continuously. (1st load already loaded; 15.3 s max standard reload time; 2.3 s loading time) Although, this seem little it is appropriate for the time the ship can survive.

The smallest phaser arrays appear to consist of 2 to 3 emitters. The big ones appear to consist of 11 or 16 emitters.

Saucer section: 2x16 dorsal emitters; 2x1.5+ dorsal emitters; 2x16 ventral emitters
Top engineering section: 2x11 hidden dorsal emitters; 2x1.5 hidden ventral emitters
Bottom engineering section: 2x1.5 hidden dorsal emitters; 4x3 ventral emitters; 2x2 ventral emitters

In separation mode the total number of emitters would grow from 83 to 111 emitters. In frontal attack the number of emitters would grow from 76 to 101 emitters (using all available). This is about 70% fire power of a Galaxy class dorsal phaser array. Phaser fire power would increase by 33% in separation mode.

Conclusion:

The Prometheus is a ship of desperation. It can only be used temporary at limited range to intercept, to delay or cause disarray to threat forces, therefore, buying time to assemble a counter force. If the ship can fire volleys of torpedoes then its greatest fire power lies in torpedoes. Its battle endurance mainly lies in its shield system and energy reserves for both shields and phasers. The already limited reserves are further decreased by separation mode.

The actions seen on the show suggest higher phaser power then there can be physically, although, the other Federation ships did give considerable support. Also Romulan Warbirds aren't tough. They have excessively more volume to protect than the power difference generated.

At best, the Prometheus can destroy a small group of ships (3) by itself. Against a fleet it could destroy two in the initial surprise. Afterward, enemy fire and its endurance will greatly limit its performance. It may or may not be able to destroy more than one more ship.

Strategy

The best strategy would be to separate timely at warp and come out of warp when just finish separation. That way the top engineering section and the saucer section can ride out the existing warp bubble without having to use power of their own.

Once at the destination, the ship must unload torpedoes onto the enemy ships as fast as possible as many as possible. Ideally using all torpedo inventories within minutes. The ship must also fire as many phasers as possible until depletion of the reserves. Then the ship should combine; maximize power output; fire phasers and retreat at maximum warp back to base. Upon return the ship should replenish all its fuel and weapons as fast as possible. If there is enough time the ship could repeat the attack-run in the same pattern.

Of course the opposing forces will have devised some defensive measures by then. In any case, as with ship to ship battle a fight will be decided within five minutes, so the ship should not expose itself too long to superior enemy numbers.

If the strategy is successful, the ship could destroy as many as 5-8 cruiser class ships. This may not seem much, but it is on average double as many as a normal ship could do (Kobayashi Maru). It is actually impressive considering an enemy fleet.

Appendix D – Crew Needs

Provision

A typical human requires 0.83 kg (pure) Oxygen, 0.62 kg frozen dried food (2.48 kg with water) or 2.5 kg food, 3.56 kg water for drinking and food preparation per day. These numbers do not include extra activity consummations, water for hygienic purposes or any other usages.

Supply storage has to be provided for a year's worth for a full crew complement or 0.913 tons of raw bio matter and 3 tons of water per person or a month's worth at full evacuation capacity, whichever is more. Extensive recycling of organic material allows replicator supply to be replenished and reused up to 4 times before loses become relevant. At which point new raw material have to be supplied.

Emergency Supply

Provisions have to offer at least 10000 kJ per person per day in dry form with a shelf life of at least five years. A three day package measures 17.5x15x7.5 cm^3 and weights about 1.5 kg. After each meal some water has to be drunk in order to help digestion.

Provisions have to offer 1.5 l of water per person per day.

Recommended rationing: For marine or space conditions rations can be lowered to one third. For land conditions rations can be lowered to one half. During the first 24 hours do only drink when really necessary. Afterward, do not drink more than 0.5 l per day. When supply is nearly exhausted one may drink only 1/10 l per day. Children usually drink 1 l per day. Their rationing should be more lenient.

Appendix E – Reference Ships

Galaxy class

Accommodation: 1012; 15000 evacuation
Dimensions

- Overall Length: 641 m
- Overall Height: 463.73 m
- Overall Beam: 195.26 m

Mass: 4960000 metric tonnes
Performance

- Normal Cruise: Warp 6
- Maximum Speed: Warp 9.6 (12 hours); Warp 9.9 upgraded (12 hours)

Armament

- 11 Type-X phaser arrays
- 3 photon torpedo launchers, 10 torpedoes burst fire, 275 torpedoes

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Afterward

Authors Notes

I never intended to do this one, but it was necessary for another project.

My interest on the Prometheus was limited to speed and shields. It was just not a viable ship design however I look at it. A ship about double the volume of the Defiant with less useful mass percentage due to the extra warp nacelles, and having Sovereign like power, was just exaggerating. Technology would have to be increased 2-3-fold or there would hardly be any crew support. Anyhow, I enjoyed the show greatly.

Here and there has been some desire to use the Prometheus class ships as a fleet flagship. This would be pretty much a poor choice. A flagship has to be able to command, coordinate, communicate, and process a fleet's data such that it can never be a small ship with limited computer capacity. Prometheus class ships are assets but hardly lead ships of any sort.

Ships of the Line

USS Prometheus NCC-74913

USS Cerberus

USS Asephas
USS Lor'Vela, Blue Fleet
USS Ukora
USS T'Ikal