STRATEGIC design

Innovative Concepts Into Tomorrow's Technology - Today

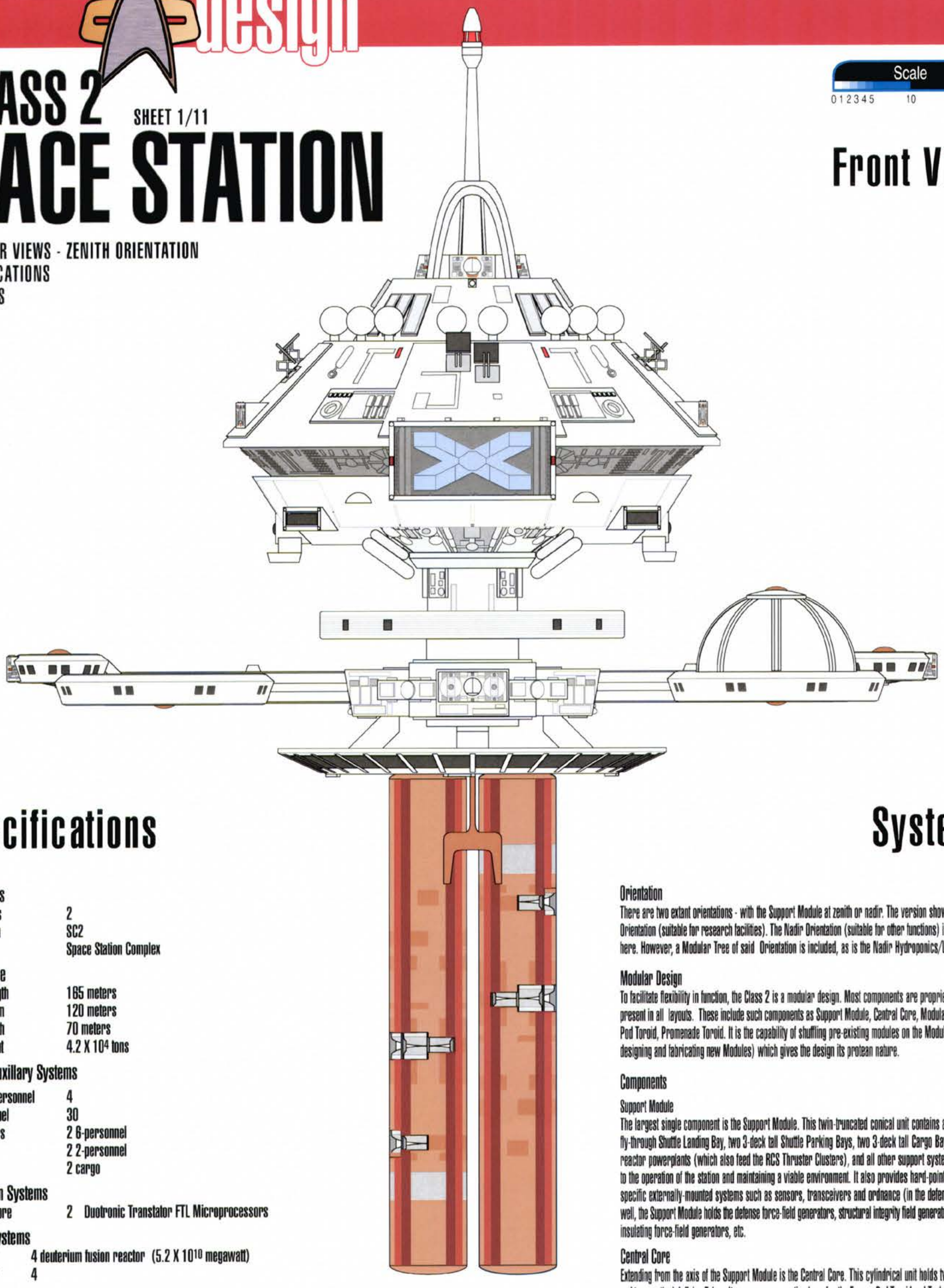
CLASS 2 SPACE STATION

SHEET 1/11

EXTERIOR VIEWS - ZENITH ORIENTATION
SPECIFICATIONS
SYSTEMS

Scale
0 1 2 3 4 5 10 20

Front View



Specifications

Particulars

Station Class	2
Identification	SC2
Type	Space Station Complex

Spaceframe

Overall Length	165 meters
Overall Beam	120 meters
Overall Width	70 meters
Displacement	4.2 X 10^4 tons

Crew & Auxillary Systems

Operating Personnel	4
Lab Personnel	30
Transporters	2 6-personnel 2 2-personnel 2 cargo

Information Systems

Computer Core	2 Duotronic Transtator FTL Microprocessors

Impulse Systems

Power	4 deuterium fusion reactor (5.2 X 10^{10} megawatt)
RCS Cluster	4

Tactical Systems

Grid	2 Deflector Shield Generator (rated 1.15 X 10^3 mw - standby / 2.69 X 10^3 mw - alert / 4.73 X 10^6 mw - 0.0017 Sec.) 4 Primary Structural Integrity Field Generator (rated 1.15 X 10^3 mw) 4 Engineering Force-field Generator (rated 2.1 X 10^2 mw)

Design History

Whether for military logistics, surveillance, research, communications or administration, Starfleet has always deployed some sort of orbital or deep space facility adjunct to its starships. Designs date back to the sparse array-style of the 21st century International Space Station Freedom. The current mainstay of midsize facilities (destined to remain in use for decades) is the Class 2 Space Station.

Systems

Orientation

There are two extant orientations - with the Support Module at zenith or nadir. The version shown is the Zenith Orientation (suitable for research facilities). The Nadir Orientation (suitable for other functions) is not illustrated here. However, a Modular Tree of said Orientation is included, as is the Nadir Hydroponics/Lounge Toroid.

Modular Design

To facilitate flexibility in function, the Class 2 is a modular design. Most components are proprietary - and are present in all layouts. These include such components as Support Module, Central Core, Modular Tree, Escape Pod Toroid, Promenade Toroid. It is the capability of shuffling pre-existing modules on the Modular Tree (or of designing and fabricating new Modules) which gives the design its protean nature.

Components

Support Module

The largest single component is the Support Module. This twin-truncated conical unit contains a double-ended fly-through Shuttle Landing Bay, two 3-deck tall Shuttle Parking Bays, two 3-deck tall Cargo Bays, four fusion reactor powerplants (which also feed the RCS Thruster Clusters), and all other support systems necessary to the operation of the station and maintaining a viable environment. It also provides hard-points for mission-specific externally-mounted systems such as sensors, transceivers and ordnance (in the defense layout). As well, the Support Module holds the defense force-field generators, structural integrity field generators, engineering insulating force-field generators, etc.

Central Core

Extending from the axis of the Support Module is the Central Core. This cylindrical unit holds two turboshafts and two vertical Jeffries Tubes. It serves as a mounting base for the Escape Pod Toroid and Tankage. In addition, it is interrupted by the Modular Tree Hub.

Modular Tree Hub

The anchoring point for the various Corridor Segments, from which depend the Modules, as well as mounting hardpoints for the Arboretum/Promenade Toroid.

Modules

There are four module sizes, each size having multiple sub-types. Modules are disc-shaped, with outer attachment points for Corridor Segments. Support systems (such as emergency life-support and power) are located under the deck, below the gravity plate generators.

Escape Pod Toroid

The Escape Pod Toroid mounts 323-personnel Escape Pods, housed in armored niches behind outer blowaway panels at the outer periphery. The are accessed from the Central Core via radiating tunnels.

Arboretum/Promenade Toroid

The Arboretum/Promenade Toroid is a lounge surrounded by a wrap-around view window. divided into 32 segments. The purpose of the Toroid is three-fold:

1. To serve as a recreation and social center for the personnel. Starfleet has found that a 'natural greenspace' is important for the mental health of personnel.
2. As an ancilliary food source. As an adjunct to the onboard food processors, the hydroponic units allow a variety of plant foodstuffs to be grown. This is a touch of luxury much appreciated by personnel on long deployments.
3. As an ancilliary life-support system. In the event of power interruption or failure of the atmospheric recycling systems, the hydroponic units can function in that role. So long as there is sufficient photon flux (internally generated or external illumination), and plant food chemicals (extracted from the waste processors), the Toroid has enough capacity to maintain an oxygen-carbon Dioxide ecology/economy indefinitely for more than double the normal crew complement.

Tankage Cluster

At the end of the Central Core is the Tankage Cluster. These 10meter diameter cylindrical tanks come in four sizes: 5000, 2500, 1250 and 675 cubic meters. The tanks are fully insulated, and hold such commodities as water, cryogenic atmospheric gases and deuterium. In addition to storing commodities for the station, they have fittings for re-supplying spacecraft.

CLASS 2 SPACE STATION

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EXTERIOR VIEWS - ZENITH ORIENTATION
SYSTEMS

Scale
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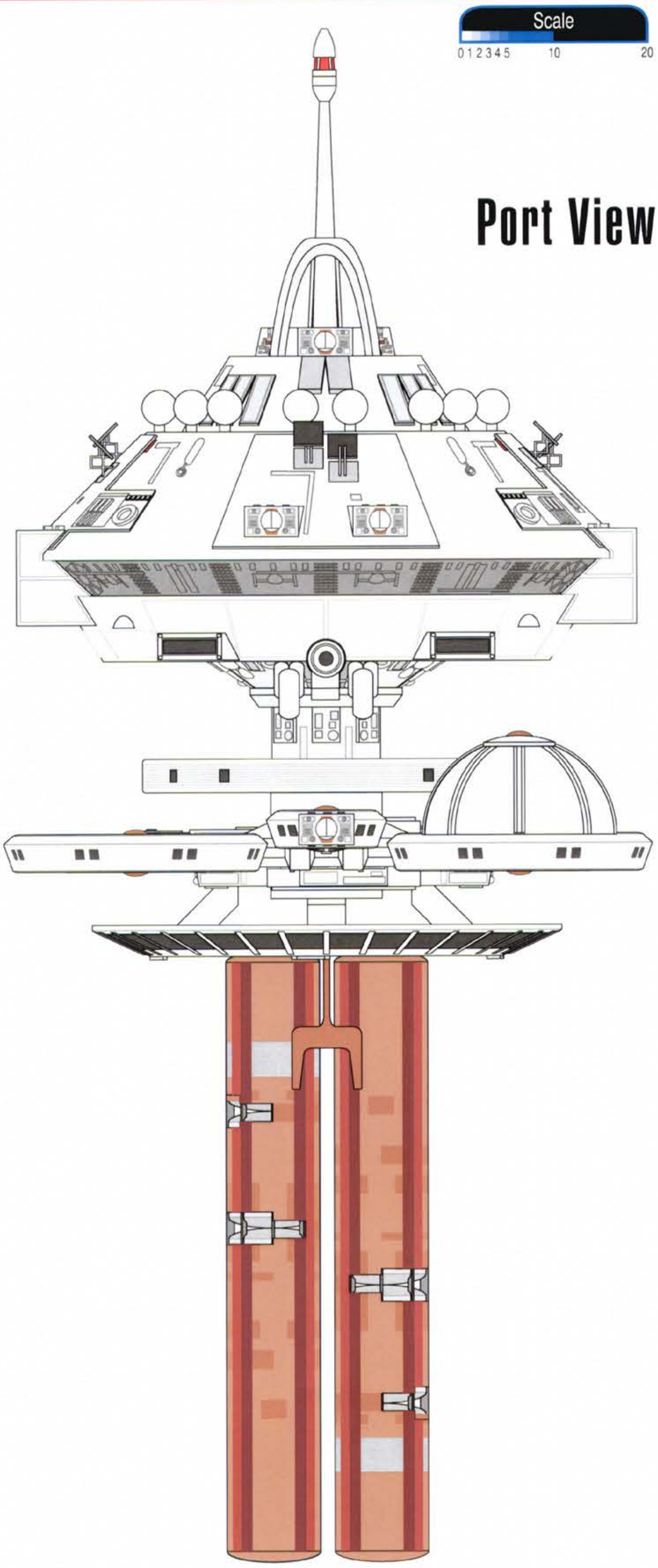
Port View



Systems

Section 1.0 Station Structure
The spaceframe of the Class 2 Space Station is tritanium/duranium macrofilament truss frames, averaging 0.25 m^2 in cross section. These are placed at the tops of all Decks. Smaller trusses are spaced between quarters, at hall junctions, and at the turbolift shafts, measuring 0.1 m^2 in cross section. This physical framework is reinforced by the Structural Integrity Field (SIF), using a network of Class 2 ceramic-polymer wave guides to distribute energy to Class 1 ceramic-polymer elements. The exterior hull substrate is poly-bonded to 2 cm by 0.5 cm bands with 2 cm studs every meter that are gamma welded to the main frame.

Section 1.1 Station Hull Structure
The first hull layer is 3 cm thick and is composed of a poly microfoam with interwoven tritanium filaments (nominally 1.5 meters in width by 2.5 meters in length). The second layer is four sheets of 0.2 cm thick tritanium, each going 90 degrees to the layer above it, for torsion strength, a fifth sheet of Aledium foil is 0.4 cm thick also and used for radiation protection. The third layer is a honeycombed duranium alloy with a micro-ceramic polymer bonded to each side used for thermal insulation and SIF conductivity. The fourth and outer layer is composed of a 1.0 cm ablative ceramic fabric with interwoven tritanium filaments. This is attached to a polycobhrams sheet by a chemical bonding process. This layer is 2.5 meters wide by 2.5 meters in length and is attached with standard duranium fasteners to the first three layers after they are bonded together. This layer is replaced as needed.

Section 1.2 Structural Integrity Field
The physical integrity of the spaceframe is augmented by the SIF. The SIF is created by four field generators on Deck 3 and smaller field generators below the deck on all Modules. Each of the four main units consists of a pair of 2 megawatt graviton polarity sources. These feed a pair of 100 millicochrane subspace field distortion amplifiers. Any two units are capable of supporting the entire SIF grid at 100% for 40 hours before gaussing causes a critical shut down. The SIF system creates a subspace distortion field that is guided along all trusses and hull plates, reinforcing these by a factor of 100,000% of their usual tensile/torsion/compression strength.

Section 1.3 Inertial Damping Field & Synthetic Gravity Generators
The Inertial Damping Field (IDF) operates in parallel with the station's artificial gravity generators, maintaining a series of variable-symmetry force fields that absorb external inertial forces. The force fields are maintained according to SFRA-standard 352.12, averaging 75 millicochranes with field differential of 5.26 nanocochranes/meter. Flux generation for IDF and gravity are provided by generators within the crawl space under each deck, in a hexagonal grid with nodes spaced 0.3 meters apart.

Section 1.4 Security & Containment Force Field Generators
There are four secondary force-field generators on Deck 4. These are responsible for maintaining containment for the Fusion reactions. Using waveguides and sophisticated forming software, force-fields can be routed to perform various tasks - including corridor security barriers, brig security barriers, and bulkhead life-support barriers (in the event of localized hull breaches), these units have a set of four 1 megawatt polarity sources feeding a pair of 50 millicochrane field generators.

Section 2.0 Computer Systems
There are two Computer Cores located on Deck 2. Each consists of four units, comprised of 200 dedicated modules of 144 duotronic chips, which, under LCARS control provide dynamic access at a rate of 4,800 kiloquads/sec. The total storage capacity for each module is 16,000 to 64,000 kiloquads, depending on software configuration and data compression rates. The CC are joined to the Optical Data Network (ODN) by triple redundant Micron Junction Links (MJL) on each module. The final layer to the computer systems is a dedicated short range Radio Frequency (RF) system that all cores and SPNs use to communicate with the control panels, access points, and PADDs.

Section 2.1 Information Gathering Systems
Information gathering systems are divided into sensors (passive energy/field detecting/analyzing systems) and scanners (active energy/field emitting-reflection dectecting/analyzing systems). Each of these is further subdivided into long-range (faster-than-light) and short-range (lightspeed). Omni-directional and Directional packages are mounted along the periphery of the stations Support Module.

Section 3.01 Personnel Facilities - Quarters
Personnel quarters are housed within the Personnel Modules, as well as removable tables, which allow the open space to be used for other purposes. One head is shared by two cabins.

Section 3.02 Personnel Facilities - Recreation
In addition to the floor spaces within the Personnel Modules (which can be utilized as Gymnasiums), there is an enormous Arboretum/Promenade Toroid, holding a variety of tables and couch, allowing personnel to enjoy the view.

Section 3.03 Crew Facilities - Dining
Personnel may dine in the Personnel Module Dining Areas, or within the Arboretum/Promenade Toroid. Food and Beverages are prepared by protein/carbohydrate synthesizers on Deck 11, and delivered to terminals via a miniature turbolift network. Terminals are also located in the lounges, Security Office and Transporter Rooms.

Section 3.04 Crew Facilities - Arboretum
The Arboretum concept is tri-functional by design. The primary purpose is as a specimen-repository/display for the Botanical Lab. The secondary purpose is as a recreational venue for off-duty personnel - and as such various benches are placed for relaxation. The final purpose is as an emergency back-up to the vessel's life-support system. Provided light, heat, air and water can be supplied, there is sufficient photosynthetic life within the Arboretum to maintain an Oxygen-Carbon Dioxide ecology/economy indefinitely.

Section 3.05 Crew Facilities - Laundry
Laundry facilities are located within the heads in each pair of quarters.

Section 3.0 Life Support
Main Life Support systems - which contain the vessel's atmosphere conditioning systems (Air refresh/recycle, temperature/humidity/ionization control), plus controls for gravitational and inertial damping generators - are located in the Support Module. Auxilliary systems are located below the decks in most modules, below the gravity plating.

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Scale
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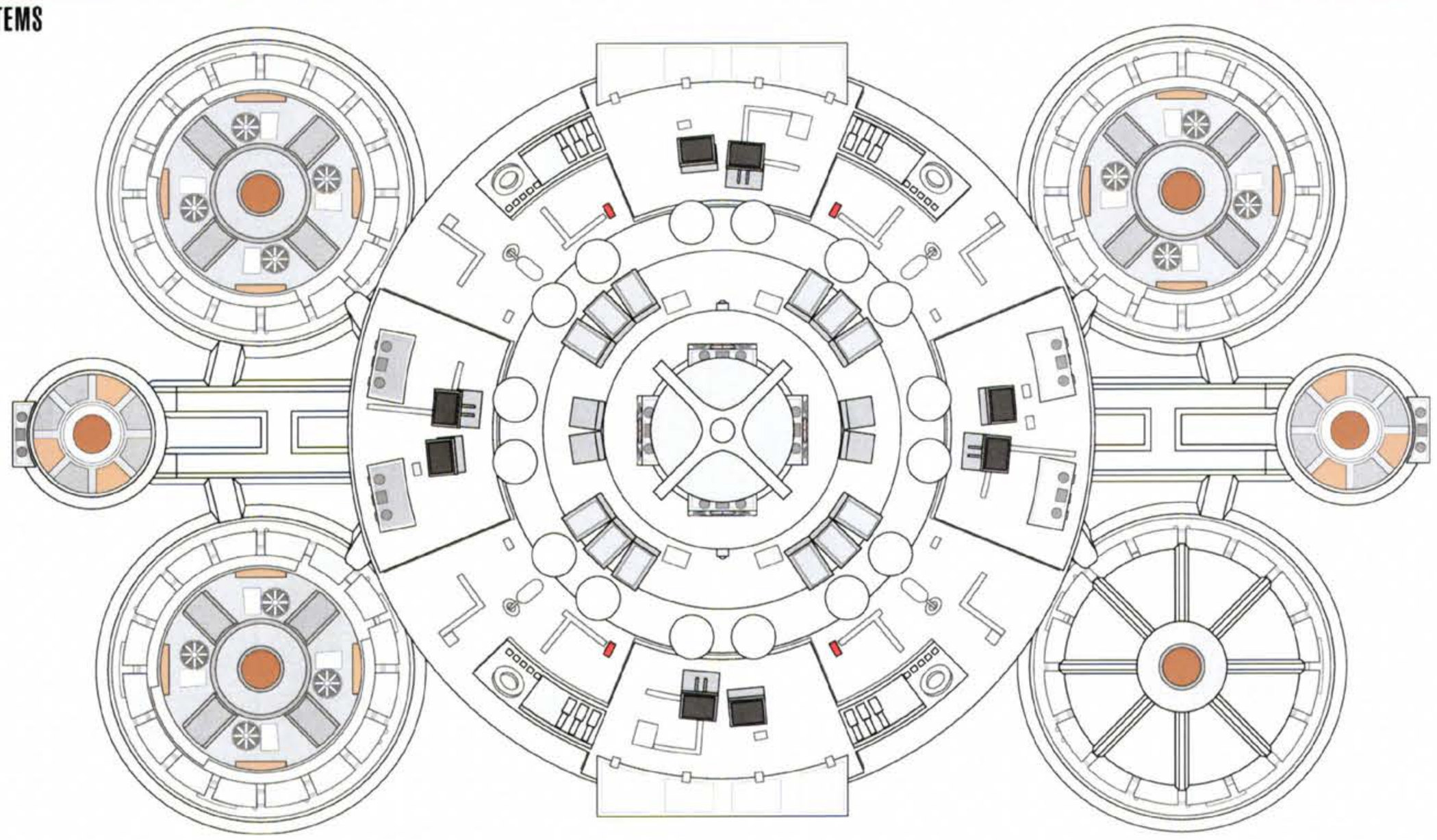
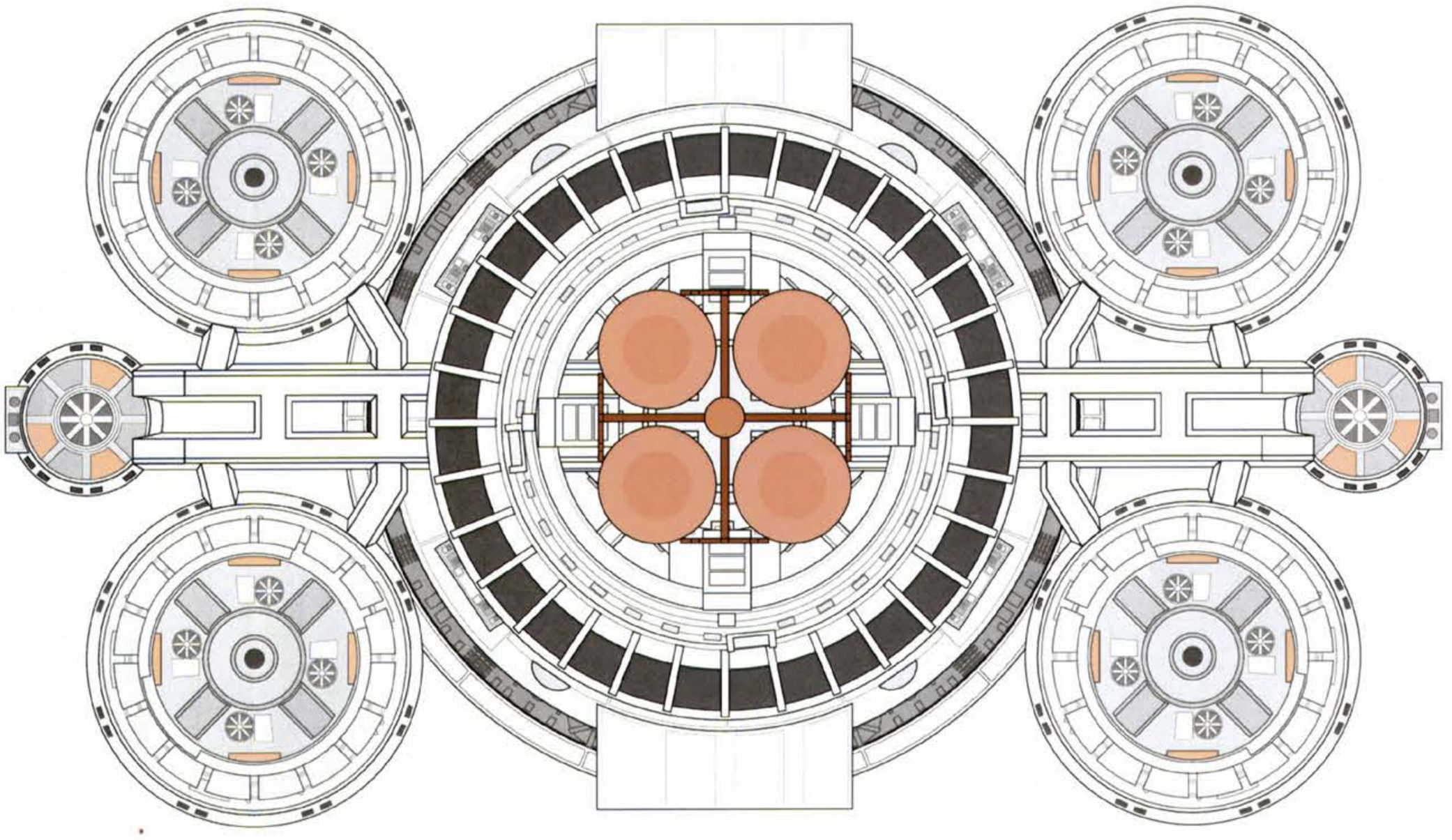
Exterior Views Zenith Orientation

EXTERIOR VIEWS - ZENITH ORIENTATION
SYSTEMS

Dorsal View



Ventral View



Systems

Section 4.0 Shuttle Facilities

Decks 8-10 are dedicated to a three-deck high Fly-through Landing Bay, and two Parking Bays - each with a Shuttle Elevator - for embarked craft. The Landing Bay is wide enough to facilitate landing two shuttles side-by-side via tractor beam, and has a mid-bay turntable.

Section 5.0 Cargo Facilities

Decks 5-7 have a 3-deck high three-deck high Cargo Bay to either side - one above each Barking Bay. The bays bulkhead-mounted niches can accomodate 112 standard cargo pods in quads. Workbee cargo trains can proceed from the Landing Bay to one of the Shuttle Elevators, ride up to the Cargo Bay and land their consist. As well, should extra shuttle parking be required, up to 4 Class 1 shuttles (or corresponding civilian craft) can be parked on the Cargo Bay deck. Recessed tie-downs and tractor-pressor tethers are built into the Cargo Bay decking - similar to those in the Landing and Parking Bays - as well as the Elevators.

Section 6.0 Engineering Systems

Main power is provided by four fusion reactors, each of which also powers a RCS Thruster system. Battery compartments for auxilliary power are located throughout the station.

CLASS 2 SPACE STATION

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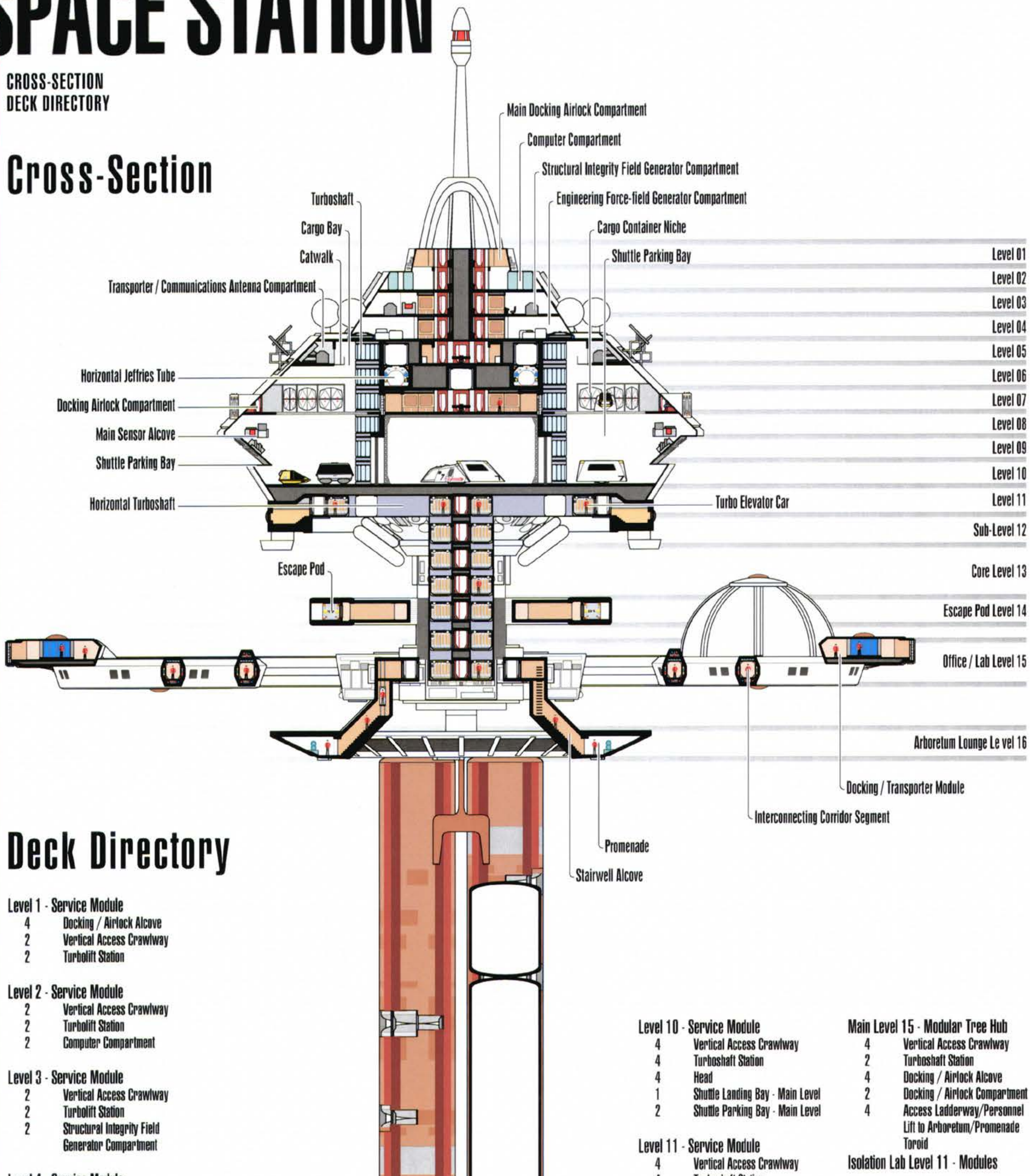
CROSS-SECTION
DECK DIRECTORY

Cross-Section



Deck Directory

Level 1 - Service Module
4	Docking / Airlock Alcove
2	Vertical Access Crawlway
2	Turbolift Station

Level 2 - Service Module
2	Vertical Access Crawlway
2	Turbolift Station
2	Computer Compartment

Level 3 - Service Module
2	Vertical Access Crawlway
2	Turbolift Station
2	Structural Integrity Field Generator Compartment

Level 4 - Service Module
2	Vertical Access Crawlway
2	Turbolift Station
2	Engineering Force-field Generator Compartment
4	Engineering Force-field Distribution Compartment

Level 5 - Service Module
2	Vertical Access Crawlway
2	Turbolift Station
1	Transporter Buffer / Transceiver Compartment
1	Regular & Hyperchannel Transceiver Compartment
2	Cargo Bay High-Bay
2	Transporter / Communications Emitter Compartment

Level 6 - Service Module
2	Vertical Access Crawlway
2	Turbolift Station
2	Cargo Bay Mid-Bay

Level 7 - Service Module
2	Vertical Access Crawlway
2	Turbolift Station
1	Security
1	Briefing Room
1	Chief Medical Officer's Office & Lab
1	Sickbay
2	Food Processor Raw Material Tankage
2	Cargo Bay Main Level
4	Docking / Airlock Alcove
2	Cargo Transporter Alcove
2	Emergency Supply Locker
2	Damage Control Locker
4	Fusion Reactor / RCS Thruster Compartment
10	Head

Level 8 - Service Module
4	Vertical Access Crawlway
4	Horizontal Jeffries Tube
4	Turbolift Station
1	Shuttle Landing Bay - High-Bay
2	Shuttle Parking Bay - High-Bay
22	Main Sensor Alcove

Level 9 - Service Module
4	Vertical Access Crawlway
4	Turboshaft
1	Shuttle Landing Bay - Mid-Bay
2	Shuttle Parking Bay - Mid-Bay
22	Main Sensor Alcove

Level 10 - Service Module
4	Vertical Access Crawlway
4	Turboshaft Station
4	Head
1	Shuttle Landing Bay - Main Level
2	Shuttle Parking Bay - Main Level

Level 11 - Service Module
4	Vertical Access Crawlway
4	Turboshaft Station
4	Head
4	Control Room
2	Docking Alcove
4	Battery Compartment
1	Life-Support Compartment
1	Waste Recycling Compartment
1	Food Sysnthesis Compartment
1	Food Stasis Compartment

Sub-Level 12 - Service Module
4	Vertical Access Crawlway
2	Turboshaft Station
16	Emergency Life-Support Tankage

Central Core Level 13 - Service Module
4	Vertical Access Crawlway
2	Turboshaft Station

Escape Pod Toroid Level 14
4	Vertical Access Crawlway
2	Turboshaft Station
32	Escape Pod Niche

Main Level 15 - Modular Tree Hub
4	Vertical Access Crawlway
2	Turboshaft Station
4	Docking / Airlock Alcove
2	Docking / Airlock Compartment
4	Access Ladderway/Personnel Lift to Arboretum/Promenade Toroid

Isolation Lab Level 11 - Modules
1	Lab Module
	- Geoplastics
	- Geoplastics
	- Geoplastics
	- Geoplastics
	- Geoplastics
1	Personnel Module
	12 - Cabins
	1- Common Room
	1 -Head
1	Docking / Transporter Module
	1 - Security Station
	1 - Small Craft Control
	1 - 2-personnel Transporter Alcove
	1 - Docking Alcove

Arboretum / Promenade Level 16
4	Access Ladderway/Personnel Lift to Modular Tree Hub
1	Ring Corridor / Arboretum

CLASS 2 SPACE STATION

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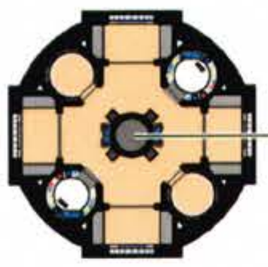
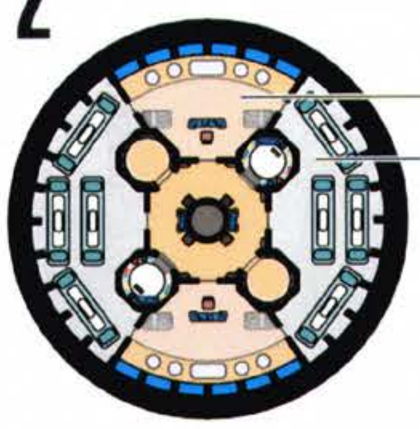
INTERIOR VIEWS - ZENITH ORIENTATION

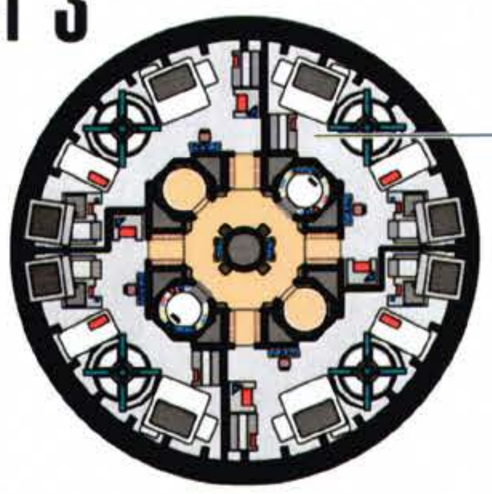
Level 1



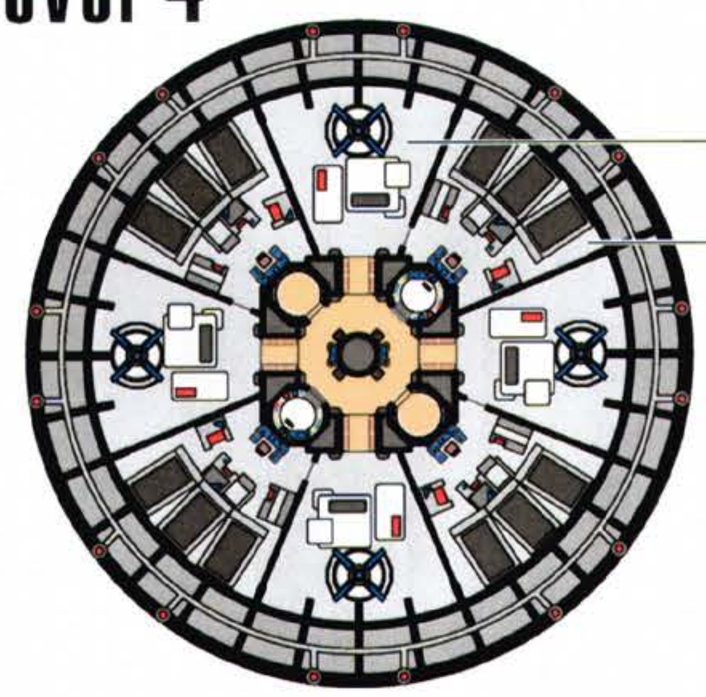
Level 2



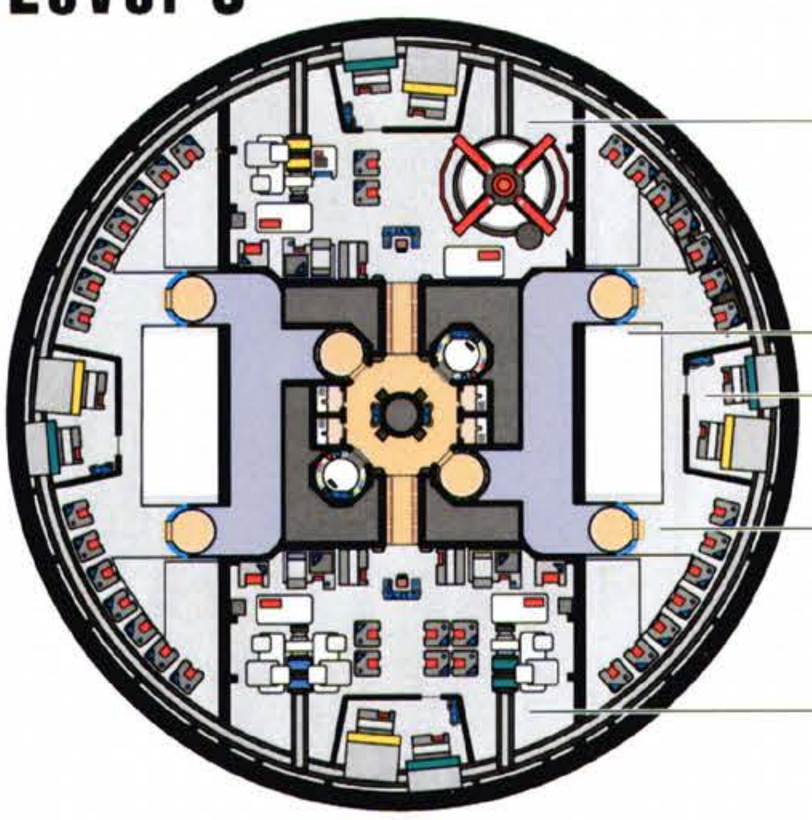
Level 3



Level 4



Level 5



Scale

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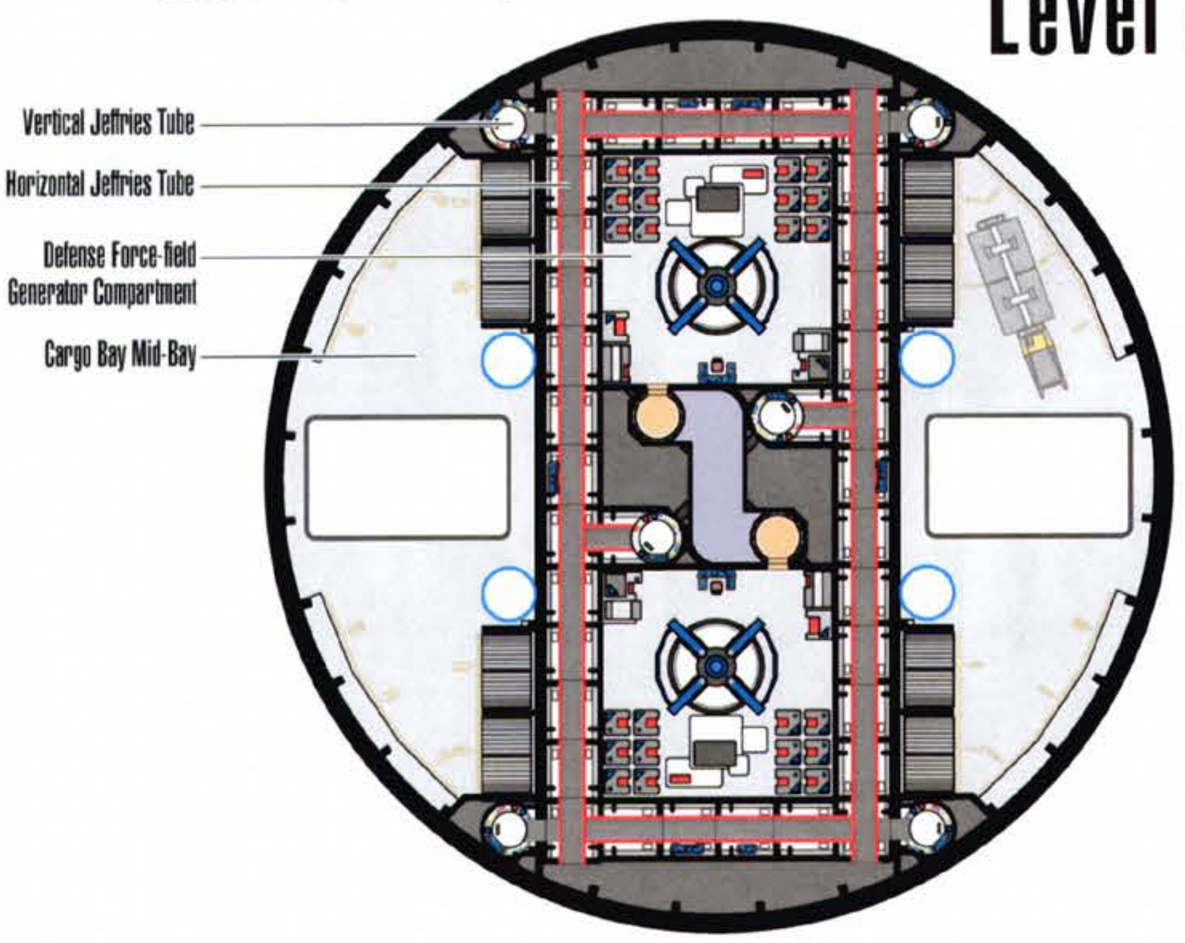
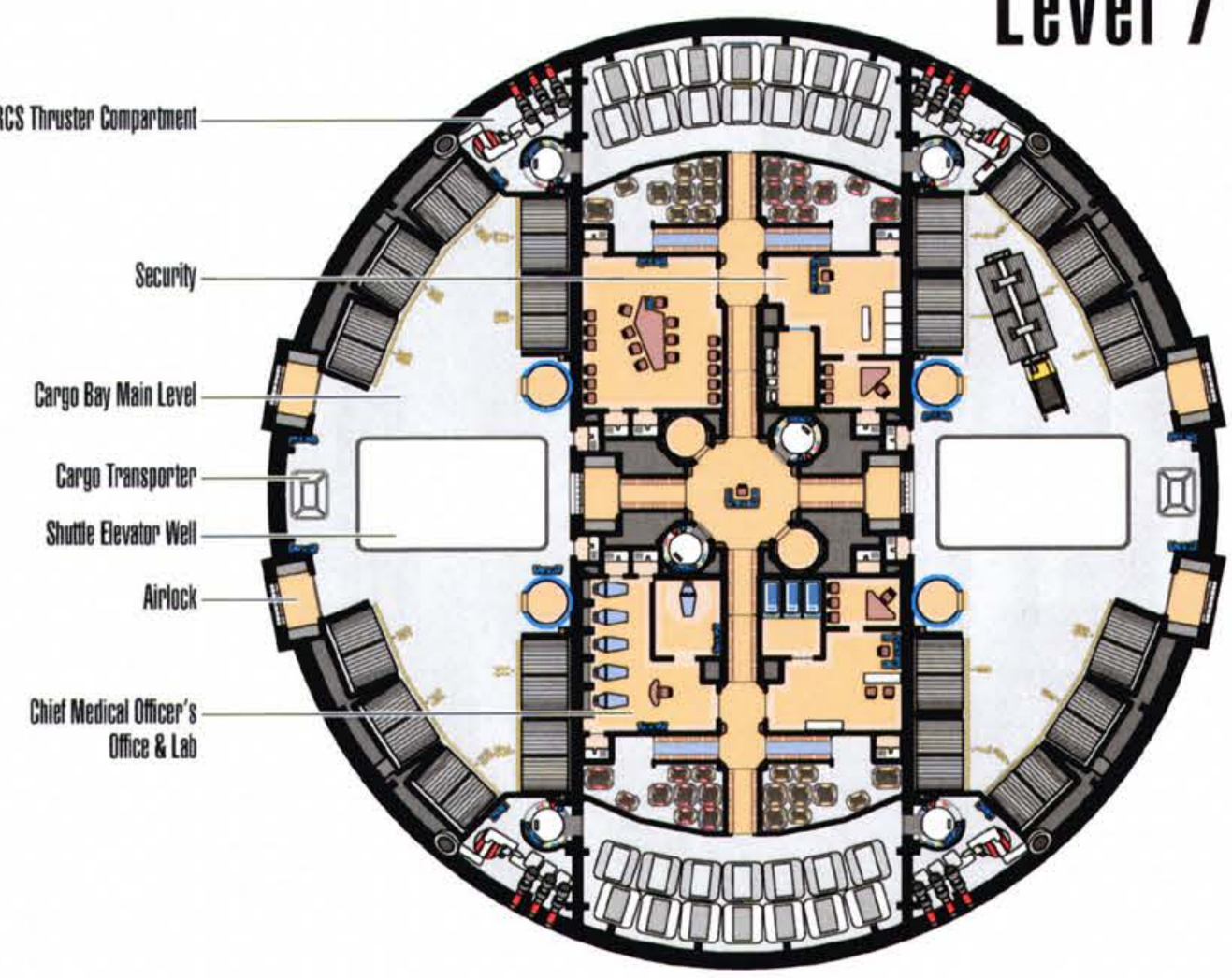
Level 6



Level 7



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Interior Views Zenith Orientation

INTERIOR VIEWS - ZENITH ORIENTATION

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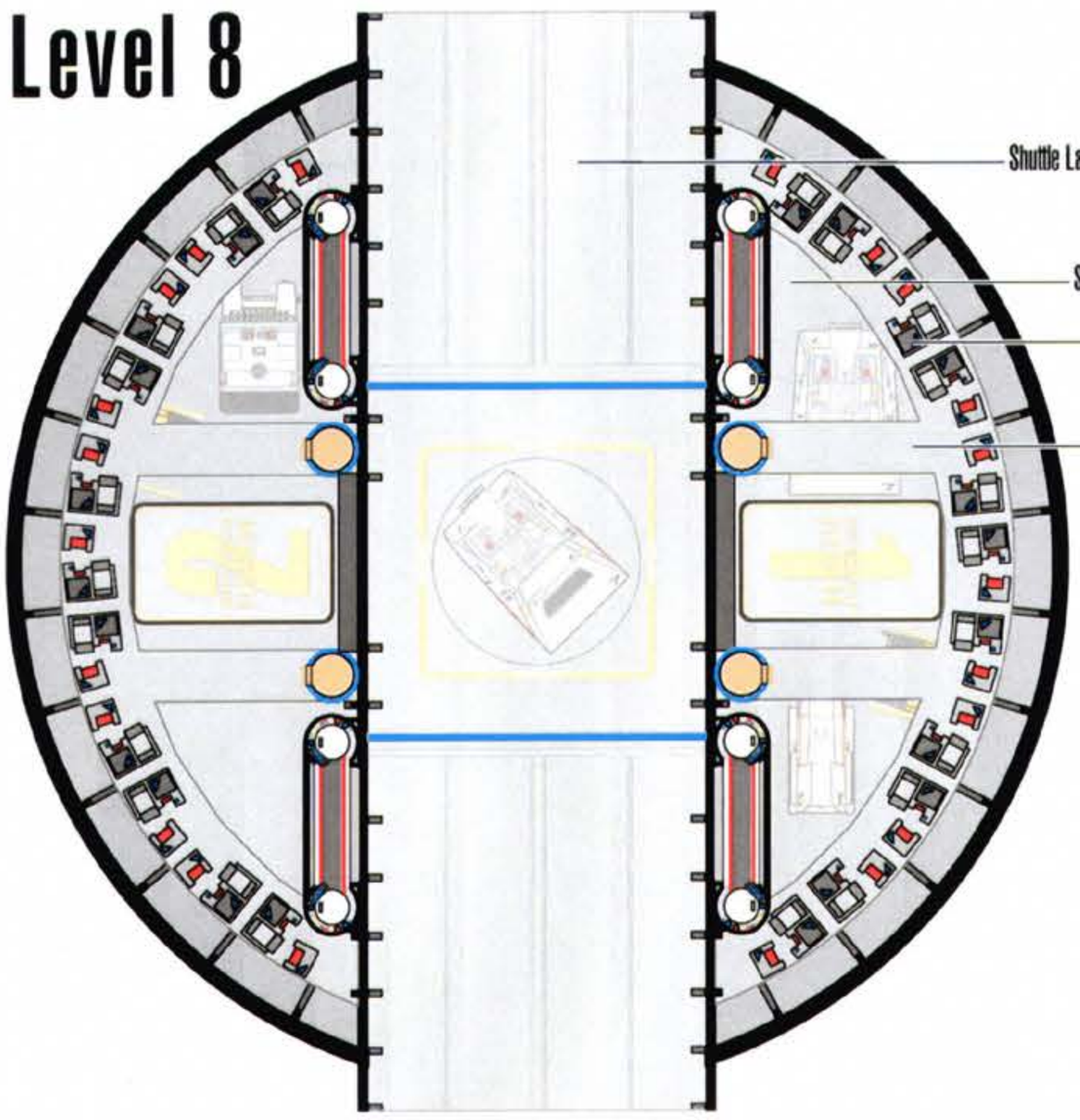
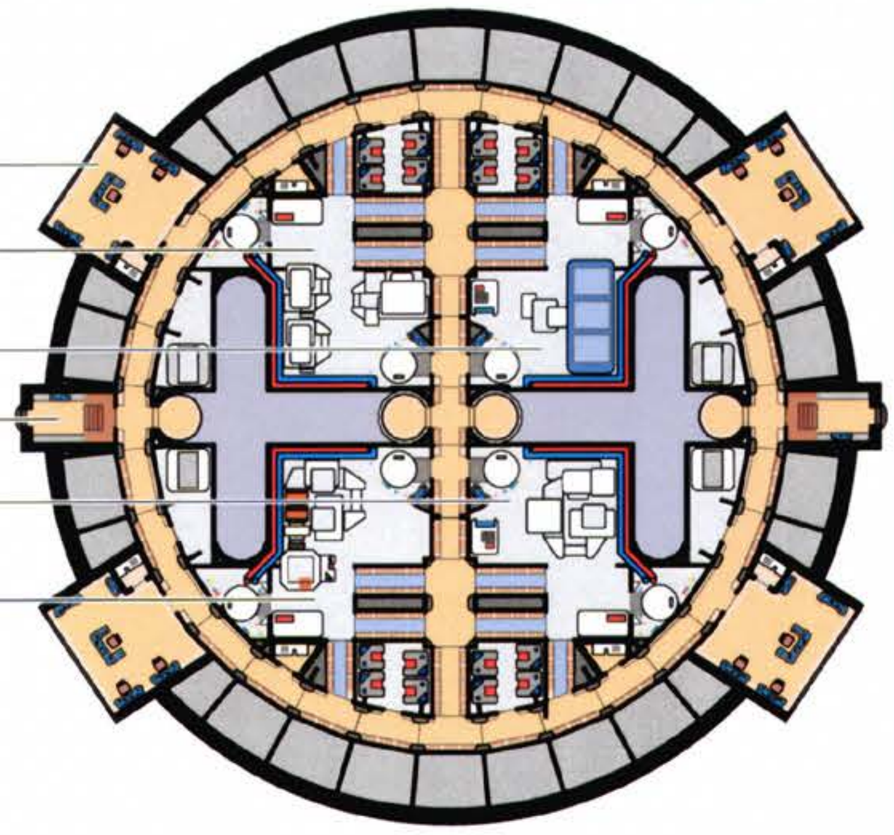
CLASS 2 SPACE STATION

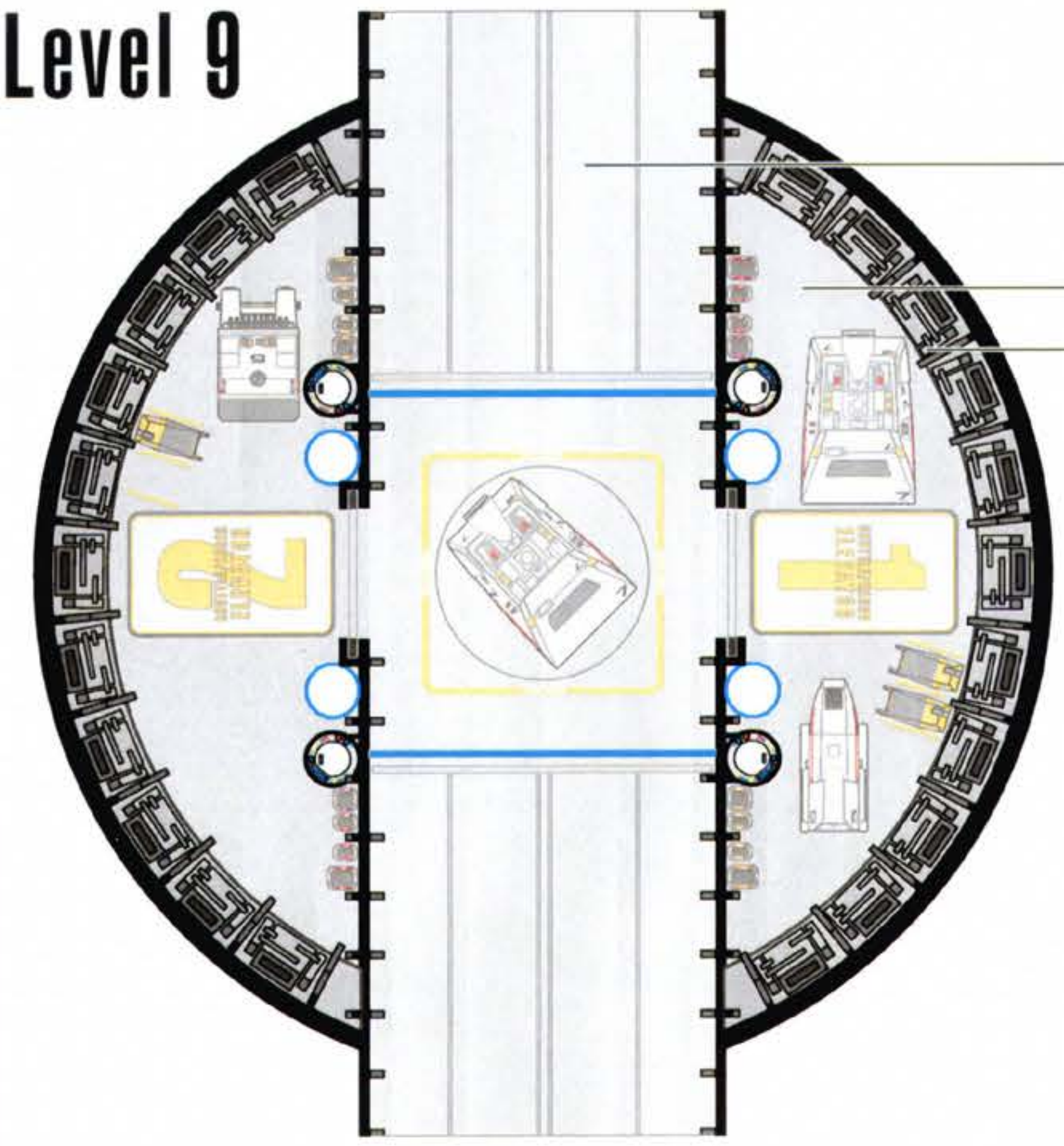
Level 8



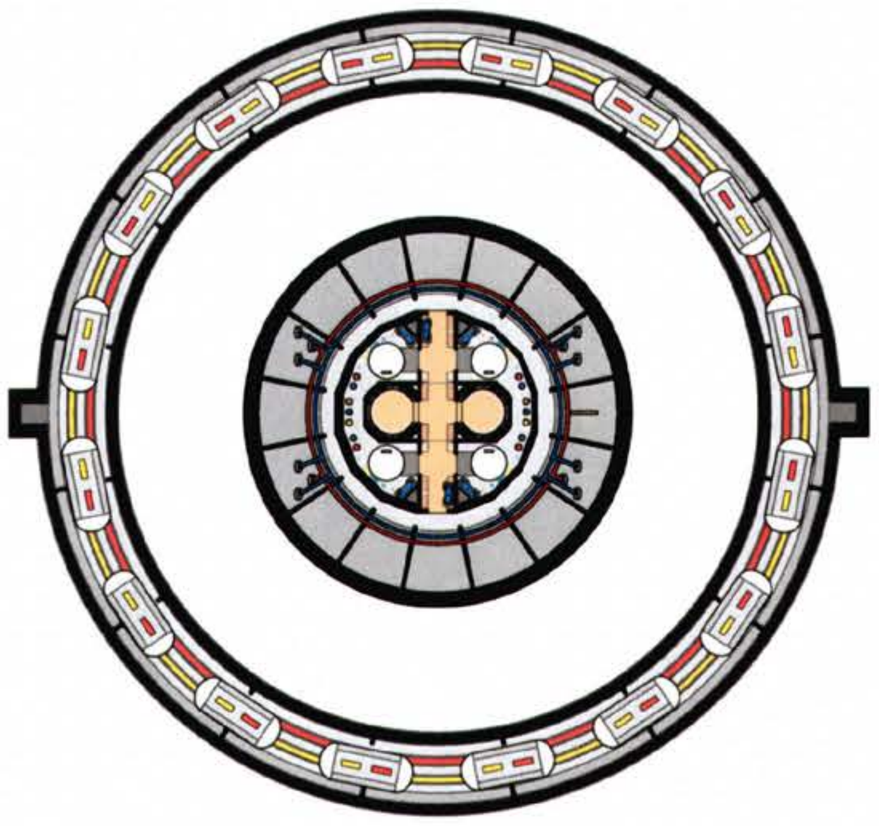
Level 11



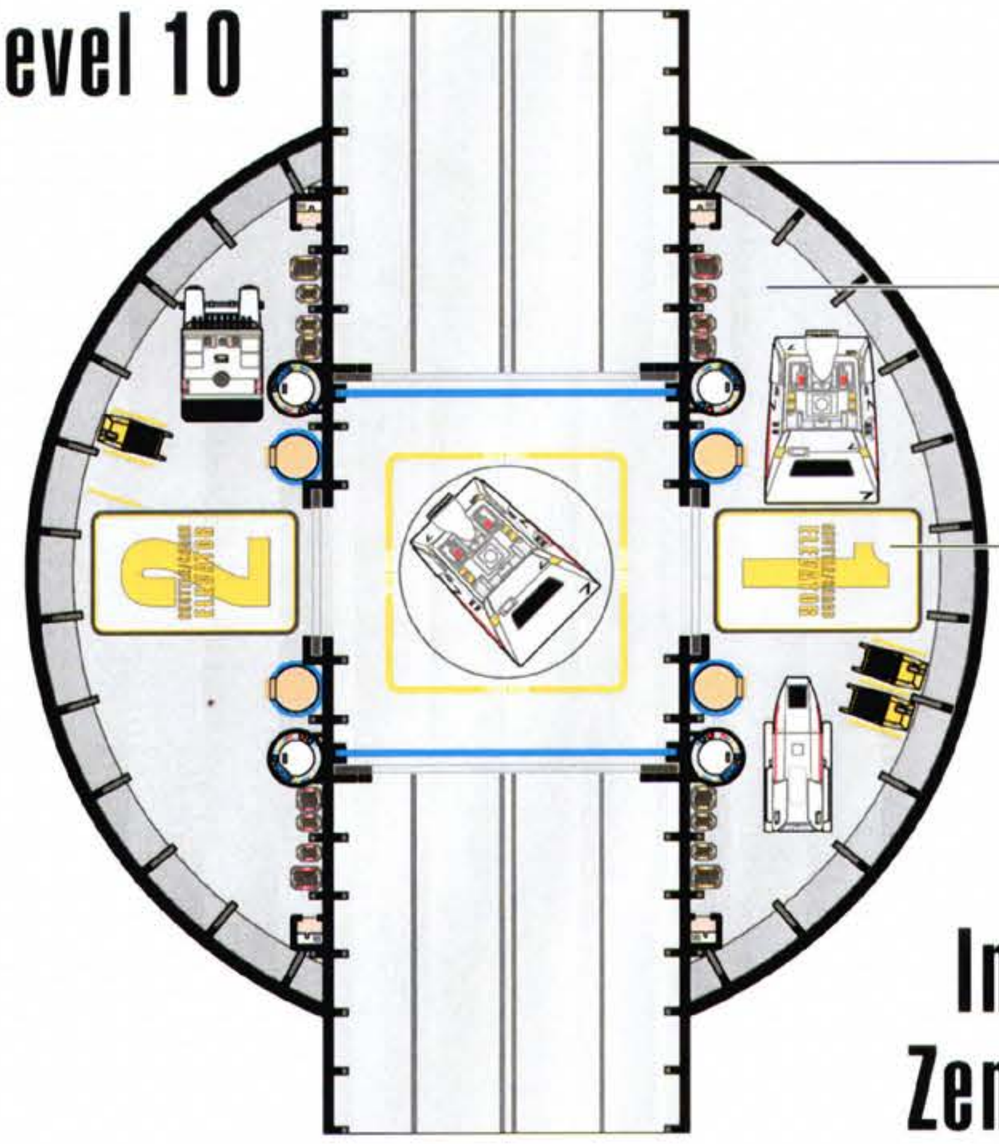
Level 9



Sub-Level 12

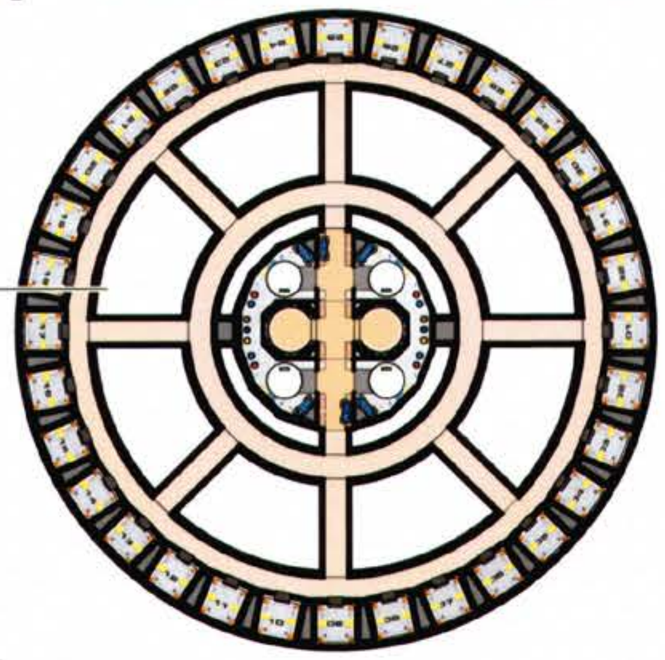


Level 10



Central Core Level 13

Escape Pod Toroid Level 14



Interior Views Zenith Orientation

Scale

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CLASS 2 SPACE STATION

SHEET 7/11

INTERIOR VIEWS - ZENITH ORIENTATION

Scale
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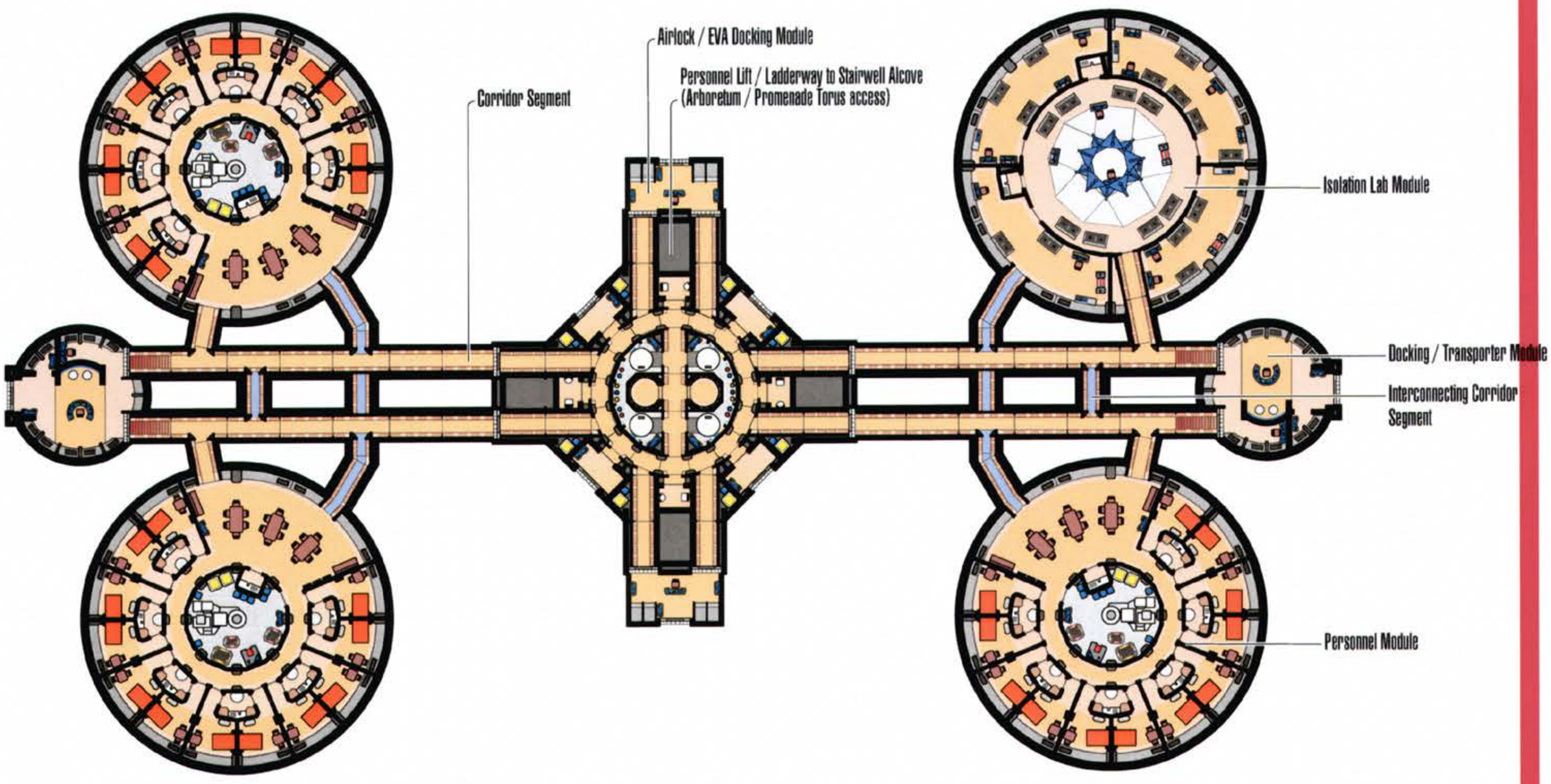
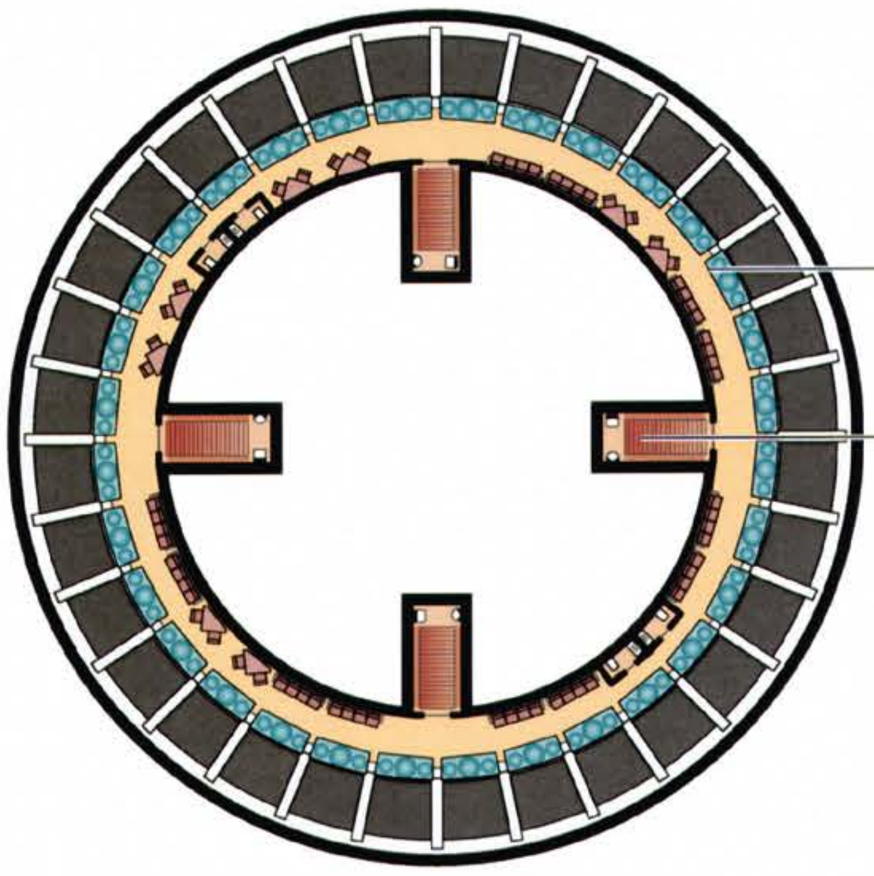
Interior Views
Zenith Orientation

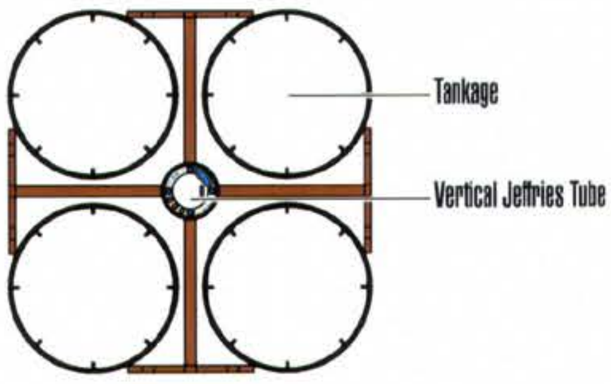
Research Level 16



Arboretum / Promenade Level 16



Tankage



CLASS 2 SPACE STATION

SHEET 8/11

EXTERIOR VIEWS - NADIR ORIENTATION

Scale
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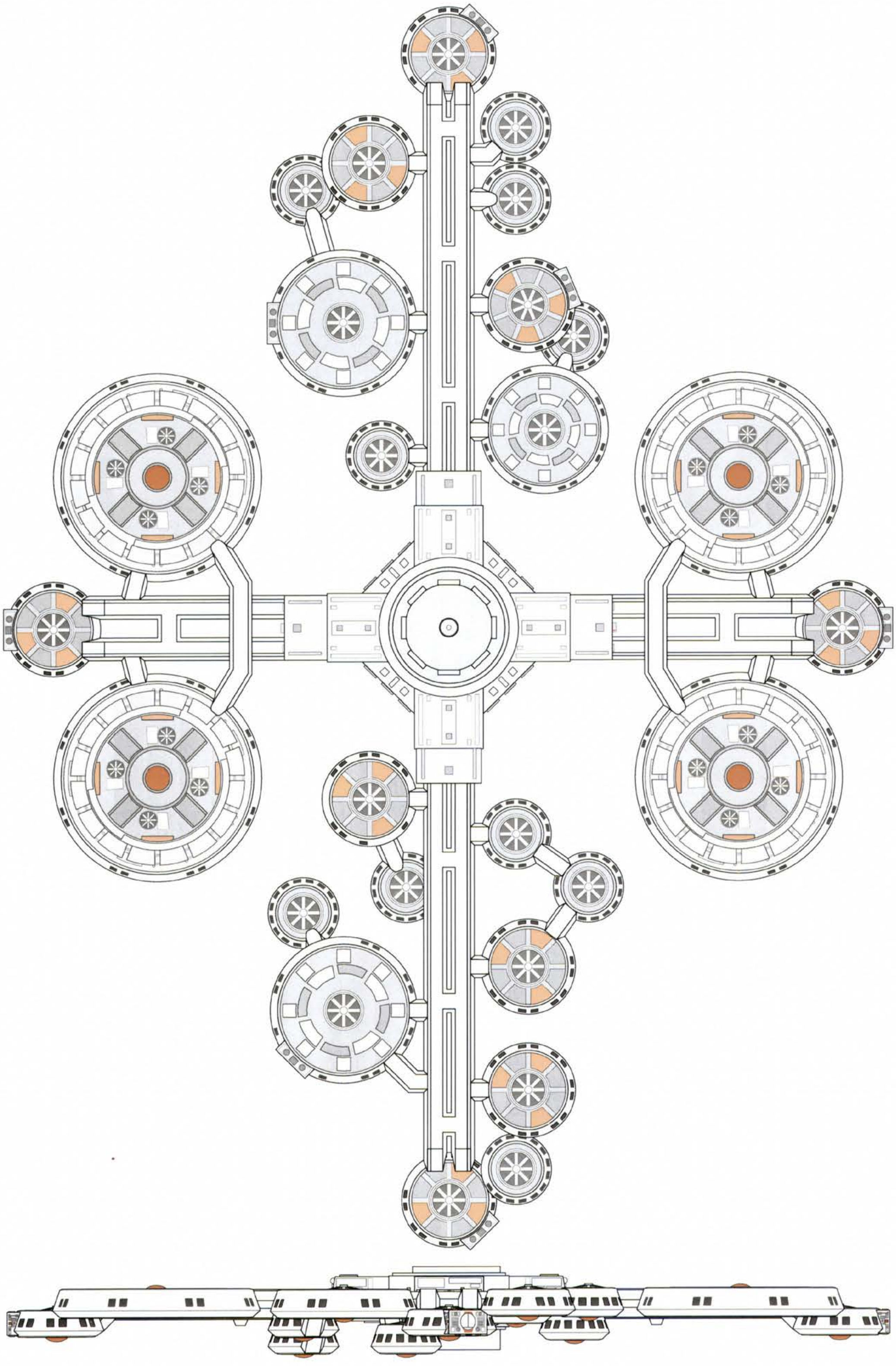
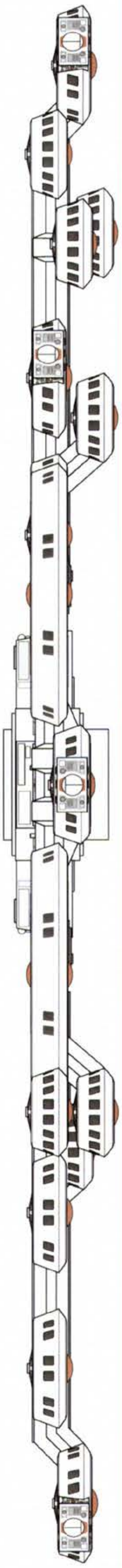
Exterior Views
Nadir Orientation

Office Level 16





CLASS 2 SPACE STATION

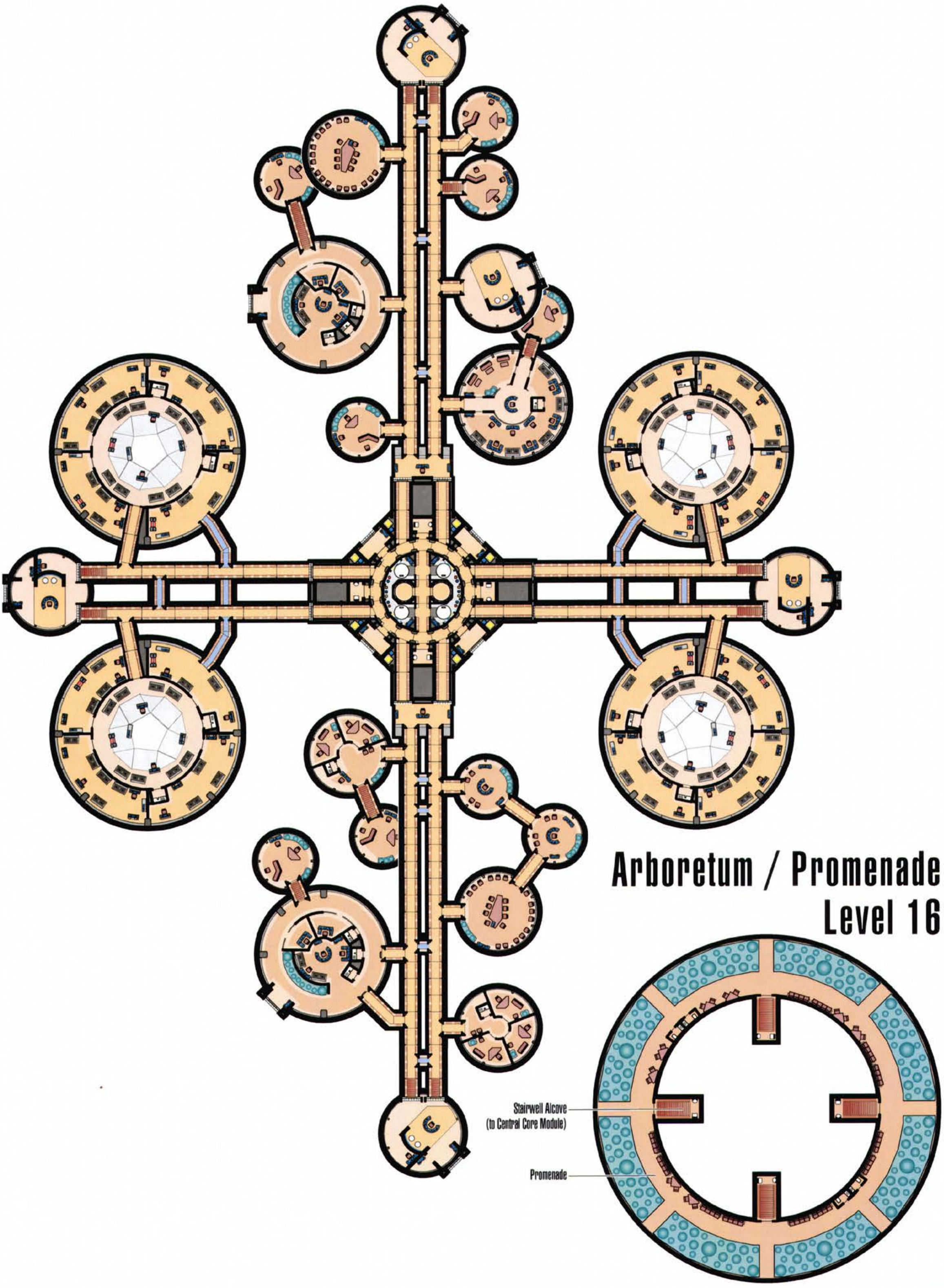
SHEET 9/11

INTERIOR VIEWS - NADIR ORIENTATION

Scale
0 1 2 3 4 5 10 20

Interior Views
Nadir Orientation

Office Level 16



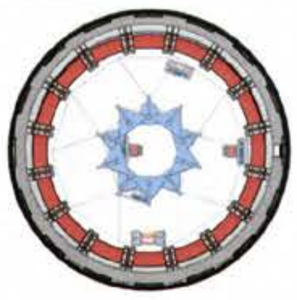
Arboretum / Promenade Level 16

Symbol Chart

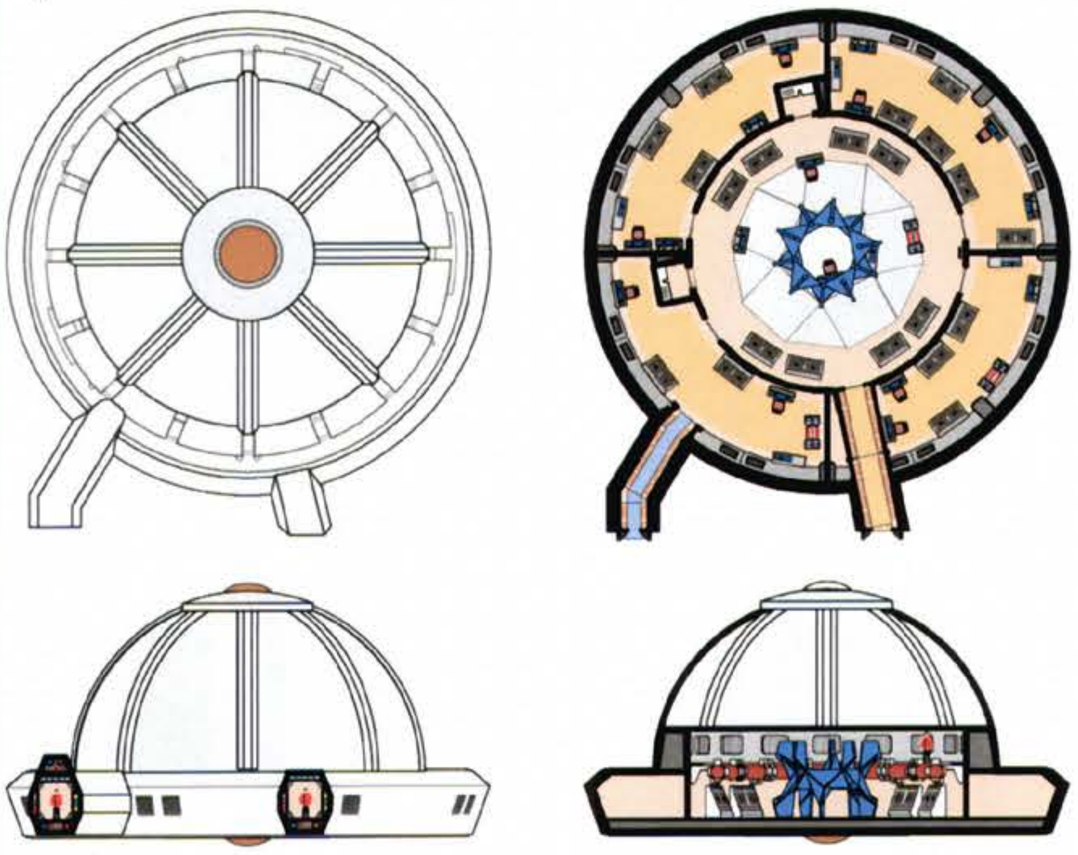
SYMBOL CHART

SHEET 10/11

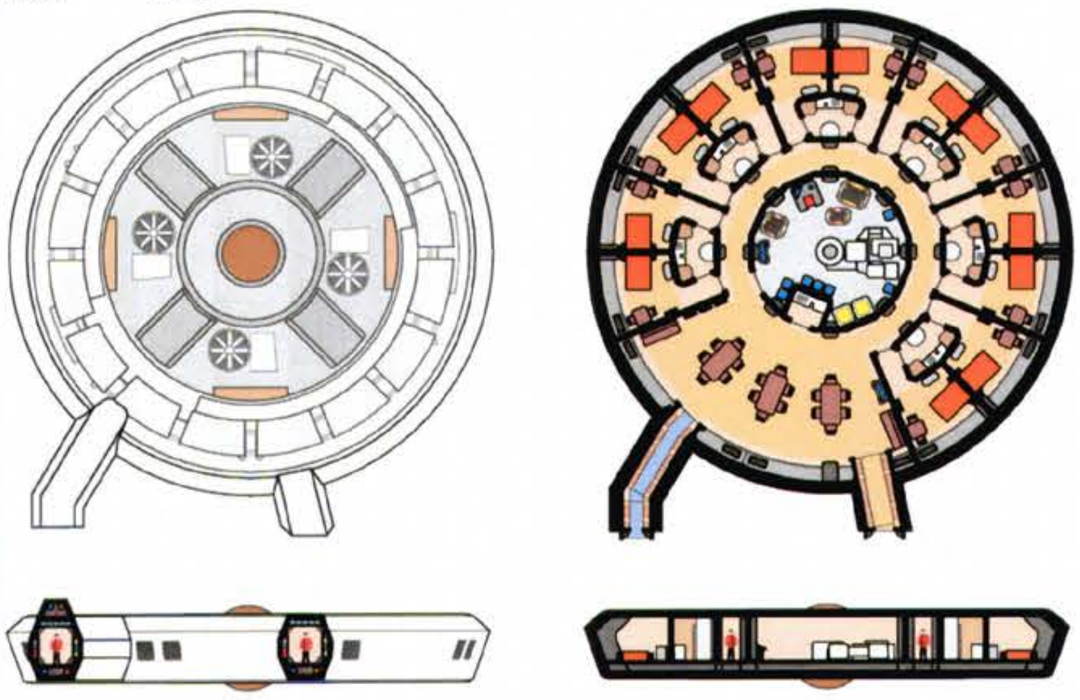
CLASS 2 SPACE STATION



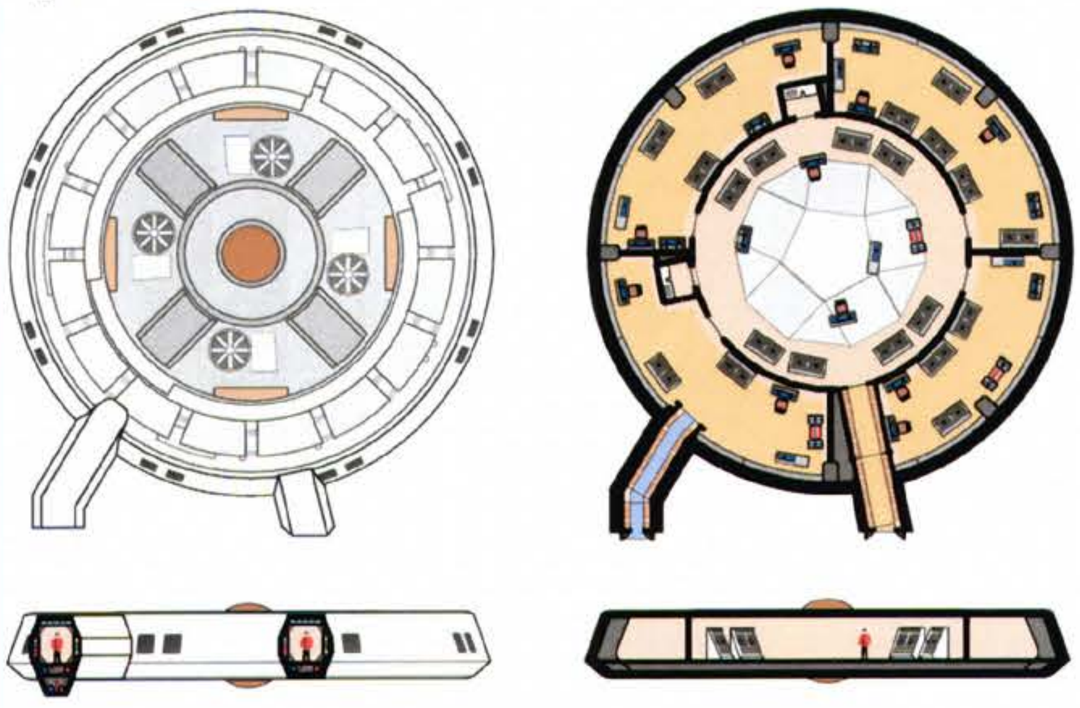
Isolation Lab Module
Diameter 30 meters Displacement 2.1 X 10^5 tons
Height 15.4 meters



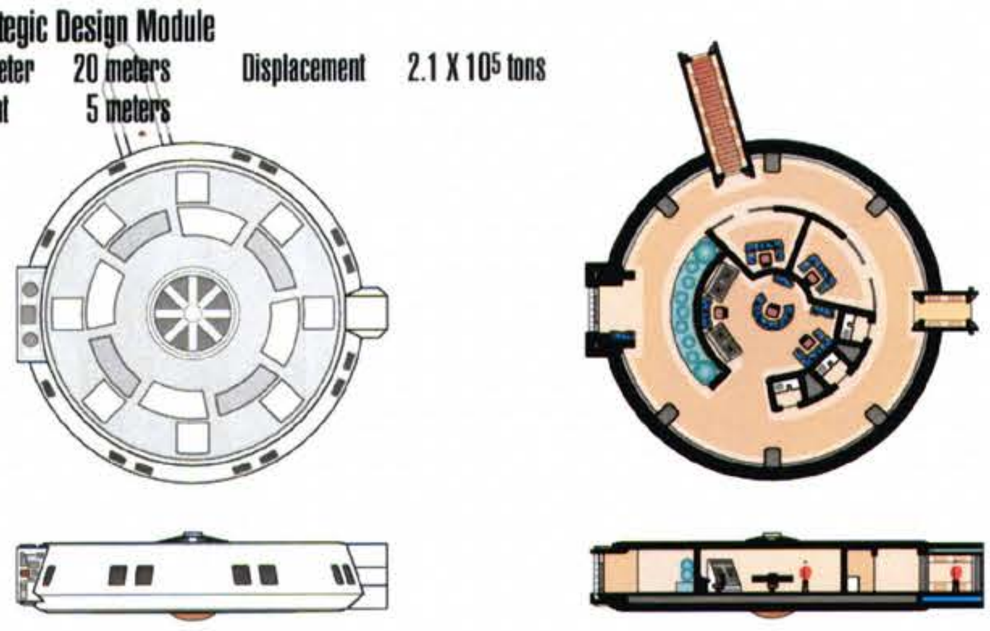
Personnel Module
Diameter 30 meters Displacement 2.1 X 10^5 tons
Height 5 meters



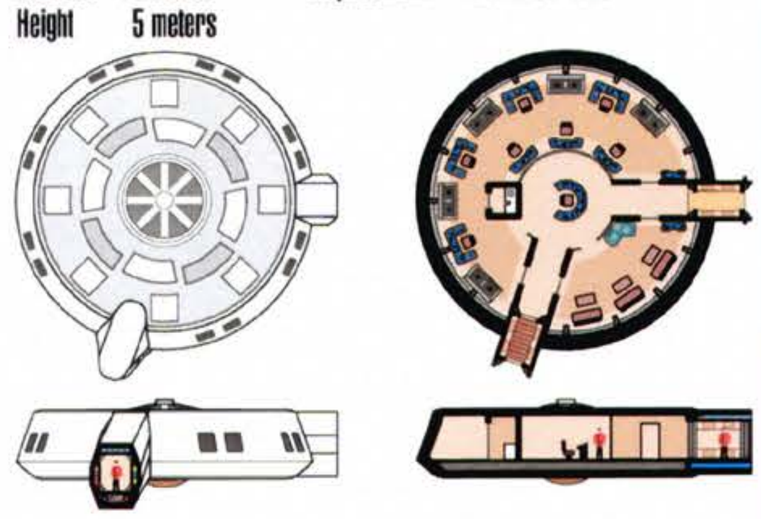
Engineering Workshop Module
Diameter 30 meters Displacement 2.1 X 10^5 tons
Height 5 meters



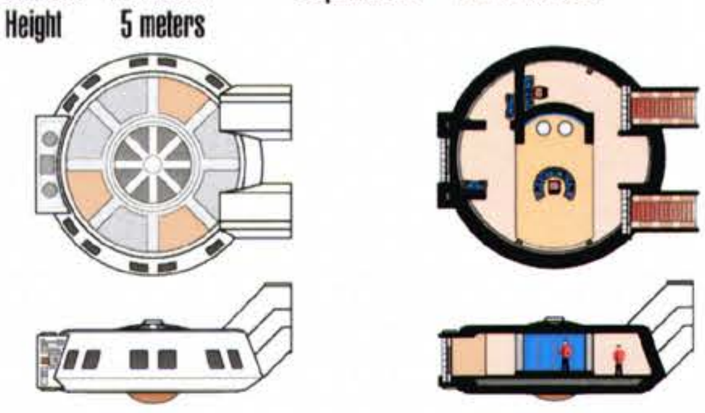
Strategic Design Module
Diameter 20 meters Displacement 2.1 X 10^5 tons
Height 5 meters



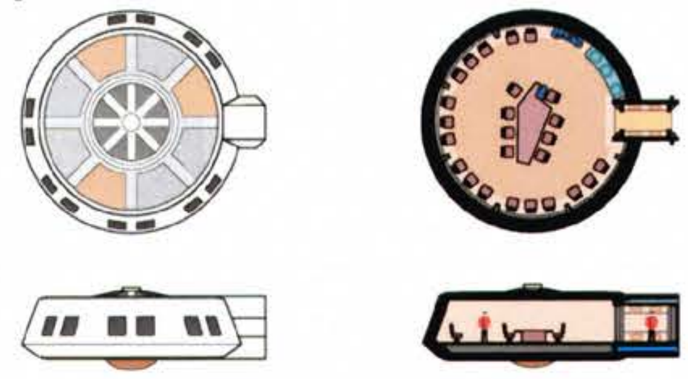
Communications Module
Diameter 17 meters Displacement 2.1 X 10^5 tons
Height 5 meters



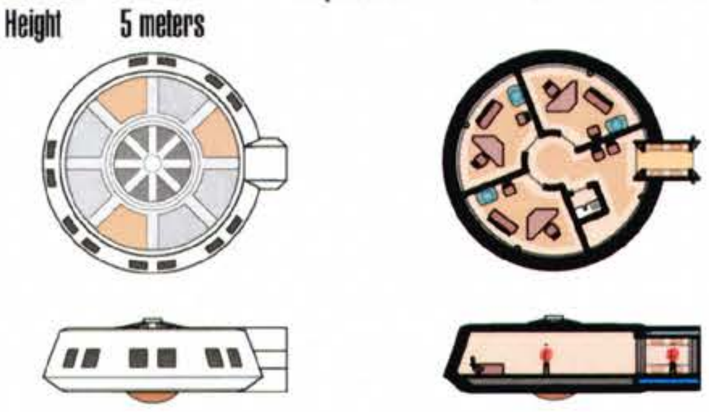
Docking & Transporter Module
Diameter 13 meters Displacement 2.1 X 10^5 tons
Height 5 meters



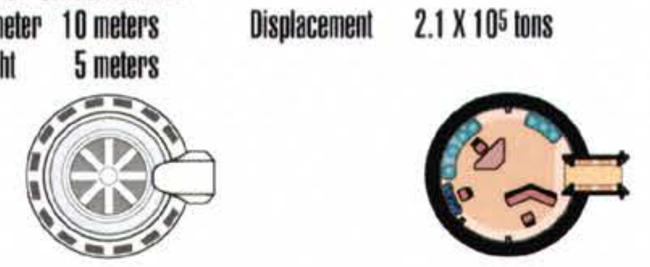
Briefing Module
Diameter 13 meters Displacement 2.1 X 10^5 tons
Height 5 meters



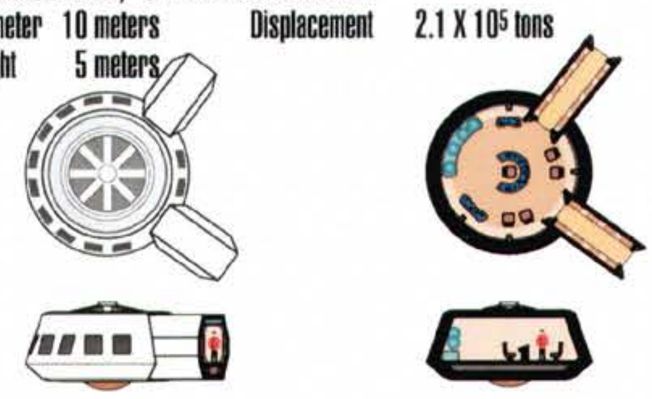
Office Module
Diameter 13 meters Displacement 2.1 X 10^5 tons
Height 5 meters



Senior Office Module
Diameter 10 meters Displacement 2.1 X 10^5 tons
Height 5 meters



Administration / Coordination Module
Diameter 10 meters Displacement 2.1 X 10^5 tons
Height 5 meters



CLASS 2 SPACE STATION

SHEET 11/11

Scale
0 1 2 3 4 5 10 20

Symbol Chart

SYMBOL CHART

AUXILLIARY ENGINEERING - COMPARTMENTS

Security
- Duty Officer's Post
- Senior Security Office
- Lockers
- Cells (1)

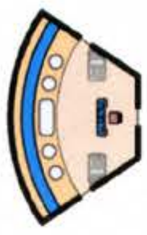
Briefing Room

Sickbay Complex
- Intensive Care (1)
- Surgery (1)
- Nurse Station

- Chief Surgeon's Office
- Pathology Lab
- Morgue

Head

Control Room



6-Personnel Transporter Room
- Operator's Station
- Pad Stage

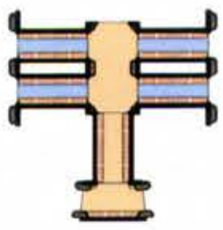
Airlock / EVA Docking Module

Docking / Airlock Compartment

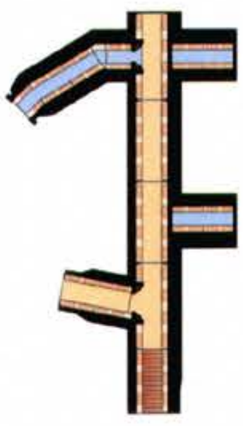
Docking Alcove

Personnel Lift / Ladderway to Stairwell Alcove

Stairwell Alcove to Personnel Lift / Ladderway)



Support Module Corridor Segments
- Hub Hallway
- Access Corridor
- Standard Corridor
- Circumferal Corridor



Modular Tree Corridor Segments
- Standard Corridor (4)
- Angular Access Corridor (1)
- Transverse Access Corridor (2)
- Angular Standard Corridor (1)
- Stairway (1)

MAIN ENGINEERING - MAIN POWER
- REACTION CONTROL THRUSTER SYSTEMS

Vectored Exhaust Nozzle Plenum

Fusion Generator (6.1 X 10^{10} Mw)

Vectored Exhaust Nozzle Plenum

MAIN ENGINEERING - ELECTRO-PLASMA SYSTEMS

Cold Fusion Battery Bank

INFORMATION SYSTEMS

Computer Core

Lateral Tactical Sensor Array

AUXILLIARY ENGINEERING - MISC. SYSTEMS

Vertical Jeffries Tube

Horizontal Jeffries Tube

Turbolift Station
Horizontal Turboshaft
Vertical Turboshaft

Free-standing Turbolift Station

Free-standing Vertical Turboshaft

Shuttle Elevator

Spar

Isolation Shield Frame

Isolation Shield Frame

Control Consoles

Damage-Control Containers

Emergency Supply Containers

Cargo Container
Capacity 10 meters^3
10 tons

LIFE SUPPORT & FLUID/GAS TANKAGE

Food Synthesizer

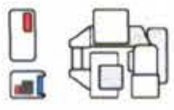
Food Synthesizer Raw Material Storage Tank (Organic)

Inorganic Synthesizer

Synthesizer Raw Material Storage Tank (Inorganic)

Organic Stasis Containment

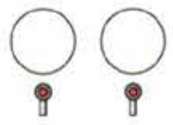
Organic Waste Recycler



Atmospheric Recycler

Emergency Atmospheric Gas Tankage

GRAVITONIC SYSTEMS



Tractor Beam / Deflector
- Emitter Domes
- Waveguide

Engineering Insulating Force Field Generator

Engineering Insulating Force Field Emitters

Structural Integrity Field Generator

Structural Integrity Field Emitter

Defense Force-field / Deflector Screen Generator

COMMUNICATIONS & TRANSPORTER SYSTEMS

Hyperchannel Transceiver

Communications Antenna

EM Radio Transceiver

Transporter Transceiver

Transporter Emitter

Transporter Buffer

Transporter Pad (6-personnel)

Transporter Pad (2-personnel)

Transporter Pad (Cargo)

EMBARKED CRAFT

Work Bee

Travel Pod

Type 3 Shuttle

Type 4 Shuttle

Type 5 Shuttle

ESCAPE SYSTEMS

Escape Pod