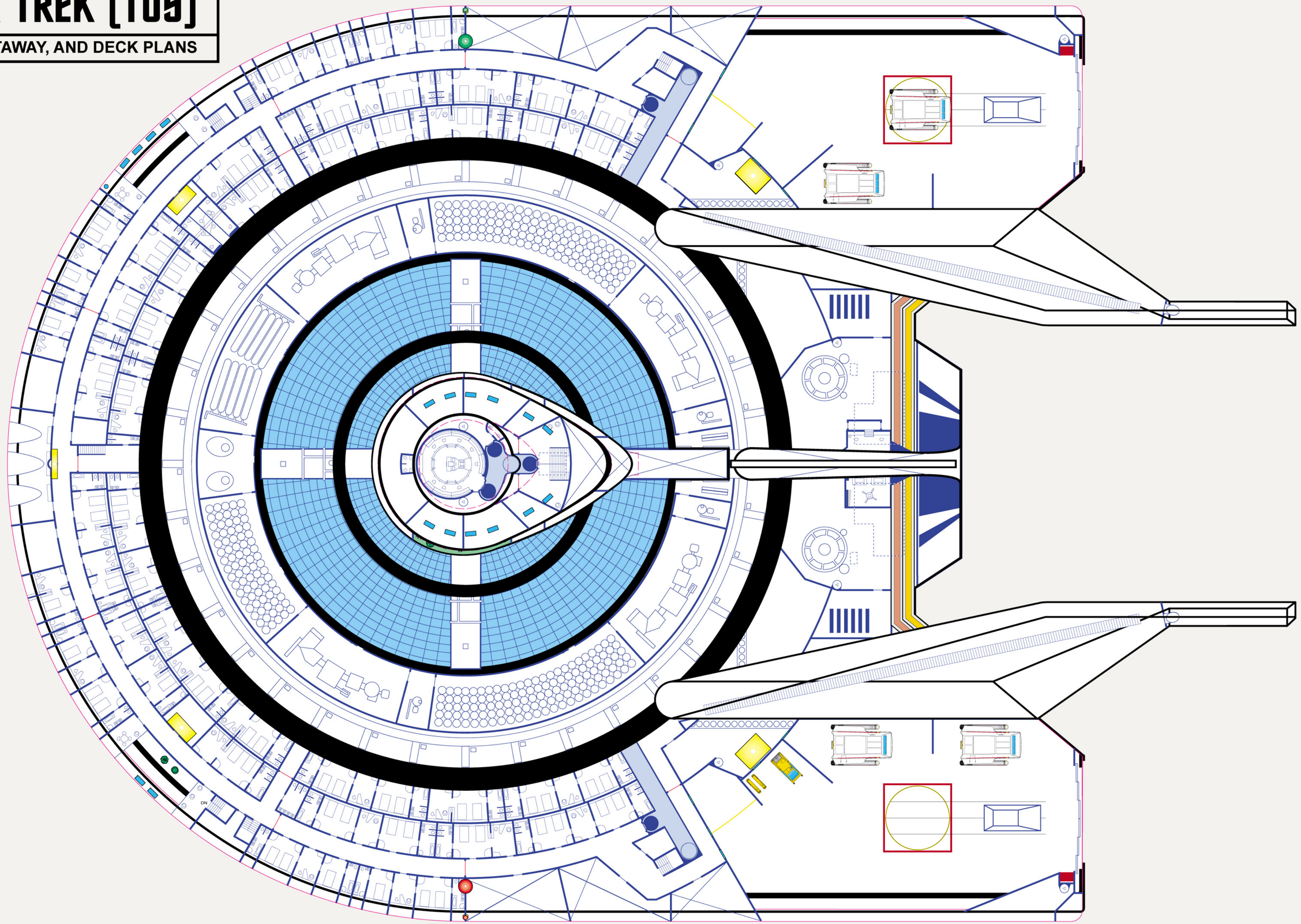
DERF TENDER

from STAR TREK (TOS)

PROFILE, CUTAWAY, AND DECK PLANS



DRAWN BY: Jim Botaitis

STAR TREK - DERF-CLASS TENDER

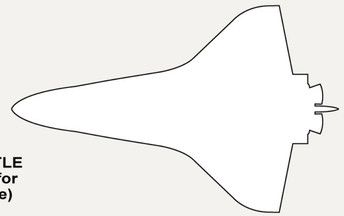
LAYOUT: PORT PROFILE — PAGE 1 of 16

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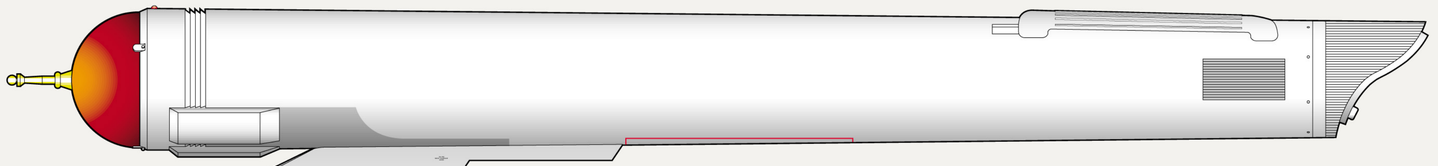
DRAWN BY: Jim Botaitis

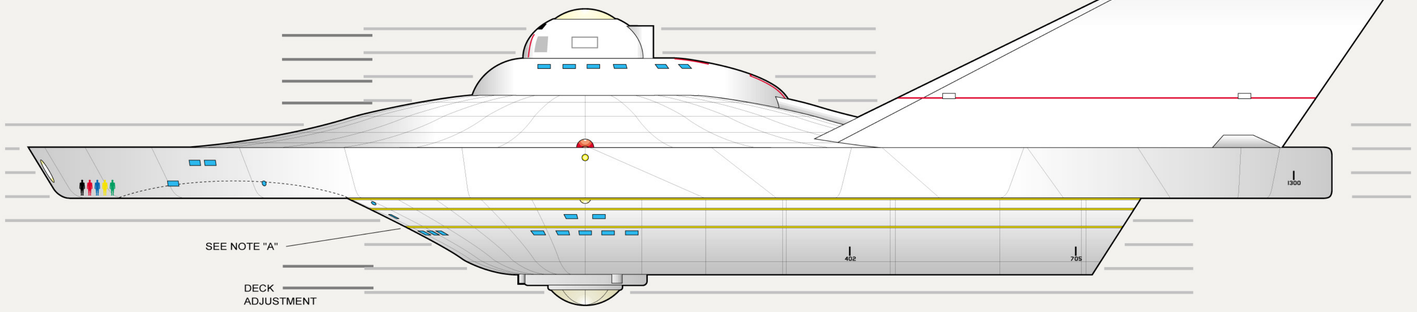
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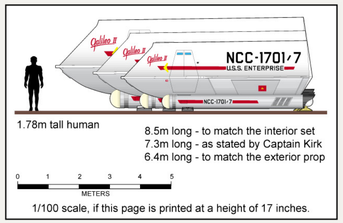




SPACE SHUTTLE
(Shown here for
size reference)







BACKGROUND HISTORY

This project is an extrapolation of the U.S.S. ENTERPRISE drawings developed in the year 2020. Those drawings were governed by 3 criteria:
(1) The 11-foot-2.08-inch (3.4-meter) studio model,
(2) The Writer's Guide, and
(3) The 79 episodes plus the original pilot.
There are no such criteria to guide these drawings, but the basic design philosophy is to complete this ship in the same style that Franz Joseph (FJ) developed for his Technical Manual and in the same style as his Heavy Cruiser blueprints. The goal is to try and fit all the components inside the hull. But what are "all the components"? What are the roles of "Tenders" in the STAR TREK universe?

A "Tender" was a type of ship used on Earth to service or support larger ships. By the late 20th Century technological improvements allowed navies to operate without depending on "Tenders" for maintenance and supply.
"Tenders" are still used by passenger liners, merchants, etc. They can also serve as lifeboats in emergencies.
There are many specialized "Tenders" ... one of them being a "Buoy Tender." Such ships were used (usually by the Coast Guards of various countries) to maintain and replace navigational buoys.

According to the FASA Ship Recognition Manual, the Derf-class Tender was designed later than the Constitution-class Heavy Cruiser and later than the Larson-class Destroyer. Elements from both were used on this ship. The lower decks of the Primary Hull were extensively modified to contain the repair facilities for navigational beacons. Before this class of ship was introduced, buoys and beacons had to be retrieved and returned to a repair facility for service. Now, they can be repaired or replaced on-site.
The Derf-class Tender has two Phaser Banks. The FASA Manual says this ship carries 7 shuttlecraft and has a crew of 72.

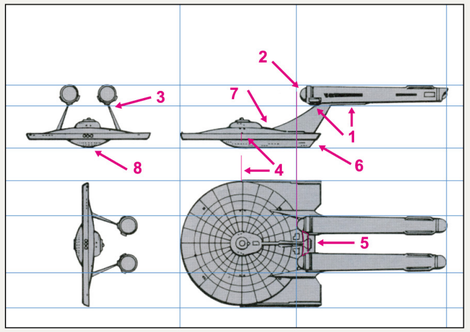
This layout retains the lines as established by FASA, but there were some problems which had to be resolved, and some modifications that had to be made to ensure the details on the 3-view drawings are consistent.

CONSTRUCTION NOTES

There have been many interpretations of this design. Starting with the original FASA drawing (see image at right) we can see some problems:
(1) The pylon and the extension conflicts with the Intake Field Generators and Antimatter Ejection Panel,
(2) Depending on the view, the Warp Engine is not at a consistent distance behind the Primary Hull,
(3) The pylon is very thin where it attaches to the Warp Engine,
(4) The Primary Hull extends beyond the original diameter but it is not drawn correctly (see pink lines),
(5) The Impulse Engine has been moved aft from the trailing edge of the Primary Hull,
(6) The trailing edge of the Primary Hull's lower decks cannot extend beyond the Impulse Engine,
(7) There is a bulge shown behind the B-C decks (especially visible in the top view),
(8) The Lower Sensor Dome has been deleted.

Here are the solutions:
(1) Modified Larson-class pylons are used, the extension is not as long, and the engine is further forward,
(2) The pylons determine the attachment point and the location of the engines,
(3) The pylons are thicker than originally drawn,
(4) The Primary Hull is not extended to the sides, only to the rear,
(5) The Impulse Engine was moved aft, thus providing space for the Power Conduits to reach the pylons,
(6) The trailing edge of the Primary Hull's lower decks was adjusted,
(7) This bulge raises the Piping / Wiring Trunk, which allows Deck 5 to continue further aft,
(8) The Lower Sensor Dome was not deleted.

Can the engine nacelle be disconnected in an emergency? Can the Primary Hull make an emergency landing? Should the 2 Main Landing Legs be deleted, or should more legs be added? How can this ship carry 7 shuttlecraft? Why so many? Where are they stored? How are they deployed and recovered? Why is there no Main Sensor Dish? The FASA manual explains that the shuttlecraft have Tractor Beams for retrieving navigational buoys, but does this ship have a Tractor Beam too? It also states this class of ship only has a crew of 72. If the extra crew quarters are removed what should be installed in their place?



GENERAL NOTES

Are the wide steps in Engineering considered to be "stairs"? Are the steps on the Bridge considered to be "stairs"?
Perhaps stairs do not appear in any episodes, but that does not mean they do not exist in Starfleet ships. Therefore:
1. After engine nacelle disconnection and an emergency landing, stairs on Decks 4, 3, and 2 lead up to the hatch, thus allowing the crew to leave the ship quickly.
2. Each of the 2 Recreation Rooms on Deck 7 have balconies on Deck 6. Those balconies have stairs that lead down to their respective Recreation Rooms.
3. Stairs connect the two levels of the Deflector Equipment at the front of the hull.
4. Stairs near the Hangar Bay entrances help connect the outer ring of Deck 7 to Deck 6.

Aside from these stairs, the rectangular ladders (within rectangular alcoves) and the triangular ladders (within circular alcoves) supplement the turbo-elevator system. If that system fails, or in some other emergency, ladders alone would not be very efficient; it is easier to carry something up stairs than up a ladder.

There are external features that do not need to be marked: hatches for the Phasers, hatches for the Photon Torpedo Launchers, and the Primary Hull / Warp Engine disconnection line, to name a few.
These drawings attempt to make sense of the markings that ARE visible on the studio model of the ENTERPRISE, all of which are then extrapolated onto this ship.

More notes relevant to each deck appear on the following pages.

Contradictions and errors exist within the episodes. I am sure 100% continuity is not possible.

I hope these pages provide you with some pleasure, information, and ideas for contemplation / consideration.

If I missed something, please let me know.

Jim Botaitis
jbot@rogers.com
October 2021

STAR TREK - DERF-CLASS TENDER

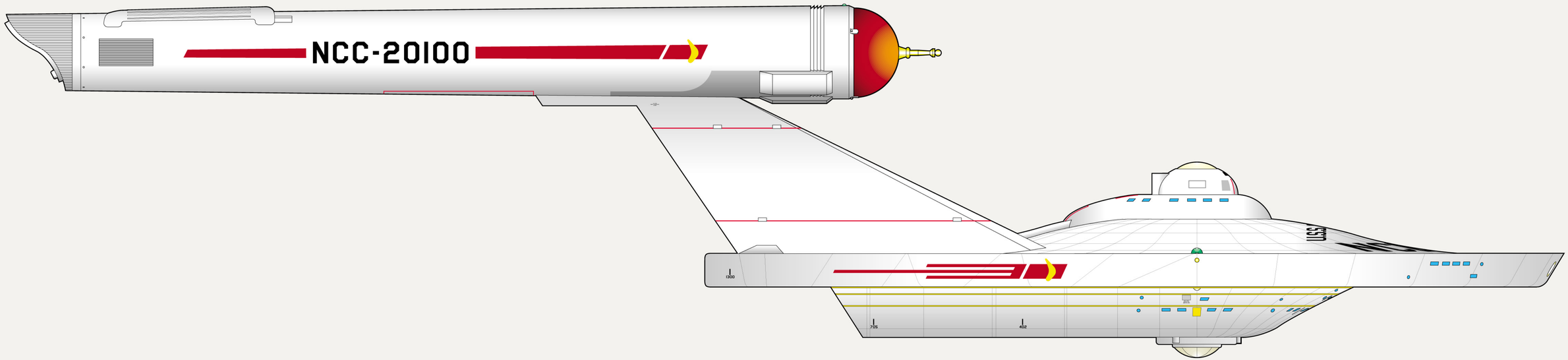
LAYOUT: STARBOARD PROFILE PAGE 2 of 16

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0 5 10 15 20
METERS



STAR TREK - DERF-CLASS TENDER

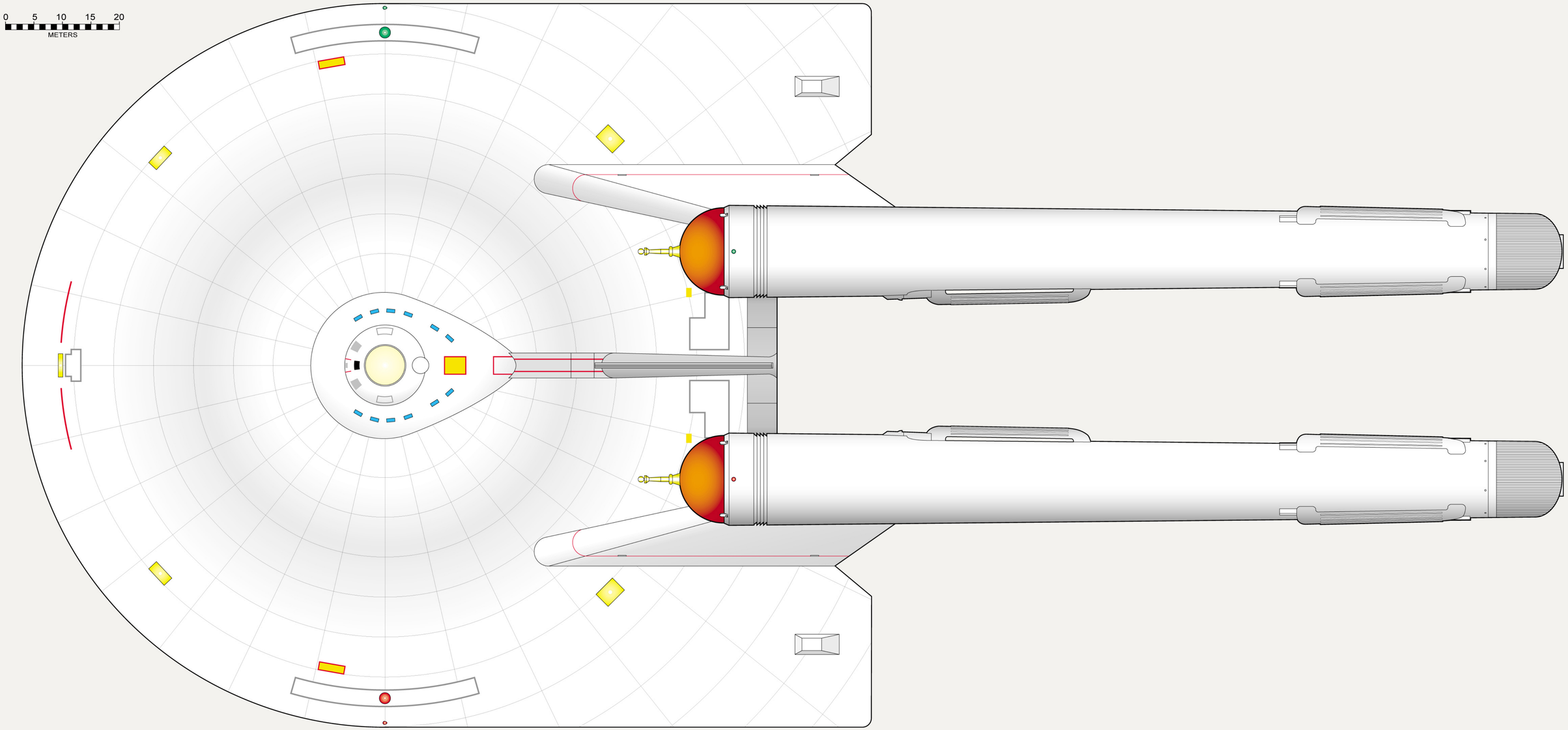
LAYOUT: TOP

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0 5 10 15 20
METERS



STAR TREK - DERF-CLASS TENDER

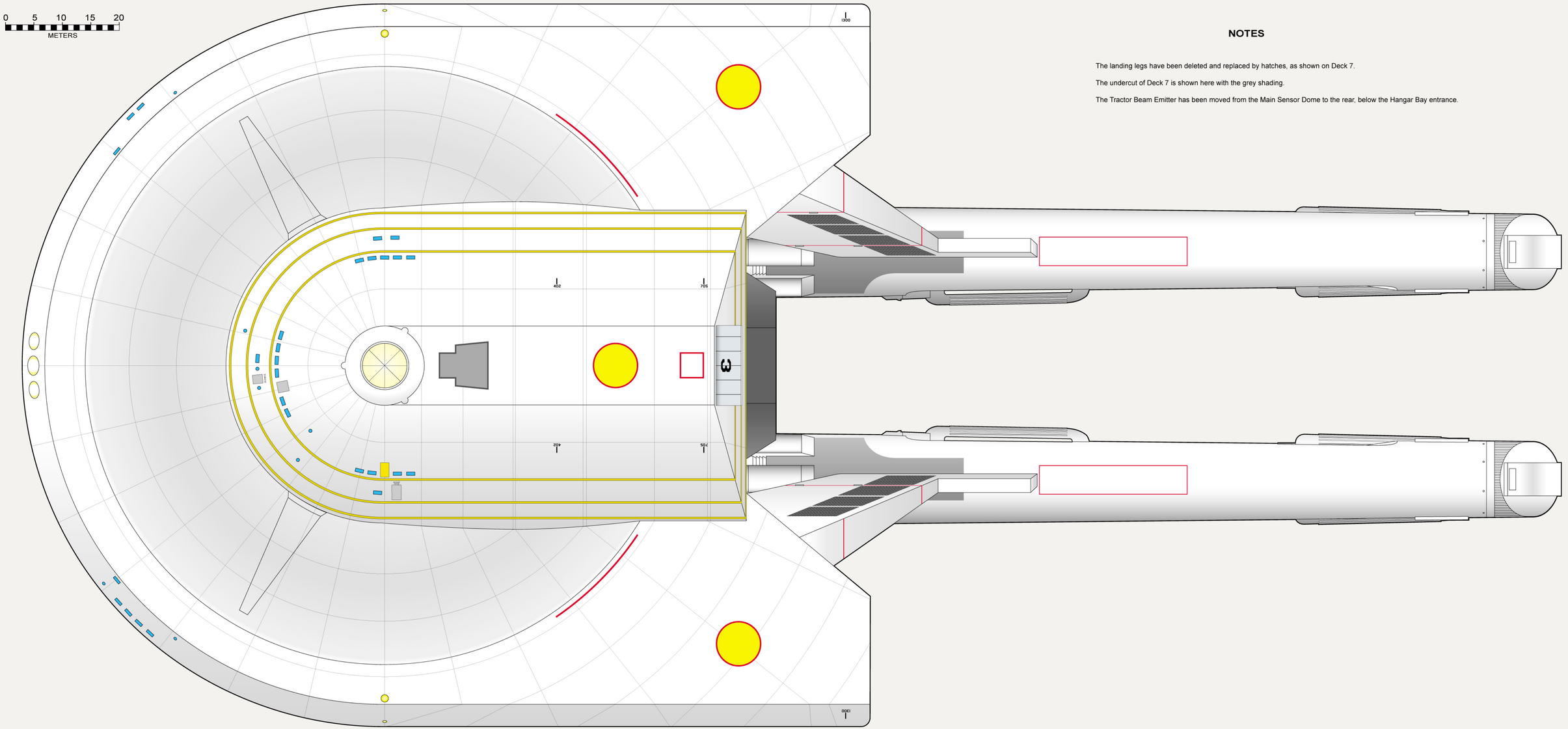
LAYOUT: BOTTOM PAGE 4 of 16

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0 5 10 15 20
METERS



NOTES

The landing legs have been deleted and replaced by hatches, as shown on Deck 7.

The undercut of Deck 7 is shown here with the grey shading.

The Tractor Beam Emitter has been moved from the Main Sensor Dome to the rear, below the Hangar Bay entrance.

STAR TREK - DERF-CLASS TENDER

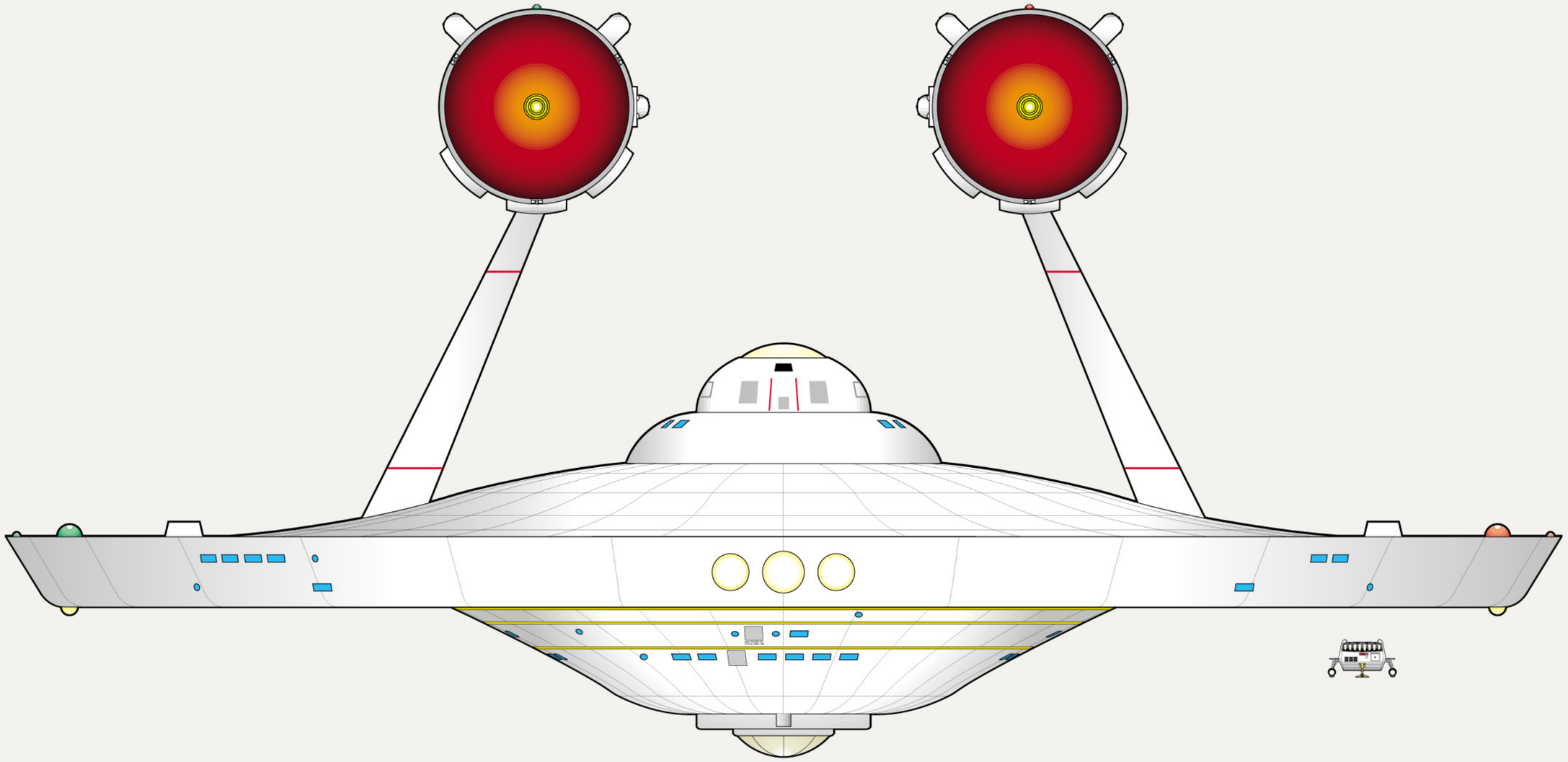
LAYOUT: FRONT and REAR **PAGE 5 of 16**

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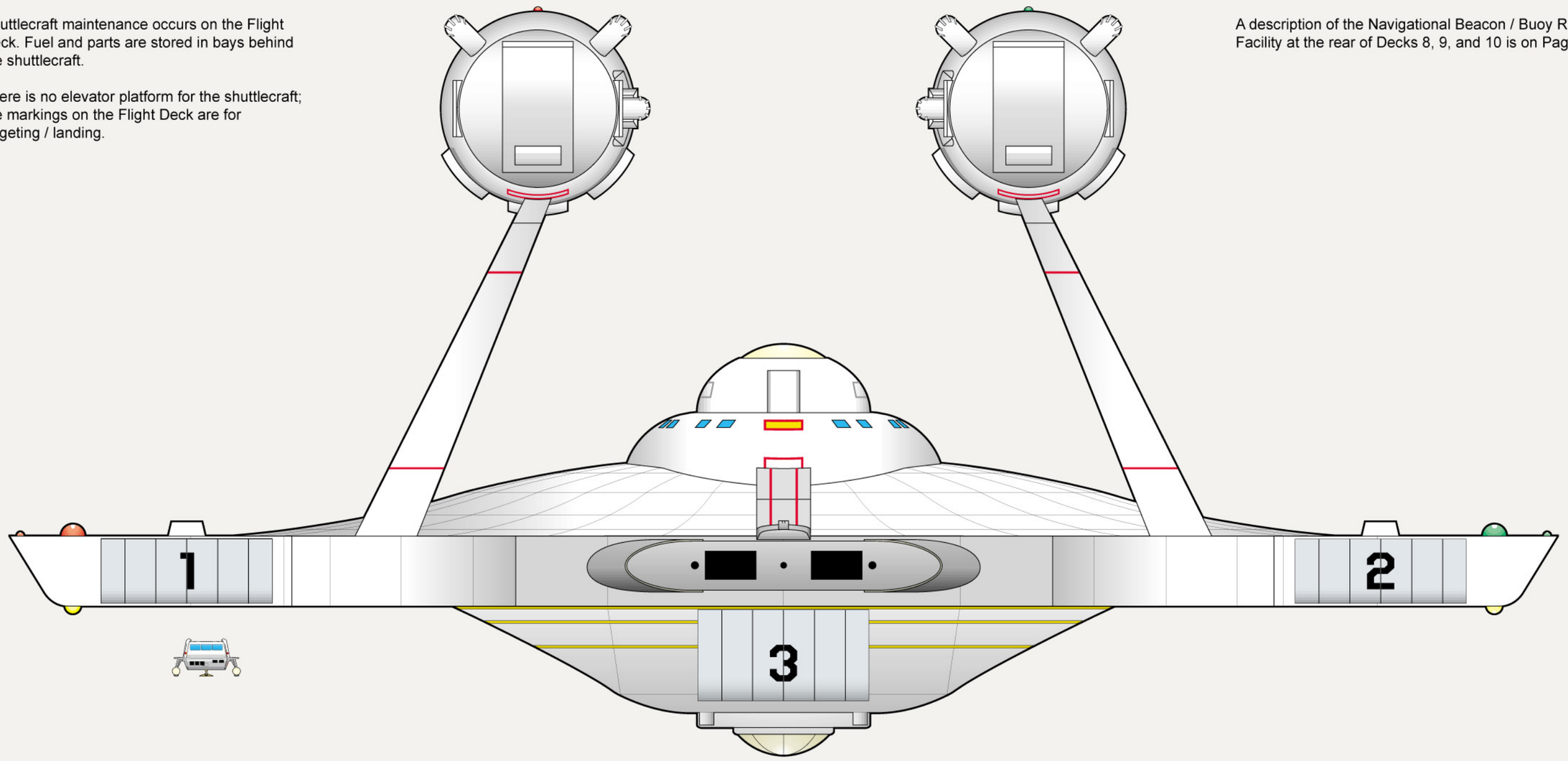
HANGAR BAYS

Shuttlecraft maintenance occurs on the Flight Deck. Fuel and parts are stored in bays behind the shuttlecraft.

There is no elevator platform for the shuttlecraft; the markings on the Flight Deck are for targeting / landing.

REPAIR FACILITY

A description of the Navigational Beacon / Buoy Repair Facility at the rear of Decks 8, 9, and 10 is on Page 14.



STAR TREK - DERF-CLASS TENDER

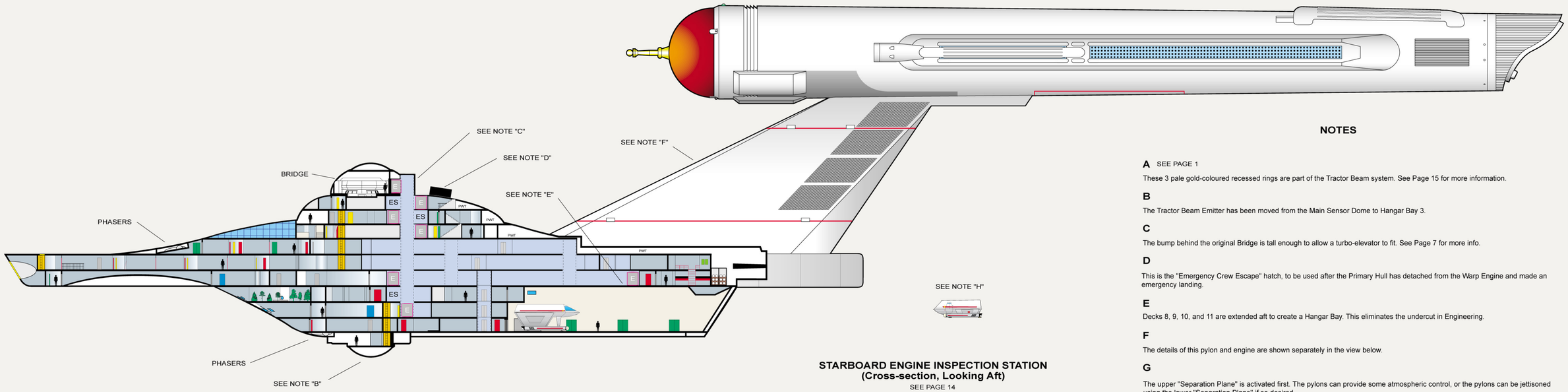
LAYOUT: PORT CUTAWAY PAGE 6 of 16

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METERS

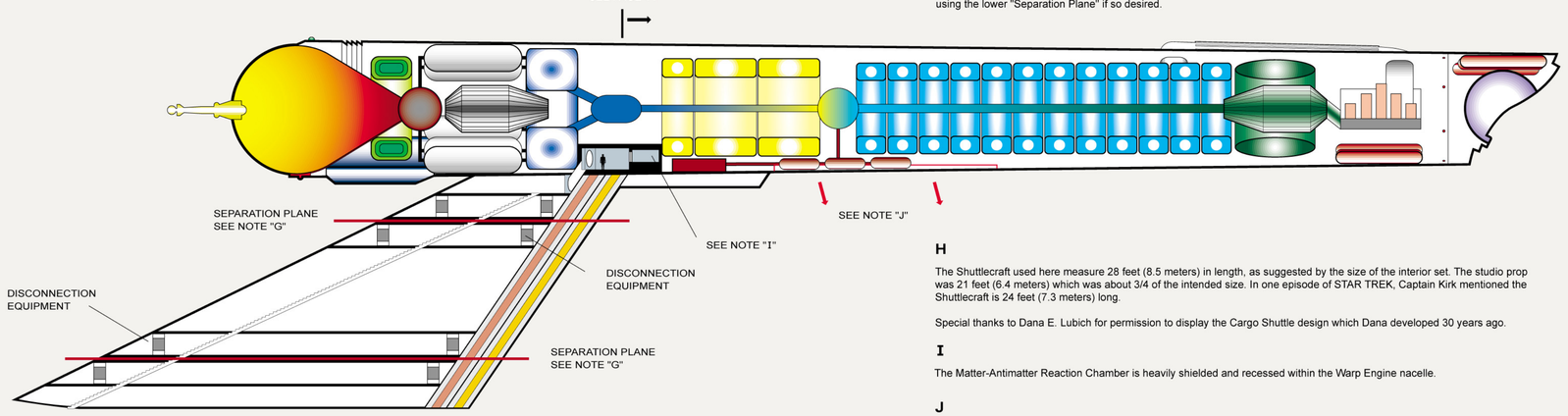


CUTAWAY SYMBOLS

- STRAIGHT WALL
- CURVED WALL
- CUTAWAY ALONG WALL
- INNER FACE OF HULL
- CUTAWAY THROUGH DECK
- CUTAWAY ACROSS WALL
- CUTAWAY THROUGH DOOR
- TREE, SHRUB
- DOORS
- ISOLATION DOORS
- PRIVACY SCREENS
- RECTANGULAR LADDER ALCOVE
- ROUND LADDER ALCOVE
- STAIRS
- RAILING
- JEFFERIES TUBE

STARBOARD ENGINE INSPECTION STATION (Cross-section, Looking Aft)

SEE PAGE 14



NOTES

A SEE PAGE 1

These 3 pale gold-coloured recessed rings are part of the Tractor Beam system. See Page 15 for more information.

B

The Tractor Beam Emitter has been moved from the Main Sensor Dome to Hangar Bay 3.

C

The bump behind the original Bridge is tall enough to allow a turbo-elevator to fit. See Page 7 for more info.

D

This is the "Emergency Crew Escape" hatch, to be used after the Primary Hull has detached from the Warp Engine and made an emergency landing.

E

Decks 8, 9, 10, and 11 are extended aft to create a Hangar Bay. This eliminates the undercut in Engineering.

F

The details of this pylon and engine are shown separately in the view below.

G

The upper "Separation Plane" is activated first. The pylons can provide some atmospheric control, or the pylons can be jettisoned using the lower "Separation Plane" if so desired.

H

The Shuttlecraft used here measure 28 feet (8.5 meters) in length, as suggested by the size of the interior set. The studio prop was 21 feet (6.4 meters) which was about 3/4 of the intended size. In one episode of STAR TREK, Captain Kirk mentioned the Shuttlecraft is 24 feet (7.3 meters) long.

Special thanks to Dana E. Lubich for permission to display the Cargo Shuttle design which Dana developed 30 years ago.

I

The Matter-Antimatter Reaction Chamber is heavily shielded and recessed within the Warp Engine nacelle.

J

Antimatter is created / stored in the engine nacelle. In an emergency, the red-outlined panel swings open and the antimatter is ejected down and to the rear. This particular configuration / orientation required the Antimatter Storage Containers to be shifted 40 feet (about 12 meters) toward the rear. The red-outlined panel was also shifted by that same amount.

STAR TREK - DERF-CLASS TENDER

LAYOUT: DECK 1 (BRIDGE)

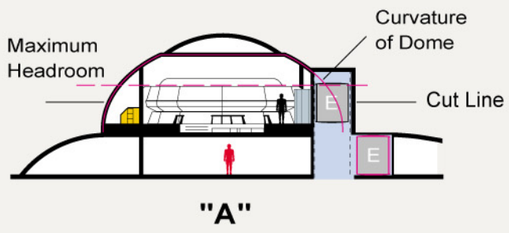
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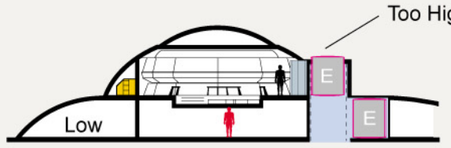


ORIGINAL BRIDGE

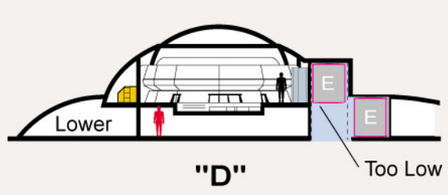


"A"

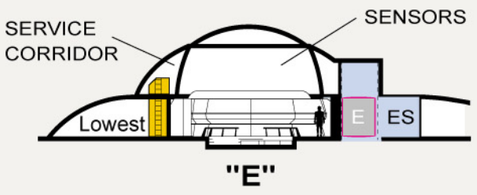
REVISED BRIDGE (3 possibilities)



"C"



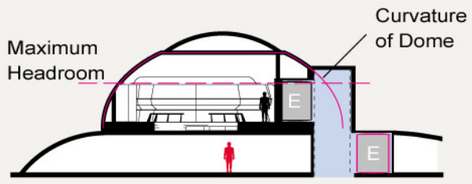
"D"

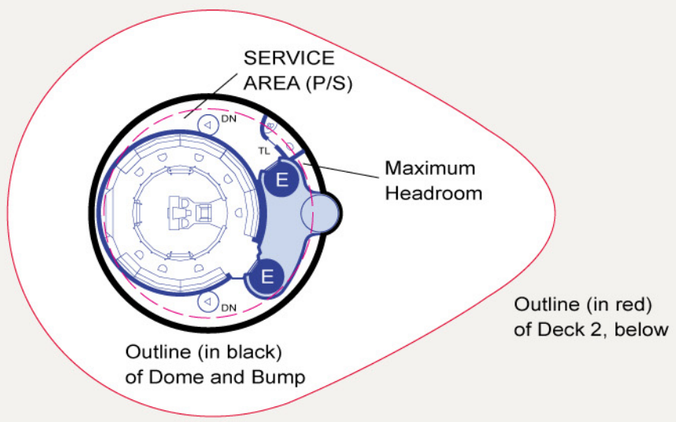


"E"

NOTES

ORIGINAL BRIDGE
The Bridge of the U.S.S. ENTERPRISE was intended to be under the dome on the studio model, as per the special effect in the first scene of THE CAGE. The original dome was taller. The bump aft of the dome

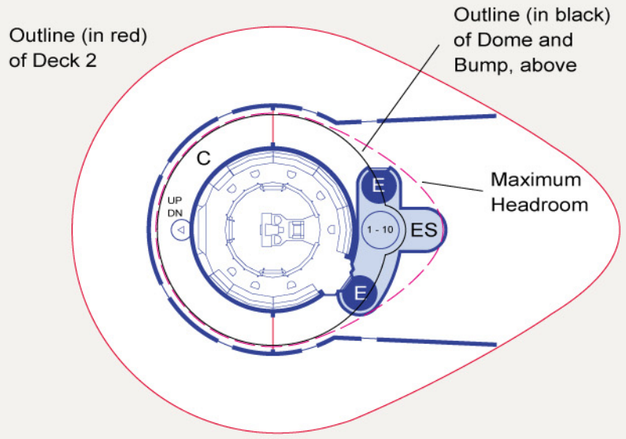




DECK 1: ORIGINAL BRIDGE ("B")

ORIGINAL BRIDGE (continued)
was also taller. A turbo-elevator car easily fits inside the bump even if the recessed floor of the Bridge is above the ceiling of Deck 2 (see "A"). However, the curvature of the dome does not allow a lateral turbo-elevator tube to fit behind the Bridge; the car has to remain inside the bump. Therefore, the Bridge has to be rotated 36° counter-clockwise.

A forward-facing Bridge CAN fit (see "B") but it has to be shifted toward the front. It is the only way a turbo-elevator car can fit under the curvature of the dome. This shift allows a lateral turbo-elevator tube and even a spare turbo-elevator car to fit behind the Bridge.



DECK 1: REVISED BRIDGE ("E")

REVISED BRIDGE (Low)
When the shape of the Bridge on the model was modified, material was removed from the bottom of the dome and the bump. The lower curvature of the dome's ceiling means the Bridge cannot be shifted forward. Placing it back in the middle means there is no space for a lateral turbo-elevator tube behind the Bridge, so the Bridge has to be rotated 36° to ensure the turbo-elevator car remains inside the bump. However, the material that was removed reduced the height of the bump too much. A turbo-elevator car no longer fit even if the recessed floor of the Bridge is dropped below the ceiling of Deck 2 (see "C").

REVISED BRIDGE (Lower)
If the main floor of the Bridge is also dropped below the ceiling of Deck 2, the turbo-elevator car does finally fit inside the bump. But, this makes the ceiling for most of Deck 2 too low. The Bridge is still rotated 36° but now the turbo-elevator car waiting inside the bump (to serve the Bridge) is too low, obstructing the shaft and preventing service to Deck 2 (see "D").

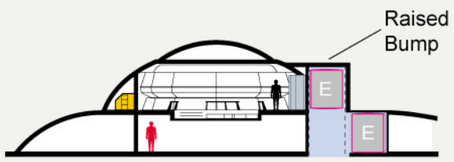
REVISED BRIDGE (Lowest)
If the Bridge is lowered all the way to Deck 2 a lateral turbo-elevator tube and even a spare turbo-elevator car fits (see "E"). But what of the dome? It could contain sensors and a service corridor . . . and now the Bridge is not as vulnerable, so all this might be a good thing.

In at least one episode, a character left the Bridge and a moment later a turbo-elevator car was available for another character to leave. Spare turbo-elevator cars must be stored somewhere close, very close.

The Bridge shown in "E" is used only in the U.S.S. ENTERPRISE Heavy Cruiser plans.

ALTERNATE BRIDGE CONFIGURATIONS
A simpler, more practical solution is to raise the bump slightly (see "F"). This is a good start. Extending the bump to the port side, or to both sides, is even better. Now a lateral turbo-elevator tube fits behind the Bridge.

The "Auxiliary Door" is optional, added here to satisfy what we see in the Animated Series. Think of it as being hidden behind the display panel to port of the main viewing screen.



MODIFIED BUMP ("F")

Such changes allow for smoother turbo-elevator operations, turbo-elevator storage spaces closer to the Bridge, and other (better, more logical) Bridge configurations. To the right are three such designs, but they won't be used here, in these plans.
They will appear in other starship blueprint sets.

v1.
A storage space for spare turbo-elevators exists to starboard. The bump is much bigger but is symmetrical.

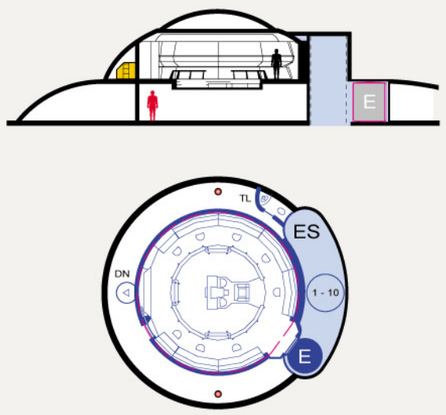
v2.
This second design minimizes the change to the size and shape of the bump but it is now asymmetrical.

v3.
The turbo-elevator storage space has been replaced by a second access

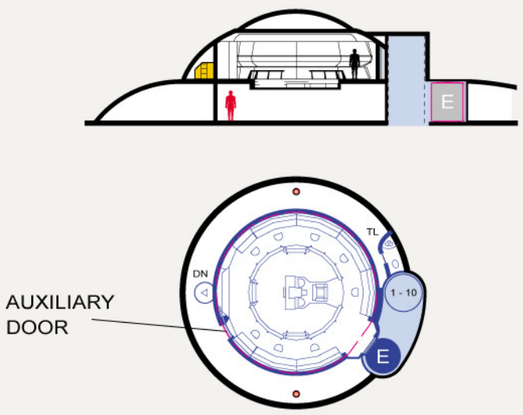
v3. (continued)
point for the Bridge. The stations have been re-arranged around the Bridge, but overall, one station has to be deleted.

In all these Bridge designs, access to the Service Corridor is via removable panels, or the auxiliary door, or the ladder.

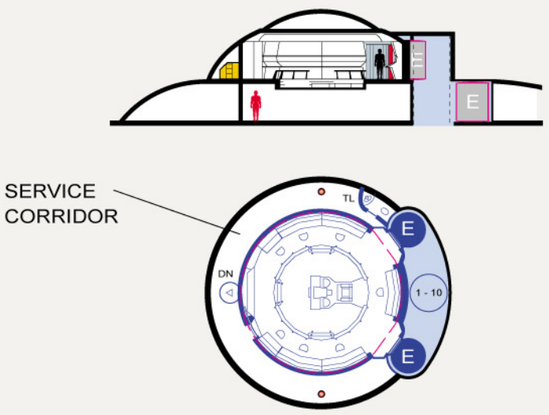
In all these alternate versions, the Bridge faces forward ... as it was always meant to be (in my humble opinion).



DECK 1: BRIDGE (v1)



DECK 1: BRIDGE (v2)



DECK 1: BRIDGE (v3)

STAR TREK - DERF-CLASS TENDER

LAYOUT: DECKS 2 and 3 **PAGE 8 of 16**

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NOTES

Notice that the Derf-class ship shown here has the older style Bridge. Furthermore, the Bridge is shifted forward. This results in the low ceiling on Deck 2 shifted forward of the center point. Also note the older Bridge had 1 ladder on each side for accessing a service area on each side.
All this results in a slightly different layout for Deck 2.

DECK 2
Even after adjusting the spacing of the top 4 decks, the recess in the center of the Bridge still affects the ceiling of Deck 2. The ceiling in the center of Deck 2 is low so that area is used for storage.
That area is labeled EL (Environmental Lockers) and contains full spacesuits, partial suits, air-testing kits, etc ... useful if exiting via the hatch.

In at least one episode, a character left the Bridge and a second later a turbo-elevator was available for another character to leave the Bridge. Spare turbo-elevators cars must be stored somewhere nearby, so one such storage spot is on Deck 2.

The Science Labs can be reconfigured, as needed.

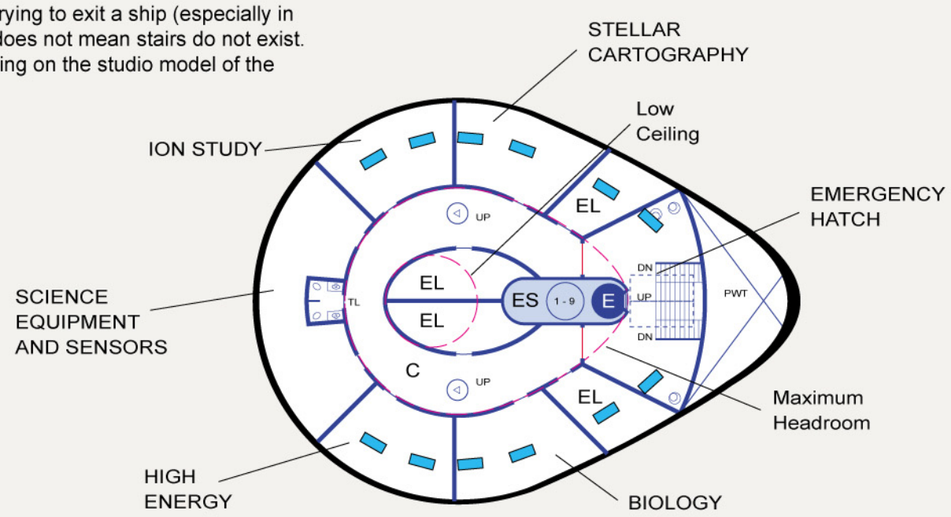
Stairs allow many people to exit the ship quickly. I can't imagine people trying to exit a ship (especially in an emergency situation) by using ladders. We never saw stairs but that does not mean stairs do not exist. The location of the hatch for these stairs coincides with an external marking on the studio model of the U.S.S ENTERPRISE.

DECK 3
Stairs for the emergency exit on Deck 2 start on Deck 4 and continue up from there past this level. On either side are storage spaces (labeled EL) containing full spacesuits, partial suits, air-testing kits, etc ... useful if exiting via the hatch on Deck 2.

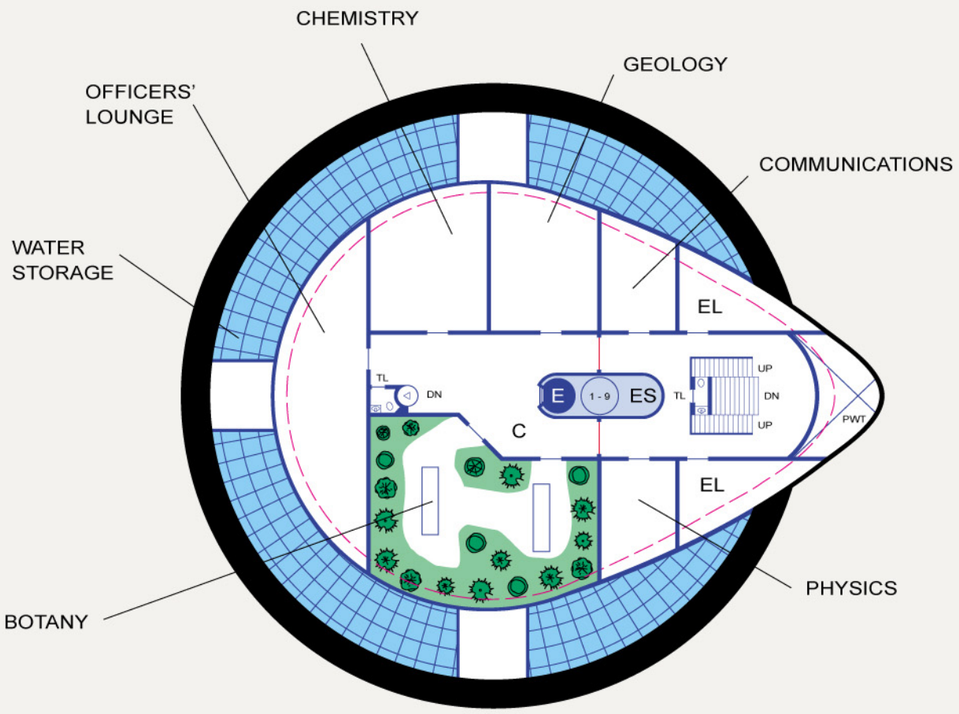
An Officers' Lounge occupies the forward part of this deck.

Some Science Labs will exist regardless of the exact role or class of the ship. They could be reconfigured depending on the mission requirements.

Water storage surrounds this deck.



DECK 2: SCIENCE LABORATORIES



DECK 3: SCIENCE LABORATORIES / LOUNGE

ACCOMMODATIONS

DECK 4 -	Ring A -	4
	Ring B -	13
DECK 5 -	Ring A -	12
	Ring B -	12
	Ring C -	14
DECK 6 -	Ring A -	12
	Ring B -	18
	Ring C -	30
	Ring D -	42
	Ring E -	32
	Ring F -	36
	Ring G -	35
	Ring H -	20
TOTAL:		300

SHIP'S COMPLEMENT

OFFICERS	12
ENLISTED	60
TOTAL	72

STAR TREK - DERF-CLASS TENDER

LAYOUT: DECK 4 **PAGE 9 of 16**

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NOTES

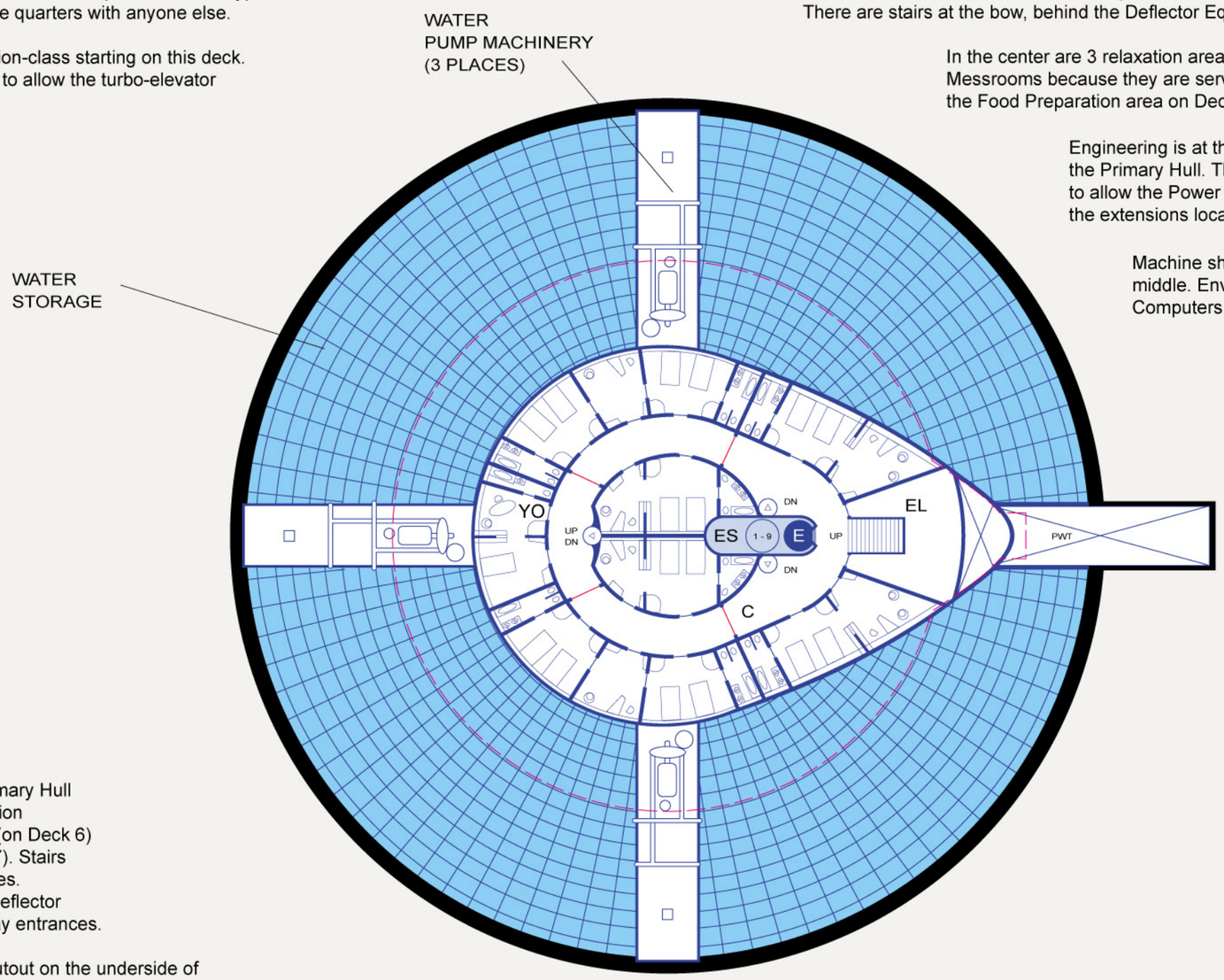
DECK 4
The stairs for evacuating the crew after an emergency landing via the hatch on Deck 2 start on this deck. Around, behind, and beneath these stairs is a storage space (EL).

TMoST mentions that Water Storage is on Deck 7. Of course, water can be placed there too, but the shallow space around this deck lends itself well to this function.

Most of the Crew's Quarters in the Primary Hull are laid out in rings. The rings are labeled from the center outwards, starting with A, then B, then C, and so on.

TMoST mentions Junior Officers have quarters on Deck 4. There are sufficient accommodations in the Primary Hull for the crew complement of this type of ship. Crew members do not have to share quarters with anyone else.

The ship layout varies from the Constitution-class starting on this deck. The Piping / Wiring Trunk is raised so as to allow the turbo-elevator system on Deck 5 to reach further aft.



DECK 7
The windows around the edge of the Primary Hull governed the location of the two Recreation Rooms / Lounges. They have balconies (on Deck 6) which overlook the main level (on Deck 7). Stairs lead up from each Lounge to the balconies.
There are stairs at the bow, behind the Deflector Equipment, and also near the Hangar Bay entrances.

The grey area represents the concave cutout on the underside of the Primary Hull. This area could be used to store water, or fuel, or air, or more general cargo. I leave the area grey (for the most part) so as to clearly set it apart from the rest of the deck.

The 2 Main Landing Legs found on Constitution-class ships were deleted and a hatch was installed at each location.

The center of this Deck contains the ship's Main Computers. The machinery for the Food Conveyors is located aft of the Main Computers. The ring around the Computers contains Sickbay. Sickbay includes various labs, offices, and a post-surgery recovery area.

The ring around Sickbay contains the Armory, Briefing Room, Chapel, Brig, a few more offices, and airlocks leading to the 2 hatches.
Two Transporters (for 6 people) as well as two Emergency Transporters (for 22 people) are also located in this ring.

The extensions to the rear on each side of the Impulse Engines are for the Flight Decks and Maintenance Bays.

Shuttlecraft maintenance occurs on the Flight Decks. Fuel and parts are stored inboard of the Hangar Bays. There are no elevator platforms or turntables for the shuttlecraft; the markings on the Flight Decks are for targeting / landing.

DECK 6
The layout of this deck is similar to the FJ design for the Constitution-class ship. I like the tri-radial symmetry. As on Deck 5, the turbo-elevator shafts are separated by 120°. I also added 4 more turbo-elevator storage spaces. This network is not as extensive as the FJ design; walking a few hundred feet or meters should not be an issue. However, it did need to reach further aft (and then drop down) so as to reach the Hangar Bays.

Over half of this deck is devoted to Crew Quarters, mostly unused. Extensions at the rear contain 2 Hangar Bays. Supports and access stairs for the pylons are on either side of Engineering.

The windows around the edge of the Primary Hull governed the location of the two Recreation Rooms / Lounges. They have balconies (on Deck 6) which overlook the main level (on Deck 7). Stairs lead down from the balconies to each Lounge.
There are stairs at the bow, behind the Deflector Equipment, and also near the Hangar Bay entrances.

In the center are 3 relaxation areas. The one at the front is a Lounge. The other two are Messrooms because they are serviced by food dispensers which are directly connected to the Food Preparation area on Deck 8.

Engineering is at the rear, unmoved from its location in the original layout of the Primary Hull. The Impulse Engines were moved aft 11 feet (3.4 meters) to allow the Power Conduits to reach Engineering. The Hangar Bays occupy the extensions located on each side.

Machine shops are to port. Turbo-elevator maintenance is in the middle. Environmental Engineering is to starboard. The Engineering Computers are to port and starboard of Main Engineering.

DECK 4: JUNIOR OFFICERS' QUARTERS

In JOURNEY TO BABEL, over 100 diplomats were transported by the U.S.S. ENTERPRISE.
In THIS SIDE OF PARADISE, over 150 colonists were transported off-planet by the ship.

Gene Roddenberry imagined a higher standard of living for everyone, even enlisted crew members. There are more than enough rooms and beds on the ship to accommodate diplomats, colonists, etc. It would only be in such situations that crew members might be asked to share quarters.

STAR TREK - DERF-CLASS TENDER

LAYOUT: DECK 5 **PAGE 10 of 16**

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0 5 10 15 20
METERS

NOTES

DECK 5
The layout of this deck is very similar to the FJ design. I like the tri-radial symmetry of his design. However, his turbo-elevator shafts were not set at 120° so I adjusted them.
There is also one turbo-elevator storage space.

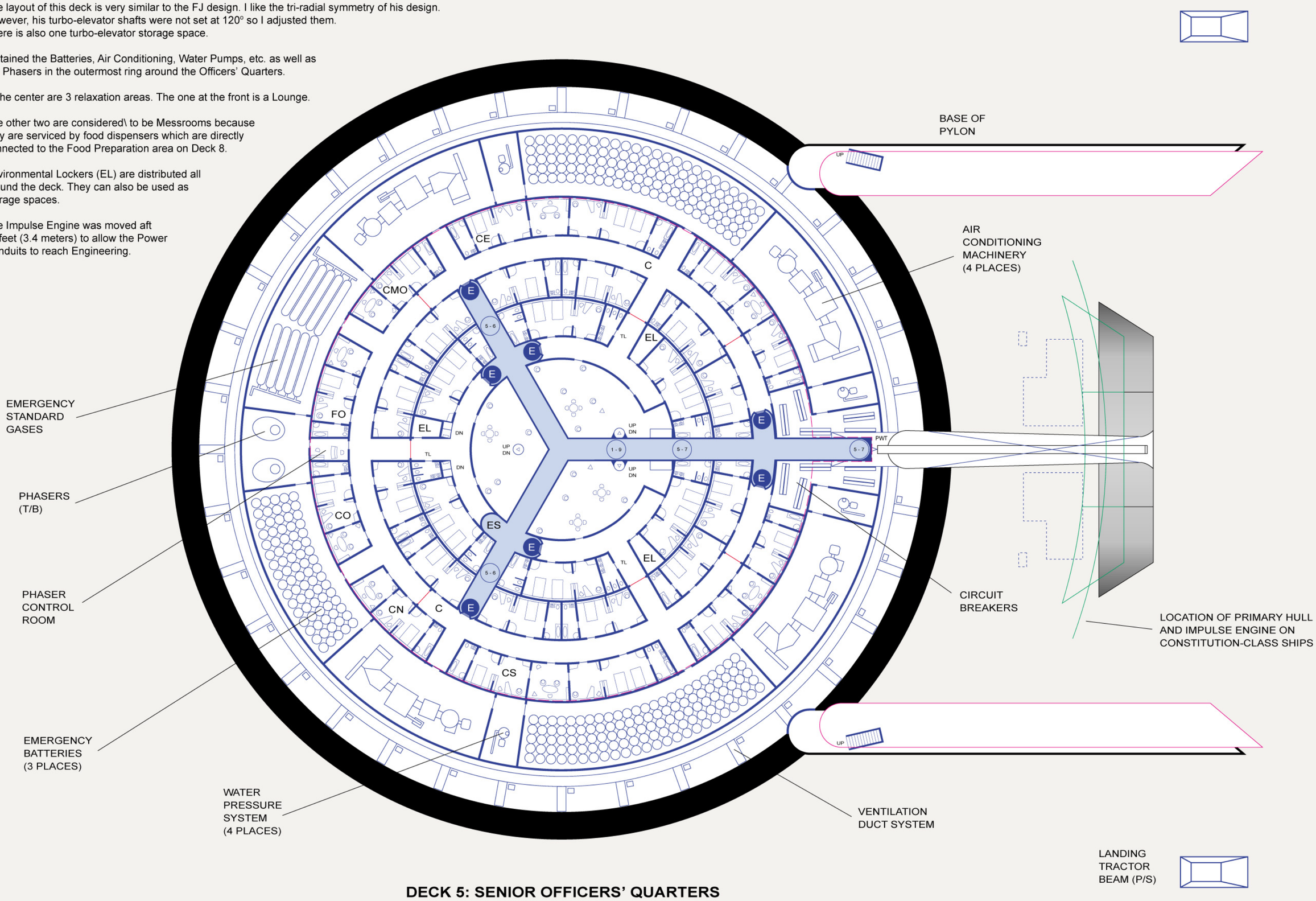
I retained the Batteries, Air Conditioning, Water Pumps, etc. as well as the Phasers in the outermost ring around the Officers' Quarters.

In the center are 3 relaxation areas. The one at the front is a Lounge.

The other two are considered\ to be Messrooms because they are serviced by food dispensers which are directly connected to the Food Preparation area on Deck 8.

Environmental Lockers (EL) are distributed all around the deck. They can also be used as storage spaces.

The Impulse Engine was moved aft 11 feet (3.4 meters) to allow the Power Conduits to reach Engineering.



DECK 5: SENIOR OFFICERS' QUARTERS

STAR TREK - DERF-CLASS TENDER

LAYOUT: DECK 6 **PAGE 11 of 16**

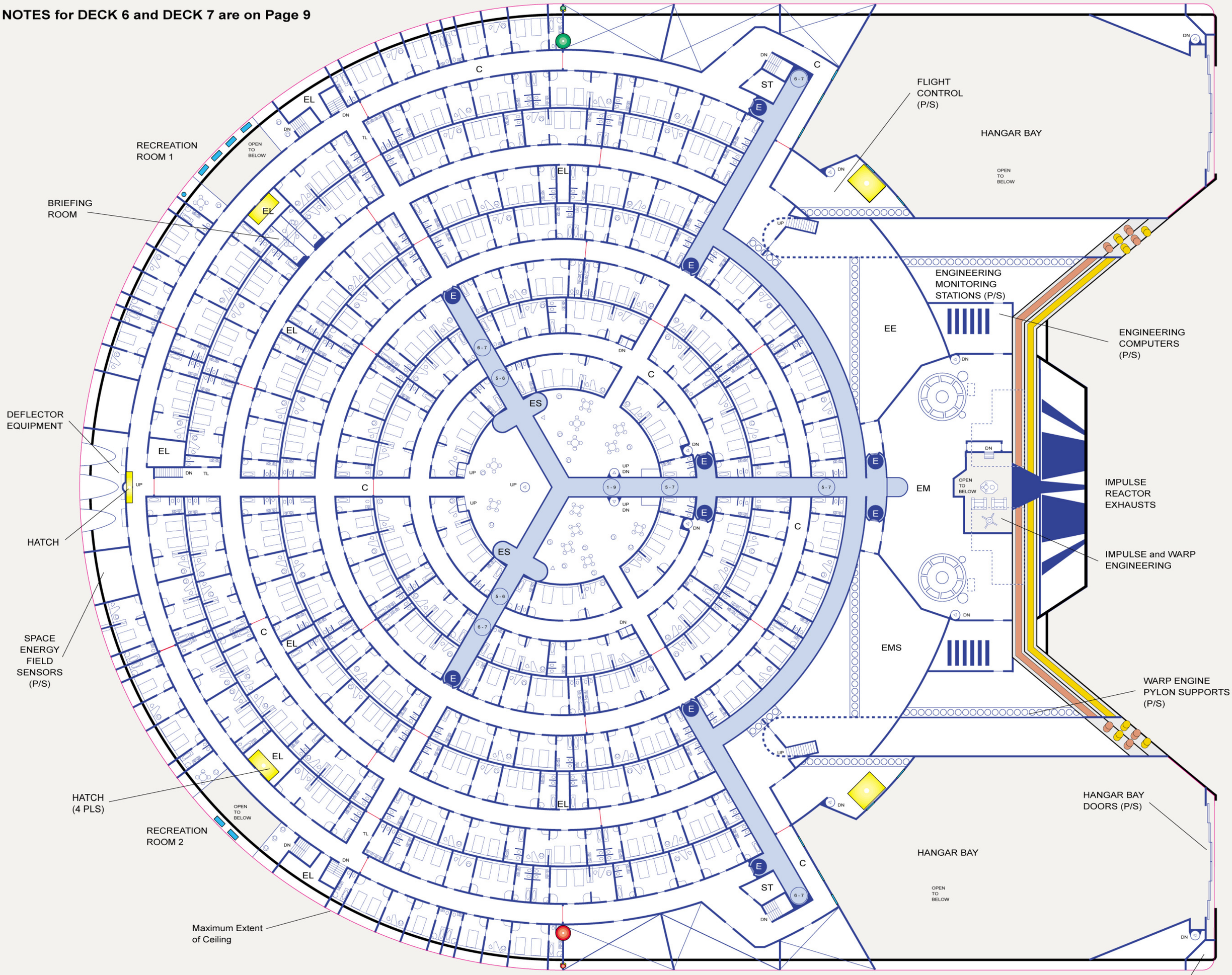
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METERS

NOTES for DECK 6 and DECK 7 are on Page 9



DECK 6: CREW'S QUARTERS / ENGINEERING

STAR TREK - DERF-CLASS TENDER

LAYOUT: DECK 7 **PAGE 12 of 16**

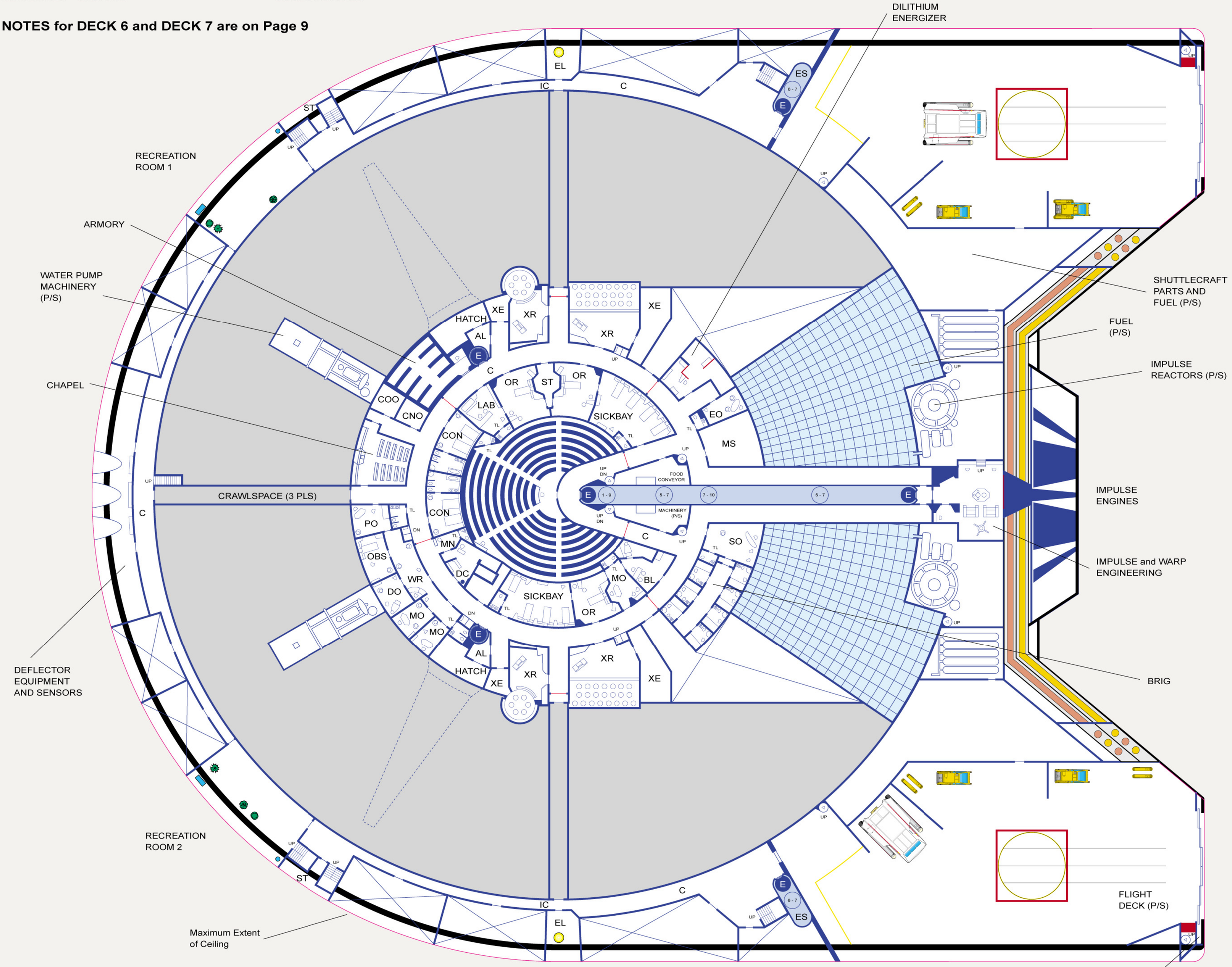
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0 5 10 15 20
METERS

NOTES for DECK 6 and DECK 7 are on Page 9



DECK 7: SICKBAY / ENGINEERING / HANGAR BAY

STAR TREK - DERF-CLASS TENDER

LAYOUT: DECK 8 **PAGE 13 of 16**

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0 5 10 15 20
METERS

NOTES

DECK 8
Most of the front half of this deck is unchanged from the original configuration of the Constitution-class ship. Laundry, Food Preparation, Main Recreation and Entertainment areas are here.

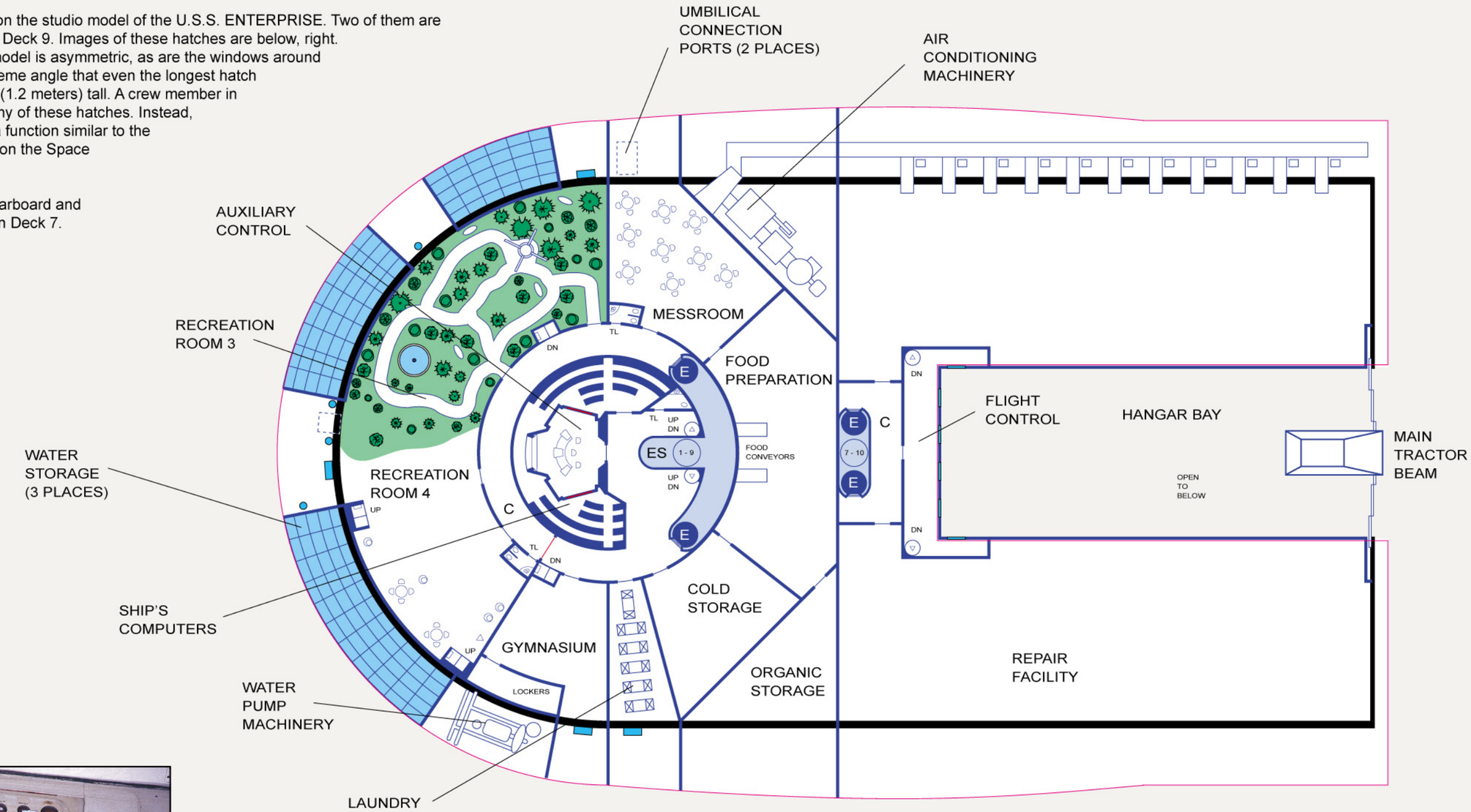
The Auxiliary Control is surrounded by the ship's Main Computers which continue here from the center of Deck 7.

The Water Storage found here is an extension of the Water Storage on Deck 7.

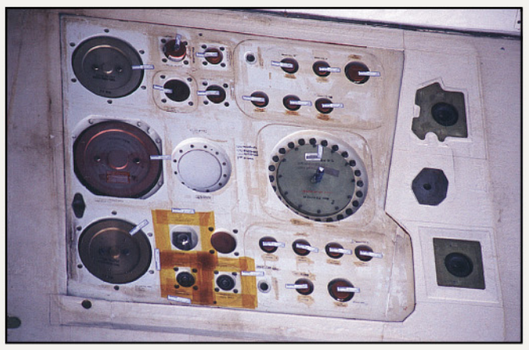
The Food Preparation area has two "conveyors" which distribute food upwards into the Messrooms located on Deck 6 and Deck 5.

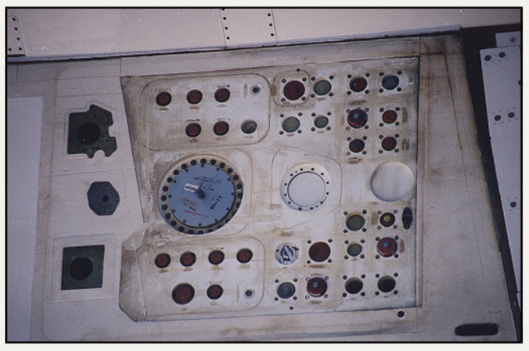
There are four hatches or ports on the studio model of the U.S.S. ENTERPRISE. Two of them are on Deck 8. The other two are on Deck 9. Images of these hatches are below, right. Their distribution on the studio model is asymmetric, as are the windows around them. The hull is at such an extreme angle that even the longest hatch results in an opening only 4 feet (1.2 meters) tall. A crew member in a spacesuit can not fit through any of these hatches. Instead, these 2 hatches probably have a function similar to the Umbilical Connection Panels as on the Space Shuttle (below, left).

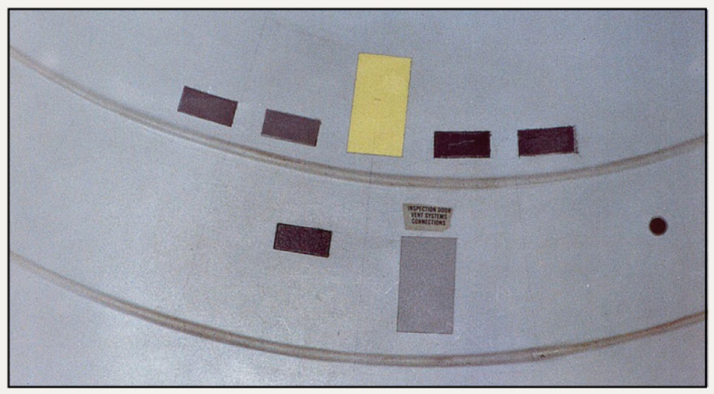
The bulge in the ceiling line to starboard and port is caused by the undercut on Deck 7.

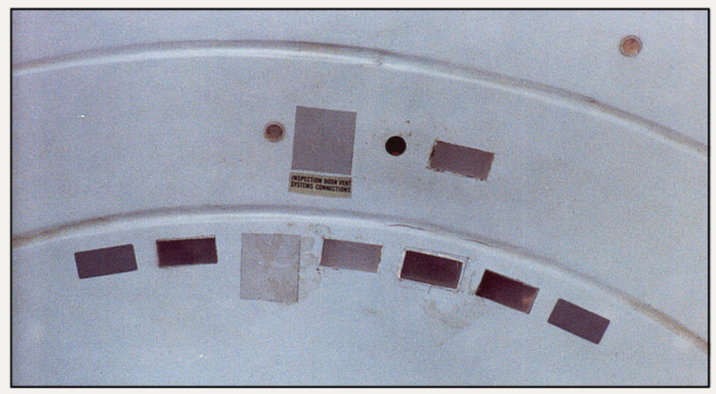


DECK 8: ENTERTAINMENT / RECREATION FACILITIES / HANGAR BAY









STAR TREK - DERF-CLASS TENDER

LAYOUT: DECK 9 **PAGE 14 of 16**

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REPAIR FACILITIES

Everything is duplicated (port and starboard); theoretically, 2 beacons or buoys can be processed at the same time.

DECK 8
Components for most types of beacons and buoys are stored on this deck.

DECK 9
Machine shops are located here for fabricating parts needed to repair the beacons or buoys.

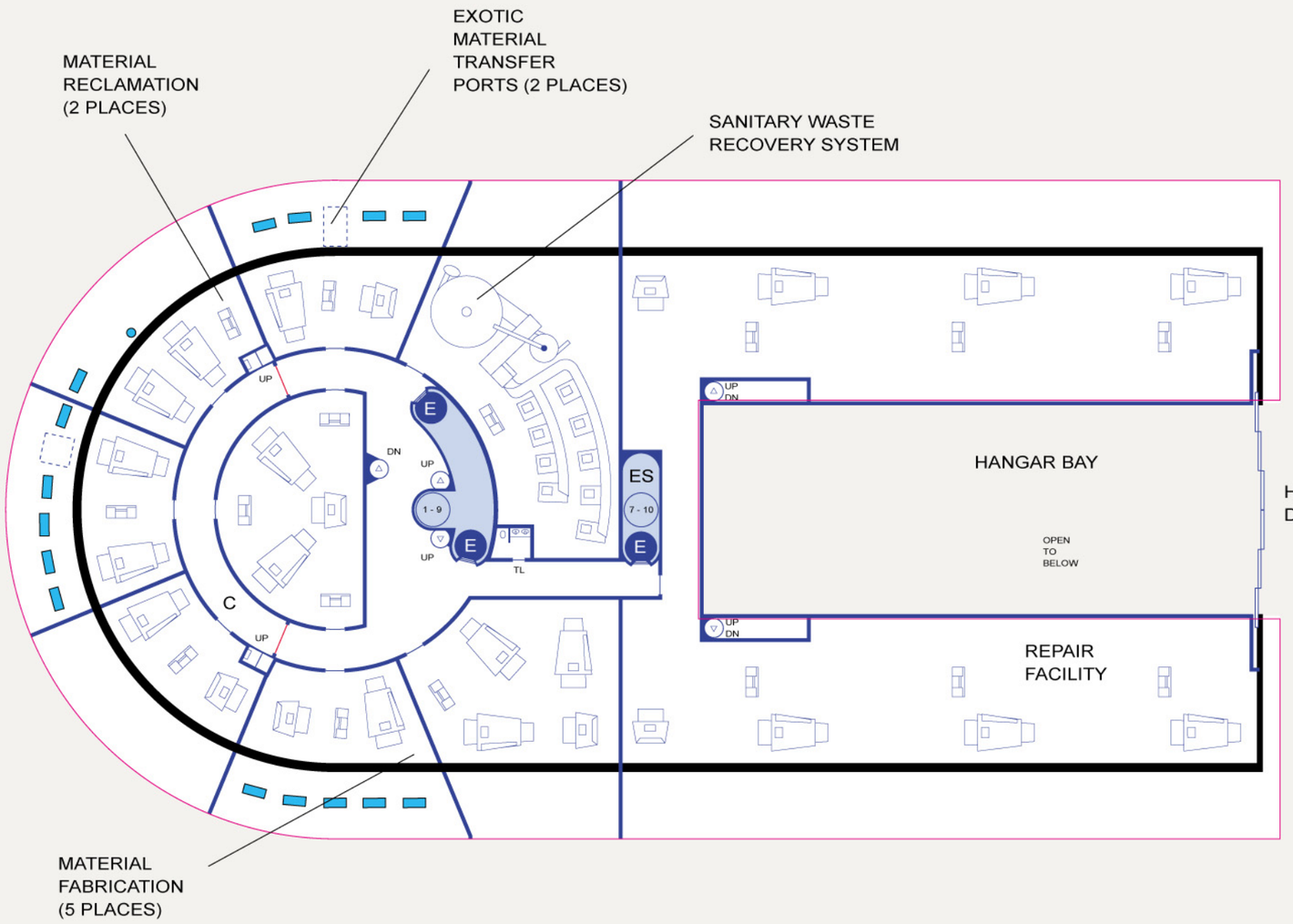
DECK 10
Once the beacons or buoys are retrieved, initial diagnostics are performed on this level. Oversized doors allow transfer of equipment and materials from the port facilities to the starboard facilities.

DECK 11
This deck is not very tall. Fuel for the Navigational Beacons and Buoys is stored here.

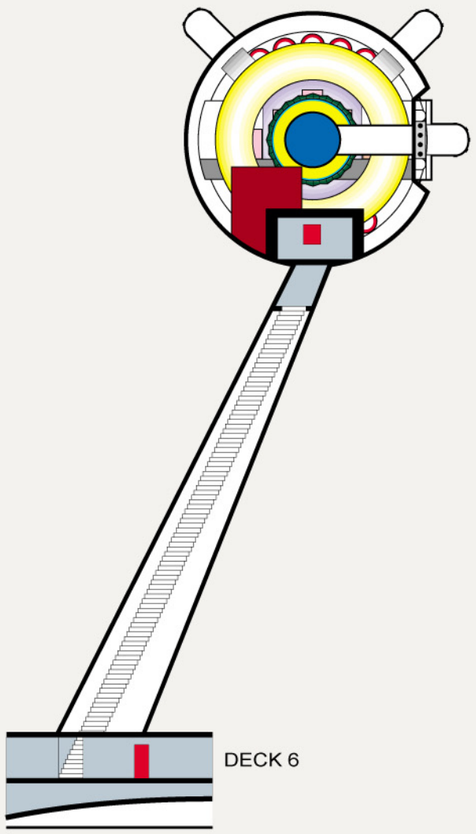
At the extreme aft is the machinery for operating the Hangar Bay doors.

NOTES

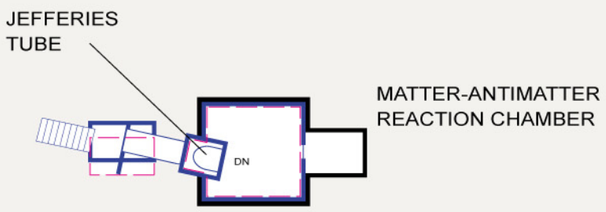
DECK 9
Most of the front half of this deck is unchanged from the original configuration of the Constitution-class ship. Material Reclamation and Fabrication is probably not a 100% efficient process. Therefore, these 2 hatches could allow for transfer of rare elements required in various manufacturing processes.



DECK 9: FABRICATION FACILITIES / HANGAR BAY



STARBOARD ENGINE INSPECTION STATION
(Cross-section, Looking Aft)



STARBOARD ENGINE INSPECTION STATION
(Plan View)

STAR TREK - DERF-CLASS TENDER

LAYOUT: DECKS 10, 11, and 12 **PAGE 15 of 16**

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NOTES

DECK 10
TMoST states that miscellaneous activities and cargo spaces are on Deck 10 of Constitution-class ships. Since cargo spaces are on this deck, it is logical to place a Cargo Transporter here.

There are Photon Torpedo Launchers on many other ships at the front of this deck with Torpedo Storage on each side. Since this class of ship does not have torpedoes, the configuration of the Cargo Holds has been modified and the Cargo Transporter Room has been enlarged / optimized for peak performance.

There is no elevator platform for the Shuttlecraft, only a turntable; the markings on the Flight Deck are for targeting / landing.

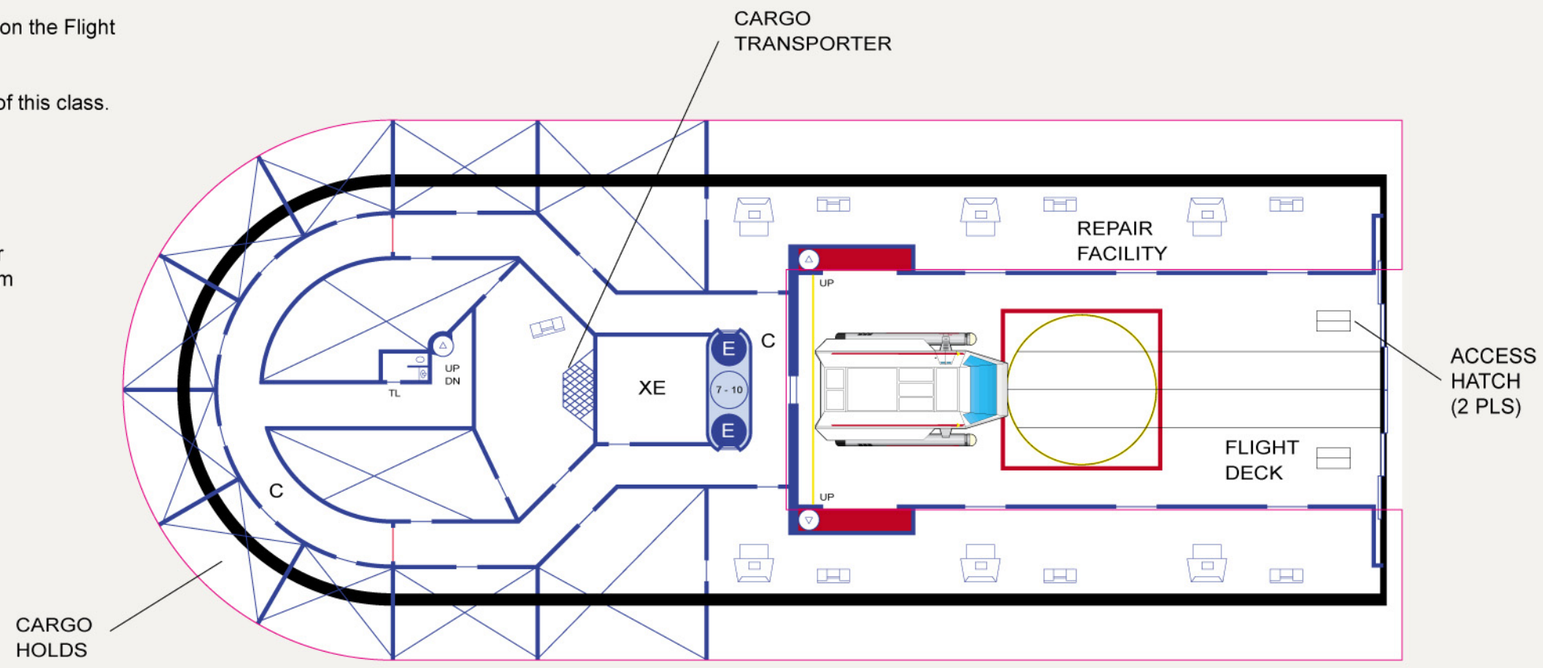
One Cargo Shuttle, 2 Shuttlecraft, and 4 Work Bees are assigned to each ship of this class.

DECK 11
Phasers are located on this deck.

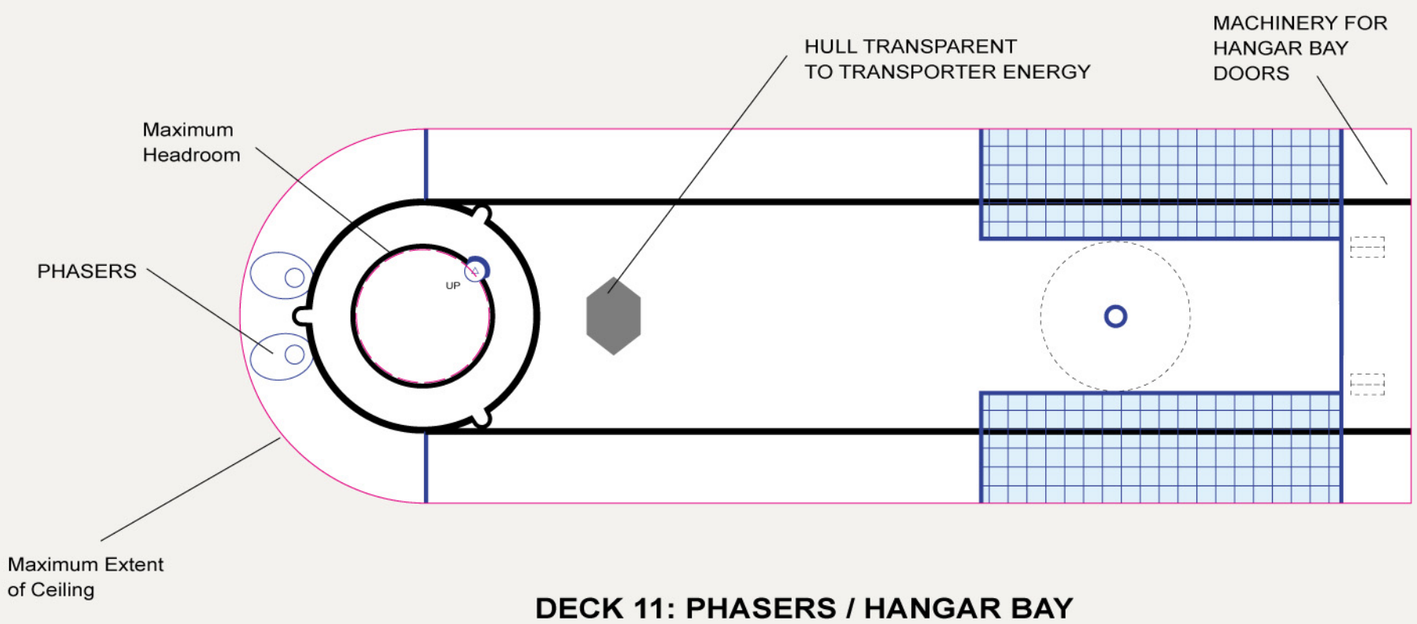
Tractor Beam equipment was located around the perimeter of the Lower Sensor Dome but it was moved to Hangar Bay 3. The housings for those 3 Tractor Beam Controllers remain, but they are empty. The Tractor Beam Emitter was moved from the Lower Sensor Dome to the Hangar Bay.

The 3 pale gold-coloured recessed rings on the underside of the Primary Hull absorb and re-direct any back-scatter created by the Tractor Beam.

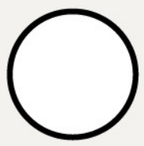
DECK 12
The Lower Sensor Dome is located here.



DECK 10: CARGO TRANSPORTER / HANGAR BAY



DECK 11: PHASERS / HANGAR BAY



DECK 12: SENSORS

SHIP DATA

LENGTH:	274 m
WIDTH:	127 m
HEIGHT:	60 m
TRANSPORTERS	
6-person:	2
22-person:	2
cargo:	1
SHUTTLECRAFT:	7
PHASERS	
banks of 2:	2
TORPEDO TUBES:	0

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GENERAL NOTES

When Matt Jefferies designed the U.S.S. ENTERPRISE, he wanted a smooth hull. He reasoned that if anything needed to be accessed, it would be done so from inside the ship. But if red rectangles and yellow circles exist on the hull, they must be there for emergency situations, quick identification, or some aspect of ship's operations.

Matt Jefferies understood that incredible energies would be required to propel a ship faster than light. If this is accomplished with antimatter, why store it in the habitable section of the ship? He and Gene Roddenberry both loved airplanes; they understood and agreed on the importance of isolating dangerous components, yet still making them accessible if required. Yes, Dilithium Crystals are stored in or near Engineering and help modify / channel the energy, but why does the antimatter need to be stored in or near Engineering?

The idea of a Bussard Ramjet was developed in 1960. This label was applied to the U.S.S. ENTERPRISE engines retroactively, after the series ended. A Bussard Ramjet compresses matter for fusion. The grey area on the engine nacelle could indicate where that matter is stored. But on the U.S.S. ENTERPRISE the matter is then mixed with antimatter. Therefore, the red rectangle on the engine nacelle could indicate where the antimatter is stored.

The red rectangle on the engine nacelle could be an access hatch, or an "Emergency Jettison" hatch. Dialogue in various episodes of STAR TREK corroborates the idea of disengaging, discarding, or jettisoning the warp engine nacelles. Dialogue also mentions ejecting the antimatter pod.

The idea of a "Warp Core" came along much later, when the ENTERPRISE was refit for the movies. Will Decker told Kirk, "This is an almost totally new ENTERPRISE." The idea of "ejecting a Warp Core" was introduced in STAR TREK THE NEXT GENERATION. These drawings make no attempt to "retcon" such concepts.

The huge pipes / conduits (visible through the grille behind Engineering) was a set built with forced perspective to suggest immense size and power. The angle on the conduits suggests they continue up the pylons of the U.S.S. ENTERPRISE.

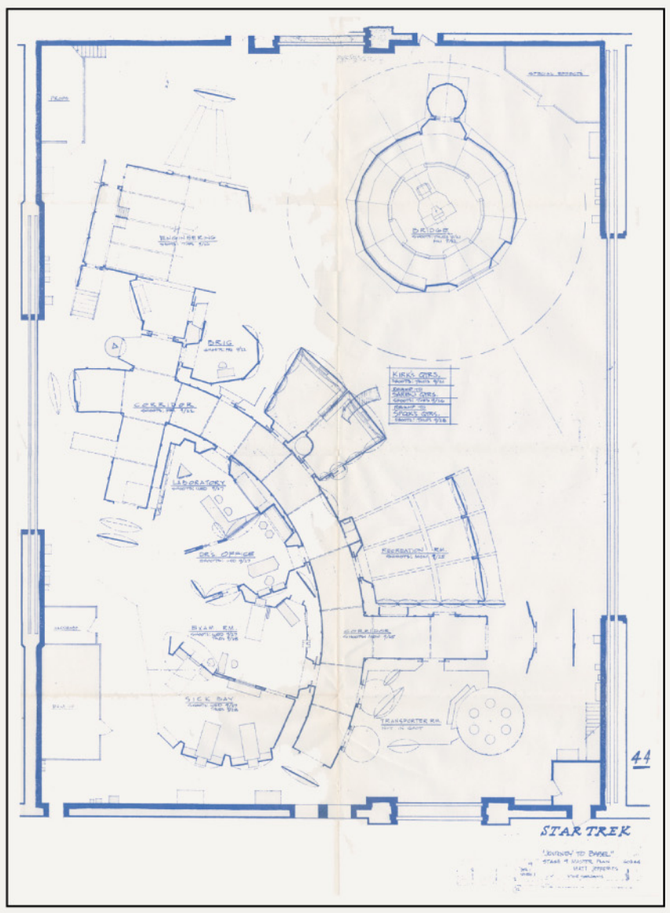
Regarding the antimatter:
CASE 1. Collect matter in the engine nacelle, send the matter to Engineering, mix it (in the habitable section of the ship) with antimatter (stored in the habitable section of the ship!), pass the energy through the Dilithium Crystals, then send the energy up to the engine nacelles to create the warp field.
CASE 2. Collect matter in the engine nacelles, mix it (in the engine nacelles) with antimatter (stored in the engine nacelles), send the energy to Engineering, pass the energy through the Dilithium Crystals, then send the energy up to the engine nacelles to create the warp field.

In both cases, energy is being transmitted. There is no need to move the fuel too (as in Case 1).
Case 1 is unnecessarily complicated.
Case 2 is simpler, and as a bonus, the antimatter is kept away from the habitable section of the ship.

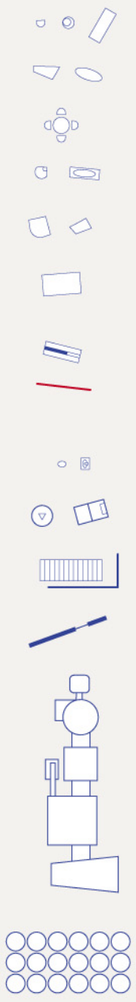
ABBREVIATIONS

AL	-	AIRLOCK
BL	-	BIO LAB
C	-	CORRIDOR
CE	-	CHIEF ENGINEER
CMO	-	CHIEF MEDICAL OFFICER
CN	-	CHIEF NURSE
CNO	-	CHIEF NAVIGATOR'S OFFICE
CO	-	COMMANDING OFFICER
COO	-	COMMUNICATIONS OFFICER'S OFFICE
CON	-	CONVALESCENT WARD
CS	-	CHIEF OF SECURITY
DC	-	DECOMPRESSION CHAMBER
DN	-	DOWN
DO	-	DENTIST'S OFFICE
E	-	TURBO-ELEVATOR CAR
EE	-	ENVIRONMENTAL ENGINEERING
EL	-	ENVIRONMENTAL SUIT LOCKER
EM	-	TURBO-ELEVATOR MAINTENANCE
EMS	-	ENGINEERING MACHINE SHOPS
EO	-	CHIEF ENGINEER'S OFFICE
ES	-	ELEVATOR STANDBY / STORAGE
FO	-	FIRST OFFICER
IC	-	INSPECTION CORRIDOR
LAB	-	LABORATORY
LL	-	LANDING LEG
LLM	-	LANDING LEG MACHINERY
MN	-	DUTY NURSE
MO	-	DOCTOR'S OFFICE
MS	-	MEDICAL SUPPLIES
OBS	-	OBSTETRICS
OR	-	OPERATING ROOM
P	-	PORT (LEFT)
PLS	-	PLACES
PO	-	PSYCHIATRIST'S OFFICE
PWT	-	PIPING / WIRING TRUNK
S	-	STARBOARD (RIGHT)
SO	-	SECURITY OFFICE
SCO	-	SECURITY CHIEF'S OFFICE
ST	-	STORAGE
TL	-	TOILET
WR	-	WAITING ROOM
XE	-	TRANSPORTER EQUIPMENT
XR	-	TRANSPORTER ROOM

THE DESILU STAGE AT THE SAME SCALE



PLAN SYMBOLS



CHAIRS

TABLES

DINING TABLE

SHOWER, TUB

DRESSERS

BED

ROOM PARTITIONS
- White circular grille
- Red hexagonal grille

TOILET, SINK

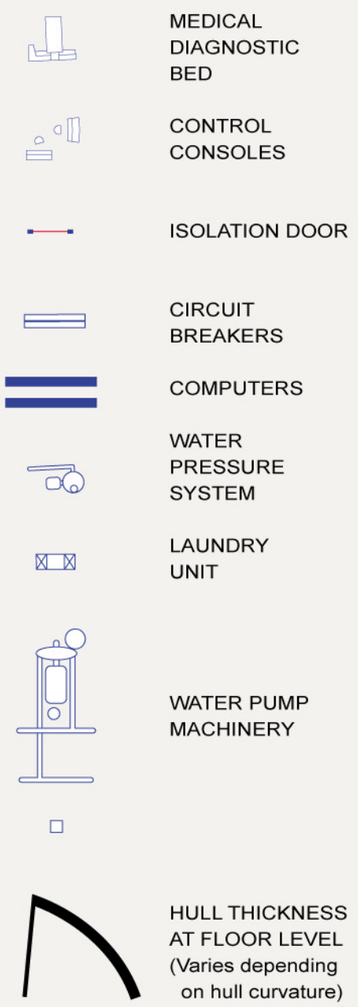
LADDERS

STAIRS, RAILING

WALL and DOOR

AIR CONDITIONING EQUIPMENT

BATTERIES



MEDICAL DIAGNOSTIC BED

CONTROL CONSOLES

ISOLATION DOOR

CIRCUIT BREAKERS

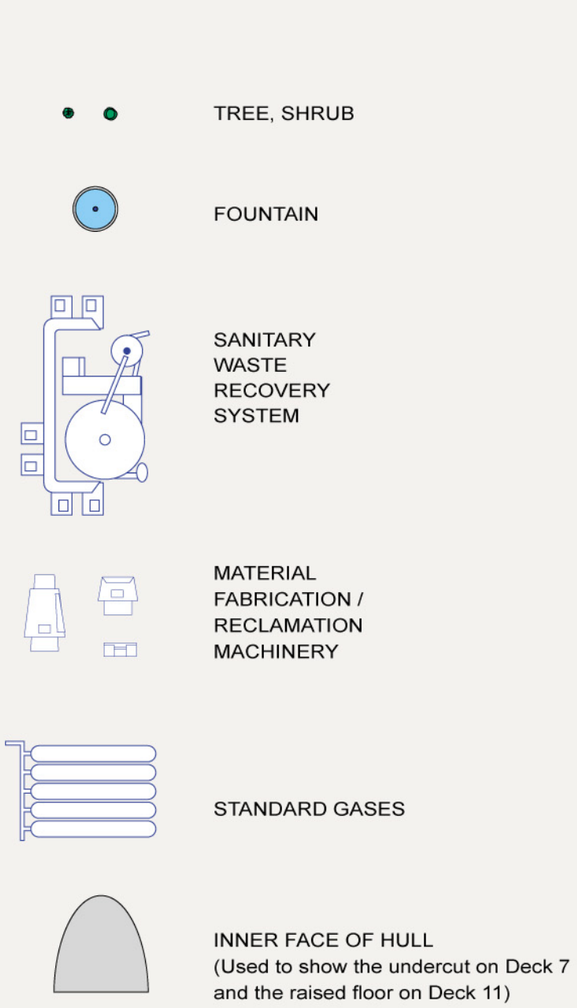
COMPUTERS

WATER PRESSURE SYSTEM

LAUNDRY UNIT

WATER PUMP MACHINERY

HULL THICKNESS AT FLOOR LEVEL (Varies depending on hull curvature)



TREE, SHRUB

FOUNTAIN

SANITARY WASTE RECOVERY SYSTEM

MATERIAL FABRICATION / RECLAMATION MACHINERY

STANDARD GASES

INNER FACE OF HULL
(Used to show the undercut on Deck 7 and the raised floor on Deck 11)

STAR TREK - TOS-era STARSHIPS

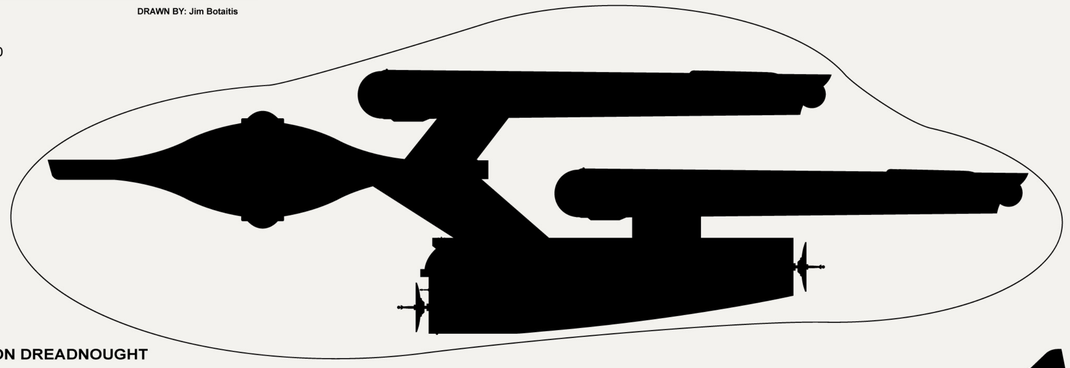
LAYOUT: WARP FIELDS of SHIPS PAGE BONUS 1

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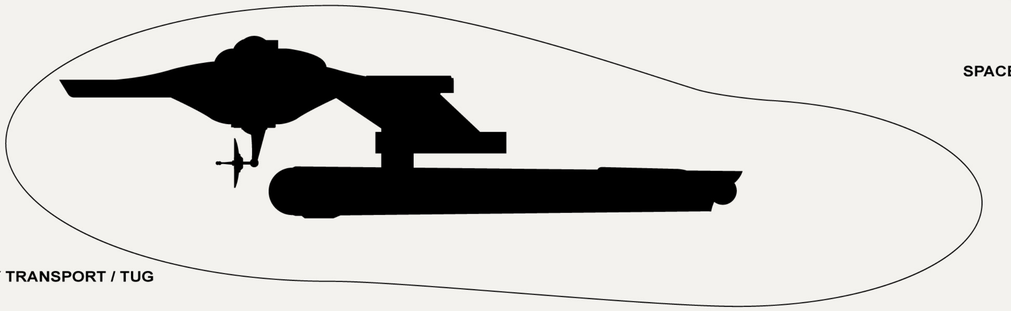
0 5 10 20 40
METERS



FEDERATION DREADNOUGHT



SPACE SHUTTLE

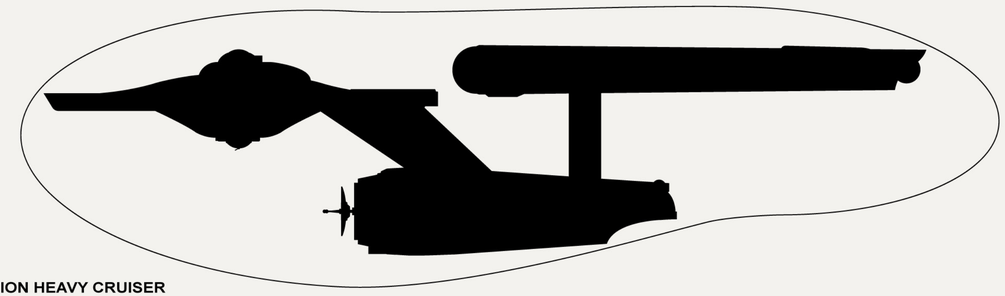


PTOLEMY TRANSPORT / TUG

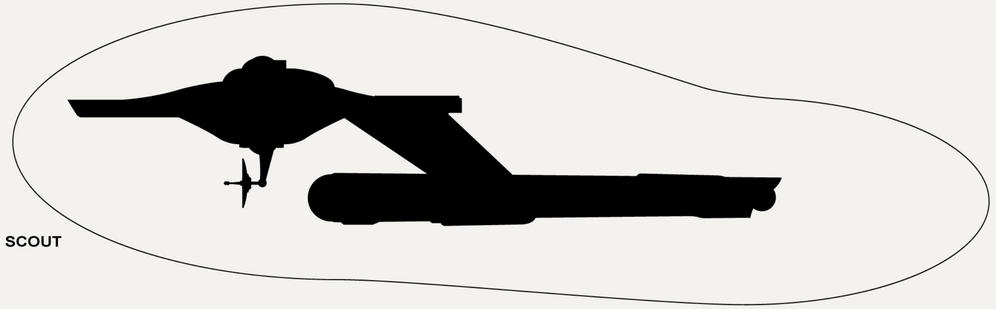
SHUTTLECRAFT



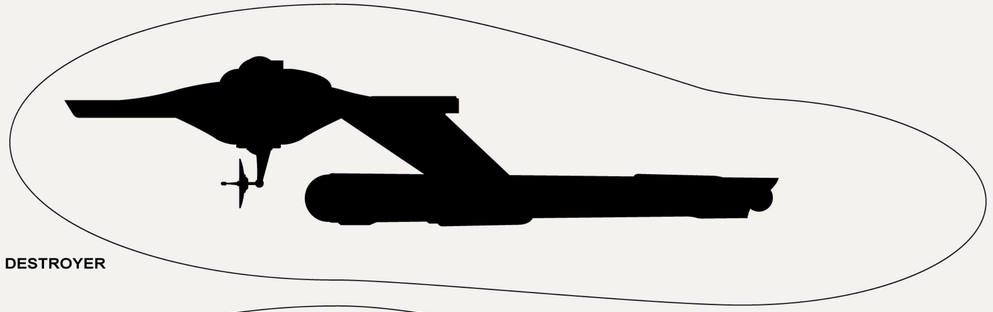
CARGO CONTAINER



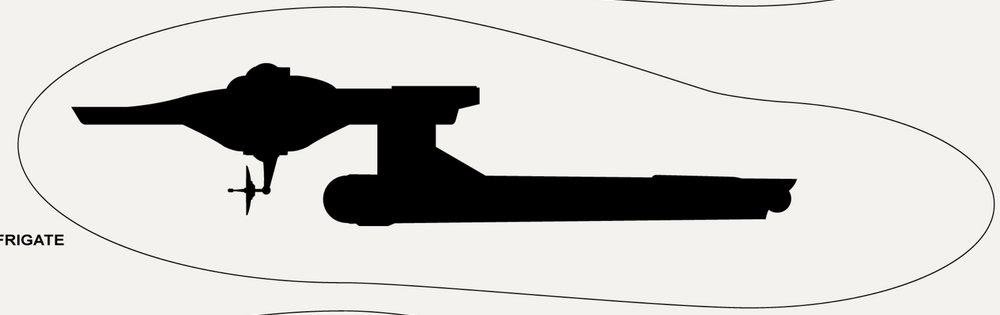
CONSTITUTION HEAVY CRUISER



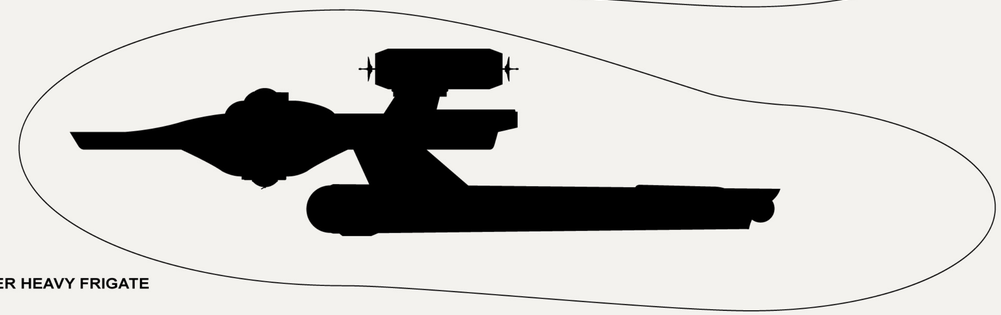
HERMES SCOUT



SALADIN DESTROYER



SURYA FRIGATE



AVENGER HEAVY FRIGATE

STAR TREK - TOS-era STARSHIPS

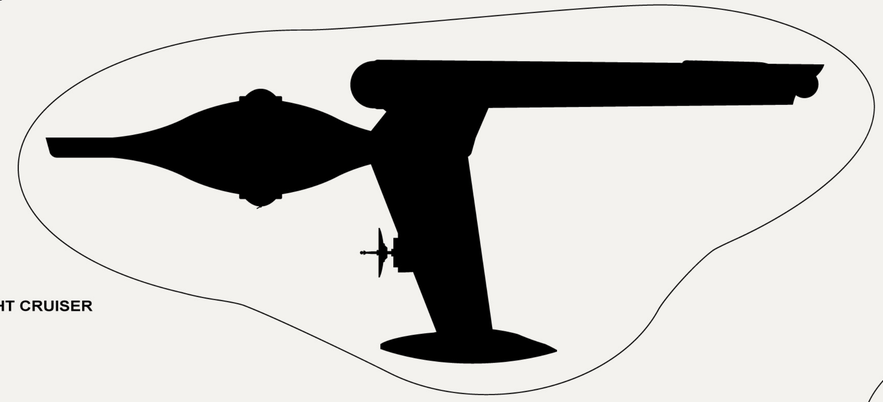
LAYOUT: WARP FIELDS of SHIPS PAGE BONUS 2

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DRAWN BY: Jim Botaitis

If printed 17 inches tall (from black-outlined edge to black-outlined edge) the scale of these drawings is 1/1000.

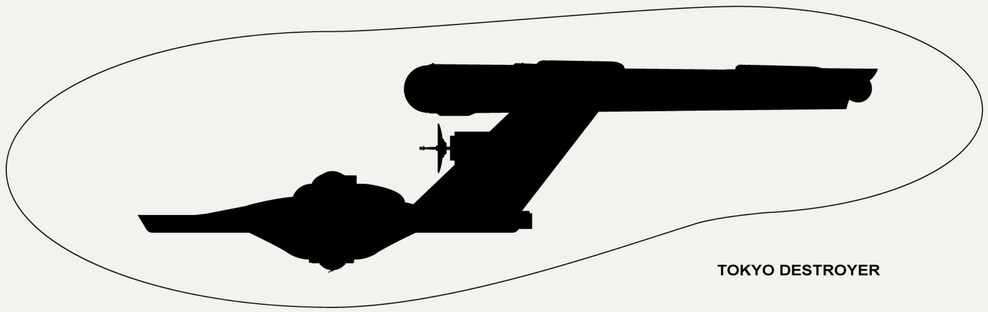
0 5 10 20 40
METERS



HOOK LIGHT CRUISER

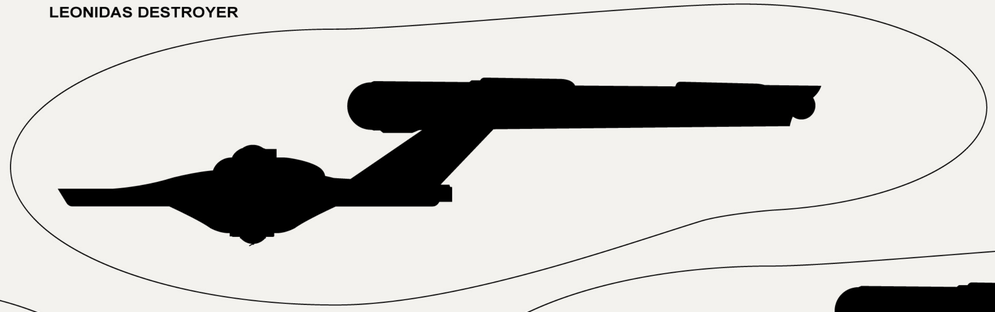


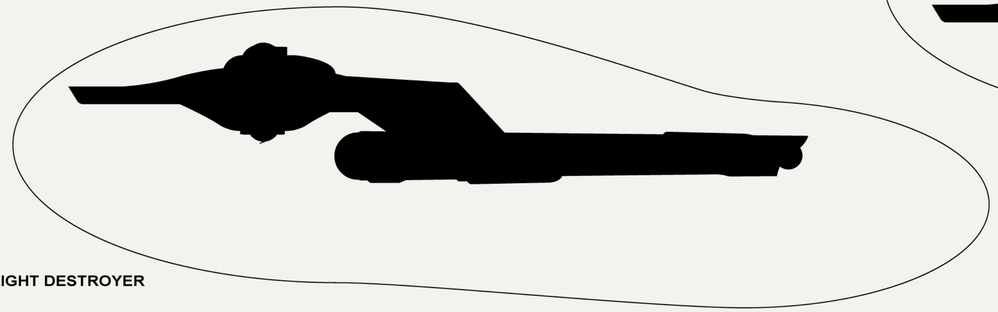
SPACE SHUTTLE



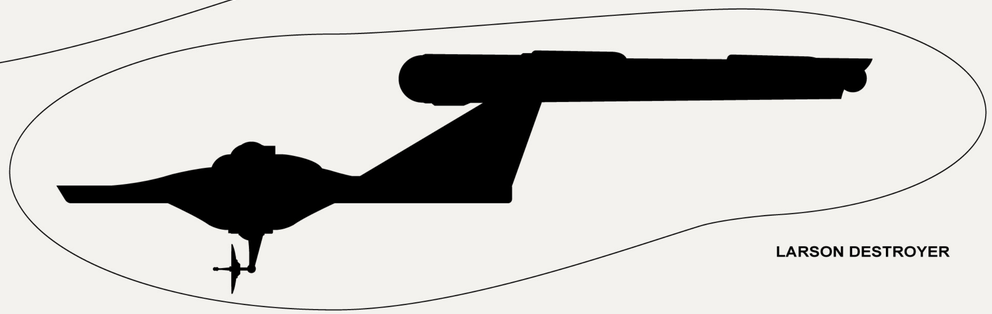
TOKYO DESTROYER

LEONIDAS DESTROYER



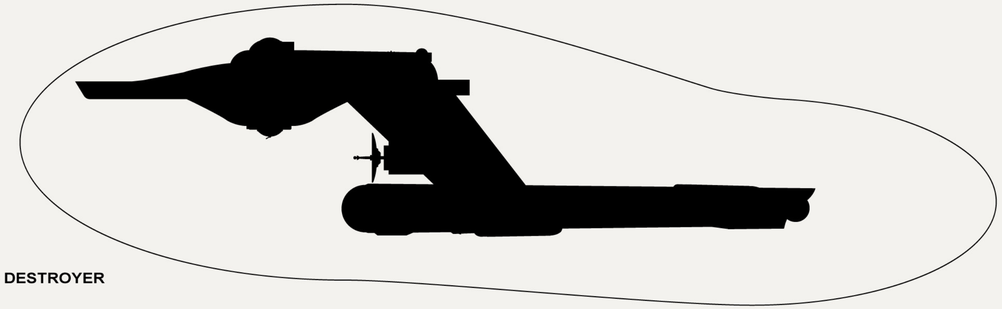


LYNCH LIGHT DESTROYER

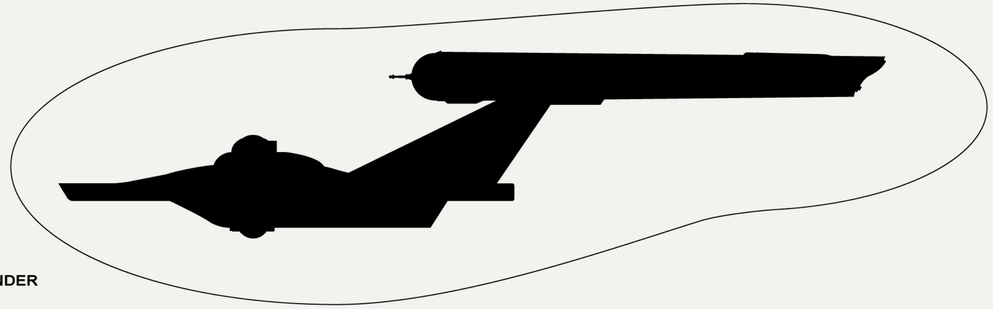


LARSON DESTROYER

SHUTTLECRAFT



MASAO DESTROYER



DERF TENDER