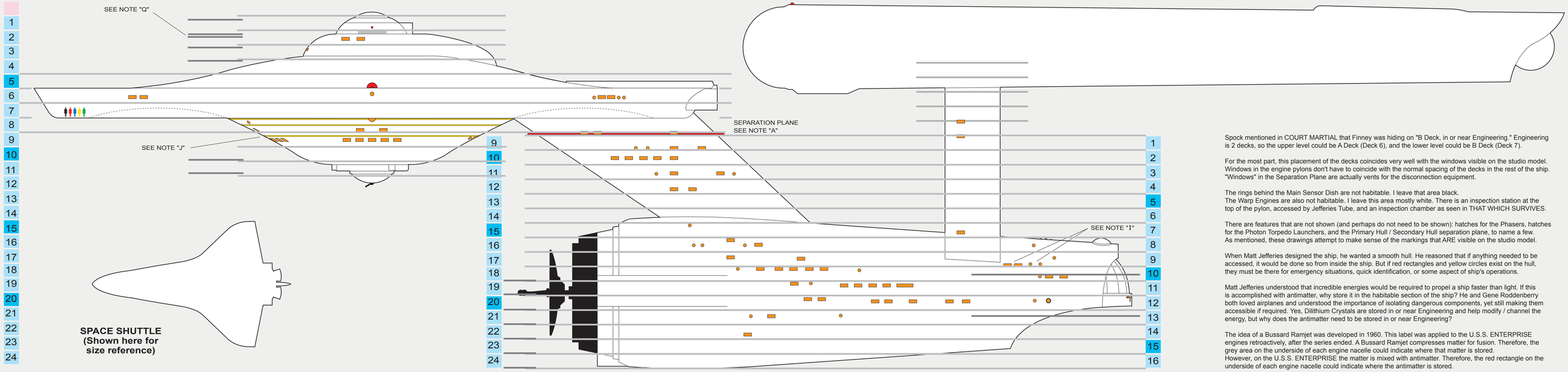
U.S.S. ENTERPRISE From STAR TREK (TOS)

LAYOUT: PORT PROFILE **PAGE 1 of 2**

DRAWN BY: Jim Botaitis

If printed 17 inches tall (from black-outlined edge to black-outlined edge) the scale of these drawings is 1/350.

0 5 10 15 20
METERS



SPACE SHUTTLE (Shown here for size reference)

NOTES

This project was driven by 3 criteria: (1) the details visible on the 11-foot-2.08-inch (3.4-meter) studio model, (2) the info in the Writer's Guide - available in the book THE MAKING OF STAR TREK (TMoST) - and, (3) all the details seen (or mentioned) in the original 79 episodes ... and the first pilot (THE CAGE).

Many other people have made such drawings: Matt Jefferies, Franz Joseph, David Shaw, Art Colvin, Aridas Sofia, Charles Casimiro, Alan Sinclair, and Agatha Chamberlain, to name a few. I did compare my drawings to theirs, but developed my own drawings, mostly based on photos of the studio model taken at the Smithsonian Museum during their restoration of the studio model.

As I progressed I kept thinking: What facts do I need to "prove"? Are references and citations needed? How well should I document my steps? How exact do I need to be when matching the details seen in each episode? For example, door locations and colours, corridor radii, movement of characters, etc?

So, again, here are the 3 criteria that governed this project:

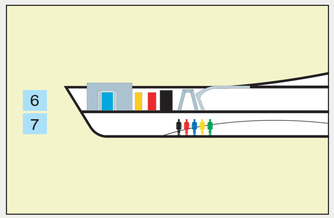
1.
The dimensions and details of the studio model are well known. It is 11 feet 2.08 inches (3.4 meters) long. The studio model was delivered with asymmetric details, then a few changes were requested and more detail was added on the starboard side. Yes, the model was asymmetric from the start. The port side has wires and holes for all the lighting. The rectangular housing beside the deflector dish on the port side is missing. The details on the inner faces of the engine nacelles do not match. This asymmetry can be attributed to the technology available at the time and does not reflect the intended design. However, the window pattern was also asymmetric from the start. This was intentional. See the photo on Page 9. The arc of windows across the front IS asymmetric. It cannot have started symmetric. The requested changes (mentioned above) made the overall window pattern even more asymmetric. Hatches were added in an asymmetric pattern. Why try to force symmetry on the hatches or the windows?
Symmetry is not representative of real ships, planes, etc. Symmetry suggests a scale model is being used. Symmetry is boring.

(The Refit ENTERPRISE has asymmetric windows, as does the ENTERPRISE A. The ENTERPRISE D has asymmetric hangar bays. The ENTERPRISE E has an asymmetric lifeboat distribution.)

2.
The book TMoST describes the U.S.S. ENTERPRISE as being 947 feet (288.6 meters) long. This makes the studio model 1/85 scale. The Primary Hull has 11 decks, the Secondary Hull has 16 decks, and the book describes what is located on each deck. For example, the Bridge is on Deck 1, Officer's Quarters are on Deck 5, the ship's Laundry and Food Preparation area are on Deck 8, Phaser Control is on Deck 11, and so on.

3.
What we see of the ship's interior in the episodes were sets built and filmed at DESILU STUDIOS. I found images of the set plans and re-sized them to 1/350 scale. The set walls were 10 feet (3.05 meters) high. This does not allow for 11 decks to fit in the Primary Hull. However, almost all other set details do fit when drawn to 1/350 scale. I chose 1/350 scale because models of the U.S.S. ENTERPRISE (as well as many other naval vessels) exist in that scale.

I started at the edge of the primary hull (see image below), where the height of 2 decks, the thickness of 1 floor, and the thickness of 2 hulls have to fit in this part of the saucer.



In CHARLIE X we saw how thick the walls are and also what is in the walls. The DESILU plans show walls that are 1 foot (0.3 meters) thick and sometimes even thicker. I decided to make all walls, decks, and hulls 1 foot thick, never thinner. In a few places, the walls are even thicker.

This leaves a ceiling height of 8 feet (2.44 meters) for each level.

The one set piece (reminiscent of a ship's rib - often seen in the Briefing Room) does not quite fit. However, all the other details (doors, openings, etc) do fit (see image at left). I consider the trapezoidal openings to be Isolation Doors ... in case of hull breaches, damage control, intruder alerts, etc.

In my profile drawing (at the top of this page) the light grey horizontal lines show the initial deck locations. They represent a constant 8 foot ceiling throughout the entire ship. I built them upwards and downwards from my starting point, Deck 6 and 7. However, this makes the Bridge too high, and Phaser Control too low.

The dark grey horizontal lines show the adjusted deck locations. This works well for the Primary Hull. The undercut on the Primary Hull affects Deck 7. This will affect the floor of Main (Impulse) Engineering. More on this later (see NOTE "O" and see the notes for Deck 7).

For the Secondary Hull, all the grey lines were shifted down so that the lowest one is aligned with the bottom of the hull. The resultant space between Deck 8 and Deck 9 becomes the "Separation Plane". Dialogue in THE APPLE suggests that the Primary Hull can disconnect from the Secondary Hull. This space is where I placed the Rear Landing Leg. The two triangular patterns on the underside of the Primary Hull are the Front Landing Legs.

Since disconnection equipment is located on Deck 8 and Deck 9, it makes sense to keep this area clear of crew and difficult to access except by authorized personnel. Therefore, Deck 8 and Deck 9 are accessible only by ladder and by Jefferies Tube.

The lowermost decks of the Secondary Hull were then shifted up slightly (dark grey lines) so that the grey line representing Deck 19 lines up with the Hangar Bay deck which can be seen outside of the Hangar Bay doors. This adjustment also allows a bit more headroom on Deck 20, necessary because of the recessed floor of the Secondary Bridge (located at the front of Deck 19). A final adjustment was made to two of the decks (but only at the aft end of the Secondary Hull) so that the Observation Gallery and Shuttlecraft Maintenance fit better.

If disconnection occurs, the decks of the Secondary Hull could be numbered as shown to the right of the profile drawing (above right on this page). This allows the Captain's Quarters to be located on Deck 12 (as mentioned in MUDD'S WOMEN). These could be his alternate quarters; his main quarters are on Deck 5, as stated in TMoST.

Spock mentioned in COURT MARTIAL that Finney was hiding on "B Deck, in or near Engineering." Engineering is 2 decks, so the upper level could be A Deck (Deck 6), and the lower level could be B Deck (Deck 7).

For the most part, this placement of the decks coincides very well with the windows visible on the studio model. Windows in the engine pylons don't have to coincide with the normal spacing of the decks in the rest of the ship. "Windows" in the Separation Plane are actually vents for the disconnection equipment.

The rings behind the Main Sensor Dish are not habitable. I leave that area black.
The Warp Engines are also not habitable. I leave this area mostly white. There is an inspection station at the top of the pylon, accessed by Jefferies Tube, and an inspection chamber as seen in THAT WHICH SURVIVES.

There are features that are not shown (and perhaps do not need to be shown): hatches for the Phasers, hatches for the Photon Torpedo Launchers, and the Primary Hull / Secondary Hull separation plane, to name a few. As mentioned, these drawings attempt to make sense of the markings that ARE visible on the studio model.

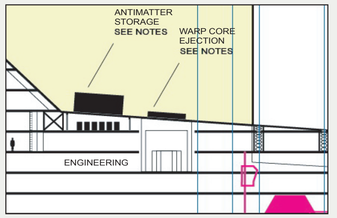
When Matt Jefferies designed the ship, he wanted a smooth hull. He reasoned that if anything needed to be accessed, it would be done so from inside the ship. But if red rectangles and yellow circles exist on the hull, they must be there for emergency situations, quick identification, or some aspect of 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 and understood 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. Therefore, the grey area on the underside of each engine nacelle could indicate where that matter is stored. However, on the U.S.S. ENTERPRISE the matter is mixed with antimatter. Therefore, the red rectangle on the underside of each engine nacelle could indicate where the antimatter is stored.

That red rectangle could be an access hatch, or an "Emergency Jettison" hatch. Dialogue in various episodes corroborates the idea of disengaging, discarding, or jettisoning the warp engine nacelles. Dialogue also mentions ejecting the antimatter pod. If antimatter was jettisoned from the engine nacelles, it would be aimed outwards and downwards, away from the habitable areas of the ship.

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. Why try to "retcon" these concepts?



If there is a Warp Core in Engineering on a ship of this era, and if it had to be ejected, would that ejection be upwards or downwards? Also, does that have any bearing with where the antimatter would be stored?

So, where is Engineering located, and where would that place the Warp Core and the antimatter? If Engineering is at the bottom of the Secondary Hull (so that Warp Core ejection is far from everything else) this places it too far away from the engines. If Engineering is far forward in the Secondary Hull, the Cargo Holds and Crew's Quarters prevent downward ejection and the dorsal decks prevent upward ejection. If Engineering is in the middle of the Secondary Hull, downward ejection interferes with Shuttlecraft Maintenance and with Cargo Operations. Upward ejection might be possible from that location.

Therefore, an early version of my profile drawing (see image at left) showed a Warp Core with an ejection hatch above. It also showed antimatter storage along the spine. However, I prefer the logic and safety of placing antimatter in the engine nacelles, away from the habitable section of the ship.

The huge pipes / conduits (visible through the grille behind Engineering) was a set built with forced perspective to suggest immense size. The angled pipes (suggesting they continue up the pylons) makes it logical to fit this between the engine pylons. Thus, Engineering is ahead of and above the Hangar Bay.

Regarding the antimatter:
CASE 1. Collect matter in the engine nacelles, 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 (as Matt and Gene intended).