18.0 GALAXY (II) CLASS STARSHIP

18.1 INTRODUCTION TO THE GALAXY (II) CLASS

The *Galaxy* class is rapidly taking the position in the modern fleet that the *Constitution / Enterprise* classes did over a century ago. The original six vessels built have been in service for over seven years now and have proven themselves capable explorers.

Recent events between the U.S.S. *Enterprise* (1701-D) and various Romulan, Klingon, and Ferengi vessels have shown a definite, and some say serious, weakness in the offensive and defensive systems of the *Galaxy* class. Though never intended to be a battleship, their great size and power nevertheless made them the primary Fleet defender.

Proponents of the dreadnought program have used this to attempt to justify their construction. In 2366 they finally succeeded in securing funding to construct the first *Olympus* (DN 23100) class dreadnought. Based heavily on the *Galaxy* design, but with the addition of a third nacelle (ala the old *Federation* class) and an extensively modified rear secondary hull (to accommodate the hangar bay, which had to be moved from it's traditional space to facilitate the mounting of the third nacelle).

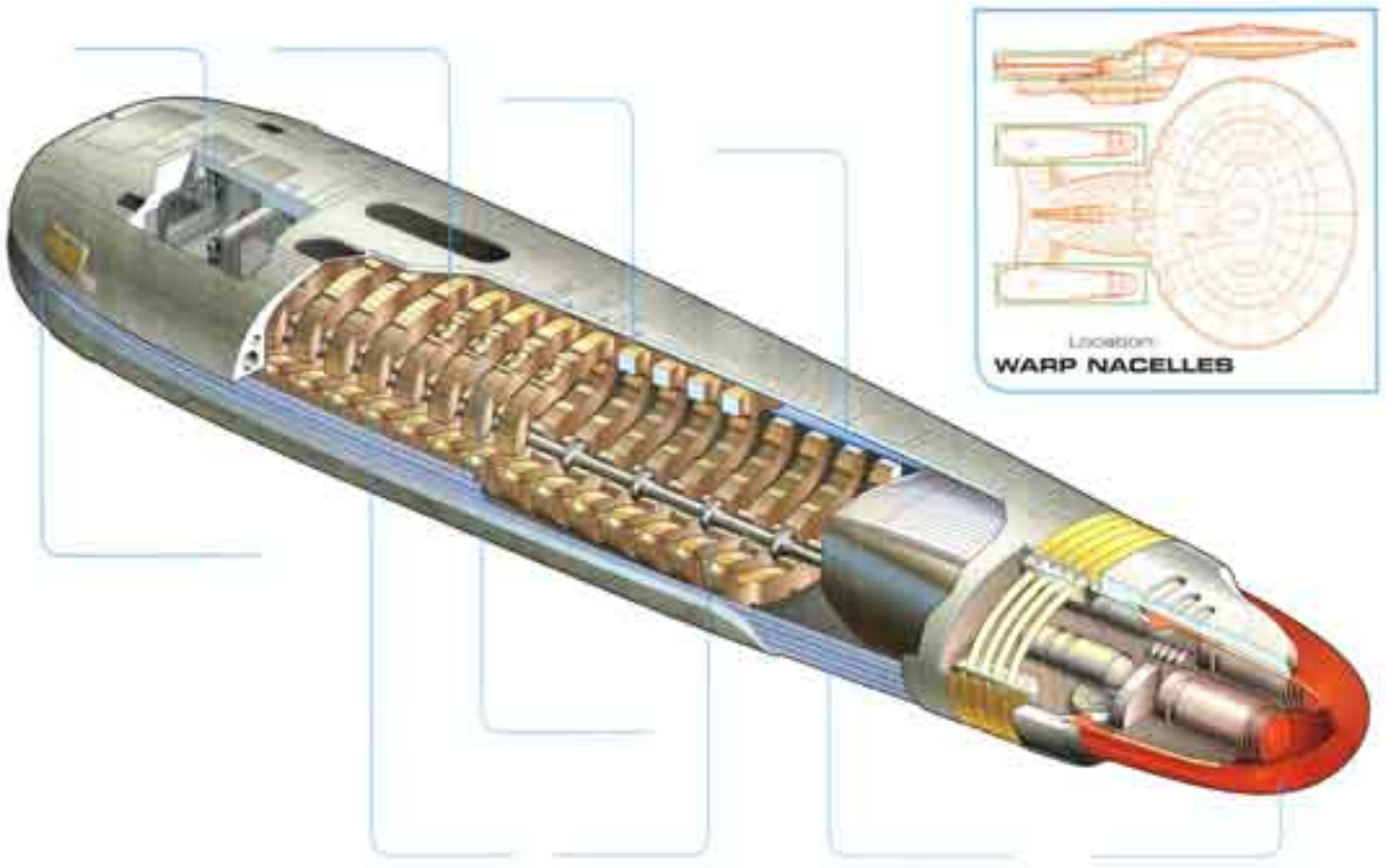
As had happened with the *Federation* class before it, the cost of conversion was astronomical, amounting to almost 35% of a new *Galaxy* class vessel. The largest part of the conversion cost is the third warp nacelle and the necessary structural reinforcement and power-transfer equipment. Proponents of the dreadnought program have always sited the enhanced weaponry and performance to justify the cost of the conversion. And opponents have always said that the money saved could be used to buy a smaller starship (in this case, an *Akira* class battlecruiser) that would offer greater flexibility to Starfleet at a much lower maintenance cost.

During the construction of *Olympus*, the Advanced Starship Design Board was commissioned by the Starfleet Spacecraft Design Advisory Commission to prepare a proposal to improve the *Galaxy* class at a much lower cost then the *Olympus* series. The Advanced Starship Design Bureau decided to concentrate on three major areas: propulsion, weapons, and shields.

18.2 PROPULSION AND POWER SYSTEMS UPGRADES

Due to size and structural considerations, the initial plan to use the Leeding Energies LF-42 engine from the *Griffon* class battleship was dropped. Instead, the existing Leeding Energies LF-41 warp drive system was modified to provide an additional 20% in peak power. The new system has been designated the LF-43. Primary modifications relate to the capacity of the M/ARC injector system and additional calibrations to the power transfer conduits to maximize plasma flow to the warp coils themselves. Additional "shaping" to the dilithium crystal within its articulation frame was performed based on computer modeling to maximize the crystal's efficiency. The warp coils themselves have been slightly redesigned to provide a 5% boost in efficiency, especially at speeds of Warp 8+. The plasma injection system has also been strengthened to allow an injector cycle time of 55 ns. This allows the *Galaxy (II)* class to maintain higher warp factor integers with less damage. For safety reasons, top speed remains limited to a duration of no more than twelve hours. *In toto*, these modifications raise the cruising speed to Warp 7 and the top speed to Warp 9.9. Another enhancement to the LF-43 system is a complete redesign of the warp core ejection system. It is now powered by separate battery units arrayed around the core, guaranteeing successful core ejection even if all power is lost aboard the ship. Ejection can be both computer-controlled and manual, with a built-in auto-ejection sequence initiated if certain parameters are reached or exceeded. This system can be overridden by the crew, however.

The heavier loads placed on the ship's power system with the uprated computer and tactical systems has been addressed with a significant strengthening and expansion of the electro plasma system (EPS) conduit grid, especially to the shield grids and AEGIS sensor arrays. The impulse drive units were left unchanged, being deemed quite adequate for their roles. The secondary fusion reactors were uprated 10% and tied to the weapons system to enhance performance.



18.3 TACTICAL SYSTEMS UPGRADES

A plan to install Type X+ megaphasers was shelved when suitable mounting points could not be engineered. Instead, the standard Type X collimator phaser arrays were greatly improved. The energy-release capabilities of the *fushigi-no-umi* crystals have been increased, delivering almost 50% more power than the standard Type X phasers installed on the *Galaxy* class. These new arrays are referred to as Type XII. An additional phaser strip was added along the top of each nacelle to correct a gunnery blind spot. The Mk 95 photon torpedo system has replaced the standard Mk 80. More powerful and with a faster loading system, the Mk 95 is an excellent long-range weapon. The Mk 95 is also the first torpedo system designed to fire the new quantum torpedoes.

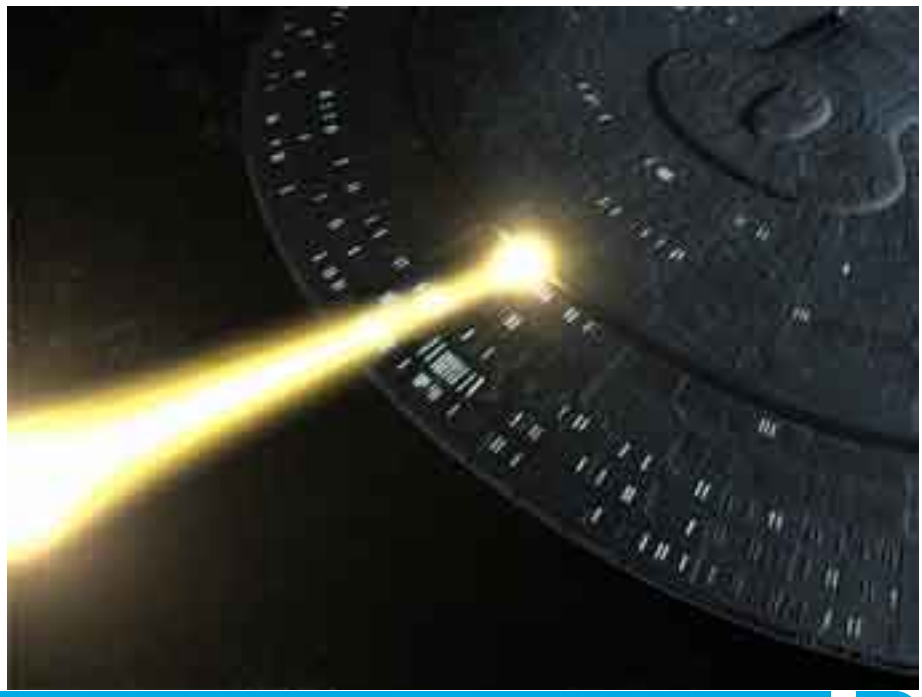
Like the *Olympus* and *Griffon* classes, the *Bright Star* was equipped with a Combat Information Center as well as the *AEGIS* Mk 7 Mod 1 Fleet Fire-Control system. This allows the *Bright Star* to command ships at the Task Force level via a Link 35 Communications Core. CETIS MK III with Type 225 TACAR II (Target Acquisition Center Accelerated Response) remain standard equipment, though the 42/ADA Countermeasures Support System has been added.

A unique feature of the *Bright Star* is her Flag Plot. A highly-specialized holosuite, it allows an Admiral and his battlestaff to "emerse" themselves into a battle, as if they were standing in the middle of it like some giant deity. All information collected by *AEGIS* and the other vessels in the Task Force / Fleet is collected, processed, and then displayed in holographic form. The Admiral can reach out and "touch" a starship to query its status, contact the Commanding Officer, or issue orders. As yet untried, it is expected to revolutionize tactical control during a battle.

Two flights of *Peregrine* fightercraft were added to help provide a multi-role capability. A flight of SWACS (Spaceborne Warning and Control System) shuttles provides extended-range sensor capability and command and control functions. Provisions were made for the ship to carry up to a company of Marines, though they are normally not carried, as they are not part of the ship's general mission.

The uprated power system allowed the installation of the FSS experimental shield system. Designed originally for the *Griffon* class SCS-X, the FSS incorporates three shield layers to allow the ship to withstand more punishment. As the outer layer is breached, the inner layers take up the slack while the breached layer is replenished underneath. All total, shield strength is doubled. Though a marvel of technological innovation, the incredible complexity of the system and shield grid required extensive modification to be fitted to the *Galaxy* class spaceframe and prevent it from being retrofitted to other vessels. As the FSS system costs twice as much as the FSQ/2, and due to the complexity, future *Galaxy (II)* vessels may not incorporate it.

A controversial addition is the FCE-2 cloaking device. As part of the FSS system, it will effectively cloak the vessel from sensors. Unfortunately, shield effectiveness is reduced by 60%, weapons cannot be fired without disrupting the field, and the energy costs, even with the second reactor, are excessive and a serious drain on the ship's power grid. The main hanger bay has undergone the necessary modifications needed to launch and retrieve the fighters. Shuttlebays Two and Three remain unchanged.



18.4 COMPUTER SYSTEM UPDATES

The new M-16 Isolinear III computer has been installed to test its performance. A partially cybernetic system utilizing "bio-neural gel pack" processors in addition to standard isolinear ones, it is both faster and more powerful than the current M-15 used in the *Griffon*, *Galaxy*, and *Olympus* classes. The gel packs utilize synthetic neurons based on the organization of neurons and synapses in the humanoid brain. The system essentially "grows" new computer circuits as needed. This allows the computer to take a "best guess" in cases where there is insufficient information to make a definitive statement in a logical manner, rather than having to spend the time attempting to calculate all possible actions. In essence, it uses a more intuitive process to arrive at a decision. When dealing with highly "fluid" situations such as those involving raw-data processing and computer modeling, the system is up to 300% faster than a similar isolinear-only unit. This makes it an excellent fit for many scientific mission profiles and therefore this computer system is planned for the *Intrepid* and *Sovereign* class starships, as well.

In addition, a highly advanced artificial-personality program called E.V.E. (**E**nhanced **V**isual interfac**E**) has been installed on top of the standard LCARS software, providing enhanced computer-human interactions. Though not an artificially intelligent system, it nonetheless puts a "human face" on the computer system, which many have considered cold and impersonal. Because of this "impersonality", many crewmembers continue to prefer manual data input and manipulation, slowing overall response times. It is hoped that the E.V.E. system will help increase computer-human response times and reduce the computer-related workload endured by the crew.

Extensive modifications were made to the computer core itself to allow a direct connection to the Combat Information Center and Flag Plot. Both have been placed directly outside the computer core, with specialized data conduits and redundant power systems to ensure the system remains active even should the ship itself be heavily damaged.

18.5 DEVELOPMENT AND CONSTRUCTION HISTORY

The ASDB submitted these changes to the Starfleet Spacecraft Design Advisory Commission on Stardate 3/6703. It was reviewed and approved within the month. With the loss of *Yamato*, Star Fleet had already decided to finish out the first and second spaceframes in storage to create the seventh and eighth *Galaxy* class starships, respectively.

The seventh *Galaxy* class starship, U.S.S. *Trinculo* (CKE 71867), was already over 40% completed, and was not considered to be a viable candidate. However, construction was halted on her so, should the changes be successful, she could be modified in the yard to the new specification.

The U.S.S. *Bright Star* (CKE 71875), tasked to become the eighth *Galaxy* class ship, was still mostly spaceframe and had yet to have her propulsion, weapons, and shields systems installed. It was decided that this ship would receive the updates and the necessary changes were made in the construction plans at the Utopia Planitia Spacedock. Once the ship was launched, she was towed to the San Francisco Fleet Yards for warp system and computer calibration. The ship was officially commissioned on Stardate 3/7005 and placed under the command of the Executive Director of the *Galaxy / Galaxy (II)* class Starship Development Projects, Rear Admiral Chris Wallace.

18.6 CONCLUSION

The cost-control attempts were partially successful, with the *Bright Star* running some 20% more than a standard *Galaxy* class. Studies on the deletion of the AEGIS / Flag Plot / Combat Information System showed that the conversion cost could be dropped close to 10%.

It was decided to omit these systems for *Trinculo*, as it would be too expensive to retrofit them into her spaceframe. Star Fleet has yet to decide whether or not to build the next four spaceframes, when the decision is made to do so, to either the *Bright Star's* or *Trinculo's* specifications.

The *Bright Star's* trials were impressive and once she entered service, she successfully engaged and fought off a Ferengi *D'Kora* class marauder attempting to purchase stolen cultural artifacts. Another, still-classified, encounter with a Romulan *D'deridex* warbird seems to show that the *Galaxy (II)* class is a match for them, as well, something that can not be said for her *Galaxy* sisters. *Trinculo* entered service in 2371 and general reports are favorable as well.