2270-2300 - Troubled Homefront

In the aftermath of the intrusion by the V'Ger entity, Starfleet of the early 2270s lived through an escalation boom, with nearly unlimited resources provided for the prevention of any further invasions of similar kind. The *de facto* source of these resources, the Organian Peace Treaty, proved but a temporary lull in Klingon-Federation political and military intrigue. Only the stern leadership of Fleet Admiral Robert Conrad and his legendary successor Heiharchio Nogura had kept Starfleet from overreacting to the Klingon threat in the preceding decades, but when these powerful figures retired from Starfleet command, other forces began vying for power in the highest echelons. The infamous coup attempt by Vice Admiral Vaughan Rittenhouse, even though doomed to fail from the outset, cast deep shadows over the public image of Starfleet – shadows the brief return of Fleet Admiral Nogura and the resurrection of the exploration program were hard pressed to disperse.

For the duration of the late 2270s, the militaristic forces inside Starfleet were again technically outnumbered by the more peaceful factions. But despite its official peaceful doctrine, Starfleet continued to prepare a huge fleet of modern cruisers with significant military as well as exploration capabilities. Also, the major programs for production of modern dreadnoughts and so-called 'space control ships' were finally providing results. Combined with transwarp development, which required high powered testbeds of gigantic dimensions, they would culminate in the *Excelsior* class, the next 'backbone' vessel of Starfleet and a worthy successor to the famous *Constitution* heavy cruisers.

The Klingon Empire's response was to uprate its battle cruiser fleet to the fearsome standard known as the *K't'inga* class, and to introduce cloaking capability to most of its naval vessels. But the

Klingon economy was slowly descending towards chaos in the aftermath of the mutually disastrous alliance with Romulans. Some visionary leaders foresaw the inevitable and strove for closer diplomatic and ultimately economic ties with the Federation. Others sought for the answer in increased military spending and frantic conquest of new worlds for new resources. No headway could be made in the UFP front, however, not even after it had become painfully evident that the Organian peace treaty no longer was being enforced at all. Yet neither side could back off, not after a series of provocations centered around the Genesis incident that introduced a new potential superweapon of immense power.

To offset the balance of terror, a far-flung conspiracy was engineered by Starfleet hardliners who, under the leadership of Fleet Admiral Lemuel Cartwright, aimed for an offensive against the Klingon Empire. Simultaneously and perhaps not coincidentally, relations with the Romulan Star Empire grew warmer. These two troubling developments came to a peak in the Praxis incident, where a key Klingon energy production facility exploded and left the whole Empire badly damaged. The conspirators saw the right moment had come, and seized it. A chain of assassinations was begun to pave way for a declaration of war against the weakened Empire.

However, the plan of the hard-liners required support of Klingon and Romulan factions to succeed. And complex plots often end in a disaster, as was luckily the case with the coup of '91. The actions of one man, Captain James T. Kirk, saved the life of president Ra-Ghotarei and the integrity of the Federation. In the aftermath of the aborted coup, relationships between the UFP and the Klingon Empire drastically improved, and a thorough cleansing of Starfleet resulted in changes in doctrine and also in equipment.

Two main fields of technology underwent rapid changes in this era. Warp propulsion inched closer to galactic standard, as the heritage of spool-coil engines was left behind and solid-state warp coils were rearranged to the linear plasma feed configuration that still persists today. Not only has the concept proven its validity, but the early LN-64 linear warp engine itself is still in widespread use in the 24th century. Also rapidly developed in this era, transporter technology moved towards much more dynamic control of the matter stream, thanks to deepening understanding of this originally so alien and mysterious field of science.

Ships deployed during this period have great commonality in construction as well as in propulsive and tactical systems, and many designs have been perpetuated into the latter half of the 24th century. Only the most warlike designs have been totally abandoned, due both to the more peaceful posture of Starfleet in the early 2300s and to the fast pace of weapons technology development in the subsequent years.

Belknap / Impervious / Excel

Strike cruiser
2270-2355

Completed:	38 total: 27 *Belknap* 7 *Impervious* 4 *Excel*
Length:	290.0 m
Beam:	141.7 m
Height:	67.5 m (*Belknap*) 66.2 m (*Impervious*, *Excel*)

Mass:	771,000 tons (NCC-2500) 787,000 tons (*Belknap*) 785,800 tons (*Impervious*) 788,100 tons (*Excel*)
Cruise speed:	w 8
Max.speed:	w 12
Endurance:	5 years
Officers:	55 (*Belknap*) 53 (*Impervious*, *Excel*)
Crew:	340 (*Belknap*) 328 (*Impervious*, *Excel*)
Weapons:	12 phaser VII emitters in 6 twin banks on primary hull 1 phaser VI emitter atop connecting neck 2 phaser VII emitters in twin bank atop connecting neck in place of phaser VI (NCC-2519, 2541) 4 phaser VI emitters in deflector module atop connecting neck in place of phaser VI (*Excel*) 2 phaser VII emitters in twin bank on ventral secondary hull 1 phaser VI emitter in stern mount (NCC-2519, 2541) 2 fwd medium torpedo tubes w/ 100 photorps or probes
Shields:	3-layer forcefields Navigational deflector beam on fwd secondary hull Secondary navigational deflectors on ventral primary hull and dorsal pod
Laboratories:	1 GP, 1 planetary sciences, 1 physics, 1 chemistry/biology
Transporters:	2 GP (6-pad), 2 cargo, 2 emergency evacuation (22-pad); Mk IV
Auxiliaries:	2 medium shuttles, 4 work pods; sometimes 'Killer bee' kits carried

Ships of historical interest:

USS Decatur (NCC-2500), *USS Raan* (NCC-2519)

SOURCES: (D SotSF)
(N SotSF)
(H SotSF)

The invention of the linear warp coil technology was swiftly and inevitably followed by the decision to create a brand new ship class, optimized to utilize the propulsive breakthrough. Since extensive refit programs for heavy frigates and heavy cruisers had been formulated already, the new class was given a specific mission outside the mission parameters of these refit designs. Despite the relative peace, Starfleet pressed for the fielding of so-called strike cruisers to provide a dedicated fast attack type for the Fleet. The ship type, formerly also called attack cruiser, would enjoy the defensive and offensive capabilities of heavy cruisers, but sacrifice endurance and exploration capacity for higher cruise speed. Indeed, the linear LN-64 engines would be taken to their extreme limits to provide a cruise speed of warp 8, sustainable until fuel exhaustion. Maximum speed would still be limited to brief bursts of warp 12, the same as with the refitted heavy cruisers.

The program was launched with the construction of *USS Decatur*, a 771,000 ton strike cruiser with heavy phaser and torpedo armament. While many systems were revolutionary to say the least, the basic spaceframe borrowed from existing designs, utilizing a modified Type-1D primary hull confiscated from the *Pompey* destroyer modernization program, and the secondary hull structural frame of a *Constitution* structural integrity testbed. The gray thermocoat finish that until then had been applied on all Starfleet designs was omitted: instead, the hull was plated with ceramic material functioning as thermocoat by itself, and the deflector grid, the field stabilization crystal and other hull surface detail were left exposed.*

The bridge and sensor bulge were more advanced if less streamlined designs than their earlier counterparts. Internally, the saucer was extensively reworked and the number of available phaser system berths increased from three to six, much as with the recent heavy frigate upgunning program. Twelve phaser VII emitters in twin-bank mounts were installed there, and plasma conduits were drawn directly from the main powerplant, which consisted of a series of magnetic bottles inside the dorsal connector and the secondary hull. This setup replaced the multilinear bottles traditional for this size of vessels and familiar from the *Constitution* or *Federation* designs. Power was provided for the new FIE-4 impulse deck with RSL series engines and for the CWD LN-64 advanced warp nacelles, mounted on triangular pylons extending from the bottom of the secondary hull.

To prepare for emergencies, the novel and untested power system was fitted with redundant failsafes. The whole pylon/nacelle assembly could be jettisoned, the vertical m/am core as well as the antimatter pods ejected, and finally the saucer separated from the engineering hull.

The ship was fitted with modern, never previously fielded fire control and navigation suites and forcefield generators. Major pieces of new hardware also included an oval, enclosed-design navigational sensor/deflector array and a torpedo deck located at the stem of the connecting neck instead of the primary hull. Also included were multiple docking ports and airlocks, reducing strain on the shuttlebay, which now incorporated an atmosphere-holding forcefield in addition to mechanical pressure doors.

The two Andorian Skar-Rat Mk 7 torpedo launchers of the new assembly easily matched the up to six tubes used in the previous generation of major combatants. With the latest in speed-loader technology and with radically improved warhead design that gave far higher destructive yield out of a lower reactant mass, they were also considered a sufficient response to the heretofore so unnerving Klingon supremacy in torpedo weaponry. Each torpedo was still individually weaker than its massive Klingon counterpart, but rate of fire adequately compensated for that. Starfleet had its sights set at even more potent systems, and officially considered the new cruiser torpedo systems ‘medium’ weapons.

The *Decatur* proved a technical and operational success, but plans were already in motion for a growth version. *USS Belknap* was finished with a far more extensive redesign of the standard saucer, adding almost 4 meters to the saucer radius in form of a new layer of circumferential structures. Also, an improved navigational deflector was chosen, and phaser armament slightly reconfigured. During the test runs, the report on the maiden voyage of the refitted *Constitution* cruiser *Enterprise* (NCC-1701) prompted Starfleet to install secondary power options to the phasers of all cruisers and strike cruisers, even though warp power tapping was still retained as the principal powering mode. The *Belknap* and all her later sisters received the secondary power circuits and extra EPS nodes required for this. With all the alterations, gross weight increased to 787,000 tons. Design details were shared with the *Constitution* upgrade and *Avenger* heavy frigate programs, resulting in great commonality.

Between 2270 and 2284, as many as 27 ships of the *Belknap* class, in three main production batches, were completed for deep space combat duties; only one of the planned 28 units was left unfinished in favor of Space Control Ship procurement. Four of the ships were later reassigned from general combat to the TacFleet special force, receiving an improved sensor countermeasures suite and, in the case of the *Raan* (NCC-2519) and the *Sur Cha* (NCC-2541) also the high dash speed LN-68 engines. Their dual role as perimeter fleet kingpins and special interdiction units frequently

took them to enemy space, and warranted the bolstering of defensive armament with an aft dorsal phaser VII double bank.

USS Decatur was also included in the class despite design differences, and mainly utilized as a training vessel, a situation parallel to the fate of for example *USS Republic* of *Constitution* class. The rest of the *Belknaps*, along with the small but growing selection of modern destroyer-type ships, formed the military-offensive strongback of Starfleet, and freed multi-purpose cruisers for exploration and frigates for defense and law enforcement duties. In the oft-practiced but seldom performed planetary assault role, the strike cruisers were in turn accompanied by through-deck cruisers, carriers and strike frigates.

The striking end of Task Force G, consisting of two Belknap *strike cruisers and three* Larson *and four* Siva *destroyers, thundering down on the defenses of Hssin during the Xindi Incursion of 2272 – one of the few publicity shots released by Starfleet. Hssin was one of the feline Xindi outposts totally leveled in the war, in retribution more than out of strategic need. The slashing strikes of the high speed* Belknaps *often caught the Xindi completely by surprise, yet a fierce defense was mounted at Hssin.* USS Baikal *(NCC-2513) had to retreat after losing all shields and suffering heavy casualties, and the destroyer* Guadalcanal *met her fiery end in the upper atmosphere of Hssin. The battle is required reading at the Academy, highlighting the advantages of a skillfully reinforced planetary defense against an all-out starship assault.*

But even this degree of escalation was not enough for the new leadership of Starfleet. Post- V'Ger doctrines of border control required heavy defensive firepower. The abortive *Federation* class dreadnought upgrade program failed to provide it; the program was thus superseded with a project utilizing *Belknap* components, resulting in the *Ascension* class of dreadnoughts. Ten ships were built beginning in 2278, and featured a third warp nacelle mounted atop the secondary hull for increased endurance in high-warp operations. This class is described later in a separate entry.

Later changes in Starfleet doctrine adapted the dreadnoughts for offensive warfare to boost the 1600-starship initiative of Commissioner Valdemar in the 2280s. Further classes of strike cruisers were also planned for offensive action; the *Impervious* subclass of slightly improved *Belknap* design increased the number of strike cruisers by ten. The jettisonable pylon assembly of the *Belknaps* was replaced by a simpler and more affordable fixed horizontal pylon system, and the secondary hull structure simplified in other ways as well. Crew requirements were slightly diminished, yet mission equipment remained largely common with the earlier type. The *Impervioues* were followed by four ships of the practically identical *Excel* subclass before production was aborted due to Khitomer treaty cutbacks.

The simultaneous launch of USS Perform *(NCC-2546) and* USS Manage *(NCC-2547) from the Cosmadyne Yards at Deneb V gave rise to sarcastic commentary on the decline of Starfleet standards, until* USS Triumph *(NCC-2548) reversed the 'downtrend'. The four* Excel *units completed were mainly distinguished by their dorsally mounted deflector and phaser VI assembly, intended to boost defenses during impulse combat.*

The peace did not come easily for the strike cruisers. Only minutes after the attempt at UFP President Ra-Ghotarei's life at Khitomer, strike cruiser *Aveley* (NCC-2543) and her two destroyer escorts, *USS Iron Sentry* and *USS Masterton*, moved into Klingon space according to their covert orders. Their aim was to level a Klingon garrison world near the border and then regroup with other strike teams for a deep plunge into the Empire. Fifty minutes into the mission, the *Aveley* was intercepted by the cruisers *Canopus* (NCC-1814) and *Hornet* (NCC-1714), loyal to the President. In the ensuing battle, the cruisers managed to collapse the shields of the *Aveley* and damage her drive systems. An onboard explosion, later judged to be the result of deliberate self-destruct, then ripped the strike cruiser in half and killed 287 of her crew, including Capt. Elijah Heinrichs and his senior officers. A hundred people were saved by the efforts of the *Canopus* and the border patrol cruiser *IKV M'Kogh*. The two destroyers capitulated, returning to Federation space.

Two similar strike attempts were cut short when the first officers of the leading cruisers took command from their captains. The dreadnought *Minsk* was prevented from proceeding with the attack through sabotage conducted by her engineering crew, later decorated for their actions.

After the Khitomer conference, Starfleet immediately deactivated 14 of the *Belknaps* and 8 of the *Impervious*es, along with most of the surviving destroyers and dreadnoughts and other offensive-mission starships. Twelve *Belknaps* and all ten *Ascensions* were decommissioned and scrapped soon thereafter; Starfleet was obligated to dismantle a certain number of its largest starships, and the strike cruisers and dreadnoughts were a suitable sacrifice, as the overtly combat-oriented sensory and analysis systems aboard the vessels were found to be quite unsuitable for supporting exploratory missions. The 24 remaining ships returned to service in defense duties until the 2330s, when the large numbers of *Excelsior*-class ships, with superior range and firepower, took over. Two *Belknaps*, *USS Ki Rin* (NCC-2539) and *USS Cicala* (NCC-2540), continued in a general training role until the late 2350s, while the other vessels were mothballed.

The surviving strike cruisers are still theoretically kept in reserve, but the serviceability of their extremely complex powerplants is suspect, and none were reactivated even at the height of the Dominion War. Twelve *Belknaps* have also been partially cannibalized for spare parts to *Miranda* class vessels.

* In contrast, the heretofore so distinctive subspace antennas were covered by the duonetically transparent ceramic coating. In his 2314 memoirs, the prominent Klingon Imperial Intelligence strongman K'tagh s.o. Kraton relates to an early confusion in predicting the completion dates of *Belknaps*, refitted *Constitutions* and other modern starships – operatives kept on reporting that the ships were in early stages of fitting the mission equipment, since even the subspace communicators were still missing!

Kethkin

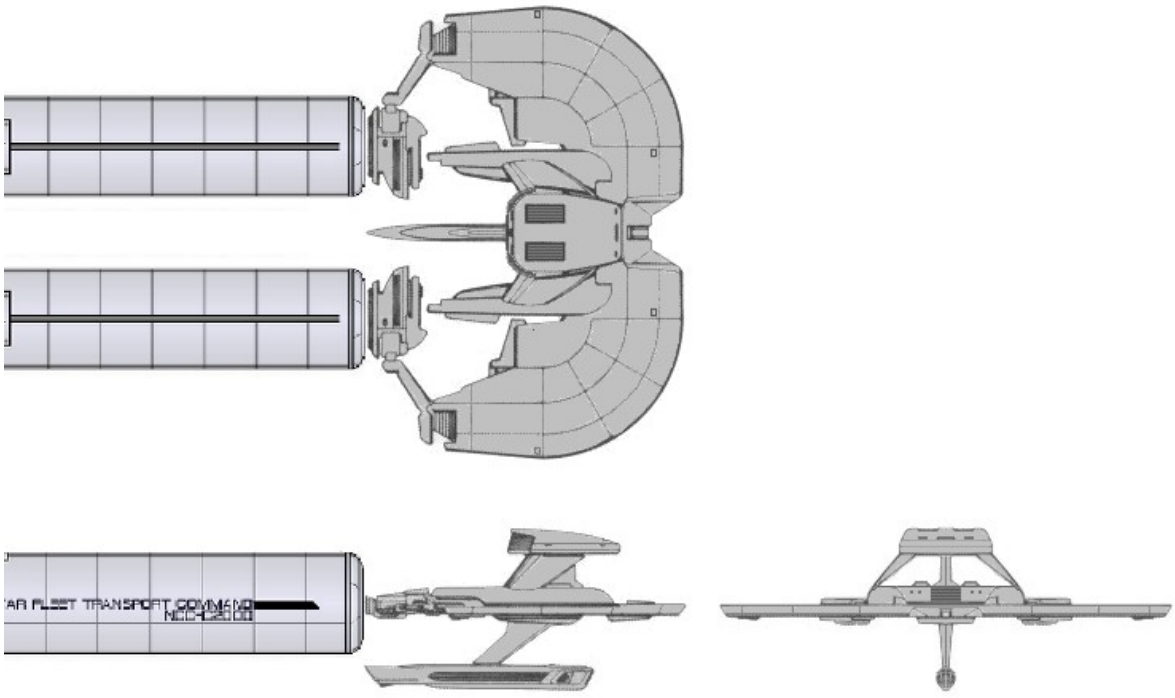
Light fleet tug
2270-2321

Completed:	128
Length:	126.1 m
Beam:	166.0 m
Height:	60.2 m
Mass:	124,300 tons
Cruise speed:	w 5
Towing speed:	w 5
Max speed:	w 7.0
Endurance:	1 year
Officers:	4
Crew:	30
Cargo:	2 x 121,600 tons (standard cargo pod arrangement) 325,000 tons (maximum load other than pods)
Weapons:	None
Shields:	1-layer conformal forcefield Navigational deflector on bow
Transporters:	2 GP (4-pad); Mk IV All ships brought to Mk V standard after 2299
Auxiliaries:	6 cargo maneuvering drones

Ships of historical interest:

USS Lumar Con (NCC-F1043)

SOURCES: (D FASA)
(N FASA)
(H FASA)



Even though Starfleet engine designers understood that linear excitation technologies would at first be useful in a narrow range of applications only, the operational leadership believed strongly in the overall appeal of the breakthrough. Immediate refit programs were initiated on the escort fleet, for example; even obscure auxiliary types such as buoy tenders were cleared for receiving the LN-61 warp engine. One could thus perhaps have expected Logistics Command to begin refitting its *Ohio* and *Mo'Kal* class light tug force as well, at the maximum rate allowed by LN-61 production.

However, here a different choice was made. Realizing the great potential of the new engine in field malleability as well as the usually quoted speed and endurance, Rear Admiral Owen Parkes personally called for the design and construction of a tug capable of handling two containers while only mounting one LN-61 unit. An upgrade from *Ohio* to *Mo'Kal* performance (warp five cruising under quarter a million tons of load, albeit with abysmal acceleration and maneuverability) merely called for sufficient input power to the new superengine. And a pair of RMR-220 units would in theory be enough to provide that power, well matching the twofold construction to be applied elsewhere on the vessel.

Creation of the single-nacelle tug started with cutting a *Mo'Kal* hull in half along the centerline. A potent power and propulsion package was then inserted in the middle, more or less doubling the width as well as height of the vessel. A navigational deflector at the very bow, a ventrally mounted nacelle, and a dorsal impulse section all received their power from the pair of reactors in a horseshoe housing at the very heart of the ship. Primary plasma conduitry ran along a sturdy vertical centerline pylon, while additional supports between the dorsal pod and the reactor bulges offered surface area for intercoolers, and the ends of the horseshoe protruded aft past the main hull to provide clearance for plasma expanders and antimatter vents.

The cargo containers would again be rigged to the ship by articulated docking adapters, this time mounted at the port and starboard extremities of the hull. In addition to optimally positioning one or two fully loaded containers for towing, the cargo slings could hold a gaggle of three empty

containers each, or grip various nonstandard loads up to a total mass of 325,000 tons. For assisting in maneuvering the loads in place, twin hangars on the dorsal pod berthed up to six potent 'mule' drones. The system greatly increased the flexibility of the tugs, as well as providing welcome independence from port assets.

Two Kethkins *prepare to get underway at Cait, one of the manufacturing centers for the tugs themselves. The ship closer to the planet is recalling her drones; the one on outer orbit adjusts the container slings to best match the load with the thrust line.*

Automation was paramount to keeping the tugs economical in other respects as well. Crew size remained at *Mo'Kal* level, and deep space navigation was made more reliable than before. Also, while there was no hope of bringing the sluggish, unarmed and lightly shielded vessels along for Fleet maneuvers, there was at least full compatibility with modern C^3I systems, unlike with *Ohio* units.

Production commenced in 2270 already, and eventually stabilized at 28 units per year to allow the total of 128 hulls to be launched in little over half a decade. Essentially, the new *Kethkin* class reached the combined numbers of *Ohios* and *Fishers* remaining in service, while carrying twice the load. This tripled capacity barely met Starfleet's needs at the time, there being major inefficiencies involved in hauling half-empty containers back and forth or securing a pair of fully loaded pods for each *Kethkin* sortie. Yet the Fleet benefited significantly from not having to streamline the logistics of 'tare shuffling': as long as the *Kethkins* provided cheap overcapacity for moving the containers around, Logistics Command could concentrate on optimizing the use of heavy tugs in delivering the actual shipments.

When modern heavy towing assets finally began to glide out of construction docks in the late 2290s, Starfleet's theater of operations had grown sufficiently to justify the full *Kethkin* numbers even under optimal logistical arrangements. *Ohio* retirement had already turned light tug numbers to a shallow decline after the peak years of the 2280s; there was constant demand for the *Kethkins* across the turn of the century, and a real need for a successor could be predicted for the 2320s.

However, advances in mercantile and theater logistics were already spelling the end of standard container operations. By the time the issue of *Kethkin* retirement became acute, flexible commerce and supply across medium and long ranges was already independent of standard containers. Thanks to ship-specific modular holds and advanced logistics AIs, there no longer existed a need to 'haul tare' across the Federation. Lacking internal cargo space, tugs of *Kethkin* design philosophy had no role to play in this new reality, and were retired and scrapped in an orderly fashion by 2321.

Andor

Cruiser
2270-2336

Completed: 14

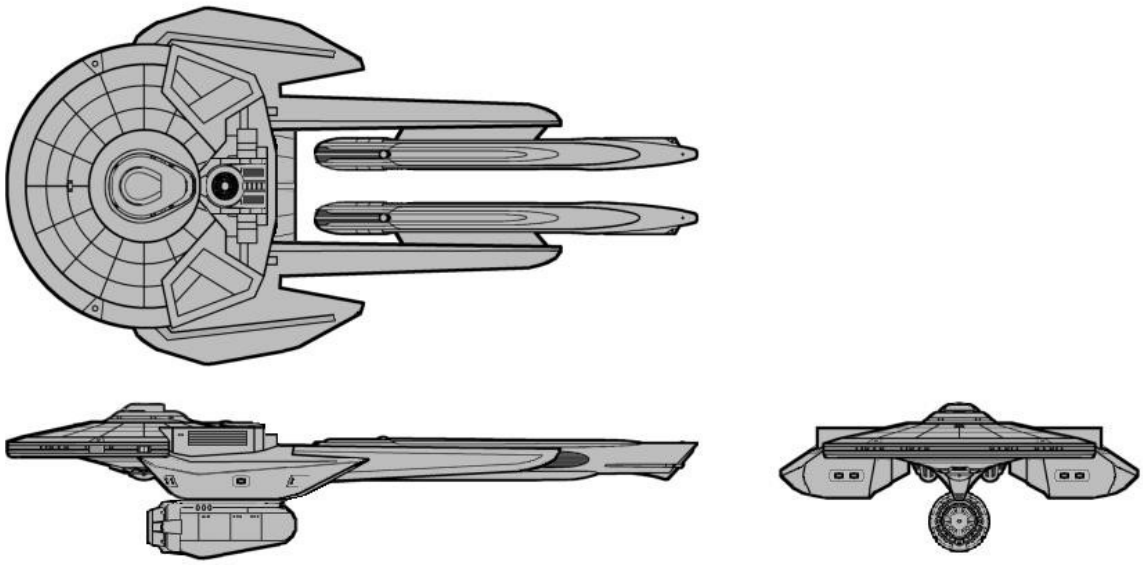
Length: 278.7 m

Beam:	139.4 m
Height:	56.9 m
Mass:	721,600 tons
Cruise speed:	w 7
Max.speed:	w 9.0
Endurance:	3 years
Officers:	44
Crew:	196
Troops:	40
Weapons:	2 phaser VII emitters in twin bank on dorsal primary hull 2 phaser V emitters on aft primary hull booms 4 fwd medium torpedo tubes w/ 120 photorps in ventral primary hull 2 aft medium torpedo tubes w/ 30 photorps each in aft primary hull booms 2 fwd/lateral angle medium torpedo tubes w/ 10 photorps each in fwd secondary hull
Shields:	2-layer forcefields Navigational deflector beam on fwd secondary hull Secondary navigational deflector on ventral primary hull
Laboratories:	1 GP
Transporters:	6 GP (6-pad), 2 cargo, 3 emergency evacuation (22-pad); Mk IV
Auxiliaries:	2 light shuttles, 4 work pods

Ships of historical interest:

USS Andor (NCC-1770), *USS F'hadzzar* (NCC-1778)

SOURCES: (D FASA, dimensions corrected)
(N FASA)
(H FASA)



As soon as Starfleet had nominated the CWD LN-64 linear excitation engine for its newest large cruisers, a number of construction and upgrade programs featuring alternate engine types came under scrutiny. Plans on destroyer, heavy destroyer and light cruiser modernization were put on ice; in absence of immediate military threats, it was felt reasonable to allow the linear engine technology

to first prove itself aboard vessels that would be built in low numbers and with maximum commitment of R&D funds and effort.

However, although all was quiet on the Klingon front, developments in and around Romulan space alarmed the local UFP member worlds. After a century of seeming hibernation, the old enemy was clearly stirring again. Actual military activities were limited to probing strikes at the moment – but wild rumors circulated of the development of polaric weapons, of manipulation of ion storms to nefarious purposes, of conspiracies, infiltrations and fifth column activities. Starfleet could hardly counter this sort of psychological warfare with deployment of conventional forces. Yet as Andor at the time carried primary responsibility for defenses in this direction, the Blue Fleet insisted on maintaining maximum readiness.

This was not the true state of Andorian Self-Defense Forces at the beginning of the seventies. The *Loknar* frigate force was worn down from decades of service against the Klingons. The fifties-vintage light *Lenthal* destroyers were creaking at the seams after four rounds of refits, and the heftier *Thufirs* after three. Organizational reshuffling following the Organian peace had scattered the various cruisers in ASDF service to exploratory errands. Ground forces had never before stood down to such a low level of readiness, and the *Chandley* strike fleet was all but idled. Yet the ASDF had a firm opinion on its preferred kind of battle, and on the hardware needed to wage it. Since it enjoyed significant autonomy within the general Starfleet budgetary framework, it was a relatively simple matter to initiate the design and construction of a new cruiser, one optimized to cover the temporary weaknesses in the Blue Shield.

A rare sight of joint operations between an Andor *and a* S'harien *battle cruiser, both combining extremely strong torpedo armament with the ability to operate against planetary targets. In terms of maneuverability, the two vessels could not be more different, however. The similarity in engine placement and hull shape belies the broader, more asymmetric nature of the* S'harien *warp field. The battle cruiser also features far more versatile impulse thrust vectoring and greater gravitics and RCS power, and carries all the sensors needed for independently engaging enemy forces in deep space. The slowish Andorian cruiser in turn excels in forward protection and sheer 'dropping power' if allowed close enough to the enemy.*

In classic Andorian style, the warp engines of the cruiser would be tucked in at ship centerline, aft of the primary hull, erecting a narrow yet robust propulsive field. Main powerplant, navigational deflector and primary shield generator would be carried in a ventrally mounted engineering hull. Lateral shield generator assemblies would further protect the drive system in a typically brazen head-on attack. To make this attack count, the cruiser would sport no fewer than four forward-firing Mk 7 torpedo tubes, two per a laterally carried weapons pod. In addition, the pods featured single aft tubes plus an articulated launcher that would cover athwartship angles. Each fixed launcher would feature a large 30-shot magazine, each articulated one a ten-shot feeder. In rather sharp contrast, only one twin FH-13 Type VII phaser bank would be carried in the primary hull, a 114 m saucer riding atop the framework of the lateral torpedo pods, the central engineering section and the

trailing booms. Exhaust from the saucer trailing edge impulse engines would be licking the top surfaces of the warp nacelles; the Andorian obsession with head-on protection did not cater for thrust vectoring or high maneuverability.

Accommodation within the primary hull followed Andorian norms as well. Some 240 crew would be needed to operate the vessel, and a reinforced platoon of boarding troops was to be carried at all times. Six GP transporters would facilitate boarding action; a minimal shuttlebay at the secondary hull stern would not, since just two light shuttles could be carried. Plans were at one point made of mounting a larger secondary hull, from the standard stock of *Constitution* refits. As soon as it became evident that standardization was not to be a central feature of that refit project, such plans were shelved.

Despite the structural and conceptual uniqueness of the design, there was little difficulty in completing the inaugural duo of cruisers by early 2270. While propulsive trials kept *USS Andor* fully employed till 2272, *USS Shran* was already engaged in tactical exercises intended to establish the type as a core element in ASDF squadrons. Production continued at a steady pace at all available Andorian yards, resulting in fourteen vessels completed by 2275. Such an arsenal restored ASDF credibility at one stroke: an *Andor* would provide a standoff or warp-in 'sucker punch' of torpedo volleys, followed by ruthless close combat and boarding action by her frigate or destroyer consorts. Several Romulan and also Klingon interlopers were engaged, and even the heaviest opponents chose a swift retreat when thus confronted.

A ventral look at USS Shran *(NCC-1771). Despite carrying a systematic Starfleet registry, the vessel represented such a concentration of national idiosyncrasies that she was best restricted to all-Andorian operations.*

The major shortcoming of the *Andor* formations was their limited sensing and computing power. The antiquated Raakuv '*Ilus*' fire control system could handle the actual attack runs well enough, but tying it to the general battle management networks was problematic, and onboard sensors alone could not locate targets at tactically sufficient ranges. Furthermore, despite her central role in the formation, an *Andor* could hardly be considered a command cruiser: the crew was overworked with running the ship already, and had no special command facilities or software in its possession.

Integration of *Andors* to battlefleets thus was a matter of intensive training and endless exercise, and only achievable within the ASDF framework. The vessels would have had difficulty finding a role in the broader Fleet anyway, due to their low top speed of warp 9, inherent in the engine configuration. Combined with the almost total lack of exploration and research gear aboard, this confined the innovative combatants to a niche role – in which they served with distinction until the 2320s. Although collision-induced structural damage forced *USS Kathosth* to be retired in 2282, no combat casualties were suffered, and an orderly retirement plan spanning fifteen years subsequently allowed the ASDF to smoothly replace the *Andors* with modern cruiser units.

Constitution refit

Heavy cruiser/cruiser
2272-2337

Completed:	71 total: 8 *Bonhomme Richard* refitted to Phase I (*Enterprise*) 7 *Bonhomme Richard* refitted to Phase II (*Constitution (II)*) 8 *Bonhomme Richard* +4 *Achernar* refitted and 4 built to Phase III (*Endeavor*) 33 built to Phase IV (*Tikopai*) 4 *Bonhomme Richard* +1 *Constitution (II)* refitted and 7 built to Phase V (*Enterprise (II)*)
Length:	304.8 m (Phases I, IV, V) 297.5 m (Phase II) 283.1 m (Phase III)
Beam:	141.7 m (Phases I, IV, V) 140.8 m (Phase II) 126.8 m (Phase III)
Height:	71.3 m (Phases I, IV, V) 71.4 m (Phase II) 73.8 m (Phase III)
Mass:	810,000 tons (Phase I) 802,000 tons (Phase II) 790,000 tons (Phase III, typical) 806,000 tons (Phase IV, typical) 811,500 tons (Phase V)
Cruise speed:	w 7
Max.speed:	w 12.0 (Phases I, IV) w 13.0 (Phase V) w 11.0 (Phases II, III)
Endurance:	5 years
Officers:	62 (Phases, I, IV, V, typical) 58 (Phase II) 46 (Phase III)
Crew:	380 (typical)
Weapons:	12 phaser VII emitters in 6 twin banks, 3 above and 3 below primary hull (Phases I, III, IV, V) 12 phaser VI emitters in 6 twin banks, 3 above and 3 below primary hull (Phase II) 2 phaser VI emitters in single turrets atop secondary hull stern 4 phaser VII emitters in a ventral position (Phases I, V) 2 phaser VI emitters in a ventral position (Phases II, III) 2 phaser VII emitters in a ventral position (Phase IV) 2 medium fwd torpedo tubes w/ 80-120 photorps or probes (Phases I, II, III, IV except NCC-1847, 1710, 1713, V) Same w/ 70 photorps and manual loading system (training duty NCC-1701) 3 medium torpedo tubes (2 fwd, 1 aft) w/ 100 photorps or probes (NCC-1847) 1 medium torpedo tube w/ 50 long range photorps (NCC-1710, 1713)
Shields:	3-layer forcefields (Phases I, III, IV, V) 2-layer forcefields (Phase II) Navigational deflector beam on fwd secondary hull Secondary navigational deflector on fwd primary hull (Phase III) Secondary navigational deflector on ventral primary hull (Phases I, V)
Laboratories:	8 (Phases I, III, most V) 10 (Phase II) 12 (Phase IV) 12 (NCC-1701-A)
Transporters:	4 GP (6-pad), 2 cargo, 4 emergency evacuation (22-pad); Mk IV (Phases I, II, III, IV) All ships of refits I, III and IV brought to Mk V standard after 2282 2 GP (6-pad), 2 cargo, 4 emergency evacuation (22-pad); Mk V (Phase V)
Auxiliaries:	4 medium shuttles, 1 heavy shuttle, 6 work pods (large hangar, Phases I, IV and most V) 2 medium shuttles, 4 work pods (small hangar, Phases II and III and NCC-1710)

Ships of historical interest:

USS Enterprise (NCC-1701), *USS Alliance* (NCC-1849)

SOURCES: D ST:TMP (alternate models: SotSF)
N STVI (SotSF)
(H own, SotSF)

In 2270 the last of the *Constitution* starships pulled in from their exploration missions after three decades of operation. The ships had expanded Federation space threefold, found the limits of near-human worlds and encountered races both humanoid and completely alien. Five ships had been lost, some to ancient war machines, some to natural phenomena or space entities either malevolent or so superior as to be completely indifferent of the fate of mere starships. In addition, six more vessels had been so badly damaged that they required extensive multi-year overhauls. Deep space was a challenge far greater than had been anticipated.

Starfleet was still wary of Klingon aggressions; but after Organia, the Councils of UFP were not. The last dissolutionary stronghold in Altair had rejoined the Federation in 2268, and it was felt that any enemy would now be met by a united front. Indeed, the Federation was now stronger than ever, with the First Federation and Coridan memberships and resources secured.

So the Federation was to expand further, to explore the unknown while guarding the known. This meant that powerful and complex craft with the ability to conduct long, self-sustained and wildly varying missions were favored in Fleet construction plans, while ships optimized for specific single missions received little funding. The technology to construct multi-purpose starships already existed; the resources to build new hulls were hard to come by. Furthermore, the Organian treaty imposed severe limits on Fleet expansion. The obvious solution to both problems was to convert older hulls. After some doubts about the financial soundness of the plan, the *Constitution* class was given a lifetime extension refit along with several weapons and propulsion technology upgrades, beginning with re-fitting the prestigious *USS Enterprise*.

While several extensive upgrades had been made to *Constitutions* during their earlier service, nothing this drastic had been attempted before. In practice, Starfleet intended to turn the almost 30-year-old ships into a larger version of the hypermodern *Belknap* cruisers. The primary hull was both refurbished internally and expanded structurally. Torpedo launch machinery was removed; the phasers, while still of the Type VII standard, were doubled in number, upgraded and rewired to tap directly from the warp core for increased maximum output. To spare the emitters, this peak power throughput normally took the form of half-second pulses instead of the two-second beams that had been standard for the original model. However, the dependence of phasers on the availability of warp power proved a serious operational shortcoming, and Starfleet was soon forced to install a cascade of EPS relays that allowed auxiliary- and battery-powered firings in emergencies.

Several key systems were completely automated, and a new central computer installed. A high degree of automation allowed the operation of skeleton-crewed vessels through a common coded network interface, or alternatively a high level of coordination between fully manned ships. A hull-wide grid for the new shield system was spread over the saucer. Even the overall hull form was altered by addition of a layer of cabins on the circumference, increasing saucer radius by over three meters – a configuration similar to the production-standard *Belknaps*. Finally, an upgraded impulse drive of RSM type was installed. Additional RCS thrusters were mounted on the nacelle aft ends for greater close-in maneuverability. Other thruster groups speckled the primary hull rim and the secondary hull as before.

Other parts of the ship underwent even more extensive modifications. The connecting neck was completely reconfigured using *Belknap* structural elements. A vertical shaft was opened in the secondary hull to house a new type of warp core, the Kiratovani KR13-N, whose two perpendicular containment tubes replaced the earlier General Atomics multilinear configuration. Incidentally, this meant that the bulk of antimatter was now handled inside the ship hull, rather than confined to the nacelle assemblies. Thus the nacelle separation system was replaced by a powered-ejection system for the entire vertical intermix bottle, firing through the bottom of the ship. The top of the bottle connected to the main deuterium tankage within the connecting neck, the bottom to antimatter tankage on Deck 20.

The chord of the dorsal was increased to facilitate new equipment, although not quite to *Belknap* dimensions. At the bottom of the dorsal, twin Skat-Rar Mk 6 torpedo launchers were located side by side, next to the ventral intermix shaft and main deuterium tanks, in another example of 'citadel' thinking that put all the eggs in one maximally protected basket at the very center of the ship. Two docking ports of standard model but without the traditional external cover plates were installed here; five more ports were provided overall, two on the engineering hull and three on the saucer. Torpedo arming/loading machinery was on the deck above. Most of the decks in the dorsal were dedicated to various support functions. Power conduitry ran along the trailing edge, from the EPS converters at the top end of the vertical intermix bottle on Deck 13 aft end all the way to the impulse engine systems on Decks 6 and 7. A Jeffries tube also accompanied these conduits.

The secondary hull was the part of the ship modified the most extensively to house new machinery. It was stripped of external plating and given an increase in size by adding an outer layer of power conduits, gangways, lifeboat berths, RCS clusters, docking ports and shield machinery. Along with the removal of laboratories and crew facilities, this freed space for the shaft of the new vertical antimatter tube as well as for a somewhat enlarged cargo bay for consumables, equipment or miscellaneous freight. Shuttle hangar space was retained but modified to serve a wider variety of craft, by adding two large rectangular elevators forward of the landing area, in place of cargo preprocessing facilities. These replaced the former turntable-elevator, which did retain its turntable role. The central turboshaft serving the hangar bay was removed to provide full-width access between the landing area and the elevators; also removed was the partitioning between the cargo preprocessing bay and the main hold, leaving gaping holes sealed only by flimsy rolling doors (or, when these were open, by containment fields).

Two phaser VIs provided firecover for the aft portion of the ship, filling a dangerous proximity gap in phaser coverage. The amidships phaser array and tractor beam emitter at the bottom of the secondary hull were retained in the refit, although the equipment itself was upgraded – the phasers to the VII standard with four emitters, the tractor beam to steerable-emitter configuration.

The most noticeable external change was the installation of triangular supporting pylons for the new and still somewhat experimental LN-64 series nacelles for the FWG-1 linear warp coils. These pylons could withstand triple the stresses of sublight accelerations compared to the earlier rectangular ones. Technical specifications for the new engines were basically identical with the *Belknap* ones, yet differing field configurations meant that significant simulation time was needed to clear the engines for the full flight regime of the *Constitutions*.

The *Enterprise* was launched prematurely in response to the V'Ger crisis, in September 2272. Following the spectacular success of the mission, seven other *Constitutions* – mainly venerable high-fatigue ships – were upgraded to this standard between 2273 and 2279. No new keels were laid, however. The old naval superstition against assigning new names to old ships was ignored for once:

the unlucky *USS Exeter*, towed in from Omega IV and dormant ever since, was renamed *USS Indomitable* to scare away ghosts from the past.

Phase I: USS Enterprise *in 2273. Note new standard paint scheme of flat white with black weapon port frames and yellow RCS assemblies. Also note how neither the docking ports nor the shield grid are covered with thermocoat any longer, saving several tons in total mass. The aesthetics of the 2240s, based on the tradition of hull armor and gunports even with both concepts long obsolete, were finally giving way to a new functionality that had an aesthetic appeal of its own.*

Long before its completion, the extensive refit proved even more expensive than feared. To keep the costs manageable, Starfleet ended up running two slightly differing refit programs of narrower scope parallel with the main effort. The first included the installation of somewhat lower-performance series LN-60 warp and Namada NK impulse engines and the KR12-N reactor system, plus the selection of a simpler torpedo system, lower-performance phasers and fewer docking ports. Upgrades to the sensor cluster and bridge structures on the saucer were not performed in this refit. The original shuttlebay configuration with heavy physical partitionings was also retained, resulting in simplicity and structural reliability but also in slightly decreased shuttle maintenance capacity in comparison with the more extensive refit. Thus, only two utility shuttles and two work pods were normally carried. Cargo holds were in turn more spacious, due to a differently positioned vertical intermix shaft that allowed for three full rows of container pockets in the forward bulkhead as well.

Seven ships were refitted to this standard, including the original *USS Constitution*. They were pressed to survey and support duty under cruiser instead of heavy cruiser designation; due to their almost frigatelike weaponry, they seldom operated independently in defense missions. This refit was left somewhat incomplete since, even discounting *USS Essex* which was retained for training use with a minimal deflector upgrade, and the survivors of the *Victory* batch that had been taken away from Operations Command to somewhat ambiguous ‘detached duty’, there still were eight rather worn-out but quite operational *Constitutions* remaining in the *Bonhomme Richard* configuration. In addition, the buyback program of exported *Achernars* had left Starfleet with a moderate number of these low-standard vessels, which were deemed to be in even greater need of an upgrade than the remaining *Bonhomme Richards*.

Starfleet did not feel it needed any more support cruisers. The ships should be brought to a standard enabling independent defense missions, preferably one that would have commonalities with the rest of the cruiser fleet but without the exorbitant costs associated with those designs. Two alternatives existed for achieving this cost-saving commonality: either mix and match the best components of either group into a roughly homogeneous whole, or create a completely new refit standard for both the *Bonhomme Richards* and the *Achernars*. The third option, of converting the ships into refit I units, was immediately abandoned as economically unviable.

Phase II: USS Constitution *gets a new lease of life. By this time, dockyard crews were quite familiar with the major task of removing entire nacelle assemblies and replacing them with modern units. As many as three ships could theoretically be processed in a year in a single drydock, although in practice each ship was given at least ten months of dockyard time. The type II refit proved so advantageous economically that costs per ship were lower than even in the* Larson *destroyer refit program.*

Seven of the ships standing in line for the refit had standard *Bonhomme Richard* hulls, while *USS Atlirith* had required a massive patch-together effort after the damage received during the Babel conference of 2267 and sported several highly nonstandard components. Four full-fledged buyback *Achernars* (NCCs 1734, 1736, 1738 and 1740 – still carrying the names of their former operators: *Isshasshte*, *Ortisei*, *Harolna* and *Hemalat*) were also earmarked for urgent upgrading. Internally, there were large differences even within the groups, since not all of the ships had undergone the same number of minor equipment upgrades. After a lengthy cost analysis, it was found that all the ships could be given commonalized duotronics of Fasfax III series, bringing them to the standard of the refit II ships and giving commonality with the modern frigate and destroyer arsenal. Phasers would be upgraded as far as funds allowed, while torpedo and impulse systems would be refurbished yet not altered. However, the greatest shortcoming was in the field of warp propulsion; neither PB-32 nor PB-47 would suffice as a common standard, but no funds existed for a full installation of LN-60 engines and their complex internal power systems.

The unique and still somewhat half-completed *USS Atlirith* was a natural choice for a technology guinea pig. Drydocked in 2270 already, the ship was now subjected to a refit that would mate special self-contained LN-52 warp engines with the existing power grid and add a full complement of Type VII main phasers, ventral Type VI phasers and a defense-optimized computer system. The LN-52 was based on the premise of warp plasma generation inside the nacelle assembly, and thus promised an effortless refit requiring no major reworking of internal structures.

The LN-52 had first been tested aboard the scoutship *Monoceros* (NCC-601). The linear engine was mounted dorsally, and initially supplemented the ventral PB-31. By 2270, the ventral nacelle could be discarded, and the LN-52 proved its mettle in a series of demanding test sprints and cruises. Yet Starfleet gave priority to fielding the engine aboard *Keppler* class tugships, to compensate for disappointments in the LN-23 program and shortages in Fleet tug availability. Application of the drive system to heavy cruisers had to wait until 2273, but did significantly improve the performance of the *Atlirith* and her sisters-to-be over the PB-47 specs. The main shortcoming now was that heavy internal reinforcing was needed on all the vessels to accommodate the propulsion units – and practically each vessel needed tailored support struts to compensate for different hull arrangements and stages of fatigue.

In the end, costs of the *Atlirith* refit were still significantly lower than for the full refit I, while combat prowess was now almost on level with that refit standard. The seven remaining *Bonhomme Richard* vessels were refitted similarly by 2274, beginning with the low-fatigue *USS Endeavor*. Due to a combination of minor equipment differences, budgetary reshuffling and a clandestine military intervention mission that took the Andorian Eagle off the dockyards before official commissioning, the refit batch was ultimately named after the *Endeavor* instead. Other naming confusion involved NCC-

1728-31, whose commissioned 'veteran' names were quickly painted over and replaced by more generic ones after the ships' involvement in another secretive operation. The four buyback *Achernars* were refitted, but four new keels were also built out of existing components to this standard when it was realized that, perhaps counterintuitively, this approach made more economical use of the remaining LN-52 nacelle pairs than further refitting of *Achernars*. Significant sums had been spent in any case, and the refit III was considered a disappointment despite the satisfactory technical performance. LN-52 production was quietly discontinued.

Phase III: The Endeavor *subclass cruiser* USS Endeavor*, accompanied by two Starfleet-operated* Achernars*, in action in the final days of the Xindi incursion of 2272. Pictures of the conflict are difficult to come by; this is a 2D reprint of a private holoshot taken by a gunner's mate aboard the heavy frigate* Resurgent*.*

In the mid-2270s, funding no longer presented a problem for cruiser acquisition programs. Instead of pressing on with the original refit program, or with the lower-cost alternatives, Starfleet made a conscious decision to use the funds to field a large number of technically slightly inferior but completely modern newbuild cruisers. The mandate had existed since the earliest days of the *Constitution* project, with a range of registries kept reserved for this exploratory force from the 2240s on. No design had been attached to the mandate during the three decades of waiting, however, as the project had been too far beyond Starfleet's financial means to reach even a speculative engineering stage. This was for the better, as the designers now could go shopping off the shelf labeled '*Constitution* upgrade' for completely satisfactory cruiser components. These included the high performance engines but not the modernized primary sensors, featured a different bridge design more resembling the original form, and introduced two extra saucer docking ports, plus a small secondary shuttlebay on the saucer aft of the bridge. An impressive 33 newbuild ships were finally completed to form the exploration strongback of Starfleet, and performed independent surveys in extreme deep space with only slightly lower efficiency than the five highly complex flagships of the modernized *Constitution* fleet. The major investment in this subclass gave Starfleet significant survey capacity until the end of the century, a fact widely utilized by the militant factions of Starfleet and UFP leadership in defending the later large-scale military building programs. While still sometimes considered a 'refit', the program owed much of its success to the fact that it avoided the compromises imposed by a true refitting process.

Phase IV: Thanks to the availability of funding, it was possible to witness events like this in the late 2270s: no fewer than four Tikopai *subclass cruisers docked at Spacedock Earth, ready to embark on exploratory cruises towards the galactic rim. One might see a steady succession in complexity from the austere standard II to the slightly more capable defensive standard III to this explorer standard IV, with the beginning point in the original* Constitutions *and the endpoint in the highly advanced standard I and V vessels.*

All these classes were collectively called the *Constitution* class, but sometimes referred to as Refit Phases I-IV, or unofficially as *Enterprise*, *Constitution (II)*, *Endeavor* and *Tikopai* subclasses.

In 2284, at the height of defense spending, a new upgrade standard was introduced for *USS Yorktown*, which already represented Phase II but now received most of the features of the extensive refit I, plus some new improvements. Notable differences from refit I included new flat-panel computer interfaces for an upgraded M-9C1 -compatible computer core, omission of half the cargo area in favor of laboratory space, and installation of handling equipment for more powerful photon torpedoes. Also, the *Yorktown* still sported the original *Constitution* shuttlebay which had been retained in refit II, giving her the benefit of additional space for shuttle workshops, and for miscellany like new and improved brig systems.

The main goal of the upgrade was to effect a significant efficiency increase in both impulse and warp drives. A new, bypass-cooled GA-2300 warp core fit nicely in place of the original through-flow system, requiring only minimal changes in ship structures and allowing for easier access to the dilithium chamber without need for teleoperated machinery. Increased safety and damage resistance were widely hailed, and the ships thus converted did indeed have exceptional engine safety records. Many later classes have adopted this system as well, although through-flow intermix bottle reactors still persist, especially on smaller ships like scouts and corvettes. Type LN-64B nacelles were installed to give a maximum speed of warp 13, the highest for cruisers at that point.

The upgrade was unofficially called the *Enterprise (II)* class, officially being *Constitution* Refit Phase V. Most refit Is were upgraded to this standard, and seven new keels were also laid. The standard was internally more diverse than the others, upgrade III excepted: *USS Yorktown* was the only one to feature the older shuttlebay, and *USS America* had an aft-facing torpedo tube in addition to the twin forward launchers. The *America* also introduced a new impulse deck that was planned for use in a wide variety of new military ship types, most of which failed to materialize.

Phase V: USS America *fires an aft torpedo in the 2295 wargames near Procyon – the first such games to include a delegation of Klingon observers, at least in an authorized capacity. The* America *was the only vessel of this refit standard to noticeably differ from the Phase I refits in exterior view. The engine and computer upgrades resulted in significantly altered interiors, though.*

This proved to be the final incarnation of the venerable cruiser design*. *USS Yorktown* had been incapacitated by the Probe in 2286, and left the dockyards as (a near-perfect replica of) the *Enterprise*, a tribute to captain James Kirk for his historic rescue mission during the Probe crisis. *USS El Dorado*

and *USS Krieger* of refit I standard were ultimately retired in that condition to fleet surplus depots, although refit V had been planned for these ships as well.

Nine of the 13 *Achernar* subclass cruisers in Starfleet use never received linear-coil warp engines. They continued to serve in their original configuration, save for a minor navigational deflector upgrade also effected on the reactivated *USS Republic* (NCC-1371) that took over cadet training from the destroyed older *Enterprise* (NCC-1701). The *Achernars* were used mainly for defensive duties and played a major role in the Xindi conflict of the 2270s, but the final ships of this class were retired with Khitomer cutbacks. Still, for most of the 2280s, Starfleet concurrently operated no less than six highly successful major heavy cruiser subclasses based on the *Constitution* design.

In 2293, *USS Alliance* inherited Federation Flagship status from *USS Enterprise*, and became the last in the long line of *Constitution* class ships to hold that title; the ceremonial mission thereafter went to various *Excelsior*, *Ambassador* and later *Galaxy* class ships.

Sailing into sunset, the former Federation Flagship USS Alliance *ends her career in 2337. One of the last* Constitutions *to be commissioned, the ship was built to* Constitution *Phase V standard after a* USS Enterprise *had once again spearheaded the upgrade, and inherited flagship status from that same vessel after her decommissioning in 2293. The* Alliance *was retired after 50 years of demanding service, including a long diplomatic cruise across the whole Federation. Only the original-batch* USS Hood *ended up having a longer service life - the ship was destroyed in a test of deflector-based weaponry in the Arcturus firing range in 2308.*

*Not counting a number of engineering testbeds created out of spare components, among the more famous the long-serving *SS Heinemann* (NAR-30229) that came to mount no fewer than eleven different and oddly positioned pairs of engines. The expansive *Constitution* refitting and construction program resulted in relatively more "spares" than any previous starship program.

Cygnus / Cochise / Amerind

Diplomatic courier/destroyer/scout
2272-2299 (*Cygnus*)
2283-2318 (*Cochise*)
2288-2330 (*Amerind*)

Completed:	45 total: 6 *Cygnus* diplomatic couriers 26 *Cochise* destroyers 13 *Amerind* scouts
Length:	291.7 m (*Cygnus*) 278.4 m (*Cochise*) 273.4 m (*Amerind*)
Beam:	141.7 m
Height:	53.3 m (*Cygnus*, *Amerind*)

	60.0 m (*Cochise*)
Mass:	389,000 tons (*Cygnus*) 324,500 tons (*Cochise*) 322,100 tons (*Amerind*)
Cruise speed:	w 6 (*Cygnus*, *Cochise*, *Amerind*) W 5 (adopted by *Amerind* after 2316)
Max.speed:	w 10.0 (*Cygnus*) w 11.0 (*Cochise*, *Amerind*) W 8.9 (adopted by *Amerind* after 2316)
Endurance:	4 years
Officers:	52 (*Cygnus*) 50 (*Cochise*) 59 (*Amerind*)
Crew:	208 (*Cygnus*) 199 (*Cochise*) 99 (*Amerind*)
Weapons:	*Cygnus*: 12 phaser VI emitters on 6 twin banks on primary hull *Cochise*: 12 phaser VII emitters on 6 twin banks on primary hull 2 medium torpedo tubes w/ 40 photorps under primary hull *Amerind*: 12 phaser VII emitters on 6 twin banks on primary hull
Shields:	1-layer conformal forcefield Navigational deflector on nacelle fwd end Secondary navigational deflector on ventral primary hull (*Cygnus*, *Amerind*)
Laboratories:	2 linguistics/communications (*Cygnus*) None (*Cochise*) 1 GP, 1 planetary sciences (*Amerind* batch 1) 1 GP, 2 planetary sciences, 1 astrophysics, 1 cartography (*Amerind* batch 2)
Transporters:	4 GP (6-pad), 2 emergency evacuation (22-pad); Mk IV (*Cygnus*) 4 GP (6-pad), 2 emergency evacuation (22-pad), 1 cargo; Mk V (*Cygnus* after 2282) 2 GP (6-pad), 1 cargo, 2 emergency evacuation (22-pad); Mk V (*Cochise*, *Amerind*)
Auxiliaries:	Two work pods

Ships of historical interest:

USS Ahwahnee (NCC-2048), *USS Amerind* (NCC-626)

SOURCES:	(D SotSF/aridas sofia) (N SotSF/aridas sofia) (H own, SotSF)

The temporary peace between Klingons and the UFP, imposed by the Organian noncorporeal entities, made a thorough mess of the strategic procurement plans of Starfleet. The latest post-Axanar plans had called for more mobility, an emphasis on border patrol and escort missions, and diminishing interest in attacking large enemy formations and capital ships. This meant the deployment of huge numbers of frigates and cruisers and the gradual downscaling of destroyer procurement, as well as introduction of a small number of dreadnoughts for best possible concentration of reserve firepower. Now the peace (or truce, as Starfleet would have liked to call it) meant that the frigate programs were becoming just as overbloated as the destroyer programs had been.

But despite their significant powers, the Organians were certainly neither omnipotent nor omniscient – and quite possibly not all that interested in protecting the Federation hides after all. Sooner or later, the Federation would have to take responsibility for defending itself again, and once more it wanted to do so from qualitative high ground. Its aging destroyers, many dating from before

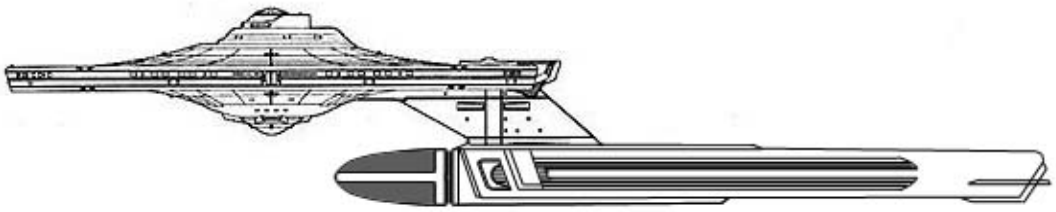
the Great Awakening, would be spending their last useful years in physical inactivity or bureaucratic limbo. Their replacements ought to represent the latest in technology and tactical thinking as well as in reliability and economy of operations, so that the transition from the old to the new would be a smooth one, giving the Klingons no opening for crying foul. After all, even if the Organian treaty were an empty letter, it was still a markedly useful one in obscuring qualitative changes behind a façade of unwavering quantity.

Thanks to the Organian Peace Treaty, bringing the destroyer fleet to the linear excitation era should have been an undertaking with every chance of controlled and scheduled success. Yet the inaugural *Baker* class was too carefully controlled, too meticulously scheduled as the optimal response to the inevitable return of the Klingon menace, to be able to adjust to changing circumstances. And change remained a constant in the 2270s, as severe animosities developed between the Federation and some of its lesser neighbors. The feline Xindi made their existence known once again in the early 2270s and led a suicidal attack against Federation core worlds. Starfleet fielded its modern strike cruisers and heavy cruisers in anger for the first time; the resulting bloodbath is one of the most shameful stains in the history of the Fleet, but poorly known among the public since the Xindi were essentially obliterated and unable to press their case afterwards. The disclosure of the 2273 Cammell IV investigation was to a select audience only. Only the 2317 publishing of "For the Living", by Caitian poet D'irraj, introduced to the average Federation citizen the true horrors of this actively forgotten war.

The heightening tensions prompted the Council to agree to the production of a greater number of modern fast destroyers than originally projected. A response ahead of schedule necessitated an affordable design, in practice a single-engined vessel. After discouraging initial results from the refit of *USS Jenghiz*, the *Saladins* were deemed second-rate vessels, good only for a limited set of attrition operations. The newer and heavier *Larsons* promised more potential for a refit, but were not considered noticeably cheaper than the development of a wholly new destroyer class.

Thus, in 2274, after considerable discussion and disagreement, the Council gave a go-ahead for the construction of 26 ships of such a class, under the long-delayed *Cochise* subclass mandate. A condition was placed on the acquisition: the remaining unmodified *Saladin* derivatives would be retired as the new class entered service, and the *Federation (II)* upgrade program cut from the modernization of all 12 vessels to that of just nine units, including the already completed *Alliance*. Starfleet complied with this, and initiated development.

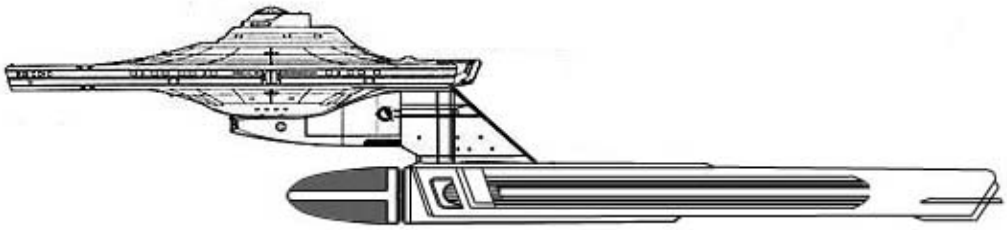
An advanced single-nacelle engine design had already been developed by Shuvinaaljis. Dubbed ACE, for Advanced Circumferential Engine, the system actually featured coils similar to those of the LN-64 series, but energized with circumferential plasma feed, and laid out in a very wide arrangement that produced an easily controllable field. A navigational deflector was integrated to the nacelle, sharing a protective hood with the Bussard collectors. Beginning in 2272, the system was installed on a series of six ships with standard *Constitution*-refit primary hulls. These ships were procured in place of the long-delayed third batch of *Hermes* scouts, under the subclass name *Cygnus* – despite the fact that *USS Cygnus* herself was one of the three units later cancelled from the proposed batch of nine.



The *Cygnuses* were intended as diplomatic couriers and mobile embassies, ferrying ambassadorial teams to locations where first contact was made, or was about to be made; thus, the scouts or cruisers that had located the potential new UFP member would not have to get tied down with lengthy negotiations. In the background lurked Starfleet's concerns over the breadth of authority given to starship captains in the field of diplomacy. Perhaps some of that risky independence could now be revoked to stabilize political conditions?

The ships carried 12 phaser VI emitters for self-defense and featured VIP accommodation, negotiation rooms, advanced communications gear and an extensive information gathering and linguistics analysis suite. Their high maximum speed of warp 10, combined with their capacious yet low-cost spaceframe, made them extremely useful in large-scale or high-priority courier operations. Construction was relatively simple, and *USS Tucana*, *USS Corvus* and *USS Columbia* were all completed by 2272, *USS Pavo*, *USS Grus* and *USS Phoenix* following by 2273. It was soon found that these stellar birds were somewhat overweight to be used as the basis for a destroyer design, however, and the plans for the *Cochise* class were altered (and delayed) accordingly.

In 2283, the design was deemed sufficiently mature and the political climate tense enough for destroyer procurement. The *Cochises* were equipped with lighter versions of the *Constitution* saucer: a sector of the aft quarter was cut so that the Avidyne 4088 impulse deck was directly behind the bridge module. This also provided excellent possibilities for exhaust vectoring and violent sublight maneuvering. The connecting neck attached to the saucer closer to the bow as well, and the ACE nacelle was thus better placed for optimal warp field generation. The KR13-L reactor, favored since the earliest *Jenghiz* experiments, was still used as the main powerplant; it was poor field geometry rather than lack of raw power that had made the earlier vessels such miserable underperformers.



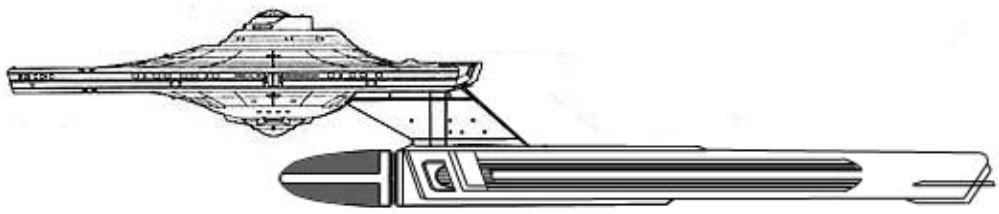
Offensive firepower consisted of a powerful Mk 7 twin medium torpedo launcher, mounted flush to the saucer underside. The assembly took the place of the sensor cluster familiar from the diplomatic ships and many other designs utilizing the standard saucer hull, leaving the destroyers ill equipped for exploration and mapping. But such duties had never really been part of the destroyer mission profile anyway. The heavy defensive armament of 12 phaser VII emitters was controlled by the highly effective '*Eyas*' targeting system, this in turn run by an Etrista main computer that was completely dedicated to the offensive/defensive mission. The advanced computing suite put the *Cochises* well apart from the earlier destroyer conversions, even if long range sensing capability still was severely lacking in accordance with the destroyer tradition. As before, the ships were intended to be operated in conjunction with cruisers or other picket ships that would take care of long range warning and

prediction as well as fleet coordination; that the newest generation of such vessels was suffering from many delays and shortcomings was not considered a major problem yet.

Two docking ports were featured on the sides of the torpedo deck, and two on the saucer; in addition, the bridge assembly held one port. No shuttles were carried, although shuttlepods could be berthed inside the two saucer docking bays, and work pod interfaces were inset into the saucer cutout surfaces. Two six-pad transporters and one cargo platform were considered quite sufficient for landing and boarding party as well as replenishment purposes.

The type remained in service until the late 2310s, although eight of the vessels were retired in the 2290s because of Khitomer Accords arms limitations. The *Cochises* were well liked among destroyer crews, and performed admirably for single-engine ships. Still, no attempt was made in the 2300s to develop a follow-on design, and the medium destroyer fleet shrank to almost zero for the following decades of peace. Holding the line were two-nacelled *Polaris* units, ships of far greater versatility, survivability, mass and cost.

In 2288, the highly efficient *Cochise* configuration was adapted for scoutship use. Starfleet had learned its lessons from the *Hermes* variants; the new *Amerind* class ships made no attempt to conform to survey duty, which was better handled by the likes of *Oberth* class. Instead, they had plenty of everything the *Oberths* lacked: an exceptionally powerful, frigatelike defensive armament of 12 phaser VIIs for deep penetration of enemy space, excellent impulse maneuverability, high maximum warp speed, low emission profile, and a long-reaching sensor suite that took the place of the *Cochise* torpedo deck. Thus, the ships were superbly suited for military scouting duty. Sensory support and control of destroyer formations was still on the formal agenda as well, but in practice the retiring *Wilkerson* class passed the destroyer leader baton to the similarly twin-engined and more lavishly equipped *Ticonderoga* class in the late 2280s.



With the flotilla leader role gone, attempts were made to increase the scientific capabilities of the *Amerinds*. Four ships (NCC-626-629) had been completed by 2291; the remaining nine (NCC-2046-2054) received upgrades to their sensors, mission computers and laboratories, and adopted a survey and charting role that changed from a thin smokescreen to a principal mode of employment with the Khitomer peace. Many argued that the major strengths of the design were being wasted in this role, but aggressive gathering of military intelligence was out of the question in the political climate of the late 2290s and early 2300s. Some sources do suggest that such operations were continued under cloak at least until 2299 against both Klingon and Romulan targets. These sources have later been largely discredited, however.

In theory, a slight drop in scouting capacity resulted after the retiring of the late *Hermes* models and associated designs – the thirteen *Amerinds* alone were not sufficient for covering the expanding exploration zones, and the first batch of eighteen ships of the *Constant* class did not see active service until just before the turn of the century. Yet decreasing offensive and defensive commitments resulted in the use of other starship types for scouting and exploration. Starfleet did not seriously consider the potentially costly conversion of *Cochises* into further scouts, preferring to maintain at least some sort

of a destroyer reserve. Instead, a second *Constant* batch of twenty was augmented by the acquisition of numerous *Surak* units from Vulcan, and by the 2320s, the introduction of the balanced and successful *Scylla* class marked return to business as usual. All of the *Amerinds* had by then been driven well past their structural lives; none were saved from swift scrapping.

Northampton

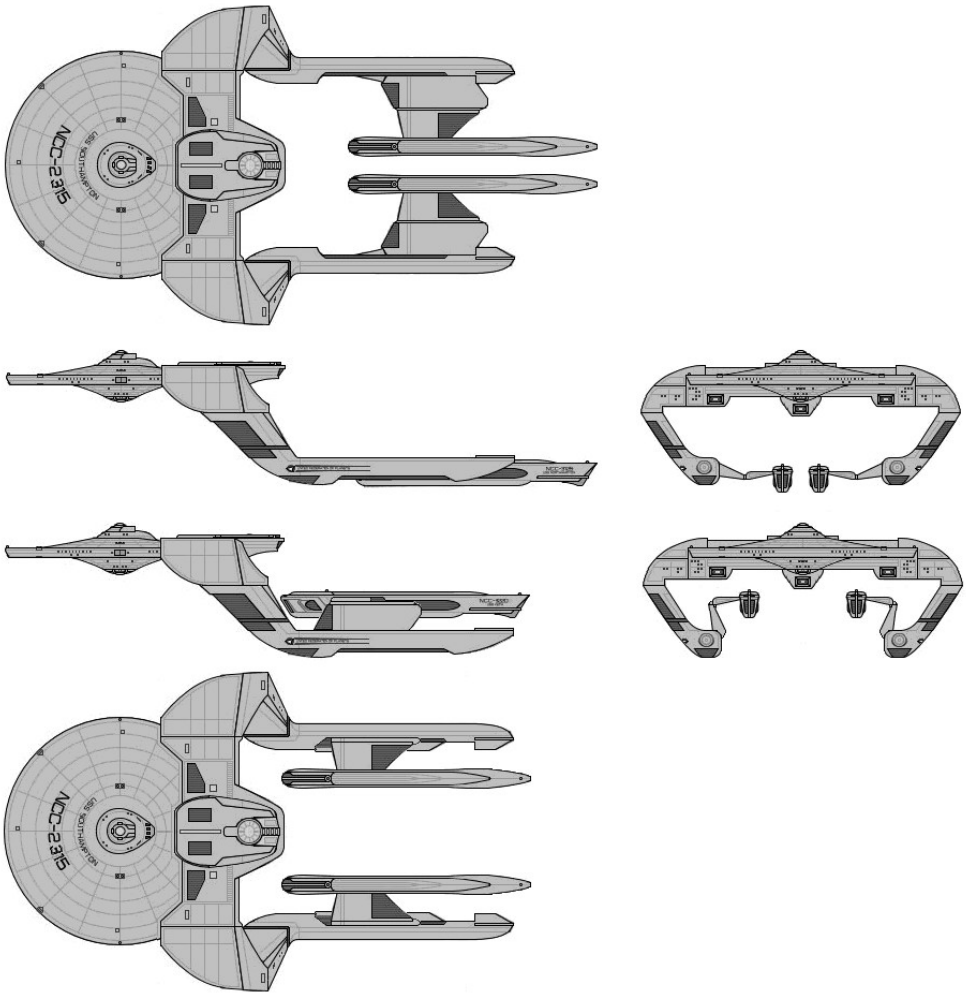
Strike frigate
2272-2321

Completed:	7 total: 3 strike frigates Mk I 1 special operations frigate Mk II 3 strike frigates Mk III
Length:	300.2 m (nacelles lowered for transport) 267.2 m (nacelles raised)
Beam:	150.2 m
Height:	75.0 m (nacelles lowered for transport) 73.8 m (nacelles raised)
Mass:	754,600 tons (Mk I, III; Mk II, estimated)
Cruise speed:	w 6 (nacelles lowered for transport) w 8 (nacelles raised)
Max.speed:	w 8.0 (nacelles lowered for transport) w 10.0 (nacelles raised)
Endurance:	5 years
Officers:	30 (Mk I, III) Unknown (Mk II)
Crew:	295 (Mk I) Unknown (Mk II) 298 (Mk III)
Troops:	220 (Mk I, III) Unknown (Mk II)
Weapons:	4 phaser VII emitters in 2 twin banks on dorsal primary hull 2 phaser VII emitters in twin bank on ventral primary hull 3 fwd medium torpedo tubes w/ 40 photorps in aft ventral primary hull extensions (Mk I) 3 fwd medium torpedo tubes w/ 60 photorps in aft ventral primary hull extensions (Mk II, III)
Shields:	3-layer forcefields Navigational deflectors on engine booms Secondary navigational deflector on ventral primary hull
Laboratories:	None
Transporters:	6 GP (6-pad), 4 assault / emergency evacuation (20-pad), 2 cargo; Mk IV All ships brought to Mk V standard in 2284-86
Auxiliaries:	6 assault shuttles, 4 work pods (Mk I, III) Unknown (Mk II)

Ships of historical interest:

USS Bremerton (NCC-2316)

SOURCES: (D FASA)
(N FASA)
(H FASA)



Not quite every program promoted after the Organian rearranging of the strategic situation was an actual attempt at coping with said change. Procurement inertia accounted for several starship classes emerging at the turn of the fateful decade; the truce with the Klingon Empire merely made it possible to divert unexpected resources into projects that otherwise would have gone forward with significantly less capable or at least less ambitious engineering solutions. A good example of this is the *Northampton* class of strike frigates, a faster and nimbler companion to the recent *Chandley* class. If not for the sudden truce, this special purpose vessel would have received PB-47 warp engines and settled for warp 6/9 performance in delivering troops to tactical hot spots. The combination of a slight delay and a sudden influx of funds and technologies instead turned the *Northampton* into a cutting edge space combatant that could respond to distant emergencies at the unprecedented cruising speed of warp eight.

Originally little different from a *Chandley*, the *Northampton* (NCC-2314) featured the same FH-11 phasers and Type O shields, and accommodated 220 Marines in the extended primary hull alongside the 325 operating crew. For delivery of the troops, only half the *Chandley* number of assault shuttles was provided, and transporters were pared down to four assault units as well. Cargo capacity was maintained at some 25,000 tons, and modern amenities increased troop endurance on long missions. Yet tedious deployment runs were less of an issue than with the *Chandley* class. A key difference lay in warp engine arrangement: to provide the necessary clearance for uninterrupted transporter operations, the warp coils were again placed at the ends of very long pylons, but this

time the rigging was given variable geometry so that warp performance could be restored closer to optimal during transit. Horizontal booms extended aft from the lower ends of the pylons, and the warp nacelles were on two-piece hinged struts that would lift them from the level of the booms to a position more typical of the rest of the heavy frigate family.

As Organian negotiations gave all strike starship development a short but mandatory breather, engine technology caught up: when work on the *Northampton* resumed, it did so with LN-64 replacing PB-47 at the ends of the booms. The exotic engine arrangement actually simplified the modifications needed for introducing linear excitation warp propulsion, and the class ship was launched for trials in mid-2272 already. These proved quite successful, and the ship was cleared for two warp flight regimes by August. Nacelles down gave warp 6 cruising and warp 8 dash speed, but nacelles up allowed "full throttle", which would kick dash speed to warp ten and maintain the ship at warp eight for just as long as a *Decatur*/*Belknap* strike cruiser could hold the speed. Warp transporting was still possible at this mode, but with various limitations on transporting arcs, signal strength, range and speed.

The concept of using transporter strike frigates in ship-to-ship combat had not yet evolved, however. Little need was seen for warp transporting of troops; instead, enemy spacecraft would be kept at bay with three Mk 7 forward torpedo launchers, the aft ones being omitted because speed was considered the ultimate protection in chase battles. Fire control was still given the same advanced resources as with Mk III *Chandleys*, and the range of sensors was even more extensive. Shuttlecraft stowage was streamlined with the use of a single aft centerline bay adjacent to the centermost torpedo launcher, and full precision tractor beam systems were installed.

Three of the advanced and expensive vessels were finished as planned, and three more added when a choice had been made on how to reduce the costs – chiefly, the torpedo systems were downgraded to the slightly more affordable and reliable Mk 6, but with an increase in the number of shots provided. This yielded rather minimal savings, and the Council wasn't happy about continuing the procurement of ships of this type. However, the second batch of three got support from on high: known as the Mk III, it was essentially the militarized version of a single Mk II vessel built in semi-secrecy for the special needs of Starfleet Intelligence. In a crisis, all four would be engaging in what *USS Augusta* presumably had been doing since her 2274 launch: delivering and extracting special operations teams on a wide range of targets, the nature of which was debated without much in the way of available facts.

Overt or covert, the Chandley dockyards at Mars were satisfied with the publicity on such a splendid flagship type. While no further orders were forthcoming, work on the *Northamptons* had established the expertise of the yards on this unique field of starship engineering, and secured the *Chandley* class refit orders for the yards. None of these older vessels could be brought to the high propulsive standards of the *Northamptons*; nevertheless, a combined fleet strength of more than fifteen modern strike frigates could be maintained for the two decades of heightened antagonism with the Klingon Empire.

The ship-to-ship combat prowess of the Mk III *Northamptons* was rarely put to test. Even fewer and farther in between were the opportunities of the Mk I units to lay bombardment with their high yield torpedo systems. Yet the ships saw constant action, their deterrence value lying not in firepower being held in reserve, but in their ability to stamp out local crises on short notice. *USS Bremerton* gained interstellar attention with her exploits in the Triangle between the three local star empires, establishing beyond doubt UFP and Starfleet influence in the region. Other strike frigates tended to remain anonymous delivery platforms for the high profile peacekeeping troops that seemingly were

everywhere at once. Much of the unity of the Federation front in the Klingon crisis must be attributed to Starfleet's newfound ability to quell local unrest without needing to resort to the formidable but sometimes excessive blackmailing power of an orbiting starship.

Kolm-An

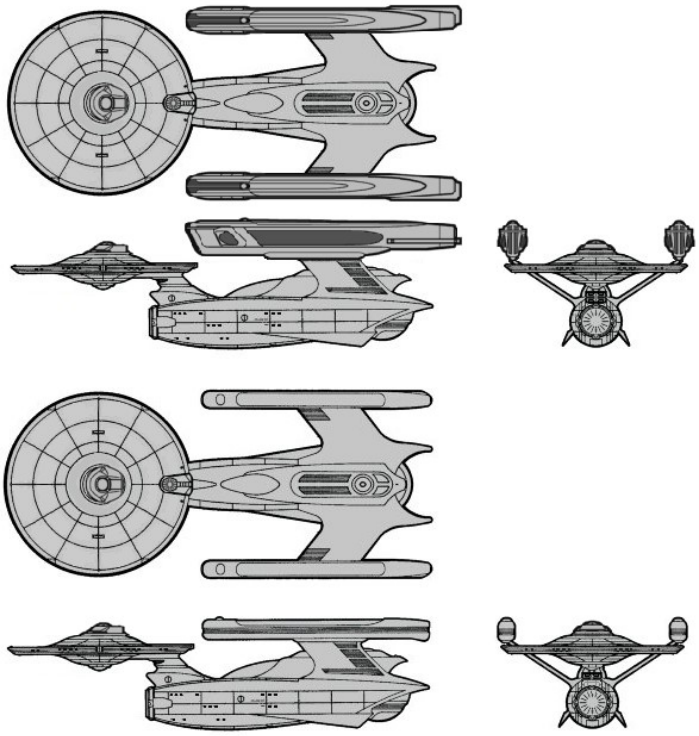
Interdiction ship
2272-2323

Completed:	39
Length:	212.4 m (LN-40A) 211.8 m (WF-12)
Beam:	92.7 m (LN-40A) 93.2 m (WF-12)
Height:	62.1 m (LN-40A) 54.0 m (WF-12)
Mass:	617,800 tons (LN-40A) 597,800 tons (WF-12)
Cruise speed:	w 6 (LN-40A) w 7 (WF-12)
Max.speed:	w 9.0
Endurance:	2 years
Officers:	7
Crew:	23
Troops:	350
Cargo:	17,500 tons
Weapons:	4 phaser VI emitters in 2 twin banks on dorsal primary hull 2 phaser VI emitters in twin bank on ventral primary hull 4 fwd light torpedo tubes w/ 80 photorps on connecting neck (original) 2 fwd medium torpedo tubes w/80 photorps on connecting neck (refit 2311-13)
Shields:	2-layer forcefields Navigational deflector on secondary hull bow Secondary navigational deflector on ventral primary hull
Laboratories:	None
Transporters:	4 GP (6-pad), 4 assault / emergency evacuation (20-pad), 6 cargo; Mk IV All ships brought to Mk V standard in 2284-86
Auxiliaries:	3 assault shuttles, 1 assault barge, 4 work pods

Ships of historical interest:

USS Kolm-An (NCC-6040)

SOURCES: (D FASA)
(N FASA)
(H FASA)



After committing to the LN-40A engine for the *Makin* class assault ship, Starfleet had to contend with the system's shortcomings. A top speed of warp nine imposed obvious tactical limitations, but did not unduly hamper assault ship operations. The more important issue was cruise performance, which for a vessel of *Makin*-like bulk was limited to warp five. On a *Baker* destroyer, more compact dimensions and tighter field geometry allowed for warp six or seven, though. This lent support to the concept of a small assault ship, one delivering just a company of troops – but with all its necessary equipment, significant orbital fire support, and decisive reaction time.

The idea had been debated for some time already, and had met with opposition from two directions. Marines themselves stayed neutral on the issue, but some Defense Command experts believed that any surface force below battalion size would be at undue risk unless operating covertly, quickly, and without the logistical encumberance of "staying power" supplies, ordnance and vehicles. Others believed in company-strength raiding and counter-raiding, but felt that it was best performed by pairs or trios of strike frigates, mirroring the Klingon operating practices.

The obvious argument against both ends and for the middle was economical: a single starship stripped of space combat extravaganza would be more affordable than a formation of large fighting vessels – and a company could be deployed at lower cost than a battalion. Yet decisive in the end was the concern about deployment time: on one hand, summoning three ships would take more time than sending one, and on the other, keeping a company in at least some modicum of shipboard readiness was practicable whereas keeping a battalion on standby for the next scramble was not. In early 2271, Council permission was given for the purchase of forty rapid reaction assault ships, or interdiction ships, to be constructed in full synergy with the *Makin* engine procurement program yet outside the dockyards required for assembling those larger assault starships.

Affordability dictated a featherweight primary hull, of escort saucer dimensions but with an enlarged dorsal superstructure topped with a full Class One bridge module. This substantial

structure would accommodate both ship and assault command functions; no separate combat information center was included for the latter, although Marine officer accommodations provided in the saucer would in practice double as planning rooms. Most of the fighting force was in turn bunked in the slim five-deck spindle of the secondary hull. A large hangar at the dorsal stern housed three heavy attack shuttles, while another bay beneath had slightly smaller clamshell doors for letting through a single assault barge for carrying vehicles and supplies. The hold just ahead of the lower bay provided for a dozen combat vehicles, mostly flitters and skimmers rather than rollers and crawlers; no artillery or heavy excavation and fortification gear was shipped. Further supplies could be moved in with assault and cargo transporters, which were of lamentably limited use for the first wave of assault.

The ability to launch the entire onboard force in one shuttle and barge sortie, typically in just ten minutes from go to touchdown, formed one-third of the deterrent of the interdiction ship concept. Another third came from the ability to maintain warp six until fuel exhaustion; the KR09 warp core sitting horizontally atop the secondary hull was pampered with ergonomic and efficient maintenance arrangements, high capacity cooling systems and a robust double-peristaltic antimatter feed. There was also some power to spare for weaponry, which completed the deterrent value. Three twin banks of Type VI phasers on the saucer gave the ship self-protection and the ability to deliver pinpoint fire support to the ground forces. A quartet of light Mk 24 torpedo tubes in the connecting neck could rain less discerning death on the planet below. An advanced combat control system featuring backpack-sized field units for a secure special datalink allowed the ground commander to directly control the full array of weapons and sensors in orbit above him or her, up to and including sending maneuvering commands to the starship.

This at least was the theory behind the bold new concept. Every aspect of it appealed to the McLaren administration: low manpower requirements, almost preemptively rapid reaction to Klingon aggressions at non-escalative strength, affordable technological sophistication, smart tactical aids in place of brute firepower… Thirty-nine of the initially approved *Kolm-An* class vessels were swiftly built, mostly at Sol and Procyon. Some saw action virtually straight off the dockyards, delivering troops against the Feline Xindi incursion. The special abilities of the ships were not yet put to test, however, as the sorties were simple troop logistics missions, trailing behind the faster strike cruiser and strike frigate responses. But when a Marine presence was left to safeguard the contested regions at the conclusion of the fighting, it was deployed onboard *Kolm-Ans* rather than garrisoned planetside.

The relative comfort of onboard accommodation now faced an absolute test, and the idea of using escort-sized starships as floating garrisons was soon found to be impractical to the extreme. The *Kolm-Ans* were distributed to zones of high Klingon activity and began operating in a more carefully preplanned manner. Inevitably, this led to the emphasis moving from rapid defensive response to offensive raiding. Between 2275 and 2287, the ships and crews chiefly trained for the near-legendary “30 minute occupation”: the Marines would land in the shuttles and deploy a few minutes before their starship cleared the horizon, then fight for the duration of one medium-height pass by the starship, and take off again, leaving behind a destroyed Klingon installation, a disrupted forward staging area, or the smoking wreck of a landed Klingon vessel that had rested secure in the belief that the region held no enemy capital ships of sufficient strength to challenge her.

All assault ships faced new challenges in the post-Khitomer world. USS Vonra *is equipped for them, sporting sleek new WF-12 nacelles to usher in the new generation of warp propulsion, and mounting two Mk 7 medium anti-starship torpedo launchers in place of the bombardment battery of Mk 24 light tubes.Very similar to the* Scylla *scout in dimensions, shape, armament and propulsive performance, the refitted* Kolm-An *lacked modern sensor and analysis gear and mainly acted in support of surface surveys.*

The skills seldom saw practical application. Only a single operation involved challenging a forward anchorage of a Klingon raider flotilla, and even that one was the result of an intelligence failure; *USS Donatu* withdrew as soon as she became aware of the presence of three D-11 destroyers, each one more than a match for the interdiction ship. Other operational sorties were aimed at identified (and sometimes misidentified) forward supply depots and listening posts in neutral or UFP space; Starfleet never dared launch a *Kolm-An* into Klingon space the way it deployed its strike frigates on covert missions of destruction in the "Dilithium War"of the 2280s.

Two of the ships spent their entire careers in training duty; two more had to be scrapped before their time, due to structural fatigue, mainly from fire support missions flown in the lower atmosphere of a target world. *USS Cestus* was lost in a rare deep space confrontation with her Klingon T-12 counterpart some months before the first Khitomer summit. As forces were withdrawn from the Klingon front, the interdiction ships faced extinction. It was their special ability to stay on extended standby that carried them over the worst, allowing for an eventual re-engining with WF-12 when LN-40A support was terminated. This boosted cruise performance further, and allowed the ships to operate in a general frontier patrol role until the early 24th century. This role mainly consisted of logistical support of priority surveys in the new Treaty Exploration Zone, for reasons of political necessity.

Tangent

Frigate
2272-2275

Completed:	26 total: 4 Starfleet frigates 22 export variants
Length:	290.1 m
Beam:	112.2 m
Height:	58.0 m
Mass:	615,200 tons
Cruise speed:	w 6
Max.speed:	w 9.0
Endurance:	5 years
Officers:	24
Crew:	246
Weapons:	4 phaser VI emitters in 2 twin banks on dorsal primary hull 2 phaser VI emitters in twin bank on ventral primary hull 2 phaser VI emitters in single banks on aft ventral secondary hull 2 fwd medium torpedo tubes w/ 40 photorps in dorsal pod 3 fwd medium torpedo tubes w/ 40 photorps in dorsal pod
Shields:	2-layer forcefields Navigational deflector on secondary hull bow

Secondary navigational deflector on ventral primary hull

Laboratories: None

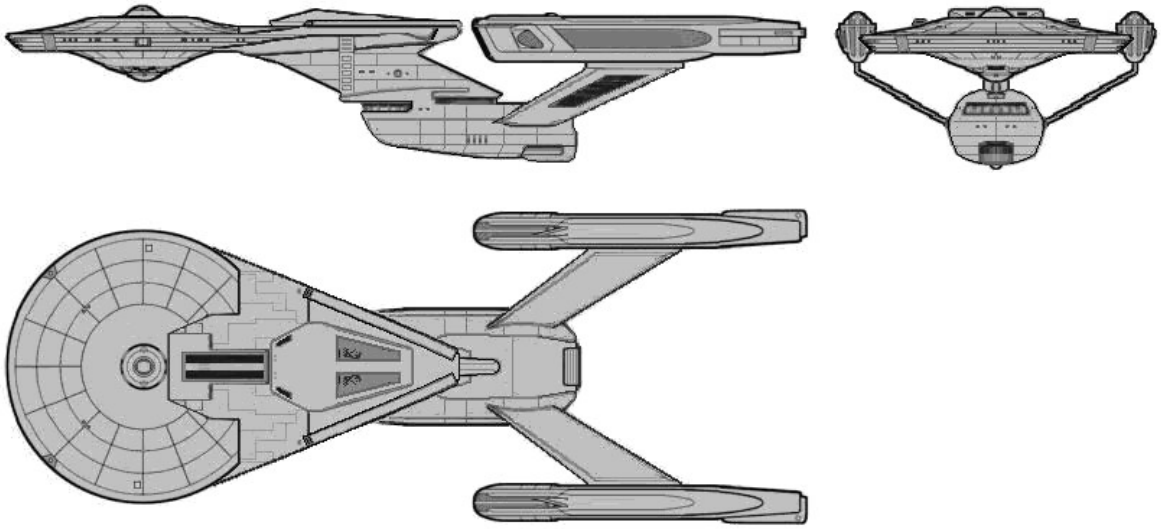
Transporters: 2 GP (6-pad), 3 emergency evacuation (22-pad), 1 cargo; Mk IV

Auxiliaries: 3 light shuttles, 1 heavy or assault shuttle, 4 work pods

Ships of historical interest:

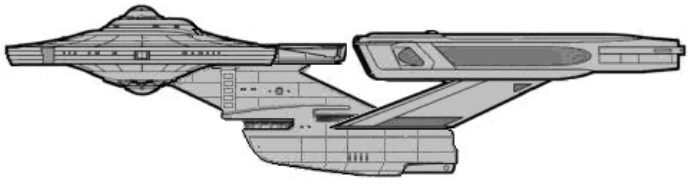
USS Tangent (NCC-4900)

SOURCES: (D FASA/Terry Atkins)
(N FASA/Terry Atkins)
(H FASA/Terry Atkins)



If the Chandley yards could thank the Organian hiatus for the success of their *Northampton* class, the Mastercom design bureau in turn could not be faulted for cursing the political developments. Their *Tangent*, designed around the Setschuen LN-40 and the hull elements of the parallel *Baker* destroyer project, was turned down from three projected roles in a row. Starfleet's permanently cold shoulder ultimately forced Setschuen and Mastercom to pursue the export market, and the *Tangent* eventually evolved into a versatile general purpose design rivaling the *Achernar* cruisers of the previous decade.

The *Tangent* proposal had its roots in the prospect of creating a flotilla leader type for the compact *Baker* destroyers. To provide the necessary extra space, Mastercom added an 80 m secondary hull, housing a slightly larger reactor than in the *Bakers*, a slightly more capable shuttlebay, a slightly more versatile deflector and long range sensor array. A cruiserlike arrangement of swept-back pylons and a neck up to the primary hull was adopted, initially using the *Baker* pylons as is. The shuttle hangar in the former *Baker* aft hull was replaced by an auxiliary power system, and the IMRF crystal was repositioned at the bottom of the secondary hull.



The original Tangent *proposal, with* Baker *pylons and saucer complete with the basic destroyer impulse deck and ventrally embedded torpedo armament.*

Torpedo firepower was the first item to be taken up a notch when the destroyer leader proposal failed to attract attention in 2270. The upper end of the connector neck received a torpedo pod, essentially a slightly adapted *Surya* frigate superstructure with two Awalt Mk 3 forward tubes outboard and two aft tubes inboard. The now launcher-free saucer was moved forward and down to compensate, increasing the overall length of the vessel to 260 m; the superstructure below the bridge was also removed to give the torpedoes a field of fire forward without having to raise the pod on support struts. Sales material for the *Tangent* now began referring to her as a frigate, and a potential *Loknar* successor.

Yet thanks to the raising of expectations during the Organian lull, the ASDF showed no interest in a light frigate capable of mere *Loknar* propulsive performance, opting rather for the joint *Daran* family of LN-64 –engined superships. Undeterred, Mastercom emphasized the escort mission and added H series extensible-shield generators with their characteristic tubular coil assemblies. These were installed in a V formation around the torpedo pod, on the very rims of the increasingly flared-out saucer aft extension. The saucer moved forward again; the primary hull assembly now took the form of an elongated teardrop, losing all traces of the original angular *Baker* aft extension design. The secondary hull flanks were extended down for extra fuel, and the IMRF crystal was swapped for a larger and more potent design to compensate for the ever-increasing mass.

The modifications were introduced swiftly and successfully, yet casual and seasoned observers alike could tell that elegance was a casualty in the process. The upshot was that the hull repositionings necessitated structural reinforcement, which in conjunction with the already robust *Baker* construction solutions resulted in a vessel highly resilient to damage.

A prototype vessel was finally accepted for construction, and was ready for trials by October 2272. While the heritage torpedo armament performed with distinction, the phaser system was found to suffer from power allocation problems; only three saucer berths rather than the projected four to six could be given Type VI armament. The *Tangent* eventually lost the deep space escort leader competition to the lighter *Babcock* mainly on manufacturing cost and operating economy arguments. She had also outgrown any hope of serving as a simple flotilla vessel now.

As an independent combatant, however, the *Tangent* was a relative underperformer. Starfleet was unwilling to settle for adequate designs when there were far more ambitious proposals on the offer, and a lull in hostilities was coinciding with bountiful budgets. Mastercom could thank the brief feline Xindi insurgency for an order of four vessels, including the prototype – to be used as gapfillers when certain border patrol assets were being reshuffled and refitted, and sold forward at the earliest convenience.

The piecemeal, off-the-shelf construction now yielded another benefit. Most of the items that had failed to be greater than their sum were declared second-rate and non-critical, and could be released for export to trusted clients. This led to Mastercom's final victimization by the Organian political shift, as the apparent lessening of the Klingon threat prompted the Federation to pull back from most of its alliances with anti-Klingon regimes of otherwise dubious reputation. It was only when the McLaren administration failed to win a second term that a politically palatable customer was found for the *Tangent*. In 2275, two flotillas of thirteen "destroyers" were sold to the wealthy frontier independents of the Triangle region; the transaction included the four ships previously sold to Starfleet, and was completed in 2281. The Affiliation of Outer Free Worlds designation for the ships was cruiser, and the *Tangents* were indeed used as capital ships for the following decade, supplementing and eventually supplanting the indigenous *Mackenzie* class – although only after some local tinkering that basically doubled the phaser firepower of the vessels. Meanwhile, Mastercom moved to other assignments, and restored its reputation in dreadnought design work.

With Khitomer peace, the Triangle was absorbed into the respective three star powers. The *Tangents* did not become part of Starfleet, though, as LN-40 was being discontinued overall, yet the *Baker* destroyers were to persist for at least a decade until the much larger *Polaris* family could take over. Several sets of engines saw use as *Baker* spares after the last *Tangent* was scrapped in 2296.

Larson refit

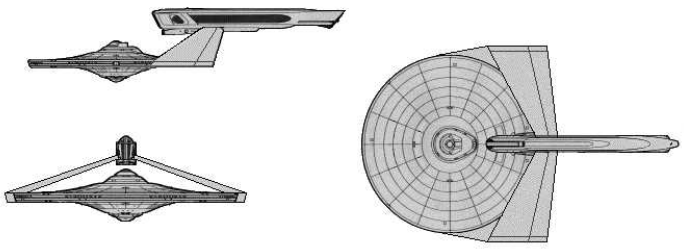
Destroyer
2273-2351

Completed:	13 converted from *Larson* and 13 built in 2273-78
Length:	207.0 m
Beam:	143.2 m
Height:	71.3 m
Mass:	388,600 tons
Officers:	52
Crew:	173
Cruise speed:	w 6
Max. speed:	w 11.0
Endurance:	2 years
Weapons:	6 phaser VII emitters in 3 twin banks, port/stbd of bridge and fwd of lower sensor array 1 medium fwd torpedo tube w/ 35 photorps or probes on ventral primary hull
Shields:	1-layer conformal forcefield Twin navigational deflectors on aft ventral hull
Laboratories:	None (standard) 2 signals analysis (sigint duty)
Transporters:	1 GP (6-pad), 1 emergency evacuation (22-pad); Mk IV All ships brought to Mk V standard after 2284
Auxiliaries:	2 light shuttles, 2 work pods (standard) 6 large surveillance drones (sigint duty)

Ships of historical interest:

USS Caspian (NCC-5501), *USS Churchill* (NCC-5504), *USS Iron Sentry* (NCC-5509), *USS Masterton* (NCC-5506)

SOURCES: (D FASA, DC Comics “Thin Ice”)
(N FASA, DC Comics “Thin Ice”)
(H own, FASA)



The modern elements introduced in *USS Decatur* were immediately adopted for all modernization programs underway or planned. Not only would Starfleet modernize its already top-class cruisers and frigates, but the dreadnoughts, corvettes and destroyers would also receive new warp drive components and sensor packages as well as the latest in torpedo systems. Two destroyer upgrade

proposals were made: one which replaced the PB-31 series engine of a late-model *Saladin* with a linear excitation nacelle and the old Scarbak impulse deck with a high power, low signature Avidyne design; and another which essentially did the same thing to a *Larson*.

The simplistic-sounding descriptions are in fact quite apt for the refit programs. The desired performance characteristics were "citius, altius, fortius" without any thought given to the mission profile of the ships. Every possible piece of new gear was to be mounted on the ships, be it needed or not. Predictably, the end results were far from functional. The attempts to convert *USS Jenghiz* (NCC-501) met with problem after problem: despite valiant attempts, the highest speed the engineers could coerce out of the single ventrally mounted LN-64 was warp 9.2, and that with structurally unsound solutions. Moreover, stock weaponry and power and control configurations from the cruiser refit program proved disastrously impractical – torpedo launchers simply could not be fitted next to the nacelle, yet there was no returning to a primary hull mounting where a vicious circle of primary and support system expansion hogged up all available space. The refit was aborted as nonproductive in mid-2271.

From the beginning, the *Larsons* offered slightly more space than the *Saladins* to mount the new internal power systems into. Also, planning for a refit had fortunately been started well prior to the introduction of the new engines, and the goals of this refit had been set. Modifications to *USS Larson* begun in 2268 proceeded almost as planned despite the last-minute change in reactor type from Kiratovani KR13-L to the customized Fairey WC-2, better matching the needs of the LN-63 flat-field engine. Also, a YPS Avidyne 4077 impulse unit was introduced. The primary hull refurbishment performed on *USS Decatur* was then repeated on the destroyers.

Wisely enough, a selection of only three twin Type VII phaser emitters was chosen instead of the full *Decatur* phaser assembly. Also, the primary hull sensor package was tailored for the destroyer, concentrating on the essential warp interception and combat awareness sensors of the cruiser suite and abandoning exploration-oriented systems. No laboratories or exploration shuttles were carried, either. The ships did feature normal crew accommodation amenities, gymnasiums and recreation rooms, as well as well-equipped sickbays. Sufficient workshops and spares supplies were provided for onboard repairs. Overall, the equipment standard of the refitted destroyer was superior to that of the original austere *Larsons*.

Engine, sensor and phaser modernization and cosmetic changes represented the bulk of the conversion costs, but were of marginal importance to the primary mission of the ships. There was lively discussion about the best way of mounting the main armament, a flexible medium torpedo system dubbed Common Claw (in anticipation of application on several other ship classes). Single and twin assemblies were tested under the bridge module and beneath the warp nacelle. Finally, the designers settled for a cruiserlike configuration where the single-tube, quadruple-loader medium launcher sat below the primary hull, its machinery offset to starboard and its centrally mounted muzzle enjoying a truly excellent firing arc. Main sensor systems were squeezed to port of the torpedo machinery. As with the later frigate designs, navigational deflectors and in some cases WADE plates were integrated to the lower hull.

A rare view from the receiving end of a Common Claw burst-mode volley. USS Masterton *and* USS Iron Sentry *of refitted* Larson *type fire at cruiser* Canopus *as part of the Khitomer coup attempt, diverting the cruiser's attention from the rebellious strike cruiser* Aveley. *The destroyers did not loiter long in the battlefield, as point-blank phaser hits from the cruiser main banks proved too much for their shields.*

The *Larson* was refielded in July 2273, soon followed by twelve more conversions and thirteen newbuilds, the registries of the latter in the 5500 range. The majority of *Larsons* was left unrefitted, largely consigned to surplus depots in the aftermath of the Organian treaty. Political considerations prevented the reactivation of these ships; now that the upgrade had been proven possible in technological terms, and could be completed at any future date, Starfleet concentrated on acquiring new heavy and medium frigates. Yet by the time a re-escalation boom finally hit the Fleet in the mid-2280s, repeated setbacks in other destroyer refit programs had left a foul taste in Starfleet's mouth; it had already decided on buying 26 ultramodern *Cochise* class destroyers instead.

Destroyers of upgraded *Larson* class featured prominently in the covert Starfleet plan to invade Klingon Empire in 2293; several vessels were assigned suicidal missions of neutralizing Klingon military starports beyond the Neutral Zone. After the plan was exposed and thwarted, a cleansing of Starfleet also led to disarming or retirement of most of the *Larsons* and other destroyers, although mostly as a cost-cutting measure. Frigates were deployed to fill in the gaps in Starfleet's defensive operations, and the specific mission of destroying capital ships with attacks of relatively light vessels officially abandoned in Starfleet. Few Fleeters shed tears when the last active-service *Larson*, *USS Jackson* (NCC-5510) sailed out for her final journey to surplus yards in 2314.

Currently, Starfleet maintains four *Larsons* in inactive reserves, having last utilized them for training purposes. The ships were not activated during the Dominion crisis due to lack of qualified personnel to run them; they are likely to be scrapped within the next five years. Their early model linear warp engines and primitive powerplants can no longer even serve as sources of spare parts.

Miranda refit

Heavy frigate (later frigate)
2273-

Completed: 68 heavy frigates total:

22 *Avenger* heavy frigates converted from *Surya*
10 *Cyane* heavy frigates
10 *Duchess* heavy frigates
8 *Kresta* heavy frigates

5 *Miranda (II)* heavy frigates converted from *Miranda*
4 *Theseus* heavy frigates converted from *Benning*
2 *Hippocrates* medical frigates converted from *Surya*
8 *Endurance* survey frigates converted from *Avenger*
8 *Gilgamesh* survey frigates

278 frigates total:

16 *Mithra* medical frigates
12 *Shockley* survey frigates
10 *Phoebus* supply frigates
80 *Splendid* patrol frigates
80 *Sheffield* patrol frigates
80 *Sharath* patrol frigates

Length: 234.9 m

Beam: 141.2 m
159.1 m (w/ side equipment modules)

Height: 50.2 m
58.8 m to 60.0 m (w/ dorsal equipment modules)

Mass: 750,000 tons (*Avenger*)
728,000 tons (*Miranda (II)*, original)
702,100 tons (*Miranda (II)*, supply ship refit)
730,000 tons (*Theseus)*
772,300 tons (*Hippocrates*)
753,000 tons (*Endurance*)
751,000 tons (*Cyane*)
758,000 tons (*Kresta*)
638,200 tons (*Mithra*)
660,000 tons (*Shockley*)
658,000 tons (*Splendid*, *Sheffield*)
655,000 tons (*Sharath*)

Cruise speed: w 7 (original)
W 6 (adopted by all after 2320)

Max.speed: w 11.0/W 8.7 (original)
w 11.4/W 8.9 (*Shockley*, *Mithra*, *Splendid*)
w 11.9/W 9.0 (*Sheffield*, *Sharath*)

Endurance: 5 years

Officers: 91 (typical heavy frigate)
51 (typical frigate)
5 (supply ship minimum number)

Crew: 269 (typical heavy frigate)
169 (typical frigate)
21 (supply ship minimum number)

Weapons: *Avenger*/*Miranda (II)*/*Theseus*/*Cyane*/*Duchess*/*Kresta* heavy frigate:
12 phaser VII emitters in 6 twin banks on main hull
2 phaser VI emitters in single banks between hangars
8 phaser VI emitters in single banks on deflector pods (optional)
4 medium torpedo tubes (2 fwd, 2 aft) w/ 40 Type III/IV photorps in weapons module (optional)
Endurance survey frigate:
12 phaser VII emitters in 6 twin banks
2 phaser VI emitters in 2 single dorsal banks outboard of shuttlebays
Gilgamesh survey frigate:
12 phaser VII emitters in 6 twin banks
8 phaser VI emitters in single banks on deflector pods (optional)
2 fwd medium torpedo tubes w/ 20 photorps in weapons/sensor/datalink module (optional)
Miranda (II) stripped-down supply ship:
12 phaser VII emitters in 6 twin banks
2 phaser VI emitters in single banks between hangars
Hippocrates medical frigate:
8 phaser VI emitters in 4 twin banks
2 phaser VI emitters in single banks between hangars
modern *Miranda* medical/survey frigates:
12 phaser VII emitters in 6 twin banks
2 phaser VI emitters in single banks between hangars
2 phaser IX emitters fitted in lower auxiliary nav deflector berth (NCC-31905, 31916)
2 fwd torpedo tubes w/ 10 Type IV photorps fitted in lateral modules (NCC-31905, 31916)

modern *Miranda* patrol frigates:
12 phaser VII emitters in 6 twin banks
4 phaser VII emitters in single banks on deflector pods
2 phaser VI emitters in single banks between hangars
4 medium torpedo tubes (2 fwd, 2 aft) w/ 40 Type IV/V photorps in weapons module (original)
2 medium fwd torpedo tubes w/ 40 Type IV/V photorps in weapons/propulsion module (refit)

Shields: 2-layer conformal forcefields (23rd century designs)
1-layer bubble forcefields (24th century designs)
Navigational deflectors on aft ventral hull
Secondary navigational deflectors on ventral primary hull and port/stbd pods

Laboratories: 2-6, in varying configurations

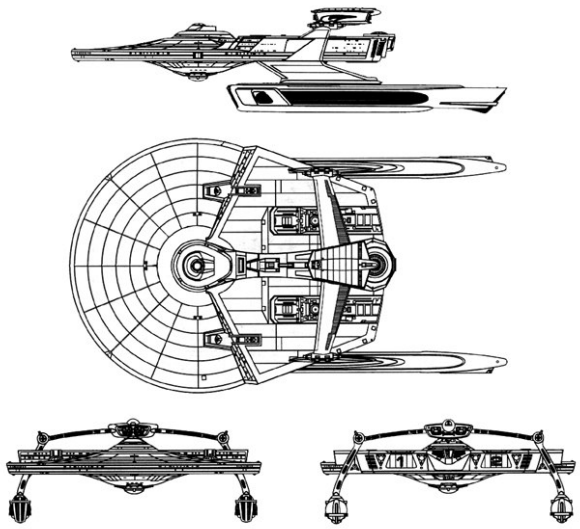
Transporters: 4 GP (6-pad), 2 emergency evacuation (22-pad), 2 assault (22-pad), 2 cargo; Mk IV
All ships brought to Mk V standard after 2283
All ships built or brought to Mk VI standard after 2311
Assault units converted to cargo units in supply variants
Some ships brought to Mk VII standard after 2367

Auxiliaries: 2 to 3 medium shuttles, 1 heavy shuttle, 1 shuttlepod, 8 work pods (original)
2 to 7 medium shuttles, 1 heavy shuttle, 2 shuttlepods, 8 work pods (24th century variants)
'Killer bees' and other tactical craft often carried (original)

Ships of historical interest:

USS Reliant (NCC-1864), *USS Saratoga* (NCC-1867), *USS Sumter* (NCC-1898)

SOURCES: D STII (SotSF)
N TNG (Encyclopedia, *Avenger*/*Endurance* SotSF, *Duchess* / *Theseus* LUG, *Hippocrates* LUG/SFD)
(H own, SotSF)



It was clear from the beginning that refitting *Constitution* ships, let alone building new ones from keel up, was an incredibly expensive operation. However, deep space exploration duties and the Federation-wide application of the mobile defense doctrine both required the maintaining of a large, high performance force of cruiser starships. Seeking to preserve as much of the pre-existing large light cruiser force as financially possible, Starfleet culled out the weakest, like the old *Anton* and *Amchitka* classes and the limited-value *Kearsarges*. This left sufficient funds for expanding the capabilities of Starfleet's strongest light cruiser -sized elements, the already beefed-up 'heavy frigates' of *Miranda* and *Surya* classes.

The technology tested in the *Constitution* refit and *Belknap* projects came to use in the design of the new heavy frigate class named *Avenger*. The spaceframe of the class was based on refitted *Surya* and *Miranda* hulls. Both the external dimensions and the potent equipment aboard the new class would immediately have elevated the ships into the cruiser category, were it not for the fact that all emphasis

was placed on defensive capacity and very little in the way of research gear was originally included. Or at least this was the official explanation; in actual fact, the decision to designate the ships as frigates was a purely political one, intended to draw attention from the major escalation of Starfleet firepower, honoring the letter of the Organian treaty while defying its spirit.

USS Sumter *seen in wargames with two* Daran *frigates in the Arcturus Firing Range. Note the torpedo and phaser module of the* Sumter*, helping tell the heavy frigate apart from the similarly shaped lighter frigates – the difference in size and phaser firepower is not apparent from a quick glance. The* Sumter*, dedicated to special operations support for most of her career, was retired in this configuration and preserved in the Fleet Museum in 2339. Most* Avenger *and* Cyane *subclass ships were mothballed and later stripped for spare parts to more modern* Miranda *generations.*

Basically the *Avenger* shared almost all the systems and design features with the upgraded *Constitutions* and *Belknaps*, but with a different spaceframe configuration, lower endurance, slightly smaller internal volume, lighter fixed weaponry and less powerful computing and analysis systems. Laboratory space was less than one-third that of the heavy cruisers, cargo space and shuttle hangars were divided into two sections on both sides of the impulse unit, and no torpedo tubes were installed within the hull. The impulse systems featured two IMRF crystals, one atop and one below the aft hull and both tied directly to the KR13-M primary power core. This arrangement offered superior thrust in comparison with the *Belknap* and *Constitution* units. The *Avenger* secondary power systems were still of the traditional deuterium-tritium type, however, and thus the ship had to carry two separate sets of fuel tanks.

Commonality with the upgraded cruisers naturally could not extend to those functions housed in the cruiser secondary hulls. Alternative means were thus devised for crew evacuation, navigational hazards sweeping and tractoring of other vessels. The number of one-and two-man pods was doubled from that of *Constitutions* and *Belknaps*, and the various auxiliary craft configured for large-scale evacuation; twin navigational deflectors on lower saucer hull, plus the use of combat shields at low power during cruise, replaced the single large deflector dish; and main tractor beam emitters were now located between the hangar doors.

In their original incarnation, the *Avengers* – named after the first *Surya* thus refitted, NCC-1860 – carried a semi-permanent weapons module containing no less than four Mk 22 torpedo tubes, their targeting hardware, and extra sensory packages to cover several ‘blind spots’ troubling the *Constitutions*. The module was mounted on an arching structure that also supported two narrow-beam deflector pods, each equipped with four Type VI point emitters (forward, aft, and to the upper outboard side). The combination made the ships frightening adversaries in any battle, from cruiserlike domination of local battlespace to the close combat of convoy escort work. Highly

automated systems allowed the frigates to be connected to the Fleet network for data exchange and for remotely controlled or net-coordinated operations.

In 2290, after an intensive production run, 33 *Avengers* had been completed, the first thirteen of them refitted from *Suryas* to full heavy frigate standard (NCCs 1860-1881). Subclass names *Cyane* and *Duchess* were sometimes used for the ships of the minimally improved, all-newbuild production batches (NCCs 1890-1899 and 1900-1909, respectively), but the ships did not significantly differ from the main body of *Avengers*. Nor did the more substantial equipment and systems upgrades of the *Kresta* subclass amount to a truly new starship; eight hulls (NCC-1966-1973) were completed between 2293 and 2297, ending the original production run of the '*Avenger* family'.

Also, five of the surviving seven *Mirandas* were between 2272 and 2276 refitted to *Miranda (II)* subclass which was externally basically identical to the original *Avenger* subclass. Internally, the ships carried some extra gear for a far frontier signals intelligence mission, building on the original strengths of the *Miranda* subclass in this respect. They often sailed out equipped with a sensor pod in place of the weapons module, and indeed were more often seen without a pod altogether than with the torpedo arch. They were fully battleworthy combatants nevertheless, and were expected to serve as an integral part of the overall heavy frigate fleet. The four modernized *Benning* heavy frigates were typically clustered with the *Miranda (II)* batch due to their similar original design, even if all individualism was actually lost in the refit that turned them into what was briefly considered the *Theseus* subclass until the conversion leader fell to Klingons in 2279. The eight vessels of *Miranda* or *Benning* origin were formally listed as *Avengers* in the Khitomer protocols; the name *Theseus* had been assigned to a modern destroyer in 2283 already.

Other variants of this design diverged more drastically from the basic configuration. Two ships (NCC-1850 and NCC-1886) received in 2281 several of the *Avenger* modifications but were internally configured for frontline medical operations, mainly casevac and triage, and placed in reserves. The ships were later fitted with a significant midhull plug to provide proper facilities for extended medical care and up to 200 covalescent patients; new names were also issued, resulting in subclass name *Hippocrates*.

The *Soyuz* class of three ships (NCC-1239, NCC-1840 and NCC-1841), discussed earlier, had been a highly satisfactory survey/sigint variant; in parallel with the *Avenger* program, the surviving two ships of that class received new warp engines, but also significantly improved command and control facilities and special sensors. The *Endurance* class was an eight-ship (NCCs 1862, 1865-66, 1871-73, 1876 and 1880) *Avenger* modification of more modest scope for similar missions, incorporating added sensor modules on the nacelles, as well as a dedicated sensor/datalink module with both the CLLT secure military link system and the wideband scientific FeRMI link. For the purposes of gathering military intelligence, the two classes were indispensable. In the scientific survey role, both classes were at most gapfiller designs, but the gaps to be filled were formidable at the turn of the century. Thus, eight more survey cruisers were completed, largely out of components manufactured for further, unbuilt *Kresta* units. The *Gilgamesh* class followed the new registry allocation rules but relied on proven hardware. The only major piece of new equipment installed was a series of four sensor arrays embedded on the aft hull dorsal surface, although two new optional mission modules were also introduced at the time: a pod combining two forward torpedo tubes with datalink and sensor gear, and a triangular subspace sensor antenna. Both of these stood on a single pylon mounted at centerline, eliminating the horizontal section of the "roll bar", but ships still tended to carry the vertical elements to mount the auxiliary phaser pods.

The half-sunken wreckage of USS Ulysses *(NCC-10767) on S-R III stands testimony to the vulnerability of lone Starfleet scientific surveys, even those performed by armed vessels. A Cardassian attack forced this planetfall in 2361, and retrieval from what subsequently became Cardassian territory had to wait until 2376. Little differentiates the* Gilgamesh *subclass vessel from combat-oriented* Mirandas*, especially with the nacelle-mounted sensor systems buried in the swampy surface of the planet.*

Also based on the *Avenger* design were two abortive attempts at three-nacelled ships, created when the limitations of the LN-64 technology began to manifest in the 2280s. The *Adamant* 'pocket dreadnought' reached prototyping stage but proved highly disappointing in performance. The *Comanche* heavy frigate, essentially a downgunned *Adamant* with the support and EPS trunkage systems for a center nacelle attached to the lateral nacelles, was planned for production after the completion of the *Kresta* batch. Financial realities dictated otherwise.

Loosely based on the work done on the failed three-nacellers was the *Kirov* class of dreadnoughts, created out of shuttlecarrier 'spare parts' to augment the *Federation* and *Ascension* force at what was to be an affordable price. This less than successful class, impressive enough in performance but little short of audacious in operating expenses, is described later in an entry of its own.

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In the first decades of the 24th century, against all expectations, the *Avenger* production lines were reopened. The collapse in Romulan relations had destabilized the entire coreward flank of the Federation. Without the long range deterrence force of dreadnoughts and strike cruisers, Starfleet had to revert to a more 'hands-on' approach; and that called for affordable yet potent medium starships in virtually every star system. However, the *Constitution* and *Belknap* cruiser variants, the backbone of the medium starship fleet, were now bowing out.

Starfleet thus found itself in need of more and faster deep space frigates, yet hesitant to invest in a wholly new design while funds and dockyard resources were being drained by the heavy starship programs of *Excelsior*, *Apollo* and *Ambassador* classes. Future doctrinal changes would later make Starfleet regret the decision, as overall frigate numbers would fall behind operational demands, and each ship be subjected to higher performance requirements. In 2311, however, the decision to add some 240 *Avenger*-derived ships to the otherwise modernized fleet was considered an economically smart move.

Impulse reactors were modified to utilize deuterium-deuterium fusion, so that the primary and secondary power system fuels could be commonalized. Heavy warp coils strengthened and fine-tuned for multiphasic operations were installed in LN-64G/H nacelles, and a top speed increase to warp 8.9 on the new scale was achieved. A variety of mission modules were fitted, including an *Avenger*-style weapon arch (now with twin Type VII phasers instead of a quartet of Type VIs); a subspace scanner

arch with a range of eight lightyears; and a simple cargo sling with two cargo grapples, intended for support and salvage missions and ferrying of outsize components in the style of the *Hensley* class but rarely used. Fifteen-person lifeboats of high endurance were added, stowed on upper shuttlebay alcoves where various interceptors and assault craft had earlier resided; all one-person pods were replaced by advanced two- or three-person DSSRV pods. Finally, shields were modernized to bubble-field configuration.

Subclasses primarily intended for defense but also specifically outfitted for science and survey missions (12 ships beginning with *USS Shockley*, NCC-21156) or for medical support and disaster relief (16 ships beginning with *USS Mithra*, NCC-25003) were fielded first. They were soon followed by purely defensive ships equipped for medium range patrol duties (80 LN-64G -engined ships beginning with *USS Splendid*, NCC-31711) and for combined patrol and exploration missions (80 LN-64G -engined ships beginning with *USS Sheffield*, NCC-31916, and 80 LN-64H -engined ships beginning with *USS Sharath*, NCC-32101, both with a thorough internal systems upgrade similar to that effected on select *Constellation* cruisers and on all the eight *Gilgamesh* vessels). As the size and performance of other Starfleet ships had increased steadily in the intervening years, the new ships were classified simply as frigates. Soon the qualifier 'heavy' was dropped for all subtypes. Total mass did factually creep down with the 24th century redesigns, from the initial 750,000 tons down to 655,000 tons, thanks both to material technology advances and an increased reliance in SIFs.

In the 2340s, the *Miranda (II)* and *Theseus* units had their sigint mission gear and most sensors removed, research and medical facilities reduced, and the already large cargo holds further expanded. The holds, spanning the aft ends of Decks 4 to 6, were readily accessible from the shuttlebays and provided considerable cargo volume for some 340 standard containers. All nine such vessels served with minimal crews as Activation Class Six fleet supply ships, running lifelines to distant colonies or remote observation posts. Their heavy phaser armament was instrumental in allowing frontline supply operations during the Cardassian War, for which the modification was primarily intended. The stripped supply versions later received some of the update features of their modern sisters, most significantly the deuterium-deuterium impulse fuel system. Yet they never incorporated a full multiphasic capacity to their engines despite abiding to the new warp speed scale; that privilege was reserved to a newbuild run of ten theoretically known as the *Phoebus* class.

Ultimately, the term *Miranda* class was simply applied to all *Miranda*-derived designs, including the few surviving *Cyanes* and *Krestas* in reserves, and all the 24th century production batches and conversions. In connection with the renaming, the defensive variants were relegated to Activation Class Four and the survey and medical ships to Activation Class Three. As the Fleet stood down from Alert Status One after the Cardassian crisis, most of the *Mirandas* were idled on starbases and some retired on Zakdorn depots. While certainly not outdated in the exploration and support role, they were deemed obsolete in combat applications and not expected to be reactivated, save for an extreme crisis.

The crisis came in 2366 in the form of the invincible Borg. While mere quantity of firepower was futile in resisting this new foe, something had to be done about the suffered and projected decimation of Fleet resources, lest lesser enemies take advantage. Starfleet promptly recommissioned all the most recent *Miranda* variants, equipping them with stock weapon modules. In certain vessels, phasers were hastily upgraded closer to modern frigate standard, lagging only slightly in power behind the newest Type VIII units, and various new sensor fits were tested although never fully integrated to the overall systems. The range of upgrades proved sufficient to allow the ships to be used defensively in the Klingon Border War of 2372-73.

However, in anti-Dominion operations, the meager impulse performance of the vessels reduced their usefulness against the very threat they were most desperately needed to combat – the light and agile Jem'Hadar attack vessels, from which Starfleet's large capital ships had to be screened. In their heyday, the *Mirandas* had perhaps offered top-class impulse thrust, but that had been in comparison to ship types now long retired. As of the 2370s, not only were the *Mirandas* incapable of the accelerations required for bringing torpedoes to bear, they were also unable to keep up with fleet impulse movements in general, slowing down entire attack formations. This had been the very reason many fleet admirals had originally ordered the ships to be omitted from their operational plans, thus committing them to mothballs.

All clear for invasion of Panora. Four Mirandas, *two of these with impulse boosters, secure a* Steamrunner *formation, and are themselves secured by* Kestrel *fightercraft, while two* Excelsiors *take the point. On this low-priority target of the July 2375 offensive, this was the entire invasion force; Starfleet still put a lot of faith in its early 24th century combat starship types, in absence of alternatives.*

The problem seemed insurmountable until 6th Fleet frontline engineers at SB 375 innovatively installed booster impulse engines into the weapons pods on four of their *Mirandas*. Armed with phasers only, but capable of 1.8 times the accelerations of the basic models, the modified frigates were finally up to the task of providing close-in escort against Dominion small craft. In addition, up to six Starfleet fighters of *Kestrel* class could be carried aboard each *Miranda*, providing added impulse escort resources.

While still vastly inferior to most of the threat vessels of the time, the heavily modified *Mirandas* provided Starfleet with a functional reserve to cover the losses of advanced frigates like *New Orleanses*. Predictably, more than ninety *Mirandas* were in turn lost in action against the Dominion forces. All the remaining *Cyanes* and *Krestas*, as well as some other mothballed ships of that generation, had to be dismantled for spare parts to keep the more modern specimen going.

At the time of the writing, it seems that some ships serving under the *Miranda* frigate designation may still see several decades of service. The utter military obsolescence of the century-old design does not unduly hamper its use in general Starfleet duties. To emphasize this broader and less militant role, a designation change from frigate to light cruiser has recently been effected on some vessels. On a separate note, there exist plans on rebuilding some of the surviving vessels into more capable combatants; this would involve a complete warp and impulse engine swap and an expansion of the hull with suitable cowlings for modern sensor gear and shielding, but much of the spaceframe could be retained. Several *Sharath* and *Sheffield* evessels in post-action mothballs are being considered for proof of concept conversion as of this writing.

One of the possible rebuilding standards currently under consideration. A Soyuz*-style stern extension for a new powerplant and chin packs for sensors and shields are the most involved elements in the refit. The installation of LN-25 series engines, strip phasers, a new dorsal weapons module and modern lifeboats can be considered trivialities in comparison.*

Lynx

Timeship
2273-2289

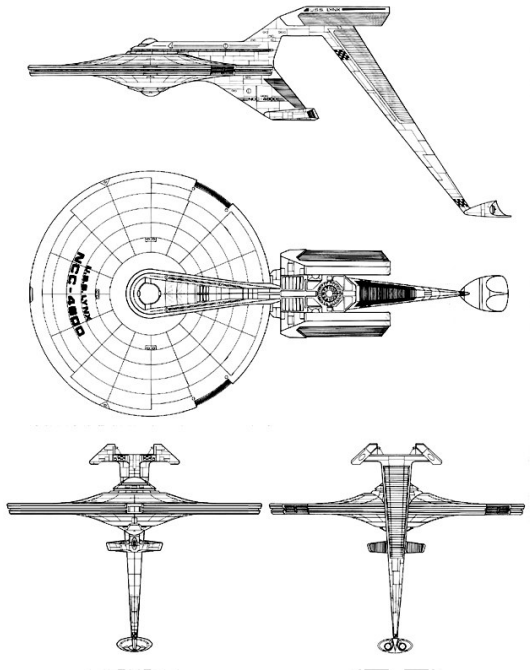
Completed:	1
Length:	237.0 m
Beam:	127.1 m
Height:	164.5 m
Mass:	540,000 tons
Cruise speed:	w 4
Max.speed:	w 6.1
Endurance:	3 years
Officers:	46
Crew:	128 (+ up to 80 specialists)
Weapons:	6 phaser VII emitters in three twin banks on dorsal main hull 2 phaser VII emitters in twin bank on port ventral main hull 2 fwd medium torpedo tubes w/ 12 photorps and 24 probes on secondary hull
Shields:	2-layer conformal forcefields Navigational deflector on time warp pylon

Laboratories: 2 GP

Transporters: 4 GP (6-pad), 2 cargo / emergency evacuation (22-pad); Mk IV

Auxiliaries: 2 medium shuttles, 2 to 4 work pods

SOURCES: (D Lawrence Miller, dimensions corrected)
(N Lawrence Miller)
(H Lawrence Miller, own)



Among the most exotic vessels in Starfleet history was the ship that, through years of sterling service, made herself so redundant that she was never built. Current records do not refer to the construction of *USS Lynx*, NCC-4600, out of the scout hull of the same name in 2273, even though they do go into Level 3C Classified detail about her career – spanning either seventeen years, or then eighty thousand, depending on the viewpoint.

The *Lynx* was a direct application of the principles of time displacement at extreme subspace field gradients, such as those encountered in warp accelerations across steep gravity gradients or rapid upramping of a cold warp engine. The theoretical basis was well understood by 2nd century Vulcan physicists already, but practical implementation in time travel was considered impossible due to the chaotically noncausal nature of the phenomenon. As evidence of the actual practicability of timeslips began to mount in the 23rd century, Starfleet was forced to take the phenomenon under serious study.

During the 2250s and 2260s, dozens of starships participated in the studies, often unwittingly by running their unprecedentedly powerful engines at the limits of their performance. The risks of such practice were immense, and the number of lives lost discouraged Starfleet from actively pursuing time travel as a sound military tactic – all the more so because intelligence reports confirmed that most UFP enemies lagged far behind in the development of time travel techniques. The Klingons were dangerously close, though, and most definitely should not be encouraged by wanton display of Starfleet capabilities.

In analyses performed after the onset of Organian peace, it was decided to support the operation of a limited number of time reconnaissance vessels only. These would be built in great secrecy and would

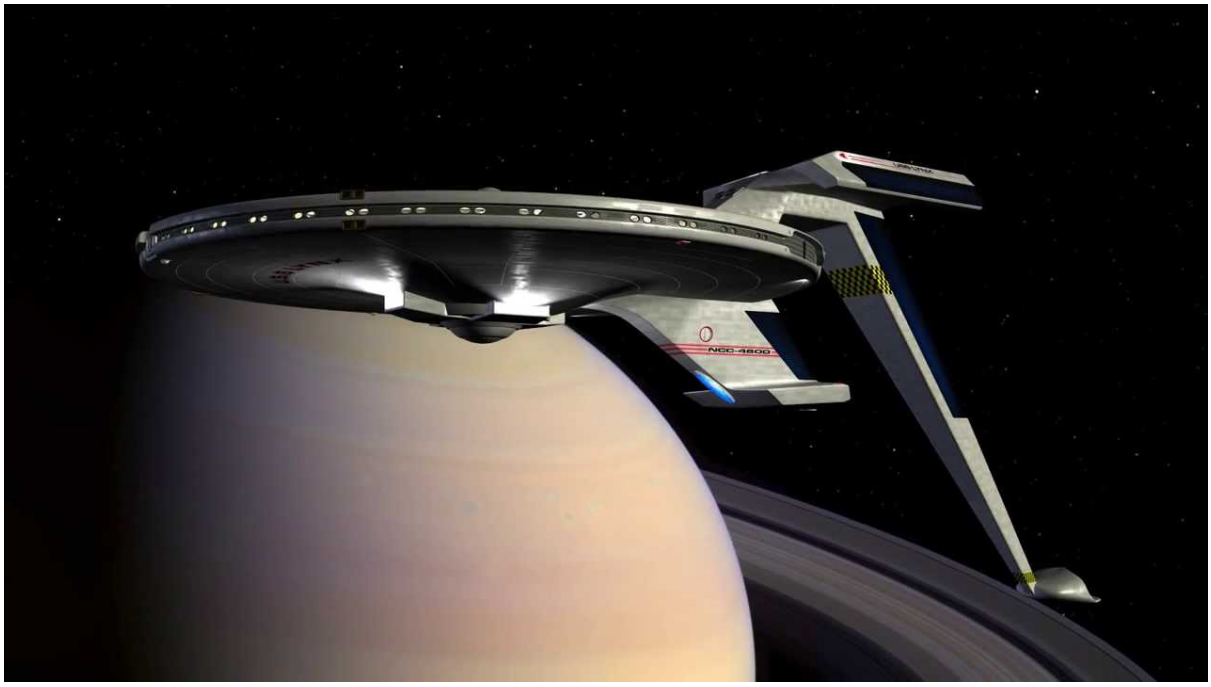
depend on the controlled cold start technique rather than the technologically less challenging but also less easily concealed gravitic-duonetic slingshot method. Modification of the *Monoceros* class scout *Lynx* (NCC-608) to this purpose was authorized on SD 2476.

The principal work involved discarding the original warp drive, installing a deliberately 'cold-stalling' coil system in its place in a trailing 'stinger', and equipping the vessel with a secondary warp drive consisting of twin WD-4 nacelles at the root of the stinger. A basic RSN impulse system was fitted on the stump of the original drive's connector neck, and the primary hull was modified to feature two aft-opening shuttle hangarettes at port and starboard trailing edge, a modern '*Artos*' navigational sensor array, and a rim of mission-specific sensors. The ship was to be armed with two Mk 6 torpedo launchers compatible with a wide range of probes, and with a full array of dorsal Type VII phasers plus one portside ventral bank. The bow ventral berths were dedicated to a countermeasures system that provided full EM and extensive gravitic and duonetic cloaking, necessary both because the ship could hardly outrun adversaries at her top speed of 6.1, and because observation of societies capable of advanced sensing was fully intended to be part of the vessel's mission profile. The starboard ventral berth in turn housed a sensor suite compatible with the countermeasures for maximally covert surveillance.

Initial results from such missions assured Starfleet that the concept was sound. Furthermore, they convinced the designers of the vessel to forgo the actual construction phase, as apparently she was already operational with the intent alone. Careful experimentation naturally preceded Starfleet's decision to abandon the construction process for good. Yet no attempt at hesitation resulted in the disappearance of the excellently performing *Lynx* or her heroic crew, some 50-60% of whom could be traced on Starfleet payroll and UFP birth records during an average dock layover or mission debriefing.

Since the ship, no matter how unbuilt, still required full operational support, she was entered into records as having been commissioned in 2273 – a date confirmed beforehand from the ship's dedication plaque. Starfleet was also well aware of the expected demise of the vessel in 2289, a fact revealed to them during the first mission debriefing but kept secret from the later *Lynx* crews on insistence of the first one. Within the seventeen years fit some three dozen major expeditions to farago historical targets and one far future cosmological vantage point, and six near-disastrous reconnaissance missions to nearnow affairs. While some crucial intelligence was gained from these latter six missions as well, the seventh (or second, again depending on the viewpoint) performed against the Klingon Empire in November 12th, 2289, proved the ship's undoing. It is unlikely that she was actually destroyed on this supposedly low-risk assignment intent on "uncovering incriminating / status-altering facts on the current Emperor's lineage", as the somewhat cryptic logs went; more probably, by some interpretations of the First Debriefing records anyway, the ship reverted back to not having been built.

Starfleet has not officially confessed to having further experimented with controlled time travel, although individual incidents continue to be logged. Any evidence of the Federation Department of Temporal Investigations operating time travel assets is anecdotal only, or possibly based on misunderstanding of temporal visits from organizations headquartered in other eras, although conspiracy theories go to surprising detail about the purported *Thucydides* class of destroyer-sized, heavily armed temporal intervention vessels.



USS Lynx *as she appeared on some 90% of her port visits. The relevance of minor variations in the checkerboard pattern highlighting the endpoints of her 'timecoils' remains unknown, as does the origin and significance of the knot symbol sometimes painted on her flanks instead of the Starfleet arrowhead. Studies of the somewhat torturous chronology of the ship's missions suggest that the vessel underwent the greatest changes in connection with nearnow excursions yet remained largely unaltered by farago sorties – a fact potentially connected to the ship's ultimate nullification.*

Chesapeake

Light cruiser
2273-2298

Completed:	12
Length:	239.0 m
Beam:	141.8 m
Height:	36.0 m
Mass:	740,000 tons
Cruise speed:	w 7
Max.speed:	w 11.1
Endurance:	8 years
Officers:	35
Crew:	197
Weapons:	2 phaser VII emitters in twin banks on dorsal main hull 6 phaser VII emitters in twin banks on ventral main hull 2 phaser VI emitters in single banks on dorsal aft hull 2 phaser VI emitters in single banks on ventral aft hull 2 fwd medium torpedo tubes w/ 50 photorps and 4 probes on dorsal lateral hulls
Shields:	2-layer conformal forcefields Navigational deflectors on fwd lateral hulls
Laboratories:	2 GP

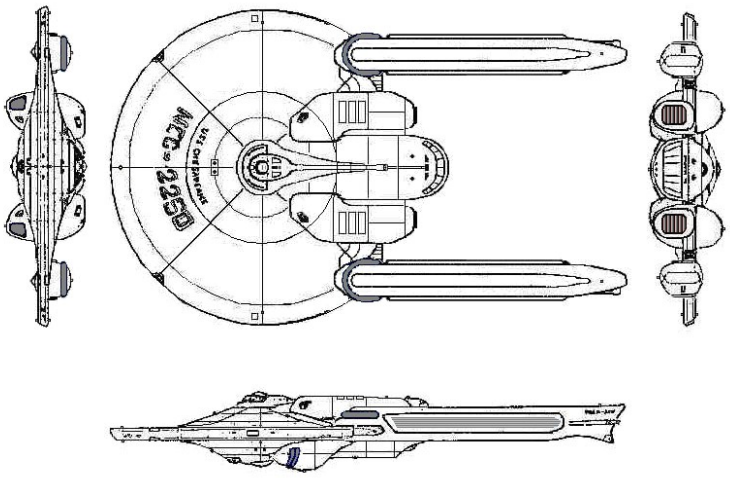
Transporters: 4 GP (6-pad), 1 cargo, 2 emergency evacuation (22-pad); Mk IV
All ships brought to Mk V standard in 2286

Auxiliaries: 2 medium shuttles, 2 to 4 work pods

Ships of historical interest:

USS Peleliu (NCC-2243), *USS Hunley* (NCC-2249), *USS Delaware* (NCC-2250)

SOURCES: (D Diane Carey "Challenger", own)
(N Diane Carey "Challenger")
(H Diane Carey "Challenger", David George "Serpents Among the Ruins", LUG, own)



The light cruiser shortage which the *Miranda* refit was to address was in most respects an illusion, since the *Miranda*, *Surya* and *Coventry* classes already filled that mission niche in all but name. Thus the handful of ships actually designated as light cruisers, mostly consisting of the limited-value *Kearsarge* class, was ironically of little significance to the argument about light cruiser resources. For some time, these elderly ships had been denied propulsion system upgrades, sensor refits and even basic maintenance. In the early 2270s, they were totally obsolete, and were in the process of being retired from active service. Nobody considered them to be of any operational worth.

The shipbuilding boom of the seventies changed the situation. Council members began asking obvious questions: if there was a shortage of light cruisers, why not upgrade the existing ships of that designation? And why not construct even more ships of that design, instead of trying to adapt ships of different design to perform this mission? Starfleet could have pointed out that refitting wasn't always the most sensible or economic choice. It could also have confessed to the nomenclature trickery that hid the fact that the *Avengers* were no "adaptations of different design" but in fact true light cruisers. Instead, it quickly succumbed to the temptation and accepted the funds offered for a major upgrading of the *Kearsarge* class. Just as quickly, it admitted that these light cruisers were beyond all help already, and the funds would have to be channeled to the development of a successor design instead.

This successor had in fact been on the drawing boards for quite some time, but repeatedly shelved first due to Organian peace, then to McLaren cutbacks, and finally mistaken for dead because of *Miranda* refitting. The design was indeed optimized for the light cruiser mission as specified by Starfleet Operations Command: heavy phaser and torpedo armament coupled with cruiserlike strong shielding and long range tactical, navigational and survey sensors was crammed into a relatively

compact and inflexible no-frills spaceframe derived from the old *Pyotr Veliky*. An adequate warp performance of warp seven cruise and warp ten-plus maximum speed was specified.

Having been drawn first around PB-47 engines, then around the cancelled PB-51, the design required some reworking to be compatible with the much-hyped LN series. The compact vessel was originally to have carried multilinear containment units along ship centerline, with direct feed through horizontal pylons to the nacelles. Now the actual intermix systems would have to be accommodated outside the nacelles as well, and a wholly new EPS distribution architecture introduced. Due to this, much more extensive hull structures were required overall. The long and relatively narrow central structure now housed main engineering functions and a shuttlebay. The structure connected athwartships with two shorter lateral structures containing secondary engineering functions, impulse and weapons systems and navigational deflectors. The LN-62 warp nacelles were rigged outboard of these, to the trailing edge of the saucer.

The KR14-M intermix systems were installed transversely, with matter feed from the central hull and antimatter feed from the lateral hulls. Plasma distributors in the lateral hulls served minimal-length, well protected primary conduitry outward to the nacelles and aft to the impulse engines, and similarly short secondary conduits to the deflectors and main hull systems. Antimatter feed to the Mk 22 torpedo launchers took place entirely within the lateral hulls, minimizing vulnerability. All this resulted in a highly functional and combat-resilient ship, with largely duplicated and widely separated yet interlinked power, propulsion and weapons systems.

Starfleet was pleased with having solved the transition from self-contained to semi-integrated warp propulsion on the light cruiser with moderate effort and expenses, and happily used the remaining funds to give her the mission equipment she deserved. The primary hull, a modified 141.7 m Class 1 saucer with a 90° sector cut from astern, received four twin phaser VII emitters, one above and three below. The dorsal port and starboard phaser berths were left empty to provide clearance for the torpedo launchers. A Class 2 bridge module with a two-level internal structure was applied; in all but the first three vessels, Deck 1 was extended aft to go flush with the central hull, providing not only additional C^3I spaces but also a more direct gangway access to main engineering and the aft hull. At the bottom of the saucer, main planetary sensors were housed in a traditional dome installation, with a single auxiliary deflector box pointing forward. The slanted Edan main navigational deflectors on the lateral hull bows peered past the sensor dome, and were each flanked by a single main navigational long range FTL sensor of QIK-30 type.

The shuttle facilities were moderately sized, with fan-type doors and space for two medium shuttles and assorted smaller auxiliaries, but without much in the way of repair and maintenance facilities. Spacious cargo holds underneath were invaluable in the long patrol and colony assist missions the ship would be tasked with. A secondary sickbay/triage facility located just ahead of the shuttlebay proved its worth as well, despite awkward access from other ship spaces. Not much else was housed in the austere central hull – there were no laboratories, major recreation facilities or luxuries like the arboretums of the heavy cruisers there. Two single phaser VI emitters atop the shuttlebay and two below completed the armament of the vessel.

A convoy of ore carriers departs Omicron Ceti under the protection of USS Iwo Jima *(NCC-2251). For the miners working in the hellish conditions below the surface bathed in Berthold rays, visits by light cruisers every three months were a welcome contact with the outside universe. For the Orions trying their luck with ore shipments, the* Chesapeakes *were a less welcome sight. When raids on mining worlds briefly increased during the early years of Starfleet's offensive against frontier piracy, the regular scheduling of shipments and starship visits was replaced by randomized timetables, making life more interesting for the light cruisers as well.*

The first light cruiser completed, *USS Chesapeake* (NCC-2241), sailed out of Earth orbit in August 22nd, 2273. At 740,000 tons instead of the planned 550,000 (an optimistic figure calculated assuming PB-51 engines), she somewhat outweighed her designation, but still compared favorably with the expensive 810,000 ton modern *Constitutions*. The greatest advantages, however, came from operating expenses: the light cruiser could sail out with just 110 crew for extended-duration operations, while the skeleton crew of a heavy cruiser included at least 180 personnel.

Naturally, the *Chesapeakes* could not be directly compared to the *Constitutions* in performance. Research facilities on the light cruisers were almost nonexistent, despite the extensive sensor suite. Fewer phaser emitters were carried overall. Torpedo magazines housed a frigatelike total of fifty-four shots against the hundred-plus of a *Constitution* or a *Belknap*. And the LN-62, with two fewer coils per nacelle than the LN-60 it was derived from, was considered a second-rate engine by the heavy cruiser fraternity: the official maximum speed of warp 11.1 fell short of the *Constitution* or *Belknap* figures (even if the *Chesapeake* herself easily reached warp 13.2 in early performance trials). A cruise speed of warp 7, on the other hand, was perfectly adequate for deep space operations and convoy escort missions.

In their limited role of patrol and escort vessels, the *Chesapeakes* still excelled in all respects. Low mass combined with high impulse performance resulted in great sublight maneuverability. The somewhat basic Fasfax main computer might not have offered analysis capabilities comparable to those of the heavy cruiser computing systems, but independent research wasn't what this light cruiser was to be tasked with. Phaser fire control was decidedly cruiser-level, utilizing the new multi-targeting FSTR/TAC hard- and software instead of the narrower-scope Cetis package of the *Miranda* refits. Had the capital costs of creating an all-new ship class not been quite so high, the light cruisers could have been chosen for mass production over the *Miranda* refits. As matters stood, however, the funding decreases (ironically resulting from disappointments in refit programs) eventually spelled the end of *Chesapeake* procurement. Twelve ships had still been built, a valuable addition to the original 22 *Avengers* and five *Miranda (II)*s.

Due to the scarcity of military crises near the core worlds in the mid- to late 2270s, the *Chesapeakes* mostly saw action in distant assignments. *USS Peleliu* (NCC-2243) was lost while defending the newly founded Belle Terre mining colony at Occult in 2275. *USS Hunley* (NCC-2249) nearly succumbed to a Romulan ambush near Delta Doradus in 2278, and had to be laid up for over two years until integrity could be restored to her perforated hull. *USS Delaware* (NCC-2250) in turn triumphed against Orion aggressions at Pacifica in late 2279. The Klingon panic of the 2280s saw the ships in somewhat different roles, mainly escorting priority shipments and protecting fleet support vessels. Also, the threat prompted Starfleet to start refitting the long-idle *Amchitka* light cruisers, a rather desperate and futile move which nevertheless resulted in five ships out of eight being upgraded.

When Khitomer peace forced Starfleet to reassess its arsenal, the *Chesapeakes* were in poor position to fight against the now-numerous *Miranda* derivatives. After a politically expedient 'demotion' to heavy frigate mission class was considered and abandoned in 2295, the surviving ten *Chesapeakes* were in 2298 collected at Arcturus and cut to pieces in accordance with Khitomer limitations on cruiser numbers. Typically the light cruisers were still in perfectly good service condition. The class ship was a notable exception, having suffered major damage in a combat engagement against herself in a bizarre time tampering incident at θ Eridani.

After the demise of the *Chesapeake* class, Starfleet underwent a major change in equipment. The introduction of the heavy *Excelsiors* and related designs redefined the light cruiser – not in mission profile, but simply in physical dimensions. Ships of *Miranda* size were now among the smallest in the Fleet, and served in the limited frigate role, lacking the relative versatility of light cruisers. Thus, it can be argued that the *Chesapeakes* were the last true light cruisers of the LN-engined starship generation. Their role in that legendary era may have been played somewhat out of the limelight, but the reader is well advised to examine the *Chesapeake* exploits more closely in what little literature exists on the subject.

Lotus Flower

Heavy tanker/transport
2274-2354

Completed:	29
Length:	380.8 m (w/ 2 extension segments) 312.8 m (w/ 1 extension segment) 244.9 m (w/o extension segments)
Beam:	111.4 m
Height:	75.0 m
Mass:	520,300 tons (w/ 2 extension segments) 484,100 tons (w/ 1 extension segment) 447,900 tons (w/o extension segments) 459,500 tons (NCC-S1809 after conversion)
Cruise speed:	w 5
Max. speed:	w 7.2 (2 extension segments, full load) w 8.0 (1 extension segment, full load) w 9.0 (w/o extension segments, full load) w 9.4 (free of load)
Endurance:	1 year (original) 3 years (2308 upgrade)
Officers:	6 (standard) 9 (NCC-S1809 after conversion)
Crew:	67 (w/o extension segments) 73 (w/ 1 extension segment) 79 (w/ 2 extension segments) 162 (NCC-S1809 after conversion)
Cargo:	300,000 tons (2 extension segments) 200,000 tons (1 extension segment) 100,000 tons (w/o extension segments)
Weapons:	Berths for 8 phaser V emitters in 2 quadruple banks above and below fwd main hull
Shields:	1-layer conformal forcefield Navigational deflector on bow Auxiliary navigational deflectors on impulse nacelle bows
Laboratories:	None

Transporters: 1 GP (6-pad), 1 emergency evacuation (30-pad), 1 large and 1 small cargo; Mk III
1 emergency evacuation (30-pad), 1 large and 1 small cargo per segment; Mk III
All ships brought to Mk V standard after 2299
All GP and evacuation units brought to Mk VI standard after 2322

Auxiliaries: 2 work pods, plus 1 work pod per fuel tank or 2 work pods per cargo container (standard)
16 work pods and 2 heavy shuttles, plus repair drones (NCC-S1809 after conversion)

Ships of historical interest:

USS Orchid Garden (NCC-S1810), *USS Silent Dawn* (NCC-S1812)

SOURCES: D TNG (FASA)
(N FASA)
(H FASA, own)

The revitalizing of the exploration and expansion program in the seventies was far more easily said than done. As President McLaren eagerly took care of the saying, securing a 2274 re-election, Starfleet sought for a leader of equal clout to manage the doing. The infamous Rittenhouse coup attempt of 2270 was a blessing in disguise, as it prompted the original proponent of the exploration program, Fleet Admiral Nogura, to return to his former position.

The extensive refitting of *Constitution* heavy cruisers was the pet project of both leaders, and the powerful pro-Starfleet propaganda campaign of 2270-73 made it a media favorite as well. Yet there was much more to exploration than just profilic starships. Nominally, a cruiser of the era might enjoy an endurance of five years and an unrefueled range of some 2,500 lightyears, but this assumed uneventful cruising. While the LN-64 was far less of a fuel hog than the older PB series engines, a single combat sortie could still send the captain agonizing over his fuel reserves. Thus, Starfleet's 2240s vintage tanker and tender assets were a major bottleneck for the projected long range operations, and in severe need of replacement.

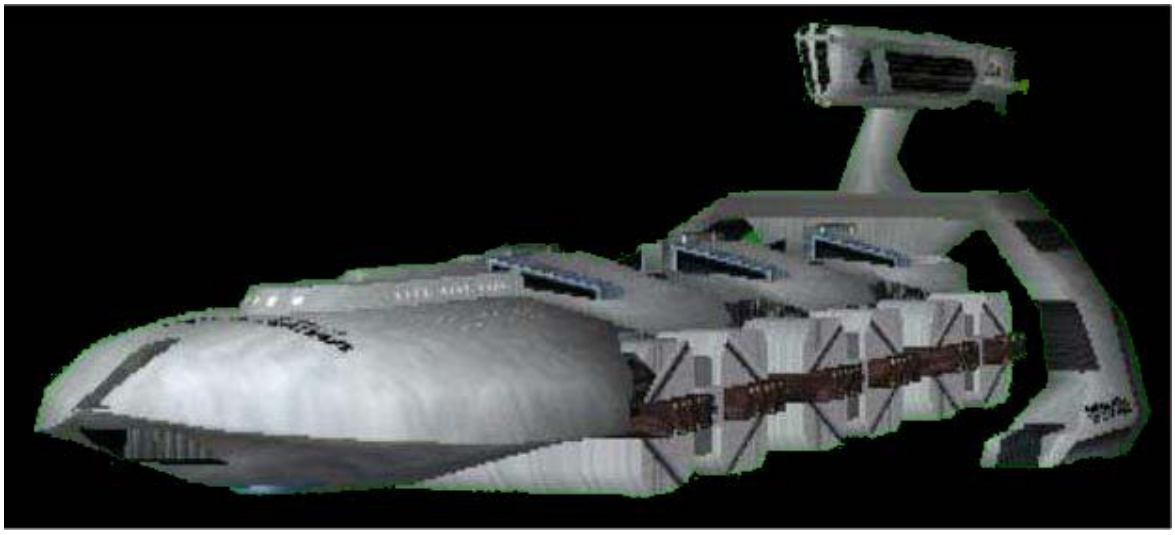
The tanker fleet modernization program was in January 2270 delegated to Logistics Command, but hit an unexpected snag when the Logistical Support Committee recommended a curiously drawn-out schedule of design and procurement. When it was revealed that the funds were being rechanneled to the sinister goals of Vice Admiral Rittenhouse, swift and discreet corrective measures were taken at the highest level. The excess numbers of LN-64C engines ordered by Rittenhouse were rerouted to the tanker program in just revenge; the tanker design itself was lifted more or less off the mercantile shelf and adjusted in all haste to accommodate these engines. Conversion of the *Hiei* heavy transport/tanker blueprints was completed by August 2273, and construction of Starfleet models could begin, now under the direct supervision of Fleet Admiral Nogura himself.

Outwardly, the new tanker hardly seemed a centerpiece of political intrigue. The vessel was of rather classic configuration, with a control compartment at bow, a propulsion section with separate warp and impulse nacelles astern, and a spine for cargo pod attachment in between. Significant flexibility was introduced with the 'militarization' of the design, however. The spine now consisted of 68 m segments, one of which was integrated to the bow section, while one or two could be added aft of this. The propulsion section would clamp onto the sternmost segment, cradling it with FIB-3 impulse engines port and starboard and mounting the warp nacelle atop. A move from circumferential to linear warp propulsion for once met Starfleet expectations, even if LN-64C was somewhat overengineered for the application. In fact, the robustness of the dreadnought engine helped alleviate the classic problem of single-nacelled transports, that of reduced performance under load. Warp 5 cruising and warp 7.2 to warp 9.0 top speed at full load compared very favorably with the original *Hiei* figures of warp 3 and 6, respectively. Yet the linear warp engine was heavier than the original Mi-133 by some 80,000 tons, or almost as much as the original cargo

capacity of the *Hiei*! This inevitably meant reduced impulse performance, as Starfleet had made no effort to install more powerful impulse engines or inertial mass reduction fields. In all fairness, it has to be remembered that the single-nacelle configuration represented a fantastically advantageous ratio of ship mass to cargo mass, less than 1.75 in the three-segmenters. The later *Overfield* and *Istanbul* multi-engine heavy transports would come nowhere near such performance – at least as long as one ingores issues of maneuverability and reliability.

Some seventy crew were required to operate the vessel in the basic Starfleet tanker-transport configuration. Accommodation was concentrated in the bow section, a classic AsTrans pseudo-aerodynamic, pen-tip shape that flared out from the main bridge on Deck 1 to two crew berthing decks below, then to two utility decks mounting the main navigational deflector and sensors at bow, and to a final three decks dedicated to support functions and stowage of consumables. There was plenty of space for military-standard shield generators (Prentice-Schafer Type L) and computers (Takakura Mk 4). Even though no armament was normally fitted, hardpoints and control software existed for two Type V emplacements. Additional navigational deflectors were mounted at the front tips of the impulse nacelles.

The service name *Lotus Flower* applied to the whole class, even though there were distinct variants: the number of spine segments was seldom altered after initial assembly. Fifteen hulls were completed with two spine segments, four with full three, and ten without spine extension. The largest vessels were almost completely dedicated to the supply of neutronic hydrogen to frontier bases, while the shorter units carried more diverse cargo. The vessels served with distinction in the conflicts of the 2270s and 2280s but, unlike the faster and more agile *Huntingtons*, seldom accompanied offensive starship formations or otherwise exposed themselves to the risk of direct combat. Ambushes were still a possibility, and shipments were typically escorted by a frigate or a light cruiser. *USS Silent Dawn* (NCC-S1812) nevertheless fell to a daring Klingon small craft raid in 2286, while for once performing the originally intended task of the class – namely, bringing antideuterium, tritium and spares to SB 36 for the exploratory fleet stationed there.



A midsize Lotus Flower *in distress – a popular if a bit sadistic scenario in Starfleet training programs, as even the formidable resources of a cruiser would be stretched in trying to protect, stabilize or tow such a behemoth. A* Lotus Flower *also always represents a valuable concentration of resources, complicating the command decisions faced by the trainees. The distress depicted here was for real, but the internal fires aboard* USS Orchid Garden *in 2311 were extinguished and the compromised tritium and magnesite tanks manually released before major loss of life. Carrying of hydrogen simultaneously with large quantities of magnesite was subsequently prohibited, even though the cross-connecting of bulk*

transporter chamber purge lines was a one-in-a-million accident (or, as suggested at the time, an audacious Romulan act of sabotage).

The expansion of Starfleet theater of operations after Khitomer peace meant that ever greater swaths of space were left without facilities that could refine heavy hydrogen isotopes. Logistics Command responded by stretching nine of the shortest *Lotus Flowers* to the two-segment configuration – by far the swiftest Fleet reaction to the new order of things, effected in just five weeks by dusting off spares. This added capacity was sufficient compensation, and freed Logistics Command from the nightmare of having to devote the sparse *Doppler* or *Dollond* assets to hydrogen hauling. The tenth 'shortie', *USS Night Rain* (NCC-S1809), was converted into a heavy repair ship in 2303, with the capacity to process *Excelsior* and *Apollo* cruisers in deep space emergencies ranging from hull repairs to warp coil swapouts. Two *Hieis* – the former *SS Edo Maru* and *SS Harika Maru*, now *USS Gale* (NCC-10901) and *USS Thunder* (NCC-10902), respectively – were also purchased for conversion to the role, while the hard-working *Aakenn* conversions formerly dedicated to heavy cruiser repairs were phased out.

Between 2308 and 2310, underway replenishment capacity was added to all the vessels, essentially turning them into independent frontline supply depots when needed. An increase in life support performance and in the fuel capacity of the tankers themselves tripled endurance, and thus further facilitated the depot ship and large tender role. Logistics management systems were updated to make best possible use of onboard transporters in the timely delivery of goods to a 'client' vessel. Select *Lotus Flowers*, mainly the midsize ones, also received CWD LN-64J and Kloratis IU-6001 engines for more economic operations.

The *Lotus Flowers* continued operations alongside *Overfield* and *Istanbul* heavy transports well into the 2350s. The Border Wars presented too great a survivability challenge, however, especially as the tankers had to operate at the limits of their propulsive performance. Re-engining was ruled out, and all vessels were stricken from active strength by 2354. Commercial customers immediately began to emerge, and the last sale was confirmed by late 2364. Fifteen of the ships went on to serve as general mercantile transports, high praise indeed to the Starfleet designers: a model taken from commercial stock a century prior was still attractive to the civilian market, thanks to the improvements introduced.

While most of the remaining vessels were sold for scrap, the three-segmenter *USS Placid Willow* (NCC-S1821) in 2364 changed ownership more or less intact, ostensibly to be converted to an entertainment complex. In fitting closure, a scandal of alarming proportions accompanied the departure of the class, just like one had shadowed its introduction. Behind the respectable façade of the *Placid Willow* purchaser lay Starfleet interests who clandestinely began to equip the vessel for carrying thousands of people on a journey of extreme range. To this day, the purpose and destination of the planned journey have not been discovered. What is known is that the Starfleet personnel acted under the influence of a group of invasive lifeforms, whose overall hostile intentions towards the Federation were unveiled in late 2364.

Huntington

Tanker
2274-2319

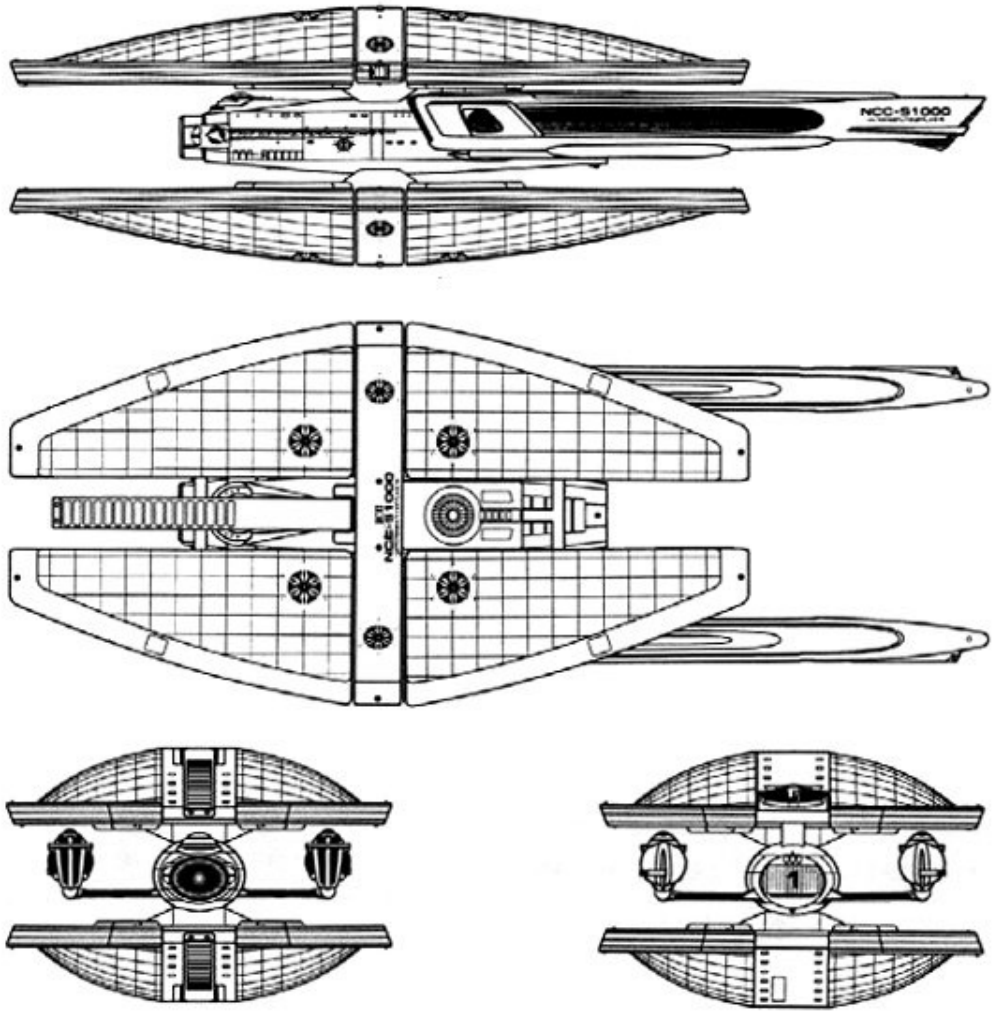
Completed:	38
Length:	259.9 m (original) 261.0 m (refit on NCC-S1000-03, S1014, S1016-19, S1024)
Beam:	102.5 m

Height:	70.3 m
Mass:	188,550 tons (original) 189,250 tons (refit on NCC-S1000-03, S1014, S1016-19, S1024)
Cargo:	22,000 tons
Cruise speed:	w 6
Max.speed:	w 7.5 (original) w 8.6 (refit on NCC-S1000-03, S1014, S1016-19, S1024)
Endurance:	3 years
Officers:	4
Crew:	48
Weapons:	2 phaser V emitters in twin bank above primary hull 2 phaser V emitters in twin bank below primary hull
Shields:	1-layer forcefield Navigational deflector beam on fwd primary hull
Transporters:	4 GP (6-pad), 2 cargo/ emergency evacuation (22-pad); Mk III All ships brought to Mk V standard after 2282
Auxiliaries:	2 medium shuttles, 4 work pods (standard) 4 tactical craft, 4 work pods (special self-protection complement)

Ships of historical interest:

USS Huntington (NCC-S1000)

SOURCES: (D Federation Frontiers / Mark Wilson)
(N Mark Wilson)
(H Mark Wilson & Eric Kristiansen)



In order to keep frontline units and outposts supplied with neutronic hydrogen, Starfleet needed more than the expensive *Lotus Flower* behemoths; an alternative tanker type had to be available in quantity. Two schools of thought had existed on the issue since the beginning of the century: some advocated the procurement of further fleet tugs that could haul fuel in standard containers, while others felt that any such construction would merely detract from the more important assignments of those tugs. The older *Ishinomaki* medium tankers denoted something of a mutual understanding between the factions, as they packed the general characteristics of a tug in a smaller, slower and more affordable spaceframe. Overhauling and upgrading these units for modern fleet speed would be prohibitively expensive, however. As the time came to design and field an all-new medium tanker, Starfleet saw no reason to look back. The most modern technology was put to use to limit costs by optimizing utilizability.

The *Huntington* (NCC-S1000) design balanced propulsive ambition against structural simplicity and single-mission austerity. The use of LN-60 engines was a controversial choice, as the concept of a "tanker cruiser" brought back painful memories of the failed *Almeida* multipurpose ships from a century prior. Logistics Command still wanted its share of the linear propulsion breakthrough, and was ready to pay top credit for it. The Defense and Exploration arms were willing to share, as the timely precision delivery of fuel to frontline assets was in their interests as well. Thus, 38 pairs of

LN-60 Mod 1 were allocated for the program, and calculations on the optimum capacity of the tanker could begin.

It was quickly determined that a load of some 20,000 tons of slush neutronic hydrogen would best meet the criteria set by the drive system performance, the frontline demand and the traveling salesman algorithm. Such a load could be housed in a structure much more compact than the standard cargo container. The tank of choice turned out to be a collapsible bladder, eight of which could be carried on a *Huntington* fully filled, and up to 24 when empty. The bladders were docked on transverse booms above and below the cylindrar main hull of the tanker, two forward and two aft on each boom when full, with empty bladders stacked atop each other as necessary. Three modes of fuel delivery were available, then: detaching of an entire bladder element, transporting its contents to a target, or pumping of fuel through dorsal and ventral umbilical booms stowed between the forward pairs of bladders.

On the receiving end for a change, a Huntington *transpumps deuterium from the Sigma Vega cracking plant on the planetoid Iota Aurigae III below. The network of automated refineries was created in the early decades of the Great Awakening, and served the deep space exploration initiative well in its earliest years. However, the refineries were highly vulnerable to raids, and their advanced di- and paralithium-based cracking systems were valued loot; by the 2280s, some 75% of the stations had been stripped of key components at least once. Still, reaching a Vega station could mean the difference between life and death for a traveler in the outer depths, and Starfleet still maintains the network along with assorted later commercial ventures.*

The complex logistics of back-and-forth movement of entire bladders were soon deemed impractical. In any case, most *Huntingtons* concentrated on delivering their loads to spaceborne end users incapable of receiving a bladder, and typically also unsuited for transrep; boom replenishment became the standard mode of delivery. Still, moving the fuel from tanker to a planetside asset was only possible by transporter, and each *Huntington* bladder was duly equipped with a focusing coil.

High warp speed guaranteed victory in the logistical challenge, but there remained other foes for the precious fuel haulers. To fight raiders to a decisive standstill, the *Huntingtons* were equipped with Type V phasers in dorsal and ventral dual mounts, and heavily shielded by a Type F field. Both defensive measures were greatly assisted by the compact layout of the ship: the curving shapes of the fuel bladders fit within a tight shield envelope, and provided obstruction-free field of fire for the defensive cannon. The tucked-in nacelles were also well protected, even though this somewhat limited their performance. Finally, impulse systems were located between the upper aft tanks, directly above the main reactor. In case both the passive and active defenses proved insufficient, a hangar aft of the reactor could embark four tactical craft for added protection – a rare precaution that would deprive the tanker of her usual two replenishment auxiliaries.

The investment in dedicated fast tankers received mixed critique both at the time and at various retrospective points. The high capital cost of 76 operational LN-60 engines and four spares was a natural target for original misgivings, and disapproving noises became louder with the 2283-85 refitting of LN-64F units on ten of the tankers. Yet production of the respective engine types was at full swing at the times in question, and was limited more by political than by economical or

technological factors; diverting of engine resources to the tanker program did not significantly hinder other projects. The freeing of general purpose tugs from theater fuel hauling, coinciding with the introduction of new light tugs capable of handling standard containers, created a surge of tugship resources that was initially seen as waste and folly, but in retrospect crucially helped Starfleet maintain both a defensive posture against Klingon aggression and a credible exploration program. In practical terms, Starfleet could delay the fielding of the giant *Doppler* and *Dollond* tugs by fifteen years. The dedicated tankers also helped the Federation wean itself from the standard container doctrine at a time when its economic and logistical usefulness was coming to an end.

For those who sailed on the *Huntingtons*, none of the above truly mattered much. In the eighties of mounting military crises and rare Starfleet callousness with its hardware and personnel, they could thank their lives on the original investment in fast, well protected fuel tankers. By the 2310s, they could congratulate themselves on a nearly casualty-free operational record, with no ships lost to any causes other than due retirement, and with just a handful of fatalities largely unrelated to enemy action or equipment failure. The final *Huntingtons* bowed out in 2319, as the somewhat heavier *Lauro* tankers brought Starfleet logistics to the levels dictated by its new reach.

Ticonderoga

Light reconnaissance cruiser
2274-2328

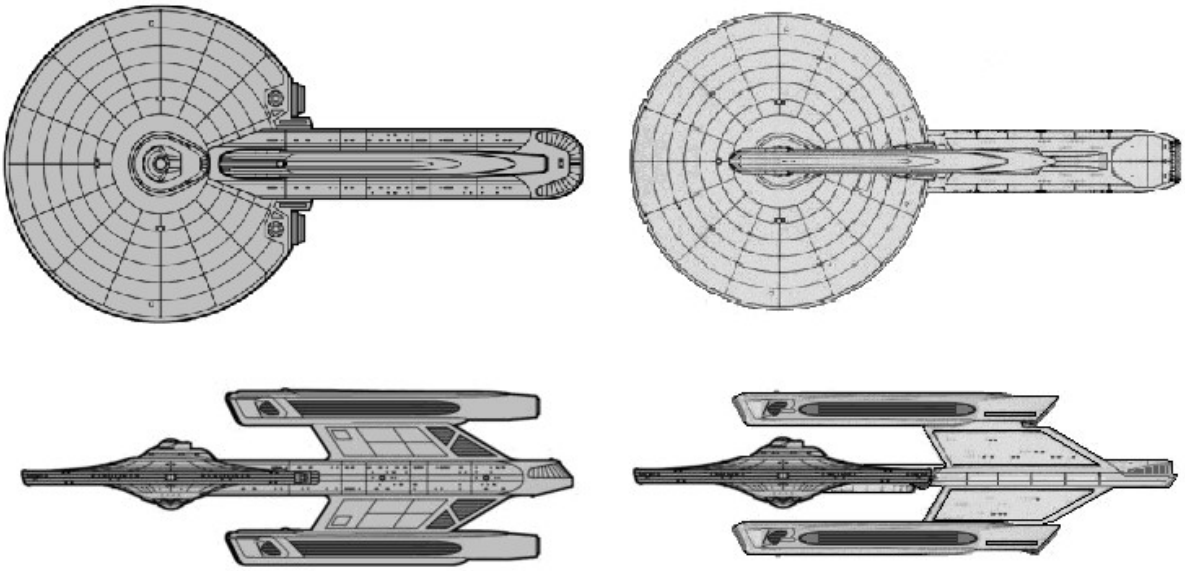
Completed:	26
Length:	234.0 m
Beam:	141.0 m
Height:	74.5 m (NCC-2020) 80.0 m
Mass:	720,000 tons (NCC-2020) 740,000 tons
Cruise speed:	w 7
Max.speed:	w 11.0 (NCC-2020) w 12.2
Endurance:	5 years (NCC-2020) 7 years
Officers:	35
Crew:	285
Weapons:	6 phaser VII emitters in twin banks on dorsal main hull 4 phaser VII emitters in twin banks on ventral main hull 2 phaser VI emitters in twin bank above shuttlebay doors 1 aft medium torpedo tube w/ 50 photorps on ventral stern
Shields:	2-layer conformal forcefields Navigational deflectors on engine pylons
Laboratories:	1 signals intelligence, 1 planetary sciences (NCC-2020) 2 GP, 1 planetary sciences, 1 astrophysics
Transporters:	3 GP (6-pad), 3 emergency evacuation (22-pad), 2 cargo; Mk V (NCC-2020 Mk IV)
Auxiliaries:	4 medium shuttles, 2 to 4 work pods

Ships of historical interest:

USS Bombard (NCC-2041), *USS Challenger* (NCC-2032)

SOURCES: (D FASA/Gary Perry&Matt Burke&Dale Kemper, modified by Brad Ferguson; size corrected)

(N FASA/Gary Perry&Matt Burke&Dale Kemper)
(H FASA/Gary Perry, own)



Not all of the funds Starfleet received for revigorating the light cruiser fleet went to the *Chesapeake* program. As it was clear from the start that the program would involve no refitting of preexisting light cruisers, there predictably was competition about the way the resources should be allocated. The demand for vessels with cruiserlike armament in a less flexible spaceframe was already being met by the *Avenger* program, so opponents of *Chesapeake* could easily plead redundancy and push for a completely different mission profile. An obvious and traditional light cruiser role was that of a destroyer leader, and demand for vessels in that category to match the most modern destroyers was certainly foreseeable.

The previous flotilla leaders had come in two tiers: the dedicated facilities aboard the *Hermes* family were suited for large formations and complex operations, while the more generic *Texas*, *Kearsarge* and *Amchitka* light cruisers had featured the right balance between adequate facilities and sufficient availability. The *Hermes* derivatives would not keep up with the projected modern destroyer types, though, and the *Avengers* could not afford to. Defense Command wanted to exploit this opportunity to field a fast vessel capable of advanced C^3I tasks, saving on other attributes to make the project affordable. Thus was born the *Ticonderoga*, NX-2020.

The registry might have hinted at a connection with the transwarp project, yet the only unconventional thing about the propulsion system chosen for the light reconnaissance cruiser was engine placement. The affordable yet capable LN-60 replaced the more modest LN-62 of the *Chesapeakes*, and a dorsal/ventral arrangement similar to that of the well-liked *Paladin* class gave the correct emphasis on speed at the accepted cost of maneuverability. But where the *Paladin* was upgraded to merely be a slightly better and faster destroyer-scout, the *Ticonderoga* brought cruiser phasers, C^3I space, laboratories and a shuttle hangar to the mix. The sternward-extending secondary hull was basically a repeat of the *Chesapeake* structure, just with added length to fully house the power systems, and the upper and lower engine pylons were sturdy structures well capable of doubling as fuel tanks.

On the surface, the design thus represented sound solutions for applying cutting edge technology, with just enough of a margin in onboard space for correcting what might go wrong at first.

Expectations were high, and secondary missions ranging from fast convoy escort to pirate hunting were being advertised – for a ship that was to meet an acute shortage of a very specific military capability! Yet mission flexibility was important at a time when peace with Klingons and Romulans seemed inviolable. Thus, after installing five twin banks of Armscor-Hindustan FH-10 heavy phasers on the primary hull, engineers also fitted a stern torpedo launcher, berthed four medium shuttles in the hangar, wired a planetary sciences laboratory next to the signals intelligence one, and added survey sensors to the ventral vertex of the saucer despite the location being obscured by the lower nacelle bow.

Within a month, it became evident that the engineers had jumped the gun. Expectations of warp 12+ performance were not being met, and the twin FID-X impulse engines under the saucer aft rim were struggling to provide projected acceleration without destabilizing the warp field. The problems were not in standards of construction, or even in execution of the concept, as repeated, frustrating engine retunings and repositionings finally showed. What was wrong was the warp theory on dorsal/ventral nacelle pairs: the advantages of this configuration could not be exploited with LN-60, but would only emerge if an inherently more capable engine was in use.

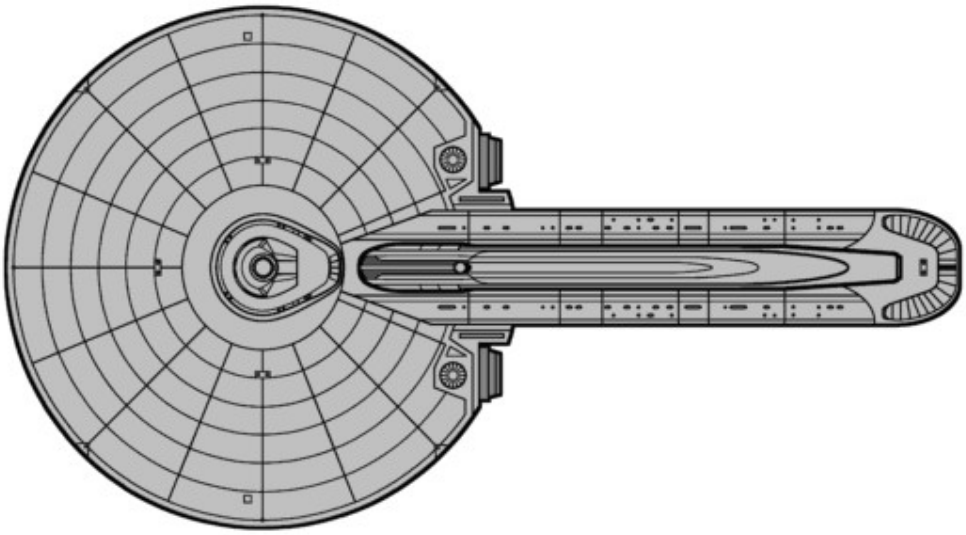
Starfleet went looking for destroyer leaders elsewhere. The *Wilkersons* were fast enough, especially when modern destroyer production wasn't pumping out superfast offensive units at quite the predicted rate. Even the *Monoceros* class sufficed for the time being, as the bulk of the destroyer force consisted of older, slower *Saladins* and *Larsons*. More significantly, the low-intensity conflicts of the early 2270s had demonstrated a new Fleet capability of networking wherein a seemingly random collection of frigates, strike cruisers and dreadnoughts could share targeting data with lesser units. The *Cochise* class was configured to be a recipient, and the refitted *Larsons* were slated to receive datalink capacity in a time of war, too. The time for dedicated destroyer leaders was more or less over.

The days of the *Ticonderoga* were not yet numbered, though. Commodore Gihlan's *Constellation* reconnaissance cruiser program introduced both conceptual and concrete hope for a bright future: Starfleet was now inclined to purchase fast, independent recce ships for its tactical needs – and the field computations and hardware design done on the *Constellation* dropped the perfect warp engine on the *Ticonderoga* engineers' laps. Simultaneously with the first modern *Constellations*, the first of an improved *Ticonderoga* generation were equipped with LN-70 and with twin Avidyne 2080 impulse engines, launching in 2286 to trials that easily verified warp 12.2 performance.

In keeping with the terminology of her benefactor, the reborn *Ticonderoga* was a reconnaissance cruiser, albeit a light one. Accordingly, the newbuilds were sent to the far frontiers to push the limits of early warning, and to provide first intelligence on approaching threats. Ripping out the flotilla control gear provided space for extended laboratories of proper light cruiser standard. While Defense Command might have considered missions of "deep space exploration" mere ruse, the dozen units completed before Khitomer peace achieved very real scientific results as well. In the frontier, there were inevitable challenges, and two of the cruisers disappeared without trace but with enough circumstantial evidence to suggest that the Klingon Empire, or at least elements therein, did not completely respect the Chancellor's signature.

The lost *Challenger* and *Bombard* were promptly honored by assigning of the names to modern cruisers – due payback for the fact that a heavy cruiser had appropriated the *Ticonderoga* name while the project was on hiatus, theoretically (but not in practice) forcing the renaming of the light recce cruisers as the *Pathfinder* class after the second ship built. The remaining fleet grew to include 23 of the *Ticonderogas*, no longer including the underperforming prototype, and served

with distinction alongside modern *Amerind* and *Constant* scouts of slightly more modest speed and range. No pirate hunts or escort missions ever distracted the ships from boldly going to see what lay beyond the rim of known. At their 2328 retirement, the *Ticonderogas* were easily the most traveled light cruisers Starfleet had ever operated.



Daran

Frigate
2275-2356

Completed:	68 total: 12 *Daran* frigates (later fast frigates) 8 *Murphy* frigates 5 *Bragg* survey frigates 26 *Knox* frigates 1 *Darter* fast frigate 19 *Decisive* fast frigates
Length:	243.6 m
Beam:	141.2 m
Height:	49.6 m (*Daran*, *Murphy*, *Bragg*) 53.1 m (*Knox*, *Darter*) 42.3 m (*Decisive*)
Mass:	739,000 tons (*Daran*, typical) 741,500 tons (*Murphy*) 738,000 tons (*Bragg*, estimated) 736,000 tons (*Knox*, typical) 731,000 tons (*Darter*) 699,000 tons (*Decisive*)
Officers:	45 (standard on patrol missions) 85 (standard on special assignments)
Crew:	260 (early standard; figures for later service years vary)
Cruise speed:	w 7 (original) W 6 (adopted by ships used in the 24th century)
Max speed:	w 11.0 / W 8.7 (*Daran*, *Murphy*, *Bragg*, *Knox*) w 11.4 / W 8.9 (*Decisive*) w 14.0 (*Decisive*, saturation drive)
Endurance:	3 years

Weapons: *Daran* NCC-3201, 3203, 3206, *Bragg*:
12 phaser VI in 6 twin banks in saucer hull
1 phaser VII emitter on fwd dorsal hull position (refit to NCC-3206)

Daran NCC-3202, 3204, 3205, 3207-12:
12 phaser VII in 6 twin banks in saucer hull
1 phaser VII emitter on fwd dorsal hull position (refit to NCC-3211)

Murphy:
10 phaser VI in 5 twin banks in saucer hull
2 phaser VII in lateral cuts on saucer hull
2 fwd medium torpedo tubes w/40 photorps on dorsal bow

Knox:
12 phaser VI in 6 twin banks in saucer hull
1 phaser VII emitter on fwd dorsal hull position (refit 2302)
8 phaser VI emitters in single banks on deflector pods above aft hull

Darter:
12 phaser VII in 6 twin banks in saucer hull
8 phaser VI emitters in single banks on deflector pods above aft hull

Decisive:
12 phaser VII in 6 twin banks in saucer hull

Shields: 1-layer conformal forcefield
Navigational deflectors on aft ventral hull
WADE plates on aft dorsal hull (*Daran*, *Murphy*, *Bragg*, *Knox*, *Darter*)
Secondary navigational deflector on ventral hull

Laboratories: 2 GP
2-4 signal processing (*Bragg*, additional, estimated)

Transporters: 1 GP (6-pad), 1 cargo, 1 emergency evacuation; Mk IV (*Daran*, *Murphy*, *Bragg*, *Knox*)
1 GP (6-pad), 1 cargo, 1 emergency evacuation; Mk V (*Darter*, *Decisive*)
All ships brought to Mk V standard after 2284

Auxiliaries: 2 medium shuttles, 2-4 work pods; Killer Bee kits sometimes carried (*Daran*, *Knox*, *Darter*)
2 medium shuttles, 4 work pods (*Murphy*)
2 medium shuttles, 2 work pods (*Bragg*, estimated)

None (*Decisive*)

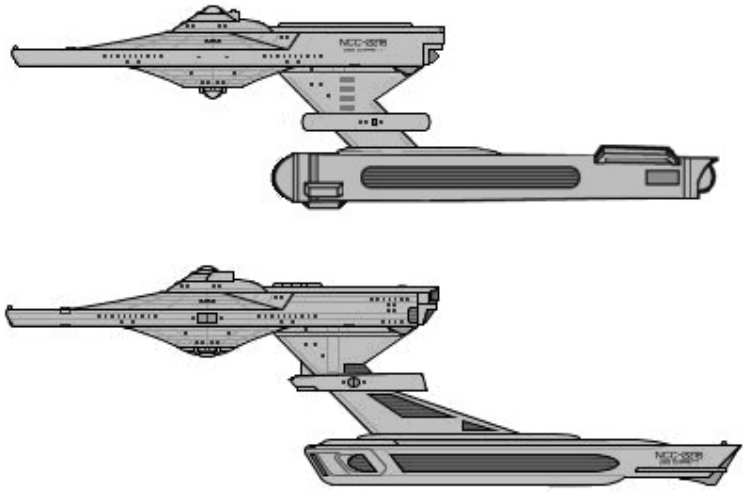
Ships of historical interest:

USS Ferghana (NCC-1939), *USS Matapan* (NCC-1960), *USS Ser'rath* (NCC-3205)

SOURCES: (D SotSF, Jackill/Eric Christiansen)
(N SotSF, Jackill/Eric Christiansen)
(H SotSF, own)

Developed to replace the *Loknar* class as the primary intra-Federation patrol and defense vessel, the *Daran* class of compact frigates made an exception to the trend of refitting or modifying existing spaceframes. Instead of a modernized *Loknar* hull, the *Daran* featured a smaller version of the *Avenger* hull arrangement. This avoided the problems of fitting warp propulsion systems based on inboard intermix in place of earlier self-contained warp nacelles. The *Loknar* class would have been eminently unsuited for such refitting, and was conceptually at odds with modern operational requirements and expectations anyway.

The frigate was initially conceptualized as a single-naceller, with a long ventral pylon for both the warp nacelle and a forward/aft torpedo launcher pod – essentially a militarized, greatly enlarged *K'kamarak*. Only a single example of this design was built, however. *USS Durrett* (NCC-3200) was completed in 2269 for a round of dissatisfactory trials, mounting a single ventral LN-47; an up-engining with a LN-64 in 2273 did not improve performance in a desired manner. Her hull met all the requirements for an affordable patrol ship, though, and was used as the basis of a highly successful series of starships from 2275 on.



The false start. Modification of USS Durret *to mount a linear excitation warp engine increased her height to a dangly 80 meters but did not give her sufficient cruise or top speed to be a contender in the patrol frigate game.*

In the first incarnation of the new patrol frigates, two LN-64 warp engines were mounted on short pylons underneath this primary hull, but farther inboard than in the *Avenger* design. The internal layout omitted most laboratory spaces to accommodate the necessary support systems in the smaller hull. The ship's twin-nozzled, twin-IMRF impulse deck of RST 1226 model was still flanked by two shuttlebays, each capable of holding two medium shuttles and up to four workbee-sized craft. The frigates were intended to support Starfleet's strategic aim of giving its new vessels considerable independent exploration capability. The shuttlebays were just part of this effort; the frigates also carried the sophisticated Poincare SSDGI sensor analysis system, allowing them to perform meaningful exploration tasks without having to accommodate onboard researchers and their laboratories.

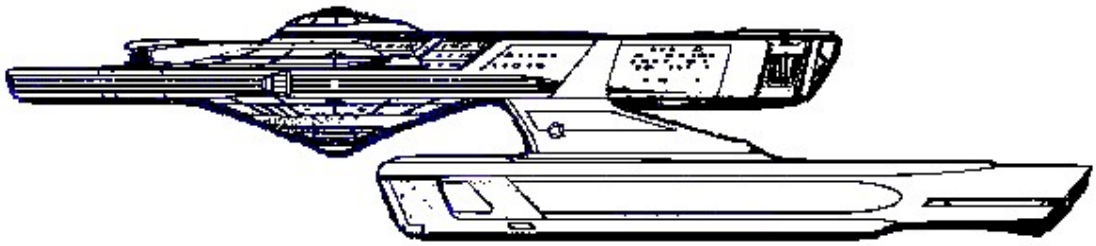
To simplify approach control, the shuttlebays were equipped with extended landing platforms, omitting the need for precision tractor beam guidance for the shuttles. As with *Avengers*, numerous one- and two-person lifepods were housed both above the shuttlebays and on the ventral hull, providing 35% overcapacity for crew evacuation if shuttlecraft were included. With lifepods alone, no overcapacity existed – but this had been the situation with frigate-sized vessels ever since Romulan wars (prior to that, undercapacity was the norm aboard small vessels!).

The weapons were limited to 12 phaser VI emitters, without torpedo tubes or attachment latches for an extra weapons module; a balanced weapons fit for a patrol type, although lacking aft-firing emitters. The ship was lavishly equipped with latest-standard fire control and medium range sensor systems, however. The notably high cruise and top speeds of warp 7 and 11, respectively, enabled effective patrolling of the Federation with fewer vessels; 12 ships of the original configuration were built between 2275 and 2277 to replace some 30+ *Loknar* frigates. However, increasing military tensions prompted Starfleet to initiate the development for a more heavily armed model to replace the rest of the *Loknars*. Initially, about half of the *Darans* were equipped with phaser VII instead of phaser VI banks, but the output of the power systems did not quite do justice to this heavier weapons fit.

The more militarily oriented follow-ons were fielded in late 2276. Equipped with narrow-beam deflector pods and phaser clusters on special mounts above the aft hull, and austere Dobis weapon control systems, *USS Knox* (NCC-1940) and her successors provided much-needed brawn at low

cost and complexity; some 3,000 tons of mass was also skimmed from *Daran* figures. The added phaser mounts hardly counted as grounds for a 'heavy frigate' designation for the new type, so from 2275 to 2293, the *Darans* were known as 'fast frigates' in compensation. Yet their performance in no way justified this moniker, either: *Knox* cruise and top speeds were quite identical to the *Daran* ones. Modifications to auxiliary craft carrying systems included addition of impulse engine shrouds to enable flight deck approaches during impulse operations, plus omission of the landing platforms in favor of a refined tractor beam system. To utilize the flight decks to the fullest, the *Knoxes* usually carried dedicated warp-capable reconnaissance craft of *Messina* class.

Going the other way, *USS Murphy* (NCC-1930) and her sisters added mass and complexity in the form of a destroyer-style Mk 8 twin torpedo launcher embedded in the upper bow. As if this didn't yet tax the spaceframe and secondary power loops enough, two single Type VII phaser banks were mounted athwartships, in forward-facing cutouts; the same weapon type was also experimentally installed on the forward phaser berths of two *Darans*. The results were comparable on all the ships, ranging from power spikes to overheating and recoil in a spaceframe too cramped and fragile to properly host the weapons. Despite the problems, the *Murphy* subclass was adopted into the operational frigate arsenal, but production never proceeded past the initial eight vessels.



The lightest heavy frigate in the Fleet? Or the heaviest light frigate? Identity crisis was the least of the problems facing the Murphy *class during its two decades of operations. At the end of this career, Starfleet still hadn't quite solved the problems of integrating a medium torpedo launcher with a saucer-type primary hull, although the cutout installations of the perimeter ships were a definite improvement over the clumsy bolt-on affair of Common Claw on the* Murphies.

Another similarly limited production run was nevertheless deemed crucial to Federation security. Without the means to openly challenge the Klingons during the Organian peace, Starfleet understandably was concerned that advances in Klingon military technology would go unnoticed and that crucial advantage could be lost in many fields. As conventional tactics of coercion and bribery floundered on newly found Klingon national pride, a hardware-based solution was sought, and five all-new spyships based on the *Daran* were built in 2276-79 to boost the aging sigint force of converted heavy destroyers and heavy frigates. The new ships received a largely internally housed instrument suite that took up the volume of the portside shuttlebay. The mundane external looks of the vessels were well suited for their assigned dual mission profile. The *Braggs* (NCC-1935-1939) were operated in a *Daran*-like manner as armed shepherds of frontline exploration, allowing them to perform both passive and intrusive analyses of border defenses on the side.

Until the activation of the first *Constellation* and *Ticonderoga* reconnaissance cruiser units, the *Braggs* were also flown solo for 'strategic exploration tasks' in the unexplored areas along the Klingon border, carrying various sensor fits for eavesdropping on Klingon transmissions and scanning for cloakship traffic as well as for useful planetary systems. In 2283, these missions proved worthwhile when several class K planets rich in key minerals and two near-spaceflight cultures were found in the area. Significant information also was gathered on the Klingon defense network, especially on the newest generation of cloak-compatible targeting scanners.

The data on Klingon offensive capabilities was of the greatest strategic interest, however. Largely owing to this data, as many as 26 border patrol frigates of the *Knox* class were built during the long production run from 2275 to 2281. That 'in-between' registries of 1930-1934 and 1940-1965 had been allocated showed that Starfleet had not yet given up on its esoteric effort of filling in all the gaps left in the registry system prior to the end of the century. When the 25 frigates of the superfast *Ianar* class entered service, all the remaining *Loknars* had finally been replaced. Even though the four new classes each had mission profiles rather different from the *Loknar* one, the generation change was one of the smoothest in Starfleet history, resulting in no drops in the quality or quantity of services provided.

Deep space maintenance of a phaser pod. The Knox *frigates were remarkably self-sufficient for local defense vessels, and could play a broader role if required. On the other hand, they were slightly too expensive to be fielded in truly significant numbers, and forced Starfleet to dally with the 'heavy corvette' concept of similarly armed yet much more limited starships.*

However, simple replacement of existing Fleet strength was not sufficient for the political atmosphere of the 2290s. War with the Klingons loomed closer and closer; Starfleet could not neglect any chance to increase its numerical strength, and using growth versions of tried and true designs was one such chance. An experimental upgrade of the *Knox* design had been tried in 2286, but *USS Darter* (NX-3213), with LN-64B mod 4 warp propulsion units, had not yielded sufficient performance improvements. A lightweight design dubbed the *Fury* class had also been abandoned in 2287, when a temporary gust of détente had swept across the borders in the aftermath of the Nimbus III hostage crisis. Now the leftover resources and engineering experiences of these two programs were combined, so that in mid-2291, a trimmed-down and beefed-up frigate named the *Decisive* (NCC-3351, no experimental registry allocated) could be placed in immediate operational readiness.

The *Decisive* featured a modified primary hull with angular contours similar to the *Ianar* class. She also sported twin deuterium-deuterium fusion impulse engine assemblies, LN-64B mod 5 nacelles and an improved main powerplant capable of field-saturation accelerations similar to those utilized by the *Ianar* class. Top speed could be increased to warp 11.4 (normal drive) and warp 14 (saturation drive) through these modifications and, Starfleet hoped, would allow the ships to perform offensive in addition to defensive duties in their assigned patrol areas. While such light vessels could not hope to challenge enemy cruisers, even when operating in pairs or three-ships, they could be used for countering the newest Klingon threat – the cheap, agile and deadly *Ch'ing* Bird of Prey cloakship, now produced in frightening numbers.

Shuttle facilities were omitted both to save weight and to allow for the revamped impulse propulsion system, thus improving the sublight agility of the frigate. Two standard docking ports, one aft of the bridge and one in the ventral primary hull, were included to facilitate small craft operations. Weaponry was of *Daran* standard, but with all-new Kalis fire control systems and a longer-ranged, low-emission sensor suite, both required for the strike operations that called for speed, stealth and precision. Nineteen *Decisives* were to be built at first, but procurement was also planned for a follow-on class. Known simply as the FF-2300 class (with tentative registries from NCC-3364 to NCC-3383 allocated), this class would introduce integrated torpedo armament to the lighter end of the frigate category and be able to challenge the Birds of Prey on an even footing.

However, the *Decisive* subclass turned out to be the last *Daran* derivative to be put to Starfleet service. Khitomer accords were merciless towards any escalation projects still in the planning stages; the FF-2300 was deemed too narrow-scoped for peacetime production, and the project cancelled before a single spaceframe had been finished.

***

USS Ser'rath (NCC-3205) was the first *Daran* battle casualty, falling prey to an apparently renegade Klingon vessel in 2279, and giving the first insuppressible evidence to the Federation that the Organian Peace Treaty was no longer fully enforced by the noncorporeal inhabitants of Organia. Preliminary investigation by *USS Escovedo* in 2284 revealed the surface of Organia wiped clean of life by unknown forces. But the results of the investigation were kept largely secret for decades in fear of forceful Klingon reactions.

The *Daran* frigates often escorted exploration task forces or single science vessels in risky assignments, also contributing to the science output with their excellent sensor suites and powerful analysis computers. Despite their far lesser sensor capabilities, the *Knoxes* were also utilized in this mission. *USS Matapan* (NCC-1960) of *Knox* class was lost outside explored UFP territory during a classified operation in 2283, along with survey frigate *USS Bragg* (NCC-1938) and two accompanying scouts. In all, six ships of the class were lost outside Federation borders, highlighting the new, expanded role of frigates in the 'post-destroyer' Starfleet. Ironically, *Decisive* class vessels saw no action outside UFP borders during the Klingon crisis, despite having been designed for that very purpose.

A minor refit was performed on the *Knox* vessels beginning in 2302: novel 'Emperor' Type VII emitters (practically draining the ship's weapons power even though only fired in pulsed mode) were mounted on the forward primary hull phaser berths. Navigational sensors were also upgraded for all subclasses. Also, the *Darans* had their port shuttlebays sealed off for increased cargo space and for use as a storage and staging area for boarding parties, both necessary features in the newly found role of intra-Federation law enforcement and shipping protection.

In 2315, multiphasic tuning was attempted on *USS Trial* (NX-1948), an extensive modification of the original *USS Le Malin*. The experiment proved only a moderate success, resulting in no speed increases and only minor cruise performance improvement. Several warp-dynamic changes were subsequently made on the vessel, including repositioning of nacelles and extending of hull; none increased performance to the desired degree. The unique vessel ultimately entered operational use as a subclass of one, equipped with a stock *Avenger* torpedo module.

The smartly painted USS Trial *in her final guise, with an extended primary hull equipped with modern lateral sensors, and with LN-64M warp engines. This warp-dynamically streamlined primary hull was at one point suggested for the entire* Miranda *fleet, yet deemed financially unfeasible.*

The *Knox* and *Daran* classes were replaced by the *Renaissance* class and retired or mothballed in the 2340s, and a few examples of both subtypes still remain in storage. The last remaining *Decisive* units were briefly reactivated in the 2350s for operations in the Talarian front, as more modern types were tied with the Cardassian conflict. These worn-down and outdated ships were decommissioned and scrapped in 2356, at which time next-generation frigates had already enjoyed decades of service.

Akula

Destroyer
2275-2287

Completed:	16
Length:	220.0 m
Beam:	141.7 m
Height:	80.1 m
Mass:	684,000 tons
Officers:	52
Crew:	173
Cruise speed:	w 6
Max. speed:	w 11.0
Endurance:	2 years
Weapons:	6 phaser VII emitters in 3 twin banks, fwd and port/stbd of bridge 4 phaser VII emitters in 2 twin banks, port/stbd of lower sensor array

2 medium torpedo tubes w/ 35 photorps on ventral engine pylon

Shields: 1-layer conformal forcefield
Navigational deflector on ventral main hull

Laboratories: None

Transporters: 2 GP (6-pad), 1 emergency evacuation (22-pad); Mk IV

Auxiliaries: 2 light shuttles, 2 work pods

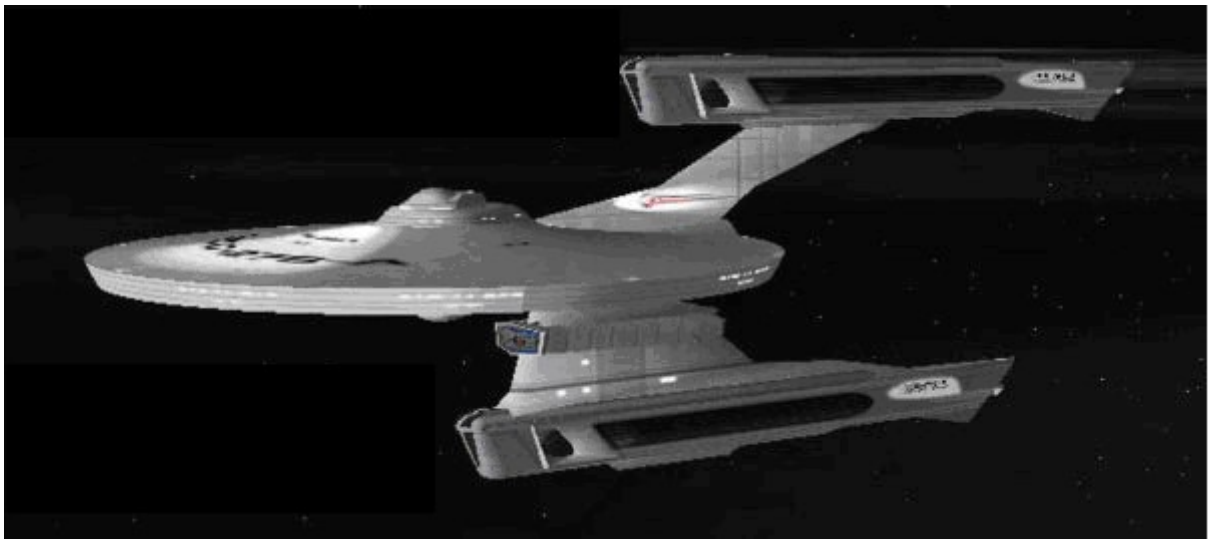
Ships of historical interest:

USS Akula (NCC-278-A), *USS Earle* (NCC-4726)

SOURCES: (D SFB/SFCII computer game)
(N SFB/SFCII/Klingon Academy computer game)
(H SFB/SFCII computer game)

The failure of the *Jenghiz* (NCC-501) destroyer conversion did not completely discourage proponents of a *Saladin* refit program. There was too much at stake for the dozens upon dozens of old single-nacelle destroyers and scouts, temporarily idled by Organia, but no doubt soon to be called back to arms. Parallel to the *Jenghiz* program, Geering had been running the *Siva (III)* project where at first one, then two LN-64 nacelles had been installed dorsally on a former *Siva (II)* spaceframe. Performance-wise, the results were a great improvement over *Jenghiz*, but the conversion process itself hopelessly awkward and expensive. A more economical way of adding a second linear nacelle to a vessel of *Saladin* descent would have to be devised, and a combination of *Jenghiz* and *Siva (III)* was seen as a possible solution.

Still, there was much potential for missteps and complications in converting another elderly destroyer to a proof-of-concept vessel. Starfleet wisely released funds for the construction of an all-new prototype, built with the future conversion program in mind but hopefully steering clear of its many unpredictable pitfalls. At a rapid pace made possible by the previous experiences, a vessel combining the *Jenghiz* lower hull and a second, dorsal nacelle was put together at Titan, and launched for trials in May 2275.



The prototype destroyer Akula *in all her glory. One of the few Starfleet vessels to carry the registry of a former namesake, the* Akula *honored the memory of the* Placido *class scout that in 2223 sacrificed herself for the Federation cause. Due to the uneventful career and pedestrian performance of the second vessel, no NCC-278-B is forthcoming.*

In profile, *USS Akula* (NCC-278-A) was as unflatteringly ungainly as her two parents had been. The lower engine pylon, which also held the KR13-L reactor and a paired Mk 7 torpedo launcher, had wider chord than ever before; the structure no longer held any commonality to the original *Saladin* neck, but at least avoided the major problems of internal volume associated with the earlier refit attempts. The torpedo launcher was also raised significantly higher, providing the necessary clearance from the lower warp field. Two shuttlecraft could be stowed at the rear end of the torpedo assembly, although not efficiently serviced. A 'Navas' tactical sensor suite was installed on the lower vertex of the modern Class D saucer hull.

The dorsal nacelle was held on a simpler, narrower pylon, swept back at an acute angle so that the top nacelle rode some 40 meters farther aft than the bottom one. The greater degree of asymmetric field control catered for warp maneuvering, and had the incidental effect of offering better dorsal phaser cones of fire plus the possibility of equipping the bridge with an aft-facing docking port. There would be five twin phaser banks in all: three on the dorsal side, two on the ventral. Shielding would rely on Type H generators, two of which would be present. Impulse propulsion was initially based on an Avidyne 4077 system, resulting in a less agile two-naceller than the FIE-2 –powered *Wilkersons*.

Trial runs verified the combat prowess and warp performance of the *Akula*, yet did nothing to assure Starfleet or the Councils of the viability of refitting the mothballed armada of destroyers to these specifications. As the need for modern destroyer units was pressing, though, the permission was given to finish a flotilla of vessels to the new design, then start the first conversions. Funds were directed away from single-nacelle destroyer production, truncating the *Larson* refit and delaying the *Cochise* program. In return, the Fleet gained thirteen attrition vessels with modest overall capabilities disproportionate to the presence of two top-rate cruiser engines.

Whenever pressed to combat, the *Akulas* acquitted themselves well enough. Many were brought against Klingon raiders in defensive one-on-one engagements, and proved to possess sufficient firepower to deter enemy light and medium units even when those outmaneuvered the less than agile Starfleet destroyer*. The overall contribution of the class was still one of adding to the already hopelessly byzantine collection of Starfleet destroyer types, holding back efforts at standardization, and throwing good money after bad in the hopes that the *Saladin* mothball fleet could be revigorated. After the *Cochise* class was found to have equal or superior performance with just one nacelle, it became obvious that the *Akula* flotilla would not survive the next defense review. The first losses in 2284, beginning with the demise of *USS Earle* (NCC-4726) at Cain, sealed the fate of the class. The brief détente of 2287 merely provided the formal excuse for the retirement of the twin-engine destroyers.

There would be no standardized destroyer type for Starfleet in the final decades of Klingon conflict. Of the *Cochises*, refitted *Larsons*, and lesser units like upgraded *Wilkersons*, *Chargers* and *Kovarises*, often just one flotilla of each type would be in service; only the small *Bakers* amounted to three. Massive logistical problems thus existed to limit Starfleet's ability to efficiently deploy its destroyer resources. It is no wonder that Starfleet after Khitomer limited itself to basically a single type of destroyer, while also commonalizing the frigate arsenal as much as possible.

* For a good while, *Akula* was in fact the standard adversary in Klingon combat simulations, enjoying a bloated reputation mirroring that of the *K'teremny* class. As Klingon simulator training generally favors unrealistically challenging scenarios, it remains in doubt whether the forces thus trained really believed they would face great numbers of the advanced design. Certainly this was not the view of the strategic leadership of the Empire at the time.

Constellation

Through-deck cruiser (later cruiser)
2276-2284

Completed:	3
Length:	315.0 m
Beam:	168.1 m
Height:	85.2 m
Mass:	1,120,000 tons
Cruise speed:	w 7
Max.speed:	w 13.0
Endurance:	8.5 years
Officers:	41 (pilots not included; usual complement 30 Starfleet and Marine pilots)
Crew:	375
Weapons:	4 phaser VIII emitters in 2 twin banks on dorsal hull 4 phaser VIII emitters in 2 twin banks on ventral hull 1 medium fwd torpedo tube w/ 150 photorps or probes on dorsal primary hull 1 medium fwd torpedo tube w/ 150 photorps or probes on ventral primary hull
Shields:	2-layer conformal forcefield Primary and auxiliary navigational deflectors on fwd hull
Laboratories:	2 GP, 1 planetary sciences
Transporters:	4 GP (6-pad), 4 emergency evacuation (22-pad), 4 cargo; Mk V All ships brought to Mk VI standard after 2314
Auxiliaries:	Up to 12 shuttles, 12 tactical craft and 6 work pods

Ships of historical interest:

USS Constellation (NCC-1974), *USS Sempach* (NCC-2591), *USS Speedwell* (NCC-2592)

SOURCES: (D own)
N TNG
(H Diane Duane "Bloodwing Voyages")

The *Constitution* and *Surya* modernization programs put together promised to be the rebirth of Starfleet, or then its financial ruination. Never before had the Fleet dared attempt the effective recalling of so many capital ships, no matter how great the benefits of upgrading. Even after the gamble was shown to be paying off, with the Klingons respecting or at least tolerating the Organian treaty and concentrating on infighting instead, the risk of financial or technological missteps hovered over the refit program.

Starfleet knew it would be raising the stakes when the dreadnought deterrence force was brought in for modernization. Fallback plans had to be devised, even though only one plan at a time could receive the financing required for success. In the early August of 2274, when *USS Federation* powered down for her demanding refit, three competing 'safety net' projects were circulating in the Council halls. Two involved 'economy dreadnoughts' modified from heavy cruiser or strike cruiser components. One defied conventional wisdom on risk reduction, however: the only thing Project Constellation owed to preceding starship classes was the prestigious name.

Devised as a means of providing high performance with mediocre hardware, Project Constellation proposed the application of four LN-60 warp nacelles and two Namada NK impulse decks on a

single saucer hull voluminous enough to house dreadnought functions. As Starfleet hesitated, realizing that the radical approach required a full scale prototype or two for mere conceptual validation, Vickers played a card worthy of the great gamble: the company suggested that the vessels built to this portly configuration would make for excellent through-deck carriers, at least in terms of the Organian treaty limitations. In theory, the Klingons could not complain when Starfleet fielded a number of newbuild 'effective dreadnoughts' in addition to the ones it was refitting. Of the ten slots agreed upon for through-deck cruisers, four still remained open as of 2275.

The *Constellation* (NX-1974) was laid down without delay, receiving a registry suggestive of through-deck cruiser lineage. Vickers recouped its losses from the abortive *Constitution* Phase II project when four of the twelve extraneous LN-60 engines were integrated to the spaceframe in May 2275. Keels for two further vessels were laid, and the lead ship initiated a test program concentrating on the unorthodox propulsion arrangements.

The four nacelles rode at the ends of standard Phase II pylons arranged in an X shape, branching out from a stubby, rectangular engineering section that merged with the aft rim of the saucer hull. Inside the section was the primary plasma distribution manifold that fed the warp engines and the twin impulse assemblies with the energies derived from a horizontal multilinear assembly on main hull centerline. More than twice the size and power of the recent cruiser reactors, the system was still fairly conventional and used off-the-shelf components. The risks of the program involved the warp field configuration, the rigorous testing of which continued as tactical systems were installed on the vessel.

The saucer was similar in diameter to the Class 1D standard, yet three decks high at the widest part. The upper and lower surfaces both held twin banks of heavy phasers to port and starboard, and a potent Mk 4 torpedo launcher on centerline, with vast magazines of large caliber ordnance – once again off the bountiful shelves of Earth's primary military contractors, and easily integrated thanks to virtually limitless available internal volume. Few other systems would compete with the aggressive hardware: only three laboratories were installed, and the shuttlebays on both hull flanks were provided with the most rudimentary support gear only. In contrast, interiors were rather lavishly decorated, both for crew comfort on long patrols, and for the significant PR role the vessel played for Vickers.

As the *Federation* refit program indeed showed signs of stumbling, the sister ships *Sempach* (NCC-2591) and *Speedwell* (NCC-2592) were swiftly completed, and equipped with even more powerful reactors and an improved computing system. Plans on procuring the fourth and fifth units, *Swiftsure* (NCC-2590) and *Stargazer* (NCC-2593), were running only slightly behind; Starfleet was now geared for the expansion of the dreadnought fleet even at the risk of Klingon counterreaction.

On maneuvers at 302 Ceti, the Speedwell *demonstrates her unique engine configuration next to the more conventionally mounted LN-60 pair of* USS Monitor.

Yet it was not the Klingons that would act in 2276, but rather their former allies and now re-embittered enemies from the Romulan Star Empire. Aggressions peaked as the result of a multitude of factors, but foremost among them was the internal instability of the Star Empire in the aftermath of the disastrous Klingon alliance and a series of failed schemes against UFP economy and security. The Federation now responded in kind, readily if secretly authorizing Starfleet to engage in Operation Grey Ghost, a military expedition to exploit the instability and score intelligence coups with outright intrusion of Romulan space. Some three dozen capital ships were involved in the effort, performing tasks ranging from raiding of Romulan centers of weapon research to supporting Romulan dissenters in fights against the Imperial forces. The massive campaign was all the more remarkable for the fact that there had been barely a month of lead time in its planning. None of the *Federations* were able to take part, and the heaviest firepower was provided by the *Sempach* and the *Speedwell*, both engaging Romulan assets on the Federation side of the Neutral Zone.

While the expedition concluded positively, providing the Federation with contacts in the Romulan government that ultimately emerged from the instability, the combat engagements themselves were a disappointment to Starfleet. Modern Romulan cloaking technology had defeated Starfleet countermeasures, and two cruisers had been lost to older Romulan vessels now equipped with a new generation of beam weapons. The delicate drive system of *Sempach* took eleven months to repair after a fairly limited exchange of fire, and *Speedwell* lost shields thrice in similarly restrained engagements. Most damningly, warp performance wasn't panning out, either; Starfleet wasted no time before diverting its efforts to the second fallback plan, the *Ascension* light dreadnoughts of strike cruiser descent. Work on *Swiftsure* and *Stargazer* (already renamed *Valkyrie* and *Hathaway*) was put on indefinite hold.

Vickers yielded gracefully, having liquidated its LN-60 excess, and moved on to LN-62 and its more lightweight applications. The *Constellations* entered a period of awkward dormancy, not quite qualifying for dreadnoughts yet not easily fitting in with the cruiser fleet, either. Few dared suggest a future role for the class – to the contrary, the motion was forwarded that the legendary name of the lead ship be freed for use on more successful designs. However, low-key work on transwarp systems would continue on NX-1974, and eventually attract the attention of Starfleet again. The surprising revival of the *Constellation* class in the 2280s is described in a separate entry.

Draco / Athabaska

Galactic survey cruiser/strike cruiser
2276-2349 (*Draco*)
2284-2311 (*Athabaska*)

Completed:	4 total: 3 *Draco* galactic survey cruisers 1 *Athabaska* survey/strike cruiser
Length:	284.8 m
Beam:	141.7 m
Height:	75.9 m (*Draco*) 62.0 m (*Athabaska*)
Mass:	1,090,600 tons (*Draco*) 791,000 tons (*Athabaska*)
Officers:	104 (*Draco*) 68 (*Athabaska*)
Crew:	496 (*Draco*) 402 (*Athabaska*)

Cruise speed: w 10 (*Draco*)
w 8 (*Athabaska*)

Max. speed: w 12.2 (*Draco*)
w 11.7 (*Athabaska*)

Endurance: 60 years (*Draco*)
5 years (*Athabaska*)

Weapons: *Draco*:
6 phaser VII emitters in three twin banks on dorsal primary hull
6 phaser VII emitters in three twin banks on ventral primary hull
2 phaser VI emitters in single banks on ventral secondary hull
2 phaser VI emitters in single banks on dorsal aft secondary hull
1 medium fwd torpedo tube w/ 100 torps and 280 probes
Athabaska:
6 phaser VII emitters in three twin banks on dorsal primary hull
6 phaser VII emitters in three twin banks on ventral primary hull
2 phaser VI emitters in single banks on ventral secondary hull
2 phaser VI emitters in single banks on dorsal aft secondary hull
8 phaser VI emitters in single banks on deflector pods on aft dorsal primary hull
2 medium fwd torpedo tubes w/ 100 torps

Shields: 3-layer conformal forcefield
Navigational deflector on secondary hull bow
Auxiliary navigational deflectors on ventral primary hull
Auxiliary navigational deflectors on dorsal pods (*Athabaska*)

Laboratories: 24, in varying configurations (*Draco*)
8, in varying configurations (*Athabaska*, survey configuration)
2 GP, 1 sigint, 1 medical (*Athabaska*, strike configuration

Transporters: 4 GP (6-pad), 3 emergency evacuation (22-pad), 3 cargo; Mk III

Auxiliaries: 4 medium, 2 heavy and 2 light shuttles, 1 or 2 special environment craft, 6 shuttlepods, 8 work pods (*Draco*)
4 medium, 2 heavy and 2 light shuttles, 4 shuttlepods, 6 work pods (*Athabaska*, survey configuration)
2 medium and 2 light shuttles, 4 shuttlepods, 6 work pods, 12 tactical craft (*Athabaska*, strike configuration)

Ships of historical interest:

USS Andromeda (NCC-2006) / *USS Athabaska* (NCC-2560), *USS Magellanic Clouds* (NCC-2005)

SOURCES: (D SFD, own)
(N McIntyre ST2:TWoK novelization)
(H SFB, McIntyre ST2:TWoK and ST3:TSfS novelizations)

Exploration Command in the early 2270s was a much diminished organization. The cancellation of the deep space program had been followed by mass retirements of exploration vessels in all size categories, and funding on anything but the ever-topical dilithium hunt seemed impossible to secure. At this nadir, a seemingly even greater blow sent the organization reeling. What else could be expected in the aftermath of the V'Ger intrusion except a massive diverting of resources to defensive starships?

Yet even as Defense Command launched modernization programs on its dreadnoughts and threw together stopgap measures such as antimatter-laden droneships, Offices of Strategic Planning was jointly approached by Exploration Command and the Federation Science Academy. Commodore Kenneth Dodge enumerated the recent incidents involving extragalactic intruders and pointed out the key role of extreme range exploration in providing advance warning against threats of this type. In a closely coordinated research proposal, Dr Esonja Malo in turn outlined a series of deep-ranging missions whose goal would be in the galactic halo, a region of considerable scientific as well as strategic interest. Both pundits made note of the recent advances in technology that would allow missions of *Byrd* type to be doubled in endurance and increased tenfold in effective range.

The initial reactions were cautiously favorable, and in the following years, proposals were polished. The original idea of an exploratory dreadnought upgrade was refined into a hybrid vessel featuring

a *Miranda* type extended primary hull for increased internal volume and auxiliary craft capacity. The mission profile was hybridized as well, making use of the new capabilities in a secondary mission of planetary assault. The bait was effective in securing funding for one such vessel to be constructed in parallel with the *Ascension* dreadnought program, and for two further options.

Also refined was the scientific plan of attack. Three primary targets were downselected for the project: dwarf galaxies within 100,000-300,000 ly from the Federation offered the greatest potential for return of data. Their location beyond the duonetosheath of the Galactic Barrier balanced their promise of mysteries against the mission risks of distance and isolation. Sorties thither and back would take up to 60 years, allowing for two years of exploration at the point of interest.

Acquisition of hull components and engines benefited from the high-level blessing of both Defense and Exploration Chiefs. Merging the hulls of ships that never were, *USS Draco* (NCC-2004) soon sported tried and true components in an exceptional combination. Her primary hull hangar facilities offered stowage for consumables as well as for the fleet of auxiliaries that would be deployed at destination. Two dozen laboratories were permanently installed and arranged so that the research personnel could be efficiently accommodated next to their working environment. For most of the journey, these facilities would serve as living quarters and communal spaces. Advanced socioergonomic data had already been gathered on the *Byrd* vessels to alleviate the risks and discomforts of the long voyage.

Life support was not a systems bottleneck; the greatest challenges lay in ensuring availability of primary power for six decades. Extensive workshops and fabricators in the secondary hull would provide spare parts and service to the fully duplicated main power chain, but fuel replenishment would require outside assets. Dense nebulae or gas giants would yield fusion fuel for an array of antimatter converters in the secondary hull. Warp propulsion was provided by three LN-64C Mod 2 nacelles, tuned for sustaining the required cruising speed of warp 10 at the cost of dash speed. Maximum impulse performance for the massive vessel was curtailed as well, yet of scant operational concern.

Nearly 300 probes were stored aboard alongside 1,600 subspace booster relays and 100 long range torpedoes, with the capacity to manufacture more of each projectile type as needed. Out of power economy concerns, phaser armament was of strike cruiser rather than dreadnought level. The one thing the *Dracos* (also known as the ‘galaxy class’, for obvious reasons) were not designed for was a rat race with the Klingons: as soon as each vessel in the class was completed, she would be launched far beyond UFP borders and never look back.

The *Draco* herself launched for trials in early February 2278, and set sail for her fated destination 280,000 ly away in July 2278. Aboard were 600 young volunteers, led by Commodore Giulio Mezzaccio. Next in line was the *Magellanic Clouds* (NCC-2005), headed for the larger of these dwarf galaxies under the command of Captain Mandala Flynn. Then followed the *Andromeda* (NCC-2006), exploring the irregular cluster in the direction of M-31 some 197,000 ly from Sol, with Captain Chase Rogers in command.

As the *Magellanic Clouds* had the least distance (about 160,000 ly) to cover, she was expected to complete her journey first. In early 2284, she could hail from the one-fourth mark, while the *Andromeda* was passing the rough midpoint of her namesake constellation at the very beginning of her journey. Lamentably, this was as far as the *Andromeda* got: communications were lost in February 2284, as three consecutive relays in her ‘breadcrumb’ chain fell silent. Having not yet

committed herself too deeply into the mission, the vessel decided to turn back and repair the connection.

Speculation and intrigue abounded. Was the suspicious damage connected to the renewed hostilities with the Klingon Empire? Starfleet Intelligence, having just delivered its conclusions on a decade of deep reconnaissance in Empire space, confessed to no contrary illusions. Nor did it admit involvement in the *Draco* missions, all of which traversed hostile space on the initial legs of their journeys. Yet the Empire would respond in kind, ramping up its intelligence gathering efforts and sending in cloaked penetrators. Something like the Genesis incident was inevitable sooner rather than later; just as inescapable were the consequences. Starfleet went to immediate war footing, and the *Andromeda* was issued recall orders. While mission risks were quoted as the primary concern, the immediate redesignation of the *Andromeda* as strike cruiser suggested otherwise. At recovery, the vessel would enter a period of frantic refitting to this originally theoretical military configuration.

The *Draco* and the *Magellanic Clouds* were beyond the impact of politics, however. Farther out than even the farthest-ranging defenders now, they hit their respective one-third marks when ultimatums were exchanged between Earth and Qo'noS, and switched from triply to doubly redundant 'breadcrumbs' as planned when brief détente upset the hawkish plans of the competing militaries. On the eve of the year that would see the Praxis explosion, the *Draco* sent a halfway mark report. The *Magellanic Clouds* did not.

Diagnostics of the communications lifeline quickly established that silence this time had ensued at the very end. The bold vessel had been lost practically within sight of her destination, and with her 600 of Starfleet's brightest. No cause for the loss could be determined, as there was no constant telemetry feed, nor was there hope of a recorder marker ever being recovered.

Only the class ship now remained committed to her mission. The Khitomer Conference came and went, with the *Andromeda* still in the process of receiving her combat deflector pods, defensive phaser clusters and twin torpedo tubes. When she recommissioned as the *Athabaska* (NCC-2560), the *Draco* sent a congratulatory hail, reporting on crew deaths and births as well as the degrading state of propulsion systems, and on the effect of the uneventful transit on crew morale. Communications grew sparse then, occasionally blocked out altogether by Barrier interference. In May 2309, Captain Lorensen informed Starfleet of the passing of Commodore Mezzaccio, of the approaching deployment of the outer-end communications hub, and of his intention to proceed with detached operations within the Draco cluster in accordance with the original plan.

Then silence fell. Starfleet hesitated with adding "presumed destroyed" after the records entry "missing", defending its cautious optimism on the recent successful return of two *Tikopai* deep rangers after extended communications blackouts. Two months into mourning on the *Tomed* incident, the breadcrumb line crackled to life once again. Capt. Lorensen's message was as brief as it was laconic: "Endpoint surveys completed. Request permission to increase settlers to 64 percent." Attached to the message was a week-long, multiply redundant stream of data packages.

As mission planners agonized whether the *Draco* could continue to operate with just a third of her original crew, as opposed to the planned return minimum of two thirds, the data were unfurled. The updated ship's complement read 284 dead, 4 missing in action, 16 in stasis, 7 in main computer, 298 born, 270 of these plus 22 others enlisted during mission, plus 48 live, 8 virtual and 9 crew-embedded passengers of Class G or higher sapience rating. At loss of means to force the hand of the

explorer crew, Starfleet agreed on 403 people staying behind to found the Lonely Mountain settlement.

The *Draco* set out for Federation space in January 2312. Recovery took place in November 2349 when *USS Prince of Wales* rendezvoused with the vessel some 12,500 ly from Earth and took aboard the crew, passengers and computer core. The deep range explorer was then scuttled, no longer considered spaceworthy by any standards.

Subsequent missions of extreme range exploration have been undertaken chiefly by *Niagara* class vessels. Propulsive advances are likely to render the mission category redundant in the near future; still, there have been no crewed repeat missions to the dwarf galaxies.

Federation refit

Dreadnought
2276-2295 (*Federation (II)*)
2274-2295 (*Alliance*)

Completed:	8 *Federation* dreadnoughts refitted to *Federation (II)* standard 1 refitted to *Alliance* standard
Length:	327.0 m
Beam:	152.0 m (*Federation (II)*) 156.7 m (*Alliance*)
Height:	79.8 m
Mass:	1,190,000 tons (*Federation (II)*, typical) 1,140,300 tons (*Alliance*)
Cruise speed:	w 8
Max.speed:	w 15.0 (*Federation (II)*) w 13.0 (*Alliance*)
Endurance:	6 years (*Federation (II)*) 4 years (*Alliance*)
Officers:	52 (*Federation (II)*) 51 (*Alliance*)
Crew:	448 (*Federation (II)*) 421 (*Alliance*)
Weapons:	*Federation (II)*: 16 phaser VIII emitters in 8 twin banks on primary hull 4 phaser VIII emitters on ventral secondary hull 4 phaser VIII emitters on aft dorsal secondary hull 4 heavy torpedo tubes, 2 fwd, 2 aft, w/ 150 torps on primary/secondary hull joint *Alliance*: 12 phaser VIII emitters in 6 twin banks on primary hull 2 phaser VIII emitters in twin bank on ventral secondary hull 2 phaser VIII emitters on aft dorsal secondary hull 2 heavy torpedo tubes w/ 120 torps on primary/secondary hull joint
Shields:	3-layer forcefields Navigational deflectors on fwd and aft secondary hull Secondary navigational deflector on ventral primary hull
Laboratories:	2-4 GP
Transporters:	5 GP (6-pad), 4 cargo, 5 emergency evacuation (22-pad); Mk IV (*Federation (II)*) 4 GP (6-pad), 2 personnel (2-pad), 2 cargo, 4 emergency evacuation (22-pad); Mk IV (*Alliance*) All ships brought to Mk V standard after 2285
Auxiliaries:	6 medium shuttles, 2 heavy shuttles, 4 work pods; various tactical craft often carried

Ships of historical interest:

USS Alliance (NCC-2105), *USS Federation* (NCC-2100), *USS Star Empire* (NCC-2116)

SOURCES: (D FJ, James Winter)
(N FJ, James Winter)
(H FJ, James Winter)

The attraction of linear-coil warp engines held through the difficult and disappointing destroyer refit programs. Starfleet was determined to re-engine its dreadnoughts and corvettes using the same technology, strongly believing that the new propulsion system would benefit any and all starship designs. But converting the *Federation* class behemoths to the new system proved troublesome and costly, and is considered something of a limited success to the Starfleet of the 2270s. It also highlights the controversy between aggressively military and moderate factions in the Council at the time.

The upgrade to LN-64 family nacelles was first tested on *USS Alliance*. In early 2269, the dreadnought was docked at Venus and her already badly worn-out PB-47 nacelles cut off and discarded. The primary hull was separated and floated out of the drydock for partial dismantling: the uppermost deck bracings were removed and new surface plating applied, so that a bridge module with extended volume and twin docking facilities could be fitted. The lower half of the saucer received a similar treatment for installation of new sensors, and the original torpedo system was completely removed in favor of a heavy duty phaser energizer assembly. Provisions were made for as many as eight twin banks of heavy phaser VIII units, five dorsal and three ventral, but the two aftmost positions on the dorsal side were left empty in the *Alliance*.

The interconnecting neck was given extra chord for supporting the middle nacelle and containing its plasma conduitry. This structure closely resembled the wide connectors of the *Belknap* strike cruisers, and the impulse engine assembly installed in place of the original engines was also related to the Scarbak RSL engine of the *Belknaps*. Somewhat underpowered for such a massive vessel, the model RSM still represented the most cost-effective option available. A modern twin-tube Mk 6 torpedo deck with a high capacity autoloader system was installed at the lower end of the connector.

The secondary hull received a thorough facelift, with a new type of long range navigational deflector installed in place of the original unit and with the shuttlebay modernized. The aft array was also extensively modified, and was now purely dedicated to long range FTL sensing and communications; reverse warp was not an option with the linear-coil warp engine technology. The number of secondary hull lifepods was increased and some standard phaser VIII installations added.

Finally, the three customized LN-64C engines were attached. The original pylon positions were retained, but the pylons replaced by modern, structurally superior units. The new main powerplant was housed in the original multilinear-bottle compartments, even though it was of the now common monolinear type, with two vertical reaction cores; certain ergonomic and technical problems inevitably cropped up due to this. Full jettison capacity was retained for the nacelles, while main antimatter fuel now resided in the lower secondary hull and was easily jettisonable as well. To control the complex engine, a full multitronic M-7 mainframe computer was required.

The new engine system was calculated to provide the ship with warp 8 cruise capacity and warp 13 top speed in normal flight mode. The experimental transwarp technology of the (at the time idled and shunned) *Star Empire* was also incorporated in the engines, so that deep subspace immersion was possible. The relaunch of the ship in late 2274 involved experimentation on this drive mode, but yielded mixed results. Navigation at transwarp speeds – officially estimated to correspond to warp 27 – was extremely difficult and great strains were based on the ship, nearly resulting in her

loss. The navigational problems also forced a non-scheduled combat engagement at the Romulan Neutral Zone, maneuvering out of which was a major tactical challenge for the vessel and an even greater political one for the Federation. Clearly, the system was far from operational, and Starfleet R&D was at loss of means for controlling subspace immersion with more precision. Transwarp development was directed on new venues and the original system subsequently left dormant aboard the *Alliance*.

The Alliance *leaving Spacedock Earth for her second maiden voyage. Vertical clearance is less than five meters at level exit; various pitch and roll maneuvers were adopted later on for added safety margin, but the fact remained that Starfleet was growing out of its most prestigious pier facilities.*

The experiences on the *Alliance* refit suggested that another type of modification be effected on the other *Federation* class vessels. The definite *Federation (II)* refit was thus spearheaded by the *Federation* herself, beginning in 2274. The process was completed in 2276, after great technical and financial difficulties.

The *Federation* primary hull was given a modification identical to the *Alliance* refit, although this time, all five dorsal phaser mounts were installed. There was great controversy, however, in deciding how the rest of the vessel should be refurbished to best answer the problems of powerplant integration encountered with the *Alliance*. Initially, it was suggested that the original hulls simply be internally reorganized to hold the improved m/am intermix system, despite the *Alliance* lessons. This was found to be both technologically and financially unwise, though. For one, the secondary hull required external remodeling so that the port and starboard nacelles could be mounted more effectively for normal-warp drive, a weak point of the *Alliance* configuration. Also, changes had to be made to the upper secondary hull structures to allow for a more efficient placement of the m/am reactor. Moreover, in the middle of simulations for these modifications, new demands were placed on the design. It was judged that the projected endurance was far too limited for the intended solo patrol missions, and the torpedo capacity too small. Also, Starfleet now wanted larger auxiliary craft capacity, for unspecified reasons.

Frustrated, the engineers went back to their drawing pads and strove to enlarge the secondary hull to meet the new demands. The aft deflector array had to go, replaced by a secondary shuttlebay. Hull extensions enabled the fitting of extra fuel and support systems. Finally, two aft tubes were added to the torpedo deck, enjoying relatively good firing arcs despite the proximity of the secondary hull dorsal surface and the three nacelles.

This version of the dreadnoughts finally met operational specifications, and was used as the basis of seven more refits. By 2277, there were eight *Federation (II)* ships and three ships of the original configuration available to Starfleet, plus the *Alliance* and the *Star Empire*, the latter briefly used for training purposes. The near-disastrous expenses of the refitting (or, more accurately, rebuilding) program precluded the conversion of the remaining vessels to *Federation (II)* status, or even their

retaining in active service. Heated budgetary arguments in the Federation council had pitted the dreadnought, destroyer and modern shuttlecarrier programs against each other, and Federation Commissioner of Starfleet Mohammad ffolkes finally settled for a compromise that allowed partial completion of each program. Support for the military factions, having briefly reached a high point after the V'Ger and Xindi crises, was again facing a downturn.

The preciously small selection of modernized dreadnoughts was at first kept close to the hearthworlds of the Federation, to be used as the heaviest component of defensive fleets. The most logical designation for these ships would thus perhaps have been 'command cruiser'. But the combination of three nacelles and heavy phaser firepower had become inseparable from the dreadnought name, leading to the designation of ships as diverse as the abortive *Adamants* and their *Komsomolsk* and *Kirov* successors as 'dreadnoughts' as well. When the final *Federation* class refits were completed in late 2277, Federation Council grudgingly agreed to field the heavy combat vessels for the original border patrol mission again, alongside the *Defender* class. But strict operational safeguards were put in place to prevent the use of these units for offensive action. There was never any intention of fitting the ships for exploration duty, since they were structurally and economically quite incompatible with such use. Still, officially the vessels had multi-mission capacity, and Exploration Command could theoretically assume control of the vessels if needed.

A line-up of three Federation (II) *vessels performing their primary mission: waiting idly above Mars, manned by skeleton crews only. The dreadnoughts offered a mighty deterrent against enemy offensives, both in defensive firepower and in the ability to inflict devastating retaliation. In prolonged warfare, concentration of power into a limited number of large warships would have been less practical, but fortunately such a state of affairs was avoided in the late 23rd century.*

The ships of *Federation (II)* class saw very limited service due to problems with the complex engine systems and powerplants. Saucer separation was tested several times on *USS Star Union* (NCC-2112) during construction phase, and an operational test performed in 2297 when the ship was due for retirement, but the option of warp drive for the separated saucer with the single attached nacelle was never used. More advanced, cruiser-based designs stepped in to replace or augment the *Federations* between the 2270s and mid-80s, chief among these the *Ascension* dreadnoughts.

None of the *Federation (II)* class ships were tested in actual fleet combat, nor did they feature in the plans of the next Starfleet faction to attempt coup d'etat. From the viewpoint of the military factions, the ships had been a waste of effort and political leverage, undermining the arguments that the heavy investment on exploration and support capacity was balancing the military buildup. For the UFP in general, however, the existence of the class provided improved security on the distant borders and was later deemed crucial in moderating Romulan aggressions. The inability of the Romulans to threaten the UFP, as well as their rapidly crumbling alliance with the Klingon Empire,

finally drove the Romulans to seek closer ties with the Federation for the duration of the late 2280s and early 2290s.

USS Affiliation was the last *Federation* class ship to be retired in 2299, at which time her modern dreadnought successors of *Ascension* and *Kirov* classes were also being phased out. Starfleet presently has no plans to reinvigorate the dreadnought designation from its 80-year hibernation. The borders of the Federation are currently too vast to be patrolled by starships, and a combination of automated tripwire systems and fast, rapid-response cruiser and frigate forces seems the only way of mounting anything resembling a border guard. Still, this doctrine of defense has been challenged by both the Borg assaults and the Dominion War; depending on postwar analysis results, a role may again emerge for spaceborne fortresses of the dreadnought type.

Ariel / Fredrikstad

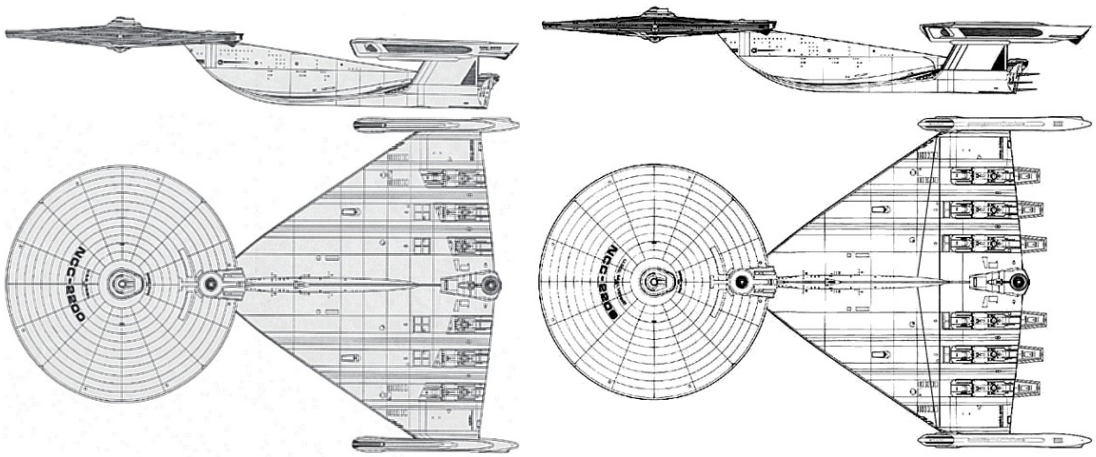
Shuttlecarrier
2277-2312

Completed:	4 *Ariel* 2 *Fredrikstad*
Length:	496.0 m (*Ariel*) 501.2 m (*Fredrikstad*)
Beam:	319.3 m
Height:	79.2 m
Mass:	1,200,000 tons (*Ariel*) 1,211,800 tons (*Fredrikstad*)
Cruise speed:	w 5
Max.speed:	w 14.0
Endurance:	6 years
Officers:	154 (*Ariel*; pilots not included; normal complement 70 Marine and Starfleet pilots) 155 (*Fredrikstad*; 78 pilots not included)
Crew:	518 (*Ariel*) 586 (*Fredrikstad*)
Troops:	1200 (*Ariel*) 1000 (*Fredrikstad*)
Weapons:	12 phaser VII emitters in 6 twin banks on primary hull 6 phaser VI emitters in single banks on secondary hull (*Ariel*) 22 phaser V emitters in single banks on seondary hull (*Ariel*) 28 phaser V emitters in single banks on secondary hull (*Fredrikstad*)
Shields:	2-layer conformal (later 1-layer globular) forcefield Navigational deflector on connecting neck Secondary navigational deflector on ventral primary hull
Transporters:	8 GP (6-pad), 10 evacuation/assault (22-pad), 8 cargo; Mk IV All ships brought to Mk V standard after 2285
Auxiliaries:	Up to 40 shuttles and shuttlepods, 25 work pods; up to 56 tactical craft of various types, typical load 24 *Victory* class, 32 *Vigilante* class Alternately up to 110 warp or impulse combat drones carried

Ships of historical interest:

USS Adjuvant (NCC-2203), *USS Ichkeul* (NCC-2201), *USS Manna* (NCC-2202), *USS Malverne* (NCC-2205)

SOURCES:	(D aridas sofia) (N SotSF/aridas sofia) (H own, SotSF/aridas sofia)



For most of the late 23rd century, shuttlecarriers were not considered a viable type of starships by Starfleet Defense Command. Colonial Operations had in the early 2270s expressed some interest in a large floating hangar, essentially a mobile starbase, for supporting colonization and terraforming operations. This was seen as part of Colonial Ops' drive to emerge from the shadow of the Defense and Exploration Commands now that the UFP Council was considering reorganizing Starfleet to a less militant posture. Predictably, neither Defense nor Exploration Command warmed to the idea of mobile starbases at this point.

However, several other powers at the time were operating carrier starships in more aggressive applications. Widely utilized by low-ranking cultures like the Xindi and the Kinshaya, the vessels launched saturation attacks of missiles, drones and manned tactical craft against well-protected enemy installations or convoys. During the early years of the Organian peace, Starfleet understandably showed no interest in such a mission profile. But with the escalation of the Klingon threat by the alliance with the Romulans (an alliance that was breaking apart already with the betrayal of Klach D'kel Brakt), Commissioner Mohammad ffolkes was able to convince the Council to approve the construction of experimental modern Federation shuttlecarriers nevertheless.

There were to be two size categories. The basic hull form was that of the old *Titan* and *Valkyr* carriers, but almost doubled in size for the respective new classes. The trailing edge of the wide triangular secondary hull would now house eight (for the heavy *Ariel*, NX-2200) or four (for the lighter *Eniwetok*, NX-2230) shuttlebay openings instead of the single wide one of the *Titans* and *Valkyrs*, for faster launching and recovery of onboard craft. Also, a sizeable navigational deflector was mounted on the secondary hull bow.

LN-65A warp engines were selected to provide main propulsion, while twin assemblies of YPS Avidyne 4089 impulse engines helped these lumbering giants move at sublight. No attempt was made to overtax the engines for cruiserlike performance; nor was the armament suite nearly as extensive as that of the through-deck cruisers. The primary saucer hull mounted six twin phaser VII units (four dorsal, two ventral, of the proven RIM-12C model), the secondary hull six single Type VI ones (RSM-14B). No torpedoes were carried. The *Ariel* was speckled with no less than 22 phaser V emitters, though, and could ward off any fighter attack an enemy carrier might wish to unleash. The *Eniwetok* was planned to carry 16 such emplacements.

The primary saucer was not of the type chosen for the various cruisers or frigates, but of a much wider and geometrically simpler design, 225 m in diameter. Its interior was optimized for accommodation of the flight crews and Marines in addition to the regular crew, as well as housing a good-sized hospital and extensive command and control facilities. Among the latter was a main

computer assembly with full M-7B2 multitronic AI routines, enabling the giants to be flown with crews of just 700 and 590, respectively. The saucer was fully capable of atmospheric entry, despite its size. The secondary hull in turn housed repair facilities, workshops, fuel and ammunition storage and space for Marine vehicles and other gear, as well as additional Marine accommodation.

A pair of Ariels *rolling into a synchronized turn during the October Calm dedicated AC exercise of 2291. Conducted with perimeter ships simulating cloaked Klingon opponents, the maneuvers honed Starfleet skills at passive AC measures such as zigzagging and warp-jumping. They also drove home a distressing point about Fleet helplessness in face of such a threat. Both the carriers were declared casualties in the first concerted assault of 'Birds of Prey', in which just one of the predators was 'killed' in return.*

Despite initial dislike, Starfleet was very happy to get its hands on the design. These immense ships could well act as spaceborne command posts, and support ground assault operations of unprecedented scale. Naturally, they would need extensive frigate and cruiser escort, and were much more vulnerable than large frigates or through-deck cruisers in troop insertion missions. But Starfleet now had frigates to burn, and the strike cruisers could well plow the way for the carriers through even the heaviest Klingon garrison world defenses. In turn, the carriers would provide rapid-fire phaser cover against fightercraft, drones and missiles, for themselves as well as for their escorts. Initial plans were for ten *Ariels* and eleven *Eniwetoks* to be constructed within the decade.

The pacifist contingent of the Council was not quite powerless yet, however. Defense cutbacks could still be mustered to counteract the most megalomanic programs. The *Eniwetok* ended up stillborn, and the unfinished prototype was sold to Ktarian interests in 2275 – and in 2279, Starfleet was forced either to abandon six of the planned ten *Ariel* carriers or to cut back the strike cruiser program and retire several dreadnoughts. Carriers were then sacrificed to keep up the other programs. The fourth and final vessel, *USS Adjuvant*, was completed in 2280 and launched with great pomp and grandeur, including Chancellor DuBarr's inspiring speech on the exploration and colonization potential of the new ship.

The operational reality for these ships was as far from exploration or colonization as it could be. The carriers operated with strike cruiser and destroyer groups in areas of border space troubled by Klingon privateer attacks, sometimes being deployed to pacify star systems considered eager to re-enact the Axanar crisis. Instead of exploration shuttlecraft, the ships carried assault barges, scoutcraft, fighters and attack drones. Now and then, Marines were deployed for extended exercises, and heavy ground assault gear was stowed in the holds intended for colony support.

The four ships remained operational throughout the 2280s, backed for a while by two reactivated *Titan* carriers from the first anti-Klingon escalation era. In 2287 and 2292, respectively, the *Ariel* class was joined by two newer and slightly longer (if only by the virtue of repositioned engines) vessels of *Fredrikstad* class, and the moderates of the Council were silenced for the time being.

Starfleet was very near the 1600-starship goal in 2293 when the escalation was abruptly halted by the Khitomer Peace Accords. With the immediate Klingon threat suddenly removed, the Council was happy to approve drastic downsizing of the Fleet, including ending combat deployments for the carriers. The *Ariels* were finally put into colonization use, and the reorganization of Starfleet command structure got wind in its sails. Within ten years, the fighters that had served aboard the carriers were abandoned throughout Starfleet as outdated, Marine tactics were altered and deployments limited, and the *Ariel* and the *Fredrikstad* were relegated to the newly founded Terraform Command that now proudly stood equal among Exploration and Defense Commands.

The *Manna* was lost at the Foxtrot VI outpost in the *Tomed* surprise strike of 2311, and the *Adjuvant* badly damaged. Repairs were deemed economically unviable. Major critique was directed at the manner by which the two carriers had been deployed to the RNZ, skeleton-crewed and virtually unescorted, in preparation for a show-of-force sortie with the 4th Fleet. Even a more conventional attack would have seriously endangered the great ships. Comparisons were inevitably made to the 1941 Pearl Harbor surprise strike where advance warnings had also gone unheeded and major ship assets left deployed in a questionable, unprotected manner. Starfleet hubris at the RNZ cost nearly a dozen ships and thirteen major fixed installations; it mattered little that these were largely of older and strategically less significant types, as some 6,200 lives were listed lost as well.

The two surviving *Ariels* were mothballed in 2312, after receiving a globular-shield upgrade in 2302. No modern shuttlecarriers were built to replace the *Ariel* vessels, although the *Fredrikstad* class of two continued operations until 2329.

Balson

Command ship
2277-2306

Completed:	4
Length:	305.0 m
Beam:	141.7 m
Height:	71.3 m (peacetime configuration) 76.8 m (crisis configuration)
Mass:	781,000 tons (peacetime configuration) 1,082,700 tons (crisis configuration)
Cruise speed:	w 7
Max.speed:	w 9.0 (peacetime configuration) w 14.0 (crisis configuration)
Endurance:	4 years
Officers:	41 ship operations 46 command operations
Crew:	395 (peacetime configuration) 439 (crisis configuration)
Weapons:	<u>peacetime configuration:</u> 12 phaser V emitters in 6 twin banks on primary hull 4 phaser V emitters on ventral secondary hull 2 phaser V emitters on aft dorsal primary hull (optional) 2 fwd medium torpedo tubes w/ 80 photorps 2 aft medium torpedo tubes (not activated) <u>crisis configuration:</u> 12 phaser VIII emitters in 6 twin banks on primary hull 4 phaser VIII emitters on ventral secondary hull 2 phaser VI emitters on dorsal aft secondary hull (optional)

2 fwd medium torpedo tubes w/ 80 photorps
2 aft medium torpedo tubes w/ 80 photorps

Shields: 3-layer forcefields
Primary navigational deflector on fwd secondary hull
Auxiliary navigational deflector on ventral primary hull

Laboratories: 2 signals processing

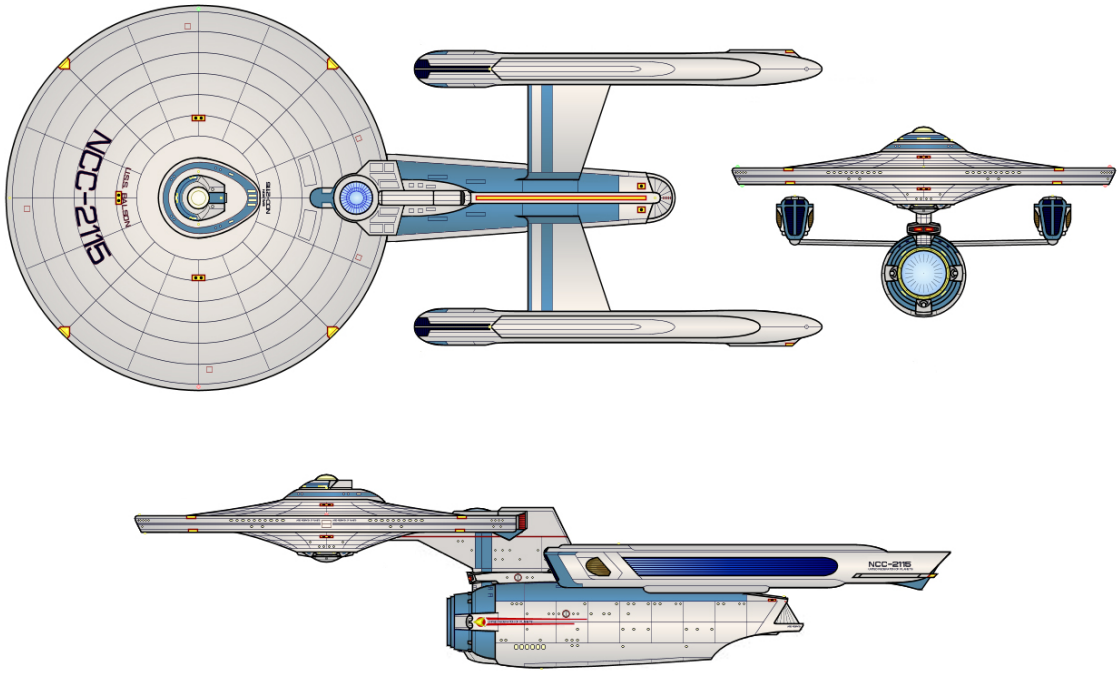
Transporters: 4 GP (6-pad), 4 emergency evacuation (22-pad), 4 cargo; Mk IV
Select ships brought to Mk V standard after 2283

Auxiliaries: 4 medium shuttles, 1 light shuttle and 4 work pods

Ships of historical interest:

USS Balson (NCC-2105), *USS Kurita* (NCC-2128)

SOURCES: (D FSRC/Todd Guenther)
(N FSRC)
(H FSRC, SotSF, own)



In strategic terms, the mid-2270s were a time of entrenching. The Klingon front, once considered too expansive to be fortified by fixed assets, had now stabilized due to the Organian truce, and sensor nets and garrison chains were being built. Major Fleet elements were recalled for modernization, and deep space exploration was once again on the agenda, although awaiting the completion of great numbers of dedicated cruisers and auxiliary cruisers being prepared for the task. In theory, there was less demand for mobile forward command posts than ever before.

In practice, though, the deep freeze of the Klingon front resulted in many ‘detached confrontations’, including outright proxy wars, local political maneuverings, and raids by frustrated Klingon independents. Increased commitment to exploration led to violent first contact with new opponents. And advanced though the defense nets on the Eridani Gap were, they could never fully equal the strength of the old fortifications of the Romulan Neutral Zone, which had benefited from extensive planetary support. Reliance on such support was politically impossible now. Nevertheless, it was difficult for Starfleet to convince all Council factions that full command cruiser strength had to be maintained.

The *Unity* vessels, children of the dreadnought cutbacks, were good and solid platforms for the task. They were approaching refitting or retirement age apace with the *Federations*, and Starfleet planned on performing a simultaneous refit with full synergy advantages. New keels would also be laid, so that each of the ten Fleets would get an HQ ship of its own (the lighter *Brenton* command ships did not yet feature in this scheme). Updated requirements were established in late 2272, and included linear-type warp propulsion with sustainable speed of warp seven, modern computing, communications, transporter and shielding systems – as well as the repeated call for an ability to mount 'general exploration and combat support missions'.

This latter requirement was once again a euphemism for mounting dreadnought-type heavy firepower and multi-nacelle propulsion on the command cruiser in times of crisis. Accordingly, a horizontal pylon configuration was chosen for the *Balson* (NCC-2105), a hybrid of *Constitution*, *Federation (II)* and *Belknap* components. The heavy cruiser primary and dreadnought secondary hulls were joined by a fin structure familiar from the strike cruisers, which themselves were slated to incorporate a third nacelle in the near future. Power systems were sized for three-nacelle operations as well.

The initial plan to use *Federation (II)* powerplant and plasma chain components suffered from the setbacks of that refit effort, though. Workarounds were readily found for the *Balson*, the design of which was still in flux. Not so for the *Unity* hulls; efforts to solve the powerplant problems were concentrated on the actual dreadnoughts, and the older command ships were at first removed from the refitting list, then stricken off altogether. Their sacrifice was not in vain, as it provided the funds and dockyard resources for completing five of the modern *Balsons*. Program downscaling also created a stockpile of surplus LN-64C engines sufficient to 'dreadnoughtize' two of the *Balsons* and still leave the necessary operational spares.

Internally, a *Balson* was very similar to a *Unity*, even though her modern secondary hull featured an aft shuttlebay and a neatly cowled antenna farm in place of their protruding *Unity* equivalents. The arboretum area of this heavy cruiser -type structure became home to additional shield generators and lateral sensors, while the cargo holds served as command facilities. Torpedo armament was also included, with four medium tubes, and each saucer phaser berth could be upgraded from Type V to Type VIII at a moment's notice, as could the quadruple ventral battery. Upper stern and fintop berths were left empty, although they could naturally be rigged with suitable weapons if situation and resources so warranted.

This dorsal view of USS Doria *(NCC-2129) reveals the attaching points for the third nacelle, as well as all the principal differences between her and a* Constitution *Phase I heavy cruiser: the horizontal pylon arrangement, the enlarged bridge*

module with twin docking ports, and the Admiral's Boat berth aft of the bridge. Overall price was about twice that estimated for a newbuild Constitution*, not including the price of the additional nacelle.*

In the end, the *Balsons* stood no better chance of actually receiving the dreadnought upgunning than their *Unity* stablemates. Attempts to stockpile the necessary weaponry were blocked by the Council, and the surplus LN-64C units were ultimately shunted to the *Ascension* advanced dreadnoughts. Also, analysis of *Federation (II)* performance made the *Balson* figures of warp 15.0 dash speed suspect, and a full warp factor was dropped from the estimate by the time the class ship had finished her propulsive trials.

The ships still performed admirably in the command cruiser configuration, and rounded out Starfleet's HQ ship arsenal till the 2287 détente. By then, extensive refitting and rearming of the defense forces had resulted in a networked warfleet that no longer required the presence of a command ship in order to fight the Klingons. Command ships were conceptually reworked to serve the needs of complex planetary assault or evacuation operations, tasks where combat capability would be a liability rather than an asset; capacious transport hulls rather than cruiser spaceframes were selected for this new breed of headquarters ship. The brawny *Balsons* still were needed to command the older fighting ships, however. Indeed, the *Balsons* were more employed than ever during the immediate pre-Khitomer years, kept at full readiness, although only deployed for major exercises.

Due to the bellicose stance of Starfleet for most of the 2280s, the command cruiser force had little time to score points on other missions. The colonies of Ivor benefited from the services of *USS Kurita* (NCC-2128) beyond coordination of the initial founding process, as the vessel in 2289 reinforced light cruiser *Vickery* in a battle against Breen raiders. Horrified by the risk at which the expensive vessel had been placed, Starfleet immediately recalled her to Subquadrant Zero without assigning an escort, thereby exposing the *Kurita* to further jeopardy when she ran into a clandestine Romulan mission on the wrong side of the Neutral Zone. Dreadnought *Entente* was assigned as the 8th Fleet command ship for the time of the *Kurita* repairs, and also took onboard some HQ ship hardware. Afterwards, strict orders regarding the *Balson* deployments kept the ships corralled at starbases. Some post-Khitomer colonization missions aside, the secondary capabilities of the *Balson* class were never to be tested again. Yet Starfleet maintained full confidence in its command cruisers till the very last, retiring *USS Walker* (NCC-2130) only after the final pre-seventies combat vessels had been withdrawn from service.

Ascension

Dreadnought
2278-2299

Completed:	10
Length:	302.0 m
Beam:	141.7 m
Height:	72.7 m
Mass:	1,087,000 tons
Cruise speed:	w 8
Max.speed:	w 15.0
Endurance:	5 years
Officers:	89

Crew: 396

Weapons: 12 phaser VIII emitters in 6 twin banks on primary hull
2 phaser VIII emitters in twin bank on ventral secondary hull
2 phaser VIII emitters on aft dorsal secondary hull
2 heavy torpedo tubes w/ 120 torps on primary/secondary hull joint

Shields: 3-layer forcefields
Navigational deflector on fwd secondary hull
Secondary navigational deflector on ventral primary hull

Laboratories: 1 GP

Transporters: 2 GP (6-pad), 4 personnel (2-pad), 2 cargo, 4 emergency evacuation (22-pad); Mk IV
All ships brought to Mk V standard after 2284

Auxiliaries: 6 medium shuttles, 1 heavy shuttle, 6 work pods; various tactical craft often carried

Ships of historical interest:

USS Ascension (NCC-2520), *USS Leander* (NCC-2521), *USS Minsk* (NCC-2525), *USS Tai Shan* (NCC-2524), *USS Temperance* (NCC-2528)

SOURCES: (D SotSF)
(N SotSF)
(H own, SotSF)

The latter half of the 2270s saw the Federation Council teeter-tottering between military and scientific Starfleet expansion programs. The expansion itself was never in doubt, though – only the forms it would take were debated. The militant factions of the Council in turn were divided in two: some supported the pouring of resources to a fleetwide upgrading program, while others pursued the development of modern vessels and scorned the blind faith of the others in linear-warp upgrading of obsolete designs.

The initial success of the *Constitution* refits created unhealthy hubris that led to the ill-conceived *Federation* and *Saladin* upgrade programs. When both of the latter turned into financial disasters, the pacifist factions of the Council gained temporary power. They were soon overrun by the factions seeking the introduction of modern military designs, however. Free of the compromises riddling the refitting of 2240s-2250s-vintage designs, the modern vessels made best possible use of 2270s technology both in propulsion and armament. Instead of the *Saladins*, Starfleet relied on upgraded *Larsons* until the highly advanced *Cochises* could be procured. The *Federations* in turn were succeeded by a modification of the *Belknap* strike cruiser design, dubbed the *Ascension* class of dreadnoughts.

The *Ascension* herself was laid down in 2277. She was for all practical purposes a typical *Belknap* up to her connecting neck upper end. The third LN-64 mod 3 nacelle added there set her apart from the strike cruisers, though. Power generation was boosted by expansion of the intermix bottle system, and phasers were given improved conduits that allowed an upgrade of the emitters into Type VIII heavy phaser standard. Also, to cope with the heavy requirements of high warp combat and three-lobe warp field management, the system received a new fire control computer, equipped with the M-7 multitronic system familiar from the *Federations*. Torpedo magazines were also enlarged, while the shuttle hangar was simplified and extended forward to take six full-size shuttlecraft or a selection of tactical craft. Ammunition magazines for the tactical craft were carved out of former cargo holds, while the other modifications were performed at the cost of all but one laboratory facility.

In essence, the *Ascension* was transformed into a high endurance strike cruiser without the original impulse maneuverability but with increased overall warp performance and better phaser fire control. While the type lacked the aft torpedo launchers of the *Federation* design, she was otherwise an even

match for that larger, clumsier and vastly more expensive dreadnought. A total mass of about 1,087,000 tons compared favorably with the 1,190,000 of the *Federations*, even though the two designs utilized basically the same warp coils, which are the most significant factor in starship mass.

While the three nacelles of the Ascensions *might resemble the warp engine configuration of the* Federations*, several telltale signs differentiate the classes. In this view of* USS Minsk *on Berengarian orbit, the* Belknap*-style secondary hull and the thin standard saucer are evident, while the nearby* USS Alliance *displays her bloated saucer profile and long, flat-topped secondary hull against the backlight of the planet's largest moon. Joint deployments of dreadnoughts were extremely rare even in the 2280s: this 2283 rendezvous was necessitated by the approach of an amoebalike space entity, presumed extremely dangerous and nearly indestructible based on earlier encounters. However, the entity entered the Berengarian system only to propel itself into the local star in an apparent suicide, so the immense firepower of the two dreadnoughts could not be tested.*

Nine sister ships were built for the *Ascension* in a highly efficient production run between 2278 and 2281. Immediately after the completion of the program, the dockyards switched back to strike cruiser production, maximizing the use of resources and expertise on these former *Belknap* construction facilities – just as the continuing *Constitution* follow-up programs and *Aleo* through-deck cruisers kept the yards dedicated to that lineage busy throughout the 2270s and into the 2280s. Dockyards of these types still exist for the purposes of servicing *Mirandas* and other elderly medium starship types.

The *Ascensions* saw some twenty years of distinguished border patrol service. Unlike the bulky *Federations*, the newer dreadnoughts also played a role in the 2293 attempted military coup d'etat. *USS Minsk* and *USS Temperance* were to penetrate Klingon space following the assassination of the UFP President at Camp Khitomer, raining death on the garrison and colony systems of Sto'Kessat and Mardarn and proceeding via B'Moth to engage the main Klingon retaliation fleet at Ty'Gokor. However, the engines of the *Minsk* were sabotaged by the ship's engineering crew, led by Starfleet Intelligence operatives situated aboard all dreadnoughts without the knowledge of the scheming factions of Starfleet Command. The case of *USS Temperance* was an uglier affair, and resulted in a lengthy court process. The ship was surrounded by Andorian local defense forces before she could proceed with her mission. When Captain Saint-Claire ordered the Andorian light frigates and cutters to be forcibly tractored out of the way, she was relieved of command by her first officer for issuing unlawful orders. However, other top officers did not agree, and the situation on the bridge quickly escalated into a firefight which Andorian boarding crews eventually had to quell. Two ablespacemen and a lieutenant from the *Temperance* were killed and an Andorian sergeant (the future influential Federation Councillor Shan Ch'arivasei) gravely injured.

The Khitomer treaty cutbacks forced the retirement of all *Ascensions* and other dreadnoughts as well as a major part of the *Belknap* fleet. An ambitious *Ascension* upgrade program was abandoned in mid-development, even though the vessels could have continued service as 'heavy patrol cruisers' in accordance with the Khitomer limitations. All the ships were stripped of torpedo armament and half their phasers, their weapons computers removed, and two hulls sold to Tellarite local defense needs. Two further similar deals to undisclosed UFP member worlds fell through, and the rest of the vessels were scrapped or used for target practice. The joint scrapping of *USS Leander* and *USS Tai Shan* at Procyon offered a rare opportunity to test the nacelle jettison and saucer separation procedures, and was a major media event attended by Klingon Vice Chancellor Bokhet and a large delegation from the Klingon Defense Forces.

Chandley refit

Strike frigate
2279-2321

Completed:	12 total: 3 refitted from *Chandley Mk I* strike frigates 4 refitted from *Chandley Mk III* strike frigates 5 built to Mk IV standard
Length:	315.2 m (refit) 320.3 m (newbuild)
Beam:	262.2 m (refit) 264.1 m (newbuild)
Height:	90.0 m (refit) 92.0 m (newbuild)
Mass:	773,300 tons (refit I) 776,700 tons (refit II) 777,500 tons (newbuild)
Cruise speed:	w 7
Max.speed:	w 9.0
Endurance:	5 years
Officers:	35
Crew:	335
Troops:	250
Weapons:	6 phaser VII emitters in 3 twin banks on primary hull 2 fwd medium torpedo tubes w/ 40 photorps in hull extensions 2 aft medium torpedo tubes w/ 40 photorps in hull extensions
Shields:	3-layer forcefields Navigational deflectors on hull extensions Secondary navigational deflector on ventral hull
Laboratories:	None
Transporters:	8 GP (6-pad), 8 assault / emergency evacuation (20-pad), 4 cargo; Mk IV All ships brought to Mk V standard in 2284-86
Auxiliaries:	12 assault shuttles, 4 work pods

Ships of historical interest:

USS Blackheart (NCC-2327)

SOURCES:	(D FASA) (N FASA) (H FASA, own)

Wisened by half a decade of linear engine refitting and newbuilding experiences, some of them very painful, Starfleet in 2277 finally believed it had the technological and financial formula for success down pat. With dreadnought construction proceeding smoothly at long last, and with the re-engining of the cruiser and heavy frigate arsenals nearly completed, Fleet analysts suggested turning attention towards the strike frigates again. Despite Starfleet's neglect of this mission class, the need for rapid, small scale ground assault operations had certainly not gone away. Since Organia had prevented trials of fire, there was no telling which of the three main methods of strike force delivery – through-deck cruiser, shuttle strike frigate, or transporter strike frigate – would offer the best tactical advantages in this role. The technological problems of re-engining the through-deck cruisers were known, however, so the more promising strike frigates were given a priority in refitting.

The *Coventry* vessels were still worthy stablemates to the *Achernar* heavy cruisers, despite (or thanks to) the venerable PB-47 engine technology shared by the types. Starfleet quickly reached the conclusion that no refit was warranted within the remaining structural lifetimes of the types. The *Chandleys*, however, were at a structural and operational disadvantage. Their use in boarding action against often highly maneuverable targets had imposed severe stresses on their already compromise-ridden pylon assemblies. A major overhaul or an upgrade was necessitated, and Starfleet chose to seek funding for the latter.

The major expenditures on ongoing supership programs worked to Starfleet's disadvantage, but the *Chandley* was finally deemed worth preserving. Promises made to the Council had been modest this time: one full warp factor added to cruise and dash performance, twenty years added to lifespan. The LN-64 mod 3 was proven and, by the new standards, affordable. So was Avidyne 4088F, despite being primarily intended for less massive applications. The technological risks of the refit would be associated with torpedo firepower increase, transporter modernization and, most importantly of all, a major shielding upgrade.

Conversion of *USS Chandley* (still nominally of the so-called Mk I standard despite an extensive career as a propulsion and SIF testbed) to the new specifications between May 2277 and December 2279 was a relatively hitch-free process. The old FH-11 phaser armament was considered competitive with the modern RIM-10 or 12 series and retained almost as such; the Awalt Mk 3 torpedo tubes were swapped for Skar-Rat Mk 6 weapons; and the transporters were all brought to Mk IV standard. Some 25% of Marine accommodation space was sacrificed to power production machinery, even though the number of embarked troops was not reduced. Long plasma leads connected a transverse intermix tube and two longitudal feed lines with the nacelle plasma injectors, and twin EPS relays fed the second-stage loop for ship's systems and impulse engines. A further 4% was swallowed by the new Prentice-Schafer Type P shield generators which also expanded somewhat into former fuel tank space. Finally, a Takakura main computer with M-6A AI routines made sure the shields and propulsive fields did not interfere with transporter operations.

Two other first-batch *Chandleys* received the treatment by 2281, and four Mk III vessels were subjected to a similar refit as well. Test firings on the revitalized *USS Chandley* prompted the adoption of the more compact, rapid-firing Mk 5 torpedo systems on these latter four ships, however. Also, Mk 5 was chosen for the five newbuild vessels that featured improved field geometry via altered nacelle placement, Type P shield generators, and a model 4088G impulse deck. This variant was dubbed the Mk IV, while the other two standards were generally referred to as the Mk I and III refits, respectively. The rest of the existing *Chandley* fleet (including all Mk II units) was deemed unsuited for refitting or refurbishment and stricken from active records by 2283. The half a dozen *Northampton* vessels kept the transporter strike frigate strength constant.

The gleaming white finish and light blue transporter emitter arches lend charisma to USS Halifax *even though her former pennant art has been removed. Refitted from the Mk III standard, the* Halifax *had a long history of space combat and boarding action behind her. She continued these activities in the new configuration until her retirement in 2312, even though suitable enemies became harder and harder to find.*

By 2284, the rebuilding and newbuilding program was complete, and Starfleet moved on to through-deck cruiser revitalization. It became Defense Command's problem to think of assignments for the modernized strike frigate fleet. Heavy corvettes were now handling much of the boarding action performed for intelligence gathering purposes. Improved tactical shielding of Klingon surface forces was in turn casting doubt on the effectiveness of transporter strikes in open warfare. No less than eight of the twelve modern *Chandleys* soon found themselves transferred to TacFleet for "special interdiction operations", often involving raids against Klingon mining outposts or ore transports. This largely clandestine "dilithium war" was of essence in crippling the military industry of the Empire, and represented the more humane ways of waging the bitter cold campaign in the eighties. Total casualties on the Federation side were limited to about 110 Marines lost in surface action, and the entire complement of *USS Blackheart* (NCC-2327) lost in 2285 in space combat

during retreat from an otherwise successful operation. Klingon casualties are believed to have been equally low, while the economic impact of the raids must have been considerable.

The *Blackheart* was the only Mk IV casualty in the operational history of the class. In addition, the Mk I refit *USS Corte-Real* (NCC-2305) was declared missing in 2287. Both ships are currently believed to have fallen victim to enemies mightier than the Klingon Empire, even though no clues to the identity of these opponents have been found. The remaining *Chandley* units were gradually retired from anti-piracy duty, the last three units sailing to be dismantled in 2321.

Proxima refit

Dreadnought
2279-2302

Completed:	6
Length:	349.7 m
Beam:	185.0 m
Height:	80.5 m
Mass:	1,252,000 tons (NCC-1110) 1,254,500 tons (NCC-1114, 1116, 1121) 1,251,000 tons (NCC-1119, 1123)
Cruise speed:	w 8
Max.speed:	w 15.3 (NCC-1110, 1114, 1116, 1121) w 16.0 (NCC-1119, 1123)
Endurance:	11 years
Officers:	80
Crew:	543
Weapons:	20 phaser VIII emitters in 10 twin banks on primary hull 2 phaser VIII emitters in single banks on dorsal aft secondary hulls 2 phaser VIII emitters in single banks on ventral forward secondary hulls 2 fwd heavy torpedo tubes w/ 120 photorps on fwd primary hull 2 fwd and 2 aft medium torpedo tubes w/ 60 photorps on weapons pod
Shields:	3-layer forcefields Navigational deflectors on fwd and aft secondary hulls
Laboratories:	2 GP, 1 tactical, 1 cartography
Transporters:	4 GP (6-pad), 6 emergency evacuation (22-pad), 4 cargo; Mk IV All ships brought to Mk V standard in 2286
Auxiliaries:	1 heavy shuttle, 4 medium shuttles, 2 light shuttles, 6 work pods

Ships of historical interest:

USS Bismarck (NCC-1121), *USS Nimitz* (NCC-1119), *USS Philadelphia* (NCC-1116), *USS Proxima* (NCC-1110)

SOURCES:	(D ST:Legacy computer game, SSA) (N ST:Legacy computer game, SSA, SotSF) (H ST:Legacy computer game, SotSF, own)

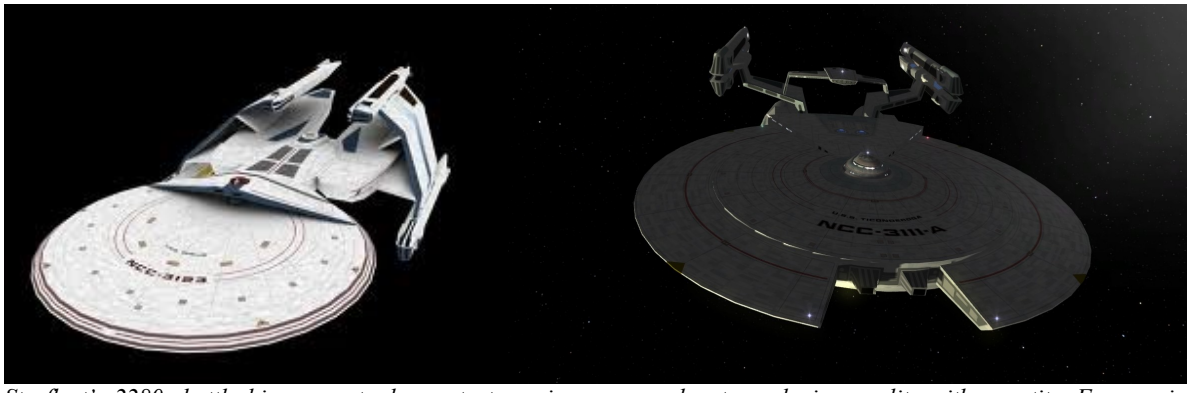
When the refitting policy of the early 2270s was finally abandoned, a proverbial lid popped on designs fomented since the Organian intervention. Only now could planning for new types of cruisers and destroyers begin in earnest; only now could preexisting blueprints for improved hull structures and propulsion systems be dusted off. Naturally, there was too much inertia on most ongoing building programs to allow for radical changes. The *Belknap*, *Enterprise* and *Avenger* lineages would be continued for the foreseeable future, and their design elements applied on as

many mission classes as possible. But engineers knew that they were not ideal for all applications, and had been planning ahead for quite a while.

Among the most mature concepts in the mid-2270s was a new type of primary hull, a saucer of increased diameter and strength. With a diameter of 185.0 meters, the structure was somewhat excessive for most contemporary mission classes – yet only because contemporary propulsion systems were not up to the challenge. For a deep space combatant in the dreadnought or perhaps defender category, such a saucer would be ideal, offering increased endurance and resilience. In this mission class, the propulsive shortcomings could be addressed in a now-traditional manner: by applying greater numbers of existing propulsion units. Only the exorbitant price of such a multi-engined giant kept Starfleet from immediately choosing her over the more affordable *Ascension*.

Design work nevertheless proceeded on the *Komsomolsk*, project number NCX-5620-V, hopefully the first in a class of six (NCC-2600-2605). Although a matching secondary hull structure could not yet be created for the saucer, an effective if not elegant alternative was found from fusing three conventional hulls into an operational whole. The central hull resembled those of the *Belknap* family. It housed the main powerplant, and carried the deep space auxiliary craft contingent in a hangar enlarged by expanding it into former cargo spaces. At the bow was a slanted Vernier SA10 deflector dish; directly above, three heavy torpedo tubes with large magazines. Two smaller hulls held auxiliary deflectors and sensor arrays forward and impulse engines aft, each with two IMRF crystals. Midhull spaces were largely reserved for fuel, granting the design exceptional range in comparison with the other dreadnoughts.

Warp propulsion was to be traditional, comprising three widely spaced LN-64C nacelles, each branching off from its own sub-hull. Performance comparable to that of the smaller predecessor classes was projected; upgrades were planned from the first trials onwards, though, and would eventually grant warp 16.0 top speed. The next generation was also clear in the minds of the designers: with four nacelles, this full battleship design would be capable of warp 18 or better.



Starfleet's 2280s battleship concepts demonstrate various approaches to replacing quality with quantity. Four cruiser-standard engines stand in for proper battleship propulsion units, in configurations ranging from the trivial and timid to the involved and odd.

Meanwhile, a competing use for the new saucer emerged. The *Excelsior* transwarp project called for large hulls for housing the equipment vital for the experiment. If successful, the project would also become the next step in defender evolution, outdating the work done on the *Komsomolsk*. In the meantime, the *Ascension* and *Federation (II)* programs would be completed, leaving the operational future of the *Komsomolsk* in grave doubt.

In order to hasten the process of introducing the non-transwarp dreadnought or defender, its designers decided to take a seeming step backward. Instead of the triple-hull configuration of the *Komsomolsk*, the first prototype would be completed by grafting the new saucer to the twin-hull propulsive section of the *Proxima* battle cruiser. Several spaceframes of the outdated type existed in Organian treaty limbo, including two that had already been modified for the use of four engine nacelles. Six of these were now pulled in for refitting; the class ship once again had the honor of being the first unto the breach.

The conversion was more of a success story than the *Federation* class one, due to several technological advantages. The twin hulls of the battle cruiser provided free space for the installation of modern inboard power systems, as there no longer was a requirement for their sizeable shuttle hangars. The original shuttlebays were replaced by stern deflector-sensors, the hangar spaces by linear intermix powerplants. Smaller bays for auxiliary craft were installed atop the forward deflector dishes, in a fashion familiar from earlier dreadnoughts. The upper propulsion system support structures required minimal strengthening in order to receive their two LN-64C Mod 2 pairs, equipped with enlarged ramscoops for deep space work. The center section of the horizontal support was replaced by a stock *Miranda* weapons wing, which also meant the simplest possible upgrade to the torpedo system.

The multi-hulled silhouette of USS Uluru *darkens the view on Andor's glowing southern ice caps during a naval visit in 2290. Crewing of the modern dreadnoughts was a growing problem in the late eighties and early nineties, as the pool of deep space specialist personnel was all but drained at that point. Repeated drafting tours to Andoria were highly successful, though. Up to 68% of the crew of the* Uluru *was of Andorian descent by 2291. In stern view, the* Uluru *does not differ radically from the original* Proxima *concept, save for the pairs of sleek linear engines and subtle hints of the more rounded-out primary hull.*

Heavier Mk 4 launchers were installed in the primary hull, which was free of refitting compromises, and could be configured almost completely independently of the propulsive section. Phaser armament was arranged in what was intended to be standard for the new saucer type, with ten mounts for twin Type VIII emitters. A cutout at bow, for accommodating the heavy torpedo launchers, was compensated for by adding pressurized wedges to the sides of the aft centerline impulse housing; these spaces largely held recreation facilities, conference rooms and other less than crucial facilities. Otherwise, the saucer kept to traditional solutions of interior layout and sensor fit, and became home to some 620 crew.

This bow quarter view of USS Nimitz *reveals more about the extent of the rebuild. The primary hull is a completely new structure, simply welded onto the original engineering booms which themselves have gained some new armor. The vertical pylons have received a horizontal section to sufficiently separate the engines so that the warp field properly covers the new hull.*

Trials on the *Proxima* began in late 2278 and justified an early commissioning in 2279. Starfleet pondered designating the new type a defender, as this mission class was less constrained by Organian treaty limitations. Yet increasing Klingon aggressions after the 2283 regime change provided solid arguments for Starfleet to withdraw from its commitments to that treaty, as well as to win funding for a total of six new dreadnoughts. This force was also to be granted an active peacetime role. Just two out of six *Proximas* (the official designation in theory being *Proxima (III)*, although the ordinal was not used in practice as no examples of older variants remained in service) would be docked for maintenance at any time. The rest would be assigned patrol areas on the Klingon front, rather than in deep space where the *Defenders* still prowled.

As production proceeded on the sister ships, the *Proxima* set speed records for ships of her category – even if said category was a rather exclusive one. With every part of the ship either drastically modified or swapped altogether, these 'ships of Theseus' only superficially resembled their 2220s forebears. Yet the structures underneath the modern exterior had much more in common with the original ones than in any other refitting project undertaken in the 2270s or 2280s, establishing a sound economical basis for the project. Furthermore, using the existing *Proxima* hulls as pretext for the introduction of all-new strategic deterrence vessels was a typical stratagem for the decades, and its possible role in undermining the Organian treaty cannot be considered to have been a decisive one.

There was no denying that the back of the camel had been broken, though. Five *Kirov* dreadnoughts would still be completed largely out of existing spares, but the resulting 30-dreadnought fleet was as ineffectual as it was diverse. Upgrading to an all-*Proxima* standard was just as impossible as the ideal solution of going for an *Excelsior*-based fleet. Debate raged on which parts of the overall force should survive, and at what expense – retiring of the *Federations* and the now rather diminutive *Ascensions*, reducing of patrol time, centralizing of support bases?

The matter was still far from settled when Khitomer peace made the force both redundant and politically inconvenient. Discarding of the smaller, older dreadnoughts followed almost immediately. Yet a hasty and ill-conceived decision was made to retire the *Proxima* force as well. It was blatantly obvious that *Excelsior* class ships could not be built rapidly enough to meet Starfleet deep space patrol combatant needs in the immediate future; the six *Proximas* would have been an excellent stopgap, one that even the Klingons agreed to accommodating. But there was no turning

back after the (baseless) allegations of the role of the modern dreadnoughts in the coup attempt of 2291 reached Klingon ears.

Culled well before their time, the still incomplete *Pennsylvania* and *Thule* performed a final service to the Fleet in 2295 by donating their primary hulls for *Excelsior* class construction, facilitating the completion of *USS Columbia* and *USS Galacta* after a long last. The *Proxima*, *Bismarck* and *Nimitz* were paid off by 2299, and their hulls put aside for the future. The *Uluru* was the last to be retired, having served as a command ship in the Romulan Neutral Zone until 2302.

Menahga / Mitannic / S'harien

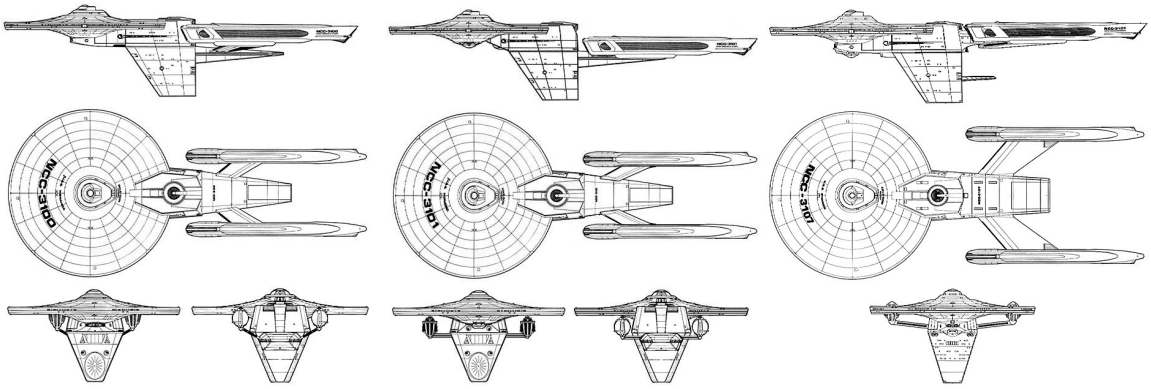
Battle cruiser
2279-2322

Completed:	12 total: 7 *Menahga* battle cruisers (later heavy destroyers) 3 *Mitannic* battle cruisers built and 4 refitted from *Menahga* 1 *S'harien* battle cruiser refitted from *Mitannic* and 2 built
Length:	301.7 m (*Menahga*) 310.8 m (*Mitannic*) 307.0 m (*S'harien*)
Beam:	141.7 m
Height:	78.0 m
Mass:	780,800 tons (*Menahga*) 779,700 tons (*Mitannic*) 773,000 tons (*S'harien*)
Cruise speed:	w 7 (*Menahga*, *Mitannic*) w 8 (*S'harien*)
Max.speed:	w 10.1 (*Menahga*) w 12.0 (*Mitannic*) w 13.4 (*S'harien*)
Endurance:	8 years
Officers:	38 (*Menahga*, *Mitannic*) 40 (*S'harien*)
Crew:	272 (*Menahga*) 269 (*Mitannic*) 265 (*S'harien*)
Troops:	135 (*S'harien*)
Weapons:	12 phaser VII emitters in 6 twin banks on primary hull 2 phaser VII emitters in single banks on aft secondary hull (*Menahga*, *Mitannic*) 4 phaser VII emitters in 2 twin banks on aft secondary hull (*S'harien*) 2 fwd medium torpedo tubes w/ 210 photorps on ventral primary hull (*Menahga*) 2 fwd heavy torpedo tubes w/ 80 photorps on fwd secondary hull
Shields:	3-layer forcefields Navigational deflector on lower fwd secondary hull Secondary navigational deflector on upper fwd secondary hull Secondary navigational deflector on ventral primary hull (*Mitannic*)
Laboratories:	2 GP
Transporters:	4 GP (6-pad), 2 assault (20-pad), 2 emergency evacuation (22-pad), 2 cargo; Mk IV All ships brought to Mk V standard in 2284-86
Auxiliaries:	4 medium shuttles, 2 light shuttles, 6 work pods (*Menahga*, *Mitannic*) 4 assault shuttles, 2 medium shuttles, 2 light shuttles, 6 work pods (*S'harien*)

Ships of historical interest:

USS Menahga (NCC-3100), *USS Arsuf* (NCC-3101), *USS Koruak* (NCC-3102), *USS Mitannic* (NCC-3103), *USS Hastings* (NCC-3104), *USS Marathon* (NCC-3105), *USS Pashto* (NCC-3106), *USS Avendesta/S'harien* (NCC-3107), *USS Austerlitz* (NCC-3108), *USS Zetar* (NCC-3109)

SOURCES: (D Starfleet Dynamics/Starfleet Prototype, *Andernach* Wold's Shipyards)
(N Starfleet Dynamics/Starfleet Prototype)
(H Starfleet Dynamics/Starfleet Prototype, own)



Starfleet's post-V'Ger budgetary bliss was in the late seventies channeled in two opposite directions. The long production run of *Constitution* Phase IV exploration vessels balanced the acquisition of modern destroyers, dreadnoughts and shuttlecarriers credit by credit, warp coil set by warp coil set. When the early disappointment of the *Federation* dreadnought program was followed by the success of the *Ascension* one, however, Starfleet ceased to think in terms of balance. The *Chandley* refit proved that old military concepts could be revitalized affordably and efficiently after all. The next such concept in line was 'heavy destroyer', the cruiser-sized torpedo platform last incarnated in the *Detroyat* class.

Refitting of original *Detroyat* spaceframes wasn't truly an option, of course. These vessels were four decades older than the *Chandleys*, and two decades senior to the oldest cruisers refitted so far. Furthermore, of the twelve intact hulls remaining as of 2277, six were still very much tied up with sigint duties. Yet as long as funding was available, there was no harm in trying out the advantageous engineering solutions of the *Detroyats*. Among these was the fully integrated, keel-like secondary hull, both structurally strong and spacious and, when built with the most modern material technology, surprisingly lightweight. This would offer greater impulse maneuverability for a cruiser-sized vessel than was possible with the more traditional two-hull solutions.

Such maneuverability had become an acute issue for Starfleet, now that the Klingons had unveiled the *K'teremny* destroyer. This frightening predator was more a cruiser than a destroyer by design, and could qualitatively challenge the heavy cruisers and strike cruisers in Starfleet arsenal. It was thus only fitting that a 'heavy destroyer' be pitted against her. Still, the official designation for the Starfleet champion was to be the more descriptive 'battle cruiser'.

The face of the enemy. Initial sightings of K'teremny *destroyers in formations similar to this led Starfleet to regard the type as a direct successor to the ubiquitous* K't'inga *vessels. Later analysis has suggested that the Klingons had their sights set at a more limited mission profile and production run, even before the program ran into economic difficulties in the late eighties.*

The formula for success was simple in theory. The vertically extending secondary hull housed the same systems as in the *Detroyats*, just in more modern form and cruiserlike scale. The main internal powerplant elements were relatively bulkier now, due to the nature of the LN-64 engines. Impulse engines would be of very high performance, and the navigational deflector a fully enclosed unit. The shuttlebay was moved from aft to forward secondary hull, as the modern engine technology dictated the placement of nacelles well astern of the hull, where they blocked the original location. A special 'beavertail' structure was created to hold the twin horizontal intermix shafts, the first-stage plasma distributors and the short pylons for the nacelles; an impulse repeater feeding from primary plasma was embedded in the structure.

Torpedo armament would be mounted both as in the *Cochise* destroyers, directly below the primary hull, and into the lower 'keel hull'. Both launcher systems would enjoy very large magazines, the undersaucer Mk 7 pair sharing 90 shots and the two lower hull Mk 4 heavy launchers having 60 shots each. Twelve Type VII phasers on the primary hull and two on secondary hull stern would be controlled by the new Atherton HAWC sensor/software package. Heavy shielding, close to dreadnought standard, was a key design element. Much of the lower 'keel' volume was dedicated to shield generators, four 600-ton units in all. The combined total of weapons was calculated to offer the *K'teremny* respectable resistance, beyond the capabilities of the existing Starfleet cruisers.

What had looked so simple on screen did not translate well into practice, however. The initial three keels that were laid in 2277-78 were completed in 2279, and *USS Menahga* (NCC-3100) was immediately commissioned for operational evaluation. Within a year, it became clear that the 60-year-old basic design was not working. Stretching the warp field lower lobe forward and down to englobe the 'keel hull' resulted in inferior performance for the LN-64 pair, barely giving a top speed of warp 10.1 despite the extra power available from the purpose-built Kiratovani Model O warp core. Ramscoop fields were wreaking havoc with primary hull aft sector systems. Pylon integrity was being compromised in simple linear acceleration maneuvers. Obviously, radical nacelle repositioning was the necessary (but not necessarily sufficient) remedy.

In the 2280s, the wargames at Procyon were an annual event. Here USS Arsuf *(NCC-3101) fires both sets of torpedo tubes in a multiple kill against three '*Ch'ing *Birds of Prey', portrayed by target drones. A* K't'inga *or* K'teremny *would be a tougher nut to crack, requiring at least half a dozen torpedo hits or point-blank phaser blasts, yet a* Menahga *could pour*

out the required fire. The problems limiting Menahga *usefulness lay in survivability, maneuverability and the ability to close in for a kill.*

It took Starfleet three years of deliberations, experimentation on the converted veteran battle cruiser *Sanhadja* (now NCC-3190), and the completion of four more *Menahgas* to decide on such a refit; in 2283, *USS Mitannic* (NCC-3103) was pulled in for restructuring. While the nacelles were moved down and aft, changes were also made to the insufficient sensor fit. The lighter Mk 7 torpedoes were omitted in favor of a full Plessey multiband sensor suite and two QIK-50 FTL scanners, offering the Mk 4 weapons the chance to score hits at longer engagement ranges. At shorter distances, efforts were concentrated at adding to the still not quite sufficient impulse thrust, reducing overall mass, and upgrading the shield grid.

The fourteen months of modifications proved surprisingly successful. Not only was the *Mitannic* conversion followed by three more, but three new keels were also finished to this standard. Top speed now matched the cruiser standard at warp 12, and warp 8 cruising was an option. The *Mitannics* fared well in wargames, and their initial operational deployments had an immediate impact on adversary deployment patterns. High on-station endurance in comparison with other cruisers, closer to that of dreadnoughts, was of strategic importance. Yet production was not extended beyond ten hulls, three of which remained in the original *Menahga* configuration. The reason for this was not to be found in the complex games of UFP acquisition politics this time, but rather in their counterparts on the other side of the border. The feared *K'teremny*, superior in quality, was not being produced in meaningful quantity after all. Clearly, the Klingons had overextended themselves technologically and financially, and by the mid-2280s were already shifting their attention towards completely different tactical goals. At the time of the 2287 détente, SF Intelligence reported that *K'teremny* production could no longer be observed in any of the known Klingon dockyards capable of the task.

Counterreactions to the changing nature of the threat quickly followed. The three *Menahgas* received a demotion to the heavy destroyer category, making room for further cruiser orders. High endurance border patrol was shouldered on the dreadnought fleet, now actively deployed on theater instead of standing by at starbases. No longer daring to count on the ability to defend, Starfleet began gearing for the financially and logistically easier alternative of offensive warfare, and started modifying the *Mitannics* accordingly. *USS Avendesta* (NCC-3107) was recalled for refitting in 2289, and emerged two years later as the *S'harien*, sporting a completely new engine assembly. The LN-64B, mounted at saucer level, gave warp 13.4 dash speed for deep penetration runs. Impulse maneuverability was improved by further mass reduction, effected by sacrificing two shield generators and reallocating their power to IMRF systems.

Changes in mission parameters were matched by mission gear alterations. Midrange torpedoes, now of the Mk 70 type, were restored below the primary hull. Full sensors were still retained at the corresponding position, requiring a slightly more complex configuration. The former location of the beavertail now housed a second, aft-facing shuttlebay for four assault shuttles. An extended approach/landing platform was included, negating the need for precision tractor beam approach control; berthing for 135 Marines and storage for light vehicles and equipment was provided next to the bay. The *S'harien* was a full-fledged planetary assault machine now, while remaining a highly maneuverable impulse combatant as well.

Battle cruiser crews can attest to there being few experiences more terrifying than living through a Hagedorn Flip-Flop. With inertial dampers whining and stars spinning, impulse engines at constant maximum thrust forward, a S'harien *can roll through 450 degrees in 2.5 seconds, thanks to the nearly axially mounted nacelles and the long momentum arm of the RCS thrusters and gravitics on the 'keel hull'. Adding a 270 degree positive yaw to this, the battle cruiser can suddenly position herself perpendicular to the flight path of a pursuing adversary and bring all weapons to bear for a shot* en passant*. In this engagement at Davlos on SD 9438.3, the maneuver by* USS S'harien *seals the fate of* IKV Kaggra*; were the roles reversed, the* K't'inga *would still be torn to pieces, by the stresses involved in the maneuver.*

The success of the *S'harien* had been anticipated, and two other spaceframes were already under construction. Also, keel for *USS Andernach* (NCC-3112) had been laid; this model would introduce a modular version of the 'keel hull', capable of rapidly shifting between the space combat and assault roles. However, the time had come for the battle cruiser fleet to suffer the first losses: from the very start of the Khitomer negotiations, the Klingon delegation insisted on cessation of *S'harien* and *Andernach* production. While the rationale for objecting to planetary assault hardware was obvious, comments were also muttered on the psychological need for the Klingons to end the story of the 'Federation *K'teremny*'.

In the end, the *Andernach* was aborted and scrapped at an early stage of production, but the two *S'hariens* were finished and deployed as planned. The three *Menahga* 'destroyers' remained unmodified until retirement in 2302. The two battle cruiser standards in turn received constant care till the late 2320s. Their role was purely offensive-defensive: the limited sensor suite and computing systems did not allow for anything else, even though the high endurance and capacious shuttlebays might have been useful in a number of roles. Decommissioning of the battle cruisers began concurrently with that of the 2270s-90s strike and heavy cruisers, and followed the same principles – Starfleet's aim was to streamline and rationalize its arsenal, and there was no place for follow-on designs to the old cruiser classes in the new fleet.

The heritage of the late 23rd century battle cruiser classes lives in current Starfleet in a negative and perhaps distorted way. When applied on foreign starships, the designation has come to symbolize limited capabilities and unwisely biased mission profiles. Introducing a new Starfleet battle cruiser would be politically impossible. Yet the heavy cruiser and explorer designs of late, especially the *Akira* and *Sovereign* classes, in many ways aspire to the original ideals of the *Menahga*, *Mitannic* and *S'harien* classes: military superiority in solo operations is guaranteed via certain design sacrifices and corresponding improvement of select tactical aspects. In face of the recent quadrant-wide military crises, it remains to be seen how far Starfleet can follow its preferred path of attaining superiority (that is, without such sacrifices, but rather via generous overapplication of resources). In the 2370s, return to the battle cruiser philosophy might be closer than ever.

Ishtasse

Cruiser
2280-2324

Completed:	10
Length:	239.0 m
Beam:	141.8 m
Height:	45.3 m

66.0 m (w/ mission hull, exploration)
64.8 m (w/ mission hull, combat/support)

Mass: 660,000 tons
752,000 tons (w/ mission hull, exploration)
750,400 tons (w/ mission hull, combat/support)

Cruise speed: w 7

Max.speed: w 11.1

Endurance: 8 years

Officers: 35

Crew: 197

Weapons: 4 phaser VII emitters in twin banks on dorsal primary hull
6 phaser VII emitters in twin banks on ventral primary hull
2 phaser VI emitters in single banks on dorsal secondary hull
2 phaser VI emitters in single banks on ventral secondary hull (NCC-2262-64, original)
4 phaser VII emitters in twin banks on ventral secondary hull (NCC-2262-64 refit, NCC-2265 onwards)
2 fwd medium torpedo tubes w/ 50 photorps and 4 probes on dorsal primary hull (NCC-2262-63, original)
2 fwd medium torpedo tubes w/ 80 photorps and 12 probes on secondary hull (NCC-2262-64 refit, NCC-2265 onwards)

Shields: 2-layer conformal forcefields
Navigational deflector on dorsal fwd primary hull
Auxiliary navigational deflectors on ventral primary hull
Auxiliary navigational deflectors on ventral fwd secondary hull

Laboratories: 2 GP, 1 planetary sciences, 1 astrophysics

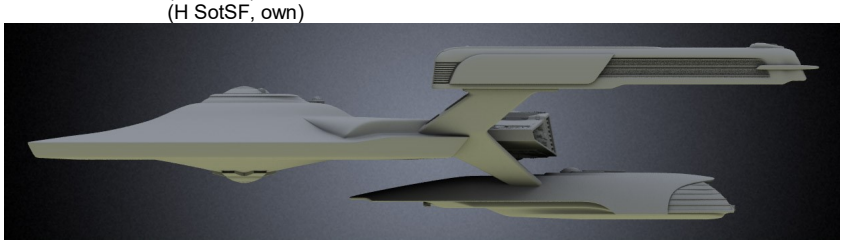
Transporters: 4 GP (6-pad), 1 cargo, 2 emergency evacuation (22-pad); Mk IV
All ships brought to Mk V standard in 2286

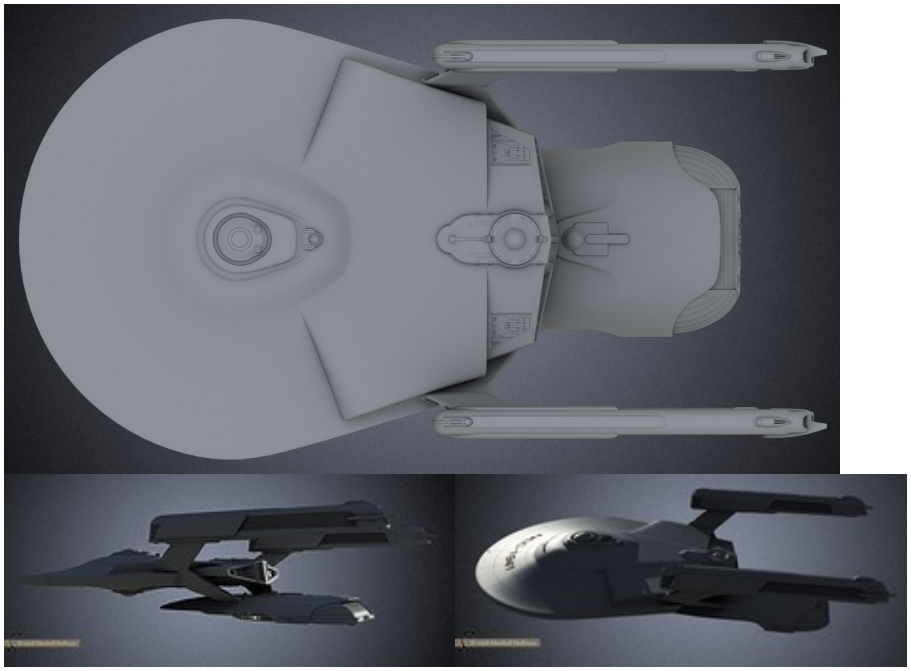
Auxiliaries: 2 to 4 work pods (w/o mission hull)
2 heavy, 6 medium and 6 light shuttles, 1 special environment craft (mission hull, exploration)
4 medium and 4 light shuttles; tactical craft sometimes carried (mission hull, combat/support)

Ships of historical interest:

USS Constantine (NCC-2257), *USS Ishtasse* (NCC-2253), *USS Komandorski* (NCC-2262)

SOURCES: (D ST3 predesign / Nilo Rodis)
(N SotSF)
(H SotSF, own)





Even though the bulk of Fleet funding in the late 2270s remained subject to adventurous power games where dreadnoughts and carriers were used as pawns, there was good continuity to the production of medium starships. Dockyards that had introduced the *Belknap* strike cruisers and the *Constitution* and *Miranda* refits could be constantly employed in producing improved successors to those starship families. Nevertheless, both medium and light cruiser numbers plunged to record depths during this era, after having been inflated by the major 2240s-50s construction programs. More than ever before, heavy cruiser became the Fleet mainstay.

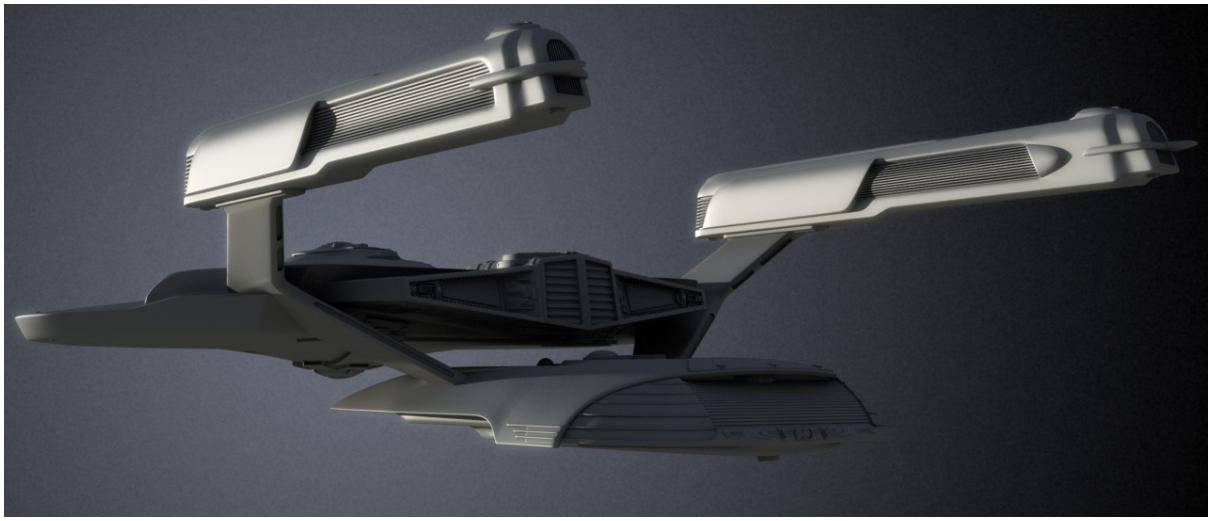
The dockyards that once had concentrated on the now neglected cruiser types wanted their share of the prosperity. Multiple light cruiser designs were proposed, ranging from the fairly conservative *Shanks* to the highly innovative *Foudre*. All were turned down, as heavy frigates now quite satisfactorily filled the niche. Medium cruisers fared little better, as Starfleet saw little reason to settle for anything less than the heaviest and most capable standards available. In practice this meant that every attempt at convincing the Commission for Starfleet that a new light or medium cruiser was needed resulted in one more hull added to the order for the versatile *Tikopai* class.

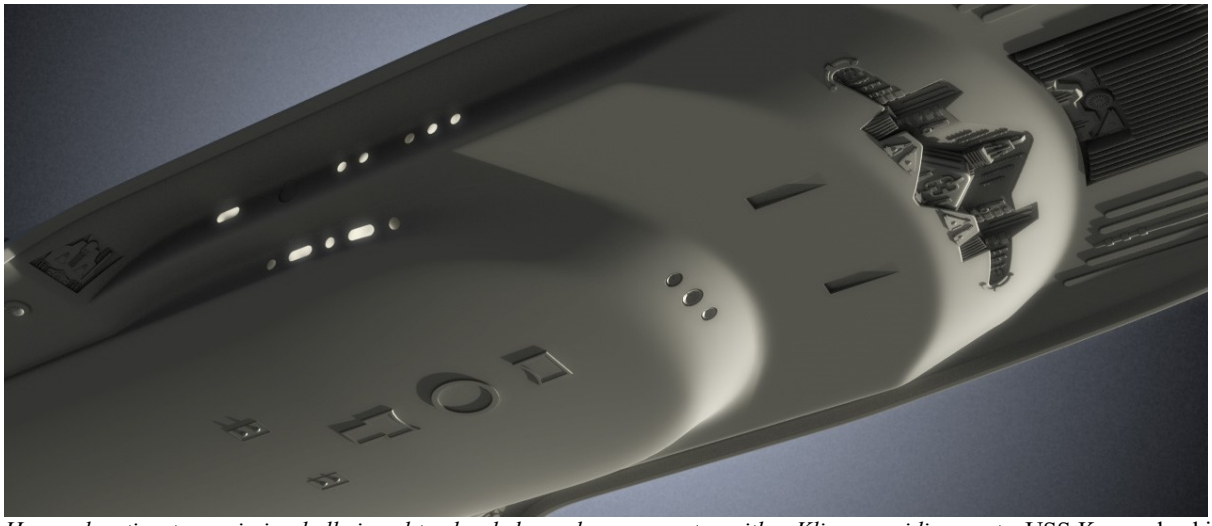
No less than eight shipyards formerly dedicated to smaller vessel production now found employment in the *Tikopai* program. For Kunman Space Division, former main contractor for the *Chesapeake* light cruisers, situation looked gloomier: its yards could not handle vessels the size of *Tikopai*. Kunman's forte was modular construction; to obtain orders, the shipbuilder now began planning for a cruiser type built of components of manageable size.

The original *Chesapeake* production run had been cut short by eight vessels, but assorted elements of these had already been partially completed. Among these was a naming and registry scheme: *USS Ishtasse* (NCC-2253) had been the first ship to be cancelled. Through its Commission connections, Kunman now offered Starfleet a medium cruiser by the same name, emphasizing the significant economic gains if the ships could be ordered as part of the *Chesapeake* package. In 2278, a go-ahead was indeed given, and Kunman prepared for the production of twelve cruisers, even if six of these were just 'options' rather than firm contracts.

The primary hull of the *Ishtasse* was swiftly put together at Dock 1 of the Newstone Colony yards, birthplace of *USS Chesapeake*. Comparable in general size to the *Chesapeake* or *Miranda* saucers, it combined a more voluminous superstructure with a slimmer, one-level main deck and minimal ventral protrusions. At upper bow were the flattened dish of the navigational deflector and the twin muzzles of the internal torpedo launchers, all neatly embedded in the superstructure. Astern, the hull expanded to an engineering area housing both the main m/am powerplant and an impulse assembly larger even than that of the *Miranda* class. The hull was almost a complete starship unto itself, pending only the installation of the 280,000 ton WD-6 engine nacelles on swept-back dorsal pylons at stern flanks.

In this configuration, the *Ishtasse* would have best been described as a heavy frigate. To provide cruiserlike capabilities, a 'mission hull' would need to be mated. These Kunman could manufacture separately, and even customize them to some degree for different mission profiles. Some 120 m long, 50 m wide and ten decks deep, the hulls provided extra sensor mounts, laboratory space, cargo holds, additional fuel reserves and auxiliary craft facilities – in essence everything that a heavy cruiser would offer. Their lightweight construction more resembled that of cargo pods, however, and featured similar advantages and drawbacks. The hulls could be attached via very simple pylons that only carried turbolift access tubes, dataways and inert fuel lines, not vulnerable primary plasma conduitry. Detaching was a matter of mere hours, and would turn the ship into a more agile basic combatant; emergency pyrotechnical severing was also an option. On the other hand, the mission hull was vulnerable to inflight stresses and enemy fire and, separated as it was from the main power loops, had to rely on auxiliary power arrangements for the most part.





Her exploration-type mission hull ripped to shreds by a close encounter with a Klingon raiding party, USS Komandorski *(NCC-2262) returns to Spacedock Earth for repairs. A ship with a more conventional internal configuration would not have survived damage of this type. Note also the very large impulse assembly and the complex and expansive superstructures under the bridge.*

The unorthodox configuration enabled rapid construction, and the *Ishtasse* was launched in the last week of 2279 already. Commissioning ceremonies were held in March 16, 2280, and a sister ship launched within the year. A further two would follow by 2285, and distributed production experiments would be begun with the remainder, now trimmed down to just six as the result of operational trials. Starfleet was quite satisfied with the type in terms of production economy, especially regarding wartime construction potential. Less satisfactory was the performance, providing good cruise speed yet maxing out at warp 11. The perceived flimsiness of the configuration was a further counterargument, even if a somewhat ill-founded one.

The obvious operational niche of these vessels was that of the similarly performing Phase II *Constitution* refits. To this end, Starfleet decided to replace all exploration-oriented mission hulls with a combat/support type instead. The original three vessels thus had to pull in for a refit that replaced the long range survey sensors with a bow battery of two hard-punching Mk 25 torpedo tubes, while the main hull torpedo systems were removed and replaced by improved fire control gear. Two twin banks of ventral Type VII phasers were added as well. The cavernous shuttlebay was not replaced by increased-capacity holds, however.

A decade of commendable service and escalating Klingon hostilities kept up Kunman hopes for subsequent orders. In the early nineties, serious plans were made of ordering up to a dozen additional *Ishtasses*, upgunned with Mk 25 secondary torpedo systems and new shield generators to true heavy cruiser standard. Production of two combat-type mission hulls was actually initiated before the Khitomer events put all plans on hold. No new *Ishtasse* primary spaceframes were completed, but project spares were used to bring back to service *USS Constantine* (NCC-2257) that in 2288 had been gravely wounded by a Klingon raiding party.

Fleet streamlining was deemed a sufficient excuse for retiring the *Ishtasses* without further refitting or major overhauls. There was still enough life left in the hulls to provide three more decades of active service, though. The last *Ishtasse*, *USS Roncador* (NCC-2260), was depowered in 2324 and converted into a storage hull.

Niffen

Buoy tender
2282-2354

Completed:	41
Length:	215.1 m
Beam:	142.2 m
Height:	66.8 m
Mass:	430,000 tons
Officers:	16
Crew:	68
Cruise speed:	w 6
Max. speed:	w 9.0
Endurance:	2 years
Weapons:	6 phaser IV emitters in 3 twin banks on dorsal hull 2 phaser IV emitters in twin bank on fwd ventral hull Up to 1,800 gravitic mines (minelayer role only)
Shields:	1-layer conformal forcefield 2 navigational deflectors on fwd hull
Transporters:	2 GP (6-pad), 1 cargo; Mk IV
Auxiliaries:	6 buoy recovery craft

Ships of historical interest:

USS DeLuna (NCC-R1640)

SOURCES: (D Jackill's / Eric Christiansen, SFCII computer game)
(N Jackill's / Eric Christiansen)
(H own)

The *Niffen* class was a minimum-effort continuation project for the *Derf* line of buoy tenders. Utilizing many of the same engineering solutions and doctrinal assumptions, *Niffen* reinforced Starfleet's combat fleet with what amounted to 41 destroyer escorts while maintaining Federation Transit Authority's arsenal of deep space maintenance and repair vessels.

Unlike many of the attempts in the seventies and eighties to find a successor for an old workhorse, however, the *Niffen* was not an actual refit of the predecessor design. A completely new saucer was combined with a single modern warp engine in place of the previous double units, and the hardware for both halves of the intended mission was rethought.

The warp engine of choice was LN-63, rigged dorsally in much the same fashion as the LN-61 in the half-scale *Remora* escorts. Performance requirements were modest, settling for a standard single-naceller cruise speed of warp six and a rarely needed dash speed of warp nine. The internal systems of the new engine took up more room in the hull than those of the older circumferential-excitation units – in relative terms. In absolute cubic meters, the single engine could be served by reduced facilities, allowing the buoy processing facilities to be tucked more neatly onboard and eliminating the need for a significant ventral hull extension. Processing now flowed through the hull from a bow opening, flanked by multiple precision tractor beam emitters and recovery drone berths, onto midhull workshops and a series of delivery chutes aft between the twin double impulse engines.

The total capacity for drones to be stowed onboard was somewhat reduced. The new mission profile emphasized the secondary military duty, but modern mines required less stowage space than the 2260s designs; space was now devoted to phasers, of which no fewer than four double banks were available, and to the doubled impulse drives. Thus rebalanced, the *Niffen* was not only a potent minelayer but also an agile escort, somewhat less affordable than the dedicated small designs, but paying for itself through the peaceful duty of communications network maintenance.

Indeed, such were the 'civilian' commitments of the type that *Niffens* seldom managed to take part in the ubiquitous military exercises of the 2280s. Lack of practice led to a self-mining accident in 2288, when *USS DeLuna* (NCC-R1640, one of the last vessels to receive a letter-specified registry) deployed a pattern of mines that mistook each other for a target and engulfed the sowing vessel in the explosion as well. Twenty-two lives were lost in the stern spaces, including mine operators and propulsive engineers, and the repaired ship had to be converted to an insystem training unit no longer suited for warp flight stresses. Escort duty was even more rarely practiced, or practiced for, and Khitomer peace finally dropped the military mission from the *Niffen* doctrine for good.

The *Niffen* fleet gradually bowed out during the 2330s, with individual vessels surviving at surveillance network maintenance tasks till the 2350s. *Andes* class general purpose tug/tenders took over, lacking internally carried special gear and instead towing dedicated buoy maintenance barges as needed. Despite similarities in configuration, the *Andes* series thus wasn't considered a direct successor; nor were any of the *Niffen* units significantly refitted to perpetuate the lineage of dual mission destroyer/tenders.

Kirov

Dreadnought
2283-2299

Completed: 5

Length: 443.8 m

Beam:	255.0 m
Height:	77.9 m
Mass:	1,580,000 tons
Cruise speed:	w 6
Max.speed:	w 14.2
Endurance:	5 years
Officers:	98
Crew:	556
Weapons:	20 phaser VIII emitters in 10 twin banks on primary hull 8 heavy torpedo tubes w/ 180 torps on weapons module
Shields:	3-layer forcefields Navigational deflectors on weapons module Secondary navigational deflector on ventral hull
Laboratories:	4 GP
Transporters:	4 GP (6-pad), 4 personnel (2-pad), 2 cargo, 4 emergency evacuation (22-pad); Mk IV (NCC-2150) Remaining ships built to Mk V standard
Auxiliaries:	6 medium shuttles, 4 heavy shuttles, 10 work pods; numerous tactical craft carried

Ships of historical interest:

USS Kirov (NCC-2150)

SOURCES: (D SFRC)
(N SFRC)
(H own, SotSF)

When Commissioner of Starfleet Mohammad ffolkes in the mid-70s bought a reprieve to the dreadnought program at the price of the shuttlecarrier one, several major carrier structural components were left half-finished. Among these were three gigantic primary hulls and no less than five pairs of LN-65A heavy duty warp nacelles, as well as four extra sets of coils. The re-escalation of the eighties was bound to make use of these leftovers, as it would of several others. However, even the aggressively inventive Mastercom and Aurora design bureaux favored by the new Commissioner Lars-Erik Valdemar were unable to come up with viable applications.

The *Ariel* carrier saucers were in theory highly capacious starship hulls. In practice, they were too much so to be of real use. Only ships of shuttlecarrier or defender size could hope to make use of such immense structures. While the Committee of Starfleet would have been delighted to field new defenders, the parallel *Excelsior* effort would have beggared the Fleet. Indeed, as far as large starship programs went, the existing dreadnoughts and the intensively hyped *Excelsiors* were already stretching the patience of the Treasury close to the breaking point. Expanded shuttlecarrier procurement remained an utter impossibility for this same reason, and for several others.

An unexpected new venue opened in 2281, when the Avenger Design Refit (ADREFT) program produced its first recommendations. Efficient application of the technology introduced in the *Constitution* and *Miranda* refits required new engineering solutions, that much was clear. The 'direct substitution' policy that had so miserably failed the *Federation* and *Saladin* refit projects was also limiting *Constitution* and *Miranda* potential. While some parties advocated an evolutionary approach through the *Constellation*, and later *Ishtasse* and *Reigate*, newbuild cruiser programs, they were in a distinct minority. A second, more extensive refit to the large *Constitution* and *Miranda* families was considered the economically most viable way of increasing the cruiser strength of the Fleet. And the ADREFT team had indeed found the formula for such a refit: by

adding a third nacelle and a new main power plant to a *Miranda*, her warp performance could be brought to dreadnought standards, and the ship sent to challenge the Klingons in deep space patrol and strike duty.

Experimentation with *USS Adamant* (NX-3029) showed the *Miranda* spaceframe to be too limiting for the projected upgrade, however. Nor was the concept of bringing in the heavy frigate fleet for time-consuming re-engining a strategically smart move at a time when the escalation craze was nearing its peak. Yet this was the opening Mastercom Starship Design Bureau had been waiting for. The huge *Ariel* saucers would offer the volume needed for proper installation of ADREFT hardware.

Two years of conversion work gave all three of the saucers a new stern, complete with an RMR-3080 reactor assembly designed for the never-built fifth *Ariel* carrier, ventral pylon mounts for three LN-65A nacelles, and four shuttlebays capable of housing and servicing ten shuttles and six to twelve tactical craft, and carrying dozens more if needed. Deep space patrol gear included twenty dreadnought-category phasers on the main hull, plus four forward and four aft heavy torpedo tubes and two powerful navigational deflectors on a dorsal weapons assembly. Plenty of internal space could be sacrificed for the power leads of the main guns without inconveniencing the crew of 654. The spacious Marine bunking and hospital areas of the *Ariel* design were available for crew habitation, and even four general purpose laboratories could be installed there.

None of the technology on these 1,580,000 ton behemoths was leading edge, and much of the development work for the three-lobed field had been performed under the project ADREFT already. The dreadnoughts met the expectations placed on them, as far as financing, project schedule and Fleet escalation ambitions were concerned. What remained to be proven was the performance and operational viability of the vessels.

In March 2283, *USS Kirov* (NX-2150, a reassigned *Fredrikstad* registry) sailed out of the huge carrier dock at Utopia Planitia for the first time, for a series of impulse tests. Later that year, tests verified the projected modest FTL cruise performance of warp 6, a price that had to be paid for the reuse of LN-65 series propulsion units. However, the flat three-lobed field did offer a maximum speed of warp 14, enabling deep space operations, and a greater degree of close-quarters warp maneuverability than that of the *Federations* or the *Ascensions*. The other ships under construction were officially launched within the year as well, and two new keels were also laid. Here would be a force multiplier on par with the *Denebs* in firepower if not in range and endurance. Here, too, would be ‘half a shuttlecarrier’, despite the disapproval of the Council.

A rare civilian assignment puts the heavy phasers of USS Sagrada Familia *(NCC-2153) to terraforming use. ‘Adjusting’ of a mountain range on Luciferia in 2294 resulted in improved weather patterns, but the teratons of dust injected into the atmosphere and the corresponding lifting of weight on the continental plate required constant observation and care for half a century afterwards. Evident from this view is the limited field of fire of the biblical-scale weapons, with practically*

*no firing solutions for dorsal aft angles – a problem inherent in the overall '*Miranda *configuration', and exacerbated here by the third ventral nacelle.*

By 2289, the fifth *Kirov* class dreadnought, *USS Pik Pobeda* (NCC-2154), had assumed patrol near Aldebaran. Also by 2289, though, Starfleet had more or less run out of funds to expand the dreadnought fleet. A force of 30 vessels, including the eight plus one *Federation* refits, ten *Ascensions*, six *Proximas* and five *Kirovs* and excluding the deactivated *Adamant* testbed and the three older *Federations* in reserve, was just barely within the operating budget. The worst credit hogs still were the active *Federations*, yet the *Kirovs* were not far behind, with at least two units down for maintenance at any given time and the rest draining Starfleet's pool of deep space specialist personnel. Defense Command was split over the issue: retire one of the types to keep the others in better repair and thus improve availability – or cover the gaping holes in defense lines rather by maintaining the entire fleet in active service and skipping much-needed dock layovers?

When the dreadnoughts finally saw combat, the disagreement proved to be of academic value only. The brief incursions performed as part of the Starfleet hardliner plan in 2293 involved several dreadnoughts, yet both the *Federations* and the *Kirovs* were left out of the action. Being the slowest units in the dreadnought arsenal, they were unsuited for rapid redeployment, and naturally could not be prepositioned without arousing suspicion on both sides of the border. This shortcoming might not have been quite so serious in prolonged open warfare – but in the end, it made the major investment in the *Federations* and *Kirovs* even more wasted than the opponents of the programs had predicted. Even before the Khitomer negotiations had begun, the *Kirovs* had been sacrificed, being at the very top of Starfleet's list of ships to be stricken.

Aleo / Jenshahn / Youngblood / Chosin

Through-deck cruiser
2283-2316 (*Aleo*)
2283-2327 (*Jenshahn*)
2290-2338 (*Youngblood*)
2292-2325 (*Chosin*)

Completed:	27 total: 6+3 *Aleo* 4 *Jenshahn* 10 *Youngblood* 4 *Chosin*
Length:	249.3 m (*Aleo*) 306.3 m (*Jenshahn*, *Youngblood*) 284.0 m (*Chosin*)
Beam:	141.0 m
Height:	71.2 m (*Aleo*) 75.0 m (*Jenshahn*, *Youngblood*) 73.6 m (*Chosin*)
Mass:	800,100 tons (*Aleo*, not including onboard auxiliaries and tactical craft) 820,200 tons (*Jenshahn*, not including onboard auxiliaries and tactical craft) 824,500 tons (*Youngblood*, not including onboard auxiliaries and tactical craft) 807,500 tons (*Chosin*, not including onboard auxiliaries and tactical craft)
Cruise speed:	w 7
Max.speed:	w 12.0 (*Aleo*, *Chosin*) w 13.2 (*Jenshahn*, *Youngblood*)
Endurance:	4 years (*Aleo*)

3 years (*Jenshahn*, *Youngblood*)
1.5 years (*Chosin*)

Officers: 41-45 (*Aleo*, pilots not included; usual complement 45 Starfleet and Marine pilots)
39 (*Jenshahn*, *Youngblood*, pilots not included; usual complement 70 Starfleet and Marine pilots)
38 (*Chosin*, pilots not included; usual complement 40 Starfleet and Marine pilots)

Crew: 409 (*Aleo*)
353 (*Jenshahn*, *Youngblood*)
320 (*Chosin*)

Weapons: *Aleo*:
12 phaser VII emitters in 6 twin banks on primary hull
1 phaser VII emitter on ventral secondary hull
2 medium fwd torpedo tubes w/ 60 photorps

Jenshahn:
12 phaser VII emitters in 6 twin banks on primary hull
2 phaser VI emitters on aft dorsal secondary hull
1 medium fwd torpedo tube w/ 30 photorps

Youngblood:
12 phaser VII emitters in 6 twin banks on primary hull
2 phaser VI emitters on aft dorsal secondary hull
2 medium fwd torpedo tubes w/ 30 photorps

Chosin:
12 phaser VII emitters in 6 twin banks on primary hull
1 phaser VI emitter on dorsal interhull
2 medium fwd torpedo tubes w/ 30 photorps

Shields: 1-layer conformal (later 1-layer globular) forcefield
Navigational deflector on fwd secondary hull
Secondary navigational deflector on ventral primary hull

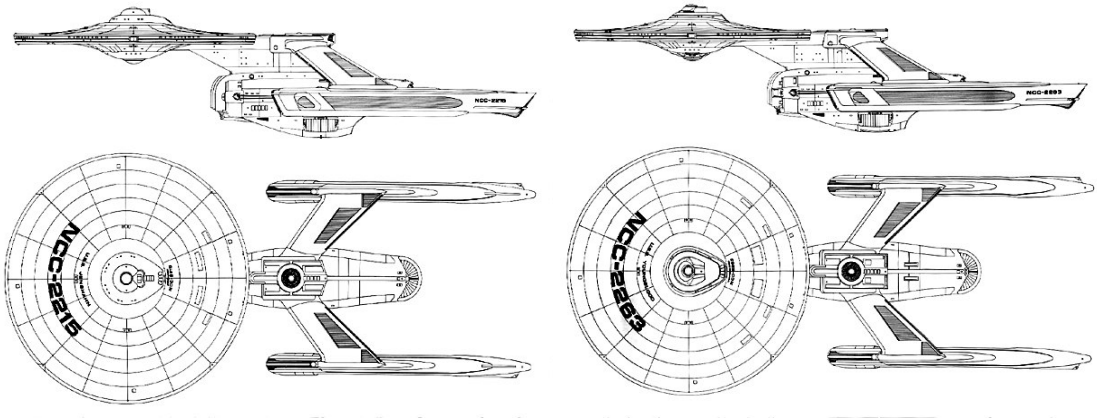
Transporters: 4 GP (6-pad), 4 evacuation/assault (20-pad), 3 cargo; Mk V (*Aleo*, *Jenshahn*, *Youngblood*)
4 GP (6-pad), 4 evacuation/assault (20-pad), 1 cargo; Mk V (*Chosin*)

Auxiliaries: Up to 8 assault shuttles or 26 various auxiliary and tactical craft, 8 work pods (*Aleo*)
Up to 14 assault shuttles or 36 various auxiliary and tactical craft, 8 work pods (*Jenshahn*, *Youngblood*)
Up to 12 various auxiliary and tactical craft, 20 hoppers, 6 work pods (*Chosin*)

Ships of historical interest:

USS Adroit (NCC-1983), *USS Chosin* (NCC-2610), *USS Jenshahn* (NCC-2215), *USS Youngblood* (NCC-2263)

SOURCES: (D FSCC/Mark Wilson)
(N SotSF, FSCC/Mark Wilson)
(H SotSF, FSCC/Mark Wilson)



In addressing the problems with fielding large shuttlecarriers of modern, operationally useful type, Starfleet did not limit itself to any particular solution. Yet many of the alternatives were just as unappealing as the *Kirov* carrier-dreadnoughts. The maintenance facilities aboard *Coventry* frigates were considered too limited and lacking in expansion potential; the ones on already modernized *Avengers*, even more so. The now-retiring *Coronado* through-deck cruisers faced the opposite

problem: their auxiliary craft systems were deemed acceptable, but their warp drives in turn too specialized and complex to be upgraded, as proven by the abortive experiments on *USS Oriskany*.

New construction was seen as the correct solution; the modernized *Constitution* or some other modern cruiser could be turned into a through-deck cruiser the same way the original *Constitution* had been evolved into the *Santee* and *Coronado* classes. The question now was, would the modification be economically and tactically viable, or would Starfleet find the capabilities it was yearning for in some other starship type? The R&D bureaus were vying for the latter choice, as drawing up all-new starships would best provide them with jobs. The shipyards in turn were hoping for further cruiser-carriers, since any new approach chosen by Starfleet might be incompatible with the current cruiser production capabilities of the yards.

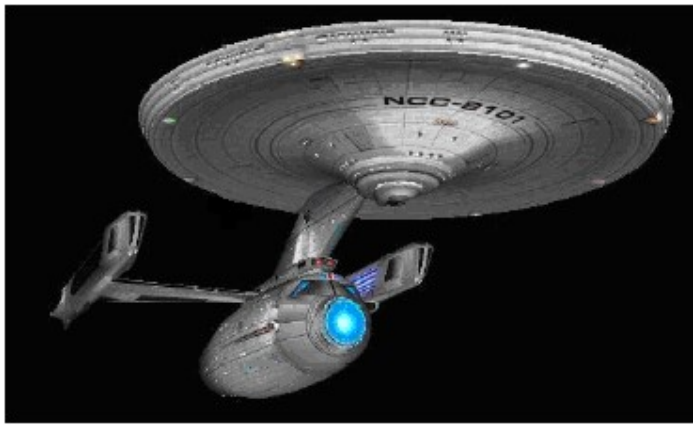
Starfleet's grounds for making the selection were solidly rooted in tactical and operational requirements, though. In face of mounting fears of Klingon invasion, Starfleet had already authorized the construction of armored hoppers and flitters, phaser and projectile artillery, portable shields, and other equipment for ground assault operations. Planetary assault missions utilizing this equipment were initially given to frigates, light cruisers and strike cruisers, by providing the vessels with extended auxiliary craft complements. It was a small leap from there to the ordering of three through-deck cruisers, the seeds of a projected 20-strong force. The production lines freed with the completion of the final examples of the highly capable and complex *Constitution* IV (or *Tikopai*) variants were now geared to produce these experimental mini-shuttlecarriers. Soon enough, *USS Advance* (NCC-1981) and *USS Jenshahn* (NCC-2215) emerged for trials on two parallel and competing concepts.

The *Advance* was Avondale's pitch, building on *Coronado* solutions as applicable to modern hardware. The warp intermix core of the *Tikopai* was cut to feature only the upper two thirds, and plasma conduits were drawn along the upper surfaces of the secondary hull from the intermix chamber to the LN-64 nacelles. Antimatter storage and feed was also reorganized to allow the flight deck to be extended through the bow of the secondary hull. The navigational deflector was changed into a slightly less capable unit occupying only the lower hemicircle of the secondary hull bow, and the broad shuttlebay doors were opened right above it. Torpedo magazines for the Mk 6 launchers were halved, ventral phasers omitted but for a single Type VII unit (which, like the primary hull weapons, was of the 'second-best' RIM-14A model), and laboratory spaces discarded as unnecessary. Cargo stowage was moved two decks down to ensure a level landing and handling floor for the small craft. Finally, the saucer was reorganized to allow for the secondary hull support systems to be housed partially inside the primary hull.

Starfleet accepted the pitch with one important modification: the name adopted for service use was *USS Aleo*, to avoid overlap with the battle cruisers from the beginning of the century. The original name was deemed acceptable for a vessel further down the path, which came to feature expressions of alliterative aggression and audacity.

Untold accidents and operational shortcomings plagued this design. Soon after completion, *USS Adroit* (NCC-1983) collided with strike cruiser *Shangri-La* when her maneuvering systems failed. *USS Alert* (NCC-1985) suffered heavy damage with a failure of the shuttlecraft approach control systems, as two tractor beams erroneously locked on one shuttle and pulled it against two assault craft. A small amount of antimatter from the shuttle was released, destroying all small craft aboard and disabling the ship for sixteen months while the secondary hull was patched together. Luckily, the antimatter refill systems of the hangar were not compromised in the incident, saving the *Alert* herself from a chain reaction that would have led to total destruction. No clear design faults could

be found in either incident, except for the fact that the crews were overtasked by the maintenance of the tightly crammed, in some aspects even jury-rigged systems.



The Aleo *class is seen here almost in its entirety, absent only the* Accent *(NCC-1984). The underutilization of the vessels after Khitomer is painfully evident from this 2305 view from SB 62. Several destroyers are also seen idled at this base near the Klingon border.*

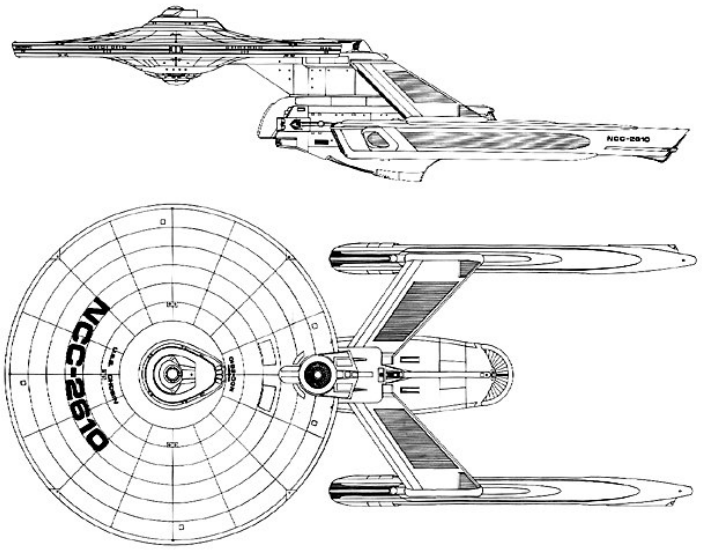
Even when all went well, the flight decks proved problematic: at even moderate impulse, only the aft approach port was available, due to the necessity of maintaining navigational deflectors on the mothership. Also, tactical craft on approach of the forward port drastically limited the field of fire of the main weapons of the cruisers, negating the advantage of that armament. Finally, the structural integrity of the hangar deck was just enough to ensure combat maneuvering at warp – but the calculations did not include the fact that mass distribution on the flight deck varied from time to time during combat, with variable-gravity systems in use and tactical craft moved around in preparation for launch. Thus, all use of variable-grav systems and the preflight preparation procedures of the tactical craft had to be carefully orchestrated during warp maneuvers.

When *USS Adamant* (NCC-1986) was forced out of warp on her first deployment as an imbalance developed in the engines, Starfleet's patience ran out. Thorough inquiries put the future of the program in doubt: the *Active*, *Affirm* and *Arrogant* were cancelled in mid-build, and nine other projected reinforcements never came to be. Competing designs were now brought forth, playing on the strong points of the *Santee* rather than the *Coronado* design philosophy.

The *Jenshahn*, offered by Shor Ta'kel, had initially received a less favorable evaluation. Her torpedo armament consisted of a single stock Mk 4 launcher squeezed in at secondary hull bow, with minimal magazines and poor fire control resources, as interhull internal volume was dedicated to a more potent warp power system instead. Her hangars were arranged on two levels, the lower one catering for an increased load-up of assault shuttles rather than maintenance, and possessing decreased structural strength due to one ventral and two lateral space doors. On the upper level, there was no through-deck capacity due to a full-size, curved-trapezoid Askhan deflector dish. Ventral phasers would have conflicted with the lower deck arrangements both structurally and functionally, and were omitted altogether. Yet all these aspects were turned to the *Jenshahn*'s favor in later analysis. The ability to fight like a cruiser was secondary now; what mattered under the current doctrine was maximal capacity for carrying assorted tactical craft, without the need for a full shuttlecarrier spaceframe.

Admittedly, the initial design suffered from some firepower problems, and an improved model was substituted for the original after the initial two ships had been completed. This augmented design was named *Youngblood* (NCC-2263), and featured a Phase V rather than Phase IV primary hull

complete with RIM-15 main phasers. Twin Mk 7 tubes were installed, yet without much increase in magazine capacity; overheating problems at the cramped location were eminent. A more powerful impulse deck of SANTH type was fitted, and maneuvering thrusters were added to reduce the odds of further collisions in close maneuvers. There were also improvements to the arrangements on the lower flight deck and a retooling of the space doors to maximize the assault shuttle carrying ability.



Seven *Youngbloods* were approved and completed between 2290 and 2295, even though political developments threatened to leave them out of work. Three more got their approval even after the Khitomer accords had been signed; Klingons were perfectly happy to see Starfleet expend its 'cruiser points' on designs that had reduced ship-to-ship fighting power. On the other hand, Starfleet hoped to wage the upcoming peace with strategic rather than tactical means, getting a boost in the colonization and exploitation of the worlds in the new treaty zones from the increased auxiliary craft and cargo facilities of the cruiser-carriers. To the end, the abortive three *Aleos* were also finally brought to completion, with a different selection of internal equipment and under the only slightly disingenious new class identity *Explorer*.

At that point, production ceased on the final member of the evolving family, a lighter and more affordable design dubbed the *Chosin* strike carrier. Auxiliary craft capacity was reduced from 36 to 12, and secondary hull phaser armament was removed altogether – but the lower hull was now configured to drop-launch up to 20 gravitic hoppers through a single ventral space door. This purely assault-oriented vessel had entered hoped-for mass production in 2290, too late in terms of the Klingon conflict; *USS Chosin* (NCC-2610) had been commissioned in January, 2292, and three of her sisters by 2294, the unwelcome children of a bygone crisis. These vessels lacked the logistical advantages of the *Jenshahns* and *Youngbloods*, and were quickly sent to reserves where the original *Aleos* already languished.

Production could have continued on the more capable types, if not for the fielding of the *Constellation* and *Reigate* class cruisers. These hard-hitting and fast vessels were able to carry almost the same complement of auxiliaries as the carrier-cruisers, without making any sacrifices in maneuverability, combat performance, structural strength or speed. Yet even they were but an intermediate step in the forming of a bold new Starfleet, one operating frontline cruisers the majestic size of the *Excelsior* class.

Starfleet currently maintains no ships in the through-deck cruiser mission class. The final *Youngblood* vessels were retired in 2338, still in quite acceptable service condition, as various standard cruisers took over what was left of their role. The *Explorers* were used so sparingly that the *Equicon* and the *Eilonwy* still were able to perform survey support duty in the 2360s, without a hint of "cruiser" or "carrier" in their mission profiles.

Planetary assault operations still require specialized ship types of their own, though, and as these operations again became part of Starfleet doctrine in the Cardassian conflict, further cruiser-carrier hybrids were introduced in the form of the *Steamrunner* class. The trend towards ships of greater flexibility and self-defense capabilities continues, and even the lightly armed *Steamrunner* strike carriers are far more potent space combatants than the *Aleos* or *Youngbloods* ever were. Still, they require escorts in order to be of operational worth. The true successors to the *Aleo* philosophy would be the *Akira* heavy cruisers of the late 24th century, capable of carrying respectable shuttlecraft or fightercraft contingents without compromises.

Odysseus

Fast cruiser
2283-2316

Completed:	8
Length:	307.1 m
Beam:	156.0 m
Height:	56.2 m
Mass:	875,000 tons
Cruise speed:	w 7
Max.speed:	w 13.5
Endurance:	5 years
Officers:	68
Crew:	392
Weapons:	16 phaser VII emitters in 8 twin banks on primary hull 4 fwd medium torpedo tubes w/ 120 torps on primary hull
Shields:	3-layer forcefields Navigational deflector on fwd secondary hull Secondary navigational deflector on ventral primary hull
Laboratories:	2 GP, 1 astrophysics, 1 biology
Transporters:	4 GP (6-pad), 2 cargo, 3 emergency evacuation (22-pad); Mk IV (NCC-2210, 2211) All ships brought to Mk V standard after 2284
Auxiliaries:	4 medium shuttles, 1 heavy shuttle, 4 work pods

Ships of historical interest:

USS Achilles (NCC-2222), *USS Agamemnon* (NCC-2227)

SOURCES: (D David George "Serpents Among the Ruins")
(N David George "Serpents Among the Ruins")
(H David George "Serpents Among the Ruins", own)

The radical advances of the 2270s and 2280s made linear-feed warp coil technology viable, allowed the first practical experimentation on deep subspace immersion, and subsequently facilitated the discovery of multiphasic warp field generation and independence from the limitations of phase-

locking. From the viewpoint of the 24th century, this appears a natural and inevitable path of evolution. However, interstellar history stands proof that it is far from the only such path possible. The period of frantic research from the late 2260s to the 2310s must thus be seen as a moment of choosing – a moment that may have delayed the discovery of true transwarp by a century, or perhaps hastened it by two.

One choice was made in 2287, when funding for the *Odysseus* project was terminated with four ships completed and four laid down. Without additional funds, this experimental starship class would never have the chance to complete the experiments it was built for. What it had already proved was enough to spell its doom: the so-called saturation drive did not yield propulsive dividends for starships larger than late 23rd century frigates.

When the first reports from saturation experiments on Andorian linear coil vessels were received in the mid-2270s, there was much excitement in Starfleet R&D bureaux and subsidiaries. Some, like CWD and Leeding, began planning modifications to LN-64 engines and RMR series powerplants to make use of the phenomenon, and ultimately helped boost the performance of modern frigates. Others initiated construction of entirely new engines. Temerand met success with the Vickers-built LN-9X series, and created the perimeter defense fleet. Geering bet its future on Setchuen-Shuvinaaljis LN-85 and the *Odysseus* fast cruiser, and lost.

The *Odysseus*, NX-2580, was admittedly a capable starship. Her saucer hull differed from the Chiokis standard, being somewhat larger in diameter and thicker by a deck. Much of the extra volume was utilized for additional weapons emplacements. The cruiser's arsenal of eight twin phaser VII banks, three ventral and five dorsal, translated into a true tactical advantage when coupled with the RCA multitargeting fire control system familiar from the dreadnought fleet. Two Mk 45 medium torpedo tubes below the bridge and two above the ventral sensor dome provided firepower superior to the heavy cruiser standard of the time as well; Geering felt that Starfleet would settle for nothing less, knowing that the upcoming *Constellation* reconnaissance cruisers would be similarly armed.

Where and when Starfleet would most need this kind of armament was another question – and as long as it could not be conclusively answered, mobility was the key. Crucial to the Geering contract was the ability of the starship to deploy to a crisis area at a dreadnought-like warp 14 to 15, outrunning both the *Constitution* derivatives and their Klingon counterparts. The pair of LN-85 engines at saturation mode was expected to provide the required speed and much more. Outriggered on swept-back pylons from a trailing secondary hull broadly similar to that of the *Chesapeakes*, the LN-85 units had a very distinctive J shape due to plasma pulse capacitors mounted at the lower bow of each nacelle. Power came from a relatively traditional swirl-chamber m/am reactor, heavily shielded both for tactical and technological reasons.

Aft of the reactor area lay a cargo hold and a shuttle hangar for a standard complement of five auxiliaries. Above and below were the impulse systems, with one IMRF unit and two nozzles each. Basically, the *Odysseus* went for a degree of clustering equal to that of the competing *Constellations*, but chose to place the torpedo launchers rather than the shuttlebays within the primary hull.

The 2283 launch of the prototype meant a PR victory for Geering, as the *Constellation* modernization program lagged a year behind. The lead ships of both projects were slated for several years of tedious testing, however. Geering's approach involved the construction of three more vessels parallel to the testing stage, a move that would ensure the company a major share of the

reconnaissance cruiser order and possibly oust Chiokis from the bid altogether. Four more keels were laid and four sets of coils cast, but assembly and subcomponent procurement was held back for the time being.

The famous last picture of USS Agamemnon*, firing desperately at* IRW Tomed.

By November 2284, Geering knew it was in trouble. Against all predictions, saturation mode was not producing speeds in excess of warp 14. In fact, higher than planned fuel consumption and plasma energy density was required beyond warp 13 already, presenting major risks or else necessitating major reworking of the entire energy distribution chain. The more conservative *Constellation* was propulsively outperforming the *Odysseus* with ease. Geering resorted to desperation tactics, cutting costs by eliminating the kind of mission flexibility that would later serve the *Constellations* so well. Orders for the final four vessels were secured by 2286. That was the extent of Geering's leash, however: as funding for further saturation drive experimentation ceased, there was no chance of selling more of the vessels by their other virtues.

Despite its creator's financial collapse, the *Odysseus* class served with some distinction through the culmination of the Klingon crisis and the escalation of the next Romulan one. The service was strictly military in nature, however. Exploration Command showed no interest in the vessels, and the spaces reserved for scientific research gear were used as cargo holds in the dull supply runs and long duration patrols the ships performed on the RNZ. Of the eight ships, named after male Iliad characters, only *USS Agamemnon* (NCC-2587) met a violent end, at the very focus of the *Tomed* Incident. Six of her sisters, representing a combination of high operating expenses and large crew requirements, had already been retired by that time; *USS Achilles* (NCC-2581) passed on her venerable name to an *Apollo* class vessel in 2313.

Constellation refit

Reconnaissance cruiser (later cruiser)
2284-2372

Completed:	33 total: 1 *Constellation* refitted and 7 built 12 *Gangut* 8 *Tehran* 3 *Harrison*
Length:	315.0 m
Beam:	168.1 m
Height:	85.2 m
Mass:	1,320,000 tons (*Constellation*, typical) 1,350,000 tons (*Gangut*, *Tehran*, typical) 1,352,500 tons (*Harrison*)

Cruise speed:	w 7 (original) W 6 (adopted after 2316)
Max.speed:	w 15.0 (original) W 9.0 (adopted after 2316)
Endurance:	8.5 years
Officers:	46 (original; later numbers vary considerably)
Crew:	389 (original; later numbers vary considerably)
Weapons:	6 phaser VIII emitters in 3 twin banks on dorsal hull 6 phaser VIII emitters in 3 twin banks on ventral hull 2 phaser VI emitters on dorsal and ventral pylons (NCC-1974) 2 phaser VI emitters on aft hull (NCC-1974) 5 phaser VI emitters on dorsal hull (other vessels) 2 medium fwd torpedo tubes w/ 80 photorps or probes on lower pylon junction 2 medium fwd torpedo tubes w/ 60 photorps or probes on upper pylon junction 1 medium aft torpedo tube w/ 30 photorps (not in NCC-1974, *Harrison*)
Shields:	2-layer conformal (later 1-layer globular) forcefield Navigational deflector on fwd hull Auxiliary navigational deflectors on ventral hull
Laboratories:	12, in varying configurations (*Constellation*, *Gangut*, *Tehran*) 2 GP, 4 astrography, 1 astrophysics (*Harrison*)
Transporters:	4 GP (6-pad), 4 emergency evacuation (22-pad), 4 cargo; Mk V All ships brought to Mk VI standard after 2314
Auxiliaries:	Up to 12 shuttles and 8 shuttlepods, 6 work pods; special mission craft sometimes carried (*Constellation*, *Gangut*, *Tehran*) Up to 6 shuttles and 8 shuttlepods, 6 work pods (*Harrison*)

Ships of historical interest:

USS Gettysburg (NCC-3890), *USS Stargazer* (NCC-2893), *USS Victory* (NCC-9754)

SOURCES: D TNG
N TNG
H TNG, ST6 (Rick Sternbach)

The *Constitution* refit proved many technological innovations that could not be fully exploited in the elderly design. The new warp technology was more efficiently utilized in newbuild ships that lacked a 2240s-era predecessor, such as the *Daran* class of frigates, *Sydney* class of medium transports, *Lotus Flower* class of heavy fuel carriers and *Grin'ki* class of tenders. Ironically, one ship type was missing from this broad selection – a heavy exploration and defense cruiser, the very mission profile represented by the *Constitution* conversions themselves. The success of these conversions meant that Starfleet could not plausibly press for the development of a truly high performance, all-new cruiser design. Such an endeavor would have required a R&D effort far more intensive than the gradual upgrading and expanding of the *Constitution* baseline model.

However, as the fifth and final *Constitution* refit design entered service in the mid-2280s, it became clear that one path had been traveled to its very end, and a new one would have to be taken. More speed and range were required to take Starfleet to unexplored territory, and more firepower needed to independently operate a cruiser-sized vessel in deep space – so argued Commodore Gihlan't'aehn, director of the Copernicus Yards and the most outspoken of the modern cruiser development advocates. Only when the first refit *Constitutions* reached the midpoint of their useful life did Commodore Gihlan's relentless promotion work finally carry fruit, and even then only through some well-intentioned subterfuge.

The vessels Gihlan hoped to field were at first marketed as limited-role reconnaissance cruisers, by virtue of warp propulsion improvements emerging from the *Constellation* test program. However,

as the new ships were hoped to ultimately inherit the dual explorer/capital warship role of the *Constitutions*, they were given the best possible firepower and endurance, as well as a full spectrum of research facilities. As "citius, altius, fortius" had already spelled disaster for several refit programs, Gihlan was careful to keep these long-term ambitions to himself, and to stress the mission-specific nature of the initial design. Yet no aspect of performance was deliberately sacrificed to serve any mission lesser than the frontline explorer/warship one.

The tight program schedule largely dictated the use of equipment familiar from the existing modern classes, but this time taken to the limits of its performance. The off-the-shelf hardware of NX-1974 was methodically stripped away in a refit begun in May 2283. The hull remained a fattened saucer based on *Constitution* dorsal structural frames, but was increased in diameter, and some key equipment was allowed to protrude outside the hull to provide even more interior volume. The four-lobed warp fields were now generated by four LN-70 engines mounted symmetrically above and below the stern, on double T rather than X pylons. These engines were based on the high performance coils of old *Constitution* LN-64 Mod 0 units, idled since the 2273 cutbacks in the Refit I program, yet were optimized for the four-lobed configuration from the get-go. Sublight propulsion was similarly based on top-of-the-line hardware: two Avidyne 4086 impulse decks flanked the nacelle pylon juncture and engineering assembly.

Six twin banks of phaser VIIIs provided the main armament, augmented by five (in the prototype, six) point defense phaser VI units. But since directed energy weapons were limited in range, three separate torpedo systems were included, two with twin Mk 70 tubes pointing forward from between the nacelles, and one with a single Mk 6 tube facing aft at extreme stern. Computing facilities of dreadnought standard, featuring the latest M-9C4 multitronic AI routines, were installed to control the complex weapons suite and the unusual warp field configuration.

USS Valkyrie*, attached to Task Force A in Klingon NZ, with SNARES long range subspace scanning gear fitted under the port propellant tank and passive AC sensors on the lower pylon, in 2293. Anti-cloak instrumentation of this type was later banned from Federation starships operating in exploration missions, and restricted to NZ patrols according to the third draft of the Khitomer treaty. It is not known whether this rule was ever enforced in practice. Clearly visible are the numerous shuttlebays and the partially exterior-mounted sensors.*

The modification was soon extended onto the *Valkyrie* and *Hathaway* as well, and new construction contracts were tentatively slotted for the near future. As the *Sempach* and *Speedwell* of older standard were decommissioned, Starfleet chose to forgo the systematic designation *Constellation (II)* for the modernized class, also repelling an initiative to move the legendary name to the *Excelsior* project. *USS Constellation* retained an NX registry for the time being, however, as there still remained plenty to explore in the exotic warp envelope of the four-nacelle design.

There was understandable debate about the mission class designation of the *Constellations* as well. The huge vessels surpassed all earlier cruisers in sheer volume, requiring a crew of over 500 despite all automation, and were intended to embark up to 200 civilian scientists and family members on some of the longer cruises, or haul up to 600 troops in a crisis. Their external dimensions still remained comparable to those of the *Constitutions* and thus allowed them to fit comfortably inside starbases and other Fleet facilities. The four-nacelle configuration meant that the ships were significantly heavier than their predecessors, more comparable in total mass to the heaviest dreadnoughts. Ultimately, however, the definer 'heavy' was dropped from the class designation of the *Constellations*, since by the 2280s it was obvious that near-future cruiser designs would all be of at least this size if not larger still. Instead, code letters CI were allocated to denote the intelligence gathering role of this new breed of cruiser.

The full spectrum of high quality Federation exploration gear was to be provided eventually. Some concessions had to be made originally regarding both quality and quantity, however, given the limited reconnaissance role of the *Constellations*. Yet all the necessary provisions were made for the installation of the items when the first *Constitutions* would bow out and relegate their exploration role to the new cruisers. There were two large, conjoined shuttlebays inside the saucer hull, each capable of supporting four full-size shuttles, or temporarily accommodating significantly greater numbers. In addition, four smaller facilities with contingency capacity for one medium shuttle or a number of small craft were available, with their own exterior doors and atmosphere-holding forcefields. Normally, only four shuttlecraft and four to eight shuttlepods were carried in the larger bays, along with a selection of sub-impulse pods and workbees; the small bays were dedicated to cargo and consumables, but sometimes also to exploration or colonization gear. The huge enclosures naturally reduced the structural integrity of the hull, but advances in materials technology and SIF performance ensured planetary landing capability for the saucer hull in emergencies. The augmented SIF systems were in fact easily distinguishable from exterior view, manifesting as surface-trunked field guides on the saucer flanks and pylons.

The fifteen-person R-series lifepods deployed later aboard some long-serving *Mirandas* and *Darans* and their variants saw their first use here, in conjunction with the one-and two-man pods familiar from *Constitutions* and *Belknaps*; the former were stored in hangar roofs, the latter ejected through hull panels. The traditional clumsy balloonlike lifepods adjacent to personnel hatches were eliminated now that such great numbers of more secure pods were available.

A completely new transporter system was also introduced, featuring for example a confinement beam much improved from the Mk IV version. Most importantly, the pattern buffer was made much more dynamic in nature, with multiple options for manipulating the matter stream. With this unit, putting transportees into temporary stasis was no longer necessary even in demanding transporting conditions. The system was quickly adopted aboard almost all cruiser- and frigate-sized vessels in Starfleet use, although many Class Two vessels still sported old Mk III gear. The in-transit accident rates of Mk III and Mk IV were now incompatible with new Starfleet safety guidelines, however, and the dynamic-buffer unit became a fleetwide standard after 2297, until replaced by the multiplex-buffer Mk VI system in 2319.

Also, sensor systems were boosted with the incorporation of gravimetric and duonetic sensor arrays and reconfigurable particle-beam scanners. These systems were similar in operation to the pod-mounted precursors aboard the *Soyuz* class, but technology advances enabled their packing into smaller space. Still, some sensor elements, deflector mounts and other pieces of equipment like enlarged

impulse propellant tanks vontinued to protrude from the main hull, giving the ship a utilitarian look when compared with, say, the streamlined *Constitutions*.

The total mass of 1,320,000 tons was in later models increased to 1,350,000 tons as even larger fuel tanks were fitted. These improved-endurance vessels were formally introduced as the *Gangut* subclass, but the new, simplified designation policy meant that the subclass name was in practice never used. The long-delayed *USS Tehran* later spearheaded a third subclass, with the expanded fuel capacity but without most of the external sensors of the other two versions. A final three vessels were completed out of surplus hardware in 2312-13, as a response to the peaking of the Romulan crisis and fear of post-*Tomed* aggressions. This *Harrison* subclass was subsequently specifically outfitted for deep space cartography, and carried sensor pallets in place of the four smaller shuttlebays.

Despite all the technology innovations, most equipment was compatible with *Mirandas*, *Belknaps*, *Constitutions* and *Darans* and their offshoot designs, so these vessels practiced operations as net-coordinated 'wolfpacks' with common support systems, although very secretively so. By 2293, eight modern *Constellation* vessels were completed, yet their very existence had been denied until 2291, and their missions were held secret even after frontline deployments. Quiet, deliberate preparations were under way for decisive strikes against the enemy at the earliest sign of weakness.

As it turned out, the Fleet now had excess fighting capacity in the form of the numerous multimission cruisers as well as dedicated strike cruisers, dreadnoughts and destroyers, tempting many high-ranking officers and several politicians to consider the possibility of ending the Klingon threat with an all-out war. This suited well the plans of certain Romulan factions. Relations between UFP and the Romulan Star Empire had never before been this good: under the new policy that had followed the 2276 uprising and the recent death of the High Praetor, the enigmatic Romulans approached the United Federation of Planets with initiatives of peace. Despite the vehement denials by the official sources of the time, it is almost certain that Romulan military aid was secretly promised to Starfleet in case a war against Klingons broke out.

Covert build-up of Federation forces in strategic starbases went on, with all the seven operational *Constellations* participating in wargames simulating parts of the intrusion plan. The pathfinding *USS Constellation* (NCC-1974) was nominally performing warp test runs, but in reality gathering intelligence on the Archanis sector garrison worlds. *USS Valkyrie* (NCC-2590), *USS Hathaway* (NCC-2593), and *USS Stargazer* (NCC-2893), on "joint exercises", stood by to lead formations of strike cruisers through the heavily defended Mempa sector. *USS Magellan* (NCC-3069) and the recently finished *USS Victory* (NCC-9754) and *USS Gihlan* (NCC-9761) were clandestinely deployed on the underbelly of the Empire, pointing their sensors towards Qo'noS itself. The at that point only partially completed *USS Tehran* (NCC-7100) did not take part in the operations.

In 2293, the perfect moment to bring the Empire to its knees seemed to have come: an energy production facility crucially important to the Klingons blew up – right next to their Homeworld. It has never been confirmed whether Federation or Romulan sabotage played part in the incident or whether it was simply the result of lax security in the antimatter conversion centers of the moon Praxis. Whatever the reason, the Klingons found themselves in a desperate situation, and war seemed inevitable.

But the pro-war conspiracy was not widespread enough within Starfleet. There were enough starship captains and diplomats who took seriously the Klingon offerings for peace that the conspirers had to revert to assassinations of key figures and involvement of the Klingons themselves in the plot. And this turned the simple plan into a multi-headed monster that finally ate its creators.

After the elaborate plot was uncovered during the Khitomer Conference in 2293, thorough investigations within Starfleet resulted in 'cleansing' of key officers (including advocates of Romulan cooperation and members of the warmonging faction, although surprisingly few of the discharged officers represented *both* of these factions), as well as withdrawal of several offensive units from the Klingon border in anticipation of negotiations to end the hostilities. All the *Constellations* were sent away to exploratory missions, to replace the *Constitutions* and other older types now being scrapped.

The scandal can also be seen as the incentive for the gradual process of abandoning the system of separate Defense and Exploration Commands within Starfleet. The merging of these two main branches was begun at a low organizational level: Starfleet started actively rotating its multipurpose vessels and their crews between defensive and exploratory duties. This was done as a precaution against the kind of 'stacking of cards' that had placed large numbers of officers sympathetic to the warmongers in important positions aboard border sector starships. The increasing speed of starships facilitated the further diverting of defense starships to exploration duty. The *Constellation* class was among the first to be deployed according to the new principles.

The old warfleet did not offer the technological resources for full adoption of this practice. Starfleet resources were now guided to the procurement of three main ship categories needed to meet the demands of the new doctrine: versatile exploration cruisers, fast long range defense starships, and high-endurance surveyors. The combination of heaviest firepower and most advanced research facilities that had marked the heyday of the *Constitution* class was at this stage left as the trademark and privilege of the *Constellations*. The other older cruisers lagged badly behind in both respects, and the very few and very expensive *Excelsiors* were originally only suited for military missions.

Ultimately, no less than 31 *Constellations* sailed out into the unknown, each completing several five- to eight-year missions beyond Dumbbell and Taurus nebulae. The first random contacts with explorers, traders or conquistadors of the major political entities in the Dumbbell direction, namely the Breen Confederacy, the Ferengi Alliance and the Cardassian Union, ended near-disastrously. But the great discoveries made at that time nevertheless again attracted the imagination of the expansionist species of the UFP; Starfleet's exploration vessels pressed on.

The 'warp renaissance' of the early 2300s marked the end to the *Constellation* rule. What had in the 2280s been envisioned as standard-setting if not record-breaking speed and endurance fell far short of the deep space exploration requirements of the 2310s. An adjusted cruise speed of warp six on the absolute scale still met second-tier survey and diplomatic mission needs, and this is where the *Constellation* units excelled. After their long service, most ended up as patrol vessels in the Neutral Zone before their final voyages to Zakdorn depots or museums. Some persisted for decades, *USS Victory* being among the last to be retired in early 2376. None of the *Constellations* have been scrapped yet, and reactivation of mothballed or even museum-preserved specimen still remains an option.

Doing her bit till the very last, USS Hathaway *participates in wargames at Braslota some fifteen years after having been retired from active service. Despite having her torpedo tubes sealed off, she remains a combatant, although her secondary phasers here only fire at laser mode for simulation purposes.*

Excelsior

Transwarp testbed/space control ship/explorer (later heavy cruiser)
2284-

Completed: 238 total:

Batch 1 (2284-98):
1 *Excelsior* transwarp prototype (later heavy cruiser Mk II)
3 *Repulse* heavy cruisers Mk I
2 *Columbia* heavy cruisers Mk II
1 *Ingram* space control ship
1 *Enterprise* explorer (later heavy cruiser Mk III)
Batch 2 (2309-13):
6 explorers (later heavy cruisers Mk III)
10 heavy cruisers Mk I
14 heavy cruisers Mk II
Batch 3 (2332-35):
59 heavy cruisers Mk I
58 heavy cruisers Mk II
Batch 4 (2340-42):
32 heavy cruisers Mk I
52 heavy cruiser Mk II
1 heavy cruiser Mk III

2 heavy cruisers Mk I refitted to command ship standard in 2351
1 heavy cruiser Mk I command ship conversion partially refitted to Mk IV explorer standard in 2367
1 heavy cruiser Mk III refitted to Mk V standard in 2372

Length: 453.1 m (Mk I, II)
467.0 m (Mk III, IV)
514.8 m (*Ingram*, as planned)
389.6 m (*Ingram*, as completed)

Beam: 185.0 m

Height: 79.1 m (all *Excelsior* marks)
63.6 m (*Ingram*)

Mass: 2,402,000 tons (NX-2000, original)
2,200,000 tons (heavy cruiser Mk I, typical)
2,190,000 tons (heavy cruiser Mk II, typical)
2,350,000 tons (heavy cruiser Mk III, typical)
2,400,100 tons (heavy cruiser Mk IV)
2,031,000 tons (*Ingram*, as planned)
1,030,000 tons (*Ingram*, as completed)

Cruise speed: w 8 (prototype/explorer/*Ingram*)
W 6 (heavy cruiser)

Max.speed: w 13.0 (prototype/explorer/*Ingram*)
W 9.4 (heavy cruiser)

Endurance: 3 years (prototype/*Ingram*)
8 years (explorer)
12 years (heavy cruiser)

Officers: 170 (typical heavy cruiser)
141 (*Ingram*)

Crew: 459 (typical heavy cruiser) + 50-100 civilians and research crew
424 (*Ingram*) + up to 500 Marines

Weapons: Transwarp prototype:
10 phaser VIII in 5 twin banks on upper primary hull
10 phaser VIII in 5 twin banks on lower primary hull
2 phaser VI in single banks between impulse engines
4 phaser VI in 2 twin banks on aft dorsal secondary hull
4 phaser VI in single banks on ventral secondary hull
2 heavy fwd torpedo tubes w/ 60 photorps or probes in secondary hull
2 heavy aft torpedo tubes w/ 40 photorps in secondary hull
Ingram:
10 phaser VIII in 5 twin banks on upper primary hull
6 phaser VIII in 3 twin banks on lower primary hull
2 phaser VI in single banks on aft dorsal secondary hull
4 phaser VI in single banks on ventral secondary hull
4 phaser VIII in 2 twin banks on engine pylons
3 heavy fwd torpedo tubes w/ 60 photorps or probes in secondary hull
Explorer variant:
10 phaser VIII in 5 twin banks on dorsal primary hull
10 phaser VIII in 5 twin banks on ventral primary hull
2 phaser VIII in single banks between impulse engines
4 phaser VII in 2 twin banks on aft dorsal secondary hull
4 phaser VII in single banks on ventral secondary hull
2 heavy fwd torpedo tubes w/ 80 photorps or probes in secondary hull
2 heavy aft torpedo tubes w/ 80 photorps in secondary hull
2 medium aft torpedo tubes w/ 50 torps in secondary hull
Heavy cruiser (Mk I, II):
10 phaser IX in 5 twin banks on upper primary hull
10 phaser IX in 5 twin banks on lower primary hull
4 phaser VII in 2 twin banks on ventral secondary hull
4 phaser VII in single banks on dorsal secondary hull
2 heavy fwd torpedo tubes w/ 90 photorps or probes in secondary hull
2 heavy aft torpedo tubes w/ 90 photorps in secondary hull
1 or 2 medium aft torpedo tubes w/ 30-60 photorps in ventral secondary hull module (carried on select missions)
Heavy cruiser (Mk III):
10 phaser IX in 5 twin banks on dorsal primary hull
10 phaser IX in 5 twin banks on ventral primary hull
2 phaser VII in single banks between impulse engines
4 phaser VII in 2 twin banks on aft dorsal secondary hull
4 phaser VII in single banks on ventral secondary hull
2 heavy fwd torpedo tubes w/ 80 photorps or probes in secondary hull
2 heavy aft torpedo tubes w/ 80 photorps in secondary hull
Heavy cruiser (Mk V):
10 phaser IX in 5 twin banks on dorsal primary hull
10 phaser IX in 5 twin banks on ventral primary hull
2 phaser IX in single banks between impulse engines
2 phaser IX in single banks below primary hull shuttlebays
4 phaser VIII in 2 twin banks on aft dorsal secondary hull
4 phaser VIII in single banks on ventral secondary hull
Single phaser VIII on dorsal pylon junction
2 heavy fwd torpedo tubes w/ 120 photorps, quantum torps or probes in secondary hull
2 heavy aft torpedo tubes w/ 80 photorps or quantum torps in secondary hull

Shields: 3-layer conformal forcefield; later models 1- or 2-layer globular forcefield
Navigational deflector beam on fwd secondary hull
Secondary navigational deflector on ventral primary hull

Laboratories: 2 GP, 1 astrography, 1 propulsive studies (transwarp prototype, original)
2 GP, 1 planetary sciences (*Ingram*)
2 GP, 4-6 labs of various types (heavy cruiser Mk I, original)
2 GP, 14-16 labs of various types (heavy cruiser, all marks, batch 2 onwards)
2 GP, 22-28 labs of various types (explorer)

Transporters: 4 GP (6-pad), 6 emergency evacuation (22-pad), 6 cargo; Mk V
All ships built or brought to Mk VI standard after 2320
All ships brought to Mk VII standard after 2348

Auxiliaries: Up to 12 shuttles of various types, 10 work pods (heavy cruiser Mk I/II)
Up to 20 shuttles of various types, incl. special-purpose craft, 10 work pods (explorer, heavy cruiser Mk III/V)
Up to 24 shuttles and 48 tactical craft of various types, 6 work pods (*Ingram*)

Ships of historical interest:

USS Enterprise (NCC-1701-B), *USS Excelsior* (NCC-2000), *USS Lakota* (NCC-42768), *USS Melbourne* (NCC-52043)

SOURCES: D STIII, ST:GEN
N STIII
H STIII-VI, TNG, DS9

It is often postulated that after reaching a certain level of technological prowess, a culture needs an external crisis to make significant advances in technology. Only wars and global disasters force the accumulated scientific knowledge to be solidified into quantum leap innovations; only mortal threats overcome the economic inertia of cultures already well off with their present technology. There are numerous examples to support the claim. Some are serene societies with an ancient technological base. Others are driven species undergoing a constant escalation of power and knowledge. Of the latter, humankind is a good example.

In the 1940s, the power of nuclear bonds was first used in technical applications – and atomic weapons escalation kick-started the space program of Earth. In the 2050s, Earth had been on the brink of nuclear annihilation – and the Cochrane team opened interstellar space for humanity to vent its aggression, although too late to save it from WW III. In the 2220s there had been a threat of interstellar war like never before – and dilithium reset the balance of power, making Klingons challenging adversaries instead of terrifying ones.

This play of leapfrog between technology and war was interrupted in 2267 by Organian intervention, effectively ending hostilities between Klingons and humans and putting the military-research machines of both Empires on neutral gear. As a result, huge numbers of theoretical studies called ‘paper tigers’ were conceived in waiting for a time when war could again be waged. These studies accumulated until reports started coming in that the erratic Organians were letting border skirmishes take place. Still, thanks to the veil of secrecy surrounding the Organian system, it took more than a decade to confirm that the powerful noncorporeal beings had in fact disappeared without trace. Starfleet, terrified of the probable Klingon reaction, diverted significant funds to superweapon programs, as it had done in the 2220s.

The first ‘paper tiger’ to be put into action was not the most fantastic or unrealistic of the lot – but it was a close call. Careful theoretical studies of interdimensional anomalies encountered during the years of exploration yielded the so-called transwarp equations. These in essence proved that by entering deeper and deeper levels of subspace, one could circumvent the power limitations of warp drive, finally achieving instantaneous travel. The power required to enter these interdimensions was huge, but a go-ahead was still given to develop a small-scale test engine for transwarp travel.

The first test rig successfully entered the lowest levels of interdimensions and achieved travel times comparable to a speed of warp 2, at extreme power costs. But the results tallied with the theory, and a second, manned testbed constructed with extensive variable geometry jumped through interdimensions to achieve the equivalent of warp 11. The test results were deciphered, and an amazing observation made: power requirements would at first grow steadily, but then level off after warp 12. To take advantage of this phenomenon, one needed a starship-sized powerplant, and the next steps in the test program involved two modified *Federation* class dreadnoughts: *USS Star Empire* (NCC-2116), which

never entered transwarp, and *USS Alliance* (NCC-2105), the proof-of-concept flights of which produced mixed results at speeds equivalent to warp 27. The experiences on the *Alliance* suggested that a purpose-built ship be designed for the actual operational evaluation of the drive, and Starfleet R&D now believed they had a pretty good idea of how to build such a ship.

In 2274, Starfleet requested and received resources to build a ship capable of realizing the dream. This would be no testbed in the traditional sense of the word: to feed the initial power, the powerplant as well as the vessel would have to be huge. To harness the drive and avoid the major problems encountered in transwarp navigation during the early *Alliance* tests, an impressive array of all-new sensors as well as exceptional computational power was required. There was thus no reason to build anything less than a starship complete with weapons, shuttlebays and crew quarters. This equipment represented only a marginal increase in overall cost.

In 2278, the starship *Excelsior* (so christened after the mysterious disappearance of a *Constitution* cruiser vacated the venerable name) was ordered from San Francisco Fleet Yards. A parallel testbed vessel, *USS Ingram*, was to be built by Star Fleet Division as an insurance of sorts, using the somewhat lesser resources of the dockyards at Proxima. Starfleet also managed to slip in an order for two other ships to be constructed there simultaneously to a full operational standard, and two more at San Francisco, even though the results of the transwarp tests were still inconclusive; *USS Proxima* and *USS Roosevelt* were built initially without transwarp machinery, a sage decision considering later events. The exact nature of the 'special' machinery aboard the *Excelsior* was not made public, either.

Warp drive was installed to propel the ships in realspace and within the dimensions. But the huge Koëller Uti K27 nacelles of the *Excelsior* also mounted transwarp coils, plus the obligatory fuel-replenishment ramscoops and RCS systems. To support the weight of the double coils and other machinery, pylons made out of high-grade duranium-tritanium alloys were mounted on a special structure that absorbed the huge torque forces and transmitted them evenly to the rest of the secondary hull. A bubble-like observation deck and shuttlebay was added aft of this attachment point, in the extreme stern. Most machinery related to propulsion and power generation was located well forward of the attachment point; within the secondary hull bow were the primary intermix and plasma distribution systems and antimatter storage, accompanied by a huge transwarp streamer coil slightly abaft and by the main deflector and the bays for twin torpedo tubes ahead.

Vast cargo holds were built into the dorsal secondary hull. In normal operations, cargo was loaded through the aft shuttlebay, although cargo transporter platforms were naturally also available. Forcefield curtains were now so reliable that mechanical doors were often kept open all the time except for combat, warp travel and assorted emergencies; shuttlecraft operations thus became drastically easier. Below the shuttlebay, outside the pressure hull, were mounting points for twin aft torpedo tubes and their magazines. Also installed on various locations of the lower aft hull were tractor beam units of unprecedented power.

The vertical intermix bottle went up through the connecting neck, as in *Constitution* ships. At the top end, it connected to feed two massive impulse engines from the primary plasma loop, with twelve fusion reactors as backup. Apart from the impulse assembly, the primary hull was a stock *Komsomolsk* piece, albeit heavily reinforced internally. It was initially left virtually empty, pending the installation of weaponry, research and crew facilities and various ship's services. The bridge module berth, partially inset into the top deck, was of standard type, yet the modules to be installed were customized for the purpose. A large jettisonable test bridge with numerous performance monitoring stations was used during the trial runs. The auxiliary bridge within the saucer in turn served as a testbed for the final main bridge configuration. For combat operations, a dedicated

armored battle bridge was planned for the secondary hull, but not incorporated in the original prototype.

USS Excelsior*, NX-2000. After her brief career as transwarp testbed, the ship was put into service at the Klingon NZ. Nominally a command vessel, the* Excelsior *also performed mapping missions that apparently were a cover for sigint operations in Beta Quadrant strategic hotspots. In this duty, the ship never had to fire her phasers in anger, although a total of 38 torpedoes were launched, mostly for testing, research or demolition purposes. Later* Excelsior *class ships saw extensive military action, especially in the Cardassian and Dominion wars. The early designation 'battleship' was never officially applied, the preferred term being 'space control ship'; Starfleet ultimately abandoned the politically undesirable and somewhat confusing nomer in favor of the noncommittal and technologically more fitting 'heavy cruiser'.*

The *Excelsior* was completed in 2284 and assigned the mission of validating the transwarp design, under the command of Capt. Richmond E. Styles. As it turned out, this mission would never be completed. In stardate 8204, the *Excelsior* was ordered to pursue the renegade Admiral Kirk, but a failure in transwarp controls, quickly found to be the result of sabotage by Kirk, prevented the ship from leaving orbit. After two weeks, all the sabotaged systems had been located and repairs completed, and a new date was set for trials. But in SD 8231, when the transwarp drive was first engaged, a field feedback nearly collapsed the containment fields, and only a swift warp core ejection saved the ship from destruction. It was found that many onboard systems were incompatible with transwarp fields, and several modifications had to be made.

Three months later the ship was finally fully armed and equipped (the weapons fit including doubly-quintuple main phaser banks and quadruple Mk 60 heavy torpedo tubes and thus upping the ante on the dreadnought and defender designs that had previously performed the 'space control' role), but still undergoing modifications at Spacedock Earth. Then the Probe crisis struck, and all the onboard control systems of the *Excelsior* were destroyed as she desperately tried to power up to intercept the Probe. Only a foolhardy time travel attempt by Admiral Kirk, ironically made possible by the earlier failure of the *Excelsior*, saved Earth from destruction. But now Starfleet had fifteen non-spaceworthy starships to worry about, and the repairing of at least five cruisers was given the highest priority.

When the *Excelsior* in late 2287 finally was ready for the crucial tests, Commodore Styles was suddenly taken ill, and the tests had to be postponed in lieu of another transwarp-trained captain. As it turned out, Commodore Styles recovered before a new captain could be trained for the demanding mission, but again two months had passed. In the final week of 2287, the ship finally engaged her transwarp systems just off the Sol system, entered subspace – and disappeared. After a frantic two-month search by numerous starships, the *Excelsior* was found floating dead in interstellar space eighteen lightyears from Earth, having suffered a total systems failure.

Post-flight analysis revealed that power consumption had in fact *increased* hundredfold after the equivalent of warp 16.3, initiating a catastrophic feedback in power systems. The transwarp equations were rechecked, to reveal one of the most embarrassing single-bit failures in the history of the known humanoid cultures. Transwarp as proposed *was* achievable, but only with energies in excess of those of a class B blue-white giant star. A radically new way of regulating antimatter annihilation would have to

be invented, or then a wholly different energy source harnessed, for this type of propulsion to become a reality.

Commodore Styles was posthumously decorated for his great contribution to Federation science, and the transwarp project buried as unsuitable for both transportation and weapon applications. The *Excelsior* was stripped of transwarp and testing equipment, and the impulse engine fusion reactors and other secondary power systems reconfigured to compensate for the removal of transwarp-standard power feeds. The aft shuttlebay was modified to house an improved cargo conveyor and added work pod support machinery, and the plush yet vulnerable observation deck removed in the process. Some personnel shuttle functions were moved to a ventral bay installed on the cavity left by the multi-hundred-thousand-ton transwarp streamer coil. This ventral facility would remain unique to the prototype vessel, as would many other features of the unorthodox design.

The ship was relegated to Task Force L in the 2nd Fleet near the Klingon border as "a ludicrously overpowered and overgunned battlewagon", as her captain, Hikaru Sulu, often called her – when he was not smiling in delight at commanding a ship never thought financially possible. The other *Excelsior* class ships completed, *USS Repulse*, *USS Proxima* and *USS Roosevelt*, never received transwarp equipment and were briefly mothballed pending the operational evaluation of the normal-warp version of the *Excelsior*.

In case of the still less than halfway complete *USS Ingram* (NX-2001), Starfleet decided to admit graceful defeat. Completing the vessel with conventional Shuvinaaljis LN-73 warp engines would allow her to be fielded in reasonable time and at less than astronomical cost, but the reduced performance forced some changes in the mission profile. The connecting neck of the *Ingram* was reduced in height and bulk, her stern completely redesigned to incorporate a drastically larger multilevel shuttlebay for tactical craft operations, and her engine pylons adorned with multi-directional phaser cannon to make use of the excessively powerful primary plasma system. The surprisingly practical 'dreadnought/carrier' hybrid was finished and launched in October 2289, commissioned before the end of the year, and wrangled out a niche of her own in single-ship planetary assault and system control operations. Yet it was clear from the outset that she would remain the only ship of her kind.

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It was not until 2290 that a new, improved *Excelsior* class vessel was built. At that time, some twenty aging *Constitution* and eight new *Constellation* cruisers were in charge of frontline exploration and power projection operations. The relations with the Klingon Empire had changed drastically, and Starfleet was being purged of war-supporting factions. Thus only one *Excelsior*, *USS Enterprise*, was ordered for long range exploration, lacking transwarp and utilizing a slightly different configuration optimized for high endurance missions. New ramscoops were installed on the nacelles, necessitating some external reworking even though the installation of conventional warp coils inside did not. Impulse power was nearly doubled by replacing the single thrust coil with twin units; hull shape was changed slightly now that it no longer needed to conform to transwarp field shapes, to accommodate enlarged fuel tanks and exploration gear; and shuttlebay volume was increased by adding large bays to both sides of the impulse deck, so that a full complement of 12 exploration craft plus auxiliaries could be carried. The original aft shuttlebay was reserved solely for cargo transfer purposes, in the configuration used in the refit of NCC-2000. The ventral cavity previously occupied by the transwarp streamer coil now housed a cluster of equipment, including two stock Mk 70 photorp tubes, two subspace relay buoy racks, and a recorder marker dispenser. Finally, secondary phasers were upgraded to RIM-20C Type VII standard. There was some predictable haggling over the correct designation for

the ship; suggestions ranged from ‘increased-endurance battleship’ to ‘deep space control and survey ship’. Ultimately, Starfleet chose the simplistic and perhaps a bit naïve (but certainly catchy) ‘explorer’.

The early ships were given seemingly off-sequence NCCs, yet there was logic to the choices. The *Excelsior* and the *Ingram* got the long since transwarp-dedicated NX-2000 and NX-2001, respectively. The *Repulse* (NCC-2544) continued the strike cruiser series that the new vessels were to functionally succeed. The *Proxima* and the *Roosevelt* followed that trend, yet got kicked up when the final *Excel* strike cruiser run cut in with six projected ships; to leave room for it and its potential offshoots, the *Proxima* series continued from NCC-2570. The *Columbia* (NCC-2571) and the *Galacta* (NCC-2572) of that series were only finished in 2298, leaving a gap in the series for a decade and a half. The Enterprise had her systematic registry, NCC-2574, changed to NCC-1701-B shortly before commissioning for prestige reasons. Finally, the *Columbia* (NCC-2571) and the *Galacta* (NCC-2572) of that series were only finished in 2298, leaving a gap in the series for a decade and a half. After this, a policy change in registry allocation outdated the consecutive-number approach.

Even the mighty Excelsiors *need underway replenishment at times. This bow shot of two of the behemoths milking from* USS Cold Wind *(NCC-S1807) during the 2328 power projection operations highlights the differences between two of the main subtypes. The* Juno (NCC-18426*, to port) is a typical Mk I specimen, while the Mk III cruiser* Atlantis *(NCC-14957) displays to good measure her lateral hull extensions, high performance ramscoops and auxiliary shuttlebays.*

It is unlikely that such huge experiments will ever again be conducted by building a machine first and worrying about its functionality later. As it turned out, Starfleet found uses for the peculiar design and never regretted the huge investment on the *Excelsior*. Several ships were ordered in the first decade of the new century to replace the vast numbers of obsolete war-dedicated ships of *Federation*, *Belknap*, *Ascension* and *Larson* classes. Officially, the mission of these vessels was to be mainly one of exploration, even though they were not ideally equipped for non-military duty.

Despite the peaceful posture, defensive priorities were not being downplayed. Modern phasers were introduced for the vessels, featuring a 200% average increase in power output and enabling sustained terajoule-range excition levels, even without the cumbersome practice of direct warp core tapping. As the continuous-beam operation mode placed a considerable strain on subspace beam sheaths, the new phaser was usually fired as a sublight weapon. The enormous efficiency and serviceability increases made this an acceptable sacrifice, especially in view of the continuously improving FTL combat capabilities of photon torpedoes. Moreover, the heavy shielding of the vessels allowed them to fight sublight battles at point-blank ranges, securing victory with tactics that would in the previous century have been suicide even for the mightiest dreadnoughts. The designation ‘Type IX’ was chosen for the new RIM-40 series directed-energy weapons, while lesser-power applications of the technology were categorized as ‘Types I-VIII’. This created some understandable confusion since very few of the older ships actually got their ‘old Type VIII’ emitters replaced by ‘new Type VIII’ units.*

The original three *Excelsiors* and the *Ingram* had until this time operated under the somewhat arcane 'space control ship' designation. To reflect the changes sweeping through Starfleet, designation for these ships and the new batch of *Excelsiors* alike was changed to more modest 'heavy cruiser'. The specifier 'Mk I' was added to the *Repulse*, *Proxima* and *Roosevelt*, while the upgraded twin-crystal configuration of the *Excelsior* gave her the 'Mk II' nomer, also applied on the *Columbia* and *Galacta*. The ships were advertised as the successors of the famous *Constitution* class, although they were seldom sent to missions of similar scope and independence; Starfleet now tried to maintain tighter rein over its captains.

The more restrained expansion policy was not enough to protect the Federation from military conflict. When the next wave of escalation swept over Starfleet, as many as thirty ships of general *Excelsior* configuration were completed, their keels laid between 2304 and 2308 and the ships emerging between 2309 and 2313. Along with the *Apollo* class, simultaneously produced at somewhat swifter pace and in higher numbers, they now formed the cruiser backbone of the fleet. Six ships incorporated all the improved features of the *Enterprise*, and were likewise at first designated explorers of *Enterprise (III)* subclass (later to be simply renamed '*Excelsior* heavy cruisers Mk III' and employed as command ships). However, most were built with only the essential improvements contained inside a hull basically identical to that of the *Repulse*, with only a single aft shuttlebay, and with either single or twin IMRF crystals, depending mainly on the dockyards responsible for their construction. Various mission modules were carried in the ventral cavity, most often comprising a relay buoy dispenser and a mine rack, but also including more exotic and often classified payloads. All the vessels featured the new WF-4 multiphasic warp drive, and could cruise at warp 6 on the absolute scale. Field strength allowed by the coils was so high that the manufacturer declined to give official performance limits; practical top speed was hitched up to warp 9.4 as operational experiences mounted.

Two more production runs followed, first in 2328-35 as the dockyard expansion program was completed, then again in the early 2340s. The last *Excelsior* class vessels to be built, *USS Melbourne* (NCC-52043) and *USS Zeebrugge* (NCC-52059) were in 2342 completed to the Mk I specifications but in 2351 internally refitted as command ships to meet the needs of the Cardassian front. The former Mk III flag hardware had at this point been miniaturized enough to fit within the standard cruiser spaceframe. Being less conspicuous than the Mk III command cruisers, the *Melbourne* and the *Zeebrugge* were considered safer assignments by the crews than most Fleet flagships, three of which had already succumbed to concentrated Cardassian attacks. Yet the communications traffic associated with the role inevitably drew in heavy fire, and both ships were rendered unspaceworthy in the respective battles of Quatal and Koralis in 2357.

Despite her decommissioned status, the *Melbourne* nevertheless partook in fleet action against the Borg at Wolf 359. She launched from Mars two months before her scheduled completion into *USS Corinth*, a Mk IV exploratory cruiser of significantly improved range and research capacity. The vessel was the first to engage the Borg cube, which had decelerated right into the weak upper flank of the fleet led by Adm. J. P. Hanson. The *Melbourne* was immediately hit by a shield-draining tractor beam. Unshielded, she still managed to shake loose, but was cut into pieces in a matter of seconds. Among the 523 lost was her young captain, the hastily reassigned Cmdr S. H. Jinnah of the *Trinculo*.

The last major batch of *Excelsior* ships, completed between 2340 and 2342 and distinguished in the Cardassian and Dominion wars, has recently entered a period of refits that will undoubtedly keep the class in service for at least half a century from now. Main targets for upgrades are the aging shield generators and computing systems. The Mk III heavy cruiser *USS Lakota* (NCC-42768)

underwent in 2372 a more extensive refit that introduced full quantum torpedo capacity to the launchers, upgraded all main and secondary phasers, and added a number of emitters and sensor arrays. Computer systems were completely modernized as well, and the Prentice-Schafer shield generators were replaced by new Sylvanesti units. This Mk V refit proved too complex and expensive to be the answer to the Dominion threat, however, and will not be extended to other Mk III vessels, nor to Mk I or II vessels from the latest production batch.

Older vessels from the early 2300s, few of which survived the Dominion assault on Alpha Quadrant in 2373-75, are being slowly retired. Still, some examples of even 23rd century ships of this class continue to serve on in space control duties alongside their newer brethren. A shortcoming common to all the Mk I and II vessels in the 24th century service environment is the completely inadequate shuttle support capacity. Small overall size also limits the mission profile in long range operations. The successor *Sovereign* class, a defense-oriented explorer design of significantly larger size and better shuttlecraft facilities, is slowly taking shape with three hulls completed by 2373, but is not likely to replace the bulk of the *Excelsior* fleet within the next decade yet. Instead, the burden of the *Excelsior* mission is partially being carried by the *Akira* class of multipurpose heavy cruisers.

* As a general rule, any ship class, subclass or refit standard introduced after 2304 features the new technology, whereas ships built before this date may well still retain their older-technology units.

Sydney

Medium transport
2285-

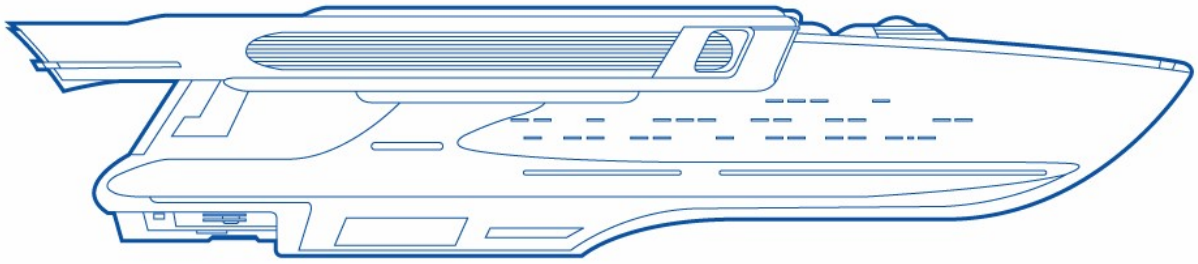
Completed:	313 total: 80 *Sydney* medium transports 124 *Kerguelen* medium transports 38 *Krasnoyarsk* supply ships 22 *Cobalt Gate* supply ships 10 *Mount Vernon* auxiliary hospital ships 14 *Etna* command ships 6 *Manila Bay* auxiliary/tactical craft repair ships 14 *Jekaterinburg* powerplant ships 3 *Remagen* powerplant ships
Length:	132.0 m
Beam:	90.1 m (most variants) 102.0 m (*Etna*, antennas extended)
Height:	42.0 m (most variants) 71.2 m (*Etna*, antennas extended)
Mass:	700,000 tons (most variants, typical w/o cargo) 790,000 tons (*Jekaterinburg*, *Remagen*)
Cruise speed:	w 6
Max. speed:	w 10.0 (most variants) w 8.2 (powerplant ships)
Endurance:	1 year
Officers:	5 (transports and supply ships) 11 (hospital and command ships) 7 (repair ships) 3 (powerplant ships)
Crew:	41 (transports and supply ships) 48 (hospital and command ships, not including medical personnel or other specialists) 72 (repair ships) 18 (powerplant ships)
Passengers:	200 (standard)

	1500+ (troop transport/evacuation configuration)
Cargo:	89,000 tons (*Sydney*) 94,000 tons (*Kerguelen*)
Weapons:	2 phaser V emitters in single banks port and starboard of navigational deflector (supply ships only) Berths for 2 phaser V emitters in single dorsal banks Berths for 2 phaser V emitters in single ventral banks
Shields:	1-layer conformal (later globular) forcefield Navigational deflector on ventral bow
Laboratories:	None (most variants) 4-8 medical (hospital ships)
Transporters:	2 personnel (2-pad), 8 small and 2 large cargo, 4 personnel/evacuation (30-pad); Mk III or IV All ships brought to Mk V standard after 2299
Auxiliaries:	Up to 16 work pods; 2 cargo shuttles often carried

Ships of historical interest:

USS Jenolan (NCC-F2010/NCC-2010)

SOURCES: D TNG
N TNG (SotSF, own)
H TNG (LUG, own)



In late 2282, a joint request for proposals was sent by acquisition committees of UFP Ministry of Commerce and Starfleet to starship design bureaux for a next-generation medium transport, between *Independence* and *Aakenn* in capacity. The following year, a Shintoi Heavy Industries proposal was selected as the most suitable design. The decision was not merely in favor of status quo, even if Shintoi proposed to uphold many of the principles applied on its previous lead product. Rather, new venues would be opened by recent technological advances. Much as *Aakenn* had benefited from Project Starship innovations, the new design was one of many utilizing technology tested in the *Constitution* refit.

The most obvious such element on *USS Sydney* (NCC-F2005), launched in late 2284 and commissioned in March 2285, was the propulsion system. Two LN-64F warp engines were mounted on short, gently curving pylons on both sides of the hull. A Class 5 warp core consisting of modular components tested on the latest *Constitutions* was installed at the heart of the ship. The spaceframe was streamlined to the extent of generating aerodynamic lift, and equipped with massive Class 6 impulse engines from Scarbak KKT series. Dominating the stern of the ship with an imposing row of nine side-by side nozzles, the engines fully facilitated planetary landings and takeoffs, making the *Sydney* the most versatile transport type available to the civilian markets.

Interior spaces of the vessel were compartmentalized by function, even if seamlessly integrated into a single hull. On the uppermost of the nine decks sat a standard bridge module, with adjoining crew facilities and a two-pad transporter. The aerodynamic hull flarings extended slightly above this level, as did twin longitudal housings for sensors and communications antennas. The aft part of this deck was dedicated to impulse and warp support machinery, including the IMRF crystal.

The forward end of the next three decks comprised a cargo loading facility, accessed through large bow doors and integrally carried loading cranes, and housing a number of cargo shuttles and work pods. Amidships there was passenger accommodation of high standard, with portholes provided for about half the cabins on Decks 3 and 4. The aft compartment housed the warp powerplant and main fuel tanks. Surge tanks on lower decks also augmented the standard gravitics-based ballast system, sharing the following three decks with further cargo holds. Some crew facilities and workshops were also present at the lower decks.

Four massive landing legs, one in each corner of the hull behind protective hatches, could be deployed for landings. However, in practice, the ships only entered atmospheres when performing colonization support missions; even the cargo shuttles normally only saw action in such primitive conditions. For all other missions, the onboard transporters were the preferred tool for transferring cargo or passengers to and from orbit. Main transporters consisted of four large 30-passenger/cargo units and two dedicated cargo units on Deck 4. Smaller repeater units were distributed across the holds. In addition to the bridge transporter, a further two-pad unit for personnel use was available on Deck 5, next to the medical facilities. These Mk III transporter systems were all off-the-shelf units, as was most of the command, control and communications gear; in this regard, there was no need to install the most modern military-standard versions.

The bow structure mounted a large multiple-emitter navigational deflector and deep-space sensors as well as docking interfaces. In some Starfleet-operated ships, two Type V phasers were also installed here for self-defense. Hardpoints were provided for additional phaser V units in preparation for a crisis situation in the near-paranoid environment of the late 2280s, but never put to actual use.

USS Perth *(NCC-2015) of the first* Sydney *class production batch approaches Deep Space 3, portraying her cargo doors to an advantage. Even in the 2370s, the venerable ships still actively serve in frontier space, and only about fifty have been 'demoted' to core space liners. Replenishing Deep Space stations is one of the main Starfleet uses of the class today, along with supply runs to fledging colonies and remote research outposts.*

The program was well worth its expenses in providing UFP and the Fleet with an up-to-date logistics vessel at relatively low development costs, and the hundreds of completed *Sydneys* soon replaced the

retiring less flexible *Independence* class medium transports. Civilian designs were slowly returning to the shipping routes as well, bringing the tonnage up to ten times the level that had preceded the Klingon conflict and easing the burden of Starfleet Merchant Marine. Logistics Command readily took direct possession of any vessels available; the F prefix was dropped from the registries soon after the initial batch of 80 had been completed. The ships of that batch could also simply have their letters painted over provided there were no overlapping registries from the *Excelsior*, *Deneb*, *Draco*, *Ticonderoga* or *Amerind* classes; otherwise, the prefix would have to be replaced by a -5 suffix to keep the bureaucrats happy.

Several *Sydney* ships also went to private or corporate owners for passenger and cargo traffic. All the operators were UFP members, though – the design failed to attract the attention of foreign buyers, who had a good selection of lower-cost vessels to choose from. The *Sydneys* could be considered somewhat overequipped for their role, making the price uncompetitive. Standard equipment for long voyages included several VR suites or later also full holodecks, while a small garden or a sauna/pool area was sometimes incorporated to the design at the cost of some passenger cabins.

A handful of *Sydneys* were converted or constructed to special role specifications during the early 2290s. Conversions to hospital or command variants were the simplest, involving the removal of cargo handling gear and conversion of the loading bay for purely shuttlecraft operations, installation of mission equipment in a modular manner in passenger and cargo areas, and adaptation of the internal power and data distribution systems to the needs of this equipment. Such modifications were also easily reversible, and eight of the ten *Mount Vernon* class auxiliary hospital ships and six of the fourteen *Etna* command vessels returned to transport duty in the 2310s. More extensive were the modifications to auxiliary/tactical craft frontline repair ships or powerplant ships, performed in support of the major escalation of the 2280s and rendered superfluous by the end of the century; these typically involved major rearrangement of the passenger deck structures. Also, up-engined transport and supply variants (the *Kerguelen* and *Cobalt Gate* subclasses, respectively) were fielded in the 2310s when LN-64J became available.

The Ramatis forward staging area in 2292 presents a rare starship spotting opportunity: an Etna *command ship stands watch as a* Manila Bay *tends to a flock of assault shuttles preparing to embark on a nearby* Ariel *carrier. Three* Krasnoyarsks *wait as a fourth has her shuttles stevedore supplies from the surface of Ramatis III, a reluctant partner in the anti-Klingon coalition, yet about to play a significant diplomatic role in defusing the Klingon crisis. Note the registry NCC-2070-5 on the* Nash *closest to the camera, indicative of identity overlap when the prefix letters were discontinued.*

Few of these trustworthy ships went to interstellar fame. However, one *Sydney* vessel, *USS Jenolan*, discovered an immense Dyson sphere in the Beta Quadrant by crashing into it in 2294. The relic, possibly but not necessarily left by the Tkon empire, is currently undergoing thorough examination, and a logistics starport has been built on the outer surface near one of the smaller entry doors to support future activities. It is believed that 12% of the sphere's surface will be mapped in detail by 2380. No surviving cultures have yet been found inside the sphere, which suffers from the instability of its central star. However, there is already evidence of at least two later civilizations inhabiting parts of the sphere as recently as 30,000 years ago, including a powerful AI left behind by one of these late inhabitants but destroyed after it attacked the Federation survey group.

Ianar

Fast frigate
2285-2325

Completed:	36
Length:	259.2 m (NCC-2314 original) 274.7 m (NCC-2314 refit, *Ianar* standard)
Beam:	146.9 m
Height:	64.8 m (NCC-2314 original) 63.3 m (NCC-2314 refit, *Ianar* standard)
Mass:	137,500 tons (NCC-2314 original) 742,000 tons (NCC-2314 refit, *Ianar* standard)
Cruise speed:	w 7
Max.speed:	w 10.2 (normal operations) w 14.0 (saturation drive)
Endurance:	4 years
Officers:	48 (not including tactical craft pilots)
Crew:	218 (not including tactical craft support personnel)
Weapons:	2 phaser VI emitters in twin bank on dorsal primary hull 6 phaser VI emitters in 3 twin banks on ventral primary hull 2 phaser V emitters in single banks on aft dorsal hull 2 phaser V emitters in single banks on aft ventral hull 2 light fwd torpedo tubes w/ 10 light photorps each in pods under aft hull 1 mine tube w/ 250 gravitic mines between shuttlebays Up to 2300 mines carried in shuttlebays (optional)
Shields:	1-layer conformal forcefield Navigational deflector on fwd hull Secondary navigational deflector on ventral hull
Transporters:	1 GP (6-pad), 1 emergency evacuation (18-pad); Mk V
Auxiliaries:	2 medium shuttles, 2 work pods Up to 4 heavy shuttles or 8 tactical craft sometimes carried

Ships of historical interest:

USS Fujian (NCC-3232)

SOURCES: (D ILFB/Rafael Gonzalez, dimensions corrected)
(N ILFB/Rafael Gonzalez)
(H own, ILFB/Rafael Gonzalez)

While the early and mid-2280s were a time of budgetary tug-of-war, there was never any question of the funding of frigates (other than the 'heavy frigate' kind, that is). Law enforcement duties were deemed vital to Federation security both by the pacifist and the militant Council factions, and

Starfleet was comfortable with this mission as well. Although heavy capital starship forces got the public credit for defeating the piracy that had been rampant until mid-23rd century, it was the lighter frigates that escorted the shipments, safeguarded the ports, and drove the pirates out into the open. And when the threat of piracy was replaced by that of cloaked Klingon commerce raiders, light escort starships again were at the forefront of Starfleet countermeasures.

As the *Loknar* class of frigates neared retirement age, without realistic prospects for linear-engine refitting, Starfleet in general and its Andorian *Loknar* operators specifically began looking for a similarly potent yet affordable, relatively lightweight successor. A design between the *Daran* frigates and *Renner* heavy corvettes in size was put forth by Hasav-Shuvinaajis GPC. Dubbed the *Ianar* class fast frigate, the ship offered considerable firepower in a compact spaceframe, mounting no less than eight phaser VI emitters (RKC-2) and four auxiliary phaser Vs (RIR-26). Unlike the similar weapon suite of the *Daring* and *Renner* corvettes, the phasers of the *Ianar* enjoyed proper medium range targeting, including multitarget and warp engagement modes. For local defense duties, the ship could carry large mine racks in her twin shuttlebays, for up to 2,300 gravitic mines; for planetary assault, up to four heavy shuttles or eight fightercraft could be taken aboard. Also, the mine tube had an internal capacity for 250 gravitic or fusion mines even when there were tactical auxiliaries onboard. A ventral pod mount was available for light torpedo launchers of the new Mk 23 type, firing corvette torpedoes half the size of standard Type IV weapons.

The potent armament was mounted on a primary hull of modified saucer shape: the bow tapered to a wedge, while the stern flared to a rectangle housing the impulse engine, main powerplant and two shuttle hangars. Warp pylons for LN-64 mod 5 engines jutted from the aft hull, angled up and astern for a wide-lobe warp field that offered superb maneuverability. Normally, this would have meant a compromise in speed – not so in the *Ianar* case! An incredible top speed of warp 14 was achieved through the use of high intermix ratio in the main powerplant during acceleration. This saturated the warp coils; consumption of antimatter then leveled off as the ship essentially coasted at high warp for several minutes, until a new pulse was administered. Thus, a *Ianar* could conceivably outrun a cruiser unless the larger vessel insisted on a lengthy pursuit in open space. The technology presented major risks, however, and would probably never have been accepted without the support (or, indeed, pressure) from the Andorian Self-Defense Forces which needed the ships for local defense and had a different attitude towards risky technology.

The dramatic flashing of the saturation drive makes it seem as if USS Couran *(NCC-3237) is constantly accelerating with respect to the chase ship making this visual recording, even though the vessel merely maintains steady warp 12. Unlike the perimeter ships, the* Ianar *class did not feature flash suppressors on the nacelles, as stealth was not an essential mission requirement. Indeed, the prominent duonetic signature of the vessels was at times deliberately used as a signal to scare raiders off their quarry. Given the speed of the type, the first sight of a distant* Ianar *was usually also the very last chance for raiders to escape pursuit.*

There was one significant drawback in the *Ianar* design. A crew of no less than 218 was needed to run this rather complex and work-intensive vessel. Costs had been cut by the omission of some engineering automation, and the multiple optional weapon systems (mines, tactical craft, torpedo pods) also required sizeable specialized operating crews. As the missions of Andorian frigates involved support and deployment of boarding parties and ground troops, more than 300 people might at times be packed aboard the light starship. This would have been more typical of *Mirandas* (360 crew), frigate starships of markedly larger size.

In addition to highly cramped accommodation and stressful working environment, the ship suffered from somewhat dated fire control computers and software. A number of vessels received M-8 AI routines to compensate, adding an unwelcome layer of complexity. Still, trained and skilled crews could feel confident in face of all possible threats in a law enforcement mission: in 2301, *USS Fujian* (NCC-3232) of *Ianar* class actually fought to a standstill an Orion heavy marauder, a ship fourteen times her size and eight times her firepower.

In all, 36 fast frigates of this class were completed, the production divided between three main locations (Andor, Earth and Izar) and five fiscal years (2285 to 2290). The original intent had been to construct just 25, by 2287, and assign all the frigates to ASDF; as a consequence, they featured Andorian-standard accommodation and command facilities. Because of the disappointing results of the more conventional *Darter* small frigate program, however, Starfleet decided to retain control of the thirteen Earth-built vessels, effecting minor compatibility modifications. A number of Andorian units served stopgap role in Starfleet service until the ships completed at Izar could be added to the pool in the late eighties.

Regardless of operator, the vessels were principally deployed on spacelane patrol, charging to the rescue when needed, and making unnecessary the continued use of sub-par escort vessels such as the *Remora* class. The potent *Daran*-type small frigates could also concentrate on border patrol duties and the occasional raid now, even though attempts to increase the speed of these vessels continued with renewed vigor; even saturation drive no longer was out of the question, and there were many commonalities between the *Decisive* class and the *Ianar* in design as well as concept.

No less than 32 *Ianar* frigates (evenly culled in Starfleet and ASDF service) survived intact to retirement age in 2325, and were placed in inactive reserves. Reactivation of the *Ianars* was considered several times by ASDF during the course of the early 24th century, as internal disputes within the Andorian society grew more and more severe. A rebellious faction actually managed to steal two of the vessels in 2341, and operated them with moderate success against the government forces throughout the 2340s. When ASDF did reactivate its light frigates, though, it was against an external enemy, one common to all Federation: 26 vessels were relinquished to Starfleet control in 2354 to ease the pressure in the Talarian front as well as in the troublesome Tzenkethi space, while the main fleet amassed at Cardassian borderlands.

A stern view of USS Tanzu *(NCC-3230) at SB 36 reveals a broad arsenal indeed: in addition to the fixed phaser mounts and modular torpedo systems, one can observe mine pallets being loaded into the port shuttlebay, with the adjoining deployment tube visible at the lower starboard corner of the door. The starboard bay accommodates numerous Wasp tactical craft, and a decoy launcher mirrors the location of the mine tube.*

The reactivated ships were stripped of their antiquated torpedo systems and mainly used mines as their primary weapons. Andorian crews of only 154 were employed for reasons of practicability, leaving the ships slightly less combat-ready than in the previous century. The vessels were then returned to mothballs and are still theoretically available for reactivation, although training the crews needed to effectively run the ships seems an impossible task. A modernization of computers as well as phaser weaponry naturally remains an option, although it is unlikely that motivation for such a project could be found, even in the ship-starved postwar Fleet of the 2370s.

Nineveh

Large exploratory cruiser
2287-2339

Completed:	5
Length:	209.8 m
Beam:	141.7 m
Height:	32.9 m
Cruise speed:	w 6.9
Max.speed:	w 8.0
Endurance:	5 years
Officers:	42
Crew:	260
Weapons:	2 phaser VI emitters on dorsal primary hull 2 phaser VI emitters on ventral primary hull 1 phaser VI emitter on aft hull
Shields:	1-layer conformal forcefield Navigational deflector on fwd primary hull
Laboratories:	12, in varying configurations
Transporters:	3 GP (6-pad), 2 cargo, 1 emergency evacuation (22-pad); Mk IV All ships brought to Mk VI standard after 2299
Auxiliaries:	2 medium shuttles, 1 heavy shuttle, 4 work pods

Ships of historical interest:

USS Nineveh (NAR-21050)

SOURCES: (D E Sharpe)
(N SotSF)
(H SotSF, E Sharpe)

As tensions mounted between the UFP and the Klingon Empire in the latter stages of the 23rd century, Starfleet Command began to move its combat-capable starships to regions of space closer to the Klingon Neutral Zone. Among those vessels were many of the *Constitution* Phase IV vessels (*Tikopai* class) – while not primarily designed for combat, these were still potent warships. As a result of this, there were severe cutbacks in Starfleet's exploration programs in the direction of the inner Alpha Quadrant. Starfleet Command knew that it was necessary to continue operations in this area to deflect difficult questions from the pacifist members of the Federation Council. It was decided that a new class

of large exploratory cruisers be built, with the range and endurance of a *Constitution* IV but with virtually no armament of tactical systems.

Unfortunately, these requirements were found to be next to impossible within Starfleet's standard budgetary framework. An alternate method of funding the class would have to be devised. Exploratory Command therefore approached the Federation Science Council with a proposal; the burden of construction for the five ships of the new class would be shared between Starfleet and the Council and they would share the usage. The FSC agreed, and design work began in mid-2285. Cooperation with the civilian organization required that the weapons on the design be reduced to below the level originally intended by Starfleet, and that the size of the design also be scaled down. The weapons fit now consisted of just two pairs of Type VI emitters on the saucer section and a lone Type VI on the aft of the engineering hull.

In February 2286, the class name *Nineveh* was allocated, along with the Naval Auxiliary Reserve registry number NAR-21050. Five of the vessels would be built at a rate of one a year from 2287-2291. The final design was based around a standard *Constitution* saucer section, with a large, bulky hull extension at the aft of the ship. All the engineering facilities, as well as consumables holds, recreation facilities and the shuttlebay, were housed within the extension. The primary hull in turn contained crew quarters, scientific equipment and labs and support facilities. Extensive sensor arrays were also mounted in the saucer section both internally and in external fairings. The FIE-2A impulse system was located at the extreme aft of the vessel; two 'Swallow' civilian grade warp nacelles (CI(L)-3 in Starfleet service) were outriggered on centerline pylons, swept back from the engineering hull. This arrangement made the vessel quite slow and unwieldy by Starfleet standards, but was deemed acceptable in what was effectively a second tier vessel.

Even if propulsive systems compared unfavorably with lesser Starfleet scientific survey designs, such as the *Nelson* deep space scoutships, there was no question that the *Nineveh* was best designated a cruiser. The ship carried the same number of labs as the *Tikopai* class, but a new modular replacement system made the actual fit far more flexible than on the heavy cruisers. In practice, the class was launched with a wide range of labs to cater for most situations. Module swaps normally only took place when upgrades were available. It was very rare for the *Ninevehs* to be sent on missions requiring only a specific type of lab, although during the Sanctuary Plague Crisis of 2301, *USS Avebury* (NAR-21051) was fitted with 6 medical labs, 4 environmental labs and 2 GP modules. Like the later *Lng'we Chi* class, the *Nineveh* carried surface exploration equipment.

USS Samos *(NAR-21052) departs Starbase 201 in late 2294. From this angle it is possible to see the exterior sensor bulges, similar to those on the* Constellation *class.*

Unlike the *Lng'we Chis*, the *Nineveh* class often deployed with mixed crews of Starfleet and civilian personnel, and their missions of exploration ranged far beyond the realm of regular Science Council surveys. Frontier operations meant the possibility of contact, sometimes involving

exchange of fire, sometimes of diplomatic overtures. The crew of the *USS Ch'ang-an* (NCC-21053) negotiated the first official trading contract between the Federation and the Cardassian Union, to solve an acute refueling problem.

However, the glory days of the *Ninevehs* were over almost before they began. The Khitomer peace freed up large numbers of Federation starships from defense duties to exploration and science missions, including the *Tikopai* and *Constellation* classes. Although this ended the solo missions in the unexplored darkness of space, the *Ninevehs* served on in an exploratory and scientific capacity with Starfleet until 2337, when it was announced the class would now be used exclusively by the Federation Science Council. The decision to relinquish the use of the vessels was not taken lightly, as Starfleet once again faced a severe shortage of science-oriented deep space vessels. But the fact remained that the *Ninevehs* were slow and poorly armed, the consequence of the compromise that had allowed them to be built.

The class, despite its low numbers, has since seen extensive use in civilian life, making several scientific breakthroughs and being used as the testbed for a variety of new sensor systems.

Continent

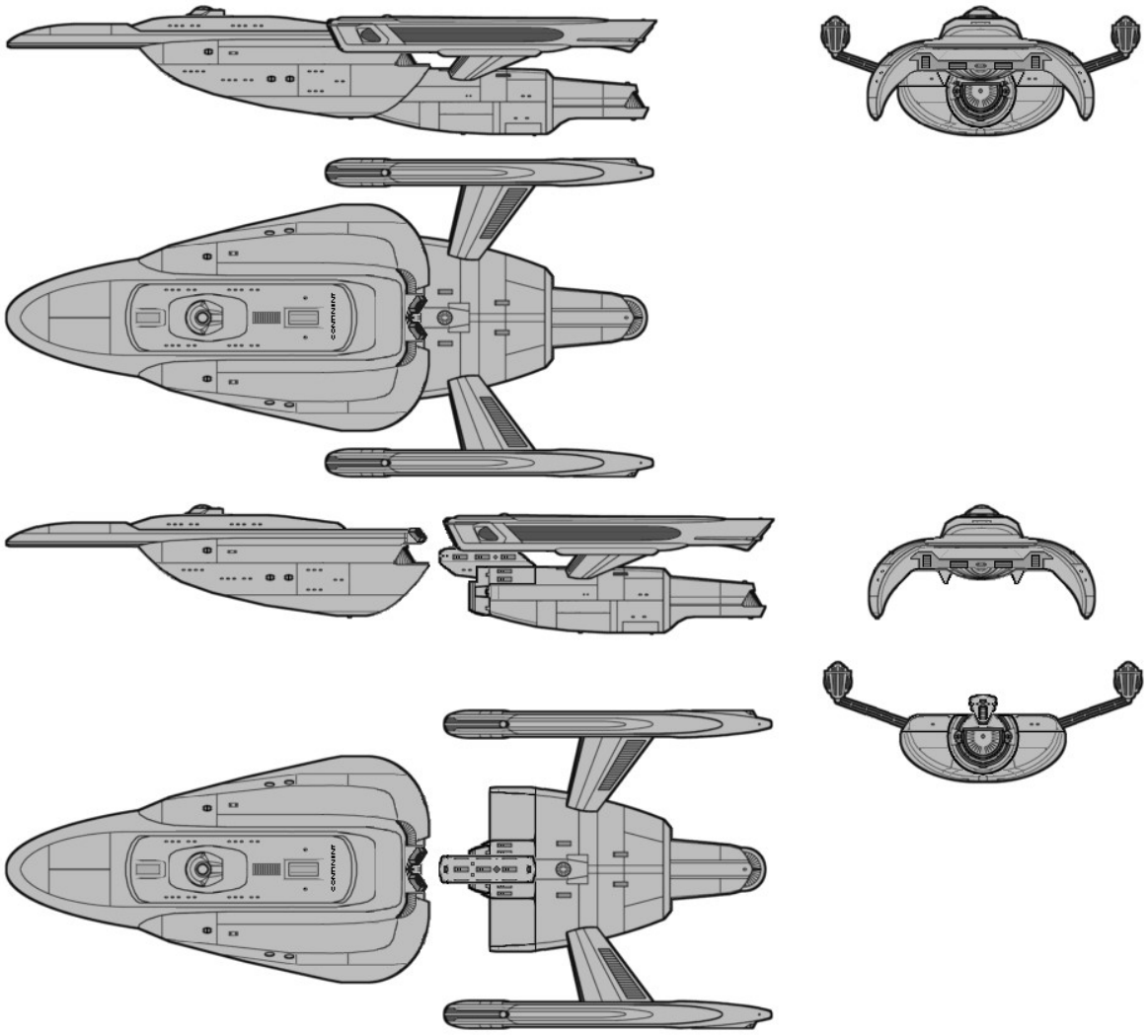
Assault ship
2289-2316

Completed:	60
Length:	320.1 m (combined ship) 208.9 m (landing section) 165.1 m (stardrive section)
Beam:	156.7 m (combined ship) 109.5 m (landing section)
Height:	57.3 m (combined ship) 52.2 m (landing section)
Mass:	729,900 tons (combined ship) 75,800 tons (landing section) 654,100 tons (stardrive section)
Cruise speed:	w 5
Max.speed:	w 7.0
Endurance:	4 years
Officers:	8
Crew:	54
Troops:	3,200
Cargo:	50,000 tons
Weapons:	6 phaser V emitters in 3 twin banks on fwd landing hull
Shields:	1-layer forcefields Primary navigational deflector on fwd landing hull Auxiliary navigational deflectors on fwd stardrive hull
Laboratories:	None
Transporters:	6 GP (6-pad), 8 assault (20-pad), 4 emergency evacuation (22-pad), 8 cargo; Mk III Select ships brought to Mk IV standard after 2271
Auxiliaries:	16 assault barges, 6 light shuttles, various tactical craft

Ships of historical interest:

USS Typhoon (NCC-6085)

SOURCES: (D FASA)
(N FASA)
(H FASA, own)



Far more ambitious than the *Makin* and *Kolm-An* fast transports it was to supersede, the *Continent* class assault ship was intended to carry two brigades of troops and vehicles to the heat of combat by landing the vessel directly onto the battlefield. In essence, a large lifting body spacecraft was to be grafted onto the propulsive section of a star cruiser, so that a separation maneuver above the target world would rid the more agile atmospheric component from the ballast of a warp drive system. Survivability would thus be increased over the clumsier *Sydney* transports that had to drag their warp coils all the way down to the surface.

Design and construction of the landing section was not an insurmountable feat as such: sublight transports of this kind were in common use across the Federation. Besting both Empress and Shintoi in competition for the contract, AsTrans was asked to draw the plans for this 75,000 ton lander with a 50,000 ton payload. The top of the vessel was a flat structure with impulse engines and command and control facilities for the 62 crew. In a trademark AsTrans solution, two drooping side hulls

provided both aerodynamic lift and accommodation for some of the up to 3,200 troops. The rest were housed in a central cylinder hull whose vehicle decks typically also carried a mix of 16 combat and 50 support vehicles.

Primary troop egress was via eight assault transporters, with additional access through ramps dropping from the inner, lower surfaces of the side hulls, while heavy vehicles could depart through broad doors astern. Batteries of light phasers at the bottom of the upper bow covered the sallying of the troops, prepared the terrain for disembarkation and digging in, and protected the lander against close-in threats. Main protection came from heavy shield generators, however, and allowed the disembarked troops to huddle in safety beneath the lander before moving on.

The aft end of the cylinder was cut to house an adapter that mated with the stardrive section whose lateral extensions supported two LN-64 warp nacelles on angled pylons. At the stern was a standard cruiser shuttlebay, an off-the-shelf *Constitution* structure, yet in this application mated to a broadened midsection that would house up to eight TBL-6 assault barges. In case the attack was to be performed without separating the landing hull, the barges could dock to the troop disembarkation airlocks, three per each side hull outer surface and two more on the inner surfaces, and assist the VBL-8 vehicle barges operating from the stern bays of the lander.

The design was thus carefully thought out and the operational concepts laid out in detail well before the first actual vessel was built. Political and financial planning dragged somewhat behind: the 2289 launch of *USS Continent* (NCC-6079) came in the aftermath of a brief détente in Klingon affairs, and Starfleet actually considered scrapping the program altogether in favor of the more traditional and affordable *Phobos* class. Increasing tensions with the Empire loosened the purse strings again, however, and both *Phobos* (66 ships) and *Continent* (60 ships) were ultimately taken to completion as replacements for the *Makin* fleet.

The landing maneuver of *USS Typhoon* (NCC-6085) at Hepteradas ended in disaster in November 14th, 2297, and left the spaceframe damaged beyond repair and 76 people dead. There would be no further dabbling with the direct assault mode in the remaining lifetime of the class. Until 2316, the *Continents* served as somewhat overcomplex conventional strike transports, the separation mode remaining a theoretical possibility only.

Laweya / Phobos

Medium / troop transport
2290-2361

Completed:	98 total: 32 *Laweya* 66 *Phobos*
Length:	245.8 m
Beam:	174.8 m
Height:	44.9 m (*Laweya*, landing gear retracted) 46.2 m (*Laweya*, landing gear fully extended) 43.5 m (*Phobos*, landing gear retracted) 46.1 m (*Phobos*, landing gear fully extended)
Mass:	728,000 tons (*Laweya*) 722,500 tons (*Phobos*)
Officers:	9
Crew:	56

Troops: 500

Cargo: 102,000 tons (cargo only)
85,500 tons (cargo + 500 troops)

Cruise speed: w 6

Max. speed: w 9.2

Endurance: 3 years

Weapons: None

Shields: 1-layer conformal forcefield
Navigational deflector on upper fwd hull

Transporters: 2 GP (6-pad), 4 troop/cargo (22-pad), 2 troop/cargo (10-pad); Mk V

Auxiliaries: 2 cargo shuttles, 2 work pods (transport)
4 assault barges, 2 work pods (troopship)

Ships of historical interest:

USS Arikara (NCC-2070)

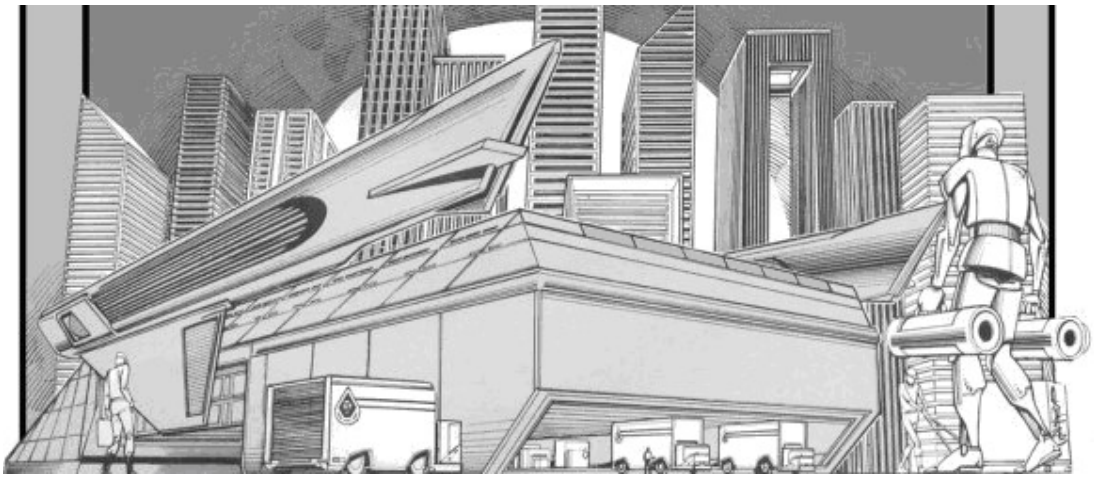
SOURCES: (D FASA, Birth of the Federation computer game)
(N FASA, Birth of the Federation computer game)
(H FASA, own)

The conceptual success of the *Sydney* class was still in the future when Starfleet decided to sponsor the design and construction of what was essentially a downrated variant. Modern military propulsion systems would still be required for the desired performance. Yet simplified construction, combined with a cargo facilities layout similar to the light *Tavares* class, would facilitate an expanded role in planetside operations. Although Marine deployment was the unvoiced prime motivation for fielding this class, domestic and foreign politics alike called for their procurement under Logistics Command auspices. Nevertheless, a valid logistics demand also existed for such a type, as several heavy and light transport types were bowing out, and their replacement by medium transports called for a massive building program ill fitting the refined *Sydney* design.

The *Laweya* medium transport, ordered from the Andorian Salazaar yards, was indeed a far more pedestrian vessel. A boxy hull design made for quick and cheap manufacturing, yet called for greater engine power in planetary landings. These were further complicated by the essentially flat bottom of the beamy vessel, with minimum-stroke landing legs beneath the midsection powerplant assembly and next to its lift engines. On the other hand, if the flat stern could be brought flush against a solid surface, a full-width loading door would facilitate rapid egress of cargo, troops or vehicles, something the high-mounted bow loading bay of the *Sydney* class could never provide. Main RSP impulse systems as well as the two LN-64F nacelles were kept well clear of the surface, the former mounted atop the cargo section, the latter rigged on broad upswept pylons. The arrangement also produced advantageous field geometry, giving the *Laweya* a slight edge over *Sydney* – vital because of the less powerful warp core of the new design. And while the resulting top speed lagged behind *Sydney* figures, cruise economy was comparable if not slightly superior.

Just five vessels of the new type had been completed when Khitomer negotiations called for discretion on, if not outright cancellation of, procurement related to planetary assault. Ironically, in the half a decade since the first prototype test runs, Starfleet had learned to appreciate the logistics support qualities of the *Laweya*, while the Marines had grown disenchanted with the clumsiness of the vessel on unprepared landing sites. But civilian markets had failed to materialize, as the *Laweya* still was overengineered and overpriced for the mercantile mission. By the turn of the century, then, only two dozen transports were in existence, against the hundred-plus of *Sydney* type.

Production picked up pace when the planetary assault mission was separated from the general logistics one, with the creation of the *Phobos* subclass specifically for the former needs. These vessels had improved troop accommodation, slightly revamped lower hull geometry, and an all-new impulse propulsion system for greater atmospheric agility. They would become the leading troopships until the creation of the *London* class; their sleek gray hulls would be a familiar sight alongside *Steamrunner* strike carriers in the early years of the Border Wars. The basic *Laweya* continued building at a sedate pace for Logistics Command. The equally laggard civilian sales went to well-established shipping lines, mainly on their secondary routes where orbital starport capacity was lacking but proper surface facilities and steady demand for freight services were extant.



SS Marston Flats *(NFT-4552) showcases the advantages and shortcomings of the basic* Laweya *configuration at a downtown Citadel, Cygnet XIV starport. The ability to come to rest on a flat surface facilitates effortless cargo transfer by surface vehicles or, if necessary, manpower. It is also obvious that the meager clearance allowed by the landing legs even in their fully extended position effectively precludes operations on unprepared sites. Note the landing shutters over the six impulse engine nozzles on the upper deck.*

Laweya and *Phobos* missions in the 24th century expanded to colonial support when it became feasible to install industrial replicators aboard the vessels. A number of hulls were converted to planetside factories, deployed on their increasingly uncompetitive warp drives to prepared sites next to a fledging colony and then operated there for years at an end. By the 2350s, most of the ships not thus converted were in troop transport reserves, with just a handful of *Phobos* units performing a supply role for Logistics Command. The last transports were retired in 2361, passing their planetary assault role to the well-established *London* and *Whitewater* force and the general logistics task to the *Yorkshire* family of transports.

Amchitka / Kearsarge refit

Light cruiser
2290-2311

Completed:	10 total: 8 refitted from *Amchitka* class 2 refitted from *Kearsarge* class
Length:	206.2 m
Beam:	130.2 m
Height:	55.2 m

Mass:	610,600 (*Amchitka*) 630,000 (*Kearsarge*)
Officers:	39
Crew:	188 (*Amchitka*) 196 (*Kearsarge*)
Cruise speed:	w 7
Max. speed:	w 10.0
Endurance:	2 years
Weapons:	5 twin phaser VII emitters, fwd, port/stbd of bridge and port/stbd of ventral sensor array 1 heavy torpedo tube w/ 120 photorps on ventral hull (NCC-1314, 1315)
Shields:	1-layer conformal forcefield Navigational deflector on fwd hull Secondary navigational deflector on ventral hull
Laboratories:	None
Transporters:	1 GP (6-pad), 2 emergency evacuation (22-pad), 1 cargo; Mk IV
Auxiliaries:	None

Ships of historical interest:

USS Amchitka (NCC-1310)

SOURCES: (D own, derived from SFB *Kearsarge*)
(N SotSF)
(H own)

The refitting of the *Amchitka* light cruisers represents a mildly interesting footnote in Starfleet history of the eighties and nineties, in that it was the final major warship conversion project to be initiated during the Klingon crisis.

The Fleet's frigate resources in the 2280s might have been formidable, yet stretched impossibly thin nevertheless by the latest developments. During the latter half of that decade, the Klingons had fielded the modern *Ch'ing* class Bird of Prey, a deadly light starship particularly suited for commerce raiding. Its combination of cloaking capability and potent torpedo armament was unprecedented for such a small vessel, and severely threatened the tender Federation supply lines, were mass production to begin. Whatever ships could be coerced to travel at warp and fire phasers were thus to be summoned for escort duty if and when the war began in earnest. Some of the 'auxiliary escorts' would be transports rigged with phasers, some perhaps law enforcement vessels or semi-retired combatants. But whenever Starfleet could afford to, it would refit vessels that already represented useful standards.

It's a matter of opinion whether the eight elderly *Amchitka* light cruisers, from the early 2240s, really deserved the priority position they got in the refitting list. For fifteen years, they had been sitting idle, even if nominally in active service. No major systems had been upgraded since the 2250s, and the meager life support system modernizations in the 2270s had been mainly to give the overseer crews some independence of spacedock life support. Yet in principle, spaceframe lifetime did allow the ships to still be used for combat. Weapons aboard had been changed once already, and modular solutions existed for the relatively simple upgrade to modern phaser VII standard. Starfleet had also amassed a great deal of refitting experience at this point. And in the late 2280s, dockyards capable of a *Decatur*- or *Larson*-style primary hull internal refitting were quite available.

In 2285, the decision was made to begin a refit at Proxima, where most of the *Amchitkas* already resided, and where a number of former commercial dockyards had recently been annexed to the existing Starfleet facilities. Simultaneously with the multiple modern warship programs underway there, Starfleet worked on all the eight remaining *Amchitkas*, discarding their old PB-35C nacelles and installing far larger linear-coil units in their place. The standard chosen was LN-62, which had been somewhat overproduced for the *Chesapeake* light cruisers – only twelve hulls of that class had been completed out of a projected 18, and there were also five full spare sets of coils. The decision to go ahead with LN-62 on the *Amchitkas* also encouraged Starfleet to adopt the unit for the *Kirsanov* perimeter ship leaders, and to produce no fewer than twenty-one new pairs between 2287 and 2289.

As with the *Chesapeake* class, a hull extension was needed in order to integrate the linear engines to a warp propulsion configuration originally intended for self-contained nacelles. This time, however, the extension was made inward, into the former shuttlebay and service hangar. This could house the entire intermix system, albeit in an awkward asymmetric arrangement. Broad canted pylons similar to the *Ianar* class ones could be attached to the former pylon mountings with minimal changes to the hull strongbacks – quite unlike the structural problems encountered in the *Constitution* refits. In the *Amchitka* case, the problems came at the other end of the pylon, when the LN-62s had to be retuned for positioning off the hull plane and modified for the new attaching points. After the best precautions of the engineers failed to prevent cracking in the nacelles and pylons of *USS Amchitka* during preliminary impulse test flights, the LN-62 was abandoned in disgust. The units were returned to storage for use as *Chesapeake* and *Kirsanov* spares, and the more expensive yet also more practical LN-61 units of smaller size were brought out.

The modified Amchitka *(NCC-1310) in all her arguable glory. Fame in the battlefields did not befall the type, nor did the ships go to score major scientific discoveries or political breakthroughs. Technically, however, the ships could have performed adequately in all the roles, especially in the early seventies when a refit of this kind first became technologically feasible. Starfleet's hesitation was only aggravated by the later, ill-timed decision to finally go ahead with the refit.*

By 2289, the new nacelle choice had proven compatible. While still heavier than the PB-35 at 230,000 tons apiece, it presented zero structural problems when mounted on the new pylons. Impulse engines had also received an upgrade, including an improved IMRF crystal and a new set of MHD taps, plus completely refurbished fuel systems. A Class 2 bridge module (an abundance of which was available from frigate production lines) was bolted on to the *Amchitka*, and the vessel was launched unceremoniously to a series of extended test flights, culminating in recommissioning in October, 2290. *USS Sakhalin* followed two months later, sporting new weaponry that included five twin phaser VII mounts instead of the former three turrets. Spares depots were pillaged for FSTR/TAC fire control systems, even if the humble sensors of the *Amchitkas* seriously limited their usefulness. Compatible communication and computing interfaces were easier to find. Feverish work

was done to integrate Fasfax III standard computer suites to the vessels, despite many early setbacks.

By 2293, all eight vessels had been refitted with the new engines and phasers, and two had also reactivated their heavy torpedo launchers, now complete with brand-new loaders. These weapons proved very unreliable, however, and were soon sealed off again. The first two conversions of *Kearsarge* ships to the new standard had also been launched, with minor differences in impulse deck configuration the only visible cue to separate them from the *Amchitkas*. Starfleet was finally seeing some payoff from this refit program: if the *Kearsarge* refitting could be brought to full steam, there would soon be some forty new phaser cruisers in the Fleet. Despite being individually much weaker than the other cruiser and heavy frigate types of the day, the ships would be a decisive factor due to their sheer numbers.

This was not to be. Before a single *Kearsarge* refit could be deployed on patrol, Khitomer limitations hit the Fleet in the face. A tactical triumph immediately turned into a financial disaster. In order to preserve more valuable cruiser units, Starfleet quickly gave up all the *Kearsarges*, cutting the hulls of the unmodified units in reserve or storage and sending the two completed units for disarming and modification into corvette tenders. The *Amchitkas* were also either cut up or turned into depot ships; only the *Sakhalin* was retained in active use as a warp navigation system testbed, disarmed but still fully mobile. Her career lasted until 2341, and she was preserved in the Fleet museum as the only surviving example of the large *Amchitka*/*Kearsarge* family.

Doppler / Dollond

Tug / tender
2291-2358

Completed:	99 total: 58 *Doppler* tug/tenders 41 *Dollond* tugs
Length:	192.0 m
Beam:	141.2 m
Height:	64.3 m
Mass:	680,500 tons (*Doppler*) 720,000 tons (*Dollond*)
Tow speed:	w 7
Max. speed:	w 10.1
Endurance:	1 year
Officers:	6 (In Starfleet service; civilian crews vary)
Crew:	18 (In Starfleet service; civilian crews include e.g. passenger service personnel)
Weapons:	4 phaser VI emitters in 2 twin banks port and starboard of bridge 2 phaser VI emitters in twin bank forward of lower sensors
Shields:	1-layer globular forcefield Navigational deflector on fwd hull Secondary navigational deflector on ventral hull
Transporters:	1 GP (6-pad), 1 cargo; Mk IV (*Doppler*) 1 GP (6-pad), 3 cargo; Mk IV (*Dollond*)
Auxiliaries:	2 work pods (*Doppler*) 4 work pods (*Dollond*)

Ships of historical interest:

SOURCES: (D various)
(N FJ)
(H FJ, SotSF, own)

After a delay of almost two decades, Starfleet finally got the funds to procure an upgraded mass production version of the trusted *Ptolemy* tug/tender in 2289. Two models had been proposed, one originally with LN-23 early linear engines that had suffered many development setbacks, one with the trusted LN-64F units. Both received a go-ahead now, the former equipped with significantly improved LN-41 warp coils and dubbed the *Doppler* class, the latter named the *Dollond* class.

The *Doppler* and *Dollond* classes of cargo tugs were built to commercial standards, with limited weaponry and without the extensive military sensors of the *Ptolemies*, relying only on a small number of the as such quite capable phaser VI emitters. Also, starship maintenance and repair gear was virtually omitted from the latter variant; these ships were designated tugs instead of tug/tenders, and used their voluminous cargo holds for boosting their general supply capabilities. This resulted in significantly lower construction costs and enabled large numbers of the ships to be built, to form the mainstay of Federation and Starfleet heavy cargo services.

An opportunity for comparisons: USS Doppler *(NCC-3831) provides assistance to her civilian counterpart from* Chariot *class,* SS Trade Winds *(NAR-9458), distressed by plasma manifold blowout in deep space. Civilian tugs generally lacked combat shields and sensors and the emergency landing capability of a saucer-hulled vessel, but otherwise closely matched the performance of Fleet tugs. They could also perform some limited recovery tasks. However, the* Dopplers *sported comprehensive repair gear, allowing many a problem to be solved* in situ*, rather than by towing – no civilian vessel had comparable dual capacity, at least not until well into the 24th century.*

Both classes represented huge systems improvements over the original *Ptolemies*, externally visible mainly in the new warp engine nacelle and pylon assemblies and an enlarged aft hull. However, the basic structure of the ships was similar enough to the original class that Starfleet officially referred to the *Dopplers* and *Dollonds* as subclasses of the *Ptolemy* class. The plans for procuring some hundred ships were at first considered overambitious, but proved barely sufficient when Khitomer peace resulted in a vastly expanded reach for Starfleet and thus stretched the supply lines close to a breaking point. In effect, some 75% of the post-Khitomer *Doppler* missions and an unacceptable 40% of *Dollond* star hours consisted of towing decommissioned starships to surplus depots or deploying new outposts and other installations to distant locations. To compensate, a new class with the capacity of carrying twin standard pods or towing light to medium starships was introduced for deep space recovery and supply runs – the so-called *Hensley* conversion of the trusted *Daran* frigate design. This gave Starfleet a greater number of *Dollond* flight hours for the vital regular supply duty, and allowed the *Dopplers* to be dedicated to towing of and tending to heavy starships. In addition, the highly successful *Fisher* class of 93 light tugs took care of short range, low speed operations.

With two standard containers in tow, USS Irwin *(NCC-3903) plows through the dense core of the Arachnid nebula at impulse speed. The extra impulse thrust the* Irwin *enjoys over the original* Ptolemy *design manifests in the red glow of the quadruple nozzles. Superficially similar to the* Miranda *class hull in shape, the* Dollond *hull dedicated twice as much volume to impulse propulsion and power generation, and omitted shuttle support facilities in favor of improved internal cargo stowage. A 'hive' for four workbees can be seen on starboard stern, however, with a cargo operations monitoring deck on the corresponding port location.*

The last *Dopplers* were retired from Starfleet use in 2344, at a time when the standard cylindrar cargo pod was already being succeeded by more modern alternatives compatible with the next generation of transports, Starfleet and Federation civilian alike. The slightly heavier *Dollonds* survived for an extra fourteen years, and saw service even during the Cardassian War. Some sixteen ships were lost to various causes, ranging from a rare instance of piracy to warp field asymmetries resulting from movement of cargo – a death toll far higher than that of many combatant designs during times of conflict. Yet, Starfleet could not afford to retire the *Dollonds* until the last spare warp coils had burned through and the last pylon structural integrity guarantees expired.

Currently, Starfleet does not maintain ships of *Ptolemy* descent in its inventory. Tugs and tenders are of structurally sturdier design, and more specialized in their missions. For military use, the 'cargo train' configuration of multiple pods is deemed far too vulnerable; for civilian use, the old containers are often either too bulky or too small. Yet, during both the early and final decades of the 23rd century, this type of starship was the true key to Starfleet successes. It is quite lamentable that no transports of this category have been preserved in the Fleet Museum.

Grin'ki

Combat tender
2293-2351

Completed:	27
Length:	268.5 m
Beam:	201.0 m (grapples extended) 141.0 m (grapples stowed)
Height:	69.1 m (grapples extended) 62.2 m (grapples stowed)
Mass:	720,000 tons
Cruise speed:	w 6 (original) W 6 (adopted after 2319)
Max speed:	w 10.0 (original) W 7.5 (adopted after 2319)
Endurance:	2 years

Officers: 9

Crew: 139

Weapons: 6 phaser VI emitters in 3 twin banks on dorsal hull
6 phaser VI emitters in 3 twin banks on ventral hull

Shields: 1-layer conformal forcefield
Navigational deflectors on engine pylons

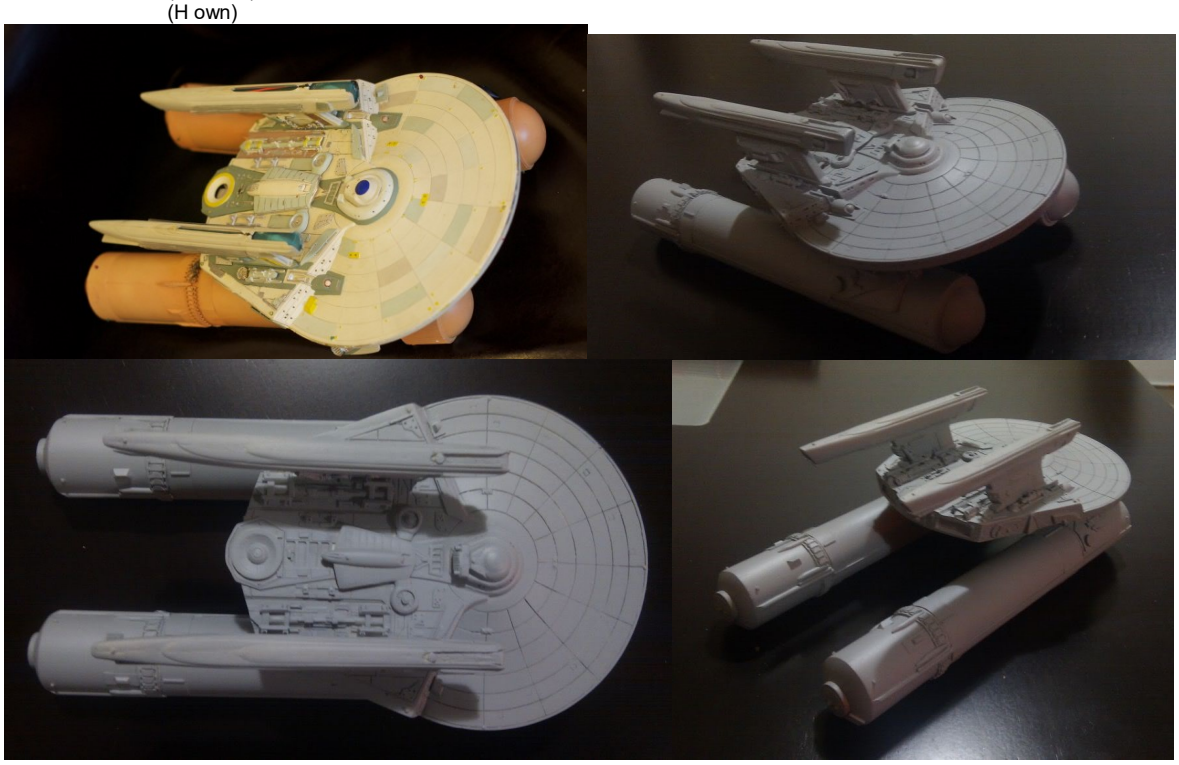
Transporters: 2 GP (6-pad), 4 cargo; Mk III
All ships brought to Mk V standard after 2299

Auxiliaries: 12 work pods; 2 light shuttles and/or 1 heavy shuttle often embarked

Ships of historical interest:

USS Gaillard, *USS Fort Worth*, *USS Diego Garcia*

SOURCES: D DS9/Adam Buckner
(N SotSF)
(H own)



The introduction of *Doppler* and *Dollond* tugs in the late 2280s had solved some of the problems associated with Starfleet recovery and repair operations. It was still a tedious task to tow the huge *Excelsior* or *Federation* vessels back to dockyards for repairs of failed warp drives or powerplants, especially considering that the new starships could within a week travel to a location where an engine problem would mean a recovery time of a year or more at maximum towing speed. Naturally, Starfleet was eager to promote *in situ* repair capabilities, in the form of various tender and repair vessels.

The *Oberth* class and its derivatives had already provided Starfleet with an excellent family of light supply ships that could be used for deep space maintenance and tender duties, alongside the *Cle Dan* light repair vessels. These vessels were optimized for assisting relatively light starships, though. While they arguably freed the heavy tugs for helping large starships, they could not be expected to provide the full range of repair services for an *Excelsior*-sized vessel. What was needed was a larger purpose-built design that could reach even distant ships in distress, provide full maintenance services, and

preferably carry spares and supplies for moderate repairs of three or more cruisers in a row. Also, zeitgeist demanded the inclusion of heavy defensive armament, not just for self-protection but for possible escort service as well.

The conversions of *Pyotr Velikiy* cruisers into *Beowulf* combat tenders met some of these criteria and gave Starfleet a yardstick for procuring the purpose-built successor. Once again, funds and resources were diverted from research-oriented shipbuilding into boosting the somewhat fuzzy and increasingly bloated midsection of Starfleet's ship spectrum. Much like the *Derf* and later *Niffen* tenders, the *Grin'ki* combat tender was built around a fighting vessel hull and given matching standard phaser armament. Warp propulsion was by LN-64 mounted on high, out of the way of the grappling gear, while impulse drive employed both RST 440 and RST 1250, the former mounted on the sturdy dorsal pylons, the latter installed exactly as in the *Miranda* refit.

The tender could mount a starship from above, grab her saucer with proximity tractors and lock mechanical clamps to the rim of a *Constitution*- or *Constellation*-sized saucer, or to the upper surface of a larger primary hull type. Finally the tender would extend the various replenishment connectors and work platforms around the starship. Alternately, the grapples could be put to use to hold one standard container each, or carry various outsize components, also in asymmetric configurations. Twin shuttlebays carried a dozen workbees with a full range of extension kits, and connected directly to internal cargo holds and workshops. A compact third bay was grafted underneath the hull for deploying small repair drones without adversely affecting normal flight deck operations. A heavy duty tractor beam assembly for towing was installed in a corresponding position atop the hold area, at upper centerline.

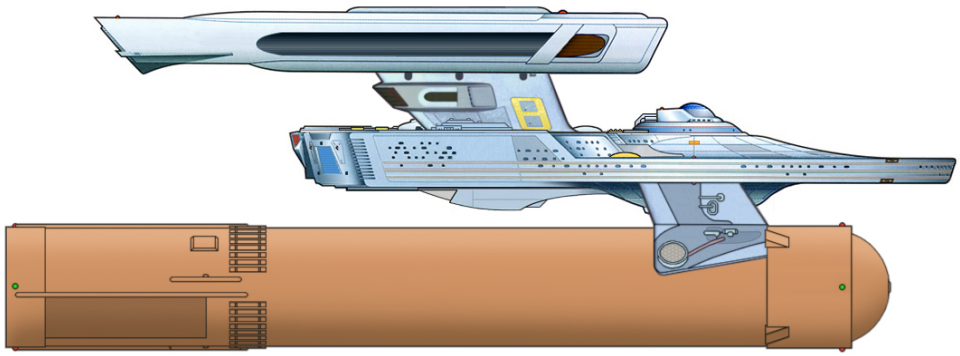
USS Gaillard *retrieving* USS Richmond *after an encounter with Klingon privateers in 2341. The adaptable grappling arms were the only thing aesthetically separating this class from the sleeker exploration and defense starships. Functionally, a* Grin'ki *could explore or defend in a cinch, perhaps even enjoying a maneuverability advantage when lightly loaded, thanks to the twofold impulse engines. The class served alongside warp-capable drydocks and a variety of tugs and tenders for the first half of the 24th century, and also saw some action in the Cardassian War as a secondary tender.*

Stowage of all the repair gear and spares necessary for independent deep space operations meant that even the considerable volume of the full starship saucer only catered for a minimal repair crew. Unless one of the shuttlebays or cargo grapples were dedicated to holding a barracks module, the tenders would have to rely on the drafting of tenant vessel crew when major repair or replenishment operations were to be performed. This did not necessarily reduce the role of the *Grin'kis* to one of 'first aid'. Sometimes, entire repair "villages" were constructed around a forward-stationed tender, and mobility was completely sacrificed for the ability to fully exploit the onboard hardware and expertise.

Yet when fleet logistics called for it, a *Grin'ki* could get mobile indeed. The LN-64 engines gave warp 10 top speed even under considerable load, and the double impulse drive provided good acceleration also in tasks unrelated to heavy towing. In the rapid mode of replenishment, the tender never docked; the workbees were used for changing of antimatter pods, and transporters for other replenishment needs. Propellant could be fed from tanks held in the grapples through dedicated telescoping tubes that could be lowered towards the refueling point at the impulse deck of the large cruiser types.

As soon as the first 12 ships were completed, a lighter model with a single grapple and without the RST 400 secondary engines was put into production. This *Gibraltar* class of tug/tenders was optimized for frigate and destroyer replenishment, recovery and repair, and carried spares and supplies for these types of starships. As many as 22 ships were completed between 2294 and 2297, alongside the final eight *Grin'kis*.

For a starship in deep space distress, the versatile *Grin'ki*/*Gibraltar* family represented a welcome intermediate step between in situ help from simple frontline supply ships and homefront care from the floating docks deployed around the Federation. Yet as bigger and bigger starships were built, and sent farther and farther out, the task of towing them home at warp speeds became so difficult that on-the-spot maintenance necessarily gained in importance. On the other hand, replicator technology development made issues of spares availability, repair crew size and workshop space much less pressing. As the result, dedicated tender tugs evolved towards pure towing machines with just a few high performance replicators aboard, and the complexity of the *Grin'ki* gave way to the austere elegance of the likes of the *Piper* class. The last *Grin'ki* class repair tender was decommissioned in 2351, at which time the *Gibraltars* were already out of commission.



Polaris / Constant

Heavy destroyer / scout
2293- (*Polaris*)
2295-2356 (*Constant*)

Completed:	99 total: 61 *Polaris* heavy destroyers 38 *Constant* heavy scouts
Length:	232.0 m (*Polaris*) 231.0 m (*Constant*)
Beam:	141.7 m
Height:	60.1 m
Mass:	689,500 tons (*Polaris*, typical) 689,000 tons (*Constant*)

Cruise speed: w 7

Max. speed: w 11.0 (*Polaris* batch 1 and 2, *Constant* batch 1 and 2)
w 12.0 (*Polaris* batch 3)

Endurance: 4 years

Officers: 48 (*Polaris* batch 1 and 2)
50 (*Polaris* batch 3)
49 (*Constant*)

Crew: 180 (*Polaris* batch 1 and 2)
199 (*Polaris* batch 3)
184 (*Constant*)

Weapons: *Polaris:*
12 phaser VII emitters in 6 twin banks, 3 above and 3 below primary hull
1 phaser VI emitter in single turret on lower surface of engineering deck
2 torpedo tubes w/ 50 photorps or probes (batch 1 except NCC-7305-7308, batch 2)
2 torpedo tubes w/ 78 photorps or probes (batch 3)
2 phaser VII emitters in place of torpedo tubes (NCC-7305-7308)
Constant:
12 phaser VII emitters in 6 twin banks, 3 above and 3 below primary hull
1 phaser VI emitter in single turret on lower surface of engineering deck

Shields: 1-layer conformal forcefield
Navigational deflectors on engine pylons
Secondary navigational deflector on ventral primary hull

Laboratories: 1 GP (*Polaris*)
1 GP, 2 linguistics/communications (*Constant*)

Transporters: 2 GP (6-pad), 1 cargo, 2 emergency evacuation (22-pad); Mk V (*Polaris*)
4 GP (6-pad), 2 emergency evacuation (22-pad); Mk V (*Constant*)
4 GP (6-pad), 2 emergency evacuation (22-pad), 1 cargo; Mk VI (*Constant* after 2319)

Auxiliaries: 1 work pod

Ships of historical interest:

USS Polaris (NCC-7300), *USS Nekkar* (NCC-7320), *USS Lightning* (NCC-9015), *USS Cavalier* (NCC-7330), *USS Saintes* (NCC-10421), *USS Imperial* (NCC-10426), *USS Katherine* (NCC-9030), *USS Chivalrous* (NCC-9409).

SOURCES: D DS9 (DS9:TM, own)
(N www.ditl.org, Mike Bartel)
(H Eddie Sharpe, own)

Linking the Khitomer peace treaty with the increased production of warships, especially warships with production runs as large as destroyers have, may at first appear illogical. However, the historic peace between the Klingon Empire and United Federation of Planets had just this effect: as the vast dreadnoughts and smaller but more numerous strike cruisers were retired or drastically reduced in number, Starfleet found itself with significant amounts of freed up resources. It was decided that this construction and maintenance slack would be used to revitalise Starfleet's impractically diverse destroyer fleet of largely outdated and outgunned designs. In 2293, when the treaty was signed, Starfleet operated just five units of sufficient strength, the two *Detroyat* class and three *Menahga* class heavy destroyers. Fortunately, there was a replacement design available right off the shelves of the Advanced Starship Design Bureau. The design had been languishing in the ASDB databanks, biding its time, which had now come: production began under the class name *Polaris* barely three months after the Khitomer Accords pertaining to destroyer production were agreed upon.

The last moments of USS Panther *at the throes of the Tomed shockwave. Part of a recording relayed by a Starfleet sensor drone in the Sector F defense grid.*

Despite distancing itself from past failures, the *Polaris* design still made good use of spares, components and tooling left over by the erratic escalation era programs. Here, in essence, was a modern era destroyer finally done right. Externally, the heavy duty saucer section was almost identical to its debuting form in the *Constitution* and *Belknap* series of cruisers, and the interhull and torpedo pod had a similar if slimmer appearance. Internally, however, the layout was quite different. Almost all of the science facilities of the cruisers were omitted to make way for tactical and emergency systems, stores and propulsion systems. Nevertheless, *USS Polaris* was the first destroyer to be equipped with a proper permanent science lab, a single General Purpose module usually used for realtime, multidisciplinary sensor feed interpretation.

The warp reactor of the *Polaris* class was located just forward of the Avidyne FIE-1D impulse engine, in a manner more familiar from the *Coronado* through-deck cruisers than from preceding destroyers. On the other hand, like the *Chesapeake* powerplant, it used an 'upside down' arrangement, drawing matter fuel from the lower parts of the ship and antimatter from the upper parts. Antimatter storage was concentrated in two armored compartments either side of the aft end of the short horizontal intermix chamber; these were fitted with an emergency ejection system, evident from the prominent hatch assemblies.

The warp core plasma transfer conduit traveled vertically down the interhull and between the torpedo launcher assemblies to a small engineering area at the bottom of the ventral pod. The facility handled primary power distribution tasks as well as antimatter transfer to the torpedo arming systems, and was a considerably more ergonomic workplace than its *Saladin* or *Cochise* counterparts. It was flanked by short, thick and broad nacelle pylons extended at a slight anhedral. The versatile structures housed deuterium tankage, mounted twin navigational deflectors forward, and supported the mass of two LN-64 mod 5 warp nacelles. Three units, *USS Alpheratz* (NCC-7301), *USS Albali* (NCC-7303) and *USS Sadalsuud* (NCC-7304) were initially fitted with LN-60 warp nacelles due to a shortage of LN-64 units, as there was no ongoing production of the latter model in the early 2290s. These ships were fitted with LN-64 nacelles in 2302.

The weapons systems of the *Polaris* consisted of twelve phaser VII in six twin banks, three above and three below the primary hull; this configuration was remarkably heavy for a destroyer-category vessel. An additional Type VI phaser was placed on the bottom of the engineering deck. The

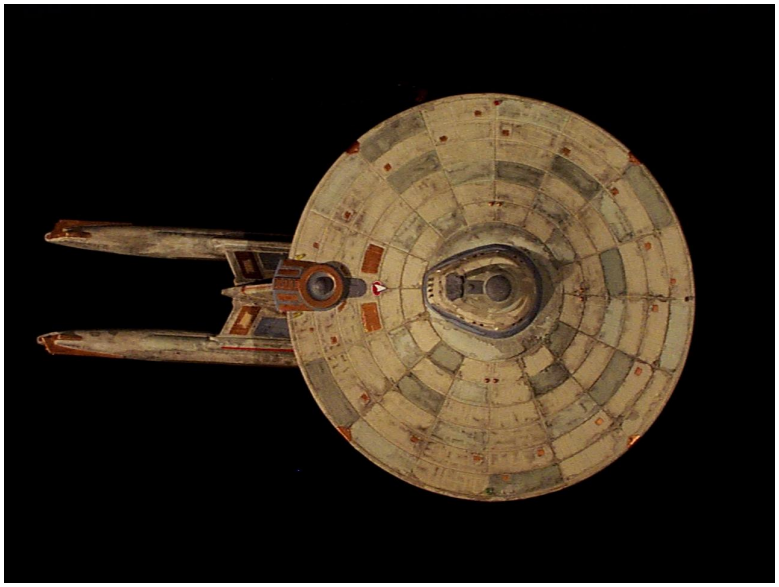
Polaris also carried two Mk 70 photon torpedo launchers with 50 photorps or probes (usually 4 tactical probes were carried). Four vessels, *USS Skat* (NCC-7305), *USS Tarazed* (NCC-7306), *USS Alshain* (NCC-7307) and *USS Mesarthim* (NCC-7308) were fitted with '*Emperor*' multidirectional phaser cannon in place of the photon torpedo launchers in order to evaluate the effectiveness of this armament in a destroyer configuration. The results were satisfactory, by and large. However, the photon torpedo was found to have many advantages over the MDPC, particularly in terms of range, and so the torpedo launcher was retained as Starfleet's primary heavy weapon.

Docking ports were placed aft of the bridge module and on either side of the torpedo pod. The *Polaris* did not feature actual shuttle facilities. No matter how much more versatile than the single-engined destroyers of the past two decades, the modern two-naceller still catered for the same basic operational requirements, and those did not call for shuttlecraft operations. A single workbee was usually assigned, housed in a small hangarette on the lower forward saucer.

The success of the first batch of *Polaris* class vessels was such that the option of a second batch was almost immediately taken and construction began on the first of these in 2299. This second batch was broadly similar to the first, with several minor systems upgrades. Finally, a third batch was authorized and ordered in 2300 and the first vessel, *USS Battleaxe* (NCC-10405), was commissioned in June 2303. The ships in this batch featured a number of differences to those in the previous two batches. They were fitted with the SANTH expanded impulse deck, as fitted to the *USS America*, as well as high performance LN-64B warp nacelles and a new warp core design, based upon that used in the *Constitution* phase V refit. Finally, the torpedo pod was expanded so the aft end was the same width as the forward. This space was mainly used for additional magazines, giving the third batch vessels almost as many photorps as some *Constitution* variants. Batch III vessels also had a vastly improved sensor system.

The ships of the *Polaris* class were usually paired with a parallel heavy scout design that had been under development for several years. The project had been initiated to take advantage of new sensor technologies, and was to be a survivable monitoring platform instead of an expendable reconnaissance intruder. The design itself was completed in late 2290 already, but authorization to build was not given until after Khitomer, in order to use newly available yard space in the most efficient manner possible.

The lead ship *USS Constant* was laid down in early 2294 and was commissioned in January 2295. Although similar to the new heavy destroyers, the *Constant* was obviously a different class to the *Polaris*; her primary hull was based on that of the *Constitution* phase IV refit (*Tikopai* class), with its advantageous configuration for sensor and analysis room installation, although the shuttle bay on the upper saucer was deleted to make way for the warp core and other systems. As in the *Polaris* class, the primary plasma transfer conduit traveled down the interhull section to a small engineering deck from where it led to two LN-64 mod 6 warp nacelles. The warp core was located forward of the RSL impulse engine.



Constant *class* USS Corunna *(NCC-9419),* Polaris *batch II USS* Impulsive *(NCC-9016) and* Polaris *batch III USS* Saintes *(NCC-10421) depart Starbase 186 in 2305 for border patrol along the Romulan neutral zone. Flotilla operations were still an essential force multiplier for the destroyer fleet, as they had been since the 2220s, yet a* Polaris *could handle her own targeting and C³I needs far better than a* Saladin *or a* Cochise*. Likewise, a* Constant *was far more versatile than a* Hermes*, capable of true independent exploration and research in addition to fleet coordination.*

Phaser armament for the *Constant* class was the same as that for the *Polaris* class, a vast improvement over the *Hermes* family. Nevertheless, the *Constant* class vessels carried no photon torpedo launchers; in place of the torpedo pod was a slightly larger sensor pod, crammed with Starfleet's latest long range military sensors. Three cylindrical sensor assemblies, similar to those on the sensor pods of the *Soyuz* class, extended from the front of the pod. Unlike the *Amerind* class, the *Constants* were fitted with some planetary survey sensors and racks for external sensor pallets from the outset. A second batch of *Constant* class vessels was commissioned in 2303, bringing the total to 38. These featured several sensor upgrades and minor improvements in other systems, and were elemental in restoring the long-neglected scientific scouting program.

The *Polaris* class gave Starfleet a heavy destroyer fleet to be reckoned with; this important sector of the Fleet was finally resurrected. Simultaneously buried was the politically unpalatable 'attrition destroyer' philosophy. Both the related classes had (by destroyer and scout standards) long and illustrious careers. The *Polaris* class was involved in several notable military actions against the Tholians, Orion pirates and Cardassian forces. Also remembered are the heroics of *USS Panther* (NCC-9020) and *USS Tarazed* (NCC-7306) in the *Tomed* Incident, and the loss of the former vessel during the unauthorized attempted rescue of the Foxtrot III outpost crew from the shockwave. *USS Lightning* (NCC-9015) was reactivated from the reserve fleet and destroyed at Wolf 359. The surviving batch I vessels were placed in the reserve fleet in the early 2330s and scrapped in the late 2350s. Batch II ships were placed in reserve in the late 2240s. Most were reactivated for the Dominion War. Batch III vessels are still active.

Constant class vessels were also involved in several famous incidents; *USS Cavalier* (NCC-7311) first discovered the Romulan ship *Tomed* crossing the Neutral Zone in 2311, and was able to get a warning to *USS Adjuvant* which, thanks to an engine cold-start, survived the cataclysm while her sister ship *USS Manna* was completely demolished. *Constants* were also involved in the Cardassian War and the campaign to finally eliminate Orion pirates. Batch I *Constants* were placed in reserve

in the mid 2340s and scrapped in the late 2360s. Batch II vessels were placed in reserve in the late 2350s; reactivating was considered at the onset of the Dominion War, but the sensors of the scouts were by that time obsolete, and their armament deemed insufficient for modern warfare.

Lng'we Chi
Exploratory cruiser
2294-2358

Completed:	46 total: 22 Starfleet exploratory cruisers 24 Federation Science Council survey cruisers
Length:	142.8 m
Beam:	42.4 m
Height:	25.2 m
Cruise speed:	w 7
Max.speed:	w 8.2
Endurance:	4 years
Officers:	20
Crew:	207
Weapons:	2 phaser IV emitters on forward hull 1 phaser IV emitter on aft hull
Shields:	1-layer conformal forcefield Navigational deflector on forward hull
Laboratories:	14, in varying configurations
Transporters:	2 GP (6-pad), 1 emergency evacuation (22-pad), 2 cargo; Mk V All ships brought to Mk VI standard after 2321
Auxiliaries:	4 medium shuttles (usually optimized for survey use) plus 2 work pods
Ships of historical interest:	
USS Lng'we Chi (NAR-25005), *USS Ndifornyen* (NAR-23015)	
SOURCES:	(D E Sharpe) (N SotSF) (H E Sharpe)

It is easy to forget that Starfleet's mission during the Klingon crisis in the late 23rd century still included exploration in addition to defense. In the 2280s, the sleek shapes of escorts and destroyers and the deadly weapons batteries of the cruisers dominated reporting on the Fleet, and the impressive scientific facilities which were at its disposal were lost in the background. Yet although the militaristic factions within Starfleet were building up defenses in preparation for the inevitable Klingon attack, the cruisers and frigates of Starfleet still performed extensive scientific and exploration missions – when they could afford the time.

Dedicated large science vessels were few and far between. The *Tikopai* cruisers, Exploration Command's trump card, had to be discounted from this category due to their ever-increasing defensive obligations. And by 2292, only five vessels of the defensively unburdened large exploratory cruiser type (*Nineveh* class, NAR-21050-54) were active. The overwhelming majority of Starfleet scientific vessels were of the small surveyor type, incapable of frontier work in a time of crisis. As a result of this, pressure was put on Starfleet to commission a new class of vessel in the

exploratory cruiser category.

Nothing on the scale of the *Tikopai* project could be attempted this time. Rather, budgetary pressures drove Starfleet's Science Division and Exploratory Command into a joint development project with the Federation Science Council, which directly handled the relatively non-dangerous scientific missions within Federation core space. The ships of this class would officially be in the Naval Auxiliary Reserve and in a joint 'pool' to be allocated to each organization as needs allowed. In reality, the vessels were permanently assigned to either Starfleet or the Federation Science Council, although all retained their NAR registries and several of the Starfleet vessels were ultimately handed over to the FSC and other civilian organizations when they were retired.

Design work began in 2289, with a view to commissioning the first FSC ships in 2293 and the first Starfleet vessel in 2294. Although the design was to be called an exploratory cruiser, by the late 23rd century this term had a very different meaning to that of the late 22nd and early 23rd centuries. Starfleet's heavy cruisers, light cruisers and heavy frigates now did most of the actual exploring, with smaller, dedicated science vessels performing follow-up missions. The new design, now called *Lng'we Chi* class, would effectively be one of these second wave vessels. While the design specification called for an endurance of 4 years, long enough for an exploratory mission to be carried out, the armament to be fitted was minimal. Warp propulsion would be at civilian level, affordable yet unsuited to most combat or emergency operations.

Unhindered by the conflicting demands of a dual mission, a design for the vessel soon emerged. A blocky forward hull was topped by a small Class 6 bridge module. Both of these were extended back for 34 meters. A 'spine' reached from the back of the bridge module, carried on over a 40-meter gap, along with a bracing beam on either side of the hull, and ended on an equally boxy 45-meter aft hull section that narrowed to a single impulse engine astern. The gap was fitted with docking interfaces for a variety of laboratory and sensor modules. The aft hull also contained a spacious shuttlebay, with facilities for up to four medium shuttles and two workbees.

Warp propulsion was provided by two civilian 'Swift' linear warp nacelles (referred to as CI(L)-4 by Starfleet) which could attain a cruise speed of warp 7 and a maximum speed of warp 8.2; they were mounted on the aft hull of the vessel, swept back. Impulse systems were Avidyne FIE-6A models. This fit gave the *Lng'we Chi* class a slight speed advantage over the *Nineveh* class large exploratory cruisers at both warp and impulse speeds.

The boxy silhouette of the exploratory auxiliary cruiser Suranimala *signals end of isolation for the skygazers of 39 Serpentis. Descended from Saurian dissenters, the 39 Ser culture did not actually warrant Prime Directive protection, but it took two months of careful observations by the* Suranimala *team to determine this.*

The weapons fit was originally intended to be relatively heavy, and mounted in an outboard pod. The Khitomer Accords put an end to the practice of turning research vessels into auxiliary combatants, though. A minimal fit of four phaser IV mounts in the Starfleet version and two in the

FSC version was chosen – otherwise, the vessels would have qualified as full cruisers under the Accords, which included several clauses limiting the total numbers of this fighting vessel type. A small 2 cm maser was fitted in early versions for spectrographic analysis, but this was omitted from later vessels as remote penetration sensors were improved. The science fit was highly impressive, with six permanently installed and up to eight exchangeable labs in the modular section. Sensor arrays were likewise impressive in their range, sensitivity and modularity. On the aft hull underside were facilities for probe launching; generally, 25 probes of varying types were carried. A huge amount of surface exploration gear was also aboard, including two anti-grav hovercraft.

The class as a whole spent most of its life investigating planets and meticulously charting entire ecosystems that had been discovered but only briefly mapped and analyzed by other vessels. A surprising array of scientific discoveries typically remained to be made on such worlds. Additionally, the exploratory cruisers occasionally provided specialist personnel for first contacts that were deemed to be too risky or difficult for the military starship crews to deal with, or occurred within explored space – such as when a race acquired warp drive for the first time, or the existence of interstellar civilization was accidentally revealed to a pre-warp civilization.

The most famous example of the latter is when the *Amerind* class scout *USS Gallaway* (NCC-628) in 2298 suffered a fracture in one of her warp coils at Theta Cygni, resulting in an emergency translation into the system. Unfortunately, this occurred within radar range of the Theta Cygnians' first interplanetary mission. The damage control teams of the *Gallaway* could handle the propulsive emergency, yet the mission of the ship had been primarily military, and there were no contact specialists aboard. The Cultural Acclimatization Rapid Response Team and the Shock & Trauma unit for Interstellar Contact deployed by the *Lng'we Chi* class *USS Ndifornyen* (NAR-23015), in a mission lasting some three years, provided damage control of a different kind. Ultimately, the Theta Cygnians became full and productive members of the interstellar community and joined the Federation in 2354.

In the early years of *Lng'we Chi* operations, some limited first wave exploration missions were also performed, with a destroyer, heavy destroyer or escort in company. These deployments were few and far between, however; the class was deemed to be too weakly armed and armored to conduct extensive exploration missions into unknown territory. Risk, after all, was the business of the heavy cruisers.

The class was in Starfleet use until 2358 when the 21 survivors (*USS Kingsway,* NAR-23020, having been lost to a rare warp core containment failure in 2339) were sold off to a variety of civilian science organizations. Most are still in operation in this capacity, including the surviving FSC vessels.

Hornet

Support carrier
2295-2327

Completed:	10
Length:	288.0 m
Beam:	141.7 m
Height:	70.2 m
Mass:	747,000 tons

Cruise speed: w 5

Max.speed: w 8.0

Endurance: 5 years

Officers: 47 (including pilots)

Crew: 172

Weapons: 6 phaser VII emitters in 3 twin banks on dorsal primary hull
4 phaser VII emitters in 2 twin banks on ventral primary hull
2 medium fwd torpedo tubes w/ 50 photorps on ventral pod

Shields: 2-layer conformal forcefield
Navigational deflector on ventral pod
Auxiliary navigational deflector on ventral primary hull

Laboratories: None

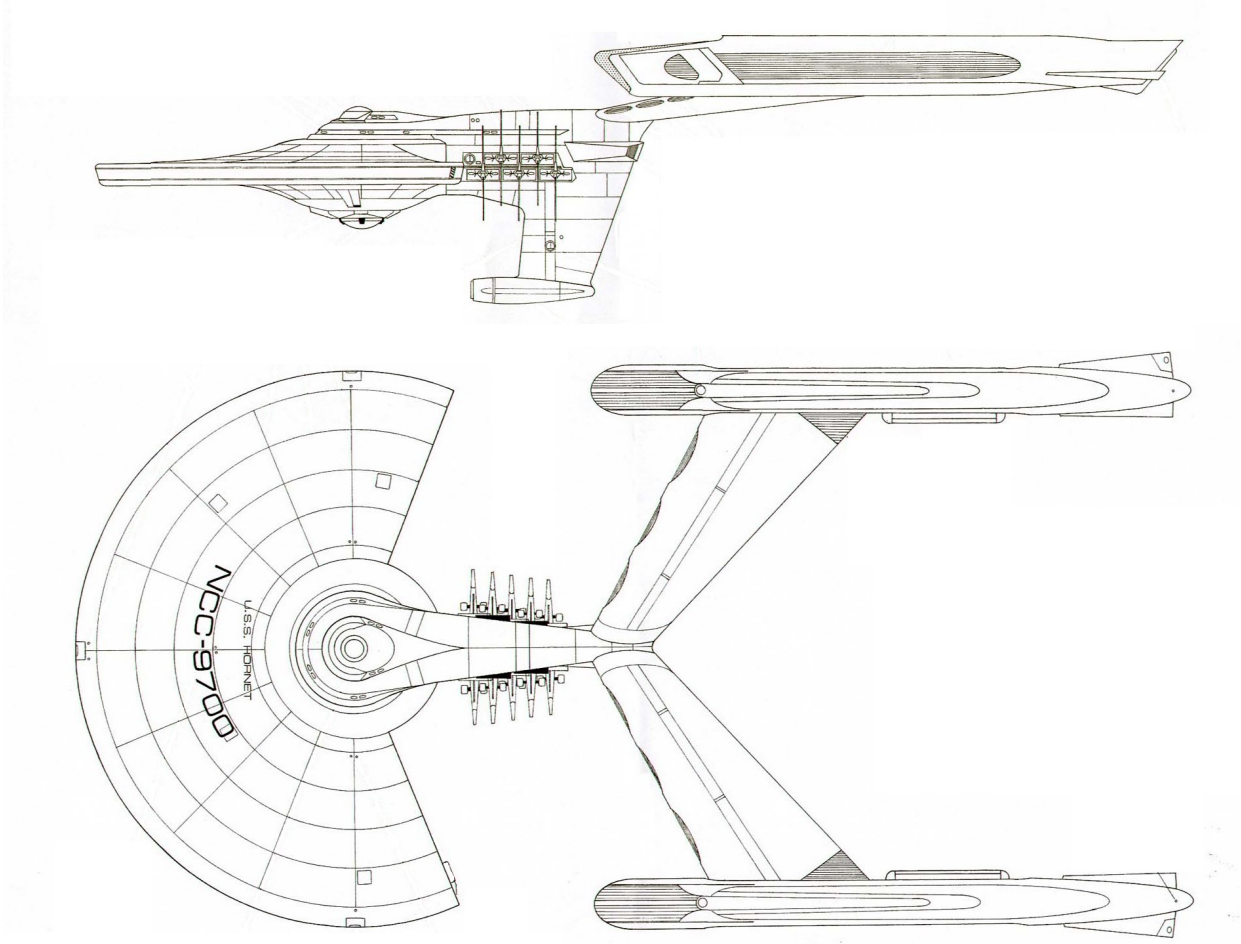
Transporters: 4 GP (6-pad), 3 emergency evacuation (22-pad), 1 cargo; Mk V
All ships brought to Mk VI standard after 2314

Auxiliaries: 10 tactical craft, 8 work pods, 6 cargo and 5 tanker trains

Ships of historical interest:

USS Hornet (NCC-9700)

SOURCES: (D Lawrence Miller, dimensions corrected)
(N Lawrence Miller)
(H Lawrence Miller)



Of the production runs interrupted by Khitomer, that of *Excel* strike cruisers was probably the most

severe in terms of financial effects. At the height of the defense spending spree, Cosmadyne had rushed to secure its piece of the action by purchasing the elements of the ships it was to assemble well in advance. In 2293, the corporation found itself stuck with six half-completed primary hulls, dozens of Type VII phaser banks, and eight hyperexpensive pairs of LN-68 engines. The latter item was the most distressing, as the engine type was optimized for the deep space strike mission and could not easily be adapted for use in, say, transports or exploration vessels.

The first instinct of the corporation was to offer a simplified version of the strike cruiser for export. Yet the government quickly put a clamp on such designs, both to plug 'starship drain' from the suddenly mothballed defense fleet, and to implement the newly possible policy of avoiding all weapons export. If Cosmadyne wished to expend its components in assembling starships, rather than selling the items separately for spares, it better come up with a design that would meet Federation needs for the postwar 2290s.

In a crash program involving equal amounts of starship redesign and market research, two possibilities emerged. The *Achernar* workhorse cruisers were in continuing need of replacement, and might benefit from reengining with LN-68. However, Starfleet did not wish to diversify its already byzantine collection of *Constitution* derivatives further, prompting Cosmadyne to offer its Plan B instead. In February 2294, the Commission for Starfleet received a proposal for an auxiliary carrier optimized for supporting police operations in remaining zones of piracy.

The hastily thrown-together light fightercarrier, tentatively and somewhat self-ironically dubbed *Rushmore*, would combine a wedged-out Class 1B primary hull and the pair of LN-68s in as simple a manner as possible. The low-cost, low-performance power system (the one item not preordered by Cosmadyne) would ride within a stern extension of the primary hull rather than in a separable secondary hull, thus resembling light cruiser structural solutions. A pair of Mk 20 torpedo launchers would be fitted in a ventral pod together with the Hobbs navigational deflector. Primary hull weapon berths would receive five pairs of RIM-12C phaser emitters, to be slaved to an '*Eyas*' targeting system.

Modest shielding and subpar warp 8.0 performance would keep the vessel from conventional front lines, but her primary armament would ideally amend and complement her other characteristics. For the anti-piracy patrol mission, the *Rushmore* would carry a wing of ten fightercraft on external berths flanking the hull extension. Several types were considered by both Cosmadyne and Starfleet, until the choice fell on the Patterson TS-675 '*Storn*' warp assault craft. A formal blessing was given for the completion of a proof-of-concept prototype, NX-9700 – unexpectedly renamed *Hornet* after the tragic 2295 loss of the venerable cruiser.

Under attack by raiders of apparent Catullan nationality, USS Washington *(NCC-9703) banks hard to clear the field of fire for her fightercraft. Although typically conducted under police authority, many an anti-piracy mission ended up as a*

full-fledged combat engagement. Several also became diplomatic hot potatoes when the pirate group was shown to operate under foreign mandate; after demolishing the asteroid base of these raiders, the Washington *discreetly delivered her prisoners to Klingon rather than Catullan custody.*

In June 2295, the *Hornet* was launched for a brief series of warp tests, then commissioned for action in the Orion direction. Requiring only 27 officers and 172 crew, plus 20 pilots, the *Hornet* was extremely affordable to operate, and provided a welcome boost to local law enforcement assets. In addition to her ten *Storns*, she operated a collection of fuel and cargo lighters and work pods from a primary hull rim bay that had two aft-facing space doors. As well as assisting the onboard fighter wing, the auxiliaries extended the reach of local craft and patrol corvettes, and ran picket in the attempts to locate and smoke out those pirates that had decided to benefit from the post-Khitomer confusion. After four pirate strongholds in UFP space had been exposed and reduced, Cosmadyne got the go-ahead for not just assembling the seven remaining auxiliary carriers, but building two more from scratch as well.

Throughout the nineties, the *Hornets* operated in missions of securing the antispin- and rimward sectors, many of them crewed by local forces rather than Starfleet deep space specialists. The *Storns* offered employment for the masses of fighter pilots trained for the Klingon confrontation that never came. Other fighter types were tested as well, including TED-B and FG drones. Yet the task of once more stamping out piracy within UFP territory was quickly completed, and the fightercraft and their carriers were again left out of work. Starfleet had no interest in upgrading and certifying the *Hornets* for deep space operations, and reduced them to police tenders by the 2310s. A series of overhauls kept the vessels spaceworthy until 2327, by which time the last hull was sold forward for local law enforcement use, stripped of all armament.

Hensley

Support frigate
2295-2347

Completed:	20
Length:	243.6 m
Beam:	141.2 m
Height:	49.6 m
Mass:	732,000 tons
Officers:	12 (support operations) 51 (combat operations)
Crew:	102 (support operations) 203 (combat operations)
Cruise speed:	w 7 (original) W 6 (adopted by ships used in the 24th century)
Tow speed:	w 5 (original) W 5 (adopted by ships used in the 24th century)
Max speed:	w 11.0 (original) W 8.7(adopted by ships used in the 24th century)
Endurance:	1.5 years
Weapons:	6 phaser VII emitters in 3 twin banks on dorsal primary hull 2 phaser VII emitters in twin bank on ventral primary hull
Shields:	1-layer conformal forcefield Navigational deflectors on aft ventral hull, integrated with cargo grapples

Transporters: 1 GP (6-pad), 1 cargo; Mk V

Auxiliaries: 2 to 4 work pods

Ships of historical interest:

USS Hensely (NCC-4300)

SOURCES: (D SotSF, Jackill)
(N Jackill)
(H own)

The *Daran* medium frigate design, having proven proficient in system defense and medium range interstellar operations, was in the 2290s somewhat surprisingly also adopted by Logistics Command for Starfleet theater logistics needs. Since the original *Ptolemy* tugs were on the verge of collapsing out of extreme age and fatigue, their successors in *Doppler* and *Dollond* classes had to assume both halves of their dual role as Fleet recovery vessels and transports. From the very start, the vessels were hard pressed to cope with Fleet needs. After the Khitomer peace, the burden became overwhelming with the need to support the construction of new outposts on an expanded operational theater. Dedicating of *Dollond* tugs to this task threatened the vital if inglorious flow of spares, consumables and new equipment and personnel to distant outposts and starbases. Starfleet began to look for ways to alleviate the problems by assigning at least some parts of the multi-faceted mission of the heavy tugs to lesser designs. When extra dockyard resources became available in 2295, through the cancellation or downscaling of many military starship programs, an order was made for twenty *Darans* of stripped configuration.

The modified design made use of components manufactured for the abortive *Darter* follow-on frigate class. Basic spaceframes were thus largely common with *Darans*, while the LN-64B mod 5 engines were reallocated from the production lot reserved for the *Decisive* class (since only one pair had been manufactured for the *Darter* program). Ill suited for heavy towing work, the engines nevertheless represented the economically most viable solution, being already fully compatible with this hull type. Still, Defense and Logistics Commands bitterly fought for the possession of the expensive engines, which might otherwise have been refitted to the earlier frigate classes, budgets allowing. The final decision to give the engines to the support frigates was also a political gesture to show that the deep penetration strike mission for which the *Decisives* had been designed was no longer a Starfleet priority.

Only eight phaser VI emitters were installed, six of them on the dorsal side; on the ventral surface, two towing fixtures for standard cargo pods were added in place of the athwartships phaser mounts and deflector positions. The field configuration needed no modification, yielding a towing speed of warp 5 with two full pods. In theory, a ‘cargo train’ configuration with up to three pods per side lined up could be towed at warp 4, barring the need to maneuver. In practice, such ‘trains’ were abandoned as a concept by the 2290s, except for returning of empty containers.

A rear view of USS Burnside (NCC-4313) *highlights the twin-pod configuration, and reveals the omission of the port shuttlebay as well. Significant amounts of internal cargo could be carried in the holds installed in the former hangar, now accessed via the starboard shuttlebay.*

Ships of this design were utilized as deep space recovery and resupply vessels between 2296 and 2347. Serving under the name *Hensley* class, the vessels both towed damaged light and medium starships and hauled fuel and supplies for task forces. This primarily freed *Doppler* class tugs from 'menial' fleet support tasks, but indirectly helped the *Dollond* tugs to return to their vital cargo runs by allowing Starfleet to reassign *Dopplers* to outpost construction in place of *Dollonds*. The domino effect was further augmented by the addition of *Fisher* and *Kethkin* light tugs to the lower tier of the cargo hauling force. In 2303, Logistics Command could finally claim to be on top of the situation. The pool of ships available for logistic needs was still precariously low until the 2330s.

When relieved of their burden of cargo, and given a dedicated combat crew, the *Hensleys* also served as local defense assets. However, their meager sensor capabilities and lack of computing power significantly reduced their usefulness. Only when fed targeting data by more capable starships could the *Hensleys* have been argued to present a significant deterrent to invaders. The lack of a proper tactical datalink on the vessels must thus be seen as a grave shortcoming.

As usual, the stresses imposed on the transports were much more severe than those facing the patrol frigates: none of the *Hensleys* was deemed worth mothballing, and all were scrapped within fiscal years 2344-7. Some of their components were added to the spares cache for *Daran* and *Knox* vessels, but these sacrifices did little to prolong the frigate lifetime, since operational concerns had already outdated the entire design family.

Deneva

Light transport
2296-

Completed:	342 total: 60 *Deneva* light transport 118 *Celes* light passenger transport 16 *Japori* light tanker 28 *Porrima* light tanker/transport 120 *Chara* light transport
Length:	63.0 m (w/o cargo sections) 82.9 m (w/ 1 cargo section) 93.0 m (w/ passenger section) 104.5 m (w/ 2 cargo sections)
Beam:	50.7 m
Height:	17.2 m (landing gear retracted) 19.0 m (landing gear extended)
Mass:	110,100 tons (*Deneva*, w/o cargo sections) 114,000 tons (*Celes*) 111,200 tons (*Japori*) 113,900 tons (*Porrima*) 130,200 tons (*Chara*, *Deneva* refit, w/o cargo sections)
Cruise speed:	w 5 (LN-80 -engined) W 5 (WF-7 -engined)
Max. speed:	w 8.1 (LN-80 -engined) W 8.0 (WF-7 -engined)
Endurance:	1 year
Crew:	6 (standard)

10 (passenger variants)

Passengers: 90 (passenger variants, typical)
180 (troop transport/evacuation configuration)

Cargo: 27,000 tons (*Deneva*, *Celes*, *Chara*)
55,000 tons (*Japori*, *Porrima*, dense fuel types)

Weapons: 1 retractable phaser V emitter in ventral berth (select *Japori*, *Porrima*, *Chara*, *Deneva* refit)

Shields: 1-layer globular forcefield
Navigational deflector on lower fwd hull

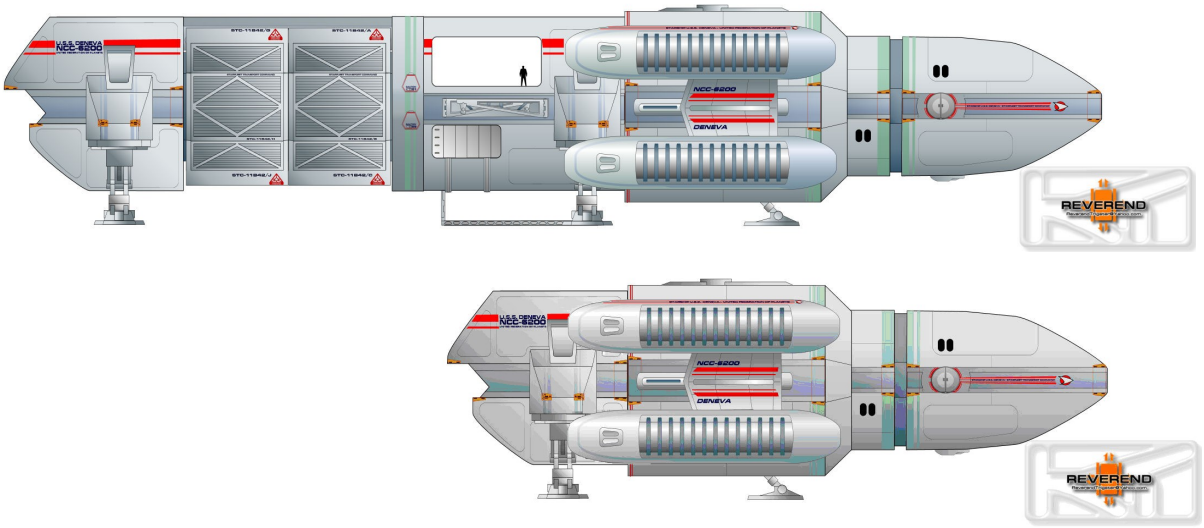
Transporters: 1 GP (2- or 4-pad), 1 cargo; Mk V or VI
Additional transporters often carried in cargo or passenger sections

Auxiliaries: 1 shuttlepod, 2 work pods

Ships of historical interest:

USS Arcos (NCC-6237), *USS Geraldo* (NCC-6209)

SOURCES: (D Kris Trigwell)
N TNG
(H own)



In addition to vessels that were capable of hauling the large cylindrar cargo pods widely used by Starfleet, the various agencies of the Federation had a need for fast utility freighters capable of moving standard cargo containers and a variety of goods in smaller portions. The medium *Sydney* class was meeting the demands as far as quality was concerned, yet retirement of the light *Tavares* units meant that quantity was constantly in short supply. How serious the shortcomings in the beginning of the 2290s truly were remains debatable, since much of the procurement policy of Starfleet at that time was either openly or covertly guided towards an eventual offensive against the Klingon Empire. Attrition calculations for such an offensive assumed heavy losses of support vessels and smaller combatants to the feared Bird of Prey raiders. To compensate, production of modern transports had to be increased well beyond peacetime needs.

The successor design to the *Tavares* class was evolutionary rather than revolutionary, but opened up new possibilities nevertheless. The forward hull of *USS Deneva* (NCC-6200) was a relatively simple development of the *Tavares* one, holding crew comforts on three decks and again placing main engineering well forward, with fuel supplies on the top deck. It was the warp propulsion systems amidships and cargo spaces aft that underwent the most noticeable and capacity-transforming changes. The former made use of newest technology: instead of two 40 m warp units

tucked close to the hull, four LN-80 nacelles of mere 25 m length were rigged on lateral T pylons, and fed warp plasma from a vertical KR05 core. This facilitated warp five cruising and gave good redundancy for deep space operations. Almost equally important was the freedom of choice in aft hull layout afforded by the malleable warp field.

Three different basic types of aft hull section could be inserted aft of the bulkhead that sealed off the engineering section. One was a simple structural core that could mount twelve containers externally. A centerline corridor on Deck 3 and power and data trunkage on Deck 1 would connect the bow and stern of the vessel, as well as provide access and utilities to the container load. A crane system on Deck 5 would allow the containers to be loaded under standard gravity conditions even on the most austere starports. Up to two such sections could be hooked on without losing planetary landing and takeoff capability, for a total load of 24 containers. Alternately, a mixed load could be carried, the second aft hull section type being an enclosed structure with multiple internal holds, an underbelly cargo elevator, and optionally also an open shuttlecraft landing area that took the uppermost two decks. The third possible load was a single large bulk hold/tank, not applicable in duplicate due to the greater mass of cargo involved.

If landing and takeoff capability was not essential, two or more midsections might be inserted, with a three-meter spacer in between. In practice, though, the overall versatility of the light transport was paramount, and plans on using up to nine container sections came to nought. Also unexploited was the option of altering the configuration of the ship after construction, save for proof-of-concept experiments performed on *USS Geraldo* (NCC-6209).

Regardless of the type or number of cargo sections built in, the stern of the ship featured aft landing legs, impulse propulsion, a loading ramp, and a docking port that typically permanently berthed an auxiliary craft for inspection, maintenance, liaison and evacuation needs. Increased automation in both propulsion and cargo handling systems allowed the paring down of the crews to just six people.

Two Deneva *class vessels offload cargo at DS K-19. The presence of a Klingon* TongDuj *transport offers an excellent chance to compare the designs, which feature a similar basic layout even when the Klingon design omits external container grapples and dedicates much more space to impulse propulsion.*

After an initial production run of 60 vessels at Earth facilities, mainly Star Fleet Division yards, Starfleet relinquished production to commercial yards around the Federation. A passenger variant was quickly introduced, featuring a ‘1.5-length’ special section for the new type of load. Sixteen dedicated deuterium tankers and 28 tanker-transport hybrids were also built, carrying integrated fuel transfer gear in addition to mounting the appropriate cargo sections. In 2308, multiphasic WF-7 engines were introduced for a batch of 120 transports, and subsequently refitted on most of the earlier units as well; cruise and dash performance increased to warp 5 and 8 on the absolute scale, respectively.

As of 2375, some 200 *Denevas* still operate in both commercial and Starfleet roles, the latter mainly utilizing the ships for spares transfer, crew rotation and resupply runs along well-established spacelanes.

Lexington

Command ship
2296-2341

Completed:	6
Length:	397.1 m
Beam:	185.0 m
Height:	50.4 m
Mass:	1,303,000 tons
Cruise speed:	w 8 (original) W 6 (adopted after 2311)
Max.speed:	w 13.0 (original) W 9.4 (adopted after 2311)
Endurance:	7 years
Officers:	181
Crew:	356
Weapons:	10 phaser VIII in 5 twin banks on upper primary hull 10 phaser VIII in 5 twin banks on lower primary hull 2 phaser VI in single banks on aft dorsal secondary hull 4 phaser VI in single banks on ventral secondary hull 2 heavy fwd torpedo tubes w/ 60 photorps or probes in secondary hull 1 heavy aft torpedo tube w/ 40 photorps in secondary hull
Shields:	3-layer conformal forcefield Navigational deflector beam on fwd secondary hull Secondary navigational deflector on ventral primary hull
Laboratories:	2 GP, 4 signals intelligence
Transporters:	4 GP (6-pad), 6 emergency evacuation (22-pad), 4 cargo; Mk V
Auxiliaries:	Up to 12 shuttles of various types, 8 work pods

Ships of historical interest:

USS Lexington (NCC-3092)

SOURCES:	(D Klingon Academy computer game) (N Klingon Academy computer game) (H Klingon Academy computer game, own)

The six *Lexington* class vessels built at the turn of the century owe their existence to two requirements that in retrospect did not really need to be met. Yet from the vantage point of the late 2280s, when the design process was started, it sounded like a good idea to introduce a powerful successor to the *Balson* class command cruisers – and to do so by using *Excelsior* components in a more affordable combination. Careful analysis provided hard numbers for the quality and quantity needed by Starfleet to keep its fleets coordinated in the ultimate confrontation with the Klingon Empire, and the six *Lexingtons* were built to match these criteria exactly.

The various battleship programs being floated around tended to involve the expensive yet already proven 185 m primary hull of the *Excelsior* class. On the other hand, they also had a tendency to collapse under their own weight, with the double results of encouraging Starfleet to search for more economical alternatives and liberating already procured and perhaps even partially constructed saucers for further use. The first *Lexington* class vessel, NCC-3092, was in fact the third to be proposed – her two predecessors were turned down after re-evaluation of their propulsion arrangements – and inherited not just a battleship primary hull, but also the secondary hull framework of the deleted NCC-3091.

The saucer was completed to rough *Excelsior* standards, with a main battery of twenty phaser VIII emitters. The impulse system was of a completely different type, though, based largely on that of the *Proxima* battleship refit; a secure supply of surplus components existed courtesy of the abandoned *Komsomolsk* and *Yamato* projects. The integrated superstructure featured three IMRF crystals and two main accelerator coil sets, and tapered forward, terminating in a two-level command center and eliminating the extensive sensor arrays that had surrounded the *Excelsior* bridge. The secondary hull in turn was barely larger than its *Federation* counterpart, merely

provided with a more modern deflector dish and a slightly elongated shuttlebay. A connecting neck of minimal height was used, housing no major functions or pieces of machinery; torpedo launchers (two forward, one aft) were located in the secondary hull bow flanks and fantail bottom, respectively.

The warp core was an evolutionary version of the *Federation* main powerplants, rather than an attempt at cramming the *Excelsior* reactor into the more compact hull. Enough power was still generated for stimulating the coils in the LN-73 engines into warp 13. This sufficed for commanding just about any formation at flank speed, save for a hypothetical flotilla of modern reconnaissance cruisers.

At only four-fifths the length and barely half the mass of the *Excelsior* nacelle, the LN-73 offered significant savings in construction costs and overall mass, while giving the behemoth the same cruise speed as the more complicated four-nacelle arrangement that propelled the equally large *Proxima* class. The engine mounting was also less vulnerable than in the old battlewagons, consisting of straight and broad trapezoid pylons. While the engineering was conservative in comparison with the *Excelsior* technologies, it was still seen as forward-looking enough to be offered to Starfleet as one solution to standardizing the diverse dreadnought or battleship fleet in the upcoming decades. This was not to be, and neither the battleship nor the dreadnought designation would ever officially describe the *Lexington* class.

At the 2296 launch, the *Lexington* was nevertheless considered a success story, and all the six keels laid in preparation for the great war were completed within the decade. As the cancellation of the interstellar Armageddon also cancelled most fleet maneuvers, the command ships sailed out on independent exploration and power projection missions, exploiting their *Excelsior*-standard range and speed. The operations set a benchmark against which the older cruiser types compared poorly; in adopting the name of a retiring *Constitution*, the class ship also symbolically ushered in an era that had no place for the venerable predecessor class. Even if *Lexington* operations were only marginally more affordable than *Excelsior* ones, Starfleet by the 2310s had assigned all of its deep space duties to vessels of this size category, and was ready to move past compromises and economy measures.

The *Lexingtons* were retired in favor of expanded *Excelsior* production in 2320 already, and placed in reserves for pure command ship duties. Even in that role, they were soon superceded by the *Joshua* class. The last vessel, *USS McLafferty* (NCC-3096), was stricken from fleet strength in 2341.

Overfield

Heavy transport
2297-

Completed:	42
Length:	343.2 m
Beam:	201.5 m
Height:	48.7 m
Mass:	940,000 tons
Officers:	11
Crew:	75
Passengers:	1,800-2,200
Cargo:	200,000 tons (cargo only) 185,000 tons (cargo + 1,800 passengers) 170,000 tons (cargo + 2,200 passengers)
Cruise speed:	w 6 (original) W 5 (uprated)
Max. speed:	w 8.5 (original) W 7.5 (uprated)
Endurance:	6 years
Weapons:	None
Shields:	1-layer conformal forcefield Navigational deflector on lower fwd hull
Transporters:	2 GP (6-pad), 4 evacuation/cargo (20-pad), 4 cargo; Mk V
Auxiliaries:	2 cargo shuttles, 2 surface-to-orbit tugs, 6 work pods (Starfleet standard; civilian contingents vary)

Ships of historical interest:

USS Andoria (NCC-9979)

SOURCES:	(D FASA) (N FASA) (H FASA, own)

Containerized transport is in theory a very efficient way of moving diverse cargo, since it minimizes the time a ship has to spend idle in port. It also solves the problems of port storage of the goods. However, if the distances spanned by star transports are long or the speeds low, port time becomes insignificant in comparison with time spent underway. Also, if containers are too large, loading them becomes a bottleneck equal to loading general cargo ships.

The expansion of Federation commerce beyond its original 22nd century constraints had begun with the pioneering exploration in the sixties and gained speed with the gradual pacifying of pirates in the eighties. By the post-Khitomer nineties, there existed several long-distance trade routes which no longer were suited for containerized operations. Use of container tugs on those routes simply hurt the pool of containers in core space without producing real scheduling advantages. The use of *Fisher* light tugs to haul empty or partially filled containers was another unhealthy practice, a result of the Klingon and pirate threats that had frightened away small general cargo vessels from the spacelanes.

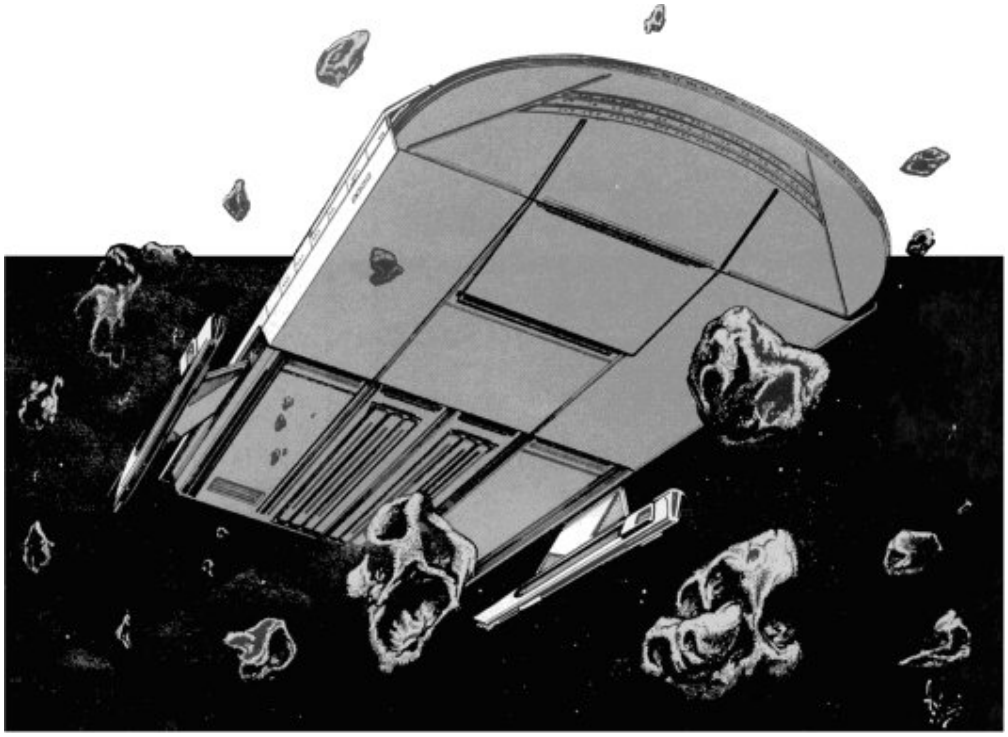
The nineties saw the revigoration of small cargo vessel operations, in which Starfleet's new *Deneva* class light transports also took part. However, this category of vessels could not serve the long-distance routes, even if they were safe from piracy now. Starfleet's own logistics operations on these routes were carefully scaled to make best possible use of container shipments, but civilian operations could not afford such inflexibility. As the Klingon threat receded, Starfleet was approached by the major shipping companies to develop the engineering and operational solutions to this problem.

By now, Starfleet had plenty of experience in this kind of work. Despite its public image as a primarily military organization, it had served the Federation in many civilian fields as well. Now the Offices of Requirement Analysis and Transportation Management under Logistics Command went to work to produce the specifications for the kind of starship that would solve the problems of the shipping companies. And in 2296, design work began on a large general cargo vessel with flexible loading configurations.

The *Overfield* class had a pseudo-aerodynamic silhouette much like that of *Sydney* medium transports, only some 250% as large. Warp engines were of the heavy LN-65 type used in shuttlecarriers, and mounted on lateral supports not unlike the *Sydney* ones. At the bow was a flat Vernier ADT-B deflector unit similar in capabilities to Starfleet's cruiser deflectors, and at the stern a capacious twin shuttlebay complete with service hangars. Up to four heavy cargo shuttles or barges could be brought aboard, although the typical Starfleet load was two such shuttles and two surface-to-orbit tugboats. Lower decks ahead of the shuttlebay and centerline engineering area (where the main fuel tanks also lay) provided alternate cargo access, with four docking berths for heavy cargo barges on each side, and with an array of transporters on the centerline.

Bow structures were in turn dedicated to passenger space, although they could also be converted to hospital ship use or evacuation. No tactical troop transporting was projected, since the ships were at the time considered slightly too large to be useful in assault role. However, they would be in Activation Class Six for strategic spacelift, like all large SF Merchant Marine vessels but unlike the majority of comparable civilian designs.

Impulse propulsion was based on six Class 2 engines, giving the ships maneuverability and insystem acceleration comparable to the nimble *Sydneys* when in standard trim. This was no overkill, however, as the heaviest projected external loads would significantly task the engines.



An Overfield *in Starfleet colors lazily rolls into sunrise over Berengaria, a grandstand stunt loved by passengers and commercial pilots alike, and evidently not completely unknown in Starfleet, either. Somersaulting the great vessels at orbit for a breakaway with the star exactly astern for immediate warping trim is more difficult than skilled pilots make it seem, considering the bulk and low RCS capacity of the* Overfields*. Helmsmen naturally claim such maneuvering has important combat uses as well.*

The million-ton *Overfield* naturally had no landing capability, but could still stevedore large loads from planetary surfaces. Her dorsal cargo holds were built of sections that could be configured for varying loads. Each section could be completed into a detachable container or general goods hold, or combined with the adjoining sections for carrying of general or bulk cargo. Sections could also be omitted for the attaching of outsize external loads. If necessary, the ship could take three side-by-side standard cylindrar containers as well. The tugboats carried in the shuttlebay could move individual containers to and from class M planetary surfaces.

This modularity came at the expense of structural strength. Yet it heralded a new era of transport design, which would later see the roughly similar *Istanbul* and *Yorkshire* classes and their civilian and military derivatives. The use of ship-specific instead of standardized containers proved an economical and practical choice. In retrospect, one could say that the extensive analysis and R&D work had been unnecessary: older and more experienced civilizations had already reached the same conclusions, as evidenced by the *Antares* and *Sirius* categories of medium transports with containerlike holds...

Despite the preceding major increases in dockyard capacity, the *Overfields* were major investments in the 2290s, and Starfleet Merchant Marine production was limited to 42 vessels. Yet civilian shipping companies put the type to further production, and its derivatives became standard cargo and passenger liners for most of the long-distance routes.

Reigate

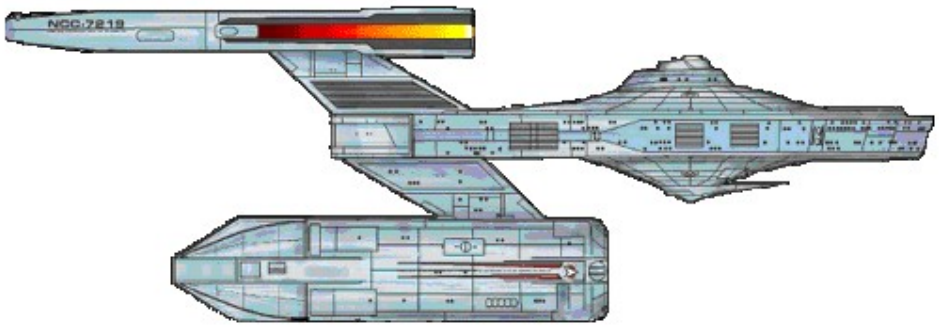
Cruiser
2298-

Completed:	20 total: 10 *Reigate* 10 *Challenger*
Length:	322.9 m
Beam:	168.1 m
Height:	110.0 m
Mass:	820,500 tons (*Reigate*) 822,100 tons (*Challenger*)
Cruise speed:	w 7 (original) W 6 (adopted after 2316)
Max.speed:	w 13.0 (original) W 8.8 (adopted after 2316)
Endurance:	8.5 years
Officers:	47
Crew:	403
Weapons:	6 phaser VIII emitters in 3 twin banks on dorsal primary hull 6 phaser VIII emitters in 3 twin banks on ventral primary hull 2 phaser VIII emitters on ventral secondary hull 2 phaser VI emitters on aft secondary hull 2 medium fwd torpedo tubes w/ 80 photorps or probes on secondary hull 1 medium aft torpedo tube w/ 30 photorps on secondary hull
Shields:	2-layer conformal (later 1-layer globular) forcefield Navigational deflector on fwd primary hull Auxiliary deflector spire on ventral primary hull
Laboratories:	10, in varying configurations
Transporters:	4 GP (6-pad), 4 emergency evacuation (22-pad), 4 cargo; Mk V All ships brought to Mk VI standard after 2314 Select ships brought to Mk VII standard after 2350
Auxiliaries:	2 medium shuttles, 4 light shuttles, 6 shuttlepods, 6 work pods; special environment craft sometimes carried

Ships of historical interest:

USS Marco Polo (NCC-7219)

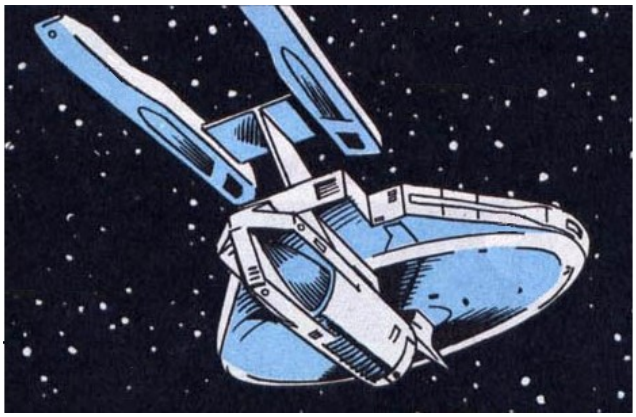
SOURCES: (D DC Comics “Thin Ice”)
(N SotSF, DC Comics “Thin Ice”)
(H SotSF, DC Comics “Thin Ice”)



As early as 2274, Starfleet had put out a call for a successor to the affordable *Achernar* heavy cruisers. At the time, the repossessed export vessels had been undervalued due to their lack of modern, linear excitation warp propulsion systems. Nothing came out of the procurement plans, however: whatever capacity gap there existed due to the older technology of the *Achernars*, the large numbers of modern *Constitution* derivatives quickly filled.

The successor question again became acute with the anti-Klingon escalation of the eighties. Cruiser reserves were so tied up that even the exploration-dedicated *Tikopai* fleet had to be defensively redeployed, and civilian vessels dispatched to survey cruises instead. Yet the ongoing escalation process also ensured that no funds remained for a sizeable new class of heavy cruisers. The *Vengeance*, *Maya* and uprated *Ishtasse* projects all passed their final design reviews, only to succumb to a sharp budgetary axe. In their stead, Starfleet chose to procure the *Constellation* and *Odysseus* 'scout cruisers'. These fast and deadly vessels pushed the limits of technology, and the latter type did so to its own peril: in 2287, project *Odysseus* was halted at just eight hulls built.

At the cusp moment of 2291, Starfleet knew it needed the missing dozen cruisers. It also well knew it could not afford twelve more *Constellations*. An alternate plan was thus put forth, consisting of the design and construction of a two-nacelled variant of the *Constellation* class. Hopefully, it would be ready by 2295, the absolute last deadline for the planned Klingon War. If not, something like the *Ishtasse* might have to be dragged from the dustbin to service after all.



The unexpected Khitomer peace did not put an end to the tortuous history of the *Achernar* replacement, even if it made the matter less urgent. The *Constellation* companion would have to be built in any case: the *Excelsior* program had proven an almost unmitigated disaster, the dreadnoughts had been sacrificed at the negotiating tables, and yet Starfleet deep space presence for the turn of the century had to be assured somehow. Project *Reigate* received a belated final seal of approval in 2296, and construction began on four hulls simultaneously.

No longer considered 'heavy' in the relative sense, the *Reigate* cruisers still were monsters in terms of *Achernar* comparison. The voluminous *Constellation* primary hull was applied as such for the new cruisers, as was the upper half of the warp propulsion support structure. Attached to the T pylon were boxy 300,000 ton LN-71 nacelles; on the lower pylon rode a secondary hull massing some 100,800 tons. Yet every single ton of the additional mass, worth almost an entire *Achernar* hull, translated to comparably increased capabilities. While somewhat slower and more affordable than a *Constellation*, the *Reigate* would be an independent deep space explorer capable of outfighting the largest known Klingon designs.

On SD 44662.3, a battle between USS Marco Polo *(NCC-7219) and the Darzun at Beta Marada is joined by* USS Enterprise *(NCC-1701-D), allowing for this dramatic yet authentic view of a* Reigate *in action. Limited torpedo firepower never particularly distressed these vessels, although shielding had to be boosted by added deflector spires to match mid-24th century standards. Multitargeting shortcomings also plagued the* Reigates *during the latter half of their long careers; the* Polo *suffered heavy casualties under the onslaught of the robotic attackers.*

The LN-71 engine was ideal for deep space exploration, capable of high sustained speed and great endurance. Impulse propulsion relied on Scarbak rather than Avidyne technology, and featured a fully enclosed stern assembly with two large nozzles and embedded IMRF systems; performance was basically identical to that of the *Constellation* engines. The inclusion of a secondary hull had a greater impact, giving the ship a considerable array of long range sensors clustered behind a single large bow dish and four smaller stern units. The central part of the hull cylinder also featured capacious fuel tanks. This repackaging of vital gear allowed the underside of the primary hull to be 'streamlined' once again to aesthetically pleasing smoothness.

The *Reigate* (NCC-7200) was launched concurrently with the *Tehran* (NCC-7100) in 2298, and two vessels of each type per year were subsequently completed until 2301, when *Tehran* production was terminated two ships early. *Reigate* construction reached the intended total of ten by 2302, covering for the retiring of not just *Achernars* but most other *Constitution* spinoffs as well. One final batch of ten *Reigates* and three *Constellations* (very seldom called the *Challenger* and *Harrison* subclasses, respectively, especially after conflicts with 'proper' class naming arose) were in service by 2315 – at a time when their future was already endangered by multiphasic propulsion technology and replicator-augmented construction of far larger cruiser starships.

Two *Reigates* still remain in service as of this writing. Battle casualties include the *Challenger* (NCC-7210), *Dido* (NCC-7202), *Marco Polo* (NCC-7219) and *Wasp* (NCC-7205), lost in 2347, 2358, 2367 and 2374, respectively. Of the other fourteen vessels, six are quite serviceable but idled at Daran, while the rest have recently been donated abroad for patrol use, an unthinkable move in the century between the Altair conflict and the Dominion War, but now par for the course again.

Hardin

Destroyer
2299-2361

Completed:	15
Length:	205.7 m
Beam:	110.0 m

Height: 53.2 m

Mass: 689,000 tons

Cruise speed: w 7

Max. speed: w 12.0

Endurance: 2 years

Officers: 48

Crew: 203

Weapons: 4 phaser VI emitters in 2 twin banks port/stbd of bridge
2 phaser VI emitters in twin bank forward of ventral sensor array
2 phaser VI emitters in twin bank on secondary hull ventral stern
4 medium torpedo tubes w/ 50 photorps on secondary hull ventral bow
2 medium torpedo tubes w/ 20 photorps on secondary hull dorsal stern
4 medium torpedo tubes w/ 80 photorps in dorsal pod (refit 2320)

Shields: 1-layer conformal forcefield
Navigational deflectors on secondary hull flanks
Secondary navigational deflector on ventral primary hull

Laboratories: None

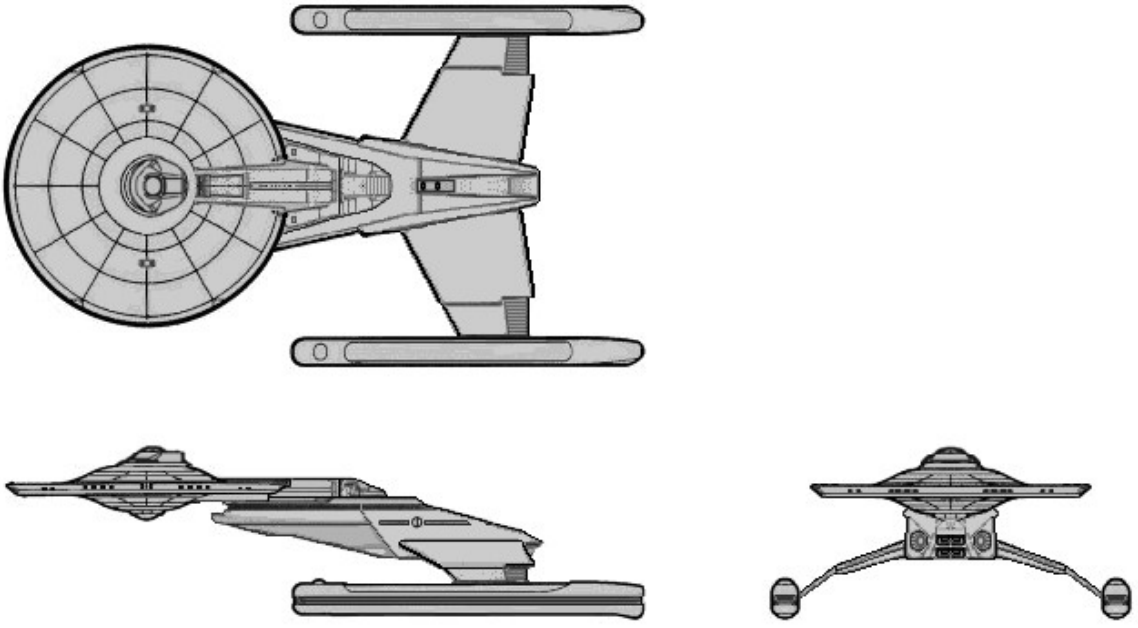
Transporters: 2 GP (6-pad), 1 cargo, 2 emergency evacuation (22-pad); Mk V

Auxiliaries: 1 light shuttle, 1 work pod

Ships of historical interest:

USS Hardin (NCC-8000)

SOURCES: (D FASA)
(N FASA)
(H FASA)



The final warship project funded out of fear of the ultimate Klingon confrontation was a successor to the *Baker* destroyer – a twin-engined, heavily armed yet mass-produceable companion to the more expensive *Polaris* class. The project had been initiated when the final of the three *Baker* batches was nearing completion, and was at first known as *Baker* Mk V, but this was purely for reasons of deception. From the very start, the intent was to correct the propulsive shortcomings of

the *Baker* by introducing a totally new warp engine. Proper deflector dishes would be added to match the warp performance increase, in a completely new secondary hull of deep wedge shapes. The primary hull would be of sleek, *Kolm-An* type construction as well.

Directed energy armament was to remain much the same as in the older destroyers. The punching power of no fewer than four forward and two aft medium torpedo tubes would be added to the mix, however. The former would be paired on the centerline of the boatlike forward part of the secondary hull, one pair above the other; the latter would be single tubes similarly perched on the centerline of the aft part, which was inverted in relation to the bow. The inversion resulted in convenient "armpit" positions for the compact Edan deflector emitters, in addition to allowing the warp engine pylons to spread out rather naturally from the lower corners. A single high output Orage Ijek CHE impulse engine fired from the extreme stern, drawing its power like the deflectors, warp engines and torpedo systems from a highly centralized and well armored "citadel" antimatter assembly.

The experimental WF-12 warp engines were not chosen merely to give this bold new ship the best possible speed and maneuverability, but to usher in the next generation of small ship warp propulsion. They featured warp geometry innovations from the *Excelsior* class, including a two-stage field cycling system with both lateral and dorsal field windows. This made them especially suited for exploring the recently discovered advantages of broadening the warp field phase variance. When the design was frozen in 2298 and production began, WF-12 became the first non-phaselocked engine specifically manufactured as such.

In the following decade, WF-12 would replace both LN-23 and LN-40 in applications ranging from assault ships to tactical and scientific scouts. For the ostensible *Baker* Mk V, the engine had been a source of concern, a major risk to be taken on the eve of the biggest war in history. As history chose a different path, the worries proved unfounded: with ample opportunity to fine-tune and test, Starfleet was able to ease the WF-12 into service without a hitch. Fifteen destroyers were completed at the end of the engine testing phase, beginning with the 2299 launch of *USS Hardin* (NCC-8000).

With sufficient power input, WF-12 afforded warp 12 top speed, better than for most of the pre-Khitomer destroyer fleet. Warp seven cruising was easily achieved, even if mission profile reconsiderations prompted Starfleet to limit fuel bunkerage to give an endurance of just two years. The Khitomer peace had dictated another change to the initial plans, too: a shuttle hangarette had been added to the spine, housing a single light liaison craft in comfort and catering for visits by up to two additional light shuttles. In the suddenly pacified but also expanded theater of operations, the destroyers would thus double as "ultralight cruisers", performing various exploration and support tasks where auxiliary craft were a necessity; the *Baker* lineage had come a full circle.

The decade of pondering thus had allowed the design to mature in many ways – yet the various modifications and additions still amounted to a compromise that did not meet the demands of the new reality. Starfleet now regretted choosing such a conventional primary hull over the more capacious "*Excelsior* generation" designs already emerging; installation of further improvements would be hindered by the lack of space. Starfleet could not simply settle for what it already had, either, as the need for attrition warships had moved to a more distant frontier, out of reach of the modestly sized *Hardins*. Higher endurance warships such as the *Polaris* and *Cochise* destroyers or the *Daran* family of light frigates were of the greatest operational worth now, despite their older warp engines. A search for a direct successor to those designs was the pressing concern for the early 24th century; the first batch of the *Hardin* class, highly successful by technological criteria, was also to be the last.

The heritage of the destroyers was a significant one, though. The thorough testing of the WF-12 engine revitalized lower-tier starship construction for the next thirty years; wholly unrelated factors resulted in Starfleet failing to produce a force of sufficient strength to contain the border conflicts. The *Hardins* distinguished themselves in numerous campaigns, resigning to the limitations on endurance or onboard sensory and targeting capabilities, and accepting the services of tender vessels and command ships while other Fleet units evolved beyond the need for such.

Towards the end of their careers, several of the vessels received a stock four-tube torpedo pod in addition to their already formidable arsenal, depriving them of all maneuverability but turning them into terrifying bombards capable of reducing the strongest of orbital and planetary fortresses. The unique capabilities quickly found favor in Defense Command. As the *Hardins* bowed out in the 2350s, their technological and tactical baton was passed to the *Wellesley* destroyers, again with small primary hulls, almost disproportionately heavy torpedo armament, and low-slung engines.

Operationally, Starfleet soon "moved beyond attrition or flotilla units" once again, and favored the more powerful *Decker* class of independently operating deep space destroyers. Yet the specter of the *Hardin* class loomed over the era of border conflicts, too: the *Rigel* class of destroyers eventually emerged in intriguing likeness of this last pre-Khitomer warship.

2300-2335 - The Golden Years and Beyond

As the last Starfleet dreadnoughts pulled in from their patrol assignments in 2294 for decommissioning and scrapping, an historic period came to an end. It had seen the conversion of United Federation of Planets from a loose network of protective alliances and trade routes to a solid political entity with common defense and flourishing internal economy. It had witnessed the two most expansionist civilizations of the area escalate their saber-rattling into open war, then settle into a grudging coexistence. It had followed the absorption of hundreds of humanoid cultures into the Federation, and revealed the staggering extent of near-human species in the vicinity of Earth.

Along with the dreadnoughts, more than 280 war-oriented Starfleet vessels large and small were decommissioned. The time of the first generation of dilithium starships was over. While this form of stardrive was not the most efficient known to exist, it nevertheless had made it possible to create an interstellar empire of unforeseen proportions. It had taken mere 200 years for this warp-capable empire of Earth to emerge from the first feeble experiments at FTL travel and interstellar relationships, to develop its antimatter drive, and in the barest eyeblink of 50 years to expand into a coalition of hundreds of members, thousands of inhabited worlds, and tens of thousands of stars. Many were those historians who predicted it would fall just as quickly.

But it had withstood its first test, its first contact with another true empire. Now was time to concentrate on something else besides warfare. The second generation of antimatter starships had still been designed for full-scale war against the Klingon empire, each ship optimized to beat her specific Klingon counterpart in battle. But most of that fleet could now be converted for internal protection and support duties, and new ships were built to be truly multimission-capable. Time for conquering was over until new annexations could be secured and integrated into the UFP infrastructure; exploration of deep space was to be continued, but without necessarily annexing all explored space.

Starfleet abandoned the system of separate Defense and Exploration Commands in 2323, moving all starship and base operations under a single operational command. This was a logical next step following the abandoning of separate tactical, strategic and scouting forces and the discontinuation of

heavy local planetary defenses in the 23rd century, and the removing of offensive operations from the Starfleet manifest in the 2290s. The reorganization also saw the founding of new suborganizations for various nonmilitary duties, including Terraform and Cartography Divisions. Cooperation with UPF bureaux of environmental, temporal and cultural interference investigations was also significantly increased and the veil of secrecy around many Starfleet operations lifted. Starbase operational command was also revamped and the deep space station system reinstated.

Also, the old quadrant system created for coordinating fleet operations in the originally roughly spherical UFP space was scrapped as the Federation expanded. Even discounting the distant Deneb and Rigel enclaves, the frontiers of the UFP were now almost 500 lightyears away from Earth, and warp probes had traveled some 80,000 lightyears into deep space. With warp drive, one could reach across the galaxy, and perhaps beyond. But wisely enough, exploration was limited to the Alpha and Beta Quadrants, where hundreds of starbases were being built to support the new, gentler push out into space.

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The time between 2295 and 2311 is often known as the golden age of UFP. Peace negotiations with the Klingon Empire progressed surprisingly smoothly, and hundreds of colonization missions were launched towards areas of space now considered safe. Despite the onset of peace, defensive capability was still maintained: recently, Earth had experienced two major intrusions by powerful alien forces, and the 'never again' spirit within the UFP guaranteed Starfleet almost limitless resources for rebuilding. Strict safeguards were now in place against overescalation, however.

Research and development prospered; the whole economy of the UFP was redefined by the invention of the replicator, a development of transporter technology. There has been much literature about the exact mechanisms of UFP's entrance to the club of replicator civilizations, so these aspects will not be further elaborated on here. Suffice to say that the building of starships was certainly not hampered by the introduction of new component replication methods.

Striplike phaser emitters debuted aboard the largest starships of explorer type, but did not yet propagate to smaller ship types. In contrast, the innovation of unsheathed heavy phaser beams was introduced to virtually all ship types and multiplied the power of directed-energy armament. The cost of losing some of the FTL flexibility was deemed acceptable as photon torpedoes reached perfection; they could now be launched with fully adjustable yield, ranging from mere grams of antimatter to a demolition yield of several kilograms. This level of weaponry finally matched the historical average for known star empires in Alpha Quadrant, marking yet another milestone in the Federation's ascent to interstellar significance.

Other technologies were also intensively researched. The transwarp fiasco spawned new data on the nature of subspace and led to many private experiments. And one of them introduced to UFP a phenomenon that would radically expand the reach of its Starfleet.

The major breakthrough in warp technology was first officially achieved in 2297 aboard a private Denevan testbed ship, *SS Resonance*. By disconnecting the phase locks of the ship's exceptionally tight-tolerance and high-sensitivity warp field coils for extended periods of time, the Denevan engineers located several natural minima in the warp field energy input curve. This hazardous-sounding practice required the field design to be altered to allow for overlapping, multiphasic fields – a feat that could not have been achieved without the research performed on deep subspace immersion during the transwarp project.

Kicking their backsides for not seeing this before, the more conservative Starfleet engineers initiated a program to examine this new natural phenomenon and to develop a multiphasic warp coil. After two years, a design utilizing a multilayer cortenide structure and several geometry innovations was finished and tested aboard various purpose-built or modified starships and lesser test rigs. The ships performed superbly on warp one and on eight non-integer warp factors that followed each other roughly to the fifth power of apparent speed.

This was the first truly new insight into the warp theory for centuries – millennia, in fact, if early Vulcan efforts were considered. With 20/20 hindsight, the engineers now understood why the ancient warp drives aboard captured old Orion ships always seemed to be out of synchronization: they were built for multiphasic operations. A new warp scale was formulated, in which there were nine energy-efficient integer warp speeds, and less efficient speeds between and above these. Infinite speed, at the end of the power curve beginning after warp nine, was labeled "warp ten" in the famous report of 2304 to the Starfleet Exploration Command, Starship Division and Federation Council. Since the report was written by Head of Starfleet R&D Manfred E. ("Manny") Fein-McHines himself, there is good reason to believe the warp ten definition was just one of the many pranks the engineering prodigy was notorious for.

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Implementing the new drive necessitated a major rebuilding of Starfleet. While the technology was not spaceframe-dependent as such, it did place new structural requirements on the nacelle assemblies, and caused problems with certain field configurations. There was little to be done to help older designs; for example the *Constellations*, on which Starfleet had placed such high hopes, got outdated before their time. The ships still persisted on exploration duty, with jury-rigged multiphasic engines requiring constant care. This led to them getting a reputation of underpowered and hobbled relics.

From Starfleet's point of view, this was unacceptable. The *IRW Tomed* massacre of 2311 left no doubt of the unfathomable malevolence of an old enemy, the Romulan Star Empire. Apparently the warming of relations between UFP and the Klingons led the Star Empire to conduct this horrible suicide first strike against Neutral Zone defenses. Thousands of UFP lives were lost. In the negotiations following the incident, war was avoided, yet Starfleet was forced to agree not to develop or operate cloaking systems. It is highly possible that the sole motivation for the cold-blooded attack was to make Starfleet sign this humiliating amendment of the Treaty of Algeron. In deeper analysis, *Tomed* must be seen as part of the effort of the Romulan Star Empire to break free of its original Neutral Zone shackles, now that the reach of its naval forces had been extended by advanced warp drives.

Up-to-date fighting capacity for the Fleet was clearly needed. A force of more than a hundred new *Excelsior* class heavy cruisers could finally be completed in the early 2330s, thanks to a dockyard upgrade program begun immediately after *Tomed*. Equipped with the modern warp technology, these ships were among the fastest and most powerful the Alpha Quadrant had seen for a thousand years – indeed, since the days of the Orion empire. But while this class successfully restored Fleet fighting capacity, other duties of Starfleet were still suffering from the neglect of the overescalation years. The earliest *Excelsiors* were not designed with long range exploration in mind, and thus lacked in research facilities and scientific sensors as well as in independent-operations endurance. In the early 2300s, Starfleet was unwilling to invest in a major refitting program, let alone production of new *Excelsiors* configured for broader mission profiles. While such refitting and procurement did take place later on, the solution at the beginning of the century was to introduce new, lower-cost exploration designs and gradually rebuild the fleet to meet the new demands.

Apollo

Heavy cruiser
2305-

Completed:	168 total: 48 heavy cruisers Mk I 120 heavy cruisers Mk II
Length:	394.5 m
Beam:	185.0 m
Height:	74.6 m
Mass:	1,998,200 tons (Mk I) 1,999,800 tons (Mk II, typical)
Cruise speed:	W 6
Max.speed:	W 9.0
Endurance:	10 years
Officers:	70
Crew:	463
Weapons:	10 phaser IX emitters in 5 twin banks on upper primary hull 10 phaser IX emitters in 5 twin banks on lower primary hull 2 single phaser VII (later phaser IX) emitters on rear primary hull 2 single phaser VII (later phaser IX) emitters on lower secondary hull 2 medium fwd torpedo tubes w/ 140 photorps and 40 probes in secondary hull 2 medium aft torpedo tubes w/ 40 photorps in secondary hull (batch 2 only)
Shields:	1-layer conformal forcefield; later models 1-layer globular forcefield Navigational deflector beam on fwd secondary hull
Laboratories:	8, in varying configurations
Transporters:	4 GP (6-pad), 4 emergency evacuation (22-pad), 4 cargo; Mk V All ships brought to Mk VI standard after 2321 All ships brought to Mk VII standard after 2361
Auxiliaries:	4 medium and 4 light shuttles, 8 work pods (batch 1) 8 work pods (batch 2)

Ships of historical interest:

USS Ajax (NCC-11574), *USS Achilles* (NCC-12532)

SOURCES: D TNG (*Excelsior* study model)
(N Encyclopedia)
(H own)

The high cost of the *Excelsior* class was a major problem to Starfleet in the beginning of the 24th century. The *Excelsiors* had not originally been intended to form the mainstay of the fleet, but rather its silver-bullet elite force; now they represented the only class of ships fast and powerful enough to tackle the challenges of the expanded exploration zones. It was of essence that a family of more affordable companion ships be fielded as soon as possible. Yet these ships had to be as capable as the *Excelsiors* themselves in both deep space exploration and defensive missions, even if their propulsive performance was allowed to be less impressive.

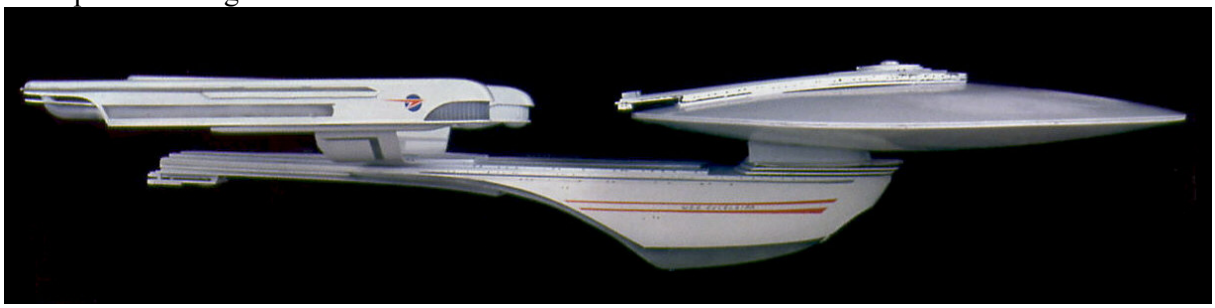
A partial solution to the eternal paradox of "cheap and efficient" came from an extensive reworking of the *Excelsior* design, begun in 2301 and completed in 2305 by one of the teams that had originally competed for the *Excelsior* order. Engine systems were the first to go: new 155 m, 640,000 ton type WD-7A (later WD-7D) nacelles from the same Centauran contractor as the *Oberth* WD-3 units were

installed to house multiphasic warp coils. This choice alone created significant savings, as no transwarp-related concessions had to be made in engine design. Some conventional warp performance was sacrificed, yet an acceptable cruising speed of warp 6 on the new scale and a top speed of warp 9 were established for the new ship type in extensive simulations.

A high performance Vulcan navigational deflector and a greatly modified, now single-nozzled, single-crystal version of the original Terran impulse system were fitted for sublight maneuvering. Instead of the multiple armored *Excelsior* tanks, Starfleet chose for the companion vessels an integrated, single-piece fuel/propellant storage tank of higher capacity and reduced weight. Reworking the engineering section and lightening the structural framework with new materials also helped in increasing impulse performance, despite the smaller engine. Finally, the main shuttlebay was positioned in the lower hull, the same way it had been installed in NCC-2000. An aft docking bay for cargo transfer was included just as in the production-standard *Excelsior* class, yet aft torpedo tubes omitted.

The modifications resulted in a greatly simplified secondary hull of reduced volume. The primary hull in turn was expanded, but again avoiding unnecessary mass. To oversimplify slightly, Starfleet engineers just took two upper halves of an *Excelsior* saucer and fitted them together. The design relied on a hardened and SIF-reinforced outer tritanium/duranium shell and relatively uncluttered inner structure, lacking the cross-tensors used on *Excelsior* saucer lower decks. The new hull required more supervision in operation since SIFs had to be kept up and stress forces monitored. Still, in normal operation, there was power to spare for maintaining integrity. In combat duty, the inherently strong *Excelsior* hulls would have been a safer choice. But Starfleet needed the extra volume, and was quite willing to pay this price.

The saucer was equipped with the capable sensors of the *Constellation* class, now housed neatly inside the hull surface, and also featured advanced systems adapted from the *Soyuz* and *Endurance* sigint platforms or designed specifically for this class. Computing power was almost tripled over *Constellations*, and 75% more laboratory space was available. For defense, the familiar twin phaser IX banks of the modern *Excelsiors* were fitted on the saucer, while phaser VII units provided aft and lower hemisphere coverage.



Maneuvering in the company of the Excelsior *heavy cruiser* USS Berlin *(NCC-14232),* USS Ajax *(NCC-11574) departs in 2327 for a seven-year mission towards the Orion nebula, an area much neglected after the 2250s. Even though the silhouettes of the* Ajax *nacelles contrast with the long, smooth lines of the* Berlin *engines, the family resemblance between these two classes is evident. The warp propulsion systems simply represent two differing design philosophies, the* Apollo *aiming for purpose-built efficiency and affordability and the* Excelsior *making use of the excess internal volume and plasma throughput of the original transwarp design.*

The class received the name *Apollo* and immediately went into high-volume production. Some 48 ships were built initially, their NCCs spanning from 11523 to 18672 in the new numbering system that allocated 1000 NCC numbers for each Fiscal Year and largely ignored the earlier practice of giving a double-zero number to the first ship of a new class. Thus, the *Apollo* numbers reflected the fact that the original batch was ordered in 2301. As it took less than 50 months to complete an

Apollo, compared with the more than 60 required for *Excelsior* at the time, the class ship was ready for trials in August 2305 already; the final vessel of the batch was delivered in March 2313. The ships were at first to be designated medium cruisers to stress the fact that they were the "poor man's alternative" to the *Excelsiors*. This confused the fact that the ships still vastly surpassed in size the *Constellation* cruisers, let alone the retiring earlier heavy cruiser types. The *Apollos* were soon redesignated heavy cruisers to rationalize the system.

With a balanced fleet of *Excelsiors* and *Apollos*, Starfleet could now afford a return to standard exploration duties. Half of the *Apollos* were initially assigned missions reaching into the new exploration zones in the direction of Deneb. Of the other half, 10-15 ships at a time served near the Romulan NZ, the rest conducting research in older treaty exploration zones, according to the newly found UFP policy of nonaggression. The operational profile of the class was thus slightly less militant than the traditional *Constitution* and *Constellation* ones, and received major support from the upper echelons of Starfleet.

But the Golden Age of UFP turned to an end soon after the fielding of the *Apollo* class. The Romulan surprise attack of *IRW Tomed* came out of deceptively blue sky. The diplomatic overtures prior to the deed had been reconciliatory in nature, the military movements unthreatening. Yet Romulan embassies and consulates everywhere in the UFP closed down (or even self-destructed!) almost immediately after the strike, heavily suggesting the strike was carefully engineered. The restraint of the Romulan fleet in the following terse weeks fooled nobody. In the months to follow, Starfleet patrol missions, as well as the long exploration cruise of the *Apollo* class *USS Achilles* into the direction of Gamma Hydra, revealed that the monsters behind the *Tomed* attack now were openly defying the borders set by the Neutral Zone treaty. What could be expected if not a horrible war of conquest?

A second batch of 'militarized' *Apollos* (simply dubbed the Mk II) was put into production, with upgraded secondary phasers and an aft torpedo launcher assembly, but without the stern shuttlebay – cargo operations were moved to the main shuttlebay instead. Exploration hardware overall was downscaled and a more combat-oriented sensor suite installed. But the dockyards of the Federation could not yet cope with high production volumes of such large vessels. Wisely, Starfleet chose to add to the capacity not by modifying or extending (and thus temporarily taking out of action) the existing yards, but by initiating an extensive program of new dockyard construction, scaled from the outset for the production of *Excelsior* category starships. This meant decades of nerve-wracking waiting.

Map: Romulan flank of the Federation in the "Twenties of Danger". The unchanged ovoid of the RNZ surface facing Earth belied the expansionist probings taking place on the far side, beyond OP 23. Starbase construction on the entire RNZ region had been neglected at the turn of the century, so that the outpost network still largely lacked rapid-response starship support. Long range cruisers were thus seen as the only option for providing this support.

Yet, the Romulans stayed notoriously quiet, completely isolated from the UFP. The only follow-up action to the *Tomed* massacre had been yet another renegotiation of the Algeron Treaty, adding the new clause that precluded the development and use of cloaking devices, and borrowing of same from Klingons or other cultures, by any Federation organization. As the concessions seemed of little

significance, the UFP Council agreed to the terms of peace at the advice of Grand Ambassador Sarek. The alternative would have been to risk a war with a long-dormant enemy, one which had perhaps been years away from Earth in the 2160s but now lay mere days away at modern high warp speeds. The fixed borders of the RNZ, originally intended for UFP protection, had suddenly become a stranglehold on the vulnerable neck of the Federation.

After the signing of the treaty, the Federation waited, tense and disillusioned. The retiring of the 'deterrent ships' in dreadnought and defender categories might not have reduced Starfleet's true fighting power, especially since the new heavy cruisers were now displaying comparable capabilities; but apparently, its psychological impact on the Romulans had been significant. The mixed *Excelsior* and *Apollo* fleet was considered poor protection if the Romulans ever combined their forces with the unreliable Klingon empire, or attacked separately but at the same time. Only after the 2330s was it finally understood that no such alliance would ever be possible, that the increased Romulan activity and strength was mainly an illusion created for Starfleet's benefit, and that the 'Twenties of Danger' had not been so dangerous after all.

The *Achilles* returned to Earth in 2328, having endured constant combat with assorted UFP enemies briefly emboldened by the Romulan interlude. Eighteen *Apollos* did not. Yet Starfleet cruisers were coming out of engagements with better odds of survival than ever, even though new adversaries were encountered as the range of exploration grew. An important element in increased survival rate was the willingness of Starfleet to adopt and adapt the tactical and diplomatic methods of peoples met during the long cruises. Despite the attempts of Starfleet Command to tame its captains, few chose to act completely by the book. Space was still far too vast and unknown for the definite book to be written; only general guidelines, not rigid instructions, grew out of the accumulating experience.

By 2377, some 90 *Apollos* still remain in active service, the bulk of them being assigned to the 2nd Fleet. Two Mk I ships have served as planetary assault command ships for the 2nd Fleet since 2352, but are due to be replaced by suitably configured *Steamrunners*. A further command ship conversion, *USS Aquitania*, was lost at Kora in late 2374. In addition, sixteen ships perished in combat against the Dominion, and a further three against the Klingons in the abortive border war. None have been lost in exploration duty after the 2330s, however.

The secondary phasers of all the first-batch *Apollos* were upgraded to Type IX standard in the 2350s, and navigational deflectors and main computers have been completely replaced as well. Yet engine modifications have not been performed. The primary task has thus largely shifted from exploration to patrol duty, now that ships with warp 6 cruise speed are no longer in short supply. The ships still excel in defensive missions, and played a significant if not quite decisive role in the antispinward theater of the recent conflict. It is only due to Starfleet's 2350s decision not to build further batches of these ships to accompany the additional *Excelsior* batches that the type is gradually bowing out. The last units are expected to remain in service beyond the projected service life of the *Excelsior* class, though.

Osaka

Fast cruiser
2311-

Completed:	14
Length:	340.9 m
Beam:	150.0 m
Height:	79.5 m (nacelles fully extended) 36.5 m (nacelles fully retracted)

Mass:	1,780,000 tons
Cruise speed:	W 6
Max. speed:	W 9.3
Endurance:	6 years
Officers:	46
Crew:	312
Weapons:	12 phaser VIII emitters in 6 twin banks on dorsal primary hull 12 phaser VIII emitters in 6 twin banks on ventral primary hull 4 phaser VI emitters in 2 twin banks on dorsal aft hull 4 phaser VI emitters in 2 twin banks on ventral aft hull 4 medium fwd torpedo tubes on dorsal primary hull extensions
Shields:	1-layer conformal forcefield Navigational deflectors on amidships ventral hull
Laboratories:	4 GP, 2 planetary sciences, 1 biology, 1 astrography
Transporters:	4 GP (6-pad), 2 emergency evacuation (22-pad), 1 cargo; Mk V All ships brought to Mk VI standard after 2322
Auxiliaries:	2 medium shuttles, 2 light shuttles, 4 shuttlepods, 6 work pods

Ships of historical interest:

USS Al-Kassarat (NCC-14010)*, USS Osaka* (NCC-14022)

SOURCES:	D TNG (assigned from Excelsior 4-nacelled study model) (N LUG) (H own)

The decommissioning of *Chesapeake* and *Amchitka* class light cruisers in accordance with Khitomer treaty limitations had not truly reduced Starfleet strength in a major way. Instead, the striking of the ships from active forces had helped streamline Starfleet's light defensive-exploratory-support arsenal, by leaving only ships of *Miranda* descent in the size and capacity range formerly shared with *Chesapeakes* and *Amchitkas*. Still, the mass retirement did mean that temporarily, there would be no ships serving under the light cruiser designation in Starfleet.

In practice, all the former heavy and medium cruisers of *Constitution*, *Constellation* or *Belknap* families were now best considered light cruisers in comparison with the new Fleet workhorse, the *Excelsior* class. With further production batches proposed, the *Excelsiors* set new standards for all starships in the cruiser category – standards the parallel *Apollo* class was barely meeting, despite its comparable and respectable bulk. The original service lifetime estimates for the *Belknaps*, the latest *Constitution* derivatives and even the almost brand-new *Constellations* had to be drastically downscaled in light of these standards.

Finding replacements for these prematurely aging vessels was not an easy task. The new technology of the *Excelsiors* and *Apollos* was expensive and complex for utilization in even slightly smaller vessels. Starfleet R&D would have preferred to spend some time coming up with a balanced design. Yet the *Tomed* strike of 2311 seemed to show that time was running out, and the pressure to introduce numerous fast light units for second-line duties became unbearable. Thus, like most of the vessels created in this tumultuous decade, the *Osaka* class of fast cruisers was born a hastily assembled mixture of the tried and true and the new and experimental.

The main novelty in the *Osakas* was warp propulsion, utilizing four WD-8 nacelles in an X-shaped arrangement. The 122 m, 400,000 ton WD-8 differed from *Apollo* standard WD-7 in both internal

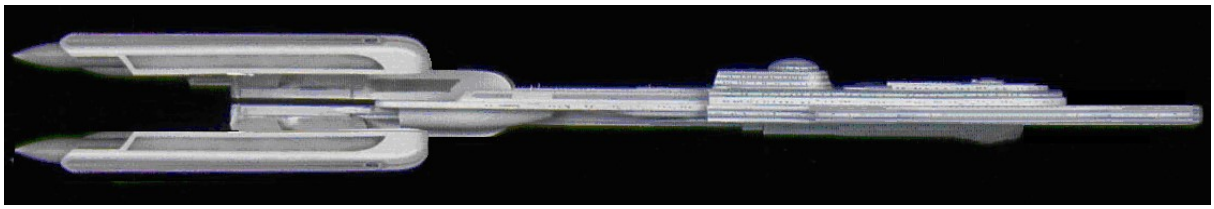
and external arrangement, yet the differences were largely cosmetic, and identical performance was attained in the end. With four coils fewer apiece, the WD-8s were noticeably shorter than the *Apollo* units, despite a spindly plasma diffuser and a reheater loop that both reduced the emission signature and increased efficiency.

Most significantly, the nacelles were mounted on movable pylons for the creation of a variable-geometry warp field. In fully open X position, they would generate a four-lobed field much like that of the *Constellations*, offering comparable cruise potential. Squeezed together to port and starboard pairs, the engines would produce a two-lobe 'sandwich' field with the top speed advantages of a traditional two-lobe field, plus the greater maneuverability allowed by multiphasic 'stretching'. Decades later, improved calculation and simulation techniques would enable Starfleet to produce such malleable fields without the need for mechanically moving parts. Yet in 2311, such a possibility existed in the wildest dreams of the engineers only.

Predictably, the introduction of major moving components to a rushed program resulted in a physically awkward vessel. Some 50 m of amidships structure had to be added to properly mount the pylons. In lieu of preplanned use for this extra volume, Starfleet decreed that additional cargo holds be installed there. This impromptu decision allowed the designers to slim down the primary hull from the original *Constellation* dimensions to a flat *Constitution*-like form, albeit somewhat sleeker and wider and not concaved from the ventral side. All accommodation, research and control functions could now be effortlessly housed within this saucer, arguably the most mature component of the new design.

The upper superstructure was built to the new tradition, featuring a long flat platform shape with a bridge dome up front. The low-profile dome was surrounded by exchangeable sensor pallets but was not equipped with a docking port. Atop the aft part of the superstructure rode a "mission box" housing shuttle facilities and torpedo launchers. The boxy eyesore came with two excuses: on one hand, both these systems required plenty of clearance from the hull as well as from the novel warp propulsion machinery, while on the other hand, the ship could on certain missions do without one or both of the systems. Thus, vessels down the line might be constructed without the protrusion, or with a lighter, torpedo-only module, possibly of some future type standardized across multiple ship classes.

Furthermore, on the prototype vessel, an extensive monitoring facility for the complex warp tests was installed above the box. Inclusion of the structure in further vessels of the type was retained as an option, mainly for flag duties for which a light cruiser would otherwise be somewhat ill equipped.



An Osaka *in her element, leading Task Force D against Talarians at Beta Trianguli in early 2334. The vessels in the task force, including* Mediterranean *transports,* Joshua *coordination ships and* Scylla *scouts as well as* Excelsior *and* Hokule'a *cruisers, demonstrate the extent to which the "*Excelsior *family" truly was comparable in scope to the 2240s and 2270s design "families". Marring the image somewhat are the* Miranda *outrider frigates; Starfleet has always been a firm believer in strength through diversity.*

At the aft end of the 'hull plug' of structural supports, cargo bays and conduitry was the main engineering compartment, with a powerful horizontal main reactor and upper and lower tail-mounted impulse nozzles. The machinery for moving the four two-part pylons took up a lot of room around the engineering core, and presented a vulnerable spot that if hit would deprive the ship completely of warp propulsion. Power systems were well armored, however, and thus the long stretch of conduitry between the propulsion cluster and the primary hull did not present a high risk. In addition, there were auxiliary reactors in the primary hull, on both sides of the shuttlebay in smoothly faired hull extensions.

The armament of the ship was transferred almost directly from the *Constellations*. Twelve main phasers on the saucer and four auxiliary emitters in the aft hull were of the trusty Type VIII, and left no blind spots for the enemy to take advantage of, even with the movable nacelles in inconvenient positions. Torpedo armament consisted of four forward Mk 70-2 tubes, this time all mounted in a single row at the front end of the mission box structure. This mounting later proved to be less than ideal due to backwash and charring problems. In 2311, however, the engineers were convinced that the earlier practice of keeping the launchers separated from the primary hull had now become an unnecessary caution and even a potential tactical vulnerability.

USS Osaka was commissioned in 2311, yet underwent warp testing for a year, resulting in slight changes in the field configuration as the best possible multiphasic tuning was sought. The main goal, a low-consumption cruise speed of warp 6 in the new scale, was attained easily; for this speed, all smaller and many larger ships had to struggle mightily. In emergencies, the *Osakas* could theoretically reach warp 9.4 or higher, but only *USS Alvin* actually exceeded warp 9.3 outside of performance trials, as she fled the *Tomed* shockwave in 2311.

By the end of the decade, the *Osakas* were supposed to begin supplementing and supplanting the smaller *Constellations* and *Reigates* as the primary lower-tier explorers; Starfleet had already confidently started retiring the antiquated *Belknaps* and *Constitutions* from this duty. Events took strategic planners by surprise once again, however. In face of new border threats, exploration and exploitation of the new frontiers had to be left to the heaviest possible units, while the ranks of local defenses had to be bolstered by affordable production. All this conspired to deprive the *Osaka* program, neither heavy nor affordable by the standards of the time, of prominence and numbers.

Just fourteen of the high speed cruisers were ultimately constructed, under the fast cruiser moniker and a mission profile dedicated to fleet scouting. These specifics were quite familiar from a procurement a few decades back. Chiokis had once already tried the stratagem of turning the pseudo-specialized *Constellations* into honest general exploration assets, and had found out that "downgrading" to *Reigate* standard was the step needed to secure the sale of a series production vessel. Thus, *Osaka* had to be dumbed down, flattened into a more conventional two-naceller and deprived of many other bells and whistles as well. Production switched to the *Wambundu* class, and the *Osakas* were scattered to an assortment of scouting and courier duties.

As of this writing, all surviving *Osaka* vessels are slated for retirement before 2380, having only barely outlived the *Constellations* they were supposed to supersede.

Ambassador

Explorer (later heavy cruiser)
2311-

Completed: 12

Length:	526.1 m
Beam:	316.2 m
Height:	216.2 m
Mass:	3,655,000 tons (batch 1) 3,850,000 tons (upgrade 1 and batch 2) 3,861,000 tons (upgrade 2)
Cruise speed:	W 6
Max.speed:	W 9 (batch I) W 9.2 (upgrade 1 and batch 2) W 9.4 (upgrade 2)
Endurance:	18 years
Officers:	130
Crew:	559 + 150-250 opt. research crew
Weapons:	8 phaser IX strips on primary hull 2 phaser IX strips on aft ventral secondary hull (NCC-10521, 10532) 1 phaser IX strip on forward ventral secondary hull (refitted on other vessels) 2 phaser IX strips on engine pylons 2 heavy fwd torpedo tubes w/ 280 photorps and 60 probes on secondary hull 2 heavy aft torpedo tubes w/ 120 photorps on impulse engine assembly
Shields:	1-layer globular forcefield Navigational deflector on fwd secondary hull Secondary nav deflector on ventral primary hull
Laboratories:	28, in varying configurations (batch 1) 34, in varying configurations (upgrade 1 and batch 2) 32, in varying configurations (upgrade 2)
Transporters:	4 GP (6-pad), 8 emergency evacuation (22-pad), 4 large and 8 small cargo; Mk V All ships brought to Mk VI standard after 2320 NCC-26517, 26531, 26632 brought to Mk VII standard after 2369
Auxiliaries:	Up to 12 shuttles of various types, 8 shuttlepods, 20 work pods

Ships of historical interest:

USS Adelphi (NCC-26849), *USS Enterprise* (NCC-1701-C), *USS Horatio* (NCC-10532), *USS Trident* (NCC-31347), *USS Yamagochi* (NCC-26510)

SOURCES: D TNG
N TNG
(H own)

In 2304, when the effects of the breakthrough in warp technology were sweeping through the Federation, Exploration Command and Defense Command jointly proposed that a new vessel be built to exploit the improved drive in extreme deep space exploration. The unvoiced desire of the Commands was to find a successor to the defenders and dreadnoughts of the previous century, a vessel capable of extended patrols in truly deep space, as well as of long range penetration strikes. However, as Khitomer accords explicitly forbade Starfleet from constructing ships in this category (and specifically declared production of the already designed *Lexington* class battleship a *casus belli*), the new starship was designated the *Ambassador* class explorer, in the spirit of the handful of survey variants of the *Excelsior* design.

No mere semantic trickery was intended, however. The *Ambassador was* to be an exploration vessel of unprecedented scope. Indeed, Exploration Command was to be the primary operator of these ships, none of which were to be left idle on Neutral Zone starbases. The demands of such a mission were exceptional. Aspects of just about every starship ever built were to be incorporated to give the type complete operational independence, but also the ability to serve as a kingpin to major fleet actions. It

was obvious from the beginning that only very few of these ships would be constructed. Six hulls, with six more as options, were ordered; each was assigned her own fleet of cruisers and scouts and an operations area even before the keels were laid.

The ships were built around a large saucer hull of *Excelsior*-like shape – 12 decks and 53 meters deep, but an amazing 316 meters wide. The immense size of the hull was made possible with the generous application of structural integrity fields. The fields made internal bracing less important and allowed for simple free-floating decks to be erected inside the exterior shell. This also made possible a significant degree of modularity, in which almost every bulkhead in the saucer could be moved at a moment's notice and rooms reconfigured for various uses.

Crew accommodation inside the primary hull was vastly improved over earlier designs. All crew members from crewmen apprentice to senior officers theoretically now enjoyed the privacy of partitioned-off accommodation if not separate cabins, a major morale-boosting factor in long exploratory cruises. Numerous recreation facilities were incorporated, ranging from advanced VR 'playgrounds' to bowling alleys and small gardens. The large hull was not merely for crew convenience, though: the ships housed command and communication equipment for leading battle fleets in their secondary defensive mission, and extensive laboratories and sensors for extended science missions. In addition, diplomatic functions were supported by communications centers and negotiation rooms as well as VIP accommodation. Training facilities were provided for various sciences and arts of space exploration and warfare.

To the saucer was attached a huge secondary hull 247 m long and 63 m wide and deep. The structure tapered from a barrel shape to a relatively narrow aft shuttlebay, while the engine pylons first spread winglike to port and starboard and then rose vertically, with a forward sweep, to support the engine nacelles slightly below the saucer section level. At 1,300,000 tons of mass and more than 220 meters length each, the multiphasic WF-10 engines not only outmassed but also outbulked most starships so far built. On the other hand, their power needs were quite reasonable, thanks to the new understanding of warp physics. While the secondary hull naturally had to house the warp core and all its support systems and fuel tanks, these took up a small percentage of available volume only. There was plenty of room for laboratories, workshops, shuttle maintenance facilities and a large cargo bay accessible through fantail doors. Growth potential was a key specification: whatever additional systems were proposed during the design process, there always was room, power and computing capacity available for them.

The vast bulk of the ship accommodated a potent collection of top-of-the-line weaponry equally easily. Torpedo armament was basically similar to that of *Excelsiors*, including two Mk 60 aft tubes flanking the impulse engine and two forward-firing tubes located at the stem of the connecting neck, even though the magazines were several times more capacious than the cruiser ones. A primary tractor beam mounted at the bottom of the ship's fantail was augmented by four secondary emitters and a number of approach control and mooring beams, most of which had combat and science uses as well. The phaser weaponry in turn featurement was basically similar to that of *Excelsiors*, including two Mk 60 aft tubes flanking the impulse engine and two forward-firing tubes located at the stem of the connecting neck, even though the magazines were several times more capacious than the cruiser ones. A primary tractor beam mounted at the bottom of the ship's fantail was augmented by four secondary emitters and a number of approach control and mooring beams, most of which had combat and science uses as well. The phaser weaponry in turn featured ultramodern Type IX striplike emitters and highly effective predictor-routine fire control systems – a hit rate of 100% has been consistently reported against non-cloaked targets. The first two ships constructed also carried phaser IX strips below the sternmost ledge of the fantail, while the third replaced these with an augmented approach control and tractoring system

for the shuttlebay, an early indication of things to come.

Even though refitting of existing designs or creation of new ships of more modest dimensions would have given Starfleet multiphasic warp capacity earlier, the completion of at least two *Ambassadors* was given priority in production. Despite the effort, the process of designing and constructing these behemoths was painful and prolonged. The first *Ambassador* class explorer, NX 10521, was completed only days before the *Tomed* incident, nearly a decade after signing of the construction contract; the second, *USS Horatio*, was commissioned a month later as NCC-10532, even though her status was still largely experimental. The third ship to be commissioned became the fourth Federation starship *Enterprise* and received special registry NCC-1701-C; she assumed UFP flagship status soon after launch.

The ships were intended to operate at defender-like speeds for extended periods of time, maintaining warp 9.4 on the new scale for days at an end. Unfortunately, post-delivery tests of the drive systems revealed some deficiencies in the new multiphasic warp theory. The warp fields of the first three vessels exhibited stability problems that could only be overcome by slight degrading of high-frequency synchronization. A proper remedy would have required repositioning the coils; that is, lengthening the nacelles, or else remounting them slightly aft of their original position. This kind of extensive refitting was not attempted so early in the life of the vessels, which did perform outstandingly in most warp regimes.

However, the subsequent ships of *Ambassador* class were redesigned to properly compensate for the instability. Nacelle placement was altered, as was the positioning of the primary hull and the shaping of the engineering section. In addition, sensor systems were improved, and extended sensor assemblies fitted under the primary hull and the secondary hull fantail. The fantail also received a dedicated cargo transfer bay to reduce strain on the actual shuttlebay facilities during deep space replenishment operations. This facility was similar in scale and operation to the *Excelsior* class aft shuttlebays, and provided a means to move cargo containers to and from the ship's holds without interrupting regular shuttle operations on the bay above.

Installing the cargo transfer bay meant doing away with the aft phaser IX strips for good. Critique was inevitably directed towards the lack of phaser coverage for lower aft sector, where a blind spot theoretically existed between the cones of fire of the pylon-mounted phaser strips. In ample compensation, some of the later models of the explorers received a lower secondary hull phaser strip, finally made possible by advances in collimation of convex arrays. Further changes included upgrades to the transporter emitter arrangements and an increase in lifeboat numbers on the superstructure (facilitated by the introduction of a smaller three-person pod type), and on upper secondary hull.

Veteran of several battles against impossible odds, USS Excalibur *fights off two* Ivarix *warbirds on SD 52827. The rogue Romulan pair has just been culled down from a four-ship by* USS Independence*, a* Nebula *now reduced to a debris cloud*

plus a swarm of lifepods. Engagements like this are welcome proof of the continuing qualitative superiority of Federation starship design, even in situations of extreme quantitative disadvantage.

Dedicated floating docks and construction gantries of a new type were required for the assembly and service of these large ship types. Earth Station Kilimanjaro was the first to be completed in 2310, with a similar dock built for the Utopia Planitia yards a few months later and six others to be deployed around the Federation. Further docks of the same type were built when the *Nebula* class ships became operational a few decades later, giving a new lease of life to the venerable San Francisco yards while putting out of operation several other small Earth yards, the Vickers and Newport News yards among them. San Francisco, Mount Kenya and McKinley orbital yards were the prime contractors in Starfleet's 2325 bid to construct three more *Ambassador* explorers. The last six contracts went to Antares Shipbuilding Industries and were distributed between their Beta Antares III, Rigel II and Cygnet XII facilities.

Performance upgrades were effected on the first-batch *Ambassadors* in the mid-2350s, resulting in reduced crew size and increased top speed. Minor modifications were performed on the ramscoops and sensor arrays as well, bringing the *Ambassador* and the *Horatio* close to the standard of the later vessels. Some of the 34 decks were completely remodeled by replacing crew accommodation modules with added laboratory space, secondary computer facilities and new life support gear and consumables storage. The modular internal structure of the ships ensured that this endurance-boosting refit was swift and almost trivially easy to perform. The upgraded vessels competed evenly with the modern *Nebula* class ships in deep space exploration, and actually enjoyed some defensive advantages thanks to their superior impulse performance. However, structural considerations precluded adaptation of GN-41 warp engines the way they had been installed on the latest *Niagara* vessels. There simply was no way of fitting hardware of that size to the location specified by warp field and spaceframe shapes.

The *Ambassador* vessels served as the definite explorers, command vessels and diplomatic liaisons of the Federation until the introduction of the *Galaxy* class. Thereafter, the vessels were relegated to defense missions on strategic starbases under the humbler heavy cruiser designation. The most recent classwide upgrade has introduced new reduced-size ramscoops and modernized navigational deflectors. With appropriate upgrades of this kind, most vessels of this class can be expected to serve in this secondary mission until the end of their nominal structural life of 80 years. At the conclusion of the Dominion War, three of the vessels have been pulled in for an upgrade that will eventually mount the ventral phaser IX, Mk 95 quantum-compatible torpedo systems, and a totally new four-chambered main powerplant on all remaining *Ambassadors*. Three others have already been completed to this standard. *USS Excalibur* was the first ship to be relaunched, enabling her to again perform an independent exploration and power projection mission well outside Federation borders, in former Thallonian space. The ship was lost in the course of this mission in 2375; her likewise refitted sister *USS Trident* continues operations in the region alongside the newest *Excalibur*, this time a *Galaxy* class vessel.

The *Excalibur* was far from the first *Ambassador* casualty. Three ships of this class were lost in action prior to the Dominion invasion – *USS Enterprise* to Romulan forces in 2344, *USS Horatio* to sabotage by parasitic alien lifeforms in 2364 and *USS Yamagochi* to the Borg in 2366 – and three losses were suffered in the major defensive battles of 2374. Some factions have urged Starfleet to consider aborting the upgrade program and retiring the remaining resource-intensive ships before their time, to make way for new *Sovereign* class starships. The future of the class is unpredictable: much depends on the final outcome of the Dominion crisis, and on Starfleet rebuilding strategy and doctrine.

Wambundu

Light cruiser
2314-

Completed: 36
6 converted to high-security/medical transports in 2362-63
2 converted to high-security/medical transports in 2368-69
8 converted to humanitarian support ships in 2371

Length: 371.5 m

Beam: 198.0 m

Height: 28.2 m

Mass: 800,400 tons

Cruise speed: W 6

Max. speed: W 9.0

Endurance: 6 years

Officers: 96

Crew: 46 (light cruiser)
12 (high-security/medical transport)

Weapons: Light cruiser:
6 phaser VIII emitters in 3 twin banks on dorsal primary hull
6 phaser VIII emitters in 3 twin banks on ventral primary hull
4 phaser VIII emitters in 2 twin banks on dorsal aft hull
4 phaser VIII emitters in 2 twin banks on ventral aft hull
4 medium fwd torpedo tubes on dorsal primary hull
High-security transport:
6 phaser VIII emitters in 3 twin banks on dorsal primary hull
6 phaser VIII emitters in 3 twin banks on ventral primary hull
4 phaser VIII emitters in 2 twin banks on dorsal aft hull
4 phaser VIII emitters in 2 twin banks on ventral aft hull
Humanitarian supply ship:
None

Shields: 3-layer conformal forcefield
Navigational deflectors on ventral primary hull

Laboratories: 1 GP, 1 planetary sciences, 1 biology, 1 astrography

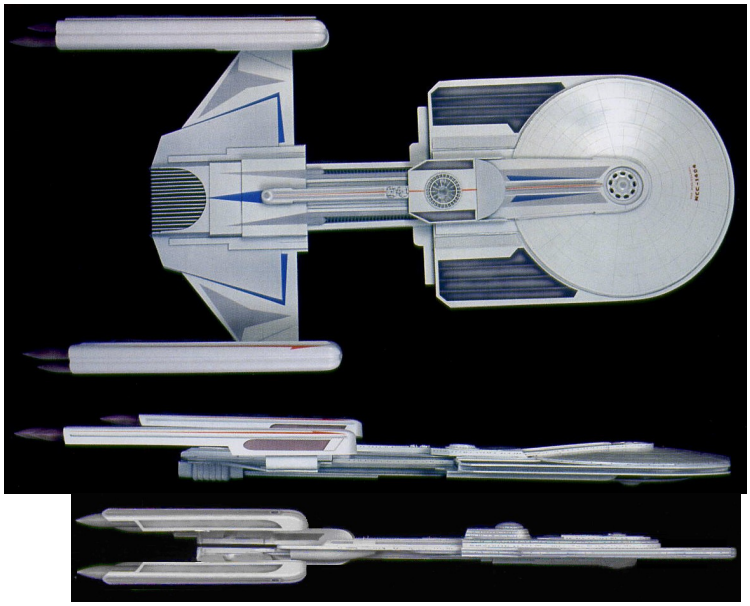
Transporters: 4 GP (6-pad), 2 emergency evacuation (22-pad), 1 cargo; Mk V
All ships brought to Mk VI standard after 2322

Auxiliaries: 2 medium shuttles, 4 shuttlepods, 4 work pods (standard)
1 heavy and 2 medium shuttles, 4 work pods (high-security/medical transport)
2 medium barges, 2 heavy shuttles, 2 shuttlepods, 4 work pods (humanitarian supply ship)

Ships of historical interest:

USS Agincourt (NCC-18992), *USS Drake* (NCC-20381), *USS Rio Verde* (NCC-20215)

SOURCES: D TNG (assigned from *Excelsior* 2-nacelled flat study model)
N TNG
(H own)



A side-by-side comparison of two class leaders, the Osaka *as she appeared for the entirety of her career, and the* Wambundu *as converted to an unarmed humanitarian supply ship.*

Turning the advanced, high speed *Osaka* light cruiser into an affordable exploration and patrol starship was almost a routine operation for Chiokis, the veteran of the *Constellation* program. The engineering solutions undertaken were quite different from that precedent, however. Rather than simply halve the number of engines, Chiokis simplified the warp geometry by cramming the four coil sets into two nacelles. Each WD-8/8 engine featured a shortened intercooler grille in the forward section, a shared ventral field window in the elongated aft section, and one conical plasma diffuser per coil set. No mechanical movement was involved in switching from cruise to dash mode now: rather, the second pair of coils would be brought to play for high speed operations with the touch of a button.

While the simplified arrangement resulted in some changes in field geometry, the fundamental flatness still precluded the use of dorsally or ventrally dangling secondary hulls in rounding out the mission suite from pure high speed scouting to exploration and patrol. Instead, shuttle facilities and supply holds were added as lateral extensions of the primary hull. The saucer itself was expanded by two decks by bulging the dorsal surface into a more lenticular shape, and was given even more internal space by removing half the phaser armament. The final step from finesse to brute functionality was the adoption of a massive IMRF crystal amidships and heavily subspace-coiled RSX 3010 impulse engines at lower stern; with this belt-and-suspenders arrangement, the design became the most agile light cruiser so far.

Affordability went up from the *Osaka* benchmark as planned. No competition with *Miranda* was seriously considered in this respect, as the older type was of a decidedly lower performance and not really deserving of a light cruiser moniker. A go-ahead for 36 truly modern vessels in the category was thus now given. The first completed light cruiser was named *USS Wambundu*, after a pygmy group living in central Africa, the oldest surviving culture on Earth and still largely unchanged by time in the 24th century. Originally, peoples of similar status throughout the Federation were to be honored in the naming of later vessels of the class – but it turned out that singling out of population groups was scowled upon in too many member worlds, and the final choices of naming were more or less random.

The *Wambundu* class gave sterling service in far frontier operations where the modern propulsion system was of the greatest advantage. Yet the ever-expanding nature of the frontier translated to a constant uphill struggle for the generalist vessels. With a little bit of everything included in the design, no single area could sustain 'critical mass' for efficient operations. A few decades into the service career, this resulted in many well-documented shortcomings in crucial missions. For example the inability of *USS Tripoli* to fully assess the damage to Omicron Theta colony in 2338 and thus to identify the crystalline entity behind the destruction led to the loss of further colonies to the entity. The failure was later deemed to have been due to insufficient onboard scientific instrumentation and staff, and too short a survey time resulting from the low endurance of the type. *USS Beagle* was incapacitated by a pirate attack as weapons power was cut and repairs could not be effected in time with the minimal engineering staff available for the duty. This left her protégé, tanker *USS Ironstream*, exposed to boarding, leading to the deaths of all 23 crew as well as the falling of no less than 18,820 kg of high-grade antimatter into pirate hands. The time of the *Wambundu* as a multipurpose frontier cruiser had come to an end.

The path not taken. Despite the complexity of the stern structures, the hull contours and paint scheme of USS Grau *arguably represent the epitome of Chiokis hull aesthetics, and differ significantly from the* Excelsior *lineage represented by the two* Mediterranean *tugs on the background in this convoy scene from 2348. There are many reasons for moving away from the classic Chiokis saucer and towards more lenticular designs, including warp-dynamic considerations and strip-type phaser mounting concerns, even the positioning of cabin portholes. Yet a certain sense of nostalgia accompanies the* Wambundu *class, last in the line of tall ships.*

The 2350s major fighting ship acquisition programs either emphasized affordability to the extent of mediocrity, or then aimed so high as to make the low numbers of ships eventually built indispensable and unavailable for "secondary tasks". Against this backdrop, the *Wambundu* shone out as a trusted and readily available design: that her multipurpose years were now well and truly behind her was but an advantage when modification into more special roles was considered. In 2361, six vessels were taken in for conversion into frontline transports for priority combat shipments such as special ordnance or medicine. Shuttle service facilities were reduced and supply holds expanded; spaces within the primary hull were dedicated to storage. The modifications were mostly internal and in theory did not reduce performance. In practice, altered crew structure resulted in an inability to efficiently use the heavy phaser weaponry in combat, yet removal of the emitters was considered unnecessary. In a crisis situation, the ships could have been easily adopted as local defense vessels; in practice, they never were. Their services as supply vessels were far too crucial in the Cardassian and Tzenkethi wars. Two more conversions followed in 2368-69.

Eight further units were converted more thoroughly in 2371 to frontline supply tasks, with even more extensive reworking of primary hull interiors and installation of barge davits to mid-hull. This time, weaponry was removed altogether, and Starfleet officially considered the vessels humanitarian supply ships. While they indeed saw plenty of action in this very role in the early seventies, delivering survival necessities to disaster zones at high speed, there was no hiding the fact that they were also efficient troop transports – a mode of operations practiced in the Dominion War.

Three *Wambundus* were lost 'out there' on exploration missions. Only *USS Drake* was later found to have been destroyed in the hands of automated Minosian arms traders; the disappearances of *USS Rio Verde* and *USS Agincourt* remain shrouded in mystery. Three of the light cruisers were destroyed in battle in the Cardassian War, two of these from the high-security transport pool. The subsequent relegation of *Wambundu* units from exploration to local defense and support duty was not prompted by lack of combat prowess, however, but by maintenance problems with the unique WD-8/8 engines. Deployments outside the primary Fleet support and service network simply proved too risky as the engines began to age.

In an interesting footnote, *USS Tripoli* suffered a truly bizarre fate while serving as a depot vessel at Qualor II: Romulan intelligence forces stole her in an audacious attempt to infiltrate and eventually invade Vulcan in 2368. A raid to recapture or destroy the stolen vessel proved unnecessary, however, as the eternally unpredictable Romulans volunteered to return the derelict in a show of goodwill.

Joshua

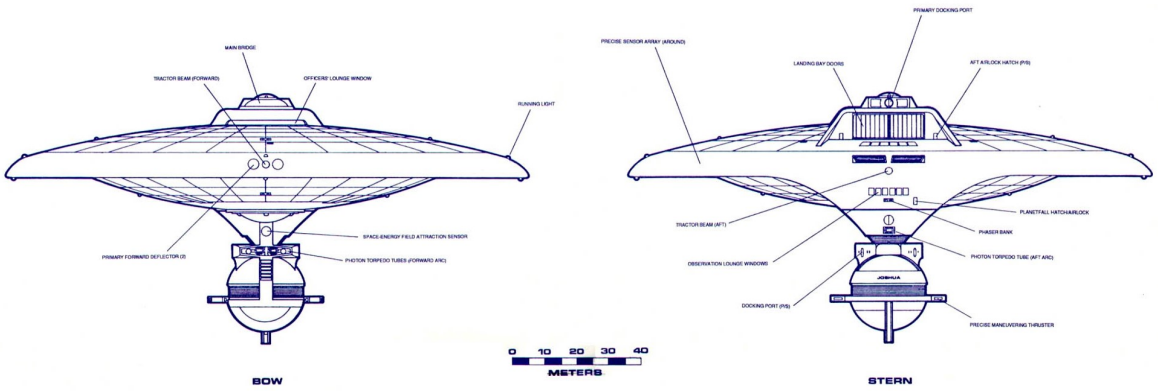
Command ship
2316-2368

Completed:	13
Length:	347.9 m
Beam:	159.2 m
Height:	76.8 m
Mass:	917,000 tons
Cruise speed:	W 6
Max. speed:	W 9.0
Endurance:	5 years
Officers:	100
Crew:	390
Weapons:	6 phaser VIII emitters in 3 twin banks on dorsal primary hull 6 phaser VIII emitters in 3 twin banks on ventral primary hull 2 phaser VIII emitters in twin bank on aft primary hull 2 medium fwd torpedo tubes on interhull 1 medium aft torpedo tube on interhull
Shields:	3-layer conformal forcefield Navigational deflector on nacelle forward end 2 auxiliary navigational deflectors on fwd primary hull
Laboratories:	4 GP, 2 planetary sciences, 1 biology, 1 astrography
Transporters:	4 GP (6-pad), 6 emergency evacuation (22-pad), 1 cargo; Mk V All ships brought to Mk VI standard after 2322
Auxiliaries:	4 medium shuttles, 2 shuttlepods, 6 work pods

Ships of historical interest:

USS Joshua (NCC-27000)

SOURCES: (D Shane Johnson)
(N Shane Johnson)
(H own)



The opening of the Klingon deadlock after Khitomer outdated Starfleet deployment plans overnight. Forces that had been garrisoned close to strategic hot spots now had to regain their mobility, to counter new, more distant and less predictable threats. The increased propulsive performance and independence of modern post-Khitomer destroyer and frigate forces helped the Fleet cope, but the decommissioning of the dreadnoughts left a gap in its ability to rapidly shift the strategic balance. Most of the dedicated command ships of the cold war era had to be retired along with the dreadnoughts, and the remainder either was too complex and expensive to be used as destroyer leaders, or then lacked in speed and range.

Defense Command had expressed hopes of acquiring command vessels based on *Excelsior* technology since the late 2280s. The state-of-the-art technologies involved remained too expensive for several decades, however, forcing Starfleet to compromise with the *Lexington* class. It was only when *Excelsior* production picked up pace that direct derivative designs of purebred performance could be fielded. Ahead of light and medium combatants and support types, Defense Command elbowed in the *Joshua* class command ship.

Built around an eleven-deck saucer somewhat smaller than the *Excelsior* original, plus a single WF series multiphasic warp nacelle, the *Joshua* (NCC-27000) represented less of an investment than the heavy cruisers. While the onboard equipment increased the price and complexity of the vessel, mass production would have been quite possible, especially since the *Joshua* was also a potent combatant in her own right. However, by the time the project began to move forward, it had already been relegated to niche status: Starfleet's new deep space command structure was to be built around the mighty *Ambassador* explorers instead.

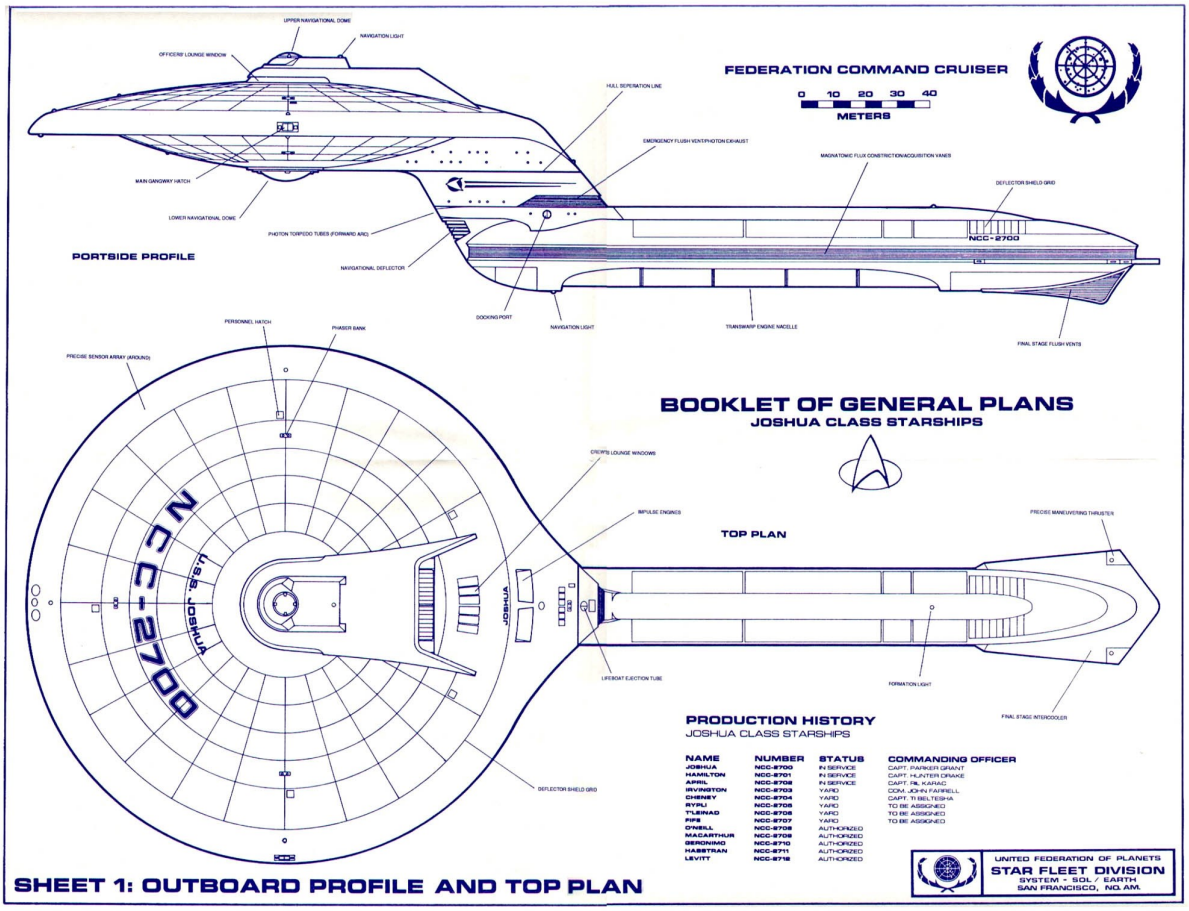
The setbacks in *Ambassador* procurement were not yet in sight when the Council decided on funding for just thirteen *Joshuas*. Construction began in earnest in 2311, the year of the *Tomed* shock. By 2314, the prototype vessel was ready for trials, although lacking in some internal gear. Already in place were the essentials: the 210 m, 700,000 ton WF-8 warp engine, the vertical KR20-A warp core in the connecting interhull, the triple Mk 70 torpedo launcher assembly straddling said structure, and the spacious shuttlebay atop the Class 2D primary hull. Three twin banks of Type VIII phasers were installed on both saucer surfaces, and an additional bank covered rear angles from slightly above the nacelle jettison separation line. Total firepower thus came close to half that of an *Excelsior*, rather fitting for a vessel that met the description in physical terms as well. There were forward and aft tractor beam emitters on the primary hull, in addition to the precision control beams of the shuttle facilities. Six docking ports, four general purpose transporters and a complement of fifteen aft-ejectable lifepods completed the means of access.

Woe the opponent who mistakes a Joshua *for a single-nacelled destroyer. While such overlap of types only existed for a brief while in the early 24th century, at least one combat engagement with careless Breen raiders is reputed to have been decided on just such an error of judgement. The heavy phasers of* USS O'Neill *(NCC-27008) are here seen in action against a Cardassian asteroid fortress.*

After the propulsive trials confirmed adequate impulse acceleration, warp 6 multiphasic cruising and warp 9 top speed, onboard equipment was completed. Below the navigation bridge, a versatile situation room was established as the nerve center of the ship. Top officer accommodation was clustered immediately beneath, featuring a spacious lounge of utilitarian as well as recreational value. While shuttle handling facilities ate into the volume of the aft hull, the forward decks were dedicated to officer and crew berthing in a luxurious stateroom arrangement – already a Fleet standard aboard the giant explorers, but a relative novelty aboard cruiser-sized vessels. Actual command, control and communications facilities and intelligence analysis centers were located close to the core of the primary hull, where a traditional vertical control computer was augmented by mission-specific processor blocks. The rim in turn was almost completely covered with signals intelligence and communications instruments under duonetically transparent sheathing, altering the profile from *Excelsior* standards somewhat. On the lower decks, the forward areas featured the auxiliary bridge, support systems and phaser controls, while the after sectors were dedicated to propulsive engineering and power generation.

By 2319, the class had been completed to Defense Command satisfaction. The fight for more hulls had been abandoned, not because the competing command ship programs would be back on track, but because the need for dedicated coordination units was found to be much diminished. The networking capabilities of modern cruisers left the command ships virtually out of work. On individual merits, the *Joshuas* were rather lightweight companions to the *Excelsiors* and *Apollos* that now dominated Fleet deep space thinking. They also were short on exploration capability, having opted for efficient communications gear and external data feeds rather than embarking versatile sensors of their own.

In practice, the *Joshua* force remained Starfleet's only dedicated fleet coordination asset, closely comparable to the old *Hermes* class, and provided command services for a variety of planetary assault operations and fleet maneuvers during the Border Wars. Various sensor and coordination systems were integrated to other ship designs through the middle decades of the century, though, slowly but surely driving the *Joshuas* out of employment. The thirteen vessels were denied most of the upgrades of the other *Excelsior*-related types. Two units, the *Cheney* (NCC-27004) and the *T'Leinad* (NCC-27006), were lost in combat with Cardassian forces. The last survivor, *USS Irvington* (NCC-27003), was solemnly retired at the signing of peace with the Cardassian Union in 2368.



Niagara

Explorer (later heavy cruiser)
2317-

Completed:	9 total: 6 batch 1 3 batch 2
Length:	461.0 m (batch 1) 479.9 m (batch 2)
Beam:	265 m
Height:	147.7 m
Mass:	4,050,200 tons (batch 1) 4,350,000 tons (batch 2)
Cruise speed:	W 6
Max. speed:	W 9.2 (batch 1) W 9.5 (batch 2)
Endurance:	19 years
Officers:	124
Crew:	409+ 150-200 opt. research crew
Weapons:	5 phaser IX strips on ventral primary hull 5 phaser IX strips on dorsal primary hull 2 heavy fwd torpedo tubes w/ 220 photorps or probes between hulls

Shields: 1-layer globular forcefield
Navigational deflector on fwd secondary hull

Laboratories: 22, in varying configurations

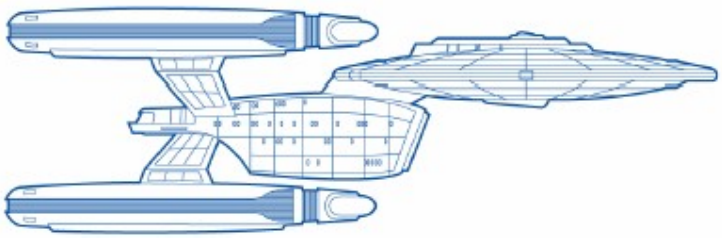
Transporters: 4 GP (6-pad), 6 emergency evacuation (22-pad), 2 cargo; Mk VI (batch 1) or Mk VII (batch 2)
All ships brought to Mk VII standard after 2359

Auxiliaries: 4 heavy and 6 medium shuttles, 10 shuttlepods, 16-22 work pods; special craft sometimes carried

Ships of historical interest:

USS Charleston (NCC-28985), *USS Princeton* (NCC-59804), *USS Wellington* (NCC-28473)

SOURCES: D TNG
N TNG
(H own)



The initial *Ambassador* warp performance shortcomings prompted Starfleet to research in greater detail the implications and applications of multiphasic warp field technology. Before settling for a reconfigured *Ambassador* design, ASDB researched the possibility of creating a more malleable warp field shape that would allow for less cumbersome retuning and reshaping in case something went wrong again. Out of these design studies emerged a practical three-lobed warp field, as well as preliminary studies of four- and five-lobed fields for multiphasic applications. As the *Ambassador* project got back on track, Starfleet decided to make the best possible use of the existing technology, expertise and resources: the *Ambassadors* would be accompanied by up to six vessels utilizing the proven powerplants and secondary hulls, but sporting a different overall configuration of three nacelles and improved primary hulls.

The decision was not met with immediate enthusiasm. Commissioner for Starfleet Matthew Perry did not even attempt to present the new vessels as part of the original *Ambassador* program, which he had recently promoted using careful calculations to support the production numbers chosen. The six additional vessels would not be required by the Strategic Exploration Plan of 2308 as fleet kingpins. Instead, they would become additional 'explorer reserves', joining the three *Ambassadors* initially left unslotted for kingpin roles. Naturally, 'explorer reserve' was what most factions in Starfleet wanted, since every vessel of *Ambassador* prestige in exploration duty would free at least four lesser cruisers for other duties. But despite the recent sweeping changes in Federation economy, the *Ambassadors* did not come for free – and triple-nacelled vessels might well cost almost half again as much.

However, the renewal of the Romulan threat once again loosened the purse strings, and amidst a vast Fleetwide upscaling of expansion plans, the six explorers were accepted with little resistance. Production commenced in 2312, first in modular form, then proceeding to assembly stage as *Ambassador* construction yards were freed. In 2317, the first of the new explorers, *USS Niagara* (NX-28904) was ready for test runs. As the UFP economy further adapted to the effects of replicator technology, the decision was made to keep the construction plants working even after delivery of six full sets of components. The costs of creating 'spare' sets were no longer prohibitive, and six 'spares' were readily completed for future use.

The original *Ambassador* Class 1D primary hull was replaced by an almost equally voluminous yet smaller-diameter lenticular, slightly oval Class 2E structure. Ten instead of eight phaser IX strips were now mounted on the primary hull, evenly divided between dorsal and ventral surfaces. The strips were positioned on the outer rim of the saucer, and were all some 50% longer than the *Ambassador* units. Superstructures were reshaped and extended to offer a more spacious shuttlebay and expanded C^3I facilities. To showcase the newest structural innovations, diplomatic functions were boosted by the addition of two large conference facilities equipped with vast panoramic windows. The rest of the saucer retained the luxurious accommodations of the *Ambassadors*, yet added a significantly more capable sensory suite as well as a powerful auxiliary deflector system mounted ventrally.

The secondary hull was largely similar to the *Ambassador* structure externally, yet featured many modifications. The most important was the altering of the pylon structure to support three warp nacelles, two above ship centerline and one directly below the hull. At the intersection of the pylon supports and power conduits lay the main impulse engines, replacing the shuttlebay of the original hull structure. Forward of this maze of machinery were the main fuel tanks, with the primary power trunk running along the centerline to the vertical warp core at the bow section of the hull.

Secondary hull armament was both potent and minimal. Two forward-firing Mk 60 torpedo tubes were included in the connecting neck, armed with heavy Type V torpedoes and equipped with rapid-fire preloaders. However, as with the *Ambassadors*, no ventral or aft phasers were installed. Furthermore, there was no lateral coverage with pylon phasers, due to the unique pylon structure. Nor were there any aft-firing torpedo tubes. The stern of the vessel ultimately proved to be an overall defensive Achilles heel: the three-lobe warp field made shielding of the aft hull difficult, leaving a vulnerable weak spot for torpedo weapons to bore through to main power couplings at the pylon conduit vertex. Yet, only one *Niagara* was lost to a crippling hit astern. *USS Princeton* (NCC-59804) succumbed to Borg fire in 2367: as soon as her aft shields collapsed, her nacelles were badly maimed and main powerplant knocked offline. Borg cutting beams finished off the helpless vessel. In most other engagements, the *Niagaras* could easily protect their vulnerable parts simply by accelerating away from the threat.

When the production run ended in 2326, Starfleet was once again the most powerful military organization in its theater of operations. Whether acting as command ships or standalone explorers, the *Niagaras* and *Ambassadors* were more than a match for the heaviest designs the Romulans or the Klingons could be expected to field. Significant forces would have to be concentrated against any single explorer to bring her down, whereas the said explorer could wreak untold havoc in enemy formations even when operating solo. Yet Starfleet had no intention of reserving its explorers for use as dreadnought-like 'deterrent ships', especially not after the Romulan post-*Tomed* clamshelling. Nor was it interested in the less than practical deep space patrol mission any more. The *Niagaras* would be sent to the interstellar abyss, not to maintain a military presence or to secure space superiority, but to perform missions of exploration and diplomacy. At times, some short-term power projection was naturally also included in the mission profile.

The period between the 2320s and the late 2340s saw the uncontrolled expansion of Federation colonies into deep space, and Starfleet had to confess its inability to protect these colonies. The big explorers themselves could play no role in boosting the colonial defenses, yet they indirectly came to benefit from Starfleet's efforts to address the situation. Namely, the GN-30/40 warp engine family was developed and fielded to meet the local defense rapid deployment needs. The largest member, GN-41, could be applied on a variety of heavy starships, including a next-generation explorer program that would eventually diverge into the *Galaxy* and *Nebula* classes. Theoretically, it could also be used to re-engine the existing explorers.

In 2349, the theory was put to practical test. *USS Cobh* (NCC-59801) was built out of the existing 'spare' *Niagara* components but equipped with three GN-41 mod 1 nacelles, looking somewhat oversized for the job yet performing quite admirably. Top speed of the vessel was increased to warp 9.5, and cruise efficiency slightly improved. Two further sets of stored components were transformed into starships in this manner, yet the impending start of the *Nebula* explorer production prompted Starfleet to drop plans of modifying the existing *Niagaras* or *Ambassadors* with GN engines. In fact, such modifications would have been extremely difficult to perform on the *Ambassadors* due to the dimensions and positioning of the nacelles. Production of further second-batch *Niagaras* was also halted.

Apart from the warp drive system, the second batch differed very little from the first. Lifepods were changed from DSRS to ASRV standard, and newer computers installed; also, transporters were of the new Mk VII standard, which was eventually upgraded to all the vessels. No effort was made to install full-length phaser strips, however, even though this technology was now becoming available. Nor were convex secondary hull phasers added, since the *Niagara* had never suffered from lack of lower-hemisphere phaser coverage – and a ventral phaser would not address the rear coverage shortcomings due to the obstruction by the ventral nacelle.

A last look up as shuttlecraft and fighter escort from USS Charleston *begin their descent into the troubled atmosphere of σ Aurigae VIb. A starship conducting deep space exploration has to be ready for every contingency, including forcible retrieval of the crew's memories from abductors hiding deep inside an inhospitable moon. The considerable auxiliary craft capability of the* Charleston *was crucial to the success of this mission.*

By the 2370s, four of the original six *Niagaras* have received computer upgrades, as well as an extensive navigational deflector refit. Of the three second-batch vessels, only *USS Claymore* (NCC-59806) survives; she is currently serving in extreme deep space exploration duty some 9,000 lightyears from Federation space, and is not expected to return until the late 2380s. Communications were originally lost in 2371, but new techniques employing deeper subspace regimes allowed their re-establishing in late 2376, albeit on a sporadic basis. So far, the ship has achieved nineteen first contacts and observed some sixty worlds falling under Prime Directive protection. UFP membership negotiations are currently proceeding with two of the contacted races, located some 4,500 ly from Earth, along the original 'breadcrumb' communications line sown by the *Claymore*.

Hokule'a / Medusa

Cruiser
2320-2376 (*Hokule'a*)
2372-2376 (*Medusa*)

Completed:	36 8 modified to *Medusa* fast cruisers in 2372-73
Length:	365.7 m
Beam:	185.0 m

Height:	75.3 m (*Hokule'a*) 91.2 m (w/ weapons module) 125.6 m (*Medusa*)
Mass:	1,860,500 tons (*Hokule'a*) 1,910,000 tons (w/ weapons module) 1,915,500 tons (w/ sensors module) 2,621,000 tons (*Medusa*)
Cruise speed:	W 6
Max. speed:	W 9.0 (*Hokule'a*) W 9.6 (*Medusa*)
Endurance:	6 years
Officers:	46 (*Hokule'a*) 42 (*Medusa*)
Crew:	303 (*Hokule'a*) 223 (*Medusa*)
Weapons:	6 phaser IX emitters in 3 twin banks on dorsal primary hull 6 phaser IX emitters in 3 twin banks on ventral primary hull 2 phaser VIII (later IX) emitters in single banks on dorsal aft hull 2 phaser VIII (later IX) emitters in twin bank on ventral aft hull 3 medium fwd torpedo tubes w/ 50 torpedoes and 40 probes on weapons module (optional) 2 medium aft torpedo tubes w/ 50 torpedoes on weapons module (optional)
Shields:	1-layer conformal forcefield Navigational deflectors on aft dorsal primary hull Auxiliary navigational deflectors on weapons module (optional)
Laboratories:	4 GP, 2 planetary sciences, 2 biology, 1 astrographics, 1 astrophysics, 1 medical, 1 sociology (*Hokule'a*) 2 GP (*Medusa*)
Transporters:	4 GP (6-pad), 2 emergency evacuation (22-pad), 1 cargo; Mk VI
Auxiliaries:	4 medium shuttles, 2 shuttlepods, 8 work pods

Ships of historical interest:

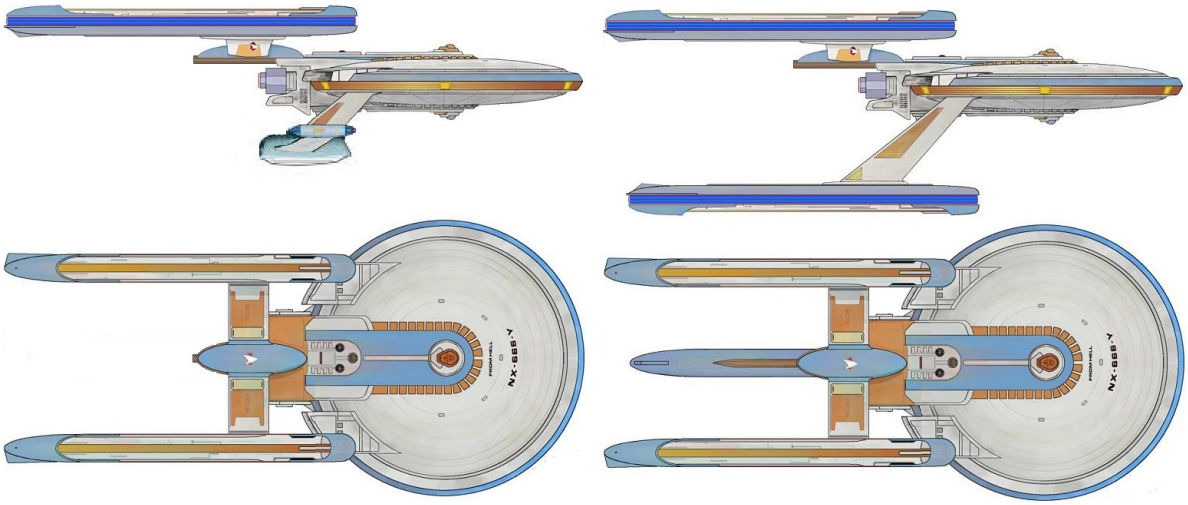
USS Hokule'a (NCC-31087)

SOURCES: D DS9 (DS9 TM, own)
N TNG (Encyclopedia)
(H own)

To take full advantage of the onset of peace with the Klingons, Starfleet in the 2300s once again chose a path of expansion favoring potent frontier cruisers over affordable combat assets of shorter reach. Questions of affordability nevertheless reigned supreme over the expansion, and soon enough it became obvious that the modern heavy cruisers would need to be complemented by a light counterpart. Yet for the first two decades, only specialist vessels of narrow mission profile could be devised in the desired size and price range. There simply wasn't much about the Great Experiment that could be considered superfluous after one included the modern deep space drive systems, their associated sub- and support systems, and the essentials of frontier survival gear.

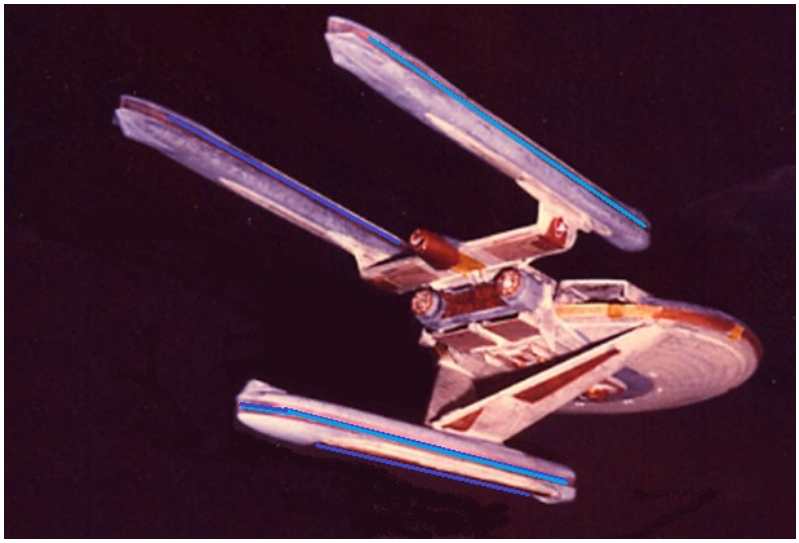
It took until past the *Tomed* incident for Starfleet to yield to the inevitable and field the obvious, if uncomfortably costly, solution: a vessel of direct *Excelsior* descent omitting the secondary hull and packing the power generation and propulsion systems in significant extensions of the primary hull structure. Named after the famous New Cetacean Institute survey trimaran based on Hawaii (as well as after *her* namesake, a Polynesian canoe used for restoration of open-sea navigation tradition to Hawaii in the 20th century), the *Hokule'a* class was to feature most of the components and capabilities from the *Excelsior* and *Apollo* heavy cruisers. Hence no 'light' definer was going to be associated with the mission class.

Traditional now was the a *Miranda*-like (or *Kearsarge*-like, considering the rather arbitrary choice of dorsally rather than ventrally mounted nacelles) warp field geometry for the vessels. The warp propulsion and power system in its entirety, the structural elements of the primary hull, and the SIF systems were off-the-shelf components of the heavy counterpart all. Impulse propulsion, again following the *Miranda* precedent, relied on custom solutions for superior performance allowed by the reduced total mass. Phaser weaponry was of *Apollo* standard, as were the combat shields. The choice for a fighting module featuring torpedo launchers was left for a later date; at this stage, only the ventral hardpoints for the support arch structure were included.



Work on *USS Hokule'a* began in 2318, on the expanded Utopia Planitia Fleet Yards. One of the six *Apollo* construction berths was reserved for eleven months for the completion of the basic spaceframe, after which the cruiser was moved to a customized integration facility for the mounting of two *Excelsior* nacelles. These housed multiphasic-tuned WF-4 engines, only recently refitted to first-batch *Excelsiors* and still something of an unknown quantity. Curved pylons joined the nacelles to a short engineering substructure jutting out of the primary hull upper stern. The warp core running along the centerline could be ejected aft while still in its own well-armored capsule. Ahead, at the junction of the substructure and the saucer, were the large round nozzles of the impulse propulsion system. Primary fuel was stored in *Excelsior*-style armored tanks ahead of the impulse engines. IMRF crystals were mounted both above and below; replenishment receptables were grouped dorsally.

The tight clustering of the multitude of systems created many problems, complicating service and repair access, thermal management and radiation shielding. On the other hand, it meant a clutter-free saucer hull that could be dedicated to mission gear in its entirety. This saucer was double the thickness of the *Excelsior* unit, and essentially consisted of the structural members of two upper halves of the heavy cruiser saucer, covered with purpose-designed hull plating. On the aft rim at 4-5 and 7-8 o'clock positions were twin shuttlebays, again remniscent of the *Miranda* arrangement, but rather modest in capacity for a ship of this size. At the centerline were the command and control facilities and main sensory, analysis and computing systems; crew accommodation and laboratories were on the outer areas of the saucer.



A stern shot of USS Aniara*, highlighting the tight clustering of functions typical of ships of the* Hokule'a *class.*

The awkwardness of the design did not translate to construction setbacks or delays. The *Hokule'a* was launched on schedule in late 2319 and commissioned in 2320, having demonstrated warp six cruising and warp nine top speed. The ship did not exceed these design goals, though, and the engineers were disappointed at the inability to make better use of the heavy WF-4 engines. Operational testing of NX-31087 continued until the end of 2321, and included weapons trials and a succession of sensor refits in search of a best possible sensor suite for exploration duty.

The delay in fielding a torpedo module was to cost dearly, though. In 2323, both of the recently launched sisters to the *Hokule'a* engaged in long range combat with unidentified deep frontier opponents, and the *Aditi* was crippled beyond salvage by the very weapon type missing from her own arsenal. A fighting pod with three forward and two aft medium launchers was hastily cobbled together, field-tested on the long-suffering *USS Trial*, and then clamped onto all the *Hokule'as* so far completed. A sensor fit once abandoned as too ambitious defensively and too limited in short range research and exploration capabilities was now pressed to duty as well. The next two sister ships to the *Hokule'a* were completed to this more militant standard in 2326. After cooler heads prevailed, a further eleven units followed fitted for but not with the fighting module, until Starfleet had exhausted the allocated supply of propulsive units. Thereafter, hull production resources were directed to further *Excelsior* construction.

Only after the completion of two more *Excelsior* batches did Starfleet return to the *Hokule'as*, constructing twenty more hulls with slightly more modern shields, upgraded impulse engines, and connections enabling the carrying of a potent sensor module in place of the torpedo one – but otherwise essentially the original design specifications. Plasma intercoolers required by the impulse engine refit were housed in boxy protrusions above and below. Apart from being unaesthetic to look at, and cluttering up the already mazelike engineering facilities, the arrangement was rather vulnerable to battle damage. Nevertheless, the increased performance provided improved survivability overall.

As the Border Wars began to loom in the horizon, Starfleet was in many ways relieved to have abandoned further development and construction of the *Hokule'a* class. The new economic realities of a replicator-based society had allowed the procurement of further *Excelsior* units on a scale Starfleet of the 2320s could not have dreamed of – and were now making at least theoretically possible the fielding of cruiser starships far superior to the *Hokule'a*. By the 2350s, the *Hokule'as*

had been denied two major refits, one concerning the main computers and one aimed at upgrading the weapons control systems to the latest *Excelsior* standard. Instead, the ships had to settle for a general systems overhaul and a limited-scope sensor upgrade.

What the aging *Hokule'as* had working for them was raw strength. Their powerplants, while aged, had superior peak and sustained power generation in comparison with the competing cruiser classes. The generously overengineered impulse, shielding and phaser systems were perfectly suited for channeling the excess energies. A *Hokule'a* could deliver and receive punishment far beyond the capabilities of most of the modern combat vessels of similar size. The numerous shortcomings in exploration duty (minimal shuttlecraft facilities, modest computing power, primitive analysis facilities, limited endurance) mattered little in the assessment Starfleet performed in 2355, at the peak of Cardassian aggressions. The *Hokule'as* were declared fit for war and pressed to action in the Cardassian theater of operations.

When the border conflicts wound down in the early 2360s, Starfleet's demand for raw strength ended rather abruptly. Most *Hokule'as* were retired and placed on surplus depots. Crews were typically transferred to *Challenger* or *Cheyenne* class ships of similar size but very different mission profiles. *USS Northumberland* was retained in active training use but had her phaser systems removed in 2367, and was subsequently excluded from combat duty.

The Dominion crisis saw many older starship classes reactivated, and eventually the *Hokule'as* were sent to the battlefronts as well. For eight of the remaining ships, the reactivation took an exceptional form: a third nacelle, taken from *Excelsior* surplus stocks, was mounted on the mission module hardpoints underneath the spaceframe, in a hasty refit intended to make use of the extra warp power available from the reactors. The remodeled warp field of the *Medusa* subclass allowed dash speeds of warp 9.6, qualifying the ships for joint operations with the modern heavy starships. The units in greatest need of high speed firepower were the 7th and 9th Fleets, tasked with deep space expeditionary operations. The Ninth suffered from a crippling lack of modern escorts, however, due to recent losses in the Klingon Border War. This drastically reduced the fleet speed and undid the tactical advantages of the *Medusas*. Thus, the three-nacellers went to the 7th and 5th Fleets; the unmodified *Hokule'as* were sent to the 9th, which was dedicated to massive, slow-moving planetary assault maneuvers for most of the war, and was reinforced by Klingon elements.

The 7th Fleet seemingly extends to infinity beyond USS Varyag*. Massed firepower was no guarantee of victory in the Dominion War, and even high speed did only so much to help locally overwhelm the Jem'Hadar war machine. Just a week after this shot, the Seventh would be quite literally decimated, with 75% casualties on her* Medusas *but up to 100% losses on other old cruiser types, and an overall casualty rate of 90%.*

In the ranks of the 7th and the 5th, the modified ships participated in the two boldest Starfleet operations of the war. Operation Deny Strength saw Starfleet striking against sixteen Dominion strongholds simultaneously at the opening stage of the war, as main Dominion forces had been lured to the Bajoran system. Unfortunately, four of the *Medusas* accompanied the raids to Kora and

D'arras, where crippling losses were suffered by the Seventh; of these cruisers, only *USS Varyag* returned, limping back at low warp to SB 375. Operation Return for the retaking of the wormhole mouth in 2374 allowed *USS Fontenoy* and *USS Cyprus* from the 5th Fleet to avenge their fallen sisters. The cruisers escorted the explorers *Galaxy* and *Endeavour* to a daring high speed feint that tied up the Dominion reserves on the far side of the Bajoran system. The feint forced the Dominion to concentrate its defenses to a passive sublight stance and paved way for the epic battle deep within the system. This battle finally claimed the *Cyprus* along with her entire crew.

The *Fontenoy* was subsequently modified back to rough *Hokule'a* standard, simply by discarding the extra nacelle, for the remainder of the war. The *Varyag*, having lost her power systems to internal explosions, was demoted to a depot ship with the third nacelle still attached. Of the unmodified vessels, *USS Trefoil* survived with relatively minor damage through multiple planetary assault missions. In turn, *USS Elentári* had to pay heavily for the successes in the Chin'toka campaign: an assault at the AR-541 gunnery outpost in SD 52273 ended in a planetary defense disruptor blast penetrating her port shuttlebay and killing hundreds of troops preparing to disembark; then in SD 52440, an insystem engagement deprived the ship of life support for several days, leaving few survivors for *USS Constellation* to rescue. Finally, even though Starfleet at last had gained foothold at Chin'arya, an escort run to the planet in SD 52492 proved fatal as a clandestinely sown minefield blew apart the ship's forward hull; casualties were again numbered in hundreds. The ship soldiered on till the end of the war, yet received several unflattering nicknames for her multi-hundred-percent fatality rate.

Currently, three *Hokule'a* spaceframes still exist, yet none are in serviceable condition; the Lady of the Unlucky Stars is still missing her forward hull. There are no plans to reinvigorate the vessels, which are likely to continue their current duty as depot ships at Arcturus, Procyon and Qualor, respectively.

Surak

Exploratory cruiser
2323-

Completed:	32
Length:	550.0 m
Beam:	126.9 m
Height:	138.5 m
Mass:	802,800 tons
Officers:	70
Crew:	380
Cruise speed:	W 8.3
Max. speed:	W 9.5
Endurance:	4 years
Weapons:	4 phaser VIII strip emitters (2 on dorsal hull, fore and aft, 2 on ventral hull, fore and aft) 1 fwd torpedo tube w/ 35 torpedoes and 65 probes
Shields:	1-layer globular forcefield Navigational deflector in connecting fin below primary hull
Laboratories:	18, in varying configurations
Transporters:	2 GP (7-pad), 1 cargo; Mk VI

Auxiliaries: 8 medium shuttles, 1 cargo shuttle, 2 work pods

Ships of historical interest:

USS Surak (NCC-33152), *USS T'Pol* (NCC-33169), *USS Zapata* (NCC-33184)

SOURCES: D ENT
N ENT, TNG
(H Eddie Sharpe)

The *Surak* class is a rare example of a Starfleet vessel originally designed for a non-Federation fleet and in use for a considerable period of time before the first Starfleet vessel was commissioned. In fact, the basic *Surak* design, originally designed for the Vulcan High Command, was first built 437 years before Starfleet decided to acquire the class!

The basic design was of a 550 meter tapered spindle, connected by a broad based interhull to a circular warp propulsion system of 126.9 meter diameter, mounted halfway along the primary hull. The annular warp propulsion system is one that is very rarely used in Starfleet vessels, or throughout the Federation as a whole. This type of system produces a wide, very stable warp field; this makes vessels fitted with an annular warp system slightly less maneuverable than those powered by warp nacelles, and also makes them easier to detect. Nacelle-generated warp field configurations are also inherently slightly faster than fields from annular systems of corresponding power, but they are less efficient at cruise; the Vulcan High Command decided on this configuration for reasons of efficiency and reliability. This was felt to be more logical than indulging in an impatient desire to reach the intended destination quickly. The impulse system was mounted at the junction of the main hull and interhull. This basic configuration was used throughout the *Suraks'* service in the Vulcan fleet. The design was also used as the basis for several other types of vessel, including large cruisers and fast patrol ships.

Starfleet's decision to acquire these vessels was rooted in the life expectancy of one of the Fleet's most famous types of exploration starship, the *Constitution* class. The last vessels of this design were expected to be retired in 2337. Loss of heavy cruiser capacity was not a factor, as the *Constitutions* no longer truly filled this niche at the time. Yet the long range scientific capabilities of the Fleet would be reduced when this backbone type of the 'lower tier' ended service. While the nine Mk III *Excelsior*, nine *Niagara* and six (later twelve) *Ambassador* explorers provided ample exploration and initial mapping/scientific investigation capacity, the loss of the *Tikopai* class ships would severely reduce Starfleet's ability to conduct long term, in depth scientific missions, beyond starbase support range.

What Starfleet clearly needed was a new class of exploratory cruiser. The classic characteristics of this mission class *relative to the rest of the fleet* remained the same as always: low acquisition costs, high endurance, and versatility in supporting multiple types of scientific surveys simultaneously and independently. *In absolute terms*, however, the definitions of high endurance and independence in the early 24th century were very different from the late 23rd century ones. While the scientific survey fleet already included respectable numbers of *Oberth* and *Lng'we Chi* vessels, as well as converted civilian vessels, these were slowish and lightly armed. More damagingly, when operating across the considerable breadth of the newly expanded Treaty Exploration Zones, they would too often have to make long replenishment runs to starbases or have resupply runs made to them. In addition, they may not have all the resources necessary for modern surveys on board.

The Starfleet-white exploratory cruiser USS T'Pol *in orbit over Sigma Delta VII in 2339. Out of the Starfleet spectrum of designs, the distinctive shape of the class guarantees easy identification from a distance, as does its unique warp signature. Very similar Vulcan designs of different sizes and characteristics abound, however, and the distinguishing features of the* Suraks *must be sought at closer ranges. Clearly evident from this view are the spacious shuttle facilities and the row of high-temperature impulse nozzles, optimal for linear accelerations but less practical for combat maneuvering. The somewhat larger* T'Anya *combat cruisers use twin red-glowing, low-temperature engines with full thrust vectoring.*

Since the *Tomed* Incident, much of Starfleet's budget had been spent on defense and gathering of intelligence, primarily on the Romulans, who had again retreated into isolation; on dockyard modernisation in preparation for a new escalation; and also on the huge *Ambassador* and *Niagara* class projects. This meant that only limited funds were available for the production of new science vessels, especially on the cruiser scale. As a result, Starfleet was forced to 'shop around.' After consideration of several candidates, the *Surak* design was decided upon; it was large enough to accommodate a large number of laboratories and support equipment, as well as having a long and distinguished career under Vulcan command.

The design had, of course, undergone a number of revisions an improvements over its many years of service; in fact, the last large scale upgrade had been completed a mere 5 years ago. Added to the fact that Vulcan shipyards were highly proficient at producing the design, this made the *Surak* class an economical and efficient way for Starfleet to expand its scientific capability.

Starfleet ordered 32 *Suraks*, to be built at Vulcan yards. They differed only minimally from their civilian counterparts; the internal arrangement was changed slightly and a military inertial compensator was fitted. Additionally, four of the new phaser strip emitters were fitted, as was a photon torpedo/probe launcher in the fore of the interhull. Shuttle facilities were located just behind the warp propulsion system; these usually contained eight medium scientific shuttlecraft and a cargo shuttle for ferrying equipment and personnel to planetary surfaces.

The first Starfleet *Surak* was commissioned in 2323 and the last in 2327. The service record of these vessels has been exemplary; they have made first contact with no fewer than 18 civilizations and mapped in detail some 75 solar systems. In 2362, attempts were made with *USS Ti'Mur* to re-engine the class with conventional nacelles for added speed. The attempt was unsuccessful and caused significant structural damage to the *Ti'Mur*, which spent 18 months in dock being repaired and restored to her original configuration. During the Dominion War, the class was temporarily retired and the crews reassigned to combat and support ships for the duration of the conflict. However, while returning to port, *USS T'Ral* (NCC-33172) was ambushed and destroyed by Dominion forces. With peace now restored to the quadrant, it is hoped that the class will continue in its duties until the 2420s at least.

Scylla

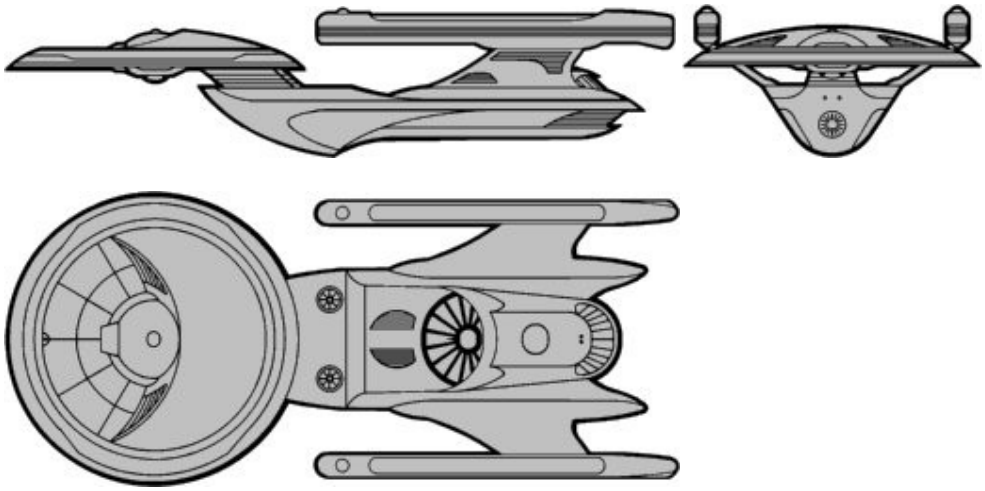
Scout
2324-

Completed:	57
Length:	208.9 m
Beam:	92.2 m
Height:	46.9 m
Mass:	548,900 tons
Officers:	19
Crew:	165
Cruise speed:	W 6
Max. speed:	W 7.0
Endurance:	5 years
Weapons:	2 phaser VI emitters in twin bank on dorsal primary hull 2 phaser VI emitters in twin bank on ventral primary hull 2 fwd medium torpedo tubes w/20 torpedoes and 80 probes on secondary hull bow
Shields:	1-layer globular forcefield Navigational deflector on dorsal primary hull Auxiliary deflector on secondary hull bow
Laboratories:	1 GP, 2 planetary sciences, 1 astrophysics, 1 cartography, 1 biology
Transporters:	2 GP (6-pad), 2 cargo/emergency evacuation (22-pad); Mk VI
Auxiliaries:	2 light shuttles, 2 work pods; special environment craft sometimes carried

Ships of historical interest:

USS Polyphemus (NCC-35008)

SOURCES: (D FASA / J.M. Kuzee & Pete Rogan)
(N FASA)
(H FASA, own)



The supposed "*Excelsior* generation" of starships started out as a series of rather dissimilar experiments, each only featuring one or two elements from the pool of hardware designed to be

shared by the classes for commonality. Large cruisers were overrepresented as testbeds for the new technologies, hardly balanced by the tiny *Mockingbird* scout that was the only smaller class to be launched with a modern D series hull. The first class to feature the Class 3D midsize primary hull, the *Scylla* medium scout for long range scientific reconnaissance and preliminary surveys, had to await introduction until the 2320s.

Following the trend set by the *Constant* class, and reflecting the greater resources now available to Starfleet, the *Scylla* was built to a two-nacelle configuration: the warp propulsion system consisted of two very slim sixteen-coil, 240,000 ton WF-12 engines powered by a compact *Apollo*-style m/am reactor assembly. The system was 'maxed out' for cruise purposes already, propelling the diminutive ship to sustained warp six for efficient ranging of the deep frontier but only allowing for an increase of one warp factor in emergencies.

With the propulsion system brought up to deep space standards, the other shortcoming that had limited the potential of the preceding single-engined scouts was now addressed. A conventional secondary hull some 140 m long accommodated the warp core at 52 degree angle forward, its antimatter tankage below, a pair of IMRF crystals slightly aft of the core-containing connector neck, and a shuttle hangar atop the long, flat fantail stern. A heavy duty tractor beam emitter was installed on the aft side of the connector, just below the impulse nozzles on the saucer aft rim; a precision unit within the shuttlebay would take over for auxiliary craft final approach procedures. Up to 7,000 tons of cargo could be brought onboard through the shuttlebay and stored in holds forward of the shuttle maintenance facilities. Warp engine pylons angled up from the sides of the secondary hull fantail, lending *Excelsior*-like lines to the scoutship. A long ventral sensor housing beneath the stern altered the profile, however.

While primary survey systems were clustered in this sensor canoe, there were additional ones domed atop the saucer hull, aft of the bridge module. The protective dome covered some 55% of the dorsal surface; a small, curved auxiliary navigational deflector unit of a new Sylvanesti design was in turn mounted ahead of the bridge, leaving only the bowmost phaser berth free for a pair of venerable FH-4 Type VI emitters, with another pair on the ventral side. Two surplus Mk 6 medium torpedo and probe launchers above the diminutive main deflector rounded out the arsenal to light yet creditable deep space standards. Fire control systems were just as modest as the low-priority armament, however, and the scout could hardly be considered an active combatant. Lack of dash speed further reduced combat potential; modern Prentice-Schafer shield generators had to provide all the required passive protection.

The *Scylla* had been built because she had to – the *Amerinds* were now falling apart from fatigue, yet their vital work could not be allowed to come to a halt. Each new *Scylla* scout off the production lines thus simply took aboard the selection of sensors from her retiring *Amerind* forebear, aiming no higher than necessary and leaving plenty of growth room for more ambitious and versatile future systems. Yet much of the default equipment was groundbreaking in its capabilities. Crew accommodation and extensive laboratory spaces shared the saucer with a large modern optical computer core and exceptionally well-equipped sickbay. Replicators were provided for the first time as standard gear for a vessel this small. Finally, the ability to carry four exploration shuttlecraft liberated Exploration Command of the need to summon a frigate or a cruiser to assist in surveys of special or transporter-hostile environments.

The project goal of replacing the *Amerind* class was met and exceeded early on. Thirty-seven *Scyllas* were built in 2323-25 and twenty more in 2329-31. They performed preliminary flyby-type surveys of the outer colonization zone and charted vast expanses of space. Without them, the

detailed surveying of the spinward flank of the UFP exploration zones would probably have lasted twice as long as it did, and tied down valuable starship resources from defense and research operations. Despite this, the *Scyllas* are often ignored in history writing: they made few contacts with previously unknown cultures or lifeforms, played no part in political scandals, and managed to avoid dramatic military confrontations. By the time of the Cardassian War, the scouts were relegated to maintaining contact with frontier colonies, or performing simple monitoring duties on quiet borders.

At the moment, ten *Scyllas* are still active in patrol missions. Their growth potential has been used up by equipping them with the latest in long range traffic monitoring gear. Their scientific contribution is currently minimal, due to the limitations placed on their mobility. No refits have been performed on the *Scyllas* since the late 2350s when four ships were retired due to unexpectedly severe engine fatigue, and the rest received strengthened power couplings and a completely redesigned plasma manifold. Yet strict flight envelope limitations are still in place. The *Scyllas* will hopefully be retired sometime in the 2380s. Whether they are to be replaced in full by more versatile modern counterparts, or go to history books as the last dedicated scoutship class to be utilized by Starfleet, remains an open question in light of the increasing capabilities and affordability of small multipurpose starships.

A deep space warp coil swapout is one of the most demanding repair tasks imaginable. Here USS Shayler *assists the* Scylla *scout* USS Lampetia *(NCC-35025). Scoutships of the preceding generations would seldom have been in a position where* in situ *repairs were preferable to warp towing. The extended range of the* Scyllas *necessitated a high degree of field-replaceability in all vital systems.*

USS Polyphemus (NCC-35008) was the first in-service casualty of the class, consumed by the flares of blue-white giant Psi Tauri B during an observation of gravitic anomalies in the system. Two other vessels have gone missing in deep space exploration duty, which is only to be expected: during the 24th century, roughly 4% of ships sent more than 1,000 lightyears from the UFP core worlds have disappeared. Of those sent 2,000 ly away, 11% never return. Of those exceeding 5,000 ly, 59% disappear. And of those exceeding 10,000 ly, 99.2% are never heard of again. Yet, the corresponding figures for unmanned probes are 29%, 66.8%, 99.998% and 99.999996%, respectively. Thus, manned exploration will continue as the primary means of charting the unknown for the foreseeable future.

Istanbul

Heavy transport
2324-

Completed:	81
Length:	421.2 m
Beam:	240.0 m
Height:	102.1 m

Mass:	2,450,000 tons
Officers:	9
Crew:	63
Passengers:	3,000-6,000
Cargo:	410,000 tons (cargo only) 285,000 tons (cargo + 3,000 passengers) 270,000 tons (cargo + 6,000 passengers)
Cruise speed:	W 5
Max. speed:	W 8.2
Endurance:	6 years
Weapons:	Normally none 4 phaser VII emitters in quadruple bank on ventral bow (Cardassian War configuration) 4 phaser VII emitters in 2 twin banks on ventral stern (Cardassian War configuration) 4 phaser VII emitters in 2 twin banks port and starboard of bridge (Cardassian War configuration)
Shields:	1-layer globular forcefield Navigational deflector on lower fwd hull
Transporters:	2 GP (6-pad), 8 large and 4 small cargo; Mk VI GP units on all ships brought to Mk VII standard after 2349
Auxiliaries:	6 cargo shuttles, 2 surface-to-orbit tugs, 6 to 12 work pods; barges sometimes carried

Ships of historical interest:

USS Babylon (NCC-34881), *USS Bombay* (NCC-35297), *USS Constantinople* (NCC-34852), *USS Gallipoli* (NCC-34864)

SOURCES: (D own)
(N Encyclopedia)
(H own)

The *Istanbul* class, the answer to the heaviest cargo hauling needs of Starfleet, was among the first transports to be built around multiphasic engines. Groundbreaking propulsion technology was indeed needed to move a vessel large enough for the purposes of Logistic Command. In order to support the building of outposts and starbases in the expanding frontier, components up to the mass of 400,000 tons were to be carried at warp speeds. In addition, the transports would be tasked with colonization missions, providing entire industrial infrastructures to the numerous colony worlds that had been founded to the barest self-sustenance standards. After a bidding and development phase of three years, the final design was frozen in May 2323, and construction began on the first of the behemoths.

Dockyards at Merak eagerly embraced the opportunity to utilize the shipbuilding expertise they had gained during the escalation years. Both the construction methods and the end product represented a mixture of the radically new and the thoroughly familiar. The WF-10F engine was a direct application of *Ambassador* hardware, dropping two coils per nacelle and optimizing for lower speeds and heavier loads by adjustments in the plasma rates. The flexibility of multiphasic adjusting meant that there was no marked drop in performance even when under nonoptimal load, however. Although two nacelles were used, the overall configuration was closer to that of the *Lotus Flowers* than of the *Overfields*. The stern engineering compartment mounted the nacelles dorsally, on a T pylon arrangement. It also housed the military-standard warp core, again courtesy of the *Ambassador* class of explorers. Also located here were the antimatter pods plus eight fusion reactors and two fuel/propellant tanks for the four Class 1 impulse engines.

From the upper forward part of the large engineering section, a ‘spine’ of plasma conduits and turbolift shafts reached towards the forward section of the ship. This took a form not unlike the bow

of the *Overfield* transports, housing the bridge module, a modern navigational deflector of flattened shape for better scanning possibilities and, at the bottom, a modestly equipped shuttlebay for cargo shuttles, tugboats and workbees. Crew facilities and space convertible to passenger or cargo purposes were located here on 18 decks.

The main cargo area, however, was the space between the forward and aft sections, below the spine. Here could be mounted several different cargo containers, for example eight purpose-built large bulk cargo tanks or one large general cargo or passenger module. The tanks could carry anything from grain to partially refined ore, and were often used for holding deuterium fuel when the ships were utilized for fleet refueling operations. Antimatter could also be carried on special tanks, but was more often loaded already packed in containers compatible with starship power systems. Eight of the old *Ptolemy*-era transport pods could also be carried here, in combination with special support beams compensating for the lesser structural strength of the pods. However, standard containers were intended to be retired from commercial inventory by 2350, in favor of ship-specific designs. Starfleet would retain some for frontline supply needs, but the concept of large standard containers no longer served commercial interests.

Mercantile concerns were admittedly secondary during the early career phases of these vessels. Significant was that the *Istanbuls* provided Starfleet with the desired long range heavy transport capacity. Having a gross weight surpassed only by starbases or sublight ore carriers, they were rather cumbersome and not suited for flexible civilian freight operations. Still, one such ship was purchased by the Coriolis gas-mining company for warp-speed transport of valuable rare gases used as replication raw material in many industrial processes. While the type eventually proved uneconomical for the company, this initial purchase helped interest many commercial operators in the basic engineering concept, and resulted in both mercantile refinements to the basic design and in the development of parallel civilian models. The *Istanbuls* e.g. spearheaded the use of modern Mk VI transporters which brought transporter safety to a new level by using multiplexed pattern buffers. The SIF configurations used were also widely adopted.

The military *Istanbuls* were baptized in fire in the Cardassian conflict that stretched the limits of Starfleet logistic capacities. The transports received a dozen phaser VII emitters for defense, in three bow and two stern clusters. The as such rather heavy armament was still found insufficient against Cardassian attacks, since the hastily retrofitted fire control systems could not track the multi-ship attack patterns of Cardassian forces. Thus, the ships were always escorted by frigates and light cruisers (with similar weapons but with proper fire control systems) when bringing material to the war zone or evacuating colonies from the harm's way. None were lost, even though a convoy of three supply ships, four medium transports and a tanker plus their two *Miranda* and *Springfield* escorts was destroyed from around *USS Babylon* (NCC-34881) in 2358, at the height of the Cardassian offensive. Half a year later, *USS Gallipoli* (NCC-34864) and her *Excelsior* escort *USS Churchill* managed to evacuate the 20,000 stranded colonists and ground troops of New Canberra from under a Cardassian attack. The attack was then countered by a major three-pronged Starfleet action, basically ending Cardassian offensive efforts. The war lingered on for many years thereafter, though, and final peace accords were only signed in mid-2366.

In transit. USS Bombay *sports the standard general cargo module in this warp speed shot. The ships always require a module of some type to serve as structural support – the spine itself can't support the stresses of warp or even impulse flight.*

After the war, the heavy logistics mission of the *Istanbul* class became less urgent, and many of the ships saw service as passenger liners. The colony founding mission still employed the class every now and then; despite a general downtrend in government-sponsored colonization, there were continuing advantages to the use of very large vessels and the single-sortie technique of settling a world. Admittedly, some risks were also greater. *USS Constantinople* (NCC-34852), the second ship of the class, suffered a major hull breach in a collision with orbital debris near Delta Doradus on SD 42437, placing over 2,000 settlers in jeopardy. Timely rescue operations prevented loss of life, but the ship's spaceframe was permanently damaged and the vessel removed from active service.

The remainder of the class still continues in Starfleet service, with the private gas liner donated back to the Fleet by Coriolis in 2351 when the company withdrew from the collapsing stock market. Two parallel civilian designs of slightly smaller dimensions, the *San Giordio* and *Gdansk* classes, serve on Federation passenger and cargo routes along with their Starfleet sisters. Several other commercial designs have also been heavily influenced by the *Istanbuls*, even though they tend to represent the lower end of the size spectrum.

Andes

General purpose tender
2325-

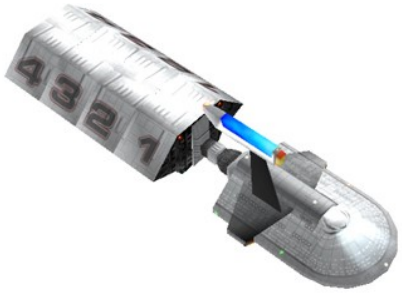
Completed:	128
Length:	271.5 m
Beam:	102.4 m
Height:	86.8 m
Mass:	250,000 tons
Officers:	11
Crew:	38
Cruise speed:	W 5
Max. speed:	W 7.0
Endurance:	2 years
Weapons:	None
Shields:	1-layer conformal forcefield 2 navigational deflectors on fwd hull
Transporters:	2 GP (6-pad), 2 cargo; Mk VI
Auxiliaries:	44 or 80 construction craft

Ships of historical interest:

USS Simien (NCC-39291)

SOURCES: (D SFCII computer game)
(N LUG "Price of Freedom")

(H own)



Standardization towards a single family of hulls and engines has been the frequent if elusive goal for starship operators throughout history. Those designing or paying for the ships may have had different ideas, however. In the final 23rd century decades of frantic defensive spending, Starfleet had gotten used to the idea that even its humblest logistical support vessels could be constructed to exacting military standards, utilizing military components of sometimes excessive strength, size and armament fittings. The realities of the 24th century were different: the vast new theater of operations demanded unprecedented numbers of support vessels, few of which could sport the hulls of combat or exploration starships. Yet there was an industrial breakthrough in the making as well, and Starfleet was determined to make use of it.

The *Andes* general purpose tender played both sides of the game: built around a standardized, mass-produceable military hull, she would bring industrial replication technology to deep space to facilitate repair, assembly and manufacture of a new generation of space structures and vehicles. Her bow was that of a Class 3D saucer, only elongated to a tombstone shape some 145 meters long. Also stretched was her dorsal superstructure, so that the powerplant for the single dorsal WF-11 multiphasic engine could be held therein and the ventral side of the vessel left clean of protrusions. Landing this compact starship would thus present no problems, not with her powerful Class 5 impulse engines blasting from their fully steerable mounts on both sides of the center of gravity, just outboard of the twin warp engine pylons. The “saddle” power and propulsion pack left free for use the entire internal volume of the aft hull it straddled.

Within were two massive industrial replicators, eight well-equipped shops for fine work, a number of holds for spares and tanks for replication raw materials. This represented only a fraction of the ship’s industrial capabilities, however: a stern towing interface allowed inflight access to cargo pods twice the size of the ship herself, essentially translating an *Andes* into a giant flying factory or assembly box as needed. Typically, the cargo pods would also feature hangars for work pods, construction tugs and other crewed and automated assembly craft, up to 80 being a fairly standard load.

Some 128 of the vessels were produced between 2325 and 2331, in a tour de force for logistics command; the preceding *Niffen* tenders could be relegated to lesser duties for the quarter of a century of service overlap. A succeeding *Piper* class was built in comparable numbers and offered similar service life overlap, while representing a further step towards the direction first taken with the *Andes*: there were even fewer dedicated onboard maintenance spaces, even more automation, and even more reliance on replication for achieving the tender mission. The *Andes* had already done away with conventional onboard processing of relay buoys, relegating that special mission to towed facilities, and easily swapping those whenever a different special mission was sounded.

In contrast with the 23rd century buoy tenders, *Andes* featured no offensive or defensive armament of any kind. There were rather fanciful ideas on the use of modified construction craft carrier pods for converting an *Andes* to an escort carrier, or of raining death from special bombardment containers, but none of these were ever put to practice on the hardware level. Bundles of planetary assault barges were a fairly standard warload for the tenders during the border wars, however. Nor was it unheard of for an *Andes* to perform a combat landing, sometimes even as a solo operation when no other units were available. *USS Simien* (NCC-39291) made headlines with a daring deployment of submarines into the equatorial ocean of Arban II, allowing a Cardassian frigate group to be destroyed in its otherwise impregnable underwater nest and freeing the entire upper Nebed sector of the menace to commerce.

At this writing, some three dozen *Andes* units, mainly from the final production batch (or *Ural* subclass), continue operations as tugs and only occasionally as frontline tenders.

Renaissance / Baracus

Light frigate / scout
2332- (*Renaissance*)
2347- (*Baracus*)

Completed:	298 total: 220 *Renaissance* light frigates 20 *Baracus* scouts refitted from *Renaissance* and 78 built in 2347-50 10 *Newport* light frigates refitted from *Renaissance* in 2359-62
Length:	210.1 m
Beam:	123.8 m
Height:	34.0 m
Mass:	694,000 tons (*Renaissance*) 698,700 tons (*Baracus*) 699,000 tons (*Newport*)
Officers:	12
Crew:	70
Cruise speed:	W 5
Max. speed:	W 9.0
Endurance:	1.5 years
Weapons:	*Remaissance*, *Baracus*: 4 twin phaser VII emitters on dorsal primary hull 5 twin phaser VII emitters on ventral primary hull 2 medium fwd torpedo tubes w/ 60 photorps and 25 probes on secondary hull 2 medium aft torpedo tubes w/ 20 photorps on secondary hull *Newport*: 2 phaser VII strips on dorsal primary hull 1 phaser VII strip on ventral primary hull 2 medium fwd torpedo tubes w/ 60 photorps on secondary hull 2 medium aft torpedo tubes w/ 20 photorps on secondary hull
Shields:	1-layer globular forcefield Navigational deflector on fwd dorsal hull
Laboratories:	1 planetary sciences, 1 astrophysics, 1 astrographics, 1 signal processing
Transporters:	2 GP (4-pad); Mk VI
Auxiliaries:	2 work pods (*Renaissance*, *Baracus* original) 2 to 4 shuttlepods, 2 work pods (*Baracus* upgrade, *Newport*)

Ships of historical interest:

USS Aries (NCC-45167), *USS Centaur* (NCC-42043), *USS Europa* (NCC-46221), *USS Garibaldi* (NCC-42688), *USS Icarus* (NCC-45152), *USS Maryland* (NCC-45109), *USS Sanfación* (NCC-42096)

SOURCES: D DS9
N TNG (*Santa Fe*, *Ukora*, *Newport* LUG Price of Freedom RPG)
(H own)

Encouraged by the results of the cost-effective *Scylla* class, Starfleet was eager to try out the '*Excelsior* family' of spaceframes on other small to medium starship projects that had been delayed by the triple shocks of Klingon peace, warp breakthrough and Romulan aggression. Among the neglected mission classes were corvettes, light/escort destroyers and light frigates – low-tier combatants whose mission profiles had become intertwined or even indistinguishable, but whose services would still be of value to Starfleet no matter what the designation.

More or less arbitrarily, the New Light Combat Starship project begun in 2327 was initially dubbed a corvette. The 'heavy corvette' designs dating from the Klingon escalation era had mostly been stricken from Fleet strength, for reasons ranging from budgetary and political concerns to the shortcuts and compromises involved in the original construction and design of the vessels. They had been built primarily for combat across medium interstellar ranges. This had taken them far from the ideals of local patrol vessel design, and more towards the optimum of what was considered a frigate at that time. Now Starfleet simply took that development to its logical conclusion and closed the gap between the patrol combatant and the frigate. It established a twofold major hardware requirement on the new design: the ability to carry the *Miranda* class torpedo pod and multiple phasers of Type VII or better. Along with this up-gunning, the project abandoned the corvette designation, which now was relegated back to short range, phaser-armed affordable patrol vessels. By 2331, the project had been renamed as the *Renaissance* class light frigate.

Medium range defense needs now drove all aspects of the design. The propulsion systems had to provide maximal warp and impulse maneuverability even at the cost of propulsion endurance and economy. Overall endurance was kept low as well, with minimal crew amenities, stores and life support reserves. Onboard repair facilities, laboratories and analysis systems were minimized on the assumption that these services would be provided externally, by planetary assets or tender vessels. What was left of the '*Miranda* benchmark' of frigates were the weapon systems and the ability to bring them to the battlefield across medium interstellar ranges.

Atmospheric stability testing on USS Icarus *(NCC-45152), a mid-series* Renaissance*, theoretically of* Santa Fe *subclass but differing from the inaugural vessel in minor details of reactor system and phaser model only. There were plans on introducing strip-type main armament for the third production batch or* Ukora *subclass, but these came to naught. Instead, ten vessels of the* Santa Fe *batch were refitted with HiBeam Type VII strips in an ultimately unsatisfactory experiment.*

Structurally the vessels were very simple, combining four main components: a pair of LN-74 engines; a complete *Miranda* weapons module including its mounting pylons; a warp core assembly; and a Class 3D standard primary hull. The weapons module and the saucer were off-the-shelf items, at least in theory. The warp core was a custom through-flow design, installed in a shaft opened through the torpedo pod. Its matter tankage was shared with that of the deuterium-deuterium impulse reactors in the saucer, as was the case in other applications of the Class 3D hull. In turn, the antimatter pods, purge systems and plasma expanders were installed at the bottom of the torpedo pod. Main plasma conduits led through the existing trunks in the weapon module pylons, first to two IMRF crystals mounted mid-span, then to the nacelles.

The 290,000 ton LN-74 engine was a modest upgrade of the LN-70, housed in a new, slimmer nacelle design and accommodating somewhat higher plasma loads to give a performance of warp 5 cruising and warp 9.0 top speed. The impulse engines in turn were standard fare, but the edge given by the wide mass reduction field resulted in superb sublight acceleration and maneuverability.

The primary hull weapons berths were filled with nine twin phaser VII assemblies. The dorsal forward berth was used as a simple power socket for the main deflector, a curved Sylvanesti array scaled up from its previous *Scylla* auxiliary application. A Class 1 bridge module was installed behind the deflector, and two intercoolers added behind the bridge to compensate for the somewhat oversized power flows of the heavy phasers. An 'accommodation-oriented' internal layout was chosen, and nearly all the standard porthole options used. Sensors were biased for warp and impulse combat, torpedo guidance and basic deep space and insystem scanning. Little in the way of planetary or stellar survey gear was carried.

As expected, Starfleet was quite satisfied with the end result. The affordable vessel could fill many gaps in the defense networks of the medium range colonization zone, freeing heavier frigate and light cruiser forces to the outer zones. Traffic control and law enforcement duties were not the forte of these vessels, though. The *Renaissances* did have good communications systems (including both the new CSNDR fleet interface and the older CLLT military datalink and Mercatur comm interface) but e.g. lacked proper holding facilities and boarding craft.

A production run of some 298 vessels, enough to replace essentially the entire *Daran*, *Knox* and *Decisive* fleets although barely sufficient for meeting the needs of the expanding theater of operations, was completed in 2339. By that time, the border crises had already prompted some changes both in the mission profile and equipment of the *Renaissances*. The medium range

colonization zone was not under threat in these conflicts. Instead, Starfleet's light forces were assigned to escort shipments, hunt down raiders, and perform SAR duty in the outer colonization zone when the main combatants were spread out and engaged in offensive and defensive battles. The *Renaissances* rose to the challenge by taking aboard extra fuel tanks, long range sensors and extended endurance ASRV lifepods, and heading for deep space. They soon proved more than a match for light Cardassian or Talarian raiders, but were still woefully outclassed by the heavy Cardassian or Tholian combatants.

Another role undertaken by the *Renaissances* in the late 2340s was reconnaissance. The endurance-boosting measures taken earlier also helped the ships penetrate Cardassian space. Their large numbers gave Starfleet good intelligence coverage of Cardassian activities, even if the sensors of the light frigates couldn't provide as much information as those of the recently built modern light cruisers. For the scouting role, the *Renaissances* were ultimately equipped with a wide variety of add-on sensing systems, marring the smooth exterior somewhat but increasing the reconnaissance capabilities of the ships tenfold. In 2353, Starfleet changed the designation of the modified *Renaissance* class (or *Baracus* class, after the first ship modified) from frigate to scoutship.

The reconnaissance modification effected on some of the light frigates in no way reduced their combat prowess. Although USS Centaur *(NCC-42043) here is forced to break off pursuit of a Jem'hadar attack ship as a further trio of these vessels shows up, her aft torpedoes make the enemy formation pay dearly for its interference. Far more maneuverable and affordable than the* Miranda *class, requiring a fraction of the crew yet carrying the same weapon load, the* Renaissance *class was at first hoped to become direct successor to the heavy frigates in all their diverse roles. However, the lack of onboard space led to fundamental inflexibility that significantly narrowed down the mission profile.*

By the end of the active phase of the border wards, the *Baracuses* had matured into powerful intelligence-gathering assets capable of extended deep space operations. In the 2360s, they were deployed mainly on missions of exploration. An important addition to their equipment were two shuttlepods on ventral berths, essential for planetary forays. Survey gear was still rather limited, but the crews were enthusiastic about facing the challenge: aboard the smallest Starfleet ships in deep space exploration duty, chances for promotion and adventure were high indeed.

The Dominion War saw the *Renaissances* mainly taking part in counter-raiding operations. They were the most maneuverable Starfleet combatants in the conflict, save perhaps for the *Chimera* and *Defiant* escorts, and thus worthy adversaries to the Jem'Hadar attack ships. Still, lack of multitargeting capability and limited shield strength meant the *Renaissances* could only take on the Jem'Hadar in one-on-one combat. The marginally clumsier *Sabers* enjoyed better fire control and fared much better in multitarget engagements, basically taking over all frontline roles by 2375.

As of 2376, five dozen *Renaissances* survive in the original patrol vessel or escort configuration, and 48 as scouts. Extreme structural fatigue limits the usefulness of the ships, and Starfleet is eager to substitute *Nova* class multipurpose vessels for this range of duties. The surprising choice for a successor reflects new thinking in patrol starship operations, with a return to predeployment of starships in areas of interest instead of reliance on rapidly redeployable forces. While somewhat lacking in maximum warp speed, the *Nova* corvette derivatives of *Ukora* subclass still outperform the *Renaissances* in almost all other respects, and offer great growth potential as well.

It is expected that the last *Renaissances* will face retirement by 2383 at the very latest.

Mediterranean / Shelley

Medium transport / tug
2332-

Completed:	160 total: 92 *Mediterranean* medium transports/tugs 68 *Shelley* medium transports/tugs/tenders
Length:	174.0 m (*Mediterranean*) 176.4 m (*Shelley*)
Beam:	94.1 m (*Mediterranean*) 92.2 m (*Shelley*)
Height:	38.0 m
Mass:	780,300 tons (*Mediterranean*) 779,000 tons (*Shelley*)
Cruise speed:	W 5
Max. speed:	W 8.8 (*Mediterranean*) W 9.0 (*Shelley*)
Tow speed:	W 6
Endurance:	5 years
Officers:	4
Crew:	37 (*Mediterranean*) 24 (*Shelley*)
Passengers:	1,500 (maximum-capacity pod)
Cargo:	19,000 tons (maximum-capacity pod) 8,100 tons (internal)
Weapons:	5 twin phaser VII emitters on dorsal primary hull 2 light fwd torpedo tubes w/ 20 photorps on secondary hull (Dominion War modification)
Shields:	1-layer globular forcefield Navigational deflector on secondary hull ventral bow Auxiliary navigational deflector on secondary hull dorsal bow
Transporters:	2 GP (6-pad), 2 cargo, 2 pad emergency evacuation (20-pad); Mk VI All ships brought to Mk VII standard after 2363
Auxiliaries:	4 work pods (basic variant) 2 work pods (Dominion War modification)

Ships of historical interest:

USS Curry (NCC-42286), *USS Lalo* (NCC-43837), *USS Malta* (NCC-43971)

SOURCES:	D DS9 (N Encyclopedia) (H own)

Whenever threatened by attacks against supply lines, Starfleet's standard response has been to convoy most supply operations in the direction of the threat, with armed starships for protection. However, the vastness of space also offers safety to lone ships moving along unpredictable routes. Tactically, the greatest need for solo supply deliveries coincides with the greatest risk for cumbersome and easily detected convoys: the extreme front line requires constant logistical support, which is best delivered when and where the enemy least expects it.

This logic drove Logistics Command in the early 24th century to convert the elderly *Miranda (II)* heavy frigates into armed supply ships, with sufficient phaser armament to allow the ships to serve as their own escorts. Starfleet also needed frontline munitions ships as well as cargo and recovery tugs, but the existing designs were quite underarmed for the task. In the post-Khitomer environment, it was difficult to get funding for such projects – even the *Tomed* scare did not help in loosening the purse strings, as a fight against the Romulans would take place well within existing secured supply lines. Also, standard containers were not going to be commercially supported much longer. It was only in 2330 that Logistics Command managed to convince the Commissioner for Starfleet (in this case, Dr. Ishra LaFontaine) to apply for funds for an armed transport/tug to succeed the virtually defenseless *Doppler* and *Dollond* class vessels.

By 2332, the first production prototype for the *Mediterranean* class was completed. The Class 3D primary hull, a saucer familiar from the *Renaissance* frigates and *Scylla* scoutships, was chosen as the basis of a new ship design for the very last time. This now tried and true primary hull was fitted both for accommodation and internal cargo stowage. An inset Class 4 bridge design was chosen, and two computer cores installed; a primary one for the ship herself, and a secondary unit for managing the more complex of the possible external loads.

The main power systems, including fuel tankage and the warp core, were packed into a ventral extension that flared out into a versatile towing fixture. More than a pod, but perhaps less than a second hull, the fixture could grapple the cylindrar cargo containers of the former standard, now bowing out, or a number of modern pods, as well as a broad range of starships and ship components. Both mechanical grapples and tractor beams were available for the task.

The ship and her varying loads were propelled to warp by two LN-64F nacelles – heavy duty, low energy density engines familiar from the *Sydney* transports. The initial pylon arrangement was complex, with the two short but broad, swept struts jutting horizontally from the engineering extension and routing primary power, and two further pylons of L shape going up to the standard ventral attachment points of the Class 3D saucer and carrying secondary power leads. The engines were tilted 90 degrees inward for a maximally malleable field.

After two production runs of 30 + 30 ships to this standard had been finished, 38 further vessels were constructed with a simplified nacelle configuration with vertical pylons connecting the engines directly to the saucer. This required redrawing both primary and secondary power conduits through the primary hull, a move that made eminent sense in terms of structural integrity and protection even if it cost some internal volume and called for extra shielding. In another tradeoff, field malleability made way for warp efficiency in this *Shelley* subclass, which mounted the nacelles upright and concentrated on regular cargo hauling and fleet supply rather than complex recovery ops.

Both variants still shared almost 90% of all systems and structures. Two navigational deflectors were installed at the bow: a light topside emitter (of *Renaissance* standard in the *Shelley*, after a

slimmer TaT system had proved unsatisfactory on the original *Mediterranean*) for cruising without cargo, and a larger ventral bow array (a modest upgrade of the *Scylla* design) for fully loaded flight. Up to four workbees and assorted repair gear were carried in the lower bulge of the fixture. A standard Class 5 impulse drive system was installed, and allowed the sublight towing of virtually all Starfleet ship designs. Warp towing was possible up to a speed of warp 6 and up to the ship size of *Excelsior* class (with various mechanical grappling options, and with tractor beam towing as a secondary option). A limited repair and refueling role could also be imposed on the ships: Starfleet decided to equip nineteen with attachments for special fuel tankage and transfer pods. Also, a number of special pods were constructed to offer hangar space and full support for up to 20 shuttlecraft or tactical craft.

It was very seldom that such pods were deployed aboard the new transports, however. Throughout the thirties and forties, and even after the sparkling of the border crises, the *Mediterraneans* and the *Shelleys* primarily served in their intended supply role, entering the combat zone not to deploy fightercraft but to replenish forward ships and bases. As the Cardassian offensives of 2355 began, the ships were also tasked with recovering wounded combat starships, although again rarely under fire. Starfleet was very satisfied with the vessels, and increased their total combined number to 160, adding 32 *Mediterraneans* and 30 *Shelleys* and introducing minor improvements to the navigation deflector and sensor systems. The CSNDR fleetwide interface system was also introduced for greater communications compatibility.

It would not be until the Dominion invasion that the *Mediterraneans* and the *Shelleys* would be pressed to an active combat role. Large fleet movements in deep space had again become a necessity, and each fleet was supported by at least four medium transports. Fuel, spares and ammunition would be carried by two of the ships, while two would be reserved either for starship recovery or for the carrying of planetary assault hardware. Two types of dedicated troop pods were available, one equipped with medium assault barges and one relying on transporters and external means of planetfall. Predictably, casualties in combat roles were high, especially in assaults against the heavily fortified Cardassian strongholds of the Dominion.

USS Curry *(NCC-42286) tows home the remains of* USS Virginia*, a once-proud* Excelsior *now reduced to a gutted secondary hull. The* Curry *was herself gravely wounded in the battle of D'arras, where 7th Fleet forces were decimated in one of only two failed assaults out of sixteen against Dominion shipyards and depots. Operation Deny Strength preempted a Jem'Hadar escalation that would undoubtedly have crushed the Federation before its defenses were ready. However, it also sapped badly into Starfleet strength and made the admirals overly cautious at a moment when persistence with decisive strikes, no matter how costly, could have drastically shortened the war.*

To enhance the survivability of the *Mediterraneans* and *Shelleys*, Starfleet frontline engineers added makeshift torpedo armament into the towing fixture. Ten-shot magazines were fitted for the compact internal torpedo launchers flanking the bow. Workbee and repair gear capacity was halved to fit in the weapons. As the *Mediterraneans* lacked proper targeting hard- and software, the extra

weapons mostly gave psychological support to the crews. The full *Renaissance*-standard phaser VII armament, however, was a very real tactical asset, and often put to use.

Despite the protective measures, casualty figures soared during the war. Almost a hundred vessels were destroyed or irreparably damaged between 2373 and 2376. Some 30% of the devastating losses were the direct result of Starfleet's reliance on the stealth of single-ship supply runs. The tactic that had worked so well against the Cardassians proved a fatal mistake against the Jem'Hadar: the vastly superior sensor technology of the Dominion allowed the enemy to pick off the single transports with ease throughout the battlefield and to vector in deadly formations of attack ships. By 2375, Starfleet had again been forced to convoy all its supply runs and to add frigate or light cruiser protection.

Some fifty survivors of the two classes currently continue service in a more peaceful and lonesome role. They haul priority cargo in even the remotest parts of the UFP, facing the terrors of the unknown with the transporteers' motto: "After three months, *anything* is better than safe transit".

USS Lalo *living up to the transporteers' motto. The militarized transports seldom spearhead Starfleet's plunge into the unknown, but encounters like this are certainly possible inside the sparsely mapped fringe areas of the Federation.*

2335-2360 - The Restless Borders

The relative peace between the known Alpha Quadrant empires was a delicate equilibrium, a historical oddity that could not exist for long – this was agreed on by all Federation historians. However, the same historians firmly believed that no aggression could ever rise from within the Federation, despite its countless internal differences and multiculturalism. There was therefore no need for a warfleet that could patrol the whole of the Federation. Concentrated defense forces were maintained near the borders of the Empires, and large 'reserves on assignment' could be reassigned from exploration duty and deployed either inward to protect the core worlds or outward to fend off an unpredicted intruder.

This doctrine of mobile defenses, ironically created in the aftermath of the internal troubles of the 2250s and only briefly abandoned during the hawkish years preceding Khitomer peace, was indeed an economically and politically viable system for the first half of the century – perhaps because it was not tested until the 2350s when the fringe interests of the Federation and the Cardassian Union finally conflicted in a bloody way.

The Cardassian War began quite like a classic Starfleet wargame scenario. At first, throughout the early decades of the century, several commercial and exploration ships mysteriously disappeared, just as had happened in the Romulan War which still greatly influenced all Starfleet strategic thinking. The next logical step, that of reconnaissance strikes against outlying Federation colonies and outposts, was taken in 2347-49 when Cardassian forces attacked, bombarded and overran a number of Federation settlements in sectors 21505 and 21506. The Cardassians were already intimately familiar with the Federation through several decades of profoundly insincere peaceful

coexistence, whereas Starfleet intelligence on the Union was severely lacking; here, too, the Romulan crisis was mirrored. Before Cardassian forces could take the final step leading to full-scale war, that of open assaults on key colonies and preemptive strikes against Fleet support installations, Starfleet initiated counteroperations carefully practiced for two centuries.

It was already known that Cardassians held a medium-sized empire somewhere deep in Alpha Quadrant, conquered by rather primitive warp-powered warships and empty promises in the preceding century; now it was realized that this empire was at odds with the expansion and exploration projects of the UFP, and on a rampage to further increase its own territories. To scout out the enemy positions, several scientific expeditions covertly practiced long range scanning and signals intelligence gathering. As these missions proved insufficient, dedicated scoutships were also dispatched, and reconnaissance drones were covertly deployed into Cardassian space.

In contrast, the insertion or drafting of field operatives proved virtually impossible, thanks to the tightly knit, state-controlled society of the Union. Local races sympathetic to the Union, like the Kressari, Klaestron or Xepolites, formed an uncooperative buffer zone between the Union heartland and the UFP core. A crucial breakthrough was later made through first contact with the Yridian League of Trade, an organization of information merchants with detailed if very expensive information on the affairs of the Cardassians and their allies. This also provided the first semi-reliable information channel on the Ferengi and the Breen, the other powerful but enigmatic players in the local field. In the prewar years, however, the Yridians appear to deliberately have shirked from contact with the Federation, possibly to avoid compromising their neutrality.

Even without inside information channels, it soon became evident that the Cardassian military was geared toward a continuing war of conquest to feed its resource-poor core world, and was prepared to assault key Federation colonies including the Minos Korva, Volon, Alpha Solarion and Umoth Nat systems. The obvious immediate strategic goal was to take control of the region of space between Chin'toka and Aldebaran, a sore wound in Cardassian flesh after a prolonged conflict with the Klingon Empire there. With the Federation pushed away, a new path of attack could be opened towards the Klingon heartland, with untold repercussions if the war escalated. Lacking a clear picture of the strength of the threat forces, Starfleet saw no alternative but to move significant defensive forces to these areas of space.

Alarmingly, unrest sparkled in other fronts as well. The Talarians were quick to take advantage of the withdrawal of Starfleet units from their borders, and made their territorial claims known once again. Starfleet was forced to reactivate some mothballed light forces and deploy older ship types to this secondary front until the 2354 showdown at Galen IV. The Tholian Assembly saw a perfect moment to reopen a long-term border dispute; faithful to their uncompromising nature, they opened the discussion with a provocative assault on star station Salem One in the narrow UFP phalanx between Cardassian and Tholian holdings, continuing with strikes against two starbases and six trading posts in the border sectors. The coinciding conflicts left the UFP interior somewhat short of starship reserves, since the ships deployed to the Talarian and Tholian fronts were in general too slow to be rapidly redeployed for core world defense. However, the doctrine of mobile defenses was flexible enough to allow for ingenious rotation of battlefleets, local forces and explorers-in-transit so that the homeworlds were never in real danger of being left alone.

By late 2354, Starfleet had lost half a dozen vessels to what were suspected to be Cardassian forces. But it had also gathered sufficient intelligence to mobilize its forces for retaliation. Despite vocal protests by Cardassian diplomats, Federation Council in March 2355 officially held certain individuals and ships of Cardassian origin but not necessarily associated with the government of the

Cardassian Union responsible for "unprovoked acts of terror and piracy" in connection with the disappearances of UFP vessels and the raids on UFP settlements. The Council authorized a limited Starfleet response of five observer ships to be sent to the region. Cardassia immediately declared war for the intrusion of space claimed by the Union. As the observer ships attempted diplomatic contact, they were attacked and forced to leave Cardassian space. This gave Starfleet a perfect excuse to launch massive counteroffensives against all frontline Cardassian units, with the aim of depriving the Union of forces gathered for attacks on the key Federation colonies.

In the eyes of some, Starfleet was guilty of entrapment and excessive use of force. The disappearances of starships, while statistically frequent enough not to be the result of natural occurrences, might have been due to forces not connected with the Cardassian Union. Only three incidents could be directly connected to Cardassian warships or other forces. And Starfleet had dealt with greater finesse with the Tholian and Talarian border conflicts in the recent past. It appears that a major role was played by Cardassian arrogance that led to a breakdown of diplomatic negotiations, and by Starfleet insecurity in face of multiple simultaneous conflicts. The Admiralty simply dared not risk engaging in a prolonged low-level war on a third front when the possibility of swiftly ending the threat at one stroke did exist.

Most Cardassian ships with their primitive compression-wave phasers weren't actually a major threat to their Starfleet counterparts. But the battles against them were fought far away from the core of the UFP – often, single Federation vessels were caught by surprise attacks. As the war escalated, Cardassian ships also attacked Federation colonies perhaps foolhardily founded in the area. Federation warships sent to the theater soon found out that wargames didn't prepare for everything: while defending planets, Starfleet ships were unable to use their warp speed advantage or torpedo weaponry superiority, and fell prey to the heavy phaser fire of *Akril*, *Regar* and *Galor* class cruisers. Several elderly ships like *Constellations*, and even two *Excelsiors*, were lost in battles against seemingly underpowered adversaries.

There was a definite shortage of affordable defense starships that could operate in the distant theater for extended lengths of time. Fortunately, several next-generation shipbuilding programs reached production phase during the conflict. More of the rapidly aging *Miranda* units were moved to the Cardassian theater to "hold the fort" as the heavy *New Orleans* frigate design was being introduced. Fast and powerful, yet relatively affordable modern scoutships of *Challenger* and later *Rigel* class were also fielded to address severe reconnaissance shortcomings. Older deep space explorers were recalled for combat duty even though it would take several years for the most distant of them to get back to the war zone. Supply ships were convoyed for protection and given frigate or light cruiser escorts. Dedicated armed supply ships were also utilized, some converted from aged *Miranda* frigates. The massive buildup ground the Cardassian offensive to a halt, and at last Starfleet could organize offensive fleets that would hunt down and destroy the main Cardassian forces.

Heavy starships and massive numbers of rapidly produced destroyers finally brought the Cardassians to their knees in late 2359. A vast volume of Cardassian space was carved away, right up to Koralis on the doorstep of Cardassian core regions. Yet the diplomats of the UFP made clear that the Federation never intended to conquer Cardassian space and only wanted to protect the colonies and local systems allied under its aegis. They also skillfully ensured that Romulan assistance to Cardassia was terminated, and a rift of distrust generated between the Cardassians and their potential allies in the highly anti-Federation Miradorn and Tzenkethi regimes.

Even when deprived of its main offensive forces, Cardassia steadfastly refused a peace treaty and fortified its inner systems heavily against Federation attacks. The Union had to give up its ambitious plans to expand further antispinward: the Federation now solidly held all Aldebaran space, including

the symbolically important Raknal system the Klingons had lost in the Betreka conflict. Yet Cardassia still controlled the acquisitions of greatest practical significance, including Bajor, Kora and Chin'toka. Thus, despite the truce, the Union very much remained a strong opponent and a continuing threat to Federation interests in the area.

Only a handful of Cardassian systems or planets were taken by the Federation, and only minimal changes were made to the pre-war border agreements – a region of Cardassian influence still protruded towards the UFP core worlds, even though now cordoned by Starfleet forces. Negotiations aimed at creating a static, easily fortifiable Neutral Zone around the region were making slow progress because of the fact that both sides had established numerous colonies in the volume of space, so intermingled that no practical border surface could be drawn to separate the two sides. Neither side was ready to risk a renewed military conflict over these basically worthless colonies, yet any sort of compromise over the geometry of the border surface would have meant a fatal sign of weakness in the Cardassian negotiation culture. Ultimately, negotiations converged on the solution of enclosing colonies of both sides inside a wide Demilitarized Zone, a region of partially Cardassian, partially UFP space where civilian traffic would be allowed but military presence strictly limited.

No major inventions or technology breakthroughs accompanied this war on the Federation side, although the advanced FN, LF and GN series warp engines were introduced. These designs fought for dominance for a while until settling for a division of labor: Shuvinaaljis' LF would become the favored heavy duty, low performance engine family for Marine and transport vessels, Leeding's GN would propel the high performance deep space types, while Cochrane Warp Dynamics' FN would be used on some medium ship types until bowing out. None of the types would quite attain the near-monopoly status of the CWD LN-64 family of the past century. Nor did the introduction of the technology result in upgrading of existing designs via engine refitting, save for some experiments performed on the *Niagara* class.

On the other hand, the Cardassian military acquired significant new technology when it obtained its first effective antimatter torpedoes and high powered phaser weapons. While reverse-engineering of captured Starfleet and Klingon equipment played a role, Cardassia also received covert technological support directly from the Romulans and indirectly through the Ferengi. Rising rapidly from the dense ranks of second-rate space nuisances to the more exclusive group of UFP arch-enemies, the Cardassians would feature prominently in Alpha Quadrant politics from the 2350s to the mid-2370s.

From a doctrinal viewpoint, the war did not challenge the Federation belief in mobile defenses, nor did it result in restructuring of Starfleet in any major way. However, ground combat was a factor in war for the first time in some two centuries, and Marine tactics and equipment evolved greatly in the conflict. Thus, several Marine assault and transport vessel types are listed in this chapter. This is not to say that such types would have been unknown in other eras, although admittedly they had not been present in such numbers and variety before. The 2340s did represent a boom in construction of special planetary assault ships, compared with the 23rd century where most of the assault support tonnage had come from regular transports of Starfleet or Federation origin.

The following list of starships dating from this period includes not only dedicated warships (even though these vessels officially sport multi-mission equipment), but also exploration, humanitarian and transport designs only indirectly related to the war. This spectrum of ships very well illustrates Starfleet's attitude towards the Cardassian War: despite the fighting at the distant border, the homefront dedicated itself to goals other than mere support of combatants. To outside observers, the war proved that the Federation now could respond to multiple conflicts of varying intensities, from

random provocations to full-scale military offensives, without being significantly overtaxed. This conclusion may have been the most important factor in maintaining the peace between the major powers from the 2350s to the early 2370s.

Decker

Destroyer
2337-

Completed:	240
Length:	287.8 m (FN-15) 288.3 m (GN-20)
Beam:	120.0 m
Height:	30.9 m (FN-15) 52.4 m (GN-20)
Mass:	740,600 tons (FN-15) 380,600 tons (GN-20)
Cruise speed:	W 5 (FN-15) W 6 (GN-20)
Max.speed:	W 9.1
Endurance:	2 years
Officers:	23
Crew:	177
Troops:	100
Weapons:	2 phaser VII strips on dorsal primary hull 2 phaser VII strips on ventral primary hull 1 phaser VII strip on ventral secondary hull 2 fwd medium torpedo tubes w/ 80 photorps on secondary hull bow 1 aft medium torpedo tube w/ 40 photorps on ventral secondary hull
Shields:	Globular forcefield Navigational deflector on secondary hull bow
Laboratories:	1 GP, 1 signal analysis
Transporters:	4 GP (6-pad), 4 assault / emergency evacuation (12-pad); Mk VI All ships brought to Mk VII standard after 2356
Auxiliaries:	4 light shuttles, 2 work pods

Ships of historical interest:

USS Decker (NCC-46000)

SOURCES: (D FASA, redraw by Calvinboygenius of STSTCS, dimensions corrected)
(N FASA)
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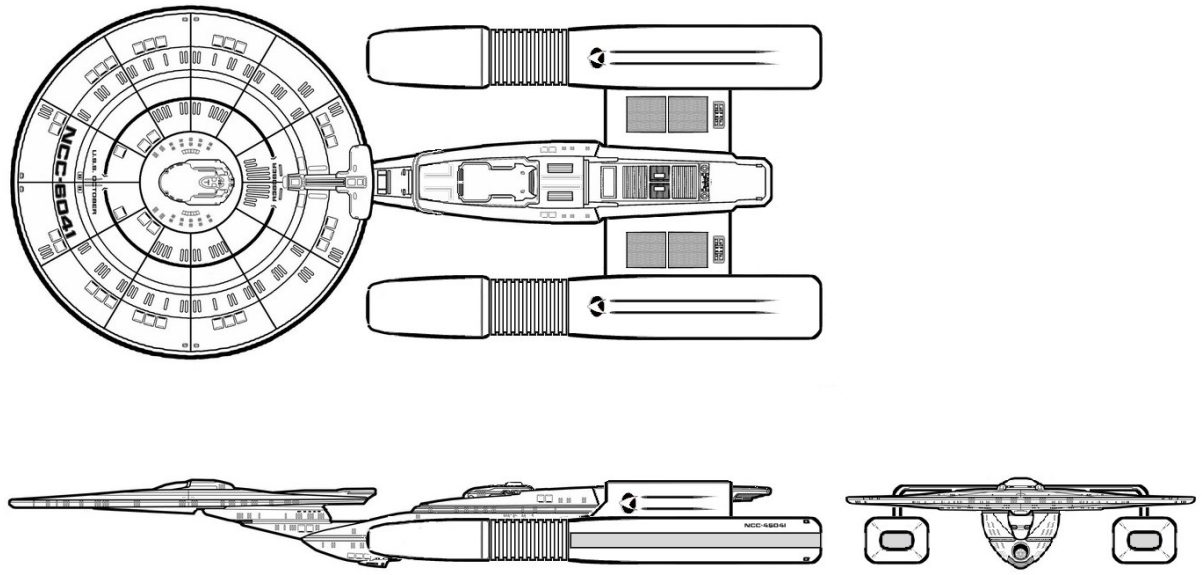


By the 24th century, major improvements in shipbuilding techniques and spaceframe lifetime had changed the basic unit of time in acquisition politics from quartals of a year to quarters of a century. It was not until 2325 that the *Polaris* class of destroyers was declared unsuited for the most demanding deep space missions, and even this was because of the changing definitions of "deep space" and "demanding", not because of growing unavailability of aging units. The next generation of destroyers could be introduced with all due deliberation, not in hasty compensation for the wear-and-tear attrition of the previous generation.

At this juncture, Starfleet was faced with problems of more abstract kind. Capital ships of the "*Excelsior* generation" had simply grown in both size and capabilities, but units of the second tier had evolved in a more complex manner. Modern corvettes, scouts and light frigates represented a broad range of capabilities squeezed into a narrow set of size parameters, and there was a considerable size gap between them and the smallest cruisers. Should modern destroyers try to fit into that gap? Or should they continue to be affordable and austere fighting units in the same size category they had traditionally held, the one now crowded by a multitude of designs? Starfleet pondered, assessed, contemplated, and ultimately decided to go for a design only slightly elevated in relative standing. Yet the technologies introduced for the vessel were groundbreaking in every respect – in practice, they defined the next generation of starships.

The *Decker* class destroyer was built around a moderate 120 m saucer with a tried and true aft ventral keel to hold the main power and warp propulsion systems. This time, these were not mounted directly onto the ventral keel, however. Instead, the engineers attached a large secondary hull to the neck, grafted a *Menahga*-style beavertail to its upper stern, and finally perched the sleek and powerful new FN-15 warp engines on solid, sturdy pylons curving down from the sides of the beavertail. Little beyond two forward torpedo launchers was housed in the neck.

The secondary hull had an oval cross section, with a large undercut aft and a fifteen degree slope to the upper forward end where the hull met the connecting neck. The lower forward end housed the Tar Laya navigational deflector necessary for high warp performance, while the lower aft part sported a rear torpedo launcher, flanked by mine tubes; this equipment was surrounded by lifeboat stations for modern, high capacity evacuation craft. The bottom vertex also held a swiveling tractor beam emitter.

In the upper aft half of the secondary hull, there was ample room for accommodating a contingent of 100 Marines – a reasonable tactical requirement for patrol duty in the deep frontier but somewhat ambitious for a mere destroyer. A hangar for auxiliary craft normally held four light shuttles but could accept larger assault shuttles for Marine use as well. There were three doors in a processing bay atop the hangar, two facing forward for light shuttle operations and a broader one aft for a wider variety of craft. Flush hatches aft of the processing bay gave direct access to cargo and equipment holds beneath. Modern lightweight hull construction techniques made possible this efficient use of available space without jeopardizing primary mission performance; a design from half a century prior would probably have connected the forward elements of the secondary hull to the beavertail with simple booms to save on weight.

All the actual power and warp propulsion machinery resided in the beavertail. A clean separation of the entire propulsive section could be achieved in an emergency, although the option also existed of ejecting just the horizontal warp core and the two primary antimatter tanks. The FN-15 nacelles held 300,000 tons of coils each, bringing the mass of the destroyer level with the cruisers of the previous century despite lightweight hull solutions. At 160 meters of length, even their positioning at the very end of the long arrangement of hulls, extensions and pylons placed their foremost coils in the immediate vicinity of the primary hull. The unprecedented field strengths involved were at first feared to present a health risk, but the separation provided proved sufficient. The long momentum arms did pose problems in impulse maneuvering, but modern construction techniques and materials could cope with whatever stresses the actually attainable maneuvers imposed.

The impulse engines of the *Decker* were positioned in a traditional manner at the aft segment of the primary hull. Very small exhaust grilles were used, vectoring past the thin forward part of the secondary hull if necessary for landing operations; little thrust was otherwise created through exhaust venting, the main propulsive forces coming from the impulse fields. This also assisted with close range stealth, an attribute traditionally lacking in destroyers – and ultimately found superfluous and counterproductive in the *Decker* as well.

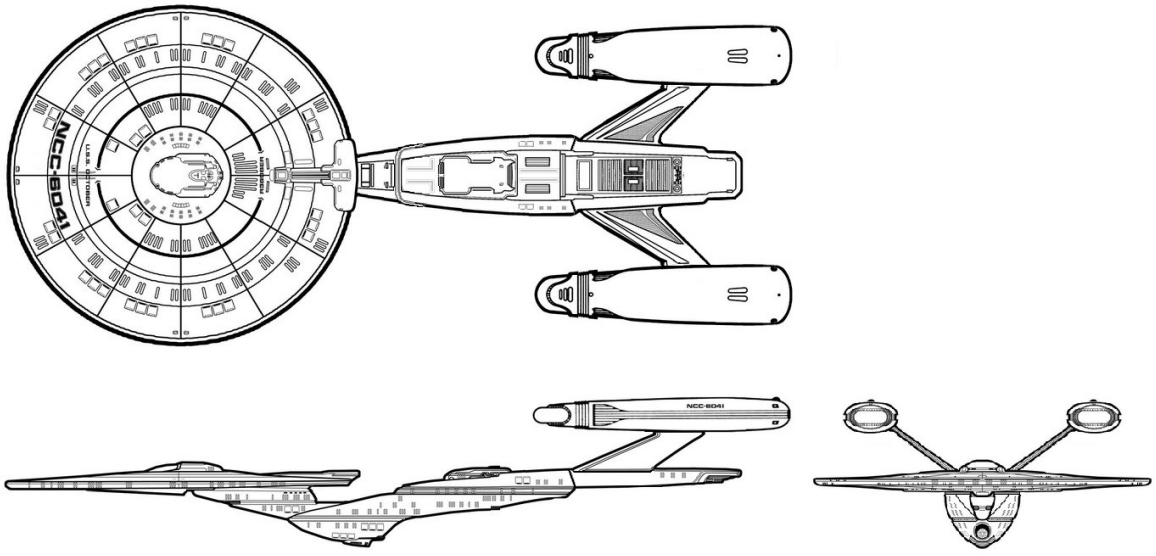
Sneaking around and hoping for a clear and decisive first shot was admittedly a time-honored destroyer and perimeter ship tactic, favored by vessels of high firepower but poor protection. Yet the preferred approach for the lone rangers of the distant frontier was to engage enemy formations from the middle, where the necessarily limited numbers of fighting units could cause the greatest devastation and disruption. To this end, the *Decker* was equipped with the most modern all-aspect weapons available. The trio of torpedo launchers inaugurated the Mk 50 weapons family, while the initially projected arrays of two times eight FH-11 phaser turrets on the primary hull were replaced by very long strip phaser arrays that featured hundreds of independently working emitter segments each, as opposed to the dozens in the *Ambassador* class main phasers. The maximum destructive output of the ship's power system could be channeled through any six emitters, but the most advantageous firing mode involved consecutive stretches of 10-15 emitters all contributing to a single beam, while sharing the duonetoshear and thermal loads. Two very long strips were applied on each saucer surface, curving around the bridge and the lower sensor cluster for some 160 degrees, and one more added to span the ventral hull undercut from port to starboard, at a position roughly opposite the dorsal shuttlebay.

Impulse engine power could be channeled to the phasers if warp power became unavailable or if the warp systems were severed from the spaceframe altogether. There even existed a fighting mode for a separated saucer, albeit at greatly reduced power levels. That such an option was even pondered is good indication of the decisive value of the modern destroyers, though, and of the lengths to which

Starfleet was ready to go to ensure the survival of these expensive units. The piling of backup upon backup paid off handsomely in deep space service, where the destroyers soon established themselves as the most reliable of the new generation of fighting vessels. Both *Springfield* frigates and *Cheyenne* light cruisers suffered from a range of toothing troubles and growing pains, while the smaller and still in many ways more traditional destroyers came to be called "damn fine *Deckers*", both by their crews and by those benefiting from the services of the vessels.

Fielding of a hundred and twenty *Decker* units between 2337 and 2346 was a major show of force for Starfleet, as each unit cost more than four times as much as an *Excelsior* heavy cruiser to complete. A second batch was nevertheless procured as well, and the destroyers began frontline service during the first years of the era of border conflicts with Cardassians, Talarians, Tholians, Tzenkethi and numerous other opponents on the very fringes of the UFP zone of influence. Their high dash speed of warp 9.1 translated to good reaction times in defensive operations, and supported Starfleet's overall doctrinal approach to the border aggressions. Yet the sheer scope of the operational theater, combined with the low production numbers of the type, ultimately made it impractical to deploy the destroyers defensively and reactively. Propulsive endurance suffered from the poor economy of the new monster engines; as Starfleet fielded a range of modern cruiser and frigate designs, it became obvious that the destroyers could not be expected to operate in joint formations with these vessels.

A re-engining was initiated in 2350, with the massive FN-15 replaced by the perhaps more sensible GN-20. At no more than 95 m of length and 120,000 tons of mass apiece, the modern engine pair gave the destroyers markedly higher cruise performance and an even more pronouncedly elongated profile. With more than a quarter million tons of coil mass shaved off, the destroyers also became significantly more agile. New keels were not ordered, however, as the newer *Zodiac* destroyers offered far more affordable firepower for the frontier battlefields.



The engine refit of the 2350s did not cut as much coil mass as the drastic trimming of the nacelles would suggest, since much of the forward volume of FN-15 had been relatively lightweight ramscoop machinery. Still, the major change in silhouette made the Decker *seem even slimmer and more fragile, despite the immense strength of the spaceframe.*

The *Deckers* remained an elite force, the deep space component of a multilevel destroyer fleet. There was little tactical use for any of the components for the time being, however, as most of the frontier conflicts were better solved by timely and decisive visits of individual cruisers and frigates.

Decker formations were mainly deployed against the Cardassians, but any lull in that specific conflict saw the destroyers scattered to frigate-type errands. For such missions, Starfleet would have preferred a more powerful and better protected vessel – a driving criterion in the designing of the ultimate destroyer of the 24th century, the *Freedom* class. As soon as the Cardassians were driven back to their pocket empire, the *Deckers* and the *Zodiacs* reverted to reserves, seeing neither flotilla nor solo action until the Dominion crisis.

Attrition has since claimed one hundred and eleven of the destroyers, and their operational niche has been almost completely taken over by the compact and versatile *Saber* corvettes.

Wellesley

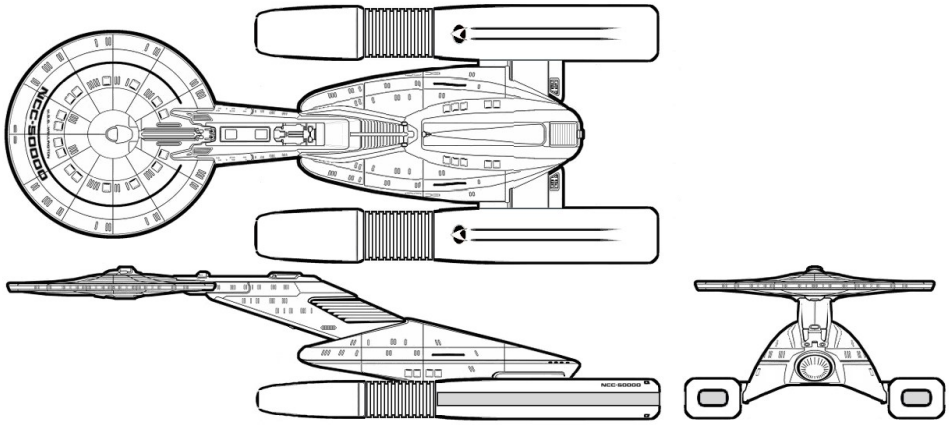
Destroyer
2340-

Completed:	33
Length:	262.0 m
Beam:	102.0 m (FN-15) 81.5 m (GN-20)
Height:	62.0 m (FN-15) 55.0 m (GN-20)
Mass:	789,300 tons (FN-15) 689,000 tons (GN-20)
Cruise speed:	W 5 (FN-15) W 6 (GN-20)
Max.speed:	W 9.0
Endurance:	1 year
Officers:	18
Crew:	157
Weapons:	1 phaser VII strip on dorsal primary hull 1 phaser VII strip on ventral primary hull 2 phaser VI strips on secondary hull upper flanks 2 phaser VI strips on secondary hull lower flanks 2 fwd medium torpedo tubes w/ 40 photorps on connecting neck 1 fwd heavy torpedo tube w/20 plasma torpedoes on connecting neck 2 aft light torpedo tubes w/ 40 photorps on aft ventral secondary hull
Shields:	Globular forcefield Navigational deflector on secondary hull bow
Laboratories:	None
Transporters:	3 GP (6-pad), 2 assault / emergency evacuation (12-pad); Mk VI All ships brought to Mk VII standard after 2356
Auxiliaries:	4 light shuttles, 2 work pods

Ships of historical interest:

USS Wellesley (NCC-50000)

SOURCES:	(D FASA, redraw by Calvinboygenius of STSTCS, dimensions corrected) (N FASA, adjusted to remove overlap with canon ship) (H FASA)

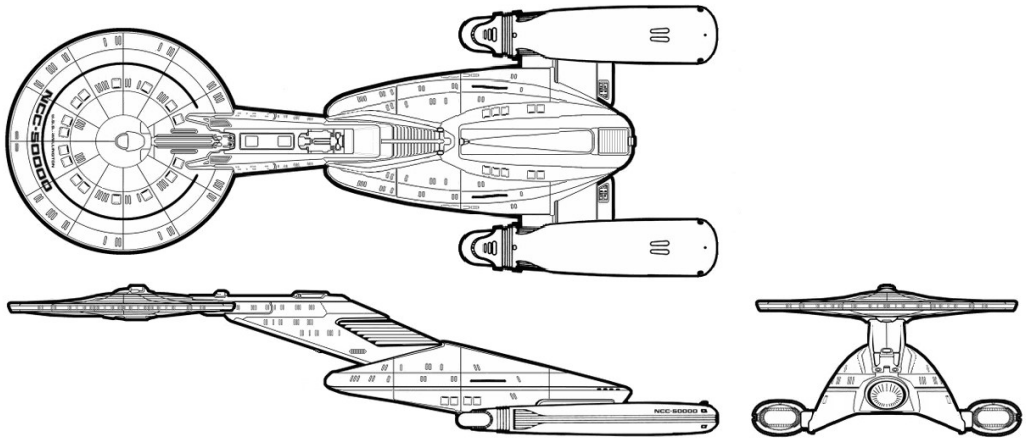


The *Decker* destroyer project was typical of the risky plunges into advanced technology that Starfleet took in the relatively peaceful early decades of the 24th century. As insurance against total failure, Starfleet also opted for a second destroyer design propelled by FN-15. Events would prove the precaution unnecessary, the *Wellesley* class seeing limited production only. This alternate take can still be considered a technological success story, and worth including in this work as an example of a possible but abandoned path of starship aesthetics.

The dimensions of the FN-15 nacelle dictated certain specifics of both destroyers, such as an elongated shape with the saucer far forward. Yet the *Wellesley* seemingly strove to be the opposite of the *Decker* wherever she could. Instead of a 120 m primary hull, the challenger had an extremely compact 85 m saucer perhaps more fitting of an escort vessel. The same advanced Type VII strip phaser armament was fitted nevertheless, but in single-piece rather than two-piece form on each saucer surface. Instead of a slender connecting neck, the *Wellesley* had a sturdy structure accommodating no less than three torpedo launchers, the uppermost being a heavy weapon dedicated to hurling massive plasma wave charges at the enemy. The secondary hull was again an ovoid truncated by slanted cuts, but far beamier and bulkier than the *Decker* equivalent, and this time held the complete warp power system within.

The great FNWD-3a antimatter reactor sat in the upper part of the hull, with a clear ejection path through the aft upper slant cut just above the shuttle hangar door and below the heat exchangers of the neck. The engine nacelles were attached by thick pylons to the sloping lower flanks of the hull, and also held the impulse engine coils and nozzles. At lower bow, a large Abean navigational deflector fired along a centreline cavity, just beneath the lower pair of forward torpedoes. An aft launcher pair below the shuttlebay rounded out the missile armament, while two short phaser strips on the upper outer and lower inner flanks of the hull gave protection in the directions masked from the fire of the main phaser strips.

Crew accommodation to port and starboard of this machinery compensated for the limited volume of the primary hull. Lifepods were provided on inner and outer lower flanks, and on the upper slant. The somewhat more conventional secondary hull layout gave the *Wellesley* an edge in structural integrity and useful volume, but on the other hand brought the majority of the crew closer to the field gradients of the warp engines.



Even in its original FN-15 guise, the Wellesley *was a rare sight in civilized space, with the few dozen units permanently scattered on frontier errands. The up-engined vessels were even fewer in numbers, and contributed relatively little to the Dominion War.*

The *Wellesley* required mariginally less crew than the *Decker*, and did not regularly ship a Marine contingent. On the other hand, the hangar facilities could more comfortably handle additional small craft if the mission called for more than the regular four light auxiliaries. The devastating potential of the heavy plasma torpedo system was balanced against the lesser shield systems of the *Wellesley*, and dictated a slightly different fighting doctrine, having more in common with the destroyer tactics of the previous century. An initial order for 33 *Wellesley* destroyers reflected the desire to field the ships in trios, the combined firepower being deemed sufficient for defeating any known capital ship adversary in a hit-and-run raid.

No further orders were forthcoming after the *Decker* proved a splendid success. Yet much like the favored sibling, the *Wellesley* was pressed to general frontier duty and kept there, the ships and crews running themselves ragged with missions that should rightfully have warranted a starship the caliber of the modern *Springfield* or *New Orleans* frigates. When *Deckers* got an engine refit, the surviving *Wellesleys* followed suite, receiving the GN-20 and the associated waterfowl-like silhouette of a hull grotesquely elongated in comparison with the aft-dangling engine nacelles. A welcome shield upgrade made the ships a credible addition to the inactive reserves, until Dominion weapons technology negated the advantage. On the other hand, the Jem'Hadar were challenged by the installation of a quantum torpedo launcher in place of the heavy Mk 60 forward tube.

Just three *Wellesley* destroyers survived the Dominion confict, and all returned to reserves at its end. The class as such is still considered to remain in active service, Starfleet supporting its peculiar and somewhat antiquated maintenance and supply systems until 2380 at least.

Cheyenne

Light cruiser
2341-

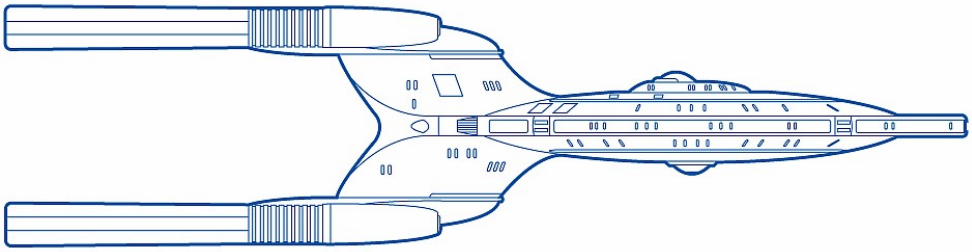
Completed:	60
Length:	300.7 m
Beam:	178.2 m
Height:	170.1 m

Mass:	1,690,000 tons
Officers:	32
Crew:	208 + 150 opt. research crew
Cruise speed:	W 6
Max. speed:	W 9.3
Endurance:	11 years
Weapons:	2 phaser VIII strips, above and below primary hull 4 phaser VIII strips, 1 on each horizontal engine pylon 2 fwd medium torpedo tubes w/ 70 photorps or probes each on vertical pylons
Shields:	1-layer globular forcefield Navigational deflectors on upper and lower pylon junctions Auxiliary navigational deflectors on upper and lower fwd hull
Laboratories:	10, in varying configurations
Transporters:	2 GP (6-pad), 2 emergency evacuation (20-pad), 2 cargo; Mk VII
Auxiliaries:	2 light shuttles, 2 shuttlepods, 4 work pods

Ships of historical interest:

USS Ahwahnee (NCC-73620), *USS Cherokee* (NCC-62292), *USS Kiowa* (NCC-50012)

SOURCES: D TNG
(N Encyclopedia)
(H own)



The 2330s were something of a watershed in UFP policies towards expansion to deep Alpha Quadrant. The double shocks of the Khitomer peace and the renewed Romulan aggressions had shaken Starfleet to the core. The first shock resulted in the cleansing of militant factions from its ranks and abandoning of outdated and bloated military resources; then the second forced the streamlined and modernized exploration force to again assume a defensive stance. By 2340, Starfleet had recovered, and was again able to operate its bifurcated resources of fast and sleek multipurpose and exploration vessels and vastly powerful defensive cruisers in an efficient and productive manner.

Unfortunately, the recovery took place too late to prevent the eruption of unrest all across the Federation borders. Private and commercial exploration and colonization had expanded the UFP sphere of influence dramatically during the golden years, and hundreds of colonies had been established in space not thoroughly explored by Starfleet. Diplomatic relations with local cultures were fragile at best, and no military protection whatsoever could be deployed across the zones of rampant colonization. Predictably, problems started to accumulate, first on the Talarian front, then in the direction of Cardassia.

Starfleet did realize it would eventually have to design, build and deploy large numbers of high speed defense vessels of adequate firepower to respond to the brewing frontierwide crisis. However, for the time being, diplomacy and intelligence gathering would have to suffice in putting out the bushfires. Still, even these missions would require some new starship assets, preferably in the form

of high speed cruisers. If modern ships in this category were not fielded, the obsolescence of the existing scouting cruiser designs (mainly the *Constellation* and *Reigate* classes, plus a smattering of newer *Wambundu* units) would not only endanger Starfleet's local defenses, but its lower-tier exploration operations as well.

An affordable modern light cruiser program, the *Cheyenne* class, soon heralded a fleetwide effort to restore border defense and reconnaissance capability. Salazaar dockyards on Andor swiftly set to work on the basic spaceframe, while the Advanced Starship Design Bureau coordinated the efforts to produce the warp propulsion system that would meet the requirements of the expanded frontier space.

By 2337, the FN-15 warp engine had been certified for use; the first of a projected family of differently sized variants, it was optimized for the *Decker* and *Wellesley* destroyers and needed to be applied in numbers to serve in a true cruiser application. Thanks to advanced materials and new internal containment field configurations, it was capable of taking 240% of the plasma loads of earlier designs. This raw power was to be pumped to the engines by a highly compact bypass-cooled warp core, only 30% larger in overall volume than that of the *Constellation* generation starships. Greater m/am injection volumes and higher-density containment fields provided the power advantage, and inaugurated a new era in powerplant technology overall. By design, the FN series of engines may not have differed all that radically from their predecessors, nor represented the kind of fundamental physics breakthrough the multiphasics did. Compared to the later GN series, they may be considered crude, even primitive. But they did represent the desired significant performance increase that would make border defenses a reality again.

Salazaar's application of the technology followed the principles utilized in the older *Constellation* and *Wambundu* starships. A four-lobe warp field was erected by four of the FN-15 nacelles at the ends of a 'double-T' pylon arrangement, and in front of this was a saucer of new, sleek contours. The two vertical engine support pylons tapered smoothly from the saucer up and down to oblong units that held the deuterium tanks. From these pods, horizontal pylons extended to support the four nacelles; plasma conduits went through the horizontal pylons to the warp coils, and through the vertical pylons to the m/am reaction unit. Each pod also housed an encased navigational deflector system. The vertical pylons each housed a single Mk 58 medium forward torpedo launcher as well.

Crew accommodation was hugely improved over the *Constellations* or *Wambundus*, made possible not only by the larger hull but by the relatively (and absolutely!) lower crew requirements of the modern type as well. Energy economy was also so much improved that the new ship had an operating range nearly doubly that of the *Constellations*, and endurance 30% higher. Still, the newer ships filled the exact operational niche of the 23rd century design – the increased scale of the operational theater 'used up' all of the enhanced performance. It soon became evident that the design was barely meeting these demands. Furthermore, reliability problems with the novel high energy plasma systems meant that some upgrade measures held in reserve for gradually increasing the performance had to be used for ensuring that the original performance could be maintained.

Typical missions of the *Cheyennes* would mirror those of the *Constellations*. Despite the light cruiser designation, the ships would concentrate only on the deep space scouting and exploration aspects of the classic light cruiser mission profile, leaving colonial protection, convoy escort and support missions to a variety of older designs. To this end, the mission equipment consisted of deep space sensors and armament. The latter included two advanced striplike phasers of the potent Type VIII, four pylon-mounted secondary strips, and the two torpedo launchers. There were also

provisions for a variety of mines and sensor and relay buoys, deployed from dedicated stern tubes and racks.

The torpedo launchers were heavily modified from their first clumsy incarnation during the lifetime of the class to allow for the launching of a wide variety of probes, as well as of full-sized Type IV or V photorps. The magazines usually carried 70 torpedo casings and 50 probes, although extension modules were available. The 2361 introduction of Mk 75 launchers enabled bursts of four torpedoes per tube to be fired, doubling the effective rate of fire.

Sensor pallets would be carried both permanently and on a mission-by-mission basis, and laboratories also outfitted to the needs of the mission at hand. Full research crews could easily be accommodated aboard the *Cheyennes*. Up to 60% of main computing power was held in reserve for the needs of the research teams, and data storage capacity rivaled that of explorer-type *Excelsiors*.

While this equipment balance was familiar from the older *Constellations*, just built to the state of the art of the day, there were some major differences as well. Auxiliary craft complement was one such difference, as the *Cheyennes* were sparsely equipped with support craft. Only two light shuttles and two shuttlepods were typically carried, in two minuscule aft bays similar in placement to the *Hokule'a* ones. Despite the cramped facilities, the craft received exceptionally good care thanks to standardized replenishment points and tractor beam mooring systems. Modern Type 6 shuttles were fully compatible with these highly automated bays, and a launch took only six seconds from the beginning of door opening sequence to the doors closing again; a shuttle recovery sequence was similarly efficient, taking about 20 seconds total. Still, the difficulty of manually docking with a *Cheyenne* was a source of endless complaints by shuttle pilots, countered by arguments from engineers that the automation could never fail.

USS Cherokee *in standard orbit. The nacelle arrangement is apparent from this picture, and considered a superb life insurance on long patrol cruises: a* Cheyenne *can theoretically cruise with any two nacelles disabled, albeit at greatly reduced speed. Post-*Cheyenne *members of this generation of starships possess superior engines that supposedly give sufficient reliability and speed even in combinations of one or two nacelles. In any case, such designs avoid the major construction and operating expenses of multi-nacelle configurations.*

Despite the advertised research capacity of the new light cruisers, the "exploratory" missions they initially undertook in both Beta Quadrant and the directions of Cardassia and Tholia were in practice pure subterfuge. Gathering of military data was of crucial importance in protecting the forward colonies. In 2353, the ships saw combat action for the first time. The enemies were not the aggressively posturing Talarians, nor the expansionist Cardassians – instead, Starbase 311 was raided by Tholian forces. The surprise strike apparently was preemptive in nature, based on flawed intelligence concerning UFP weapon development being conducted aboard the lightly defended

installation. Cruisers *Sioux* (NCC-52882) and *Cherokee* (NCC-62292) managed to pursue the raiding party and defeated several Tholian vessels in battle, although the main force fled across the border. Soon thereafter, the Talarians began open attacks as well, and several *Cheyennes* had the unthankful duty of cleaning up after a raid: the ships easily disposed of the retreating attackers, but usually arrived too late to save the crews and inhabitants of the outposts that had been targeted by the raiders.

In the antebellum conflict against Cardassian forces, the ships seldom saw combat. This was mainly because Cardassian military intelligence was far superior to Talarian, and Cardassian hits were timed so that the target was at best protected by system corvettes, at worst completely open to attack. The problem of protecting the expansive spinward flank of the Federation could not be solved by *Cheyenne* class alone, no matter how many of them were built. The principal production run for *Cheyennes* ended in 2350, after just two production batches of fewer than 30 ships each – far too early in the eyes of some.

The crucial factor in ending procurement was the quickly outdated warp engine technology of the vessels. The FN-15 offered very little growth potential, and was only applied on two other classes of starships before being phased out. Cochrane Warp Dynamics had to downscale its operations considerably as a result, and ended up as a subcontractor for Shuvinaaljis' LF-20; many expected the manufacturer to bow out of engine business altogether. Later designs like the *New Orleans* class shared many *Cheyenne* technologies, but relied on a new family of Leeding-built warp engines that would soon permeate throughout the fleet. Many suggested refitting engines of this GN family to the *Cheyennes* as well, in a 1+1 dorsal/ventral configuration, but Starfleet decided otherwise. An all-new design, the *Challenger* class scoutship, was built to this configuration instead.

Retirement of the *Cheyennes* was out of the question, however. Even some old *Mirandas* had to be retained in service to keep Starfleet operational through the tumultuous fifties. By the Dominion crisis, lack of funding for upgrades or even for adequate servicing had rendered the *Cheyennes* almost inoperable in their original deep space scouting and patrol mission. The postwar de-escalation has recently allowed Starfleet to finally decommission many of the antiquated *Miranda* or weathered *Springfield* vessels, but the surviving 45 *Cheyennes* have stepped in on their place and must still soldier on for the time being. It is virtually certain that the *Cheyennes* will not receive any major upgrades, but the projected retirement date has been repeatedly pushed back, and is now set at 2383. Hopefully by that time, the Fleet will be able to tackle the local defense problem without having to tie down its light cruiser resources.

Only two casualty replacements (*USS Quanah Parker*, NCC-71811, and *USS Ahwahnee*, NCC-73620) for the Cheyennes were procured, largely to the original specifications save for minor computing system upgrades. After the completion of these vessels, only six FN-15 nacelles and five sets of coils remain in storage; no further production is planned. The existing stock hardware will be barely sufficient to sustain these vessels and the *Springfield* frigates to the end of their projected lifetimes.

Steamrunner

Strike carrier
2342-

Completed:	299
Length:	355.0 m
Beam:	268.5 m

Height: 60.1 m

Mass: 2,101,200 tons (batches 1-2, w/o auxiliaries)
2,100,300 tons (batch 3, w/o auxiliaries)
2,101,000 tons (batch 4, w/o auxiliaries)

Officers: 89 (pilots not included; normal complement 70 Marine and Starfleet pilots)

Crew: 307

Troops: 650 (batches 1-2)
820 (batch 3)
None (batch 4)

Cruise speed: W 6

Max. speed: W 9.0

Endurance: 4 years

Weapons: 1 phaser VIII strip on dorsal primary hull, ahead of bridge
2 phaser VIII strips on dorsal primary hull, above the ramscoops
1 phaser IX emitter on ventral primary hull bow (batches 1-2)
1 phaser VIII strip on ventral primary hull (batches 3-4)

Shields: 1-layer globular forcefield
Navigational deflector on fwd secondary hull

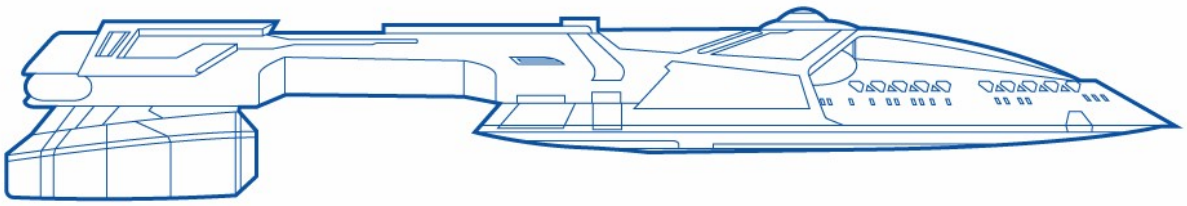
Transporters: 2 GP (6-pad), 4 cargo, 6 evacuation/assault (20-pad); Mk VI (batches 1-2)
All ships brought to Mk VII standard after 2352
2 GP (6-pad), 4 cargo, 8 evacuation/assault (20-pad); Mk VII (batch 3)
4 GP (6-pad), 4 cargo, 4 emergency evacuation (20-pad); Mk VII (batch 4)

Auxiliaries: Up to 50 assault shuttles or interceptors or 25 medium barges

Ships of historical interest:

USS Appalachia (NCC-52136)

SOURCES: D ST:FC
(N Alex Jaeger)
(H own)



By the late 2330s, Starfleet's efforts to polish its public image in the aftermath of the overescalation, abortive coup d'etat and subsequent Khitomer peace were completed. They had gone the full swing from denying all military ambitions to responding to the *Tomed* crisis, and had now reached an equilibrium. An essential element in maintaining the equilibrium was the new policy of designating all fighting vessels as multipurpose starships, and assigning them exploration duties in addition to their military ones.

Ships designed and built at the turn of the century or in its first decades existed in all categories. The fleet of frigates formed the military strongback, the scouts, surveyors and explorers the exploratory one, while various cruisers balanced between the two roles. The need for a medium fighting vessel in the destroyer class was not all that pressing, since the mission of performing crippling attacks against superior enemy capital ships no longer was part of Starfleet's doctrine. In short, despite the age of some designs and lack of numerical strength in some fields, there were no significant gaps in the Starfleet arsenal, nor were there extraneous designs.

A certain category of ships did divide opinions. All the through-deck cruisers had been scrapped soon after Khitomer, and the last big dedicated carriers had been lost in the *Tomed* strike. It was obvious that the huge shuttlebays of the *Ambassador* and *Niagara* explorers could carry just as many shuttles as the through-deck cruisers had lofted, but two organizations were asking for more and cheaper carrier ships. Terraform Command needed support vessels for large-scale terraforming programs, and the Marines were in need of an affordable carrier for their assault craft. Both projects were considered somewhat unfashionable, however, since there had been no obvious demand for terraforming or planetary assaults for quite a while.

Regardless of these considerations, Starfleet of the late 2330s possessed enough shipbuilding capacity to experiment on ship designs even if they weren't sorely needed. There *was* in fact a demand for Marine carriers now that the UFP borders were too huge to be patrolled and planetary takeovers were a distinct possibility; and rapid terraforming *was* becoming more practical with the introduction of controllable protomatter techniques. A proof-of-concept vessel could easily be built to see if she would be of operational worth.

By 2342, such a vessel was ready for test runs out of Spacedock Arcturus. *USS Steamrunner* was a structurally very simple starship, built to commercial standards, with large and robust LF-20 warp nacelles bolted directly onto a semicircular primary hull. The centerline of the hull housed a spacious hangar for up to 50 medium shuttles or assault craft, or 25 assault barges. The bridge sat atop the hangar, with a lower level serving as flight control center and providing a panoramic view of the flight deck through large windows. Crew and Marine accommodation, hospital spaces and cargo holds were spread out on the sides of the hangar. A through-deck capability was provided by two generously sized, side-by-side bow access doors and a wide, single-piece stern door.

In the final stages of the Dominion War, a formation of four Steamrunner *strike carriers and eight* London *troopships hovers over Cardassia IV, disgorging troops to the surface of the former mining colony transformed into a Jem'Hadar breeding facility. Cardassia IV was swiftly captured more or less intact, the Jem'Hadar fortifying inside their facility until ordered to cease hostilities. In contrast, the ground battles at Chin'toka and Kora took a heavy death toll even after the Federation and Klingon troops had attained space superiority in the systems. Almost all Starfleet task forces were forced to include at least one* Steamrunner *in case of unexpected ground operations, even when operating far away from the front lines.*

Main engineering systems were held in a separate engineering hull dangling between the aft ends of the nacelles, offset down to provide an unobstructed approach and departure path for the shuttlecraft. The main deflector was mounted on this secondary hull. Impulse power was provided by separate fusion engines flanking the shuttlebay in the main hull, so a jettisoning of the secondary hull would not completely cripple the ship. Planetfall was a precarious undertaking requiring a careful sliding of the warp nacelles from their mounts and applying heavy IDFs on the shuttles,

barges and cargo before dipping into an atmosphere. Still, the control authority provided by the attached impulse engines made this an operational possibility – to such a degree that the ship was designed to allow for efficient combat disembarking of troops immediately after planetfall! A ramplike surface aft of the stern door would let ground vehicles roll off the main shuttlebay level, while two auxiliary doors in the ramp surface would provide direct access to the vehicle stowage deck below the hangar.

Defensive armament was potent, including three phaser VIII strips on the dorsal hull and one heavy Type IX emitter on the ventral bow. In deep space, the vessel could fight like a cruiser; in planetary orbit, the phaser IX could be used for bombardment while the shuttles disembarked from the safe haven between the nacelles and the secondary hull, or shot out from the bow doors. None of the weapons or navigational deflectors would interfere with shuttle flight paths in any flight modes, a feature superior to the old through-deck cruisers.

Marines immediately endeared themselves to the design, which was a far cry from the clumsy transports of the previous century. However, they took initial exception to the three modern and complex strip phasers, and would have far preferred a more traditional array of paired Type VIII point emitters. Terraform Command considered the strips superfluous in any case, but found many uses for the Type IX emitter in tectonic manipulation.

Nevertheless, production picked up pace slowly. Only twelve vessels were built in the initial batch. A far more aggressive production run started in 2353, in response to the Cardassian threat, and resulted in no less than 82 of the vessels, now classified as strike carriers. A thoroughly remodeled computer and sensor system transformed the ships into full-fledged space combat vessels which required no escort from frigates or cruisers. Despite participating in intense campaigns in the Cardassian and Talarian regions, the class suffered only light losses. Only one assault mission, to Kora in Cardassian space in late 2357, ended in failure, but the sixteen *Steamrunners* were able to retrieve 95% of the remaining surface assault force before retreat.

Some 165 additional vessels were ordered in 2359, towards the end of the active phase of the Cardassian conflict. These featured a noticeably smaller shuttlebay configuration with a split stern door, and correspondingly increased troop accommodation and enlarged supply holds. Forty ships were also completed for command duties, with either an enhanced Surface Operations Command Center or a Theater/Fleet Communications Node. All these vessels omitted the ventral phaser IX and carried a strip-type phaser VIII in its stead.

The ships proved surprisingly resilient to planetary defense fire, although for example *USS Tennessee* was incapacitated for a year when Cardassian surface-to-orbit disruptors breached her shuttlebay and caused a series of internal explosions. In contrast, six ships of the 1st Assault Wing of the 3rd Fleet were lost when defending against the Borg in 2373 – the *Steamrunners* were of poor maneuverability both at warp and at impulse, and easy prey to the Borg lasers.

The *Steamrunners* played a major part in the Dominion conflict in 2373-75. Names like *USS Veracruz* and *USS Grenada* became regular newscast material as planet after planet in Cardassian space was assaulted. While there never was any pretense of 'liberating' these planets from their rulers, Starfleet went to great pains not to antagonize the Cardassian populace any more than necessary. Two minor Cardassian outpost colonies eventually joined the Federation effort in ousting the Dominion from Cardassian space thanks to this policy, although the majority of Cardassian establishments put up heavy resistance even after their Dominion commandants had retreated.

Yet piecemeal conquest of Cardassian territory did little to further the main goal of the war, ousting the Dominion from the Alpha Quadrant. A gradual war of attrition against the superior production methods and capabilities of the Dominion would surely beggar the Federation and the Klingon Empire, leading to phyrric victory at very best. Both UFP and Klingon strategists sought for a decisive fleet battle that would make feasible a subsequent massive strike against Cardassia Prime. While such strategy had miserably failed Earth in the Romulan War, the unique astrography of the war theater did cater for the possibility. Thrice the UFP/Klingon/Romulan alliance amassed attack fleets at Bajor, relying on the unique protection offered by the neighboring Badlands and the powerful masters of the Bajoran wormhole; twice the fleets were disbanded to defend crumbling fronts elsewhere. Finally, a series of hard-won victories forced the enemy to divide its defenses, allowing the third combined fleet assault to proceed on SD 52944. Dozens of *Steamrunners* were expended in space combat, both at the main breach point and in various support missions where primary combatants could not be made available.

The viewpoint of a shuttle pilot on final approach to USS Mount Rushmore *reveals the cavernous dimensions of the shuttlebay. Several assault barges can be seen on the port side, while the line of Type 5 medium shuttlecraft on the starboard side gives an idea of the scale. The wide windows of the flight control center, directly below the navigation bridge, are visible on the ceiling of the bay.*

In the mid-2370s, the *Steamrunner* class is for all practical purposes an outdated starship type. It no longer matches the current adversary designs in space battle, and its engine systems are also rapidly becoming difficult to service and operate. The more versatile *Akira* class of heavy cruisers is currently tasked to augment the *Steamrunner* in the strike carrier role, but Starfleet cannot afford to completely convert to *Akiras*. The surviving 102 modern *Steamrunners* will still form the core of Starfleet planetary assault forces, even though the original concept of unescorted operations no longer is valid.

The older half of the *Steamrunner* fleet remains available as a second-wave assault transport force. However, with diminishing planetary assault commitments, Starfleet has relinquished the most expendable of the *Steamrunner* units to assorted support tasks. Fourteen units of the older batches have been modified to serve as frontline repair and replenishment vessels, two of these in direct support of SCE operations. Four further vessels still retain elements of their wartime conversion to hospital ships. Additional conversion is scheduled, mainly for the terraforming role that for thirty years has eluded the *Steamrunner* class. The exact balance of equipment is yet to be decided, but modern protomatter technologies will no doubt be exploited.

A war memorial of sorts, USS Sloane *(NCC-52843) serves as a depot hull at SB 92 after having been rendered unspaceworthy in uneven space combat on SD 51996. Along with* USS Appalachia *(NCC-52136), the vessel served as impromptu escort to* USS da Vinci *(NCC-81623) in securing a strategic communications node at Phicus. Full accounts of the engagement have not been released, and the survival of the* Sloane *and* da Vinci *(as well as the node) remains a considerable mystery. Speculation on possible Borg technology being carried aboard the strike carriers, both veterans of the Sector 001 battle of 2373, would certainly help explain this incredible feat of arms.*

Yorkshire

Medium transport
2344-

Completed:	338
Length:	321.0 m
Beam:	102.0 m
Height:	43.0 m
Mass:	590,300 tons
Cruise speed:	W 4
Max. speed:	W 8.0
Endurance:	3 years
Officers:	4
Crew:	19 + opt. passenger service personnel
Passengers:	650 (maximum; normally only cargo carried)
Cargo:	64,000 tons (cargo only) 60,000 tons (cargo + 250 passengers) 56,000 tons (cargo + 500 colonists) 24,000 tons (maximum planetary liftoff load)
Weapons:	2 phaser VI strips, on fwd hull dorsal and ventral surfaces (optional) Up to 32 phaser IX emitters in quadruple container mounts (fire support ships)
Shields:	1-layer globular forcefield Navigational deflector on dorsal aft hull
Transporters:	1 GP (6-pad), 2 cargo, 2 emergency evacuation (20-pad); Mk VI
Auxiliaries:	1 cargo shuttle, 1 light shuttle, 2 work pods

Ships of historical interest:

USS Denver (NCC-54927), *USS Galway* (NCC-), *USS Southampton* (NCC-)

SOURCES: (D Armada computer game)
(N Encyclopedia)
(H own)

Created to supplement Starfleet's selection of transports with an intermediate type, the *Yorkshire* medium transports were designed for economical operations with a light crew and greatly varying cargo. The ships were of modular design, featuring an engine package with two midsize nacelles for a medium-performance LF-25 warp engine, two impulse engine units, a dorsal navigational deflector, plus a ventral shuttlebay and its support facilities. Abeam and ahead of this cluster of utilities were up to fourteen cargo pods in two lateral rows, of the smaller standard type carried aboard *Istanbuls*. The pods were attached to a central spine which housed a crane system for handling the modules, a gravitic conveyor for loading and unloading cargo internally, and a

personnel turbolift shaft. Unlike the *Istanbul* spines, the structure in the *Yorkshires* was almost as tall as the ship's end compartments, giving improved structural strength and enabling operations even without attached cargo pods.

The cargo could be brought aboard by two cargo transporters or by a cargo shuttle through the shuttlebay, then repositioned with the help of the conveyor and two onboard workbees; or it could be packed into a cargo pod which would then be docked with the ship. Also, outsize components could be carried by removing some or all of the pods. This flexibility facilitated a wide spectrum of operations.

Forward of the cargo area was a slim habitat and command hull, consisting of a *Steamrunner*-like semicircle which blended near-aerodynamically to the cargo pods. The structure featured the bridge atop; an optional ring of defensive phasers on the next deck down, around officer accommodation; another ring of lifepods surrounding crew quarters and a mess hall/briefing room; a deck dedicated to life support systems and recreation facilities; plus finally a set of takeoff engines and landing gear. Some cabins could be adapted to carry VIP passengers; others could be converted to secure vaults for priority cargo. In an emergency, if warp core or AM pod ejection failed, the engine package could be severed from the rest of the ship, the cargo bays jettisoned, and finally the forward hull propelled away by RCS and dedicated separation engines to act as a lifeboat – a feature shared by many starships but rare in transport vessels.

Unlike the heavy transport ships in Starfleet inventory, the *Yorkshires* had a rudimentary landing capability on planets, even though cargo mass at take-off was rather limited. Landings were an essential part of *Yorkshire* operations, though, since one of the multiple missions of the class was colonization support. While most settler teams relied on small purpose-built colonizers of *Erewhon*, *Osprey* or *Davenport* classes, Starfleet was often called in to move outsize equipment like terraforming or weather control gear; for this purpose, *Istanbuls* were in rather short supply and required ground-to-orbit tugs, but the *Yorkshires* could flexibly carry both the settlers, their supplies and terraforming gear right to the surface of the target planet.

Landing systems were based on the application of a strong SIF and the use of six landing legs, three on the forward hull and three on the aft compartment. Lift engines were provided in six locations. Even under the influence of 1.5 Earth gravities, the ship could land with a full load and deploy it using onboard cranes. The class was in 2356 extensively employed in colony retrieval operations in the Cardassian War zone, and often was asked to lift hundreds of people and hundreds of tons of sensitive Federation technology under combat conditions. The crews of *USS Southampton* and *USS Shreveport* were decorated for valor in retrieving the entire Old Georgia colony while under constant attack by Cardassian mechanized infantry and airborne artillery in SD 37260-37271.

A colony is born. USS Jersey *deploys a weather control package onto the arid surface of what is to become the Maynard's Meadow colony, with settlers and their equipment already scattered around the vessel. In addition to this role in supporting UFP expansion, the* Yorkshires *have helped maintain the existing Federation by performing a variety of cargo services.*

Due to the rather spartan accommodation standards of the typical passenger pods, the ships never really threatened the *Sydney* and *Overfield* starliner versions in frontier passenger traffic, although as many as 650 passengers could be carried on these converted cargo pods for colonization or evacuation missions. In combat role, the ships were often equipped with two to four heavy landing barges, the use of which would present a lesser risk than the planetfall of the entire vessel under enemy fire. This would prevent the carriage of more than six regular cargo pods, however. Less often, six special pods, each with a medium landing barge attached, could be used for troop transport.

Towards the end of the Cardassian War, special fire support pods were also fielded aboard the *Yorkshires*; each held four Type IX point emitters and an antimatter reactor. Mass limitations dictated that a fully armed *Yorkshire* could bring 32 heavy phasers to bear from eight bombardment modules. Targeting was by external data feed, for which a special CSNDR module had to be mounted on the dorsal spine. The weapon system was used for example in support of the second Hakton invasion in 2359, mainly to cover for the lack of heavy starship assets on this secondary theater of operations. The system had no frontline role against defended installations, as it in no way reduced the inherent vulnerability of the transport vessels.

Yorkshire class transports have been popular among Starfleet transport crews because of their good handling capabilities and the relative leeway given for their missions – while the larger transports trundle along preset space lanes like commercial liners, the *Yorkshires* zip through space on Starfleet and civilian errands, traveling from the congested vicinity of Earth to the outer reaches of the Federation. They are expected to be accompanied in 2379 or 2380 by a modern modular medium transport design which is yet to be officially named. Their operational concept faces stiff competition from the non-modular *Sequoia* class of medium transports, however, and Starfleet postwar procurement policy may steer away from cargo pod type vessels altogether.

The ways a medium transport can achieve fame in peacetime are few. In 2362, *USS Galway* self-destructed spectacularly to disperse an apparently malevolent 2-AU-wide spaceborne entity attacking Borealis IV, while *USS Denver* was struck by a Cardassian gravitic mine in 2368, years

after the ending of open hostilities. Both vessels suffered only relatively light casualties, however, thanks to timely evacuation and rescue operations.

Olympic

Troopship/various others
2345-

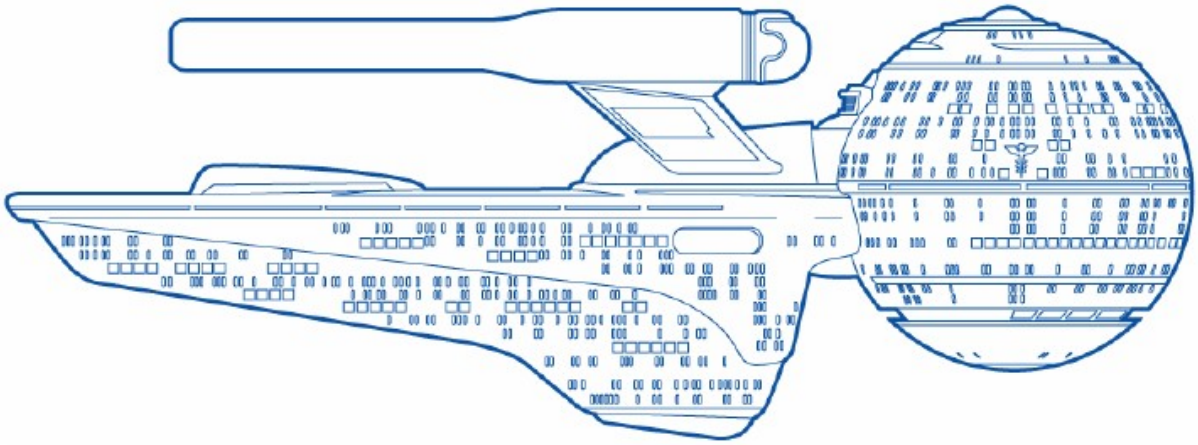
Completed:	202+ total: 108+ *Olympic* troopships 14+ *Forrest* tactical command ships 22+ *Mariette* survey command ships 24+ *Bergen* small craft tenders 18+ *Hope* hospital ships 16+ *Jamestown* medical support ships
Length:	319.8 m (standard) 302.1 m (*Bergen*)
Beam:	101.2 m
Height:	125.6 m
Mass:	1,090,000 tons (*Olympic*) 1,099,800 tons (*Forrest*, *Mariette*) 1,101,200 tons (*Bergen*) 1,095,400 tons (*Hope*) 1,098,000 tons (*Jamestown*)
Cruise speed:	W 5
Max.speed:	W 8.9
Endurance:	3 years
Officers:	18 (*Olympic*, *Bergen*) 16 (*Forrest*, *Mariette*, ship operations) 37 (*Forrest*, command operations) 12 (*Mariette*, command operations) 12 (*Hope*, *Jamestown*, ship operations) 21 (*Hope*, *Jamestown*, medical operations)
Crew:	63 (*Olympic*, *Forrest*, *Mariette*, ship operations) 59 (*Olympic*, troop support operations) 78 (*Forrest*, command operations) 270 (*Mariette*, survey and command operations) 56 (*Bergen*, ship operations) 29 (*Bergen*, maintenance operations) 53 (*Hope*, ship operations) 140-190 (*Hope*, medical operations) 51 (*Jamestown*, ship operations) 120 (*Jamestown,* medical operations*)*
Troops:	1,000 (*Olympic*)
Weapons:	2 phaser VI strips on primary hull
Shields:	Globular forcefield Navigational deflector beam on fwd primary hull
Laboratories:	1-3 GP; none normally installed (*Olympic*, *Bergen*, *Forrest*) 1 GP, 2 planetary sciences (*Mariette*) 1 GP, 3 biomedical (*Hope*) 1 GP, 1 biomedical (*Jamestown*)
Transporters:	4 evacuation/assault (20-pad), 6 cargo; Mk VI (*Olympic*) 2 GP (6-pad), 2 emergency evacuation (20-pad), 1 cargo; Mk VI (*Bergen*, *Forrest*) 4 GP (6-pad), 4 emergency evacuation (20-pad), 1 cargo; Mk VI (*Hope*) 2 GP (6-pad), 4 emergency evacuation (20-pad), 6 cargo; Mk VI (*Jamestown*) All ships brought to Mk VII standard after 2359
Auxiliaries:	5 light shuttles, 4 work pods; bay for 1 medium assault barge (*Olympic*)

3 medium shuttles, 9 work pods (*Bergen*)
4 light shuttles, 6 work pods (*Forrest*)
8 light shuttles, 4 shuttlepods, 6 work pods (*Hope*)
2 heavy shuttles, 4 shuttlepods, 6 work pods (*Jamestown*)

Ships of historical interest:

USS Cantell (NCC-59062), *USS Pasteur* (NCC-58925), *USS Jubilant* (NCC-55789), *USS Nobel* (NCC-55012), *USS Titanic* (NCC-55066)

SOURCES: D TNG
N TNG (Encyclopedia, own)
(H own)



Originally designed as a combined deep space supply and troop transport vessel, the *Olympic* class was an exercise in humility – a simple application of the most recent 24th century technology in an efficient manner. However, the class soon diverged to meet an increasing range of demands, beating even the *Sydney* family in the number of roles assumed. In the era of hyper-flexible multipurpose starships, the existence of six mission-specific subclasses is sign of significant diversity indeed, and the number is likely to grow in the near future.

Response to the 2341 Starfleet call for a support ship for its frontier operations had been swift enough, with re-engined variants of existing Fleet and civilian designs well represented among the bids. However, Starfleet wanted a fresh start, calculating that a ship built with latest SIF advances as the starting point would have a superior hull structure and thus offer superior volume and utilizability. Other new gear would include the most modern transporters, shields and life support systems available.

Despite the declared policy, propulsive systems did not quite enjoy a *tabula rasa* history. The 310,000 ton FN-16 engine was a direct development of the technology introduced in the recent medium combat vessels. High propulsive performance was not a primary design goal; instead, reliability was of paramount importance. The modern coils of the no-frills unit offered extreme durability as long as plasma energy was not pumped up to the levels used in the more military applications. While the nacelle dimensions otherwise remained comparable to FN-15 (the aft half having been lifted from the military engine basically as is albeit rotated ninety degrees), the front half diameter was noticeably increased. Compact Chiralia ramscoops optimized for lower speeds were installed at the front ends, and enlarged manifolds and filters introduced for increased endurance.

Around these Starfleet-defined features, Baltimore Astronautics sculpted the winning bid, mating a gargantuan spherical hull to an engineering and support systems section of simple, boxy construction. The sphere alone would have matched the existing medium transports in cargo capability; the secondary hull added enough volume for the berthing of a thousand troops in conditions that would in no way reduce combat readiness no matter how long the crossing.

Yet, rather than a floating dormitory, the *Olympic* was an independent and potent starship. Basic equipment included a navigational deflector and associated sensors in an instrument crevice on the lower hemisphere of the primary hull, strip phaser arrays near the top and bottom, a situational awareness sensor array on the centerline, and a bridge module at the top. Further sensors for assault operations management plus a tractor beam were located at the secondary hull bottom vertex. The aft end of the secondary hull was dedicated to an assault barge boarding facility, compatible with barges up to TLB-36 size but carrying none on a permanent basis. Submerged into the dorsal surface of the hull was a much more modest shuttle hangar, with room for a handful of shuttlecraft and their support equipment, and with a dorsal space door sporting minimal approach control automation.

Multiple twenty-pad transporters were installed in the main hull around the central core, providing easy access to storage and workshop facilities in addition to serving as troop insertion devices. Extensive crew or troop accommodation was modular in construction and could easily be converted to further storage space. The rest of the hull featured a standard sickbay that was expandable to a combat triage facility, twin galleys and mess halls capable of serving the up to 1,000 onboard troops in three-shift catering, laboratory space for up to three modular research units, and other typical if uniquely configured starship utilities. The secondary hull housed a smallish warp core and deuterium and antideuterium tanks, plus two auxiliary fusion reactors and a secondary computer core, all separated from the rest of the interiors by secure bulkheads and extensively automated. Impulse propulsion was provided by a single narrow-nozzle engine above the primary/secondary hull joint.

The wide Multimodal Docking Adapter was first introduced on starships of *Olympic* class. The adapter features a standard expandable docking collar 3.4 m across, inset into wide cargo doors that measured 6.9 by 24 m in this class. A forcefield envelope can be erected both across the doorway, and between the ship's hull and a docking target up to 40 meters away. Behind the doors lay a spacious airlock and staging area, helpful both in embarkation and disembarkation of troops, and in supply transfer. Most starships built after the 2340s feature this interface, and thus remain backward-compatible with craft and installations dating back almost two centuries, yet can also soft-dock with virtually any other structure imaginable.

An Olympic *looks surprisingly like the ancient* Daedalus *class survey ships, but is more than three times the size and power, and of course optimized for a wholly different mission. The 24-deck primary hull in itself outbulks the whole* Daedalus *design, and even the five deckfuls of lifeboats probably outperform any auxiliary craft carried by the old survey cruisers.*

Only minor alterations were needed to transform the design into a variety of utility purposes: by the time the second *Olympic* class proof-of-concept ship, *USS Atlantic* was fielded, contracts for no fewer than four subvariants were already signed. The derivative designs share practically all the

basic systems of the *Olympics*, which had been built for the very simple basic mission of ferrying of troops and supplies in support of deep space fleet movements. Most of the variants also appear almost identical externally, save for minor details like porthole placement or number of lifeboat hatches. Internal differences are a legion, however, and warrant closer attention.

* * *

Although the request for proposals that resulted in the *Olympic* class troop and supply vessels had been simple and concise, all bidders fluently read between the lines. Clearly, a successor to the *Sydney* class was being sought, in all but the original medium transport role of the class. Conversion of a troopship to a command vessel was a simple enough matter, and the *Forrest* command subtype was quickly fielded to accompany the *Olympics* in missions of planetary assault. Equally easy was the refining of the *Forrest* concept into the *Mariette* survey oversight vessel, just as capable of controlling systemwide survey operations as a full-fledged explorer, yet at a fraction of the expenses. Baltimore had more difficulty meeting the predictable call for a small craft tender. Despite the engineering challenges, the company did not want to settle with delivering barebones *Olympics* for conversion at Starfleet yards. Instead, the *Bergen* tender was completely built at the company yards at Sol V, in close cooperation with leading small craft manufacturers.

Key to the role was a modified stern, where the barge boarding bay gave way to a semi-open docking area where various small craft could be rapidly refueled and replenished. For more involved overhauls and repairs, two pressurized bays were opened into the ventral primary hull. In the prototype, all facilities were equipped with advanced tractor beam control; Starfleet settled for less capable systems in the production models to cut costs and complexity. The extensive overall automation offered by Baltimore was also pared down, and a larger operating crew brought aboard instead. Starfleet chose to extensively cross-train the crew so that there were relatively few maintenance specialists who would not serve as part of the ship operations crew as well; thus, the official figures for 'ship operations crew' actually were lower than for the troopships. Typically, specialists from Starfleet Corps of Engineers would also be present on long or demanding deployments.

A modest initial order called for ten tender vessels. The number was doubled with the loss of colonial bases for small tactical craft, and attrition replacements kept the production line open well into the sixties. No definite plans exist for extended *Bergen* production, yet six more attrition replacements are under construction in the aftermath of the Dominion conflict. The renaissance of tactical craft operations, especially the fielding of thousands of *Kestrel* fightercraft, would seem to warrant a much greater fleet of tender vessels. The cruiser-type motherships, despite their acknowledged versatility, cannot be expected to take on extended repair commitments. Of course, Starfleet may also come up with a design other than the *Bergen* to meet this need.

* * *

Several new ship types emerged or proved themselves as a consequence of the Border Wars. The armed supply ship concept was baptized as old *Mirandas* and moderately newer *Wambundus* fought against Cardassian convoy killers. The *New Orleans* deep space frigate proved to be an excellent weapon against such attacks, as well as in duties of planetary protection, whenever available in sufficient numbers. The modern strike carriers and troop and vehicle transports revitalized Starfleet planetary assault traditions. The large explorers of *Ambassador* and *Niagara* classes had enough teeth to be completely immune to Cardassian attacks, and were soon accompanied by *Nebulas* and *Galaxies*.

In view of the long distances involved, an old ship concept also gained in prestige, although Starfleet had hoped it would never again have to field such a vessel. Early on in the Border Wars, the starship sickbays and colony hospitals had proved insufficient in handling the casualties of total war so far away from UFP medical centers. The necessary response came in 2349 with the launch of a dedicated hospital ship class of modern standard. Called the *Hope* subclass, the vessel featured the voluminous basic design of the *Olympic* class multi-utility ships, yet with mission-specific equipment and alterations both to spaceframe and support systems.

The aft end of the secondary hull of the *Hope* ships was dedicated to reception of incoming patients, mainly through a significantly enlarged shuttlebay housing eight casevac-configured Type 6 shuttlecraft as well as four Type 15 or 16 shuttlepods for delivery of field medics. Shuttle operations support systems were redesigned for the casevac mission, with improved turnaround time despite the greater number of craft in operation. Triage facilities were installed in place of workshops in the upper engineering decks. Turbolifts were redesigned, and a special patient lift tube was run from the shuttlebay and from the MDAs to the primary hull medical facilities. Troop transporters were removed; main six-pad transporters were clustered in the primary hull around the central core of operating rooms. Further medical facilities took up most of the main hull, but their installation necessitated no significant modifications, as internal modules could simply be plugged in.

Phasers were still carried on the primary hull surface. Although they were officially to be used mainly for non-combat purposes, it was again found that the hospital ship status in no way protected these vessels from attacks and atrocities. Combat-strength shields were of course necessary for any starship, and installed without hesitation.

Initially, fourteen ships were constructed to the full hospital ship configuration. Six more were combined hospitals and humanitarian supply ships, featuring half the patient beds of the dedicated hospitals and only two operating rooms instead of six. The space was used for increased-volume cargo holds, two large Mk II industrial-grade replicators, and portable humanitarian aid facilities. In 2356, *USS Cantell* (NCC-59062) of this *Jamestown* medical support subtype was intercepted and boarded by the crew of a Cardassian destroyer, intent on confiscating the medical equipment and communication codes on board. The following battle inside the ship resulted in massive casualties, finally also depriving the hospital ship of all power. The destroyer was in turn deprived of most of her command crew, leaving the aggressor unsure of further course of action, so that *USS Wellington* was able to intercept her and take into custody her remaining crew. Among the consequences of the *Cantell* Incident were thirteen amendments to the Seldonis IV Conventions on war crimes, plus the distribution of hand weapons to the sickbays and other similar areas of all starships for anti-boarding use whenever traversing disputed territory.

After the end of the Cardassian hostilities in 2365, fourteen more hospital vessels and ten humanitarian aid ships were constructed, essentially unaltered from the successful 2350s configuration, and clearance was given for the conversion of four *Miranda* and two *Wambundu* ships to high security medical transports. These vessels formed the frontline component of SF Medical Command forces, serving in areas where *Oberths*, converted civilian ships or field hospitals could not safely be deployed. The *Hopes* and *Jamestowns* saw extensive service in the Klingon Border War of 2372-73, where the medical ship status protected them from direct attacks in most cases – thanks to deepening Starfleet understanding of Klingon codes of honor and the fascinating Klingon interpretation of terms like “non-combatant” or “civilian”.

At the time of the writing, at least nineteen of the medical versions of *Olympic* class ships are under construction, reflecting two primary concerns for the UFP medical services: the need to provide

medical facilities to war-devastated colonies and homeworlds, and a continuing role of humanitarian assistance in the deep Alpha frontier. The ships are usually commanded by people with prior extensive medical training, just as most surveyor captains are first and foremost scientists. Highly automated systems reduce the workload so that the captains can in effect handle the double assignment of commanding their vessels and directing the medical work conducted aboard. The setup lends more credence to the non-combatant status of these ships than the painting of blood-colored Roman torture devices, twisted snakes, roaring lions, bloodied swords or other rather aggressive human symbols of a humanitarian mission on the hull ever would.

* * *

By 2375, some 108 *Olympics*, 28 *Hopes*, 16 *Jamestowns* and two dozen *Bergens* plus fourteen *Forrest* and 22 *Mariette* command ships have been fielded. Following the branching into these mission classes, production of each incarnation of the robust design has proceeded without significant later modifications. Plans exist for expanded variants of the supply/troopship type, but so far the basic design has met all the needs of Logistics Command. Medical Command is equally satisfied with its variants, and has stated its disinterest in developing new hospital ship types until the 25th century.

Springfield

Frigate
2346-

Completed:	68 8 modified into *Pyrenees* mine warfare ships
Length:	324.8 m
Beam:	246.0 m
Height:	52.6 m 63.3 m (w/ ventral weapons modules) 77.8 m (w/ ventral sensor module)
Mass:	920,000 tons 936,000 tons (w/ 2 dorsal weapons modules) 954,400 tons (w/ dorsal booster module) 1,130,000 tons (w/ DSMSS ventral sensor module and dorsal booster module) 1,180,500 tons (w/ FSSA ventral sensor module and dorsal booster module)
Cruise speed:	W 6
Max.speed:	W 9.1 (standard) W 8.9 (w/ ventral subspace scanning array module)
Endurance:	4 years (standard) 9.5 years (w/ dorsal booster module)
Officers:	29 (standard) 34 (sector control mission)
Crew:	187 + opt. 60 research crew (standard) 187 + 20 sensor specialists (sector control mission)
Weapons:	2 phaser VIII strips above and below primary hull 2 phaser VIII strips on nacelle pylons 1 or 2 medium torpedo tubes w/ 80 photorps each in optional weapons modules 250 gravitic mines each in optional weapons modules
Shields:	Globular forcefield Navigational deflector on fwd secondary hull Auxiliary navigational deflector on ventral primary hull
Laboratories:	1 GP, 1 planetary science, 1 signal analysis, 1 astrophysics

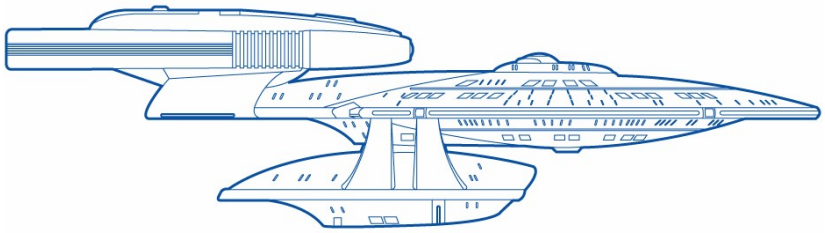
Transporters: 2 GP (6-pad), 2 emergency evacuation (22-pad); Mk VI
All ships brought to Mk VII standard after 2356

Auxiliaries: 1 medium and 2 light shuttles, 6 work pods

Ships of historical interest:

USS Chekov (NCC-57302), *USS Keats* (NCC-57334)

SOURCES: D TNG (FASA *Paine*)
(N Encyclopedia, LUG "Price of Freedom")
(H own)



The worrisome developments of the deep frontier had not caught Starfleet completely by surprise. Ever since the early 2330s, the limited reach and capabilities of the local defense fleet had been generally recognized. Both the superfast scouts and gigantic explorers were eminently unsuited to providing sustained protection for border colonies, and the various heavy cruisers were needed elsewhere. By the end of the 2330s, the new production batches of *Miranda* frigates were already heavily tasked, and the operational lives of the older variants were being extended through compromise-ridden overhauls and refits. A companion to these almost geriatric ships in the light local defense role was clearly needed, preferably one with higher endurance and better cruise performance. In 2340, the decision was made to procure not just one type, but a whole family of starships: at least two frigates, a lighter intermediate modular type and a heavier, more integrated advanced variant; a light cruiser; a heavy cruiser; and eventually, one or two explorer designs.

The program underwent a series of early changes. Initially, the recently developed FN-15 engine was considered the ideal powerplant for the various applications. Also, the lightweight SIF-reinforced saucer of *Cheyenne* class was to be the basis of hull construction. However, experiences gathered from the *Cheyenne* program soon prompted Starfleet to aim higher, and both a new engine design and a new standardized Class 3E primary hull were introduced in 2343. At that time, Starfleet was already committed to FN-15 production, though, with some 40 engine pairs already completed. It thus chose to equip the lower-tier 'FF-M' frigates with this engine type while testing the new GN series in the upper-tier 'FF-I' heavy frigate, building both ships around the new hull.

By 2344, the 'FF-M' program had proceeded to prototyping stage, and acquired a class name – *Springfield* class. The development of SIF-reinforced hulls free of internal bracing was taken to its conclusion in the radically evolved oval saucer. Some 246 meters wide, the saucer sported just seven very spacious decks, not counting a two-deck bridge superstructure. Full modularity of internal components was just one advantage provided by the bracing-free hull; structural strength and flexibility vastly improved the survival odds in case of emergency planetfall, and overall performance was improved thanks to significant mass reduction. Lifepods were efficiently arranged across the surfaces of the hull, and vast numbers of portholes could safely be incorporated into the design for improved crew comfort. Weapon and sensor mounts represented new design philosophies as well. Sensory gear was distributed in pallets on the saucer rim, and main phaser weaponry now consisted of two long segmented Type VIII strips on dorsal and ventral surfaces, providing near-complete coverage at a fraction of the complexity of earlier point-emitter or short-strip arrangements.

Two impulse engines on the saucer aft rim featured spherical, modular fusion chambers almost twice the size of traditional *Constellation* generation units. Between them, the primary hull extended aft in a sleek three-deck structure that tapered towards the stern, while also flaring out into two pylons for the warp engines and one for the attaching of dorsal pods. In addition to housing the heavy-duty primary power generation system, this hull extension also accommodated matter and antimatter tankage, leaving the actual saucer almost completely free for mission gear. The vertical pylon in turn was wide enough to house a reasonably sized shuttlebay, in which three auxiliaries were normally carried.

The FN-15 nacelles were mounted well above saucer level, just as with the pathfinding *Deckers*. The warp field was of the traditional *Miranda* configuration, simply inverted, so the tried and true balance between economy, performance and maneuverability was maintained. Initial test runs in late 2344 verified a cruise speed of warp six and a top speed in excess of warp 9.1, as well as full compliance with maneuverability requirements. Engineers speculated on even better fuel economy and possibly increased top speed if GN series engines were substituted, but the financial reality did not allow for such upgrades at that point.

By the end of 2346, three *Springfields* had been completed. Full mission equipment now included four rather lavishly equipped laboratories, two main computer cores and two engineering subunits, and accommodation for 230 permanent crew plus up to 60 research staff or other specialists. These already impressively low personnel requirements were further reduced by increased automation, so that by 2350, the ships could be operated by as few as 216 crew – a figure smaller than that of 23rd century frigates a third the size! Many seasoned Fleet personnel expressed their doubts on such overt reliance on automation and hypermodern technology in a ship essentially dedicated for combat in conditions where dockyards and other support facilities often would be of low provincial standard. Also, many were anxious to see the ships in frontline service as soon as possible, grieving over the wide gaps in frontier defenses.

By and large, the resources of Starfleet dockyards in post-replicator economy were up to providing the required ships at requested rate, despite the complexity of the technology. Some delays accumulated, however. A podded assembly for Mk 80 rapid-fire medium torpedo launchers was late in development, and first saw service in 2347 aboard the *New Orleans* frigates. Two such pods were intended to be mounted on a *Springfield* against the three of the *New Orleanses*. In practice, the *Springfields* usually ended up carrying an endurance-booster pod instead, to compensate for the limited fuel capacity of the basic hull. This large, angular assembly took up both of the pod attachment points at the end of the dorsal pylon. The booster pod featured both matter and antimatter storage tanks, tripling the fuel capacity. It also housed some nearly cruiser-standard navigation and communication gear necessary on deep space assignments. While the pod drastically increased the endurance and operational range of the frigates, just as specified in the Fleet requirement, it also carried a heavy penalty in maneuverability. In short range operations, the *New Orleans* type pods were vastly preferable.

Some ships were also cleared for the carrying of one of two significantly larger pod assemblies, mounted on a ‘roll bar’ similar to the *Miranda* pod support but in this case carried ventrally. These modules both held a wide selection of long range sensors, one (the DSMSS pod) catering for deep space exploration needs and the other (the FSSA pod) for Fleet surveillance and situational awareness. Both of the large pods presented structural integrity problems, however, limiting both warp and impulse performance, and were rarely carried on standard missions. In practice, certain specific ships from the original, somewhat underperforming batch were chosen to carry the pods semi-permanently, to help coordinate Fleet operations in deep spinward sectors.

Sailing serenely against a nebula backdrop, USS Carchemish *rolls to reveal the FSSA long range scanning pod. The 11 ly scanning range of the unit enables the frigate to coordinate Fleet operations in sector-wide scale, making a border defense flotilla independent of fixed sensor installations or explorer or heavy cruiser sensing capabilities, all of which were in short supply in the border sectors in the 2340s and 2350s. However, the pod also deprives the frigate of some maneuverability, as well as of the ability to carry torpedo pods – the dorsal mounts have to be occupied by the booster pod whenever the sensor pod is carried.*

Another field where construction and procurement was delayed was engineering computer subunits, a rather crucial piece of hardware for the frigates. Their systems integration took longer than predicted; adding to this, the FN-15 warp engines also suffered from some early reliability problems. As the threat of Border Wars began to loom more concretely over Starfleet, *Springfield* production numbers were cut in favor of heavier *New Orleans* units and other designs mounting the newer and more refined GN family warp engines.

Despite being shorthanded by such decisions, and hampered by some growth pains often associated with pathfinder designs, the *Springfield* class still met the expectations Starfleet had placed on it. As later events cut short the entire frigate construction effort, the mere 68 *Springfields* completed out of hundreds planned came to play a relatively important role in local defense missions. Perhaps best remembered are *USS Chekov* (NCC-57302), distinguished in the Wolf 359 battle against the Borg, and *USS Keats* (NCC-57334), defender of the Romulan Neutral Zone in the Heze incident.

As of the mid-2370s, almost half the surviving *Springfields* have been retired from frontline combat service. The nine fleet control modifications surviving of the original group of fourteen are now dedicated solely to their picket missions, and eight frigates have been reconfigured for minelaying and minehunting as the *Pyrenees* subclass. Twelve units are held in reserve, mainly to spare the warp propulsion systems. The early FN-15 engines of all the vessels are nearing the end of their usefulness, both due to wear and tear and because their technology has become obsolete. Most engine spares still available are slated for sustaining *Cheyenne* operations. Weapons pods from *Springfield* vessels are in turn being relegated to units operating *New Orleans* frigates, as are standard sensor pallets and other interchangeable hardware.

New Orleans

Heavy frigate
2347-

Completed:	159 18 modified into *El Dorado* strike frigates
Length:	345.2 m
Beam:	246.0 m

Height:	63.4 m 71.1 m (w/ dorsal and ventral weapons modules) 73.4 m (w/ dorsal assault barges and ventral weapons module)
Mass:	1,250,000 tons 1,274,100 tons (w/ 3 weapons modules) 1,345,300 tons (w/ 2 dorsal assault barges and ventral weapons module)
Cruise speed	W 6
Max.speed	W 9.2
Endurance	13.5 years
Officers:	68
Crew:	285 + opt. 30-100 research crew
Troops:	200 (strike frigate only)
Weapons:	2 phaser VIII strips, above and below primary hull 1 phaser VIII strip on ventral secondary hull (batch 1) 2 phaser VIII strips on ventral secondary hull (batch 2) 1 to 3 heavy torpedo tubes w/ 80 photorps each in optional weapons modules
Shields:	Globular forcefield Navigational deflector on fwd secondary hull Auxiliary navigational deflector on primary hull bow
Laboratories:	2 GP (standard) 2 GP, 1 planetary sciences, 1 astrophysics (typical modular fit on exploration duty)
Transporters:	2 GP (6-pad), 2 emergency evacuation (22-pad); Mk VI All ships brought to Mk VII standard after 2356
Auxiliaries:	1 medium shuttle, 3 shuttlepods, 6 work pods (batch 1) 6 work pods (batch 2) 2 heavy warp assault barges (strike frigate)

Ships of historical interest:

USS City of Corpus Christi (NCC-60666), *USS Rutledge* (NCC-57235), *USS Renegade* (NCC-63102), *USS Sevastopol* (NCC-62445)

SOURCES:	D TNG (N Encyclopedia, LUG “Price of Freedom”) (H own)

In early 2340, simultaneously with the initiation of the *Springfield* program, a decision was made to follow up with an even heavier frigate design roughly analogous to the retired cruisers, heavy cruisers and strike cruisers of the preceding era. Some factions initially advocated fielding the design rapidly and in quantity, to fill in the gaps in colonial defenses. But disappointing reports on the reliability of the FN series warp engines worked against this solution, as did the fact that truly immense numbers of ships would be needed. In the absence of clearly defined immediate external threats, Starfleet decided to invest in research and development of more reliable and capable propulsion systems, so that fewer numbers of ships could respond to frontier crises from across greater distances. In the meantime, the most recent *Miranda* batches would continue service, providing some of the needed numbers – but, alas, nowhere near the needed performance. The onset of hostilities soon committed Starfleet on the path taken.

Long range deployments were becoming an increasingly important part of Starfleet’s defensive mission: the low-intensity conflicts that were common along the borders of any large star empire would now be fought hundreds of lightyears away from the core worlds, necessitating complex logistics and communications arrangements worthy of a high-intensity conflict of the previous century. The demands on ships were similarly increased, so that a 2340s frigate could be nothing short of a 2280s strike cruiser in performance. To ensure quality of design, Starfleet opted for a development period lasting until 2345.

Thanks to the lull of peace in the years dedicated to the groundwork, the ship that emerged from the 'FF-I' program was a remarkably mature design, in many ways different from the parallel, more basic *Springfield* frigates. The essentials of a starship were very neatly packaged into the now-standard Class 3E oval saucer hull 246 m in greater diameter and an engineering section approximately 90 m wide and 220 m long. Type GN-30 energetic-plasma warp coils of Leeding manufacture were installed on streamlined nacelles mounted on aft-swept pylons, and two impulse engine installations were provided on the saucer trailing edge. The miracle in packaging technology was made possible by the use of lightweight materials, extremely compact new impulse systems and a carefully designed warp core that fit into the interhull, leaving the secondary hull free for powerplant monitoring systems, EPS converters and antimatter pods, plus a lightweight deuterium tank of high capacity.

The mission gear was elegant in its simplicity and purposefulness. Two segmented phaser strips of Type VIII were mounted on the saucer, and one strip ventrally just below the navigational deflector (in later models accompanied by another ventral strip farther aft). Apart from that, no fixed weapons were carried. As with the *Springfields*, sensor gear was limited to the essential military sensors and navigational systems plus a rather minimal scientific sensing suite. Two computer cores, one in the saucer and a larger, engineering-dedicated one in the secondary hull, maintained the ship but were relatively unsophisticated for research and analysis purposes.

Comrades in arms share the services of a depot ship at Beloti. The 2353 scene from the Talarian conflict highlights the marked difference in hull size between the Miranda *and* New Orleans *frigates, and gives clear indication as to why the latter enjoy such superior endurance. In contrast, propulsion systems do not markedly differ in dimensions, and the performance differential there is fully attributable to half a century of technological advancement.*

In the first batch of vessels produced, one medium shuttle and three shuttlepods were carried in a small hangarette between the dorsal pod mounts – enough for replenishment and rescue operations but insufficient for exploration. In later vessels, this auxiliary contingent was omitted altogether. The research facilities aboard only included two modest general-purpose laboratories as a standard, although the modular interior made installation of additional laboratories a simple task. Two six-pad transporter units were provided for away team and replenishment use; an extensive network of waveguides and secondary platforms allowed cargo to be distributed efficiently without the need for a greater number of actual transporter units. A full 4 pi coverage without proximity limit was provided for the first time, with two dorsal and two ventral saucer emitters plus two pylon and two ventral secondary hull emitters. Four docking ports were available, comprising two personnel ports in the

saucer and two MDAs in the connecting neck, and a new standard of refueling and replenishment umbilicals was introduced for the spine of the secondary hull, making possible a rapid and efficient link-up with suitably equipped supply ships and tankers as well as with various spacedocks. Tractor beams were installed on secondary hull bow and stern.

As in the earlier heavy frigate classes, external modular mounts were available for special gear. In this newest frigate, officially designated the *New Orleans* class in 2345, there were provisions for three external modules, two atop the saucer and one below the engineering hull. Short range planetary and stellar survey sensors, endurance booster units and relay buoy dispensers were common, but torpedo launchers and minelaying pods were also available. As in the case of the *Mirandas* and *Springfields*, the modules were in practice carried quite permanently, always including at least one and preferably two heavy torpedo pods with Mk 80 launchers. In contrast with the 'FF-M' program, there was no mounting option for a large long range sensor array; the *Springfields* would provide such sensing services for the whole border fleet.

USS New Orleans was launched in early 2346 and quickly excelled in performance tests over the simpler *Springfields*. Efficient RCS systems, a powerful IDF and a wide two-lobe field gave the type excellent maneuverability at speeds ranging from impulse to medium warp. A top speed of warp 9.2 was confirmed, and enabled the frigate to operate farther away from starbases than earlier types. The desired overall endurance of more than 13 years was reached without the need for booster packs. Everything seemed set for successful frontier operations of unpreceded scope.

Initiation of full scale production was certainly still wrought with risks. The rapid-fire torpedo armament, the twin warp engines and the navigational deflector of the *New Orleans* were all test articles for yet improved new classes of major starships. In many respects, the *New Orleans* can actually be seen as a scale model of the upcoming *Galaxy* class of explorers, and a major influence on the design of other classes of the *Galaxy* family. Yet once testing of the inaugural unit was completed, Starfleet waived the need for further test specimen and opted for operational production of two batches of eighty ships of the class, one spaceframe of which was later cancelled.

Two New Orleans *frigates on patrol in the upper atmosphere of a gas giant. While frigates are not landing-capable, they usually have adequate upper-atmospheric flight characteristics, and the* New Orleans *class is no exception to that rule. It is typical for frigates to operate in small formations instead of performing solo patrol.*

The first batch of these frigates got its baptism of fire in the Cardassian War, and succeeded beyond expectations. For example *USS Sevastopol* was soon credited with a solo kill of the Cardassian battle cruiser *Margon* (although admittedly Cardassians used the term battle cruiser liberally, applying it to destroyer- or cruiser-sized vessels with low power compression phasers and no torpedo systems). But despite their speed, agility and shielding, the frigates were far from invulnerable. In 2355, *USS Asurbal*

succumbed to planetary defense disruptor fire while on a reconnaissance mission in Cardassian space. *USS Corpus Christi* was in turn lost in a collision during maneuvers near Ficus Prime in 2356.

To meet the demands of the war theater, Starfleet readily purchased a second batch of vessels, sometimes known as the *Oberon* subclass. Almost a hundred and twenty ships in total had thus been completed when the Borg came rampaging through the Federation in 2366; *USS Kyushu* and *USS Alexandria* were destroyed at Wolf 359. These relatively light losses did not necessitate a redesign of the ships or a reformulation of their operating procedures. Due to the special needs of the Cardassian front, however, eighteen vessels beginning with *USS El Dorado* were modified for high speed planetary assault, their upper pod berths permanently converted to attachment points for two TBA-38 heavy warp-capable landing barges.

After the emergence of the Dominion threat and the lessening of tensions between the Federation and the weakened Romulan empire, the frigates were moved to the Cardassian border – only to be redeployed closer to Earth when tensions with the Klingons heightened. In the ensuing action known as the Klingon Border War, the class suffered heavy casualties as the ships were forced to engage in one-on-three combat against Klingon Birds of Prey, or to singlehandedly fight delaying actions against planetary assault squadrons. As many as 26 out of 151 were lost or incapacitated in the war, forcing Starfleet to largely rely on older types in the following Dominion conflict. This was apparently a Dominion goal in masterminding the conflict: orders for targeting the most modern starships specifically were later traced back to General Martok – that is, to the Founder impersonating him in early 2374.

The tumultuous military situation of the 2370s seems to ensure the continuing Starfleet support to dedicated military ships of frigate class, but the time of the *New Orleanses* is largely over. Their fate was sealed not by inferiority of design, but by a combination of high costs, horrendous combat losses and the need for Starfleet to recover from the Dominion War as rapidly as possible. Five of the remaining *New Orleanses* were lost in the Dominion assaults on carefully besieged and isolated Benzar, nine in the massacre of Starfleet's most prided 7th Fleet. Nineteen of the frigates perished in the prolonged and costly battles over Chin'toka, until finally only a small force of 64 was left in operational condition.

The surviving units continue service with upgraded torpedo armament and warp pollution prevention systems, and a quantum torpedo pod has been designed and produced in small numbers for select units. But no new keels will be laid to replace combat losses, and partially incapacitated vessels are being scavenged for spare parts instead of being repaired. In face of the acute turn to the worse in frigate availability due to the war losses, Starfleet has resigned to the fact that the local defense role of the frigate starships no longer exists. In fact, the use of a separate frigate designation has been questioned now that the missions and capabilities required of these designs completely overlap with those of light cruisers, vessels of similar size.

Piper / Hogan

Tug / tender
2347-

Completed:	149 total: 80 *Piper* 69 *Hogan*
Length:	125.4 m (*Piper*) 119.8 m (*Hogan*)

Beam:	47.0 m
Height:	31.4 m (*Piper*) 31.6 m (*Hogan*)
Mass:	430,000 tons (*Piper*) 360,000 tons (*Hogan*)
Cruise speed:	W 6
Max.speed:	W 8.9 (*Piper*) W 9.0 (*Hogan*)
Tow speed:	W 5
Endurance	4.5 years
Officers:	5
Crew:	15
Weapons:	None
Shields:	Globular forcefield Navigational deflector on ventral bow
Laboratories:	None
Transporters:	1 GP (6-pad), 2 cargo/emergency evacuation (12-pad); Mk VI All ships brought to Mk VII standard after 2358
Auxiliaries:	6 to 8 work pods

Ships of historical interest:

USS Piper (NCC-55326)

SOURCES: (D Armada computer game)
(N LUG)
(H own)

Despite the successes of the *Deckers*, *Springfields* and *Cheyennes*, Starfleet in the late 2340s believed that Leeding's GN series of warp engines should be the one to pan out as "the LN of the 24th century". The FN was considered little more than a marketing gimmick from the has-been Cochrane Warp Dynamics. Therefore, when Kloratis in 2346 requested a pair of modern engines for its medium recovery tug and tender project, there were opposite forces in action: a Fleet desire to standardize for GN, and a simultaneous pressure to shove the FN project to some practical if secondary use. As both Starfleet and CWD felt the latter pressure, it was no surprise that Kloratis soon received an offer for a very affordable FN-17 engine package.

At 105 m effective length but 200,000 tons of coil mass, the FN-17 nacelle was a clumsy solution for propelling medium starships. However, this robust system was ideal for tugship applications, capable of taking a wide range of power input up to and including the sort needed for towing heavy cruisers. The nacelle had the typical FN thin, rectangular cross section, but featured an integrated plasma reheater bulging out from the middle. The sturdy outer construction allowed mounting in every conceivable manner; the one chosen by Kloratis was a broad, triangular pylon jutting from the upper forward surface and connecting to a tiny spade hull just 47 meters wide and 60 meters long.

The slim hull housed the bare minimum of gear needed for towing another starship. There were two Firaura Class 5 impulse engines on the trailing edge, with a Class 1 tractor beam in between. Forward and outboard of the engines, there were two dorsal openings for work pod hangars / cargo holds. On centerline, the hull was topped by a bridge that featured panoramic windows for situational awareness during close-quarters repair operations, and direct access to space via a rear-facing airlock assembly. The forward half of the hull was dedicated to habitation and associated amenities, with ten lifeboats on the upper deck and crew quarters on the rim of the next, and with communal spaces and support facilities in the middle. The lower deck mainly contained workshops and auxiliary systems, including a deflector array. Main power production was almost completely contained in the nacelles, with just the antimatter pods and prime dilithium foci in the lower hull, and deuterium tankage in the pylons. The bulk of the power came from secondary intermix in the reheaters, an automated arrangement of somewhat poor serviceability.

In the middle of a wartime convoy, these three Piper *tugs appear humble indeed in comparison with their older* Mediterranean *sisters – or even with their seemingly oversized loads of standard containers. Tractor beam handling of such cargo was not as perilious as it seems here, but nevertheless was rarely practiced. Yet towing of assorted supplies or fuel was just as routine for the versatile* Pipers *as recovery of wounded starships.*

Seemingly short on elegance and efficiency, and lacking in physical stature as well, the tuglet was in fact a power tool of unprecedented practicability. Omission of mechanical grapples and expansive onboard workshops heralded the new technologies of improved tractor beams and versatile replicators. Automation on all aspects of tugship operations allowed for a compact crew to sail the compact ship: there were just five officers and 15 crew aboard, living in relative comfort. Expert systems and robotics allowed the ship to perform useful repair and tender duties as well. Indeed, a typical towing assignment might be cut short thanks to efficient underway repairs effected by the towing vessel.

In 2347, as the completion of *USS Piper* (NX-55326) was nearing, such capabilities were still speculative and perhaps difficult to swallow. Inertia of tradition was understandably strong among those used to the more muscular *Ptolemy* or *Mediterranean* philosophy of towing and repair. That changed as the giant cargo carrier *USS Nullarbor* was distressed near Arcturus. A rescue mission was mounted by vessels available at the dockyards, and the Kloratis testbed vessel had the honor of towing the *Nullarbor* to port, after rapidly rigging the carrier's own tractor beams to fill in for the systems still missing from the tug. Aboard to observe was Rear Admiral Tasak from Logistics Command. That very day, the admiral decided to withdraw his support from the projected giant conventional tugship intended for securing the return of damaged explorers (an acute problem if these ships were going to be pressed to combat duty in the near future). Instead, Tasak saw the potential in the Kloratis testbed, and within a week had created a strong support group for procurement of some hundred and fifty of the smaller tugs.

Four months of final testing completed, the ship got her first operational mission, delivering an entire spare nacelle to *USS Horatio*, in time for the explorer to be repaired for a demanding mission to the Breen border. Further testing of the tug was postponed as she entered a long period of refurbishing. In the meantime, the first 'proper' *Piper* class vessel, *USS Manada* (NCC-55401) had already been completed. This ship was rated for warp 6 cruising, warp 8.9 dash speed and warp 5 towing, and was shielded to Class Four defensive standard. There was no provision for more than a token armament, and none was ultimately installed.

As predicted, the success of the GN series of engines quickly spelled the end of the clumsier FN technology. Starfleet briefly approached Leeding for compact GN nacelles for the ongoing *Piper* construction, but no suitable model was available at the time. Instead, Shuvinaaljis wedged in with LF-25, which was installed on fifty vessels to shave off about 70,000 tons of coil mass, yielding the slightly shorter and marginally faster *Hogan* subclass. Simultaneous construction and operation of FN-17 –propelled *Pipers* continued, however.

By the mid-fifties, Starfleet operated 80 of the *Pipers* and 50 *Hogans*, mainly in heavy-duty starship recovery and resupply missions in the Cardassian combat zone. Some of the earliest units were soon relegated to priority cargo towing, however, as the late fifties saw Starfleet ordering a further nineteen tugs. Specifically equipped for extending their warp fields further, these vessels were the only ones capable of efficiently warp-towing a *Nebula* or *Galaxy* class explorer, and proved quite handy in moving starbase components as well. The earlier vessels were refitted with the required field manipulation coils and software as dockyard resources permitted.

After the end of Cardassian hostilities, this refitting was aborted, but an impulse engine overhaul initiated instead. The vessels served with distinction in mundane supply roles as well as in deep space recovery and construction duty. One vessel was even transferred to the SCE for the latter task.

The daunting task of warp-towing a Galaxy *class explorer falls on the broad shoulders of* USS Bradshaw *(NCC-55920) as* USS Trident *hands over the paralyzed starship* Excalibur. *The* Excalibur*, nearly torn apart by powerful noncorporeal entities near Danter in late 2377, was the first* Galaxy *to require such services; typically, it is both a matter of pride and a harsh operational necessity for* Galaxy *captains to get their ships warpborne independently of tugship services.*

Currently, 142 *Pipers* remain in service, the Dominion War having claimed five vessels and everyday wear and tear a further two. In face of the dwindling FN-17 maintenance resources, engine refits to LF-25, GN-45 or other modern standard are in the planning. Despite the limited top speed that curtails some fleet operations, the *Pipers* continue to fully meet Starfleet recovery tug requirements. They are supposed to soldier on until the 2400s.

London

Troop transport
2348-

Completed:	262 total: 80 *London* 182 *Whitewater*
Length:	288.0 m (*London*) 300.6 m (*Whitewater*)
Beam:	102.0 m
Height:	45.2 m
Mass:	619,900 tons (*London*) 632,000 tons (*Whitewater*)
Officers:	19 (*London*) 17 (*Whitewater*)
Crew:	42 (*London*) 44 (*Whitewater*)
Troops:	750 (*London* maximum load) 900 (*Whitewater* maximum load)
Cruise speed:	W 6
Max. speed:	W 8.5 (*London*) W 9.0 (*Whitewater*)
Endurance:	2 years
Weapons:	2 phaser VI strips on dorsal midhull (optional) 2 phaser VI strips on ventral midhull (optional)
Shields:	1-layer globular forcefield Navigational deflector on dorsal bow
Transporters:	1 GP (6-pad), 4 cargo, 8 evacuation/assault (20-pad); Mk VI All ships brought to Mk VII standard after 2352
Auxiliaries:	Up to 8 assault barges (*London*) Up to 10 assault barges (*Whitewater*)

Ships of historical interest:

USS London (NCC-58136)

SOURCES: (D Birth of the Federation computer game)
(N Birth of the Federation computer game)
(H own)

The initial transgressions of Cardassian forces in 2347 were immediately identified by the Federation as preludes to a future conquest campaign. With the modern frigate and cruiser procurement still in its early stages, Starfleet realized it would most probably have to accept the initial falling of some frontier worlds to Cardassian hands when this campaign started in earnest. And this meant surface combat if the planets were to be retaken.

There wasn't an officer in Starfleet who did not dread this form of combat. Unlike starships, ground troops did not enjoy the protection of advanced shielding technology. While a starship's shields would recover as soon as weapons fire on them ceased, no infantry-level shield yet devised could withstand a direct hit from anything bigger than a disruptor rifle without degrading or collapsing permanently. Shields up to platoon size were strictly anti-shrapnel, anti-projectile devices, generally of little worth against energy weapons in a dynamic battlefield situation. Unless precision orbital bombardment could silence all enemy fire, massive casualties would accompany every ground operation.

Combat visuals from the planetary battlefields of the Dominion War are plentiful and cover the whole range of violence achievable by humanoids. This bayonet fight amidst wreckage of ambushed ground combat vehicles, with orbital bombardment leveling the hills on the background in hopes of silencing the transporter jammers that prevent withdrawal, graphically illustrates the position of infantry in the 24th century: with the help of the most modern technology, combat has once again been brought down to the most basic level.

Standard doctrine called for avoidance of ground combat and use of siege tactics if conquest of a planet was deemed a necessity. But this doctrine had been formulated with the implicit assumption that Starfleet seldom would need to conquer new planets. Retaking of UFP worlds would require a swift ground invasion and a minimum amount of orbital bombardment if anything of worth was to be recaptured intact. The only practical solution was to deliver as many troops to the surface as possible, as safely and rapidly as possible, to compensate for the horrendous casualties in the combat itself.

How to deliver troops? Assault shuttles could be carried by standard starships, but more efficiently aboard the big *Steamrunners*, whose cavernous loading bays would better allow vehicles and equipment to be loaded. Transporters could also be used once the landing zone could be cleared of shields and jammers, and pattern enhancers and beacons deployed either by troops or drones. After establishing these first beachheads, ships from orbit could pump down troops. But this would be slow and tedious work; so as not to tie down combat starship resources, the bulk of manpower and machinery to be taken down should be handled by dedicated troop and equipment transports.

So what Starfleet now needed was large numbers of transport ships for the second assault wave. The bottleneck would be movement from orbit to surface. Ships in the second wave should still move their cargo as rapidly as possible to minimize exposure to enemy fire; yet landing entire transports was risky, and using transporters and small shuttles far too slow *and* risky. The

intermediate solution was to employ heavy landing barges, larger than the ones carried by *Steamrunners*. The TLB-36 80-person and TLB-40 120-person as well as VLB series vehicle-carrying barges were rapidly developed to augment the TLB-12 barges of the *Steamrunners*. Standardized in their docking interfaces, the larger barges could be stacked to transport ships in required combinations.

Using the *Yorkshire* medium transports as a rough basis, Starfleet designed and constructed two proof-of-concept vessels, *USS London* and *USS Red Creek*, during 2348. The ships utilized a strengthened midsection, with the spine widened into a single load-bearing habitat hull that had eight lateral docking berths for large troop or vehicle barges or containers. The bow section was still a semicircle, but lacked the aerodynamic grace of the *Yorkshire* bows, investing instead on heavy armoring. Propulsion systems were completely reworked to feature two FN-25A engines, giving a total length of 288 meters. Also, lifeboat rows and berths for defensive phasers were added amidships. Landing capability was still retained, although safe liftoff would normally have required leaving the barges or other external loads behind. The ships were seldom called to perform planetfall. Instead, it was typical for them to carry a mixture of four cargo pods and four barges, and to ferry the contents of the former down using the latter.

By 2355 and the onset of actual planetary assault operations, 58 *Londons* had been constructed and more were emerging from the shipyards. Starfleet now opted for an up-engined design sporting two FN-25D nacelles, capable of sustaining warp 9.0 and staying apace with *Steamrunners* and modern frigates; this increased the tactical value of the ships immensely, even though there still was no intention of risking them on first-wave operations. Troop-carrying capacity was also increased by stretching the midhull by one docking berth pair or 22.6 meters, as well as by decreasing accommodation standards.

At the end of the active phase of the Cardassian War, some 80 *Londons* and 176 of the improved *Whitewaters* had been constructed, and a total of 37 ships lost. Six casualty replacements were finished but immediately placed in storage. Only 50 of the vessels were kept active in peacetime, dedicated mostly to colonization missions and general commerce. Reactivations in the Klingon Border War cost Starfleet fifteen more vessels and some 6,500 personnel – but casualties in the Dominion War far exceeded these, with 42 ships lost and 24,900 personnel killed before they could even reach their designated battlefields. Heavy escorts usually secured safe passage for the ships in interstellar space, so most succumbed to planetary defense fire during final approach to the target planets.

An 'operational convoy' of personnel, vehicle and munitions transports approaches Chin'toka, a seemingly bottomless sink of troops and equipment. Despite constant patrols and sweeps, Dominion mines and suicide runs took their toll on such convoys till the very end of the struggle over the system. USS Cedar Rapids *(NCC-58157) on the forefront is a veteran of thirteen such missions, as evidenced by the charring and denting on her hull. She would go on to survive two more convoys before hitting one mine too many.The sturdiness of* London *construction compares graphically with the sleeker lines of the two* Yorkshires *in the convoy.*

The *Londons*, *Whitewaters*, *Steamrunners* and *Yorkshires* represent an aspect of Starfleet that all may not have an easy time thinking about. More than the heaviest of cruisers, more than the deadliest of destroyers, the troop transport brings the concept of war into the word "warship". Each ship represents hundreds if not thousands of lives deliberately heading for mortal danger. Still, the Starfleet approach at least requires a first wave of assault to silence the ground defenses long enough for the troops to be deployed – the preferred Klingon way is for the ground warriors to ride into the battle aboard first-line Birds of Prey.

Despite increasing interest in Starfleet on small starships capable of planetary landings, SF Marines have no intention of converting to the riskier Klingon method of planetary assault in the near future. However, major changes in the political theater have made it very likely for Starfleet and Klingons to fight side by side in future conflicts as well. This in mind, doctrines have been developed wherein planetary assault would be performed jointly, with Klingon beachhead forces securing the landing sites for massed Starfleet troop disembarkation. The *Londons* and *Whitewaters* are expected to continue service at least until the turn of the century, as the primary Starfleet types in the joint operations. Supplementary types may be introduced in the 2380s, possibly combining the roles of the strike carrier and the troop transport, but design work on these vessels will not be started until a full analysis of Dominion War experiences is completed.

Challenger

Scout cruiser
2349-

Completed:	89
Length:	369.9 m
Beam:	246.0 m
Height:	104.3 m
Mass:	2,820,000 tons (batch 1) 2,940,000 tons (batch 2)
Cruise speed:	W 7
Max. speed:	W 9.5
Endurance:	12 years
Officers:	34
Crew:	119+ 50-60 opt. research crew
Weapons:	2 phaser VIII strips on dorsal primary hull 2 phaser VIII strips on ventral primary hull 2 phaser VI strips on aft dorsal primary hull (batch 2) 2 phaser VI strips on aft dorsal primary hull (batch 2) 1 aft medium torpedo tube w/ 130 photorps and 80 probes (batch 2)
Shields:	1-layer globular forcefield Navigational deflector on dorsal pylon Auxiliary navigational deflector on primary hull bow
Laboratories:	4 GP, 4 planetary sciences, 2 biology, 1 linguistics, 2 astrophysics, 2 cartography, 3 medical

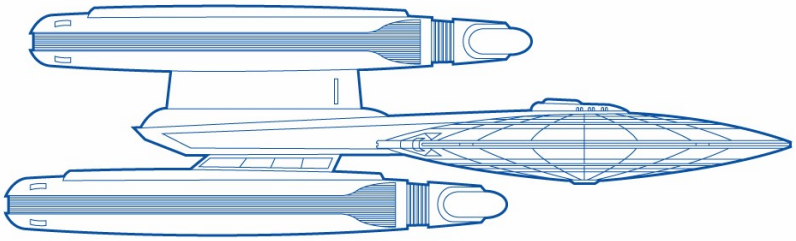
Transporters: 4 GP (6-pad), 2 emergency evacuation (22-pad), 2 cargo; Mk VI
All ships brought to Mk VII standard after 2359

Auxiliaries: 4 medium shuttles, 4 shuttlepods, 4 work pods (batch 1)
1 medium shuttle, 2 shuttlepods, 4 work pods (batch 2)

Ships of historical interest:

USS Armstrong (NCC-57537), *USS Bethesda* (NCC-57569), *USS Buran* (NCC-57580), *USS Marignano* (NCC-57921), *USS Washington* (NCC-57936)

SOURCES: D TNG
(N Encyclopedia)
(H own)



Developing a working warp engine is a huge task involving years of detailed simulations and experimentation. But once a coil configuration has been created, a warp engine is a surprisingly malleable piece of technology. Field geometry can be altered within broad parameters, and ships of significantly varying shapes can thus be propelled by the same nacelle type. However, warp engines can seldom be satisfactorily sized up or down without extensive recomputations. Starfleet had never successfully scaled up the popular LN-64, for example: the originally transwarp-optimized Koeller-Üti nacelle family had usurped the place of the heavy LN-65 design.

Understandably, early 24th century engineers dreaded the prospect of having to downscale the *Ambassador* or *Niagara* engines or upscale the FN-15 to meet Fleet medium combatant and explorer propulsion needs. Yet the days of the LN series and classic CWD engineering solutions were clearly over: the sort of energy densities used in the modern power systems were not compatible with the constraints placed on coil dimensions by those nacelles. And the very ship category to be replaced next was the one utilizing just this outmoded type of warp engineering.

Despite representing high standards of shipbuilding, the older light and medium cruisers were still essentially based on outdated concepts of warp physics, and featured materials and engineering solutions that would not have allowed the installation of powerful yet heavy *Ambassador* warp engines. In practice, the inability to upgrade the cruiser engines meant that Starfleet suffered from an actual cruiser shortage in many operational theaters. As discussed, border patrolling was becoming virtually impossible – the policy of not annexing all explored space meant that the shape of the Federation diverged significantly from the ideal sphere, drastically increasing the surface area of UFP borders. Even following the gradual speed increases in the frigate fleet, Starfleet would be able to intercept attacks only after they had penetrated the border.

Yet what was the border but a line drawn in space? The true threshold was not the political boundary. What mattered was the distance at which the enemy could be detected, its intentions divined and its movements predicted. And this distance could be pushed much deeper into foreign or unexplored space by fielding fast scouts that would find out what lay *beyond* the final frontier.

The mathematics of the situation were unyielding: the minimum cruise speed for effective scouting forces in 2345 was warp seven on the new scale. Slower ships would spend too much time in transit to be cost-effective in frontline reconnaissance. Dash speed was irrelevant to the argument – only

sustainable speed mattered. This ruled out the *Scylla* scouts and all slower designs. And the one theoretically acceptable type, the recently fielded *Cheyenne* class scouting cruiser, was only barely meeting the criteria due to her clumsy quadruple FN-15 engines. Starfleet thus set the following requirements for a next-generation deep space reconnaissance starship: a cruise speed of warp 7, a top speed exceeding warp 9.2, a minimum endurance of seven years, and full research and exploration capacity including advanced analysis computers and capacious shuttlecraft facilities. Defensive strength could be bargained on to keep the construction and operating costs down.

The ASDB set to work in 2346. It soon became evident that simple reengining of an existing scout design would not be worth the while. A significantly larger spaceframe was required to ensure endurance and adequate research and analysis facilities. Adapting the *Cheyenne* might have been an option. However, shuttle support requirements alone would necessitate adding a proper secondary hull, which would also be needed for housing the decreed additional fuel and larger powerplant. It was eventually decided that the intermediate *Cheyenne* primary hull design that still featured many 23rd century engineering solutions would have to go. An expanded version of the *New Orleans* and *Springfield* saucers was chosen instead.

The Class 3E1 saucer in its final form, approved in January 2347, was configured for four primary roles: as a habitat for most of the 153 permanent crew; as a research center with eighteen laboratories, two computer cores and a broad spectrum of palletized sensors; as a command facility for both ship-specific and fleet intelligence gathering and processing operations; and as an impulse spacecraft capable of emergency planetfall or extended relativistic transit. Two twin full-length phaser VIII strips, installed in place of the single strips of the frigates, provided directed-energy firepower at a reasonable cost, and made possible the kind of aggressive reconnaissance mission profiles that preceding 24th century scouts had not been capable of. Still, combat engagements were assumed to be rare events for the ships, as their missions were characterized by speed and stealth.

Save for the impulse engines, all engineering functions were centralized in the secondary hull in a classic manner. The upper levels were dedicated to a very large single-piece deuterium tank, the lower ones to antimatter pods. The core was horizontally positioned and could be ejected aft from a hatch between cargo hold doors, but otherwise relatively conservative in design. Support facilities flanked the centerline engineering assemblies; outermost of all was a rim of lateral short range sensors. In the initial 42 of the ships, a cruiser-style shuttlebay for four medium craft and a number of smaller auxiliaries took up most of the space astern. In the later vessels, this bay was omitted to give room for an aft torpedo launcher, a Mk 51 self-defense weapon found necessary through combat experience. Four short phaser VI strips were also added near the primary and secondary hull interface. Two *New Orleans* –style hangarettes were installed on the primary hull to compensate, but their crampedness was matched only by their awkward placement. In practice, the latter-batch scoutships never operated full contingents of exploration auxiliaries.

Overall, the construction and configuration of the hulls and the powerplant represented a standard application of mundane technologies. The true strength and *raison d'etré* for the new scoutship were her two GN-41 warp nacelles, based on the *New Orleans* GN-30 units but significantly scaled up to what were in practice cruiser dimensions. With fourteen heavy coils apiece and with twin ramscoops, and at 1,200,000 tons of nominal mass, the engines were mounted on two pylons – one branching up from atop the deuterium tank bulge, and one extending down. The configuration, familiar mainly from the *Ticonderoga* scout cruisers a century prior, provided the extreme structural robustness required for the huge engines. It also facilitated an elegant and efficient warp field shape for a top speed of warp 9.5, far in excess of the capabilities of the preceding scouts. The spacious upper pylon also housed an impressive cluster of long range sensors, the principal mission gear of the vessel.

The main downside of the vertically stacked nacelle configuration was a decrease in warp maneuverability, perhaps not as pronounced as with single-nacelle designs but certainly significant in close combat. And combat awaited the scout cruisers, almost straight from the start of series production initiated in 2350. During the Cardassian conflict, the *Challenger* and her rather hastily fielded sisters could easily avoid warp dogfights, and the captains trained on older reconnaissance vessels like *Scyllas* or the small *Renaissances* took to these long-distance, safe-clearance tactics naturally. The superior speed of the *Challengers* guaranteed easy victories over Cardassian pursuit vessels both large and small. But the lack of torpedo firepower meant that the *Challengers* could not readily fight back from their position of safety.

In joint operations with more maneuverable frigates, the new ships did provide a meaningful defensive deterrent with their multiple phasers. In the Cardassian conflict, the safety of an outlying colony often hinged on the timely arrival of high speed interception forces, and such forces out of necessity usually consisted primarily of *New Orleanses* and *Challengers*. Pitted against a Cardassian raiding or planetary assault flotilla, the fast frigates and scouts would fight in medium range / short range pairs, covering up for the design weaknesses of each other. In deep space, both ship types would take part in fleet action, the scouts designating targets for the frigates to herd in and for the cruiser forces to finish. In many ways, the interaction was reminiscent of the unity of late 23rd century fleets, despite the fact that a more diverse set of goals and means now reigned over Starfleet operations and ship procurement.

A humble memorial in space. USS Buran *(NCC-57580) distinguished herself in the battle of Wolf 359, fighting a point-blank phaser battle for almost thirty minutes against the Borg cube. Ultimately, the* Buran *was lost in a daring but failed warp ramming maneuver that terminated in one of the powerful tractor beams of the cube. The twisted hulk of the ship was deemed both unsalvageable and unsuitable for preserving in the Fleet Museum, and towed to Qualor II surplus yards like so many other Wolf 359 victims. This second-batch scout still fared better than her first-batch sister* USS Stafford *(NCC-57531), gutted by internal explosions and fires after a crippling hit to the stern shuttlebay. None of the 163 people aboard survived.*

The success in the Cardassian campaign did not continue into the tragic Klingon-Federation war of 2372-73. Misled by Founder infiltrators, Klingons advanced in the Archanis front and hunted down local defenses, concentrating especially on modern starships. Isolated *Challengers* were seldom able to defend themselves against flocks of Birds of Prey. Still, the conflict gave birth to heroic stories. *USS Armstrong* (NCC-57537) and *USS Bethesda* (NCC-57569) excelled in blockade running and insertion of Marines into planets heavily besieged by Klingon forces. *USS Washington* (NCC-57936) fought a valiant battle against a *Vor'cha* and her two support Birds of Prey in defense of Cobalt Gate, a vital waypoint for evacuation of military equipment and personnel from the soon-to-be-lost Archanis sector. The completely outgunned *Washington* held on for six hours, warp-strafing the superior enemy and retreating again, until the arrival of two *Excelsiors* forced the attack cruiser to fall back to a position within Klingon-held space. This enabled Starfleet to withdraw with

practically zero logistical losses, and few of the sensitive systems had to be destroyed in place. After the truce, civilian evacuation was let to proceed unhindered, a testament to the changing attitudes of the Klingon empire.

In long range reconnaissance duty, the *Challengers* were a success story rivaling that of the *Constellations*. Experienced crews and commanders were often transferred to *Challengers* from the aging reconnaissance cruisers, or from the small *Renaissance* scouts, so that their expertise could be used for leading edge exploration and intelligence gathering. Nevertheless, the deep space exploration role played by the *Challengers* never approached the fame of preceding cruiser and succeeding explorer designs. As the multiple conflicts tied down and wore down Starfleet's forces, it grew more and more timid of sending smallish and poorly defended vessels beyond the established UFP borders. From the defensive standpoint, the limited phaser coverage and warp maneuverability of the *Challengers* were a fatal combination when the ships lacked the torpedo weaponry needed for standoff combat. For exploration purposes, the ships were admittedly diminutive in comparison with the explorer classes that emerged soon after them. Still, it has to be remembered that Starfleet never intended for the *Challengers* to compete with these ship classes: the reconnaissance mission is a highly specialized one, and the decision to build a specialized vessel for it has proven correct many times over.

Eighty-nine *Challengers* were ordered in all. Fifty-five of the ships are still in service, four of them recovering from severe damage suffered in the Dominion War. The next generation of starships features the *Griffin* and *Intrepid* classes of light cruisers in the vital reconnaissance role, but their production pace has been kept moderate and their assignments diverse, thanks to the continuing availability of *Challengers* and the somewhat newer *Rigel* scouts. All the surviving *Challengers* are expected to go on serving alongside their stablemates of *New Orleans* design generation well into the 2390s – and very possibly beyond.

Korolev

Heavy surveyor
2352-

Completed:	12
Length:	310.0 m
Beam:	190.0 m
Height:	44.2 m 123.1 m (w/ ventral pod)
Mass:	938,000 tons 960,000 tons (w/ ventral pod)
Cruise speed:	W 6
Max.speed:	W 8.9
Endurance	6 years
Officers:	24
Crew:	195
Weapons:	2 phaser VI strips on main hull forward flanks
Shields:	Globular forcefield Navigational deflector on forward hull bow Auxiliary navigational deflector on ventral pod
Laboratories:	6-10, in varying configurations

Transporters: 4 GP (6-pad), 2 emergency evacuation (22-pad), 4 cargo; Mk VI
All ships brought to Mk VII standard after 2358

Auxiliaries: 4 medium shuttles, 2 shuttlepods, 2 work pods; special environment craft sometimes carried on NCC-59387

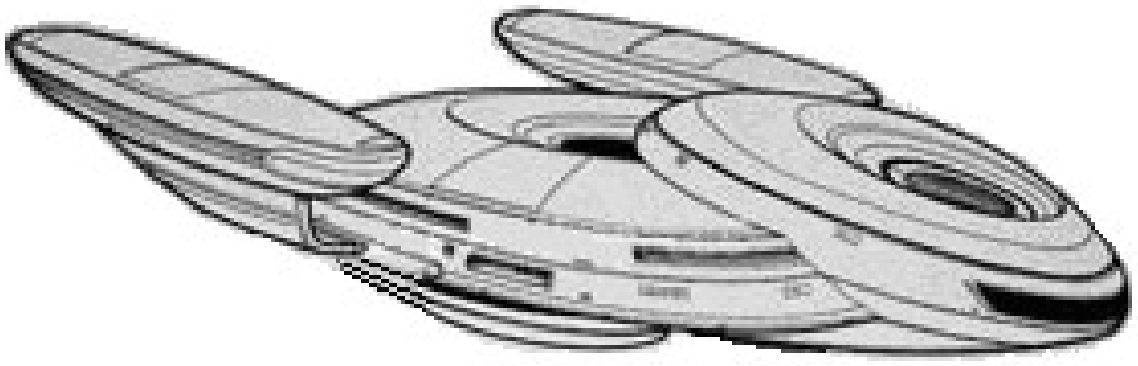
Ships of historical interest:

USS Qian Xuesen (NCC-59943)

SOURCES: (D Jim Martin VOY study drawing)
N TNG
(H LUG, own)

As Starfleet's strategic focus gradually moved towards the frontier theater of operations, the organization found its survey forces left behind. The modern *Oberth* variants from *Sagan* subclass onwards were capable of warp 6 cruising, but they severely lacked in endurance. By the 2340s, significant support forces had to be deployed to keep a deep space survey going: consumables and equipment had to be ferried to the forward-deployed *Oberths*, crew rotation had to be arranged, and communications and tactical protection established. The tenders and supply ships of the Fleet were spread unacceptably thin already, and the first signs of aggression from the Cardassian Union tied down all frontier combatants for the time being.

Starfleet had little choice but to send out special heavy surveyors that would feature support capabilities as well. Some 'mother hen' vessels could be drafted from the aging *Miranda* fleet, but these were far from ideal for the application (and far better suited for certain other pressing frontier needs). The New Athens creators of the original *Oberth* design had a different solution in mind. In 2346, they sketched a growth version of their venerable surveyor, propelled by cruiser-standard warp engines and reaching an operating mass of nearly a million tons. The design was mulled over for two years, then accepted for limited production under the class name *Korolev*.



The Korolev *is no combatant even when unburdened by the ventral scanning pod, as this ambush at Valo readily attests. Blind spots in phaser coverage make it hard for this relatively slow vessel to effect an escape, although* USS Sarabhai *(NCC-58912) did manage to shake off the Cardassian pursuit by a judicious use of vented deuterium.*

Four years were required to transform the non-critical project to duranium reality. Four hulls were constructed side by side, each with two WF-13 warp engines on lateral, upsweeping pylons and a Firaura Class 4 impulse system in the lower stern of the ovoid, nine-deck main hull. At upper bow, another narrow ovoid intersected the main body, providing the ship with a separate command section that added three more decks' worth of total height and integrated the main navigational deflector to its extreme bow. The end result aesthetically somewhat resembled a rounded and smoothed *Aerie* surveyor, yet in gigantic scale – total length for the vessel was 310 meters. The generous dimensions translated to increased capabilities overall: the *Korolev* (NX-59387) was able to carry 219 crew, up to a hundred researchers or passengers and some 8,000 tons of cargo at warp 8.9 to targets several years

and thousands of lightyears away, or support independent survey operations for the better part of a decade.

It also took Starfleet some time to develop practicable operating procedures for the massive vessel. While the three sister ships from the first batch immediately sailed out on missions of survey logistics support, extensive testing was performed on the *Korolev* herself to find out the best possible combination of equipment and personnel for independent research tasks. A ventral pod was devised to house a large subspace scanning array, similar in concept to the ones built for the *Springfield* class but optimized for studying astronomical phenomena rather than tracking spacecraft. Medium rather than light shuttlecraft were shipped in the stern bay, and some internal rearranging was performed on the prototype ship to allow the embarking of special environment research craft.

As soon as the initial batch vacated the Centauri dockyards, another was laid down and orders confirmed for a third. A consistent naming policy honoring Earth's spaceflight pioneers was extended to the class, despite the protests of those who had been assured such cultural myopia would be limited to the survey ships of *Oberth* class only. This time, emphasis was on the figurative fathers of assorted national space programs, perhaps befitting the 'mother hen' role save for the gender bias. The more relevant controversies on policy concerned the manner in which these vessels were deployed in frontier space. The loss of *USS Qian Xuesen* (NCC-59943) in 2353 to suspected Cardassian forces launched heated debates on either up-arming these vulnerable vessels, or then redeploying them on theaters of low risk (such as there existed at the time). Yet no such steps were taken, and the eleven active vessels continued research and support work throughout the Border Wars under the largely theoretical protection of Starfleet combat units.

In the 2370s, the *Korolev* class remains a viable type for survey and support alike. Yet propulsive technology has evolved past the original solutions, and Starfleet has seen no point in constructing further units for the class. Engine upgrades have so far been limited to adding four more reaction chambers to the impulse assembly, as part of a preplanned overall improvement to secondary power systems. The WF-13 might be replaced with a more capable system eventually, and studies have been carried out on installing more phaser strips and adding modular torpedo launchers. In practice, the class is unlikely to continue an independent deep space research career, and will probably be mainly employed as a support asset for the *Nova* surveyor fleet for the next 40-50 years.

Zodiac / Rigel

Light destroyer / scout
2351-

Completed:	166 total: 106 *Zodiac* destroyers 60 *Rigel* scouts
Length:	215.3 m
Beam:	206.0 m
Height:	43.2 m
Mass:	922,000 tons (*Zodiac*) 931,000 tons (*Rigel*)
Officers:	29 (*Zodiac*) 27 (*Rigel*)
Crew:	197 (*Zodiac*) 178 (*Rigel*)

Cruise speed: W 5

Max. speed: W 9.2

Endurance: 4 years

Weapons:
2 phaser VII strips on dorsal primary hull
2 phaser VII strips on ventral primary hull
1 phaser VII strip on secondary hull stern
1 fwd medium torpedo tube w/ 50 photorps on connecting neck
1 aft medium torpedo tube w/25 photorps on connecting neck
5 phaser IX strips on dorsal aft secondary hull (not in *Rigel*, NCC-62098)
5 phaser IX strips on ventral aft secondary hull (not in *Rigel*, NCC-62098)

Shields:
1-layer globular forcefield
Navigational deflector on secondary hull bow

Laboratories: 1 GP

Transporters: 2 GP (6-pad), 2 emergency evacuation (18-pad), 2 cargo; Mk VII

Auxiliaries: 2 light shuttles, 2 shuttlepods

Ships of historical interest:

USS Liguria (NCC-62551), *USS Tolstoy* (NCC-62095), *USS Polaris* (NCC-62845)

SOURCES:
(D LUG)
(N TNG)
(H own)

As new intelligence poured in on Cardassian strength and intentions, Starfleet found itself struggling to produce enough vessels for the military needs of the faraway frontier. The reactivation of older frigates, accompanied by a doctrinal change, was hoped to ease the problems of equipping defensive and escort forces. However, by 2350, it had become obvious that a defensive stance would not be enough to discourage Cardassian assaults on border worlds. Unlike the Talarians, whose strikes were poorly coordinated and forces thinly spread, the Cardassians would be able to amass their assault fleets in heavily defended areas within strike range of Minos Korva and Alpha Solarion, the only properly established Federation support bases in the area. The enemy had to be denied the use of such staging areas through the application of coordinated fleet action.

For the first time in half a century, Starfleet would be in acute need of purely offensive firepower again. There was no way the heavy duty *New Orleans*, *Akira* or *Nebula* projects could be accelerated to fill in the gaps in the arsenal. Whether the *Decker* destroyer could be sufficiently updated to provide the combination of performance and affordability was a question Starfleet had no time to ponder. A simpler, cheaper solution was needed quickly, and an obvious one was soon put forth: attrition spacecraft should be constructed, using the already existing *Saber* template. Desperate for greater numbers of vessels carrying modern armament and sensors, the Admiralty once again chose to believe that in times of crisis, requirements on self-protection and survivability would be less than paramount.

Work immediately began on a primary hull spaceframe following the general *Saber* layout and utilizing commercial standards. There were six decks, including the dorsal bridge assembly. Decks 2 and 3 held accommodation and carried two dozen medium lifepods plus two phaser VII strips. On the fourth and fifth decks, a bow opening was provided for a hangar housing two light shuttles and two shuttlepods as the standard complement. Decks 5 and 6 contained computing and support systems and ventral phaser armament, personnel and cargo transporters, as well as additional lifeboats.

A new secondary hull was designed in parallel, housing a powerful MDD-20 reactor assembly for high warp performance. This hull rode slightly below centerplane, with the vertical warp core positioned to touch the primary hull aft rim. Aft of the core lay bulging fuel tanks and armored antimatter pods; very little of the space was crew-accessible, there only being two full-height decks in the hull. Impulse propulsion rested on two affordable Kloratis FIG-2T engines on the primary hull, flanking the main reactor. Warp engines were of the improved and enlarged LF-28 type, and laterally outriggered on downcanting pylons. The wider separation, dictated by greater field strength for high speed, allowed for warp maneuverability similar to the *Saber* performance without the need for tilting the nacelles.

Two mission profiles were now imposed on the affordable combatant. The majority of the production run would be completed for offensive duty, while sixty would be turned into scouting units with advanced sensors. The latter work was swiftly carried out, with *USS Rigel* (NCC-61107) sailing out in early February of 2351, trailing long range subspace scanners on her secondary hull. Major problems and delays were encountered in arming the design for the former role, however.

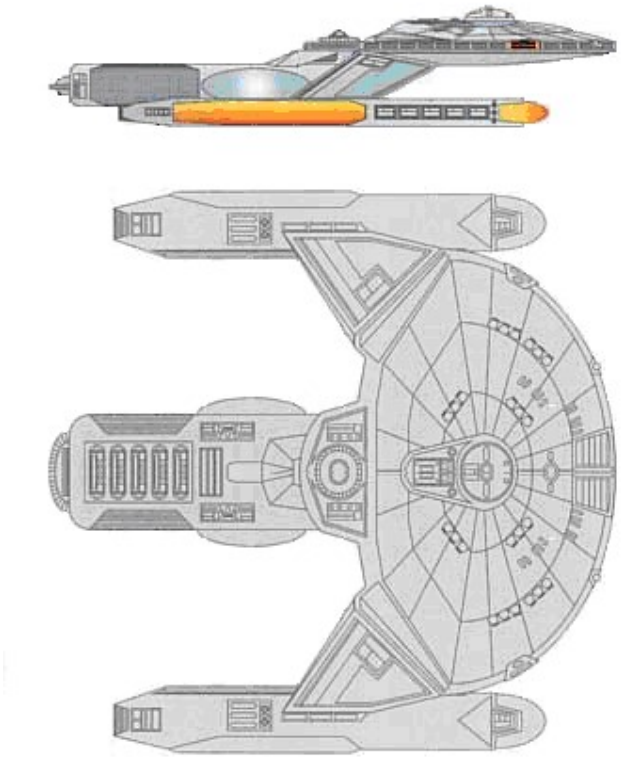
Unlike the 23rd century destroyers, which had been built around a pre-chosen torpedo system, the new class was to be armed off the shelf as a measure of economy. This was the most complex part of the effort, as it required far more integration work than the upscaling of the power systems. The selection of available weapons was not very wide: there were the expensive Mk 80 podded launchers of the frigates, the more capable Mk 75 integrated rapid-fire units of the light cruisers, and the hypermodern Mk 82 weapons of the *Nebula* class, or possibly a single heavy launcher based on the podded Mk 85 weapons of the *Nebula*.

The frigate pods were abandoned almost from the beginning, as each alone would have been almost the size of the secondary hull so far designed. Yet the light cruiser weapons had been intended for mounting some distance away from the primary hull, and with their associated systems had greater space requirements than the competing designs. After careful yet urgent analysis, Starfleet chose an unconventional yet deadly primary armament of multiple Type IX phasers, well befitting the agility and aggressiveness of the overall design. Five dorsal and five ventral strip emitters of 20 m length were clustered at the aft end of the secondary hull, each a minor modification of the HiBeam B series Fixed Installation Defensive Element. The improvised weapons mounts gave the stern of the destroyer a rather menacing appearance, capped by a curved phaser VII strip at the transom.

Field of fire directly ahead was limited, but were the destroyer to slip into an enemy formation, the concentration of fire would prove devastating against most opponents. Limiting factors also included main reactor output and the capacity of the giant heat exchangers flanking the phaser batteries. In practice, only one strip at a time would be fired, the bank of five discharging in quick succession and then cooling and recharging for another volley. Sustained rate of fire was slightly inferior to that of torpedo volleys from contemporary frigates. On the other hand, the phaser destroyers did not suffer from limited ammunition. In planetary assault duty, an otherwise idled destroyer could theoretically sustain bombardment for up to eight hours before overheating.

In May 2352, the pathfinding destroyer was christened *USS Zodiac* (NCC-61040, no experimental registry allocated) and finally launched for impulse trials. Full power tests of the main reactor quickly followed, culminating in main armament firings. At warp speeds, the destroyer handled quite pleasantly, the wide field giving nimbleness that had been lacking from the previous generations of attrition warships. After the performance margins were deemed satisfactory, extra protection was installed around the main power conduits, and internal bulkheads were added in the engineering compartments.

By 2355, more than eighty *Zodiacs* and all the sixty *Rigels* had been constructed in an escalation program that would not even have been possible in the pre-replicator eras, yet now barely inconvenienced the civilian operations of the dockyards. Operational experience readily confirmed what the brief trials had suggested: the destroyers performed admirably as far as speed and acceleration were concerned. Tactics had to be gradually evolved to take into account the unique nature of the main armament. Nevertheless, the 24th century destroyer was a much more flexible fighting machine than her 23rd century counterparts. The single-nacelled destroyers of old had to coexist with ships so much faster, more maneuverable or more heavily protected that joint operations beyond flotilla action often were futile. In contrast, the *Zodiac* class could regularly and naturally take part in joint fleet operations, without having to rely on the support of a dedicated destroyer leader vessel. Indeed, a 2360s combat formation would appear an unstructured horde to an unaccustomed observer, its attrition units freely intermingling with capital ships and auxiliaries.



Something of a 'double Saber*', the* Zodiac *class balances between affordability and potency.* USS las Casas *(NCC-62573) presents the latter face to Talarian cruisers, which are sorely outgunned by the single destroyer.*

Zodiac/*Rigel* construction was ended at the third production batch in 2359-60, comprising forty destroyer units and bringing the total to 166. With the same investment in *New Orleans* class vessels, Starfleet could have produced perhaps 80 units, translating to a maximum of 240 torpedo tubes in the battlefield. The total now came to more than a thousand heavy phasers instead (excluding the special operations vessel *USS Cassino*, NCC-62098), distributed in a more survivable manner.

Ultimately, as intended, the *Zodiacs* and *Rigels* were utilized for daring raids against Cardassian military staging areas and depots, as well as ambushing large Cardassian formations attempting to

raid Federation colony worlds. The destroyer starship had thus returned to its original role, dictated by its design against the official Starfleet doctrine that still considered destroyers 'multimission' starships.

This is not to say that the range of military missions available to the type would have been especially narrow. *USS Tolstoy* (NCC-62095) and *USS Nehru* (NCC-62559) were lost to the Borg in 2366. The *Nehru* was torn apart in the early stages of the battle by tractor beams, while the crew of the *Tolstoy* probably fell victim to assimilation after Borg cutting beams had deprived the vessel of her port engine nacelle. The security teams deployed on the Dyson sphere by *USS Liguria* (NCC-62551) while she was safeguarding UFP research efforts there in 2370 established first contact with an AI ambassador of a race that inhabited parts of the sphere 30,000 years ago. Subsequently, the full firepower of the *Liguria* was needed to bring down the vicious attack of the AI. The race remains nameless and the history of the sphere still largely unknown, but the abandoned cities inside have now claimed 39 Federation lives. Exploration continues mainly through remote observations, still frequently safeguarded by destroyer starships.

The Dominion assault on the Alpha Quadrant saw the return of the mission the *Zodiacs* and *Rigels* were designed for, and took a heavy toll on the destroyer fleet. Four *Zodiacs* were lost in the massacre of the 7th Fleet. Two others, *USS Sirius* and *USS Toltec*, ran into a Jem'Hadar ambush in the Cuellar system while searching for the missing *USS Tian An Men*, and had to be scrapped due to the extensive damage received in their daring escape. The accompanying *Rigel* scout, *USS Haleakala*, was completely destroyed in the attack, and the tender *USS Corregidor* was forced to jettison her core and then be abandoned, but the crews of the two vessels were rescued aboard the *Toltec*. The demanding rescue operation under enemy fire has attracted much attention even in the Klingon and Romulan intelligence circles, and has altered perceptions about the use of transporters during intense warp maneuvering and constant shield activity.

Four phaser beams from four emitter strips probe ahead as USS Horseshoe Bend *(NCC-69441) smokes out a cloaked Klingon cruiser during the Founder-instigated hostilities of 2372. The considerable prowess of the* Rigels *in ACW was largely wasted in the Dominion conflict, as Jem'Hadar vessels apparently either were not equipped with cloaking systems, or then operated them to such a high efficiency that none were ever caught in action.*

Currently, the 42 surviving *Rigels* and 65 *Zodiacs* are all undergoing midlife refits that are intended to give the class the capacity to survive beyond the end of the century. Regardless, active service of these ships is supposed to end by the mid-2380s, as mothballing of the combat-dedicated type will offer significant savings in crew resources and operating expenses.

Nebula

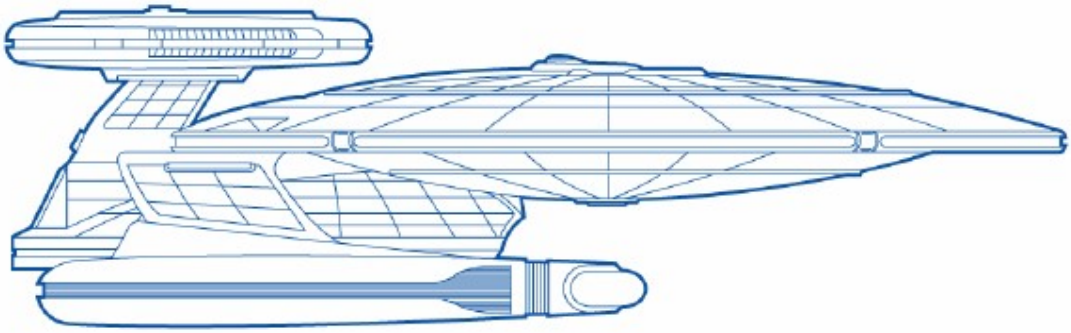
Explorer
2352-

Completed:	39+
Length:	439.1 m (standard) 451.6 m (NCC-60430, 62043, 62095, 62099, 63133, 63172, 63194) 442.2 m (standard, w/ weapons module)
Beam:	442.1 m
Height:	109.2 m (batch 1) 106.6 m (batch 2 onwards) 130.4 m (standard, w/ weapons module)
Mass:	3,138,100 tons (most batch 1) 3,140,100 tons (NCC-62043, 62051, 62095, 62099, 63133, 63172, 63194) 3,153,000 tons (batch 2, w/ weapons module) 3,140,000 tons (batch 2, w/ subspace scanning array) 3,309,000 tons (batch 3, typical, w/ weapons module) 3,311,200 tons (batch 4, typical, w/ weapons module)
Cruise speed:	W 6
Max.speed:	W 9.7 (batches 1-2) W 9.9 (batch 3 onwards)
Endurance:	24 years
Officers:	202
Crew:	301 + 150-300 civilians and research crew (room for 3000 passengers)
Weapons:	1 phaser X strip on fwd dorsal primary hull 1 phaser X strip on fwd ventral primary hull 1 phaser X strip on fwd ventral secondary hull 2 phaser X strips on nacelle pylons 2 phaser X strips on aft dorsal primary hull (batches 1-2) 2 phaser X strips on aft ventral secondary hull (batch 2 onwards, plus upgraded batch 1) 2 phaser X strips on aft dorsal secondary hull (batch 4) 2 medium fwd torpedo tubes w/ 60 photorps above main deflector dish (batches 1-3 except NCC-62043, 62051, 62095, 62099, 63133, 63172, 63194) 1 heavy aft torpedo tube w/ 120 photorps (NCC-62043, 62051, 62095, 62099, 63133, 63172, 63194) 1 heavy fwd torpedo tube w/ 140 photorps (batch 4) 1 heavy aft torpedo tube w/ 110 photorps (batch 4) 2 to 4 heavy fwd torpedo tubes in weapons module 2 to 6 heavy aft torpedo tubes in weapons module
Shields:	Globular forcefield Navigational deflector beam on fwd secondary hull Auxiliary navigational deflector on fwd ventral primary hull
Laboratories:	32, in varying configurations
Transporters:	4 GP (6-pad), 4 emergency evacuation (22-pad); Mk VII Some units brought to Mk VIII standard after 2370
Auxiliaries:	At least 12 light or medium shuttles, sixteen shuttlepods, 4 atmospheric transports; room for 6 runabouts; special-environment shuttles also carried

Ships of historical interest:

USS Bellerophon (NCC-62048), *USS Endeavour* (NCC-71805), *USS Farragut* (NCC-60591), *USS Hera* (NCC-62006), *USS Lexington* (NCC-61832), *USS Merrimac* (NCC-61827), *USS Monitor* (NCC-61826), *USS Proxima* (NCC-61952)

SOURCES: D TNG
N TNG
(H own)



In the late 2330s, Starfleet had started preliminary development of a new class of explorers to meet the requirements of ever-increasing distances and needs of operational independence. These ships were also to retire the hopelessly outdated *Constellation* generation of cruisers from exploration duty, and to augment the *Ambassador* and *Niagara* vessels in expanding the limits of UFP knowledge. The first steps in developing the advanced explorer vessel led to the upgraded variant of the *Niagara* class that met most Starfleet expectations and design requirements. The work performed in the 2350s and 60s resulted in two ship classes of superb exploratory and defensive capabilities, namely the *Nebula* and *Galaxy* classes. Both would rely on only two of the gigantic warp nacelles used on the *Niagara* class – but this time coupled with a high performance powerplant and state-of-the-art warp field design, to comprise the GN-41 engine.

For the *Nebula*, a design utilizing the general field configuration familiar from the *Miranda* class was chosen. The *Mirandas* had in many ways been the predecessors and affordable alternatives to the *Constitution* class. Similarly, the *Nebula* was to be a simpler, more robust version of the upcoming *Galaxy* design. These two modern ships would share many of the main components, but the *Nebula* would feature a less challenging overall configuration and slightly more modest performance specifications. In contrast, the design would enjoy some advantages in combat capability.

A gigantic Class 1E saucer hull, the largest man-made object theoretically capable of making planetfall intact, was introduced for the *Nebula* class. It provided excellent room for equipment and facilities necessary for fully independent deep space exploration. The warp propulsion system of two GN-41 engines with 16 coils and 1,370,000 ton mass apiece gave a cruising speed of warp six and a maximum sustainable speed of warp 9.5, equaling the performance of the modern *Niagaras* with one nacelle less. Multiply redundant fusion reactors powered two rather compact and well shielded impulse engines on the saucer aft rim to give the ship a maximum acceleration of 790 g. Inertial dampening fields were of extraordinary strength, and the significantly improved mass-masking subspace field surrounding the hull increased both maneuverability and linear acceleration over that of the *Niagaras*.

Otherwise, the construction was quite conventional if the preceding frigate and cruiser types are used as the yardstick – except, or course, for the vast size of the vessel. A large shuttlebay atop the saucer was spacious enough to operate half a dozen runabouts or interceptors in addition to the normal shuttle contingent. Even more could be temporarily stored aboard. In most of the ships, the secondary hull housed additional shuttle facilities. A gigantic rolling door was featured in early vessels, yet was later superseded by a set of smaller doors: operational experiences proved that the ability to carry outsize cargo was outweighed by the disadvantages of decreased structural integrity, wider-area atmospheric containment fields and cumbersome door operating procedures, especially for everyday operations of small liaison craft. Many early vessels were refitted with the smaller doors, a refit that usually also introduced additional stern phasers at the cost of some shuttlecraft maintenance facilities and storage space.

USS Nebula herself never received an aft shuttlebay of any kind, due to her special stern configuration. This structure was also used on six other *Nebula* vessels built at 40 Eridani A and 61 Cygni yards, and was mainly intended to provide the ships with the ability to carry the new aft-firing, high-capacity Mk 85 torpedo launcher designed for the *Galaxy* class. Soon enough, Starfleet decided on a different balance of firepower and shuttlecraft capacity, and production of the long-stern model was discontinued by 2356.

Forward of the hangar or torpedo assembly was the main engineering facility, then the exceptionally large and capable Mordecai Farsight navigational deflector and sensor array. Accommodation and some workspaces unrelated to engineering tasks were present in the engineering section, yet not to the degree later seen in the secondary hulls of *Galaxy* class ships; the *Nebulas* did not need duplicated functions for primary and secondary hulls, since they would not operate in separated flight mode. Apart from the long-stern ships, which utilized the *Galaxy* Varan T-Max deflector system rather than the dedicated Mordecai model, use of commonalized secondary hull components and elements was limited to those directly relating to the warp drive.

Impulse power systems were basically identical to those of the *Galaxy* class, save for the smaller number of fusion reactors – secondary power system redundancy requirements were not as high as in that two-section starship design – and the low emission profile nozzles. Warp powerplants and coil assemblies were also identical with the early *Galaxy* vessels, but the *Galaxies* from *USS Enterprise* onward adopted an improved system of 18 instead of 16 coils per nacelle, as well as a slightly improved main powerplant. *Nebulas* were slow to follow, with only the third production batch incorporating these upgrades and subsequently attaining higher top speeds. The compact field design led to slightly lower top speeds than those of the corresponding *Galaxy* class configuration, but this was not seen as a problem.

Weapon fits varied somewhat within the class, sometimes being specific to production batches, sometimes following more complex divisions. The arsenal included two 270-degree phaser X strips of immense power on saucer surfaces, a wide ventral phaser X band under main engineering, two lateral strips on engine pylons, and two to four auxiliary phasers mounted in pairs on either the aft rim of the saucer (the first batch of six short-stern plus seven long-stern vessels), the fantail of the secondary hull (third batch onward), or both (refitted first-batch ships save for the long-sterners, plus second-batch units). On some vessels, two Mk 82 medium torpedo tubes were included in the flat interhull that joined the primary saucer to the secondary hull. In addition, the ships were to carry extra torpedo launchers or other mission-specific equipment in switchable modules atop a support structure behind the saucer shuttlebay.

Nebula *class* USS Prometheus*, with standard weapon module, encounters the subspace sensor -carrying* USS Aveley *near Minos Korva in peacetime exercises of the ships that would in crisis form the 9th Fleet. Due to minor design differences, the theoretically interchangeable modules were in practice anything but. Only six ships in the Fleet were capable of carrying the extreme range sensor array module, which also called for a special shield configuration. Some eight vessels in addition to these were incapable of taking the weapons pod. Also, a lengthy 'learning process' took place every time a module was fitted to a new ship, required for the computer systems to merge for peak efficiency.*

Introduction of mission modules greatly increased the flexibility of the class. *USS Nebula* was initially finished without module attachment points. It was *USS Farragut* that first received a mission module: heavy torpedo armament (forward and aft tubes with 140 Type V torpedoes and a number of probes), additional tractor beams (four independently steerable emitters) and special sensors (including tactical scanners with 8 ly range) were packaged into a triangular 'fighting pack' dubbed the Offensive/Defensive Support Assembly. Other modules less frequently used include winglike subspace scanning arrays, semicylindrar terraforming systems containers, and various mountings for the carrying of outsize cargo like entire warp nacelles or hull sections of smaller starships. However, the O/DSA is the most usual variant mainly because the heavy launchers aboard it are deemed necessary for most missions. The module itself is configurable for a variety of missions as well, and the recent Dominion War saw the installation of up to six additional medium Mk 82 or 84 torpedo launchers athwartships of the centerline two plus the two heavy Mk 85 standard launchers previously carried on the module.

The mounting of the O/DSA is somewhat problematic for shuttle operations, as it limits access to the main shuttlebay. The capacious aft bay on the majority of the ships more than covers up for this, however, and thus Starfleet engineers have not dedicated much resources to the development of less obstructive support systems for the module.

Due to the relative simplicity of the design, several *Nebula* class vessels were completed before the commissioning of *USS Galaxy*, even though the latter, more 'flashy' design project was initiated at the same time with the *Nebula* project. As many as 13 ships were ordered initially, in the two distinct designs described above yet formally listed as a single batch. An option for ten more was included in the contract, and evolved into the second production batch, characterized mainly by armament refinements. The third batch of eight featured an increased percentage of *Galaxy* components, including a slimmed-down primary hull and the uprated warp propulsion system. A fourth batch, rather hastily assembled for the needs of the 2370s military crises, goes one step further, introducing a secondary hull virtually identical to the *Galaxy* one, along with the associated deflector, phaser and, most importantly, heavy torpedo systems. A trend of 'Galaxifying' characterizes the refitting of earlier *Nebula* units as well, and for example the venerable *Farragut* underwent a comprehensive rebuilding of her primary hull to the slimmed-down standard in 2366-67.

In Starfleet service, *Nebula* class starships share the dual exploration/defense mission of the *Galaxy* class, but somewhat less often participate in diplomatic missions due to their more utilitarian accommodation standards. *USS Merrimac* and *USS Kashin* are exceptions, permanently equipped with diplomatic-quarters internal modules and serving as dignitary liaison vessels. The vessels can be easily distinguished from the rest of the second batch by their larger number of portholes and omission of primary hull secondary phasers. Despite these modifications, the ships remain full-fledged combat and exploration vessels, and participated in many actions during the Dominion War. *USS Bonchune* of the third batch was converted to similar standard following the loss of three *Galaxy* class vessels, but has only recently resumed operations after receiving major damage on assignment to distant Beta Quadrant border. The exact circumstances in which the damage was received have not been revealed to public,

even though some fifty lives were lost in the incident. A fourth ship is to be similarly equipped by 2379; there are several heavily battle-damaged vessels under consideration for the conversion.

USS Lexington, NCC-61832, was the first unit to be deployed for exploration duty in 2353 and performed an exemplary eight-year mission in the direction of the galactic rim. This was followed by a five-year survey of the Pleiades region, supported by *USS Enterprise* and the brand-new *USS Endeavour* and their respective surveyor and scout companions. The ship entered a long layover period after that mission, receiving for example gel-pack logic processors and holodeck facilities. Following a tour of duty as the flagship of the 4th Fleet in the Dominion War, acting mainly in the heavily contested Dorvan sector, the *Lexington* now continues a high-profile exploration career under the command of her legendary captain Bahay'ai Kae Navar Venei.

USS Proxima was presumed lost to Dominion forces in 2372 as she failed to return from her armed reconnaissance mission in Gamma Quadrant space. The Dominion readily took credit for the loss. In fact, the wreckage of the ship was later located on a desolate class K world, neither the ship nor her deceased crew displaying any battle damage or other signs of violence. No explanation has yet been found for this mysterious loss, although theories range from devious Changeling infiltration to telepathic attack to a possible Q intervention. Similar mystery surrounds the earlier disappearance of *USS Hera* in 2370.

The extensively updated *USS Farragut* had a most illustrious exploration career until her loss in the Federation-Klingon war in 2372. Her reputation as the "cavalry regiment of space" was also well-deserved, and the people of eighteen starships, dozens of smaller vessels and six colony worlds can thank her for their lives, endangered in conflicts ranging from the Cardassian War to the Maquis rebellion. *USS Sutherland*, a war survivor, has gathered a different reputation: wherever the ship goes, a good party can be expected!

Production of *Nebula* class explorers continues at a leisurely pace. At least ten more ships are expected to be completed to a standard combining the best attributes of batches three and four, across a period of ten years, to cover war losses and to take the place of retiring *Ambassador* units. Some innovations in shielding technology are to be incorporated to later models, and computing systems may be upgraded to feature gel-pack components for the final six vessels. However, future production plans are hampered by the uncertainty surrounding a potential successor design based on *Sovereign* technology. After the completion of all the 42 ships currently funded, plus possible additional units assembled out of spares, no new keels are to be laid until a decision is made concerning this successor vessel.

Akira

Heavy cruiser
2354-

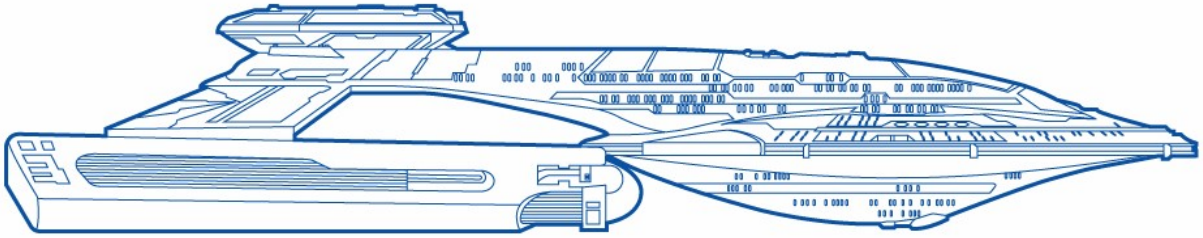
Completed:	76+
Length:	440.1 m
Beam:	300.0 m
Height:	82.8 m
Mass:	3,049,000 tons (batch 1, w/o auxiliaries) 3,052,000 tons (batch 2, w/o auxiliaries) 3,050,200 tons (batch 3, w/o auxiliaries) 3,055,000 tons (batch 4, w/o auxiliaries) 55,200 tons (auxiliaries, exploration configuration) 25,000 tons (auxiliaries, interdiction configuration)

Cruise speed	W 6
Max.speed	W 9.5
Endurance	17 years
Officers:	82 (exploration configuration, typical) 108 (including pilots, interdiction configuration, typical)
Crew:	320 (exploration configuration, typical) 392 (interdiction configuration, typical)
Weapons:	2 fwd medium torpedo tubes w/ 120 torps and 40 probes above navigational deflector (one in batch 1) 1 phaser X strip on dorsal forward primary hull (type IX in batch 1) 2 phaser X strips on ventral forward primary hull (type IX in batch 1) 2 phaser IX strips on ventral aft primary hull beneath engine booms 2 rotating 16-cell torpedo launchers w/photon, tricobalt or pulsar torpedoes on weapons module 2 twin mine/drone dispenser tubes on port/stbd primary hull flanks
Shields:	1-layer globular forcefield Navigational deflector on lower fwd primary hull
Transporters:	4 GP (6-pad), 4 assault (12-pad), 6 emergency evacuation (22-pad), 2 cargo; Mk VII
Auxiliaries:	6 medium and 10 light shuttles, 12 shuttlepods, 12 work pods (exploration configuration) 10 *Kestrel* interceptors, 2 *Tempest* strike fighters, 5 shuttlepods, 10 work pods (interdiction configuration)

Ships of historical interest:

USS Thunderchild (NCC-63549), *USS Spector* (NCC-63646)

SOURCES: D ST:FC (*Starship Spotter*, Armada computer game)
(N modelers)
(H *Starship Spotter*, own)



The decade between the earliest signs of border unrest and the outbreak of open war in the spinward flank was full of nervous waiting and speculation. The Cardassian, Tholian and Talarian aggressions began in earnest too soon, too vehemently, and over too wide a volume of space. The ambitious plans of fielding fleets of frigates to protect the outer colonies and distant allies had not yet been concretized into actual finished ships. A number of diplomatic contacts had been made, and some strategic intelligence had been gathered, but the war theater was still largely hostile and unknown. Starfleet was forced to rethink its doctrine once again, and somehow create a delaying strategy until the fleet would be ready to fight.

The strategy of choice was to be an increased presence combined with flexibility and resilience – in other words, the deploying of light and thinly spread forces. In addition to reactivated old frigates, Starfleet began sending out wings of tactical fightercraft, battalions of ground forces, and strategically positioned orbital defense installations. All these elements were already available in quantity and, despite long dormancy, some quality. Unfortunately, the means of deploying them were not. Carrier starships were few in number, and the fledging *Steamrunner* strike carrier program had not been optimized for presence, but for precision strikes.

A more suitable carrier starship for keeping the enemy on his toes would have the standard outriggered warp nacelle configuration for increased performance. Furthermore, torpedo armament

and tactical long range sensors would be required to allow these motherships to perform offensive and defensive raids where and when the enemy least expected. The complexity of such a project was at odds with the urgency of construction, however. It was only in 2352, too late again from the strategic point of view, that funds were allocated for the construction of a prototype Independent Interdiction Cruiser, a starship capable of deploying a considerable force of tactical craft or assault troops as well as performing a cruiserlike mission of exploration and defense. This versatility allowed the ship to find a niche even in the new strategic reality, and ultimately to emerge as the defensive mainstay of the 2360s and 2370s, supplanting and ultimately no doubt succeeding the *Excelsior* class in this role.

How had the ASDB integrated all the functions into a single starship? Distribution and sectionalization was the counterintuitive key to the success: not only did *USS Akira* feature a frigate-style dorsal fighting module, but primary and secondary power systems were also mounted in separate hull sections. Two long booms extended aft from the dorsal surface of the primary hull. Each held a complete warp core assembly that included independent antimatter tankage, second-stage plasma chargers, expanders and impulse repeaters. Also included were all engineering support systems and a cluster of fusion reactors and batteries. Main impulse reactors and engines were housed outboard of the booms in the primary hull aft rim, leaving the central part of the hull completely free for the carrier functions of the ship.

The twin-boom structure of USS Akira *harkens back to both the 23rd and 22nd centuries, and to the* Loknar *and* Enterprise *classes, respectively. As usual, form tells nothing of function in this respect: the mission profile of the* Akira *class bears no resemblance to that of frigates or exploratory cruisers. Note the two cutouts for the aftermost torpedo carousel, each allowing for two cells to be fired at any carousel position; a corresponding opening exists for the forward carousel for firing up to four cells.*

The warp engines themselves were of LF-35 type, canted to 47 degree angle at the ends of 19 degree anhedral pylons for greater maneuverability. The LF-35 massed an incredible 1,400,200 tons apiece, and cost fortunes to develop, yet a GN-41 unit of otherwise similar performance could not have been used in the tilted configuration. The compensation for asymmetric torque at this configuration required an additional offset field coil at the front end of the engine, since a more traditional field coupling using

the drive coils themselves would have created dangerous gradients at the shuttle approach area, even on idle mode.

The vast hangar on the centerline had two aft doors with associated approach control systems, and three forward launch tubes for in-warp deployment of interceptors. Stacked storage and processing of craft on both sides of the main hangar left the center floor free for flight operations. A dozen fighters was a typical warload, although slightly larger numbers could be stacked aboard at the cost of operational flexibility. Overhead control rooms enjoyed an excellent view of the flight deck, and were part of the heavily shielded even if somewhat exposed cluster of C^3I facilities that also included the main bridge; communications, sensor control and analysis rooms; and various conference and debriefing rooms.

Crew accommodation was provided mainly in the lateral sections of the main hull, while a ventral bulge housed facilities ranging from mess halls and holodecks to a large sickbay and Marine accommodation. The main navigational deflector was mounted at the forward end of this bulge, and the single medium torpedo launcher of Mk 80 standard was packed aft of and above the deflector machinery. Other fixed weaponry included three long primary phaser strips, of Type IX in the first batch of vessels but of Type X from 2359 onwards, and secondary strips beneath the engine boom stems for aft coverage.

Keeping with the intended tactical mission profile of the ships, the rest of the armament was modular, if a tad heavier than in corresponding frigate designs. As star system control instead of sector control was the tactical goal of the heavy cruiser, modular armament was usually of anti-surface rather than anti-starship type. The dorsal fighting module featured two rotating cassettes with sixteen cells, each firing short range, high yield photon or tricobalt torpedoes for planetary bombardment. Single-fire Type XII phaser cells were another option for the carousels, although rarely put to use.

The weapons suite kept on evolving in response to the tactical challenges of the wars the ships engaged in, and the observed weaknesses of the opponents there. The late sixties saw the introduction of so-called pulsar torpedoes, drawing energy from the subspace field output of the target ship to increase the destructiveness of the impact and to destabilize the enemy drive systems. Another short range weapon, this was eminently suited for deployment from *Akira* carousels. Batch four of the *Akiras*, built between 2370 and 2372, added quantum torpedo capability for close range ship-to-ship or ship-to-craft combat applications. Also, pairs of lateral mine-sowing tubes were adopted for deployment of combat drones in support of fightercraft operations. Select ships of batches three and four have also experimented with pylon phaser strips to better cover the aft firing arcs, but as with the *Sovereign* class, the installations have proved an engineering challenge and are considered somewhat unreliable.

Protective of her flock of fightercraft, USS Shaalis *spits out a volley of torpedoes at a Dominion cruiser near Kora. Against the Jem'Hadar, both photon torpedoes and fightercraft proved less than potent weapons, yet the* Akiras *were for once in a position to replace quality with quantity. The Cardassian opponents against which the ships had originally been optimized fell to* Akira *weapons easily enough in the struggle against the Dominion, just as they had fallen fifteen years earlier. In turn, Cardassians tended to concentrate their fire against* Akiras *instead of the factually more fearsome* Galaxies *or* Nebulas, *to the apparent chagrin of their Dominion masters.*

At the time of this writing, *Akira* is the workhorse of the cruiser fleet at the frontier, having allowed the *Excelsiors* if not to retire, then at least to withdraw to the inner colonization zones. It is also a primary planetary assault type alongside the purpose-built yet outdated *Steamrunners* – a double role that caused major logistical problems during the buildup to the Dominion War, as the key vessels had to be recalled from relatively distant assignments first. The class is expected to soldier on after the eventual retiring of the *Excelsiors*, perhaps similarly concentrating on defensive missions when a new cruiser type is introduced for frontline exploration. In many respects, it rivals the various explorers in capacity, yet represents significant savings in construction and operating costs. It would be no surprise if Starfleet decided to build yet another batch of the ships in the near future; life-extending upgrades are certain to be performed on a regular basis.

Norway

Strike transport/strike command ship
2354-

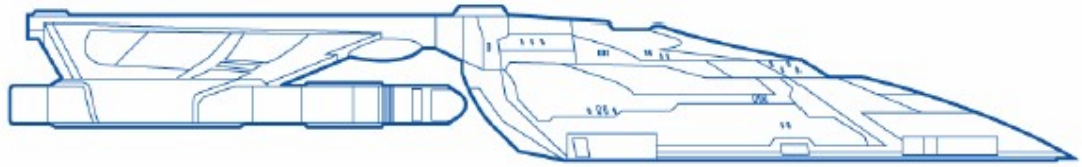
Completed:	28
Length:	364.8 m (nacelles fully forward) 397.5 m (nacelles fully aft)
Beam:	225.6 m
Height:	52.5 m
Mass:	622,000 tons (w/o barges) 1,086,000 tons (w/ 8 TBA-40A barges) 1,090,000 tons (w/ 8 TBA-40A and 8 TBA-40B barges)
Cruise speed	W 6
Max.speed	W 9.0
Endurance	5 years
Officers:	38
Crew:	152
Troops:	1,500
Weapons:	2 phaser IX emitters on bow (NCC-64923, 13 others) 2 fwd medium torpedo tubes on bow (NCC-64975, 13 others) 2 phaser VII strips on dorsal hull 2 phaser VII strips on ventral hull 2 phaser VII strips on dorsal hull (NCC-64975, 13 others)
Shields:	1-layer globular forcefield Navigational deflector beam on dorsal bow
Laboratories:	2 GP, 1 medical, 2 signal analysis
Transporters:	4 GP (6-pad), 6 emergency evacuation (22-pad), 4 cargo; Mk VII

Auxiliaries: 8 warp plus 8 sublight heavy assault barges, 2 light shuttles, 4 work pods

Ships of historical interest:

USS Budapest (NCC-63549), *USS Macedonia* (NCC-64975)

SOURCES: D ST:FC (Legacy computer game; dimensions, crew DS9 TM)
N Encyclopedia
(H own)



The art of planetary assault gained many practitioners and few critics during the years of Cardassian conflict. Never before had Starfleet engaged in so many planetary takeover operations, or fought so bitterly in defense of its own surface assets. Without the existence of ships dedicated to the support of ground operations, the outcome of the seemingly lopsided border war could have been very different, despite Starfleet's quantitative and qualitative superiority in deep space.

By the midpoint of the war, as Starfleet again went to offensive mode, there was a broad selection of planetary assault vessels available: *Steamrunner* strike carriers for the first-wave insertion of troops and vehicles and provision of support fire; *Yorkshire*, *Whitewater* and *London* transports for the second-wave delivery of further troops, supplies, munitions and even portable fortifications; *Saber* strike corvettes for both fire support and assault escort duty; and *Nobel* troopships, *Hope* hospital ships and *Forrest* command vessels for comprehensive orbital support of the ground troops.

Yet casualties during first-wave strikes still reached unacceptable figures. The piecemeal delivery of troops by assault shuttles and 60- to 120-person landing barges left them in a position of weakness until the forces could establish contact, regroup and begin their offensive. Situational information was always lacking, and the first thirty seconds after delivery often presented a deadliest danger to the assault force, which could find itself in a small-arms ambush against which the mighty phasers of the orbiting starships were powerless.

An example of the later torpedo-armed type, USS Budapest *(NCC-64923) prepares for a ferry sortie without onboard barges in the early days of the Dominion War. Note also the additional, unarmored lifeboat stations at hull flanks, exposing the identity of the* Budapest *as an assault command vessel even when the various antennas are retracted.*

The simple answer to this was to provide the first-wave troops with better initial protection. Heavier landing barges were the obvious solution, preferably escorted by fightercraft through the atmosphere and then squatting down on the ground to form an impenetrable fortress against ambush. There was a clear upper limit to landing barge size, though – a *Steamrunner* could not carry anything significantly larger than the TBL-12, and the big but vulnerable *Yorkshire*, *Whitewater* or *London* transports could not haul in their larger assault barges during the first wave.

In November 2353, Starfleet Marine Command set a requirement for a new type of assault vessel, one capable of carrying a number of heavy barges to low orbit under fire, suppressing surface defenses with at least *Steamrunner*-like efficiency, and delivering the barges within five minutes to minimize vulnerability. The vessel would have to stay apace with other first-wave units, with a cruise speed set at warp 6 and a top speed at warp 8.9 -plus. The designation 'strike transport' was chosen for the novel starship type.

A hull form between the sleek saucers of high speed starships and the capacious boxes or cylinders of conventional transports was chosen. Maximum survivability against planetary defenses was sought by carefully shielding the warp engines and the landing barges behind the bulk of the hull, and by submerging the main bridge into the top structures of that hull. Even lifepod stations were armored, with 32 large fifty-person pods secured behind flush but jettisonable plates. Weaponry was concentrated on the bow, where either twin Type IX point emitters (a batch starting with *USS Norway*) or Mk 75 torpedo tubes (a batch starting with *USS Macedonia*) were available for planetary bombardment, and on the dorsal and ventral surfaces of the primary hull, where twin phaser VII strips

were provided. Formidable in appearance, the armament provided only rudimentary ship-to-ship combat capabilities due to the specialized fire control resources for the primary weapons at the bow, and their lack of all-around coverage; in the torpedo-armed vessels, self-defense was boosted with two more phaser VII strips on aft dorsal primary hull. Tractor beams, shuttlecraft facilities and other general starship utilities were of low capacity, clustered out of the way at lower stern between impulse engines.

Some 1,500 troops could be packed into the well shielded and armored forward part of the hull, smooth and almost devoid of portholes and sensor pallets. The armed and armored TBA-40 barges, available in both warp and impulse configurations, rested stacked between two longitudal booms extending aft from the hull. The maximum load was sixteen, of which at most eight could be of the TBA-40A warp-capable type; these had to be stored closest to the forward hull for proper trim, while the much lighter TBA-40Bs could be placed more freely. As the ship penetrated system defenses, troops would embark the TBA-40s via passageways in the booms. A jettison sequence taking just 120 seconds would deploy the barges, which would then charge towards the target planet either at high impulse or medium warp, depending on choice of launch threshold. The mothership would provide constant fire support.

The booms also contained plasma conduits leading from the hull-mounted, twin-chamber reactor via broad, downcanted pylons to the GN-40 warp engines. The modest-performance engines, essentially armored 260,000 ton variants of the original GN-30 frigate engine, had opaque duonetic covers in place of field windows. A variable geometry mounting system that included sliding rails and a row of nine drive plasma leadthroughs per nacelle allowed the z-axis placement of the coils to be adjusted. The curious arrangement was necessary to preserve the center of mass during barge deployment, since each warp-capable TBA-40A massed some 58,000 tons: as soon as each warp barge launch was confirmed, the nacelles would move forward one small but vital, four-meter notch, to preserve immediate warping trim.

Combat deployment of assault barges at Kora. USS Venice *and* USS Dartmoor *block heavy disruptor fire from the surface with their forward shields, and respond in kind with bow phasers. Two 'snake lines' of tactical craft wait behind the strike transports for their mark to escort the barges down to the planet.*

In mid-2354, the tactical theory was put into practical test. Four ships, including the class ship *USS Norway* (NCC-63522), were ready. In teams of two, they spearheaded Starfleet's first deep-penetration attacks on Cardassian ground targets at Draygo. The planet had been heavily fortified for use as a resupply base, even though it featured no industrial infrastructure or even major habitation. As a flotilla of *Excelsiors* easily dealt with the two Cardassian cruisers in orbit, *USS Prague* and *USS Burgundy* approached to within 200 kilometers of the planet and spat out their assault barges. Cardassian planetary defenses were completely surprised when their first shots failed to destroy the strike carriers, and were soon overwhelmed by a combination of orbital fire and surface assault. The fact that the port nacelle of *USS Grozny* was blown away by a heavy surface disruptor did little to quell Starfleet

enthusiasm at the success of the operation. Further vessels of *Norway* class were immediately signed for, bringing the total order to 30.

Subsequent *Norway* operations lacked the advantage of surprise, and it was soon found out that an approach no closer than 800 kilometers from the target was advisable. Landing barge transit time was not significantly increased, yet the position outside the upper atmosphere offered greater freedom of movement for the carriers. In practice, planetary defense would still remain lethal out to the distance of 50,000 kilometers – but at low orbit, only a few of the surface cannon could be brought to bear at a time, and only a handful of these could fire through the atmosphere at zenith angles of minimized beam attenuation. Close-in fighting techniques thus significantly decreased the vulnerability of the attacker, a fact the Klingons had discovered long ago but the Federation was slow to accept.

After the Cardassian War, six of the *Norways* were equipped with extensive sensor and communications facilities for use as planetary assault command centers. The armored lifeboats were replaced by C^3I systems; the ships instead received additional, conventional lifeboat stations. Four of these survived the Dominion conflict, and Starfleet is considering modifying one other *Norway* to the command configuration. No newbuild *Norways* are planned, however, although this is not due to any shortcomings in the design or its execution. The neglecting of ship-to-ship combat capability is now recognized as an error, as exemplified by the disastrous battle of Setlik in 2374 where even the presence of a heavy *Nebula* escort was insufficient in protecting the assault wing of eight *Norways*. Yet, remedies would be readily available. Also easily solvable would be the minor problems with the sliding mechanisms of the variable-geometry nacelles, and the lack of computing power.

Much more damningly, the TBA-40 armed barge concept, despite its flawless execution, did not quite prove to be the hoped-for survivability multiplier. Like the *Yamato* class battleships of the 1940s, the *Newport* class fast amphibious assault ships of the 1970s, or the *Xining* class heavy air-cushion cruisers of the 2020s, the *Norways* represented the ultimate in one naval doctrine – and by convincing the Admiralty that no further improvement was possible, spelled the end of that doctrine, and of themselves.

A formation of the gigantic TBA-40As in maneuvers alongside a Saber *corvette escort at Ajilon in 2373, during the retaking of the planet. The Klingon front provided better justification for the inclusion of warp capability (and the associated mass penalty) in the barge design than the Cardassian one: since the Klingons were fully expecting a close-in fighting technique, a medium range deployment of the barges often took them by surprise. As Klingon antiship defenses also were optimized for short combat ranges, this deployment mode offered the motherships better protection as well.*

Thanks to the emergence of multiple new assault techniques, especially those gleaned from the Klingons, the concept of rapid assault barge deployment from low orbit no longer dominates Starfleet

thinking. Nor are the *Norways* due to be replaced by direct successor designs. Instead, their heritage lives in a different way: the narrow hull form used in the vessels has provided part of the data that recently has resulted in a new line of starship design, evidenced e.g. in the *Griffin*, *Intrepid* and *Prometheus* classes.

Griffin

Light cruiser
2355-

Completed:	41+
Length:	330.9 m
Beam:	78.2 m
Height:	109.0 m
Mass:	580,000 tons
Cruise speed	W 6
Max.speed	W 9.8
Endurance	2 years
Officers:	32
Crew:	168
Weapons:	2 phaser VIII strips on fwd dorsal primary hull 2 phaser VIII strips on fwd ventral primary hull 2 phaser VII strips on aft dorsal primary hull 1 forward medium torpedo tube w/ 20 torps on fwd secondary hull 2 aft medium torpedo tubes w/ 20 torps on aft primary hull 2 aft medium torpedo tubes w/ 20 torps and 250 relay buoys on aft secondary hull
Shields:	1-layer globular forcefield 1-layer conformal forcefield Navigational deflector dish on fwd secondary hull Auxiliary deflector on fwd primary hull
Laboratories:	8, in varying configurations
Transporters:	2 GP (6-pad), 4 emergency evacuation (12-pad), 1 cargo; Mk VII Most units brought to Mk VIII standard after 2370
Auxiliaries:	2 light shuttles, 2 shuttlepods, 1 heavy shuttle

Ships of historical interest:

USS Montgomery (NCC-68909), *USS Griffin* (NCC-65621), *USS Yeager* (NCC-65674)

SOURCES: D DS9
(N LUG)
(H LUG, own)

The experience Starfleet R&D had gathered during *Norway* development was sufficient to prove the general viability of spoonlike primary hulls and narrow warp fields. It took a little more effort to convince those in charge of Starfleet ship procurement to convert to this new approach in all the upcoming starship projects. Yet the speed advantage offered by the new field shape was so significant that it could not be overlooked. Ships that would benefit the most of the current state of art were in the category of less than a million tons of total mass. And Starfleet was on the verge of a breakthrough that would involve ships of this size: for the first time, starships larger than corvettes would have full planetary landing and takeoff capability. All that was needed was a means to get adequate performance from warp engines smaller even than the GN-30/40 frigate units – and the narrow warp field would provide this means.

The lightweight warp engine, dubbed GN-45, reached prototype stage in 2356. It featured a compact set of nineteen coils, integrated RCS and field control units, and two small ramscoop windows. At mere 190,000 tons apiece, GN-45 would make planetary landings a possibility. The problem was that the short coil assembly lacked the lateral control to force a narrow field, unless the nacelles were located slightly below the hull (just as in the *Bradbury* heavy corvettes) and also laterally apart. How could such a ship hope to land?

The answer came from variable geometry. Movable winglike pylons were constructed to raise the nacelles above ship centerline for landings, and lower them for warp drive. Centrally mounted between the pylons were the main and auxiliary powerplants and impulse engines, as well as the antigrav and thruster system that would allow the ship to make controlled planetfall. Four stabilizing pads would then support the ship on the surface.

A spoonlike hull, far stronger and more streamlined than the large *Norway* structure, was then coupled with the new engine platform. Some high performance sensors were introduced, in a layout that would also be used in the *Intrepid* and *Philadelphia* light cruisers as they reached production stage. The data processing system was an uprated *Zodiac* one, adding a secondary processor core. Full primary hull phaser armament of heavy Type VIII primary and Type VII secondary strips was also featured.

Due to the planetfall design, the navigational deflector dish below the primary hull had to be given very compact dimensions. An auxiliary navigational deflector in upper primary hull bow compensated for the resulting limited power of the main unit.

Two capable shuttlebays were included in the design. Their stern-facing rectangular sliding doors flanked the impulse engine cluster, yet were in no danger of being subjected to the impulse exhaust. Each bay normally held just one light Type 6 shuttle and one shuttlepod, however. In compensation, a heavy shuttle resembling in function the captain's yachts of the large explorers served as the main auxiliary craft. The great wingspan of the shuttle already dictated stowage in a berth under the primary hull, rather than beyond the doors of a hangar. Rapid embarking was a welcome side effect of the arrangement, the need to dodge the main deflector beam a less desirable consequence. Extensive airlock facilities were available in the spine of the ship. MDA-type docking ports, three in all, were at the rim of the primary hull for easy access.

In a process of gradual upgunning similar to that of the *Sabers*, the ship eventually came to carry an exceptionally heavy torpedo armament. A single Type V Mk 80-2 tube fired forward from below the bow deflector on the secondary hull, and initially single, later twin Type V tubes covered aft angles from between the impulse engines. Finally, twin Type VI Mk 82 medium launchers on the primary hull spine doubled as relay dispensers and helped the new *Griffin* class in the traditional light cruiser duty of maintaining communication and intelligence-gathering buoy networks in deep space areas where unprotected buoy tenders dared not operate.

Despite the emphasis on lightweight construction and planetfall-optimized geometry, performance figures of the finished ship were superb: an *Griffin* could fly circles around a *New Orleans* or *Springfield* frigate at impulse speeds, outgun her with phasers and torpedoes, reach a higher top speed, and target wildly maneuvering opponents with deadly accuracy. Only warp maneuverability at medium speeds was slightly inferior to the frigate designs; weaponry, endurance and overall versatility were sufficient to grant the *Griffin* class an immediate light cruiser status.

Six initial vessels of the class were completed between 2355 and 2359 using the very first *Cheyenne* assembly yards at Epsilon Indi, now reserved for prototyping use. The challenges of planetary operations were tackled in a series of extensive tests, which culminated in a simulated planetary assault and evacuation mission involving multiple transatmospheric runs by both *USS Griffin* and *USS Yeager* in 2360. Warp propulsion systems underwent even closer scrutiny after the near-loss of the *Griffin* in a 2360 test run, and weren't fully certified until 2361.

As production picked up pace with the introduction of more modern assembly facilities, the vessels proved themselves as light combat platforms and escort vessels. However, since the Cardassian War was winding down, major orders of *Griffin* cruisers had to wait. Only after the culmination of the 40s-vintage programs in the *Galaxy* class of explorers did Starfleet again turn its attention to modernizing its cruiser arsenal.

The first major combat deployments for the *Griffins* came in the brief Cardassian conflict of 2369. Several hastily assembled formations performed offensive feints across the Dorvan sector to put pressure on the dangerously posturing Cardassian forces – but the focus of the crisis was on low-key covert operations. As forces led by veteran Capt. Jellico paralyzed an entire Cardassian fleet at McAllister nebula, and small infiltration teams began their operations within Cardassian space, three *Griffins* under the overall command of Adm. Haden were sent to penetrate to Rakal, Celtris and Trelka, where the Cardassians were supposedly preparing metagenic weapons for deadly deployment across three sectors.

The *Gustavus Adolphus*, the *Sehnacherib* and the *Blue Mountains* all reached their respective targets undetected and unchallenged, proving several Starfleet covert operations concepts. The feared last hurrah of the Cardassian Union never came, however: the metagenic weapon program proved to be a mere ruse, and the delays that hit the Cardassian fleet at McAllister collapsed their entire assault plan. Political downfall of the militant Central Command soon followed, drawing the UFP intimately into Cardassian politics again as the newly liberated Bajorans called for Federation assistance.

On the devastated yet continually contested surface of Kano'arya, the Gustavus Adolphus *quickly solidifies her position by landing inside a crater carved by her ventral phasers and enfilading the battlefield with lateral phaser fire. A landed starship often proved to be as fearsome an adversary as an orbiting one. Armored with dozens of kilometers of solid rock between her hull and the nearest surface-mounted directed-energy anti-starship weapons, she could only be uprooted by ballistic or orbital fire, neither of which was a realistic option in the presence of friendly surface troops. Entire divisions could thus be evicted from around a landed starship, be it by firepower or anticipation thereof.*

Stakes at Bajor were raised by the discovery of a stable wormhole there. Several *Griffins* were included in the area defense forces deployed in the sector, and the *Yeager* and the *Montgomery* of the class ultimately took to permanent protective patrol at the wormhole mouth. Predictably, hostilities against multiple opponents erupted at this crucial juncture. During the Klingon invasion of Cardassia, the *Montgomery* was credited with the interception and impounding of three Maquis vessels attacking a Cardassian supply convoy in May 2371. In a classic example of battlefield irony, she later exposed and utterly destroyed an identical convoy under Dominion control in late August 2373. *USS Rommel* took part in similar anti-convoy action, and also followed larger Starfleet units to multiple kills against isolated but heavily defended Dominion supply units in early 2374. Through sheer luck, *USS Bactria* managed to locate the main Dominion frontline supply of ketracel-white, the enzyme vital to Jem'Hadar soldiers, vectoring in special operatives to destroy the asteroid depot and thus slowly turning the tide in the heated war.

When the lengthy fighting with the Dominion forces finally came to an end, the fleets at Bajor were largely demobilized, as no proper starbase facilities existed in the system. The *Yeager* and the *Montgomery* still persisted, though, thanks to their ability to replenish planetside. Apart from them, only some *Defiant* escorts are permanently deployed at this vital nexus of commerce and exploration at the time of this writing.

The original order of 64 *Griffins* is subject to much debate now that the improved *Intrepid* class is available, and the final production run may be as sort as 42 ships, or as long as 95. Starfleet is eager to retire all its worn-down *Miranda* derivatives and *Excelsior* era cruisers as soon as possible, and has dedicated all the resources formerly reserved for these types to the building of new light and medium starships. As the *Griffins* have demonstrated prowess in both light combat and scouting duties, some hope to replace the entire remaining *Miranda* and *New Orleans* fleets with them, keel for keel. In this scenario, the originally intended long range exploration missions of the *Griffins* would be taken over by the even more capable *Intrepids*. More somber scenarios call for the use of *Griffins* in mixed fleets.

Galaxy

Explorer
2357-

Completed:	16+
Length:	641.0 m
Beam:	442.1 m
Height:	145.0 m
Mass:	4,788,500 tons (NCC-70637, 71807) 4,960,000 tons (exploration mission, typical) 4,910,000 tons (defense mission, typical) 4,820,000 tons (Dominion War partial build) 5,240,000 tons (NCC-76126)
Cruise speed:	W 6 (stardrive section or combined mode) W 2 (saucer section)
Max.speed:	W 9.6 (stardrive section or combined mode) W 4 (saucer section)
Endurance:	24 years
Officers:	220
Crew:	510 + 200-300 civilians (room for 5000 passengers)
Weapons:	1 phaser X strip on dorsal primary hull 1 phaser X strip on ventral primary hull 2 phaser X strips on dorsal forward secondary hull 1 phaser X strip on dorsal fwd secondary hull (batch 1 only; n/a in combined flight mode) 1 phaser X strip on ventral forward secondary hull 2 phaser X strips on dorsal aft secondary hull 2 phaser X strips on ventral aft secondary hull 2 phaser X strips on nacelle pylons 2 phaser X strips atop nacelles (NCC-71854 only) 1 aft heavy torpedo tube w/ 75 torps in primary hull (batch 1 only; n/a in combined flight mode) 2 heavy torpedo tubes w/ 200 torps and 80 probes in secondary hull
Shields:	Globular forcefield Navigational deflector beam on fwd secondary hull Auxiliary navigational deflector on lower saucer surface
Laboratories:	42, in varying configurations (batch 1) 12, in varying configurations (batch 2 prior to projected update)
Transporters:	4 GP (6-pad), 4 emergency evacuation (22-pad), 4 cargo; Mk VII Most units brought to Mk VIII standard after 2371
Auxiliaries:	At least 12 light or medium shuttles, sixteen shuttlepods, 24 work pods; room for 4 runabouts; special-environment shuttles also carried

Ships of historical interest:

USS Enterprise, *USS Yamato*, *USS Odyssey*, *USS Challenger*, *USS Venture*, *USS Galaxy*, *USS Cortez*, *USS Magellan*

SOURCES: D TNG, (TNG TM)
N TNG
H TNG, (TNG TM)

Destined as the inheritor to the *Ambassador* mission that was now being vacated by the incompatibility of those ships with modern warp engines, the *Galaxy* class became the natural flagship class for Starfleet in the 2360s. A growth version of the already immense *Nebula* class, these hideously expensive ships were initially built in small numbers. They nevertheless saw extensive use in defense, diplomacy and exploration missions throughout the Federation from the very start. In addition to directly replacing the aging *Ambassadors* and *Niagaras* in the independent explorer mission, they took advantage of their superior speed and sensing capabilities to take over part of the duties of a diverse collection of smaller vessels.

The basic structure of the vessels consisted of a slightly trimmed *Nebula*-type Class 1 saucer hull, to which a heavy self-defense photorp launcher and some auxiliary power systems were added, plus a separate stardrive hull which sported advanced armament and equipment for completely independent operations. The saucer was equipped with a low-warp propulsion system that could accelerate the great bulk of the hull to warp two, or maintain speeds up to warp four by sustaining a field handed over from the main engines in the stardrive section. The philosophy behind this experimental arrangement was to enable the major civilian contingent aboard the ships to be evacuated when battle was anticipated, through saucer separation and redocking maneuvers.

The two halves of USS Enterprise *redocking on the orbit of Deneb G IV after the first operational warp separation maneuver on SD 41153. Each* Galaxy *was designed to withstand up to twenty separations and redockings before major structural overhaul. Although the hardware was theoretically not fully interchanceable, a 'soft docking' could be achieved between any saucer and stardrive section, including saucers from Batch 3* Nebula *vessels. In such a linkup, the halves would mostly continue to operate as independent starships, being unable to fully merge computing, power distribution or gravity systems.*

Operational experience soon discouraged the use of such evacuation maneuvers. The ship was found to be dependent upon the saucer's power reserves and wide-coverage phaser strips in battle – and separating the low-warp saucer was seldom a viable tactical option anyway. In combat duty, the ships were simply sent out without civilians aboard. Saucer separation was naturally retained as an emergency bailout option, as is the case in most Starfleet designs.

The ships nevertheless introduced many other leading-edge technologies not previously seen aboard starships: modern holodecks were provided for recreation as well as for research and training use, numerous civilian facilities were available for the comfort of the families aboard, and the latest technology was introduced for the large shipboard medical facility to ensure treatment of planetwide catastrophes and shipboard accidents to the fullest extent of Federation medical expertise.

The modularity of the *Nebula* design was retained, the interiors being easily reconfigurable for diverse purposes. Thus, a *Galaxy* class vessel would be able to perform a ten-year exploration mission, then convert within a month to a center of diplomatic operations or a full-fledged combat platform. Online modifications were also possible, and captains tended to extensively reconfigure their ships according to personal preferences.

Some modular options of the *Nebulas* were now carried permanently. The secondary (or 'battle') hull featured two heavy torpedo launchers of the type carried in *Nebula* modules, removing the need for medium hull tubes. While the total number of tubes was smaller than in a torpedo-podded *Nebula*, the advanced launcher/loader system could provide an equal rate of fire. Also, as all tubes were now compatible with the heavy Type V torpedoes and similarly sized probes, ammunition replenishment was simplified. Many of the sensor packages of the *Nebula* modules were now distributed along the primary and secondary hulls, leading to more complex and cluttered exteriors where the lateral sensor heads or replaceable equipment pallets protruded from the hulls.

Many combat-oriented features of the *Nebula* design were abandoned in favor of higher propulsive performance. Not only was the silhouette of a *Galaxy* almost twice as large as that of a *Nebula* overall: the *Galaxies* omitted impulse exhaust screening systems altogether, and carried main powerplants and navigational deflectors superior to the *Nebula* ones in performance, but also in emission signature. Naturally, this machinery also carried a superior price tag as well as a combat penalty of added complexity. Nevertheless, the ships ultimately proved extremely resilient to enemy fire, even when forced to low-impulse combat and deprived of their propulsive advantage.

Geared for war, USS Onslaught *externally differs little from her predecessors. Internally, she is but a shell, lacking 60 % of onboard accommodation modules and more than 75 % of research gear. The 2371 Starfleet decision to launch such 'barebones'* Galaxies *on an accelerated schedule in preparation for the looming conflict was well founded, as these vessels went on to score the greatest number of capital ship kills in the Dominion War. The* Galaxy *class remains the most formidable combatant in Starfleet arsenal, although future production batches may receive tactical upgrades based on modifications performed on certain operational units.*

The first ship, *USS Galaxy* (NX-70637), was commissioned slightly ahead of schedule in 2357 for extensive operational trials. The trials resulted in minor redesign of the engine systems of the successor vessel *USS Yamato* (NCC-71807), and a major upgrade introducing two more coils in each GN-41 mod 3 nacelle for *USS Enterprise*. These two ships were thus slightly delayed, being fielded in 2362 and 2363, respectively. After that, production was stepped up and the bulk of the class was completed within the next four years on a total of four docks around the UFP (all but halting the construction of *Nebula* class explorers, since dockyards capable of handling such massive vessels were few and far between: even Utopia Planitia only featured two such facilities in 2363). Six ships were finished and

commissioned, and six spaceframes stored disassembled around the Federation awaiting for possible later activation.

Of the six original ships of *Galaxy* class, three (*USS Yamato*, *USS Odyssey*, *USS Enterprise*) were destroyed within the first decade of operations, even though captained and crewed by the best in all Starfleet – names like Varley, Keogh and Picard did not protect the tall ships from rather unglamorous ends. Unshaken, Starfleet began reconfiguring the remaining three vessels, and initiated the construction of six further units from the prefabricated components; production lines were also reopened for the procuring of a projected sixteen new ships, with four more as options. The new ships feature modified power systems with reduced warp damage to the fabric of space and with increased top speed, enhanced phasers, torpedo systems compatible with quantum warheads, and several computer system upgrades. The newly assembled ships still lack most of their intended research gear, having been utilized mainly as military command ships. As of 2377, most are undergoing the installation of this equipment at Utopia Planitia.

USS Excalibur (NCC-76126) is so far the only ship out of the new batch to feature fully operational latching systems of the original type, as she is the trials ship for an advanced warp-propelled saucer. Equipped with a retractable dorsal nacelle assembly that replaces the main shuttlebay, the *Excalibur* saucer is capable of independent acceleration to warp 3.1, or significantly improved sustaining of warp after FTL separation. The resulting independent combatant is also soon to be equipped with light torpedo launchers in the style of recent *Sovereign* class modifications. The stardrive section remains true to the batch standard, unless one counts the special software and interfaces required to operate in separated flight mode. Operational experiences on the *Excalibur* are ambiguous so far. The ship did not quite reach Dominion War battlefields, and the only postwar combat engagement involving separated mode in SD 57628.3 resulted in major damage to both sections, requiring an intensive and ongoing layover at SB 27.

The other nonstandard *Galaxy* in current inventory hails from the original production batch. *USS Venture* (NCC-71854) became a seasoned veteran of all the conflicts of the 2360s and 70s, and underwent extensive repairs and modifications after several destructive engagements. The starship served as the command vessel of Vice Admirals Hastur and Ross during the long campaign against Dominion and Cardassian forces. Currently, the *Venture* is assigned as the flagship of the Federation, although it has been suggested that the honor be next given to a *Sovereign* class ship to reflect the more military posture of Starfleet at the moment. The *Venture* remains committed to a six-year exploratory mission slated to begin in 2378.

Andromeda

Heavy scout
2358-

Completed:	62
Length:	432.2 m
Beam:	256.5 m
Height:	109.1 m
Mass:	1,630,000 tons
Officers:	32
Crew:	104
Cruise speed:	W 7

Max. speed: W 9.45

Endurance: 6 years

Weapons: 2 phaser VII strips, above and below fwd hull
2 phaser VII strips above aft hull
2 phaser VII strips below aft hull

Shields: 1-layer globular forcefield
Navigational deflector on ventral hull

Laboratories: 2 GP, 2 planetary sciences, 1 astrophysics, 1 biology

Transporters: 2 GP (6-pad), 1 emergency evacuation (22-pad), 2 cargo; Mk VII

Auxiliaries: 2 medium shuttles, 2 shuttlepods, 8 work pods

Ships of historical interest:

USS Prokofiev (NCC-68814)

SOURCES: (D TNG)
(N Encyclopedia)
(H own)

At the long-awaited end of the 2350s border crises, Starfleet's selection of modern starships finally appeared complete, with all major ship groups brought to the latest-generation standard and with large reserves of older types available. Even though debates over resources allocation were becoming less frequent in the halls of the Council, some representatives voiced their concern about the continuing starship development. Was it not already guaranteed that Starfleet would have high-quality exploration ships available for the next thirty if not fifty years? Were not defense needs being met or exceeded by the current fleet? What were the pressing reasons for the allocation of replicator time and interstellar transportation resources to Starfleet's R&D and construction bureaux?

Federation Commissioner of Starfleet T'Sokal gave a thorough and categorical answer. The exploration performed by the UFP rested on three layers: first, on unmanned probes and subspace telescope observations; second, on small and medium multi-purpose starships of cruiser, scout and surveyor size; and third, on the large explorer-type ships introduced in the early 24th century, performing independent exploration and drawing in their wake the second layer of smaller ships. The second layer was naturally the most diverse, and still included small numbers of antiquated ships of for example *Constellation*, *Wambundu* and *Hokule'a* classes. While the *Akira* program held promise of an acceptable first-rate cruiser strength, the *Rigel* scouts did not yet provide Starfleet with sufficiently numerous and fast scoutships to chart the ever-expanding deep frontier. Without significantly faster scouts, the required travel times and mission durations would become unacceptable for the upcoming major exploration effort in the spinward direction beyond Deneb.

At the end of the fifties, Starfleet was in a very different position regarding advanced starship introduction than at the beginning of the decade. The *New Orleans* project had been defeated by the mounting costs of designing and building several pieces of radically new equipment and, simultaneously, integrating them into a working whole. Ten years later, the equipment had reached maturity, and the integration into a deep space scoutship proved a much less painful affair than it had been during the *Zodiac*/*Rigel* project. The main technologies to be integrated were the GN-4X series warp engine, the MDD-58 reactor assembly and the Argus CK tactical sensor suite. The template to be filled was the large Class 2E saucer of the *Niagara* class.

In late 2356, the *Rigel*/*Zodiac* dockyards were reactivated and all the existing structural and propulsion hardware spares gathered for assembly of the prototype vessel, *USS Andromeda* (NX-67801).

Construction of the new spaceframe proved relatively straightforward and inexpensive. Essentially, a single GN-41B nacelle was bolted to the primary hull via a connecting fin a dozen decks high. The most demanding task ultimately was fitting a modern m/a reactor inside the connecting neck, along with the required support machinery. Some 40% less space was available than in the *Zodiac* configuration. Still, the MDD-58 was a significantly more compact system to begin with than the older MDD-40 let alone the frigate-standard MDD-52.

The immense bulk of USS Andromeda *could be supposed to instill nothing but awe in her operating crews, yet irreverent references to '*Lollipop *class' follow the ship through assignments and crew rotations. The decorated sister ship* USS Candace *suffers from a double curse in this respect. In all fairness, the crews of the 'suckers' are the first to defend their vessels when questions are raised about the viability of the single-nacelle configuration.*

By 2357, the engineering problems related to hardware packaging within the neck had been solved and construction had resulted in a prototype vessel. Again, deuterium tankage sat closest to the primary hull, filling most of the connector neck. A reaction chamber for the MDD-58, a compacted variant of the *New Orleans* powerplant, was located halfway up the connector, and antimatter tankage was arranged along the upper surface of the warp nacelle. The main power trunk angled along the aft rim of the connector, bringing power both down to the warp nacelle and up to a single compact impulse unit, as well as forward to converters and distributors for shipboard use. Plasma purge systems below the nacelle front end were accompanied by a power tap for the tractor beam.

The impulse engine at the juncture of the connector and the saucer also featured twin fusion chambers for auxiliary power, recessed into the saucer. The reactors would remain with the saucer in a hull separation maneuver, providing power even in dire emergencies. This was the sole major departure from the *Zodiac* power system configuration necessitated by the neck-type instead of longitudal boom mounting of the nacelle.

The generously sized saucertop shuttlebay provided the scouts with superb exploration gear. Two medium shuttles and numerous lighter units were normally carried, although some scouts also made good use of the facility by carrying special-environment exploration craft. Preliminary charting and scouting of ocean-covered worlds or of planets shrouded in ionization or anomalous atmospheres no longer required the resources of a full cruiser.

In addition to the shuttlebay, four primary docking ports were available, two in the saucer and two in the connector fin. Two transporter pads for personnel were located on Deck 4, with a cargo unit and an evacuation unit between the cargo bays on Deck 5. The sickbay was constructed to be easily expandable to nearby crew quarters and other spaces for disaster relief. Other facilities were originally kept extremely spartan for a ship of this era, featuring only two general-purpose and four specialized laboratories and some recreational spaces plus basic workshops and support facilities. The voluminous primary hulls catered for significant future expansion.

Completed in 2358, with the downfall of Cardassia already in clear sight, the *Andromeda* in practice was a ship of peace built on experiences of war. The difference between the hastily created *Zodiac* and

the carefully integrated *Andromeda* showed clearly in the relative performances of the vessels. Even though the single-nacellers were superficially similar, and utilized closely related variants of the GN-4X series of engines, the more modern design cruised effortlessly at warp 7, and left the earlier scouts in her wake with a top speed of warp 9.45. The warp signature of the more modern engine variant was also superior, presenting a much smaller target for enemy tracking systems and a far cleaner emission spectrum to trouble the onboard subspace sensors.

By the end of the Cardassian War, Starfleet was generously equipped with fast and capable modern scouts. An inevitable destroyer modification was also performed on the *Andromedas*, although at this point it was less out of a strategic necessity than out of interest in extending the tactical value of the destroyer fleet through higher fleet speed.

Freedom

Heavy destroyer
2358-

Completed:	128
Length:	432.2 m
Beam:	256.5 m
Height:	111.7 m
Mass:	1,642,000 tons
Officers:	22
Crew:	79
Cruise speed:	W 6
Max. speed:	W 9.45
Endurance:	6 years
Weapons:	2 phaser VII strips, above and below fwd hull 2 phaser VII strips above aft hull 2 phaser VII strips below aft hull 2 fwd heavy torpedo tubes w/ 40 photorps in connecting neck
Shields:	1-layer globular forcefield Navigational deflector on lower hull
Laboratories:	2 GP
Transporters:	2 GP (6-pad), 1 emergency evacuation (22-pad); Mk VII
Auxiliaries:	2 medium shuttles, 2 shuttlepods, 4 work pods

Ships of historical interest:

USS Firebrand (NCC-68723)

SOURCES: D TNG
(N modelers)
(H own)

Between the *Saladin* and *Andromeda* classes, the history of single-nacelled starships had seen a steady progression from modest vessels less than 200 m long to 430-meter behemoths. Yet the concept of 'attrition unit' had always accompanied this general design, no matter how bulky the hull attached to the single nacelle, or how many hundreds of lives were at risk aboard. At the beginning of the latter half of the 24th century, the largest Starfleet capital ships once again dwarfed their single-nacelled companions by a wide margin, while the medium starships featured twice the propulsive hardware and

more than thrice the complexity and cost of the single-nacellers, even if they shared the primary hull size.

In this context, it is only natural that Starfleet in 2356 would set a requirement for a torpedo-toting companion to the *Andromedas*, to be used for maximizing the available fleet firepower in offensive maneuvers. Never mind that such vessels would outbulk and outperform a 23rd century heavy cruiser many times over: sending them to battle instead of *Akiras* or *Niagaras* would be the economical way to secure victory. It would only be later, in a moment of deepest desperation in the Dominion conflict, that vessels smaller than the *Andromeda* class would be summoned to the front lines for the expendable force-multiplier role. During the closing years of the Cardassian conflict, an *Andromeda* derivative was the least expensive starship Starfleet would dare field in open combat.

The combat variant of the *Andromeda*, the *Freedom* class destroyer, carried modern directed-energy weaponry in the form of two bow and four smaller aft-quarter phaser VII strips on the saucer. Little was changed from the scoutship design or the preceding *Decker* destroyers in this respect. However, a heavy twin Mk 65 torpedo launcher was added to the connecting fin, not built around the podded weapons used in *New Orleans* frigates but still modeled after them. The necessary modifications to power systems within the fin were rather minor: antimatter feeds were added for the torpedo loaders, and two extra antimatter tanks were carried inside the aft part of the torpedo deck. Automation in engineering management systems was brought to the level of other contemporary designs.

Trial runs revealed some deficiencies in radiation protection in the torpedo deck early on. The close proximity to the nacelle exposed the torpedo crews to benign levels of duonetic radiation only, but caused interference in some delicate parts of the arming and priming systems. Worse still, the acceleration fields of the launch tubes would undoubtedly disrupt the propulsive warp fields, and vice versa. As the construction schedule did not allow for a reworking of the actual spaceframe, alterations were made to the shape of the propulsive warp field. While the modifications did not degrade the overall performance of the ship, destroyer crews now had to learn a combination of handling qualities different from those of the *Andromeda* scouts.

As many as 62 vessels were built until it became evident that the Cardassian War could be won without further escalation. In peacetime, the role of the ships was much more limited, due to the combat-oriented sensor and analysis gear and lack of multimission provisions. The *Freedoms* thus typically ended up being idled on strategically important starbases. A follow-up batch of 66 vessels (seldom called by the subclass name *Arlington*) with upgraded sensors and fire control systems and a wider spectrum of shield frequencies joined the 59 survivors of the Cardassian conflict in 2360, but could not find a civilian role, either. Yet the expenses of the extra unit procurement were so close to negligible in the new economic reality that not even the Vulcan members of the Council raised an eyebrow.

On May 21st, 2367, Starfleet summoned all its near-Earth forces to oppose the Borg invasion. The *Freedom* class destroyer *Firebrand* was undergoing crew rotation and servicing of torpedo systems at Earth at the time, and joined the armada that gathered at Wolf 359 to combat the Borg cube. Due to a torpedo loader malfunction, the ship was not included in the initial attack run against the Borg. But as the cube returned fire and Admiral Hansen's escorts *Lancer* and *Kyushu* were distressed, Capt. Adalai E. Stifton of the *Firebrand* moved in to evacuate the disintegrating vessels. The *Firebrand* managed to save almost 150 of the survivors before subjected to Borg fire, then broke free with a phaser attack and launched evacuation pods housing the survivors. The original crew of the *Firebrand* then continued attack, only to succumb to total power failure under Borg fire, and loss of all hands, possibly partially through assimilation. The hulk of the ship was considered unsalvageable.

Although flying in formation, the scout Calliope *and the destroyers* Aggressive *and* Fujinami *do not form an integrated combat unit in the style of* Hermes *and* Saladin *vessels a century prior. The rendezvous between battles in 2359 is a chance meeting, as well as an impromptu PR opportunity for the Ardanan shipyards mostly responsible for their construction.*

In 2373, the *Freedoms* were called to arms against the Klingon Empire. However, Starfleet hesitated to engage in offensive action against its former allies, and the role of the destroyers in this conflict was a minor one. The 2374-75 offensives against Dominion forces residing in the Alpha Quadrant were a different matter, and the destroyers excelled in strikes against medium Dominion installations. Klingon forces often ridiculed the ships for their clumsiness and for what they perceived as excessive bulk, yet were happy to cooperate with them on heroic missions of destruction that were often daringly performed without frigate or cruiser support. Casualty figures soared, however, and some 32 ships had been declared lost, missing or ripe for scrapping by late 2375.

Currently, thirty-three *Freedoms* are available for Starfleet operations, and three more are undergoing repairs that will restore spaceworthiness by 2378. Upgrades are being performed on the engine and weapon systems to keep the ships operational for at least twenty years. The first important modification has been the adding of new ramscoops for deep space operations in 2364, followed by a computer overhaul in 2369. A gel-pack processing system is due to be installed to all ships in 2376-79, and new long range sensors are planned for the late 2370s as well. The modernized equipment will allow more flexible roles for the vessels, including rudimentary exploration duty. However, Starfleet has decided to respect the inherent strengths of the design, and is again officially promoting the mission of crippling enemy ships and installations at low cost and high risk.

At this writing, the *Freedoms* are intended to remain in active service at least until the 2390s, while spaceframe lifetime nominally extends to 2430. On the other hand, no single-nacelle designs are being considered for other roles at the moment, and the *Freedoms* may well become the last single-nacelle ships in Starfleet inventory. The reader is allowed healthy skepticism in this issue, however. The *Saladin* design has arisen from the dead more than once already.

Alaska

Battle cruiser
2359-

Completed:	9
Length:	625.2 m
Beam:	224.0 m
Height:	100.1 m

Mass: 3,176,500 tons

Officers: 40

Crew: 780

Cruise speed: W 6

Max. speed: W 9.0

Endurance: 6 years

Weapons: 2 phaser X strips, above and below primary hull
1 phaser X strip on ventral secondary hull
2 phaser IX strips on aft dorsal primary hull
2 phaser IX strips on aft dorsal secondary hull
1 phaser IX strip on aft ventral secondary hull
2 fwd medium torpedo tubes w/ 120 photorps in dorsal superstructure
2 fwd medium torpedo tubes w/ 120 photorps in connecting neck
2+2 aft medium torpedo tubes w/ 120 photorps on dorsal secondary hull

Shields: Globular forcefield
Navigational deflector on secondary hull bow

Laboratories: 2 GP, 1 signals, 1 tactical analysis, 1 planetary science, 1 medical

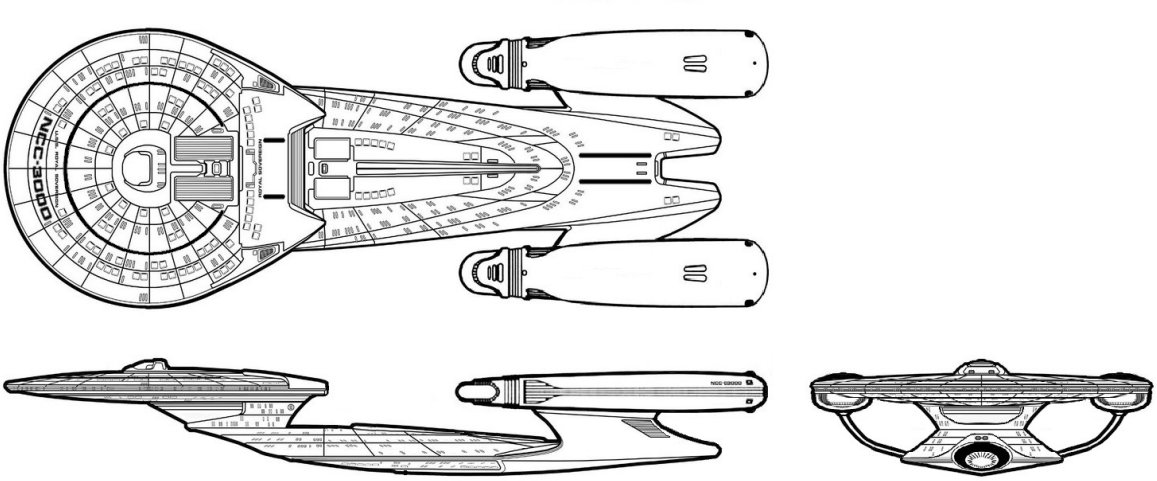
Transporters: 6 GP (6-pad), 5 emergency evacuation (22-pad), 6 cargo; Mk VII

Auxiliaries: 4 heavy, 4 medium and 4 light shuttles, 4 shuttlepods, 4 work pods

Ships of historical interest:

USS Royal Sovereign (NCC-63000)

SOURCES: (D FASA/Calvinboygenius of STSTCS, own)
(N FASA)
(H FASA, own)



Just before the end of the 2350s, and the culmination of the era of border conflicts, one final element of the "*Galaxy* generation" of starships was brought to completion. Great hopes had been placed on this addition to the spectrum of modern types. Yet such was the pace of development that when all these hopes were met by the inaugural ship, Starfleet immediately truncated procurement at a handful of the great ships and declared the competition reopened on the most important military quest of the time – finding a truly modern replacement for the *Excelsior* class of combat cruisers.

The carefully planned and spotlessly executed ASDB battle cruiser project appeared to have all the right ingredients for a ship to succeed the venerable *Excelsiors*. The dimensions, mammoth as they may seem in absolute terms, were a close match to the older combat type and more affordable than the full explorer spaceframes of the *Galaxy* and *Nebula* classes. The high performance warp engines were

lifted from the latest models of the explorers and given a powerplant to match, yet mounted to minimize frontal profile, shieldable volume and the need to modify existing *Excelsior* dockyards and other support assets. All sensing and computing capabilities were improved on, and weaponry was brought to decisive standards by incorporating Type X phaser strips on the 224 meter primary saucer and at the bottom of the secondary hull of slim yet *Galaxy*-like contours. Two pairs of Mk 80 medium torpedo launchers, distributed for both survivability and coverage under the bridge and at the connecting neck, gave forward firepower similar to that of the *Akira* class, but with much simplified ammunition logistics and greater maintainability. Two pairs of aft launchers on dorsal secondary hull eliminated blind spots and compensated for the ponderous turning rate of the tall vessel.

Modern technology also allowed the designers to give exploration capabilities to their creation without detracting from her combat qualities. A saucer shuttlebay, roughly half the size of its *Galaxy* forebear but very similar in design, regularly housed and serviced sixteen general auxiliaries but could accommodate larger numbers or more specialized types with ease. The shuttles could operate without impeding the work of the mothership's navigational deflector, her main directed energy armament, or her trio of impulse engines below the shuttlebay main door. Lighters and barges could similarly approach a secondary bay at the very stern of the vessel to bring aboard fuel and consumables even when the ship stood in full readiness for combat scrambling.

There were no compromises in protection, either. The globular forcefield generators were of full explorer standard, yet handling a much tighter shield envelope and thus giving greater resilience and faster bounceback and relaxation. Passive protection included carefully laid out internal compartments and a good distribution of lifepods. Saucer separation was not intended as a regular or repeatable maneuver, but was an option in extreme emergencies; on such an occasion, special impulse engines would be activated on the stern corners of the separated saucer, and auxiliary fusion reactors would fire up the primary hull shield and phaser power systems for sustained combat capability. The engineering hull could not operate on its own, but in joined mode would similarly retain auxiliary fighting power even were the powerful horizontal warp core to be ejected through its dorsal covers.

The twelve vessels ordered in 2355 were to be just the start in replacing the entire *Excelsior* force, with dedicated command variants also in the planning. By this time, Starfleet was quite resigned to the fact that one-on-one replacement would mean a roughly sixfold acquisition price tag for each vessel. The *Springfield* and *New Orleans* frigate force had been left well below its planned strength due to costing four times the acquisition price of the cruisers they were supposed to replace. The battle cruisers were not to suffer from tight purse strings, though, as the UFP economy was on a constant and dizzying upswing again. The opposite force acted against them instead. At the completion of the first ship, *USS Alaska* (NCC-63001), Starfleet had already sent requests for proposals to create a combat type that was significantly faster, featured a more advanced phaser system, and could accommodate upcoming special weapons emplacements in a modular fashion – something the tightly integrated and thoroughly optimized *Alaska* would have been hard pressed to achieve.

Of the initial order, three vessels were cancelled just prior to the laying of their keels; the engine coils cast were readily absorbed by the rest of the GN-41 operator community. Two of the stillborn ships never received more than placeholder names before succumbing to the forces of development. The *Royal Sovereign* left a more bittersweet legacy, donating her name to Starfleet's next champion in the quest to replace the *Excelsiors*.

The *Alaska* and her eight sisters served with relatively cost-efficient distinction, but as fleet kingpins rather than workhorse units. They met very few criteria of the classic battle cruiser, as they did not suffer from deliberate "payoff" weaknesses in offense or defense. What they lacked in, besides heavy

torpedo launchers and all-around phaser X coverage, was command and control, analysis and planning facilities on par with the explorers. They were still fleet combatants through and through, not deliberately generalized frontier guardians like the *Akira* class, and their contribution to the cohesion of formations in the early Dominion War was considerable. Deeper into the conflict, it became clear that independent melee fighting would be the decisive factor against a technologically superior and disciplined enemy that could sense Starfleet maneuvers and coordination attempts at a distance and disrupt most communications at will while itself remaining immune to jamming. Kingpin thinking was abandoned, and among its victims were any remaining plans of completing additional *Alaska* spaceframes to cover war losses.

Six surviving battle cruisers continue operations as of this writing, while plans on removing their torpedo launchers and replacing them with heavy or quantum-compatible tubes are not proceeding for the time being.

2360-2370 - Coming of Age

The border conflicts of the 2350 petered out almost unnoticed by the public as the decade turned; many thought of this as the end of an age of turmoil. Yet it was the years immediately following the Cardassian War that were the true turning point in history, for all their seeming stability or restoration of status quo. The core worlds had survived the border conflicts unscathed, and the prosperity of Earth radiated to the nearby homeworlds more brightly than ever. The exploration drive had brought many deep-Alpha cultures to contact with the UFP, and trade and cultural exchange benefited both sides. But one group of people was unimpressed by the achievements of the Federation and its Starfleet. The colonists of the final frontier felt betrayed by Starfleet, abandoned by Earth, and sold out by the negotiators of the Cardassian cease-fire which showed no signs of solidifying into a lasting peace. Perhaps just was their estimate that their efforts were grossly undervalued, and that there was a deep rift about 150-200 ly from Earth, dividing the UFP into the wealthy core and the pariahs of the border.

Starfleet's efforts at the time were twofold: one, to further develop the apparently successful doctrine of mobile defenses, so as to be able to handle the numerous low-intensity conflicts that resulted from the UFP clashing with expansionist local powers like the Talarians and the Tzenkethi and, due to the ever-increasing size of the UFP, involved extreme interstellar distances and major logistic problems; and two, to establish an infrastructure of trade and co-operation between the core worlds and the new partnership worlds in deep Alpha. Borders to the Klingon and Romulan realms were peaceful, even though Starfleet had withdrawn major forces from these areas to support the Cardassian War efforts. Thus, the shipbuilding programs concentrated on building frigates and light cruisers for local law enforcement, transports for trade and colony support, and surveyors and scouts for exploration. The huge *Nebula* and *Galaxy* explorers remained elite units, with mass production a theoretical option only.

With the evaluation, invitation and sometime admission of numerous new cultures to the UFP, the area of space Starfleet had to patrol to be able to trigger the mobile defenses was rapidly increasing again. The existing frigate and scout fleets provided barely enough vessels for this purpose, and there was discussion of stepping up the scout program considerably. Resources for this did exist, despite the expensive large explorer programs, since replicator economy was now in full swing and scarcity of material a thing of the past. Thus, the 2360s mainly saw Starfleet concentrating on greatly extended production of the successful yet numerically weak 2350s designs, with surprisingly few new lineages introduced.

The network of starbases was extended by the establishing of ten major fleet facilities of the new superheavy Class VI design (essentially an enlarged version of the historic Earth Spacedock), and as many as two hundred small stations of the proven towable Class II and III designs. Cardassian border areas were sown with Class IV bases to support frigate operations and intelligence gathering.

The colonists would have more appreciated battleships or heavy cruisers for protection against Cardassian harassing - and against the occasional attacks by new and threatening space-pirate adversaries only known by the name Ferengi. No human had survived to tell of an actual close contact with these raiders, although secondhand information was available: Yridian informants told the Ferengi would eat their opponents alive if negotiations were attempted, and a report by a Klingon privateer, supported by a trophy ring of huge ears, seemed to confirm the enormous size and physical strength of the new foes. But Starfleet refused military build-up at the Cardassian frontier, citing both operational and political constraints. In fact, the Union was at one point asked to assist in controlling the Ferengi and Breen threats, highlighting the complexity of the political scene. Nobody seriously thought this alliance between the former enemies would reach even the solidity of the uneasy UFP-Klingon partnership, however.

In addition to the brewing of political trouble, the groundwork for several major technological innovations was laid in this period. Subspace phasing phenomena were studied, eventually leading to advances in cloaking technology and shielding. Holographic entertainment technology produced a viable multipurpose tool for research and training as well. Replicators were perfected to the degree that neural tissue could be synthesized - theoretically, instant replication could now replace time-consuming biological cloning processes, although major ethical problems were foreseen. And the ever-elusive transwarp development continued.

Sequoia

Medium transport
2360-

Completed:	216
Length:	212.0 m
Beam:	150.0 m
Height:	57.3 m
Mass:	920,000 tons
Officers:	6
Crew:	12
Cruise speed:	W 6
Max. speed:	W 9.1
Endurance:	2 years
Weapons:	5 phaser VIII emitters on primary hull
Shields:	1-layer globular forcefield Navigational deflector on primary hull bow
Transporters:	2 GP (6-pad), 4 cargo; Mk VII
Auxiliaries:	4 light shuttles, 2 shuttlepods

Ships of historical interest:

USS Yellowstone (NCC-70073), *USS Berkshire* (NCC-70120)

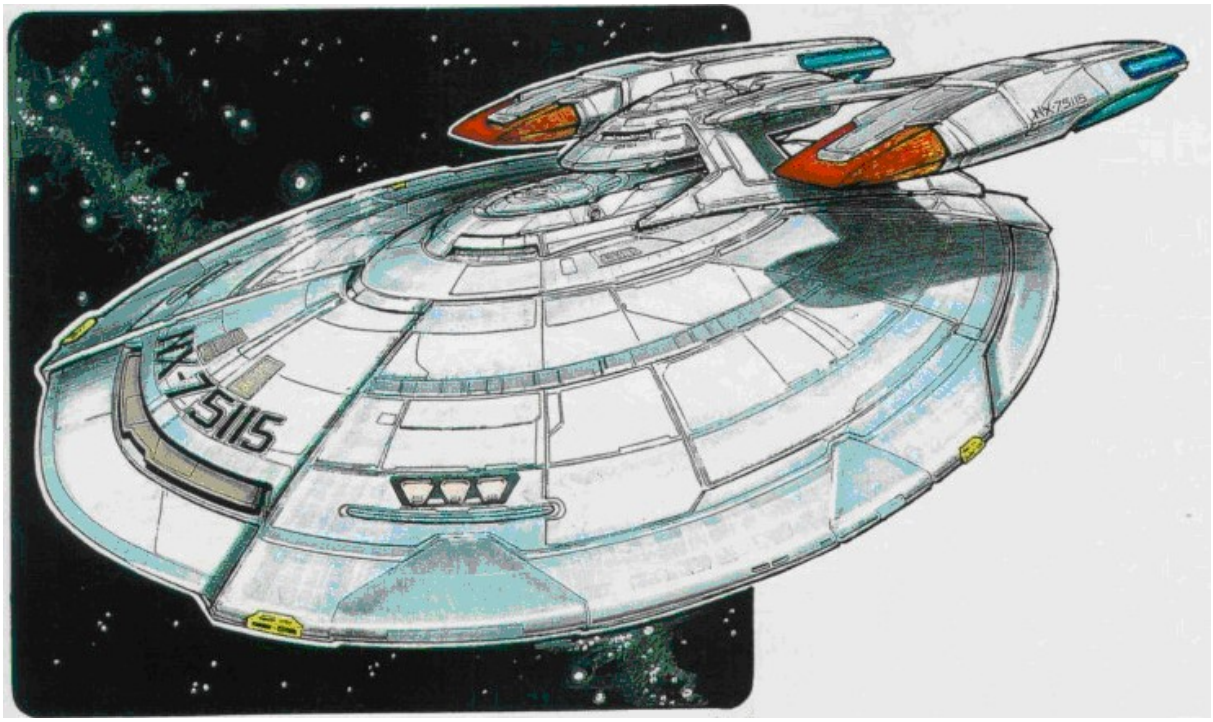
SOURCES: (D John Eaves)
N DS9
(H Eddie Sharpe)

By the 2350s Starfleet Logistics Command had gathered a huge number of vessels to supply and support the scattered outposts and ships of the Fleet. The largest family of these was that of medium transports (leading among these the *Sydney* and *Yorkshire* classes built to exacting frontier service standards). However, these ships were now between 20 and 60 years old; Starfleet knew that the warp systems on the *Sydney* class ships would have difficulty keeping up with the new ship classes being designed and fielded. Indeed, many were lost in the early stages of the Cardassian War while on unescorted independent supply runs, a fate partially attributable to their inability to maintain practical convoy speed.

Additionally, it was felt that the modular construction techniques used in most Starfleet transports gave insufficient structural integrity for combat or high stress operations. Even if the Border Wars had outwardly not been a major challenge to Starfleet, they had in fact shaken Logistics Command, as a relatively weak opponent had been able to inflict disproportionate losses on the transport fleet. As a result of this, a request was issued for a new medium transport type, of non-modular construction and with slightly heavier armament than was usual on ships of this type. The Commission for Starfleet allocated resources in October 2358, and design work began later that year.

The resulting design, finalized in April 2359, was highly distinctive, looking more like a combat starship than a freighter. A spacious, saucer-shaped primary hull contained the cargo facilities, accessed via loading bays astern. The ship was also to be provided with four cargo transporters. Shuttle control and monitoring facilities as well as deuterium stores were housed in a two-deck structure raised above the aft centerline of the hull. Engineering, crew quarters and the bridge were located in a three-deck subhull mounted on twin struts above the primary hull. From this structure extended two pylons, each mounting a 260,000 ton LF-27 warp nacelle. These nacelles were readily identifiable as members of the LF family, despite their new faceted ramscoop covers, but were significantly more compact and efficient than the units installed on the *Yorkshire* medium transports. Impulse engines were fitted both to the lower aft of the primary hull and the aft of the command subhull.

The accommodation standards for the 18-man crew are among the highest in Logistics Command, and the commanders of *Sequoia* class ships never pass up the opportunity to entertain other transport captains to demonstrate this. Due to the non-modular construction of the class, the interior holds in turn are designed to be able to secure almost any type of internal cargo container. The interiors can also be easily modified to carry non-standard containers, bulk and personnel.



USS Xanthe Terra *is seen resupplying Starbase 349 in 2364. The large aft loading bay is visible in this image, as are the advanced warp nacelles and command subhull.*

The final design of the saucer section was, for a transport, rather revolutionary. Although clearly of *Galaxy* era origin, the saucer also exhibited many of the advanced combat survivability features that would become familiar on later vessels, notably on the *Sovereign* class. The prototype (NX-70070) and first 52 ships in the production run were fitted with lifepods of a design similar to those used in the *Griffin* class; subsequent vessels were fitted with those used in the *Nova* class. The weapons fit was significantly heavier than in most medium transports, consisting of five Type VIII emitters with centralized multitargeting fire control. Even a photon torpedo launcher was suggested, but omitted as too bulky and labor-intensive for the small crew. In any case, Starfleet did not anticipate taking the transports to the front lines of major wars. The increased weapons fit on the *Sequoias* was intended to help guard single vessels against small raiding forces of vessels less powerful than Starfleet standard. Several transports had been lost to Cardassian forces in this manner, yet Starfleet was certain that the concept of sending single vessels to supply missions could be made to work with ships as potent as the *Sequoia* class.

Production lines for the *Sequoias* ran for fourteen years, producing a total of 216 ships. Most missed the Border Wars; they primarily performed supply runs to smaller outposts and starbases, couriering personnel and equipment to the new stations that solidified the Federation postwar positions. Starfleet plans still called for the class to provide tactical logistical support in major fleet deployments. While no such deployments took place in the 2360s, this role was performed admirably in the 2367 fleet exercises, following the first Borg Incursion.

The real trial of fire came in the Dominion War, with transport crews often risking their lives to get supplies through to battered and beleaguered Federation task forces and outposts. Instead of shrugging off random raids, the *Sequoias* now faced carefully coordinated Jem'Hadar formations, and the odds of survival weren't good. Twenty-one *Sequoias* were lost in the course of the war, including *USS Alsace* (NCC-70201), which deliberately rammed a Jem'Hadar vessel at the Battle of Betazed.

Yet even ten percent losses have to be considered a major improvement over the fate of the *Mediterranean* or *Yorkshire* classes in the war. The ending of the long production run by no means spells an end to the career of the *Sequoia* class. The design has gained the reputation of a reliable and efficient transport, and is likely to remain in service well into the 25th century.

Sovereign

Heavy cruiser
2367-

Completed:	3+
Length:	737.5 m
Beam:	257.6 m
Height:	96.0 m
Mass:	3,204,800 tons (NX-74222) 3,228,000 tons (NCC-75227 modification) 3,231,000 tons (NCC-1701-E modification)
Officers: Crew:	130 725
Cruise speed:	W 7
Max. speed:	W 9.7 (original) W 9.95 (upgraded)
Endurance:	10 years
Weapons:	2 phaser X strips, each in 3 segments, on dorsal primary hull 2 phaser X strips, each in 2 segments, on ventral primary hull 1 phaser X strip on ventral secondary hull 2 phaser X strips on pylon dorsal sides, 1 per pylon (NCC-1701-E, NCC-75227) 2 phaser X strips on pylon ventral sides, 1 per pylon (NCC-1701-E, NCC-75227) 1 heavy torpedo tube w/ 90 quantum torps under primary hull 2 fwd medium torpedo tubes w/ 80 quantum or photon torps on secondary hull 2 aft medium torpedo tubes w/ 80 quantum or photon torps on lower secondary hull 1 aft medium torpedo tube w/ 40 photon torps on upper secondary hull (NCC-1701-E, NCC-75227) 1 fwd medium torpedo tube w/ 40 photon torps on upper primary hull (NCC-1701-E, NCC-75227) 2 aft light torpedo tubes w/ 60 photon torps on aft primary hull (NCC-1701-E only) 2 fwd light torpedo tubes w/ 60 photon torps on fwd primary hull (NCC-1701-E only)
Shields:	2-layer globular forcefield Navigational deflector on fwd secondary hull Auxiliary navigational deflector on fwd primary hull
Transporters:	6 GP (6-pad), 12 emergency evacuation (22-pad), 4 cargo; Mk VII NCC-75227 brought to Mk VIII standard in 2373
Auxiliaries:	Fourteen shuttles of various types, 10 shuttlepods, 22 work pods, captain's yacht; special environment craft sometimes carried

Ships of historical interest:

USS Enterprise (NCC-1701-E)

SOURCES: D ST:FC, ST:NEM
N ST:FC
(H ST:FC, SciPubTech)

The projected replacement for the successful but aging *Excelsior* class was merged with a third-generation explorer project early in the 2360s. The result was *Sovereign* class, first deployed in 2367 and representing in design the first major departure from the '*Galaxy* family' of starships. The new class displays several advances in various areas of technology, while adhering to the basic design solutions of Federation starships throughout ages.

The ship features a large saucer hull with terraced dorsal and ventral surfaces – a shape deemed more affordable and practical than the smooth skin of earlier designs, since the aerodynamic shape for the saucer in emergency landing is dictated by its deflector fields and bow shock anyway. The hull houses full exploration starship functions, including crew accommodation with extended mission amenities, high performance main computer cores, modular research facilities, multiply redundant support systems, safely overengineered impulse engines and a very large primary shuttlebay, similar to those aboard *Galaxy* and *Nebula* vessels.

A total of twenty-nine decks are provided, about half of these in the primary hull. Uppermost is the bridge with its sensor dome and adjoining captain's ready room and conference room, followed by a support functions deck with some lifeboats and officers' ready rooms, then by a wider deck containing for example the officers' mess, three docking ports and some support systems. Deck four forms a long wedge from the saucer center to the aft rim, ending in large cargo holds and a shuttlebay observation deck.

From Deck 5 down, the hull finally attains its saucer form. The extremely large, almost explorer-standard upper shuttlebay is located on Decks 6 and 7, its service hangars extending down to Deck 9. The bay is flanked by two high performance impulse engines. Main computer cores begin on Deck 6 and go down to Deck 9. Some biocircuitry is included in the design, taking over higher mental functions and thus giving the twin cores reasoning capabilities equal to those of the somewhat larger *Nebula* or *Galaxy* units. As usual, the computer system is considered a Class H7 sentient lifeform and granted appropriate civil rights.

The auxiliary service facilities for the shuttlebay extend down to Deck 10, which also houses the main support functions of the saucer. Below that deck the hull again tapers down until the heavy torpedo launcher on Deck 13, fully compatible with quantum torpedoes. The high firing rate, short barrel launcher is intended strictly for sublight combat, making best possible use of the close-quarters controllability of quantum warheads. Directly behind the launcher is a docking berth for the captain's yacht, a large auxiliary capable of warp drive and (reflecting both the militaristic paranoia of the early 2370s and the recent advances in lightweight mounted weaponry) currently armed with both phasers and microtorpedoes.

Deck 8 is actually the uppermost deck of the secondary hull, but only on Deck 13 do traditional secondary hull facilities begin to show up, including the main propellant and matter-fuel tanks and the high bay for the secondary hull shuttlebay at the extreme stern of the ship. In the event of saucer separation, Deck 13 becomes the top surface of the stardrive section bow, while Deck 8 forms something of a hump amidships of the section. In any case, the stardrive section is not supposed to operate in the separated mode, and is expected to be set to self-destruct following a separation.

Even in this view of USS Sovereign *and* USS Enterprise *flying side by side, many of the modifications implemented on the latter are difficult to discern. These include secondary hull reshaping, hull interface reinforcing, pylon redesign and nacelle repositioning, as well as additional weapon emplacements – measures echoing the gradual perfecting of the* Ambassador *class design half a century earlier.*

The main powerplant core begins on Deck 10; the matter injector system extends to the secondary hull where it meets the antimatter system at Decks 15 and 16, where main engineering lies. Unlike many previous generations of heavy starships, the *Sovereign* features armored and compartmentalized fuel/propellant storage in the form of eight self-sealing subtanks for slush deuterium and four smaller tanks for slush antideuterium. This arrangement was first adopted for use on smaller ships such as the *Intrepid* light cruisers, and differs radically from the *New Orleans*, *Galaxy* or *Nebula* single-compartment tanks that have been found to be vulnerable in battle.

Down on Deck 15 is the secondary hull shuttlebay, three decks high, constituting the stern of the hull. On the forward end is the upper edge of the navigational deflector, and below the dish a tractor beam and sensor array, on Deck 19. On the aft end of that deck is a Mk 95 twin standard torpedo launcher, and on the next deck a twin forward launcher, each with magazines for some 80 torpedoes. Combined firepower is nearly equal to that of the two *Galaxy* class superlaunchers – not including the primary hull launcher, which brings the *Sovereigns* quite on par with the larger explorers in sublight combat. At the very bottom of the ship is the antimatter generation facility, fed interstellar hydrogen by no less than six high performance Bussard collectors.

Fitting the large ramscoops was something of an engineering nightmare, but considered necessary for extreme deep space exploration. Finally, a configuration where two scoops were mounted side by side and one atop them and slightly aft was chosen, with the protective shroud sloped to allow better access off the saucer hull shuttlebays. Aft of the scoops are long yet slim and surprisingly lightweight, 1,200,000 ton H-44 warp assemblies of 26 coils, followed by RCS systems and second-stage plasma coolers. The engines represent a triumphant comeback for Cochrane Warp Dynamics, and provide warp seven cruising and warp 9.95 official top speed. They are far from economical at high warp, however, and Starfleet has been forced to experiment with alternate nacelle placements, much as with the *Ambassador* class.

USS Sovereign (NX-74222) was finished after a long preliminary trials period in 2372 and formally launched with pomp and grandeur to a seven-year exploration mission, with Capt. Heywood Foster Ni (formerly of the famed *USS Iroquois*) in command. After the launch, keels for six new ships were laid, projected to be completed in 2376. However, the Dominion War brought these plans to a halt, and the currently projected completion date is late 2379 for the first three vessels.

Launch of the captain's yacht from USS Sovereign*. The nearly corvette-sized craft still fulfills the traditional role of a detached VIP facility, mobile consulate and field command center, yet introduces new operational possibilities via adoption of high performance warp propulsion.*

Meanwhile, the spaceframes of two ships of the first production batch, *USS Enterprise* (NCC-1701-E) and *USS Bismarck* (NCC-75447), have been completed and furnished, and the ships launched to defensive/diplomatic missions. *USS Enterprise*, the sixth starship in UFP service to bear the name, has distinguished herself in repelling the 2373 Borg intrusion and subsequent time-tampering attempt, while the third starship *Bismarck* was a key asset in the fight against the Dominion, her crew decorated many times over.

Operational experiences on both the vessels have prompted Starfleet to use several of the modular upgrade options available on the vessels: an additional stern torpedo tube has been installed atop the aft shuttlebay, and another forward launcher on the lowermost level of the saucer superstructure. These weapons, planned for from the outset, are identical to the paired secondary hull main launchers in all respects save one: quantum torpedo arming systems are not duplicated due to lack of space. The *Enterprise* has also received light sublight torpedo turrets atop the primary shuttlebay and on the forward primary hull. Also, both vessels have finally had pylon phaser X strips installed to cover a dangerous cone of vulnerability astern.

The phasers will be installed on all subsequent ships, but torpedo armament is expected to undergo further changes as the current systems are evaluated. Use of numerous light sublight launchers is hoped to address the significant tactical problem of defending against saturation attacks by heavily shielded small attack vessels, a deadly scenario introduced in the Dominion War. In many ways, the scenario echoes the old Romulan conflict as well: there, too, Starfleet initially strove to thwart small vessel saturation attacks by multiplying the number of weapon emplacements on existing large starships. It remains to be seen whether the modern solution will be just as short-lived as the historical one.

Two structural modifications have also been implemented on the *Enterprise*, which suffered major secondary hull damage in the Cathaxis crisis and required extensive repairs basically amounting to rebuilding. The first modification is specific to the *Enterprise*, and involves a reconstruction and reshaping of the lower stern around the area of the disastrous aft torpedo system explosion. The second is intended to address the original shortcomings that led to the Cathaxis damage, however, and will thus become part of all the future *Sovereigns* as well: the upper keel structure has been significantly reinforced at the juncture of primary and secondary hulls, manifesting as arched structures on both sides of the main shuttlebay door. Even this measure is suspected to be insufficient in alleviating major torque problems with the long hull, and Starfleet currently hopes to reduce the mass of the primary hull, either by internal reorganizing or through application of more powerful mass-masking fields.

Despite the growth pains, the *Sovereign* class is slowly but steadily moving towards Fleet backbone status. If all goes well, the last *Excelsior* class heavy cruisers will give way to *Sovereigns* by 2400. Hopefully, a projected initial production run of 22 *Sovereign* class vessels in three principal production batches will be finished by 2382 already.

Aegian

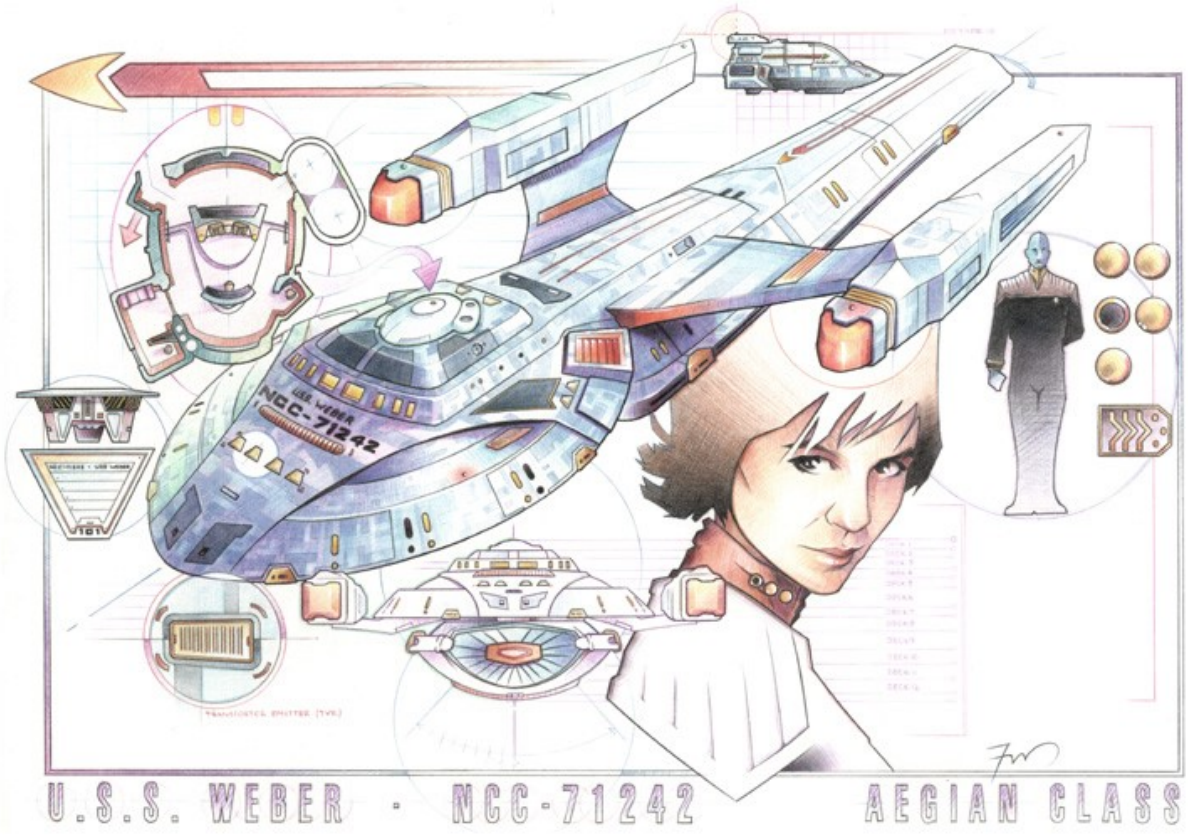
Frigate
2369-

Completed:	38+
Length:	273.2 m (w/o modules) 325.7 m (w/ endurance booster and shuttlebay module, shield enhancer module, medical module) 332.2 m (w/ shield enhancer and shuttlebay module, survey support module)
Beam:	117.1 m
Height:	43.7 m
Mass:	600,000 tons + hull (w/o modules) tons (w/ endurance booster and shuttlebay module) tons (w/ shield enhancer module) tons (w/ shield enhancer and shuttlebay module) tons (w/ medical module) tons (w/ survey support module)
Cruise speed	W 6
Max.speed	W 9.2
Endurance	3 years
Officers:	23
Crew:	103
Weapons:	1 phaser VIII strip on fwd dorsal primary hull 2 phaser VIII strips on fwd ventral primary hull 1 phaser VIII strip on ventral aft hull 2 phaser VII strips on nacelle pylon ventral surfaces 2 fwd medium torpedo tubes w/ 20 torps on primary hull bow 2 aft medium torpedo tubes w/ 20 torps in dorsal aft hull
Shields:	1-layer globular forcefield 1-layer conformal forcefield Navigational deflector beam on fwd secondary hull Auxiliary shield enhancer on stern module (optional)
Laboratories:	1 GP (standard) 1 GP, 3 medical (w/ medical pod)
Transporters:	2 GP (6-pad), 4 emergency evacuation (12-pad), 2 cargo; Mk VIII
Auxiliaries:	2 shuttlepods, 4 work pods (standard) 2 medium shuttles, 2 shuttlepods, 4 work pods (w/ medical, shuttlebay, or shield enhancer and shuttlebay module) 2 medium shuttles, 4 heavy shuttles (or 3 + 1 runabout), 4 work pods (w/ survey support module)

Ships of historical interest:

USS Weber (NCC-71242)

SOURCES: (D Starfleet Command / Armada computer games)
(N Starfleet Command / Armada computer games)
(H Starfleet Command / Armada computer games, own)



Some twenty years into its most recent frigate programs, Starfleet began looking for a successor design to meet its light mobile combatant needs. The higher end of the mission, the one originally burdened on the *New Orleans* and *Springfield* types, no longer urgently needed a specific new class, as it had been absorbed by the emerging excellent cruiser designs. The lower-tier duties, including fleet outrider, escort, fire support and patrol, were the ones where quantity would remain a priority, and modularity the primary means of achieving it.

In the financial and strategic environment of the late 2360s, it was possible to design and implement a more complex mass production vessel than the *tabula rasa* philosophy *Saber* corvettes and the specialized *Rigel* destroyers had been. From the beginning, the new frigate was to mount a sophisticated suite of fleet support systems, designed to enhance and expand the combat performance of vessels in her immediate vicinity in every possible way. This included picket sensors, signals intelligence and countermeasures gear, weapons systems that could be slaved to centralized fire control, and a range of mission modules that would provide support functions. Among the most ambitious was a Hycor shield generator capable of not only extending its protective bubble over vessels under escort, but also of feeding field energies directly into compatible projection grids in the vicinity, thereby remotely boosting the shields of nearby vessels.

The massive generator was but one of the modular options available, yet the one that dictated the nature of the frigate's modularity. For proper warp and impulse trim, all the extension modules would be carried astern, smoothly locked onto an adapter right next to the main powerplant and central computer of the vessel. They would then form an integral part of the vessel's secondary hull, a fairly traditional, ovoid cross section structure of five decks. At the bow of this hull would in turn be the potent multimode navigational deflector; on top, a superstructure would cradle the horizontally branching pylons for the FN-18 warp engines. This spine-like structure extended

forward across the primary hull saucer as well, merging the ship into an integral whole: without her extension module, the ship was quite capable of controlled planetfall in one piece, and could jettison the module as well as the nacelles in more alarming situations.

The module configurations currently possible include the barebones shuttlebay, accommodation and endurance boost pack; the short shield enhancer that lacks range boost and shuttle facilities; the longer module that adds these; the medical module with casevac shuttle landing bay; and the long survey support module that is basically all shuttlebay. Each variant features additional RCS clusters and a smattering of lateral sensor arrays to compensate for the bulk and obstruction necessarily caused by the module.

While the aft end of the spine was dedicated to engineering systems, the amidship section featured two Mk 80 torpedo launchers angled 40 degrees upward from aft. Forward of this was officer accommodation, including a spacious mess hall with forward-facing viewports. Atop the forward part sat another superstructure deck, this one largely dedicated to sensor gear, but also sporting docking adapters port and starboard and two lifeboat stations aft. Topmost was a classic bridge dome, a surprisingly compact and austere facility for controlling the multitude of systems available. Indeed, it would only be in networked fleet action that the frigate could bring all its assets to bear.

The primary hull decks down from the spine, four in all, housed traditional functions: crew accommodation, sickbay, basic laboratory facilities and storage. At the bow were the forward torpedo tubes; slightly aft of them, a row of lifeboats, then the forward Type VII phaser strip. On the aft quarters, two Avidyne 5050 impulse engines provided frigatelike agility near the vessel's center of mass, also perfectly catering for planetfall and subsequent takeoff. The saucer underside was completely flat, with two Type VII phaser strips and a sensor cluster neatly tucked out of the way of the main deflector.

For basic operations without extension modules, or with a simple shuttlebay stern extension, the ship required a crew of just 126. Fleet protection duties would bring in the shield generator module and 22 more personnel; medical support could be offered with a hospital module and its 45 specialists. Scientific research would be boosted with the adoption of a module housing extended shuttlecraft facilities (for up to four heavy shuttles, or three such shuttles and a long range runabout) and computing and coordination systems, although the role of the frigate was to be that of a warden, not that of an active field researcher.

After the class began development in 2364, there were several subsequent changes in the timetable. The frigate was first put on the fast track to construction after *USS Enterprise* (NCC-1701-D) encountered the Borg at system J-25 in 2365. The lead vessel, self-evidently named *USS Aegian* (NX-68849) for her prowess in wielding shields, was still not completed in time for the Wolf 359 battle, but she and her sisters saw action against the Borg during the 2373 invasion of Federation territory. More significantly, they fought in the prolonged Dominion conflict, eight of the 36 vessels completed adopting the role of medical frigate and two serving as dedicated reconnaissance coordination ships.

In terms of compactness, the *Aegians* almost match the *Saber* and *Ukora* corvettes of significantly lower warp performance and firepower. The built-in sophistication of the frigates is bound to wane as future leaps in technology, tactics and strategy necessitate upgrades that ill suit the tight integration and limited onboard spaces. Yet the performance margin that allows for the carriage of a wide range of modules is a good indication of longevity for this newest frigate type as well.

Intrepid

Light cruiser
2369-

Completed:	9+
Length:	344.0 m
Beam:	63.6 m
Height:	129.1 m
Mass:	700,000 tons
Cruise speed	W 7
Max.speed	W 9.975
Endurance	3 years
Officers:	36
Crew:	164
Weapons:	2 phaser VIII strips on fwd dorsal primary hull 2 phaser VIII strips on fwd ventral primary hull 1 phaser VIII strip on dorsal secondary hull 2 phaser VII strips on aft dorsal primary hull 2 phaser VII strips on aft ventral primary hull 2 phaser VII strips on nacelle pylon dorsal surfaces 2 phaser VII strips on nacelle pylon ventral surfaces 2 phaser VII strips on aft ventral secondary hull 2 fwd medium torpedo tubes w/ 20 torps in secondary hull 2 aft medium torpedo tubes w/ 20 torps in primary hull
Shields:	1-layer globular forcefield 1-layer conformal forcefield Navigational deflector beam on fwd secondary hull Auxiliary deflector on fwd primary hull
Laboratories:	16, in varying configurations
Transporters:	2 GP (6-pad), 4 emergency evacuation (12-pad), 2 cargo; Mk VIII
Auxiliaries:	8 medium shuttles, 1 heavy shuttle, 4 work pods

Ships of historical interest:

USS Voyager (NCC-74656), *USS Bellerophon* (NCC-74705)

SOURCES: D VOY
N VOY
(H own)

As soon as the design for the narrow-hulled *USS Griffin* was frozen, Starfleet began probing the possibilities of designing and building a landing-capable light cruiser of more conventional design. Among important aims were inclusion of a proper navigational deflector dish and a large and capable shuttlebay, improving of top warp speed and increasing of endurance. With these additions, the vessel

could meet the criteria of the SV-65 "troubleshooter" program, Starfleet's latest attempt to pacify the deep frontier without fielding large numbers of superior combatants.

Invaluable in the designing process were various subscale testbeds – perhaps the most important among them the pathfinder ship NXP-2366LS/T, a leftover spaceframe from the early stages of the *Defiant* program. Landings and takeoffs were performed using this vessel and a variety of nacelle geometries, with inert masses representing different warp engine models. Super-compact landing gear designs were refined, soon resulting in a folding pad capable of extending to 600% its stowed-away length and 300% its folded surface area.

The Utopia Planitia Experimental Dock Two, Pier 34, proudly presents a row of pathfinder vessels. The Intrepid *landing test platform to the extreme left, accompanied by two propulsion testbeds of similar design, from the* Defiant *and* Sovereign *programs, respectively. To the right, Pier 35 cradles a series of* Oberth *and* Garneau *testbeds from earlier programs, of significant historical interest.*

Parallel with this program, Starfleet had to run several others to verify the multiple demanding aspects of the projected vessel, so that it took almost ten years after the successful completion of the original *Griffin* tests until the cruiser could be declared operational. The silhouette of *USS Intrepid* featured blended shapes, with a primary hull closely matching the *Griffin* one, and with a secondary hull bearing a relationship to the *New Orleans* design. The lower spine of the ship was a curved form far smoother than the cluttered *Griffin* quarterdeck, featuring docking interfaces common for example with those of *Galaxy* and *New Orleans* classes and thus enabling effortless resupply by forward tankers.

What was totally new, however, was the radically redesigned propulsion system. The two GN-45 nacelles were mounted on very short movable pylons, enabling the compact coils to generate a wide variety of field configurations. When in 'up' positions, the nacelles could emulate a narrow field shape, giving the vessel an incredible sustainable top speed of warp 9.975 – and the tilted nacelles also provided superb warp maneuverability, exceeding even that of the other major tilted-coil designs, such as the *Akira* heavy cruisers. When in 'down' position, they produced a more balanced, less energy-hungry field allowing the ship to cruise at a comfortable warp 6.

Cruise speed was refined down to warp 5 when it became known that high-cochrane warp fields caused damage to the galactic subspace medium, but then raised to warp 7 when it was realized that the 'bent' field design generated by tilted nacelles was inherently less likely to cause damage than even a low-level standard field. The cruise configuration for the nacelles was also abandoned, and the ships presently always warp with their engines fully up, to produce the bent non-polluting field design. This way, no performance-hampering field manipulators have to be installed to counter the subspace damage. Impulse flight requires the pylons to be in the down position, however, since the originally intended operational procedure had encouraged the designers to mount the impulse engines on the moving pylons, making them operable (naturally) in the low-warp position. Also, the engines are

always lowered for atmospheric/landing operations, not just for proper trim but also for clearing the impulse engines for full thrust vectoring. Immense loads on the pylon hinges and actuators during and after landing are the unfortunate consequence.

USS Stargazer *settles down on the surface of Mars after her 2371 maiden voyage to Arcturus and back. The nacelles are in the down position, landing legs deployed and structural integrity fields configured for supporting the primary hull against the planet's gravity.*

The main power system relied on a heavier version of the warp core of the *Griffin* class, with new turbulent-flow bypass cooling systems and superpurge capacity for improved warp core fast jettison modes. In addition, the ships carried a preassembled spare core for extended missions: long gone were the days when light cruisers were supposed to be short-leashed poor man's starships hopping from outpost to outpost in their patrol runs. Fuel was packaged in a series of separate self-sealing tanks, increasing combat durability dramatically over the integrated-tank design that had been typical of the preceding generation of ships.

Other new features included a state of the art data processing system abandoning subspace accelerators in reasoning circuits and replacing them with massively parallel-processing organic gel blocks that could generate specific complex molecular networks for each task and leave number-crunching to accelerated optical computers. The ship thus resembles a cerebroprosthesis patient whose simpler brain functions are boosted by positronic processors, while higher association is handled by organic matter.

Armament for the type included five primary phaser VIII strips and eight small phaser VII strips for defense, plus four Type VI Mk 82 medium photon torpedo tubes, two forward and two aft with a standard load of 20 torpedoes for each pair. In times of crises, however, the magazines could hold up to 100 torpedoes. Several micro-probes were routinely carried for remote sensing. A large multi-compartmentalized shuttlebay for eight light shuttlecraft was included in the secondary hull. In addition, each of the two primary hull cargo holds could house a Type 12 light shuttle, and *USS Voyager* and *USS Discovery* sailed out equipped with an impressive total of six Type 6/8 and four Type 12 shuttles, plus full spares and supplies. The atmospheric auxiliary craft introduced for the *Griffin* class was still provided for heavy-duty surface-to-orbit transport, docked to the underside of the primary hull (except in the *Voyager* and the *Discovery*, which had not yet received an actual flight article at launch and had their aeroshuttle berths plated over – a single Type 9 cargo shuttle was carried aboard these ships instead).

Two six-person transporters with extensive site-to-site modes and two cargo platforms were available. No less than twelve emitters for the transporters were provided on the hull. Transporting

through raised shields was considered a viable option in some non-combat scenarios, based on extensive tests aboard *USS Clarke* and *USS Warren* in the mid-2360s. The highly malleable warp field design also offered better windows for warp transport, allowing for a differential of as many as 1.6 warp factors in ideal conditions.

At this writing, nine vessels of this class have been completed. *USS Intrepid*, the class ship, was built in five years and commissioned in 2369, followed after an exhaustive testing period by *USS Voyager* and *USS Discovery*, which took just 1.5 years to build and were put to service in 2371. Six more keels have been laid and twelve more are in order. However, the Dominion War has slowed down production significantly, and the timetable for the completion of all the 27 ships projected, let alone potential additional orders, is still very much open.

The class was believed to have suffered its first casualty when *USS Voyager* disappeared in 2371 in the Badlands anomaly region while chasing a group of Maquis insurgents. In early 2374, however, information was gained that the ship had in fact been swept across the galaxy to deep Delta Quadrant. Efforts to establish contact with the vessel finally succeeded in 2376, and retrieval was effected in 2377, through a Borg transwarp conduit. This incredible feat was only part of the major intelligence coup on Borg culture and technology that the journey of the *Voyager* and her captain Kathryn Janeway brought about. Debriefing of a Borg informant, already publicly identified as the former UFP citizen Annika Hansen, as well as the reverse-engineering of technology brought back by the vessel, is expected to take several more years to complete. Rumors abound of crucial breakthroughs in offensive, defensive and propulsive technologies, however. It remains to be seen when (and even if) Starfleet will be ready to apply them to the rest of its arsenal.

2370-2375 - Invasion!

The latter part of the 24th century saw the eruption of borderland troubles that would prompt a full-fledged separatist movement within the UFP. This coincided with two major shifts in interstellar power – the arrival of the Borg who severely tested both Earth and Romulan defenses, and the opening of the Bajoran wormhole which revealed the Gamma Quadrant superpower Dominion. Both of these threats challenged the Starfleet mobile defense doctrine, as the Borg transwarp drive and the wormhole gave the enemy a crucial speed advantage in the deployment of forces.

The emergence of the Dominion threat prompted both Cardassians and Klingons to step up their activity in the region, soon involving the Romulans as well. For the Klingon Empire, elimination of one of the players seemed a perfect way to rekindle the flames of fighting passion and to test the troops and weapons in battle after a long period of dormancy. In 2372, Chancellor Gowron decided to lead his forces against Cardassia, which he suspected of having fallen under Dominion influence. His ambitious and outrageous plan was to strike directly at the core of the Union, through the Bajoran sector so conveniently cleared of Cardassian defenses by the Federation two decades earlier. Although the invasion was aborted for political reasons, it still achieved most of its strategic goals: the Klingon fighting machine once again was a force to be reckoned, and the Houses and factions were now solidly allied behind Gowron's lead.

The ranks of the Federation were less solid. The tumultuous times would force Starfleet to adopt an almost fanatically military posture after a period of complacent supremacy. So alien was this militaristic mindset to many Starfleeters that common sense and logic was often swept aside. Politicians fortified behind the clauses and moments of the Prime Directive, leading the UFP into unhealthy isolationism. Some Starfleet leaders overreacted to the point of attempting military coup

– fortunately, the tradition had weakened in the intervening hundred years so that the coup leaders were just a faint afterimage of the likes of Rittenhouse, Cartwright and Drake. Still, at the end of the period, the Federation seemed to be at the brink of destruction both from inside and from outside, and the only hope was of the latter threat unifying the forces against the former.

An unfortunate conflict between the Federation and the Klingon Empire in early 2373 proved a crucial turning point. Instigated by the Dominion Founders, it at first seemed to weaken both combatants and pave way for a Dominion invasion. However, the successful triggering of this war apparently also hastened the invasion plans, so that the main Dominion offensive began long before the UFP and Klingon forces had significantly hurt each other. Even though the Dominion managed to establish a well-fortified beachhead in Cardassian space, the UFP-Klingon front solidified against them. And a crucial judgment error by the Dominion allowed Starfleet to mine shut the vital wormhole connection for a critical three-month period, forcing the deadly Jem'Hadar forces to the defensive for the initial stages of the war.

Still, Starfleet was hard pressed to mobilize its forces in time. Although recalling of ships had been begun in early 2371 already, the Fleet reached fighting strength only in late 2373. Had the Klingons not chosen to side with the UFP, the situation would have looked grim indeed. Yet the Dominion War of 2373-75 must be seen as the finest hour of Starfleet so far; so many things went right despite the cards being heavily stacked against Starfleet. Coordinated operations of fleets of up to 600 vessels proceeded far more smoothly than anticipated, even if larger fleets were virtually uncontrollable in battle. Logistics problems could be overcome with minimal activation of Class 4 or 5 resources. Incredible feats of intelligence gathering and covert operations were performed against the far superior Dominion sensor capability. And the defensive lines of the core region held even after the devastating antispinward plunge of the Jem'Hadar – an attack unparalleled in the history of the quadrant, one that in effect severed the UFP, Klingon and Romulan forces from each other and caused key UFP worlds like Betazed, Benzar and Bolarus to fall one after another. It is truly a miracle that the entire defensive network of the UFP did not collapse in the critical months of early 2374.

In the map of the war theater of 2374, the true extent of the Dominion assault is revealed. The Dominion quickly retreated from the easy pickings of spinward resource bases, both to appease the Breen and to redirect forces for an antispinward plunge. This maneuver was not made towards the UFP core as expected, but out through the DMZ, past Betazed and Aldebaran, and corewards through Regulus and Kaleb to Romulan space, which the Dominion forces were free to utilize until late 2374. The insane plunge through UFP heartland severed the Federation supply lines and brought Benzar and

Bolarus to their knees; eventually, even Betazed fell. Only the October 2374 declaration of war by the Romulan Star Empire saved Vulcan from falling as well.

Ships designed in response to the conflict were few, since even in two years only so much R&D can be performed. Mostly, Starfleet's technological response consisted of major upgrades to existing shielding systems, for resilience against the phased polaron weaponry preferred by the Jem'Hadar. Yet for example quantum torpedo technology was fielded for the first time, and light torpedo launchers proliferated across Starfleet's arsenal of small craft.

Nova

Surveyor / multipurpose platform
2370-

Completed:	79+ total: 10+ planetary surveyors 18+ deep space surveyors 19+ relay layers 32+ minesweepers
Length:	178.0 m
Beam:	86.2 m
Height:	34.5 m
Mass:	260,000 tons (planetary surveyor, typical) 260,800 tons (deep space surveyor, typical) 260,900 tons (relay layer) 264,500 tons (minesweeper)
Officers:	24 (typical surveyor) 11 (relay layer, minesweeper)
Crew:	65 (typical surveyor) 43 (relay layer) 60 (minesweeper)
Cruise speed:	W 6
Max. speed:	W 8.0
Endurance:	2.5 years
Weapons:	Standard: 4 phaser VIII strips on forward primary hull 4 phaser VI strips on aft primary hull 1 phaser VIII strip on ventral secondary hull 2 phaser VI strips on aft secondary hull Relay layer, additional: 2 fwd medium torpedo tubes w/ 20 photorps Aft dispensers for 800 small or 60 medium subspace relays or up to 1,200 gravitic mines Surveyors, minesweeper, additional: 2 fwd medium torpedo tubes w/ 20 photorps 2 aft medium torpedo tubes w/ 20 photorps
Shields:	1-layer globular forcefield Navigational deflector on fwd secondary hull Auxiliary navigational deflector on fwd primary hull
Transporters:	2 GP (6-pad), 1 emergency evacuation (12-pad), 1 cargo; Mk VIII
Auxiliaries:	1 light shuttle, 2 shuttlepods, 1 work pod, 1 atmospheric auxiliary (planetary surveyor) 1 light shuttle, 2 shuttlepods, 1 work pod, (deep space surveyor, relay layer) 2 shuttlepods, 2 work pods, 1 minesweeping auxiliary (minesweeper)
SOURCES:	D VOY N VOY (H DS9 TM)

Even though Starfleet after the explorer programs of the early 2360s had decided to again move towards small, specialized ship types, the solution of creating an efficient light starship eluded SF R&D until the end of the decade. Key elements in the eventual success were a new warp propulsion system, to be scaled up and down and shared with a variety of modern designs; a modular impulse propulsion system with a variable number of reactors, nozzles and self-sealing tanks; and a hull designed to accommodate various sensors, weapons and special systems to meet a wide variety of user needs.

Basic engineering solutions, including general hull shape, came from the family of testbeds used in many recent starship programs. A final shape was decided on in 2369, differing from the *Defiant*, *Intrepid* and *Sovereign* pathfinders in minor details only. A four-deck spoonlike primary hull housed all major control and accommodation functions, while four decks of secondary hull contained the main powerplant, propellant tanks, main deflector dish and a shuttlebay for up to two medium shuttles and two shuttlepods. The Shuvinaaljis-built, 120,000 ton H-47 nacelles utilizing some of the modern lightweight technology of the *Sovereign* class were mounted on canted, swept pylons of fixed geometry, and contained the latest model of ramscoop, some 40% more efficient than earlier designs of similar size.

By giving this barebones starship the modular gear required for the projected missions, Starfleet could turn her into any of four urgently needed ship types: a planetary surveyor, a deep space surveyor, a patrol ship or a relay layer. In 2372, a minesweeper variant was added to the family, and the patrol ship design revamped enough to warrant a separate class designation. Six main locations were available for modular gear: a large cutout at the extreme bow, ready to take an auxiliary deflector and long range sensor package of desired type; two primary hull berths for sensors or weapons; a berth below the primary hull for an auxiliary craft or a sensor package; a dorsal secondary hull berth for torpedo launchers or relay/mine dispensers; and a series of ventral cavities for landing gear or extra fuel.

A planetary surveyor would mount a medium navigational deflector with minimal medium range navigational sensors, be equipped with full landing gear, and carry an atmospheric auxiliary ventrally. Short range sensors would be fitted on the primary hull berths, while the dorsal berth on ships deployed on high-risk exploration zones would typically mount twin aft torpedo launchers to augment the two fixed forward tubes.

A deep space surveyor would carry improved long range sensors and a larger deflector and omit the auxiliary craft in favor of further sensing systems. Landing gear would be replaced by fuel tanks. Again, the option for added torpedo firepower would be used on select assignments.

Relay layers would otherwise resemble deep space surveyors, but would carry relay dispensers instead of aft torpedoes, and comm equipment instead of primary hull sensors.

Finally, minesweepers would have the medium navigational deflector, medium navigational sensors and full torpedoes, yet carry sensors dedicated to minehunting, omit the landing gear in favor of stronger shields, and berth an auxiliary vessel specifically designed for locating and disarming mines.

In practice, the configuration of the vessel was always set at construction; the mission equipment was not easily swappable once installed. The first four ships off the dockyards at Utopia Planitia and 40 Eridani were of the planetary surveyor configuration, followed by a batch of six deep space

surveyors. The procurement then settled on a rhythm of one planetary surveyor, two deep space surveyors, and either two minesweepers or two relay layers per cycle, with six cycles completed by 2373. At that point, surveyor procurement was discontinued and minesweeper and minelayer production given priority in the program, to cope with the needs of the Klingon Border War and the rapidly approaching conflict with the Dominion.

Due to their low top speed, the *Novas* seldom featured in major offensive fleet actions during the Dominion War, no matter what their configuration. The minelayer variants saw extensive use in the defensive battlefields, however, and the deep space surveyors performed sentry duty in areas of low risk. After the war, production has been redirected at further planetary surveyors, and continues at a steady pace.

In addition to the variants described here, the *Nova* spaceframe has been further modified for specialized use. The *Ukora* corvette features significant performance increases and a slightly altered spaceframe. A four-nacelled variant called the *Loki* class has also been developed for courier duty. Both modifications are described in part II of this work. There also exist plans of adapting this design for the salvage tug role, with slightly different engine design and rearrangement of the aft hull. It can be expected that the class and its derivatives will eventually see as widespread use as the *Oberth* and *Garneau* designs of the late 23rd century.

Philadelphia

Light cruiser / anti-Borg platform
2372-

Completed:	4
Length:	361.2 m
Beam:	192.0 m
Height:	76.5 m
Mass:	1,290,000 tons (NCC-74120) 1,295,500 tons (NCC-74121, 74150) 1,260,300 tons (NCC-74293)
Cruise speed	W 7
Max.speed	W 9.85
Endurance	2 years
Officers:	34
Crew:	161
Weapons:	2 phaser VIII strips on fwd dorsal primary hull 2 phaser VIII strips on fwd ventral primary hull 2 phaser VIII strips on dorsal secondary hull 2 phaser VII strips on aft dorsal primary hull 2 phaser VII strips on nacelle pylons 2 offensive deflector beam emitters under primary hull 1 fwd medium torpedo tube w/ 20 torps between deflector beam emitters (not in NCC-74293) 2 aft medium torpedo tubes w/ 20 torps on aft primary hull (not in NCC-74293)
Shields:	1-layer globular forcefield 1-layer conformal forcefield Auxiliary deflector on fwd primary hull
Laboratories:	1 offensive analysis
Transporters:	2 GP (6-pad), 2 emergency evacuation (12-pad); Mk VIII
Auxiliaries:	2 work pods (NCC-74120)

2 shuttlepods, 4 work pods (other vessels)

Ships of historical interest:

USS Elkins (NCC-74121)

SOURCES: D DS9
(N own)
(H own)

Out of desperate times may grow desperate measures – yet old clichés were not what Starfleet was relying on after the first Borg strike at Earth was only barely repelled. The vast majority of anti-Borg programs initiated after the first contact at J-25 were in fact terminated in 2367, as Starfleet R&D finally gained detailed information on Borg tactical capabilities and on the performance of various special weapons against them. Development now centered on a select few technologies, most of which were aimed at increasing the flexibility of existing weapons systems. Few radically new weapon types continued to be explored. Against the Borg, any single superweapon developed would only be useful for a limited number of shots, so effort to develop such a weapon would be wasted unless first-shot lethality could be guaranteed.

There was one weapon that offered both flexibility and the potential for first-shot kills. Deflector beams were highly malleable in their properties, and could channel vast amounts of power in a controlled manner. The failure of *USS Enterprise* (NCC-1701-D) to inflict damage with such a weapon in 2366 was attributed to an insufficient rate of upper-band subspace frequency scanning. In theory, the weapon would work, but only if it could outsmart or at least outpace the constantly retuning subspace shielding of a Borg vessel. Yet rapid retuning would be destructive to known deflector systems, and investing in non-reusable machinery the size of starship deflectors fell squarely in the category of 'wasted effort'.

However, there was a relatively obvious way out. By running several deflectors simultaneously, the attacker could effect abrupt shifts in frequency without overtasking any single unit. As an added advantage, the ship would not be deprived of warp speed even if one of the deflectors were destroyed – although the deflectors under consideration for the weapons application were very special units, largely unsuited for navigation purposes.

In 2369, Starfleet obtained the funding for the second dedicated anti-Borg starship to emerge from the 2365-66 crash program. Unlike the *Defiant* pulse phaser platform, the *Philadelphia* (NX-74120) deflector cruiser was built out of conventional starship components, and was given relatively good spacekeeping qualities and overall accommodation standards as the result. A *Griffin*-type primary hull was gracefully mated to a broad secondary hull that hugged two side-by-side cylindrar 'Onager' offensive navigational deflector emitter assemblies underneath. Outboard of the Onagers were curved pylons for heavy GD-50 warp nacelles, 400,000 ton growth models of the *Bradbury* corvette GD-18/20 units. They were supposed to erect a very broad field (by modern narrow-field standards at least) to enhance maneuverability so that the boresight-only main weapons could be brought to bear. At sublight speeds, immense impulse engines aft of the weapons would give the required control authority.

Power was provided by three separate m/am chambers. There was a reactor assembly in each deflector cylinder, dedicated to the operation of the weapon. In addition, the spine of the ship expanded into a primary engineering section astern, between the impulse nozzles, and contained a third reactor for operating the ship's warp drive. The stern section also held secondary power systems, intercoolers and plasma expanders, all crammed into minimum space. Nowhere in the secondary hull were there provisions for crew accommodation, consumables storage, shuttlecraft, or sensors or analysis systems.

A Dominion asteroid fortress is torn apart by the twin beams of USS Robespierre*. Less than practical against starship targets, the Onagers were often fired at fixed installations to highly destructive effect. Field commanders would gladly have seen more of the weapons on the front lines, and had to be strictly discouraged from using regular starship deflectors in this tasking manner.*

Secondary weapon systems were surprisingly potent, however. Six Type VIII phaser strips were carried, four dorsally and two ventrally. Lateral Type VII units on pylons and aft primary hull provided additional firecover. Both the aft medium torpedo berths in the primary hull spine were filled with Mk 82 Type VI launchers, and a third was installed between the Onager business ends, firing forward. Expanded magazines were not fitted, however, so the maximum warload was sixty torpedoes, without provision for quantum warheads. Targeting and fire control systems for the secondary weapons were *Griffin* standard. Primary sensor pallets in turn carried gear optimized for realtime damage assessment, and tied directly to the Onager control computers so that weapon frequency could be constantly tuned for maximum lethality.

The intimidatingly potent *Philadelphia* weapon system was also hugely expensive, and far from certain to meet the expectations. Starfleet nevertheless was willing to invest in a 'preproduction batch' of four vessels. The *Philadelphia* was within 2370 followed by *USS Elkins* (NCC-74121) and *USS Robespierre* (NCC-74150), both of which added a dorsal hump to the quarterdeck to accommodate a hangarette for two shuttlepods. The fourth and final vessel, *USS Surigao* (NCC-74293), omitted the torpedo armament and featured an improved Onager system of more compact size.

Despite the tight production schedule, none of the vessels was in service during the SD 50893 Borg Incursion yet. The first true test of fire for the weapon system came in the early battles against the Dominion in 2373, where the *Elkins* fought in the ranks of the 7th Fleet and the *Surigao* with the 4th. The ships seldom could get the Onagers to bear, however, and ended up fighting with their secondary weapons in the role of regular light cruisers. The *Elkins* suffered major structural damage at Tyra, and was kept out of the action for the rest of the war. The *Surigao* was lost at Chin'arya in May 2375 to an Onager misfire that ripped open the ventral primary hull and caused a series of secondary explosions. Some 90 lives were lost.

Production of the *Philadelphias* has not continued after the war. Starfleet is unlikely to commit further resources to the experiment until the first reports of performance against an actual Borg

opponent come in. To increase the odds of such an engagement taking place, the ships are undergoing an engine upgrade. The GD-50 mod 1 is supposed to give a pursuit speed of warp 9.95, allowing the surviving fleet of three to intercept possible Borg incursions both in UFP fringe areas and core space. The vessels are rotated almost monthly between starbases some fifty lightyears from Earth, with at least 50 ly also between any two *Philadelphias*. Fixed four- to six-barrel Onager installations are being added to the Luna Defense Perimeter, and plans exist for adding deflector systems to the planetary defense networks of Vulcan, Delta, Izar and Vega as well.

The future of the Onager program is in some doubt, however. New technologies acquired with the recent recovery of *USS Voyager* hold great promise of providing Starfleet with truly potent anti-Borg weapons, possibly of types that can be retrofitted to existing starships and other defense platforms. It is also possible that these technologies have applications in conventional warfare. As no official information on the acquisitions has been released, though, the only verifiable fact remains that the *Voyager* herself possesses (or at least briefly possessed) the ability to resist the Borg. Meanwhile, Starfleet continues to explore further alternate uses for the proven *Griffin* basic spaceframe, possibly now coupled with the the GD-50 engine rather than the limiting GN-45.

Prometheus

(Drone?) cruiser
2374-

Completed:	3+
Length:	415.1 m
Beam:	170.0 m
Height:	113.2 m
Mass:	1,450,000 tons
Officers:	Unknown
Crew:	Unknown, estimated at 120
Cruise speed:	W 8
Max speed:	W 9.95 (estimated)
Endurance:	3 years
Weapons:	At least 13 phaser IX strips in various locations At least 3 quantum torpedo tubes (NB: Not all weapons can be fired in docked mode)
Shields:	1-layer globular forcefield Navigational deflector on dorsal primary hull
Transporters:	At least 1 Mk VIII GP unit
Auxiliaries:	2 light shuttles, 2 shuttlepods

Ships of historical interest:

USS Prometheus (NX-74913)

SOURCES: D VOY
N VOY
H VOY (Eddie Sharpe)

Very little is known about the *Prometheus* class, whose existence has only very recently been verified. Development of the design apparently started in response to the first encounter with the Dominion in 2370. The possibility of conflict led Starfleet to reactivate many of the anti-Borg programs that had fallen by the wayside in recent years, and combine them with the technological

advances made in the development of the *Sovereign* class. One of the designs being considered by Starfleet for use against the Borg had been a 'multi-vector attack cruiser.' This was based on the simple tactic of hitting the Borg vessel with very powerful conventional weapons from multiple directions, thus inflicting major damage without giving the Borg time to adapt. However, it was recognized that an attempt to produce large numbers of small ships would result in a *Defiant*-like design that would not have the required deployment speed; probably would be parceled off to starbase defense, aggravating the speed deficiency in outer perimeter interception missions; and might not have the overall power to operate sufficiently destructive phaser armament in the first place.

The design team therefore decided to proceed with a high speed cruiser design that could separate into 3-5 sections, each capable of independent action. From here on, the history of the class becomes a little hazy; much about it remains classified. It is known that the first ship, *USS Prometheus* (NX-74913), was commissioned in 2374 and the second, *USS Cerberus* (NCC-74928), was launched six months after, in early 2375. Whether or not any further hulls or sections have been or are being produced is unknown, although there is evidence to suggest at least one additional full fighting unit has been procured.

Rumors also abound on an incident involving the first ship and the Romulans. Apparently, there were Romulan personnel aboard the vessel at one point, and the vessel exchanged fire with both Starfleet and Romulan units. Built on the officially unsubstantiated testimony of a freighter captain who observed the supposed event and its related communications traffic from afar, the 'incident' may also be chalked up as a misunderstanding of a mundane event, though, and not at all atypical of the covert operations mythos. The likeliest explanation is a clandestine joint combat evaluation exercise, similar to those performed with Klingon vessels in the 2350s.

The design itself is clearly a product of '*Sovereign* era' technology, the distinctive triangular primary hull setting it apart from the curves of older designs. Four warp nacelles of unknown designation but evident H series origin are located towards the aft of the vessel, and it is believed that an internal or extensible-retractable warp nacelle setup allows FTL travel for the third section when separated. Official mass figures implicate the presence of more than four sets of warp coils. Pictures so far published do not describe this section in sufficient detail or from suitable angles to ascertain the capability, however.

The known weapons fit is heavy, although the exact distribution of these weapons between the three sections is not known. It would appear likely, though, that major firepower is concentrated in the sections equipped with the more powerful engines. Indeed, there are several indications that these sections are intended to be operated as combat drones, with the control crews standing off in the third, less maneuverable and less heavily armed section. The significantly higher agility allowed by the lack of crew would explain the lack of rear-facing armaments on the combat sections – as well as the very low numbers of lifeboats evident in these sections.

Drones have not been a favored Starfleet approach to alleviating the risks of space combat. Swarms of small drones have proved impotent against most threat types, while giving control of a large, starship-sized weapons system over to a computer is wrought with danger. A compromise in the form of a remotely controlled pair of heavy combat drones appears logical enough, but the issue is still subject to speculation, as the *Prometheus* operational profile remains shrouded in mystery.

It is believed that the design was already in operational use during the final years of the Dominion War, possibly in high risk intelligence gathering missions. Starfleet appears satisfied with its

performance, as evidenced by further procurement, no matter how modest at this point. Still, information released by Starfleet has been minimal: a brief outline of the origins of the class, basic specifications (which may not be entirely accurate) and the names and registries of the first two ships, along with two official pictures. Whether any more information is released in the next few years remains to be seen.

Iwo Jima

Assault ship
2375-

Completed:	41+
Length:	170.1 m
Beam:	226.7 m
Height:	120.9 m
Mass:	820,000 tons
Officers:	19 (not including Marine officers)
Crew:	78
Troops:	480
Cruise speed:	W 6
Max speed:	W 8.9
Endurance:	1 year
Weapons:	2 phaser VIII emitters on bow 2 fwd torpedo tubes w/ 50 photorps 1 aft torpedo tube w/ 20 photorps
Shields:	1-layer globular forcefield Navigational deflector on primary hull bow
Transporters:	4 GP (6-pad), 4 troop transport (30-pad); Mk VIII
Auxiliaries:	4 work pods

Ships of historical interest:

USS Culebra (NCC-78660)

SOURCES: (D Armada II computer game)
(N Armada II computer game)
(H Armada II computer game)

Modern shipbuilding technology and methodology offers good possibilities for bringing even radically new concepts to prototyping and testing stage in a short span of time. Yet any sizeable starship still takes a certain minimum time to construct, and there has thus been doctrinal resistance to the idea that ships, rather than tactics, should adapt to emerging threats. The Borg have nevertheless recently challenged that doctrine by their example – and as the direct result, Starfleet's

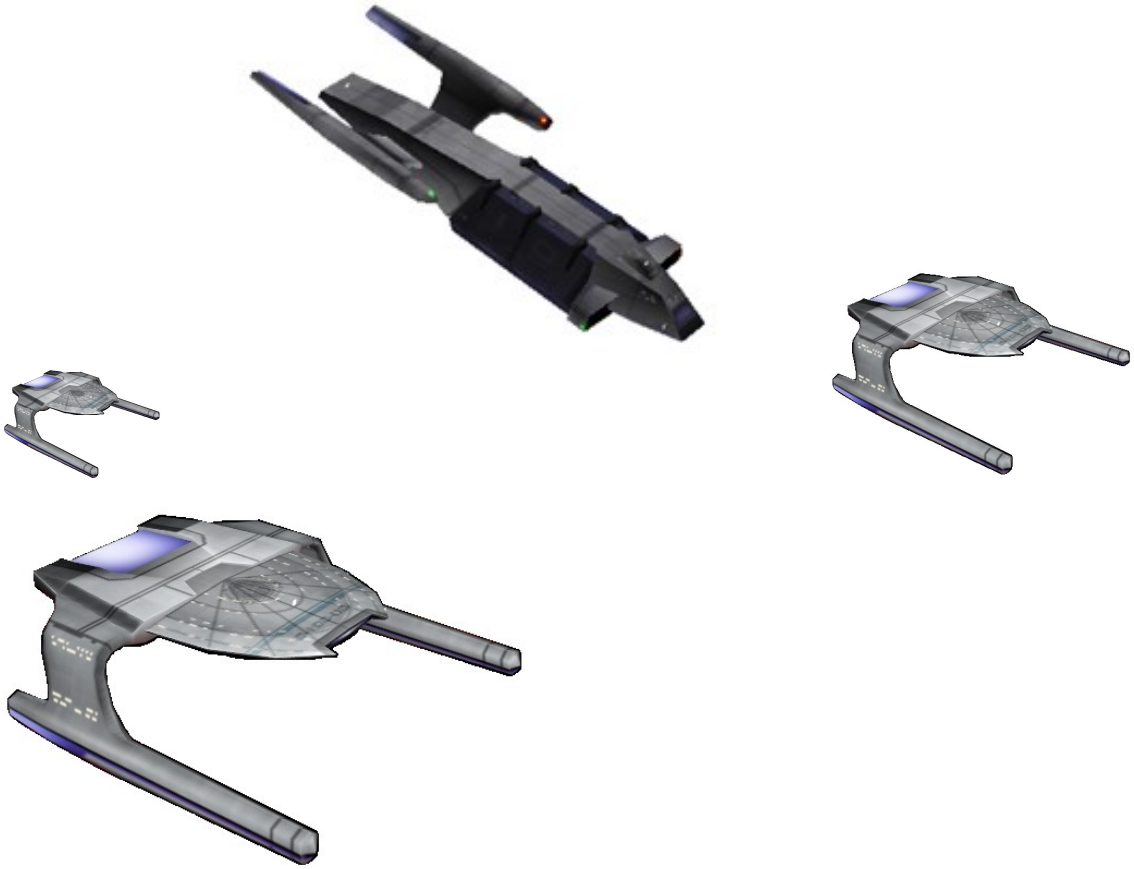
think tanks and shipyards were in the 2370s capable of offering stiff resistance when the Dominion invaded the Alpha Quadrant with its alien approach to warfare.

Adaptation of already designed anti-Borg projects provided some powerful weapons for use in the Dominion War, including the *Defiant* pulse phaser combatants and the *Philadelphia* deflector bombards. Completely new shipbuilding projects first began to yield results in 2375, as several large combatants entered testing phase. While industrial inertia would prohibit them from entering the war in time, the shipyards would manage to bring to production stage one all-new type, modest in dimensions yet anything but in strategic significance.

The *Iwo Jima* assault ship can be seen as the modern counterpart of the *Chandley* transporter assault frigate of the late 23rd century. Yet while the older vessel was a niche weapon in the fight against the Klingons, the *Iwo Jima* is a frontline combatant that has been built in significant numbers and will see further construction after the end of the war. She packs comparable firepower and improved troop capacity in a more compact and survivable hull, and introduces a few improvements the Borg can once again be thanked for. Pulse phasers, thoroughly combat-tested by the *Defiant* class, give the *Iwo Jima* the necessary piercing power for negating enemy shielding before boarding action. A powerful tractor beam assists in this, as its reverse-engineered "ripper" functionality is capable of disrupting most types of forcefield grabbed by the beam. Analysis of Borg teleportation technology has also improved the performance of Starfleet assault transporters. The sum effect of the three advances is likely to make boarding warfare a prominent and practical feature of modern starship combat again; it has already resulted in several victories in the Dominion conflict.

The FN-20 engines, 390,000 tons apiece, bring the total length of the ship to 170 meters. Only a little more than half of this is habitable space, though – quite sufficient for accommodating up to 480 combat-ready troops for brief periods of time, but too compact for carrying boarding shuttles, let alone assault vehicles or supplies. The *Iwo Jima* is a dedicated boarding ship with only a secondary role in planetary assault. The shielding of the type is quite sufficient for both roles, however, and not subject to the compromises of earlier transporter strike frigate designs. Ship-to-ship armament also enjoys parity with other members of the smallish frigate category, as the *Iwo Jima* is provided with two medium torpedo tubes flanking the bow navigational deflector, and with a rear tube for protection in situations where the as such nimble vessel is unable to maneuver. Only long range phaser armament and associated fire control is lacking, making the *Iwo Jima* an escortable rather than independently operating assault type.

Plans exist for growth models of the promising design, possibly eventually catering for the planetary assault mission. This would mean sacrificing some of the agility of the vessel type, though, severely limiting its usefulness in boarding action. Were the specialist pulse phasers and tractors to become difficult to properly bring to bear, the entire doctrinal *raison d'etré* for the type could crumble. For the foreseeable future, Starfleet is likely to avoid compromising on generalist troop insertion ships and continue with separate boarding and landing types, the latter of which is still waiting for a modern design.



Three Iwo Jimas *flying in formation with a* Harper *class civilian transport pressed to assault support duty. The lack of space onboard the* Iwo Jima *presents quite a handicap on long duration missions. A suitable tender can turn an* Iwo Jima *formation into a formidable and reasonably independent hunting pack, however. Note additional accommodation spaces in the warp engine pylons, as well as the considerable size of the IMRF unit between the impulse assemblies – both still compatible with the minimal frontal profile of this head-on attack vessel.*

After 2375 - Whither Federation?

The end of the 24th century is now nearing, but still obscured from our view (save for the occasional time travel reports, notoriously unreliable in the eddies of ever-changing time). What will happen in the ongoing conflict with the Dominion? Will mankind ever return to the Gamma Quadrant? What, ultimately, is the role of the Borg in the development of our galaxy? Shall we ever dare venture to the Delta Quadrant and defy the Borg in their element? These questions may await answer for centuries, but they may also demand it within the next couple of years – the Borg may return faster than we think, and despite the short respite, the Founders haven't said their last word yet, either.

The secession and later destruction of the Maquis has been referred to as the severing of a limb to save the body from necrosis. But perhaps it should be seen as the birth of a child, an event where both sides gained something from their separation, and new life was brought to the world. For many, the loss of the Maquis community is a true loss also to the UFP. The colonial issue is still far from solved, and negative feelings will linger a long time after the criminal courts have finished their sessions.

The exploration program is again underway. Despite the disruption caused by the war, survey operations continue with business as usual. But is this how it should be? The experiences with the use of Prime Directive as a political tool have led many to think that the rules of First Contact should be amended, perhaps even radically so. Also, the very structure of UFP exploration program and its aims at expanding the UFP knowledge and sphere of influence should perhaps be reconsidered in face of what we now know of our galaxy's history and political situation.

Just as after the Romulan War, the Klingon encounter and the first Borg incursion, the UFP is again at a major crossroads. We can choose between war and peace, alliance and adversity. But we might make even more radical choices – between isolation and sharing, Collective and community, arrogance and acceptance. These are also the choices facing Starfleet. Its role is again being redefined, and what paths its starships may travel in the future depends on the political choices of today. Vast technological advances are accessible now: transwarp conduits, artificial wormholes or interdimensional portals promise freedom from the limits of warp drive. If Starfleet chooses to strive for that freedom, perhaps to travel beyond the galactic barrier at last, then it in turn will be in the position to present the UFP with new choices – provided that we survive the ones we make today.