



UNITED EARTH STARFLEET

NX-ALPHA

TYPE: TEST SHIP

LAUNCHED: 2143

LENGTH: 20 METERS

TOP SPEED: WARP 2.2

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Development Directo Maggie Calmels

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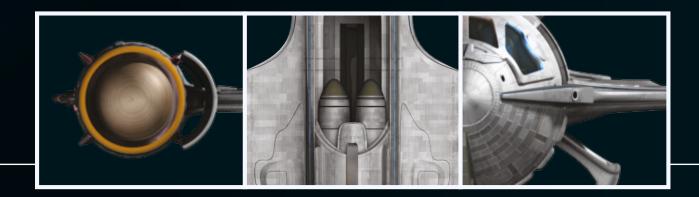
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NX-ALPHA
SPECIFICATION



TYPE:	(TEST SHIP
AFFILIATION:	UNITED EARTH STARFLEET
LAUNCHED:	2143
DESTROYED:	2143
LENGTH:	20 METERS (APPROX.)
TOP SPEED:	WARP 2.2
PILOT:	A.G. ROBINSON





the warp 2 barrier. It was flown by test pilot
A.G. Robinson in 2143, 80 years after the

Phoenix had first achieved warp 1.

In the years following the successful faster-thanlight flight of the *Phoenix*, the United Earth Space Probe Agency merged with Starfleet and set up the Warp Five program. As its name suggested, this scheme was designed to develop a warp five engine. The main scientists involved in this project were Dr. Zefram Cochrane, the designer and pilot of the *Phoenix*, Dr. Tasaki, and Dr. Henry Archer, the father of Jonathan Archer, who would later become captain of *Enterprise* NX-01.

These scientists did much of their work at the Warp Five Complex, which was located just outside of Bozeman, Montana, the site of the *Phoenix's* construction and launch. The scheme was overseen by Commodore Maxwell Forrest and was supervised by the Vulcans. They helped in so far as they were willing to point out any dangerous mistakes that were made, but they were unwilling to share their knowledge of warp mechanics.

SLOW PROGRESS

The program evolved into the NX Project in the 2140s as the scientists sought to test their warp engines in prototype starships. Progress was frustratingly slow, especially as Cochrane retired and disappeared to "parts unknown," while Henry Archer died due to advanced Clarke's disease in 2124. Nevertheless, the warp engine that Henry Archer was primarily credited with designing was eventually fitted to an experimental starship.

In 2143, the prototype *NX-Alpha* was ready for its inaugural flight. Several commanders in Starfleet were in competition to pilot the ship in its attempt to break the warp 2 barrier: Gardner, Duvall, Robinson and Jonathan Archer. In the final weeks before it was launched, this was narrowed down to just two: Archer and Robinson. Archer dedicated himself to the project and spent 18 or even 20 hours in the flight simulator, but he was overlooked in favor of Robinson.

Despite Archer's disappointment, he congratulated Robinson and monitored the flight from the Warp Five complex. Once *NX-Alpha* was launched and in orbit, problems arose in the warp field stabilization protocols, delaying the warp 2 attempt. It was not long before the problems were

◀ At Enterprise NX-01's launch ceremony, a recording of a speech given by Dr. Zefram Cochrane in 2119 at the Warp Five Complex was played to the attending dignitaries. Cochrane was filmed with Dr. Henry Archer and the other scientists involved in developing a warp engine that would allow humans to travel further than they ever had before.

UNITED EARTH STARFLEET ALPHA

The *NX-Alpha* was the first human-made starship to exceed warp 2 before it broke apart on its first test run.

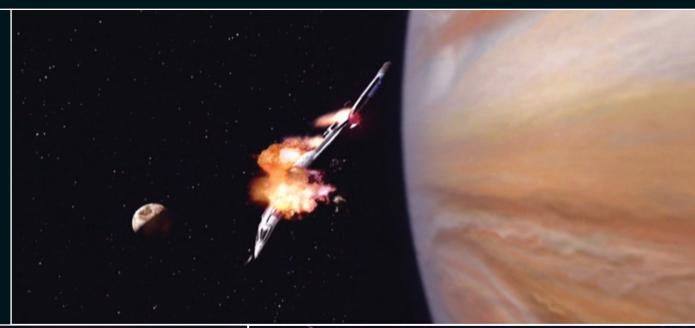




- Once in orbit around Earth, various checks were made on the NX-Alpha's warp engine before it began its attempt at reaching warp 2.
- ▶ Problems arose in keeping the warp field stable, but these appeared to have been solved as the *NX-Alpha* accelerated to warp 2.
- ▼ Jonathan Archer monitored the progress of the *NX-Alpha*'s maiden flight on a display that recorded its warp jumps at the NX complex.



- After breaking the warp 2 barrier, the NX-Alpha's warp field became unstable, but Robinson believed he could go even faster. This led to a catastrophic collapse of the warp field and the ship exploded.
- In order to prove that the warp engine worked, Archer and Robinson decided to take the NX-Beta on a test run without permission. They 'stole' it from its hangar during the night when no one was around.











▲ The cockpit of the NX-Alpha had seating for two pilots, but the craft could be flown by just one. The technology and controls featured in the cabin were much more sophisticated than they had been in the Phoenix when it made its flight 80 years earlier. The instrument panels directly in front of the pilot not surprisingly dealt with the direction and velocity of flight, while the panels to the right monitored the engine and warp field.

ironed out and flight control gave the order to go to warp. Moments later, *NX-Alpha* accelerated through warp 1, on to warp 1.5, and after a small bump, past warp 2. Robinson had done it – piloting the first human starship to warp 2. As he continued to accelerate, however, the craft began to shake alarmingly and warp field integrity fell to 20 per cent. Robinson was ordered to slow to sublight speeds while the problem was diagnosed.

Robinson had ideas of his own, and believed he could push the ship even faster. He continued to accelerate to warp 2.2, but as *NX-Alpha* approached Jupiter, the warp field collapsed and the ship exploded. Fortunately, Robinson survived as he ejected from the craft, making him the first person to deploy an escape pod at warp, and he was later picked up and brought back to Earth.

In the debriefing of the mission, Robinson blamed a fundamental flaw in the design of the

OVERVIEW

warp engine for the loss of *NX-Alpha*. The Vulcans agreed with him, and told Starfleet to put the NX program on hold.

BUST UP

Archer was furious as it would set the project back decades, and he believed the cause of the accident was pilot error. Robinson would have none of it, and refused point blank to take any blame. Instead he placed the failure on Henry Archer, accusing him of "designed a lousy engine," a statement of staggering insensitivity which triggered a fist fight between the two men.

Once Archer and Robinson had calmed down, they tried to work out how they could keep the project alive. Robinson realized that however many simulations and calculations they made, the Vulcans would never countenance restarting the project. The only thing that would prove that

it worked was to take a ship out and perform the flight. They therefore decided to appropriate the *NX-Beta*, an almost identical ship to the *NX-Alpha*, without permission to perform a test flight.

With the help of engineer Trip Tucker at the NX hangar, Archer and Robinson 'stole' the *NX-Beta*. As they pushed past warp 2, the same fluctuations in the intermix chamber occurred as before, but this time they were able to make adjustments to keep the warp field stable. Moments later they reached and held steady at warp 2.5, proving the engine worked.

When they returned to Earth, both men were suspended from duty. There was a real threat that they would be dismissed from Starfleet altogether, but the men felt it was worth it to keep the NX Project on track.

As it transpired, Archer and Robinson were only suspended for three months, but the Vulcans ran

every simulation they could think of on the warp engine before they were convinced that it would work. In 2145, over 20 months after Archer and Robinson's unsanctioned flight in the *NX-Beta*, Commander Duvall broke the warp 3 barrier in the *NX-Delta*. The success of the NX Program eventually led to the first warp 5 engine, and the launch of *Enterprise* NX-01 in 2151.

▲ The NX-Beta was virtually identical to the NX-Alpha. By controlling the ratio in which the matter and antimatter were combined, the warp field remained stable and it successfully reached warp 2.5.



DATA FEED

A.G. Robinson and Jonathan Archer were friends and great rivals. Robinson was somewhat arrogant and more of a maverick than Archer, attributes that he felt were the reason that he was chosen to pilot the NX-Alpha. Robinson and Archer came to blows after the destruction of the NX-Alpha, but later made up and took the NX-Beta on its record breaking flight. Robinson was killed in 2153 while climbing Mount McKinley on Earth, shortly before he was expected to take command of Columbia NX-02.

6 NX-ALPHA

SIMILARITIES AND DIFFERENCES

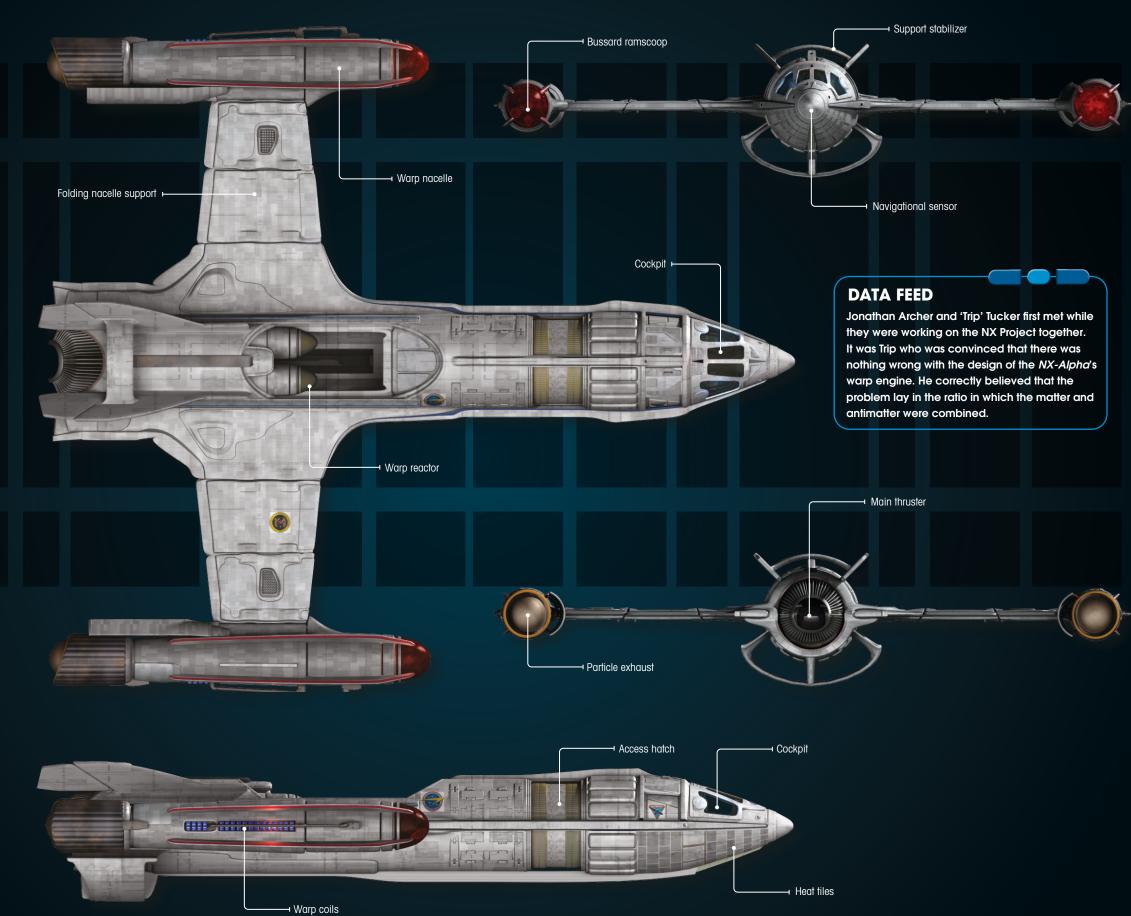
The *NX-Alpha* was similar in appearance to the *Phoenix*, Earth's first warp ship. The cockpit module at the nose of the ship was almost identical from the outside, but the interior was much different. The command module of the *Phoenix* had seating for three occupants, and the technology was much more rudimentary as Dr. Cochrane had to make do with whatever parts could be scavenged on post-apocalyptic Earth. In contrast, the *NX-Alpha* had seating for two crew members, and its controls and interfaces were much more sophisticated. While the NX-Alpha's cockpit had a pressurized and breathable atmosphere, the occupants wore full spacesuits and helmets in case of sudden depressurization.

Behind the cockpit module, the *NX-Alpha* still had a cylindrical main body like the *Phoenix*, but it had shorter and much more advanced nacelles, which were attached to thicker articulated wing-like structures.

The main differences between the two ships were to be found at the rear. The *Phoenix* was launched through Earth's atmosphere and into space via rocket boosters that detached from the craft once it was in orbit. The *NX-Alpha* used rocket-like propulsion to speed along a horizontal sled-track that had an almost vertical launch ramp at the end. The combined effects of these launch systems powered the craft into orbit, and the rocket-like engines remained part of the ship rather than detaching and falling away.



▲ The Warp Five Complex included a launch system for the NX-Alpha and the NX-Beta. They were blasted along rails that ended in a vertical ramp, launching them through the atmosphere and into orbit.



PILOT PROMOTION

Duvall was made captain of the Shenandoah seven years after he broke the warp 3 barrier in the NX-Delta. Upon hearing the news, Jonathan Archer remarked, "Thank God we're a hundred light years away."

RIVAL CAPTAIN

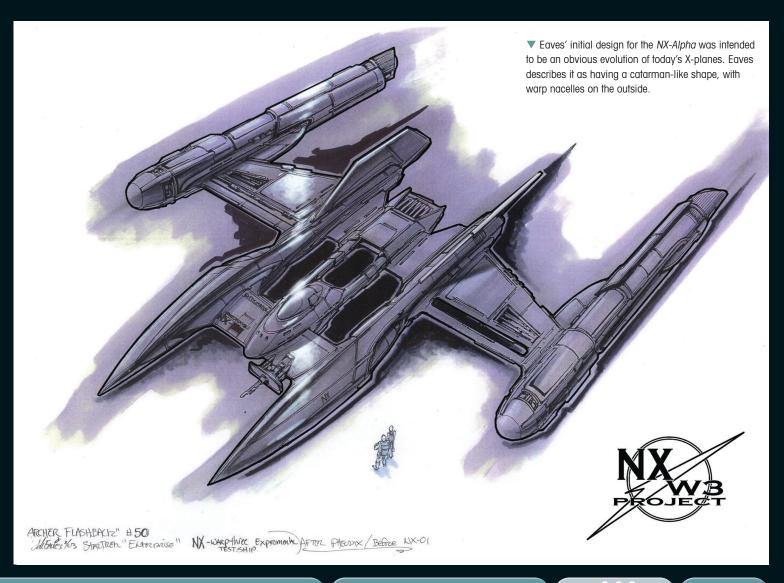
Commander Gardner, who was another of the test pilots in the NX Project, was Vulcan Ambassador Soval's first choice to become captain of *Enterprise* NX-01. Soval felt Captain Archer was too impulsive to hold such an important position.

NX ENGINEERS

Other people who were part of the NX Project included Captain W.M.
Jefferies and Lt. Charles Tucker III. Jefferies wanted to fit powerful weapons to NX-class ships, something that Jonathan Archer was initially against, but later agreed was probably a good idea.

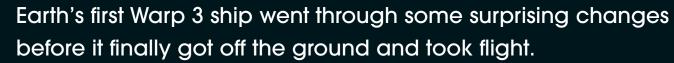
NX-ALPHA

PLAN VIEWS



DESIGNING THE

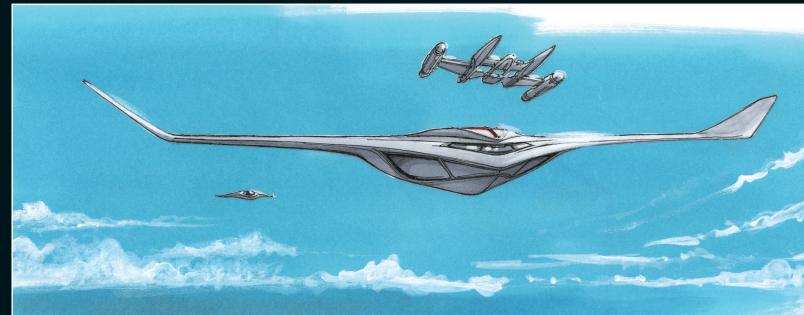
NX-ALPHA

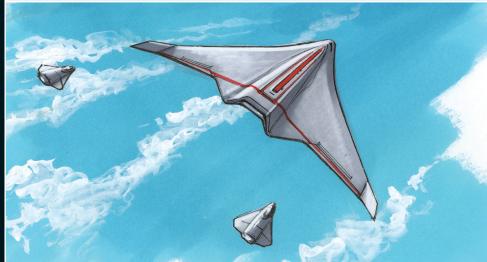


of concept artist John Eaves' favorite assignments. The script called for an experimental ship that was more primitive than the *Enterprise* NX-01. Like most of the rest of the art department Eaves was deeply

esigning the NX-Alpha was one interested in real space flight and fascinated by everything that had ever been done by NASA so he was delighted that this ship represented a bridge between today's experimental spacecraft and Matt Jefferies's STAR TREK aesthetic. "My first pass was very

plane-like," Eaves recalls. "It had warp nacelles and a twin fuselage, like a catamaran, with the capsule suspended in the center. It's got all your STAR TREK elements on it but it was also an evolution of an X-plane. It was kind of where those two things met"





This first design was approved without any serious alterations, but now the art department had to work out how it would be launched. The script made it clear that the experimental NX base was on the ground so somehow the ship had to get into orbit. Massive rocket boosters didn't seem appropriate. Eaves would get it off the ground then it thought the answer might lie with NASA so he called them up.

"We went out to Edwards Airforce base to visit NASA and to research all their plans for that kind of spaceship. Two gentlemen named Tony Moore and Pete Merlin invited me up and we went through all of the NASA stuff at that time." Moore suggested that the NX Alpha could be carried into the upper

atmosphere by another ship, in much the way that the space shuttle had been mounted on the back of a 737. "It was kind of like a Spaceship One scenario," Eaves says "there was a mothership and then the Alpha would piggy back on the top. The mothership would break off when it went into space."

Moore also provided Eaves with inspiration for the design of the ship that would carry the Alpha into near-orbit, when he pointed him towards the design of an experimental craft called the X-48B. "It was a future ship idea," Eaves explains, "NASA does this unusual thing where they make quarter-scale

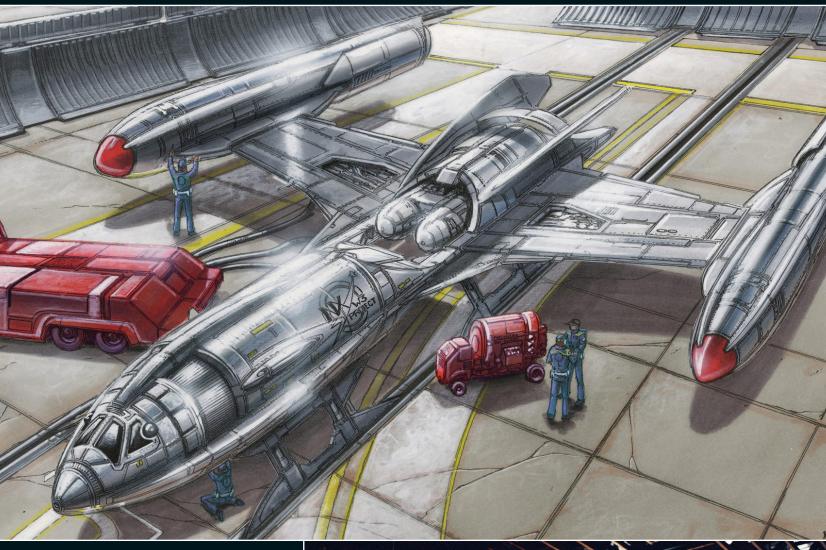
◆ After talking to NASA Eaves came up with a system for launching the NX-Alpha that involved a second craft, with a blended body, that carried it into the upper atmosphere.

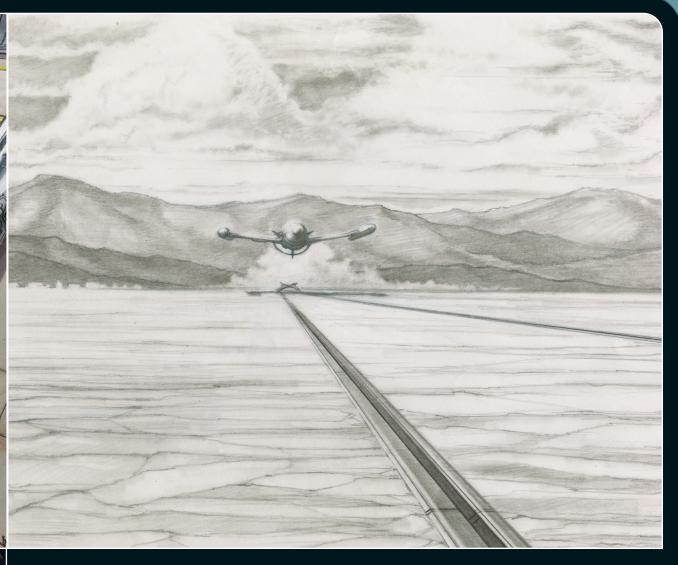
models. The X-48B was one of these model tests that we used as the basis of our design. It had what they call a blended body, with little wingtips at the end. We came up with this kind of smooth, limping body and detailed that into a futuristic version with the Alpha on the back."

Eaves produced a drawing showing the two ships together but around this time it became clear that the production couldn't justify the cost of building two ships instead of one. There was another problem: the art department had to show the outside of



▲ The badge for the experimental project was designed by Mike Okuda.





◆ The NX-Alpha was

suggestion was that it would be launched by magnetic rails.

▲ When the producers decided to reuse elements from Earth's first warp ship, the *Phoenix*, Eaves redesigned the NX-Alpha to look more like its illustrious predecessor, using elements of his original design for the *Phoenix* that had been rejected.

the ship and to build a set showing the interior. It was decided that in order to make the most of the budget they should reuse the *Phoenix* nose cone that had been built for STAR TREK: FIRST CONTACT. It was an elegant solution: the production already had a model of the exterior and a set for the interior. And, all-importantly, it made sense that the NX-Alpha would be a direct descendant of Earth's first warp ship.

This meant that both of Eaves designs would be lost. Instead he returned to his design for the *Phoenix*. "I pulled the Phoenix up and tried to move it ahead.



▲ The decision was taken to reuse the nose cone and cockpit of the Phoenix because they had already been built Some of the earlier Phoenix designs had and would allow the art department to put more on screen for the same budget.

a lot of open framework, with exposed tanks, fuselage and engines, so we carried a lot of those design elements over to the Alpha."

This still left Eaves with the tricky issue of how to get the NX-Alpha off the ground and into orbit. Again the solution the final rendition." was to be found at Edwards Airforce Base. "We went for an idea where it was of the practical needs of the set that launched from a testbed. They built a test track out at Edwards in the 50s and the hangar bay. The ship Eaves had the 60s that was on the lake bed. They'd accelerate these little nose capsules up to super speeds to do the tests. It was a magnetic system and we thought we could launch off of that."

Eaves produced drawings showing his so they folded up like an accordion." new ship launching from the kind of flat terrain that can be found at Edwards but the process had a few last twists for

him. A change in the script called for the base to be in a forest, so the massively long track he'd designed was no longer practical. "We did another version where you have a track with a ramp on it and that's what we used in

A final change came about because the art department had designed for come up with simply couldn't get out the doors. "The wings I designed were fixed and it made it too big so Doug (Drexler) designed these hinge points for the wings – it was a weird kind of L-kink

Finally, after all the twists, turns and redesigns the NX-Alpha was ready for



THE ROAD TO

WARP 5

STAR TREK's science consultant Andre Bormanis writes an article about why it was so important for humans to develop a warp 5 engine – that is, if they really wanted "to seek out new life and civilizations."

▲ It's one thing to be able to travel faster than the speed of light, but to explore a significant number of new worlds, humans had to go much faster. This was finally possible with *Enterprise* NX-01's warp 5 engine.

he dream of interstellar travel became a reality on April 5, 2063, when warp pioneer Zefram Cochrane successfully tested the first faster-than-light starship. His seminal flight drew the attention of the Vulcans and the rest, as they say, is STAR TREK history

The years between Cochrane's daring mission, as portrayed in STAR TREK: FIRST CONTACT, and the

voyages of the *U.S.S. Enterprise NCC-1701* helmed by James T. Kirk, were something of a mystery in the *STAR TREK* universe. But all that changed with the debut of the fifth *STAR TREK* television series, *ENTERPRISE*.

Set in the year 2151, some 90 years after Cochrane inaugurated the warp age, *ENTERPRISE* followed the adventures of the crew of the first



warp-5 starship. Before 2151, humans had been puttering around the nearby stars at low warp for nearly a century. They visited a handful of star systems, and established a few research stations and colonies. Cargo ships crewed by 'space boomers' – people born and raised on starships – transported supplies and exotic alien goods. But with the advent of the warp 5 engine, humans were finally ready to get out into really deep space.

The difference between warp 2 and warp 5 is significant. The warp speed scale isn't linear; it's geometric. Warp 1 is equivalent to the speed of light (commonly designated by the letter c). Warp 2, however, isn't twice c; it's nearly 10 times c. Warp 3 is about 40 times c, warp 4 is about 100 c, and warp 5 a bit over 200 c (this speed scale was established during the first season of STAR TREK: THE NEXT GENERATION and didn't exactly conform to the warp factors referenced in THE ORIGINAL SERIES, but it was followed on ENTERPRISE).

HABITABLE PLANETS

Our Galaxy, the Milky Way, is a big place; its spiral arms span 100,000 light years and contain several hundred billion stars. A sizeable fraction of those stars are like our sun and have families of planets.

Proxima Centauri – the next nearest star beyond our solar system – is about four and a quarter light years away. At warp 2, about the maximum speed Earth ships could achieve in the early 22nd century, getting there would take 155 days, or about six months (this is about as long as it takes present-day spacecraft to get to Mars, the next planet out in our own tiny solar system!). But at warp 5 the journey time would be significantly reduced – in fact you could make the trip in just a week. This would be a significant game changer,

- ▲ Zefram Cochrane was the first human to break the warp barrier, and this led to first contact with the Vulcans and a new era for space flight
- ▼ A young Jonathan

 Archer and his father

 Henry dreamed about

 exploring space, but felt
 the Vulcans held back the
 warp program.





▲ The warp reactor, or warp core, was where the matter and antimatter were mixed together to create the power for fasterthan-light travel. The warp core on Enterprise NX-01 was an oblong cylinder connected by pylon tubes into the warp nacelles.

Prior to the launch of Enterprise, the humans with the most experience of space travel were 'boomers.' These were individuals who lived, and sometimes were born, on freighters that spent months or years traveling between planets.

as a voyage that would have taken 10 years on a warp 2 ship would take just five weeks on a warp the final frontier big-time.

NEW POSSIBILITIES

There are a dozen stars or so within 10 light years of Earth, including Alpha, Beta, and Proxima Centauri, and Sirius, the Dog Star. All are perfectly lovely places to visit, but a 10-light-year radius from Earth spans a pretty limited territory - galactically speaking. And at a measly warp 2, it would take a whole year to cover that distance. At warp 5, however, 10 light years would be a walk in the park: two and a half weeks.

At warp 5 you can cover a distance of 100 light years in less than six months. That makes a huge difference, as how many stars do you think are within a hundred light years of Earth? Thousands, including many that are familiar to STAR TREK fans: Aldebaran, Regulus, Arcturus and Vega, to name

just a few. To coin a phrase, warp 5 pushes back

The warp reactor that powered the *Phoenix* or the NX class of ships was fundamentally no different than the warp reactors on 23rd- and 24th-century starships. This really shouldn't be very surprising. The rocket engines that blasted the



Space Shuttle into orbit were essentially just refined creation of a faster-than-light engine, he versions of the engines that powered V2 rockets in presumably imagined a material that - under the World War II more than 70 years ago.

Dilithium crystals lay at the heart of a warp core, about designing such a material, and eventually moderating the matter-antimatter reaction that created warp plasma. Lithium is an element found in a number of common mineral compounds. Dilithium was a fictional crystal substance that probably included lithium atoms in its matrix. Cochrane may have found a source of dilithium deep in the Earth's crust, or perhaps dilithium crystals formed in asteroids and comets in the far reaches of the solar system, and then occasionally fell to Earth encrusted in meteorites.

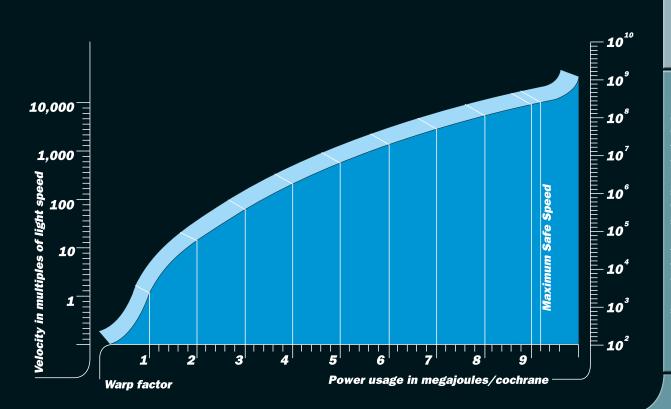
DESIGNER MATERIALS

Warp coils were fashioned out of an artificial, composite material called verterium cortenide; composite materials are common in today's world, one example being the graphite shafts of tennis and golf clubs. Scientists have made great strides lately in the creation of 'designer' materials. They start with a set of requirements: tolerance to heat and cold, hardness and flexibility, resistance to corrosion, etc. and then design a compound, atom by atom, that has the desired properties. When Cochrane was dreaming about the

proper conditions - could warp space. He then set hit upon the formula for verterium cortenide.

Channeling warp plasma through the coils of the warp nacelles thrust the ship into subspace, and off we went to the next star system. But achieving the level of power required to throttle up from warp 2 to warp 5 was no easy task. Given the geometric increase in speed, one can imagine how difficult it must have been to generate and control that much power. Taking another cue from history, it took tens of thousands of dedicated scientists and engineers several decades of hard work to evolve rocket technology from the V2 to the mighty Saturn V launch vehicles that carried men to the Moon. One would imagine that an even greater degree of effort was required from people like Henry Archer to achieve a reliable warp 5 engine after the initial invention of warp drive.

Like the square-rigged sail and the rocket motor of ages past, the development of the warp 5 engine marked the beginning of a totally new era in human exploration. *Enterprise* NX-01 was truly a quantum leap in space technology!



■ The warp speed graph had an exponential growth. This meant that warp 5 was not simply warp 1 – it was actually 214 times faster than the speed of light. Although warp 5 made significant space exploration practical, it was still more than eight times slower than warp 9.6, which was the U.S.S. Voyager NCC-74656's top sustainable speed.



TRIVIA

In the STAR TREK: ENTERPRISE episode 'First Flight,' we are introduced to Ruby, a waitress who works in the 602 Club. She had previously been mentioned in the season one episode 'Shuttlepod One,' when Trip Tucker and Malcolm Reed, fearing that they were about to die, confessed that they had both had a relationship with Ruby. According to Trip, Ruby had already picked out the names of her children and said she would marry the first man to guess them correctly. Trip guessed Cyrus, Chester and Rosalie, which turned out not to be right.



FIRST APPEARANCE:

DESIGNED BY:

KEY APPEARANCES

STAR TREK: ENTERPRISE 'First Flight'

As Enterprise NX-01 prepares to investigate what they believe is a dark matter nebula, Captain Archer receives news that his friend A.G. Robinson has died in a rock climbing accident.

During the shuttlepod mission into the nebula, a wistful Archer reminisces to T'Pol about the time he and Robinson were rivals to pilot the *NX-Alpha*. This was an experimental ship designed to break the warp 2 barrier. Despite the fact that the NX-Alpha's warp engine had largely been designed by Archer's father, Henry, Starfleet chose Robinson to make the record-breaking attempt.

Robinson successfully piloted the NX-Alpha past warp 2, but shortly after the ship broke apart and Robinson only just survived by deploying an escape pod. In the aftermath, Robinson blamed an inherent flaw in the warp engine, which Archer saw as an insult to his father, and the two came to blows in the 602 Club.

The next day, the men settled their differences and formulated a plan to take the NX-Beta on a test flight without permission. The flight was a success and proved the engine works. Back in the future, Archer and T'Pol confirm that they have discovered a dark matter nebula, and Archer calls it the Robinson Nebula in honor of his friend.

The 602 Club, where the members of the NX Program socialized, was named after a bar that was in operation between 1951 and 1991. It was a popular hangout for students from the University of Wisconsin-Madison, including one former student named Rick Berman. He of course went on to be executive producer and co-creator of several STAR TREK series, including ENTERPRISE.



'First Flight' revealed the reason behind Charles 'Trip' Tucker's nickname. His father and grandfather were both named Charles, so he was Charles Tucker III – the third, or Triple, shortened to 'Trip.'

COMING IN ISSUE 85

FEDERATION HOLOSHIP





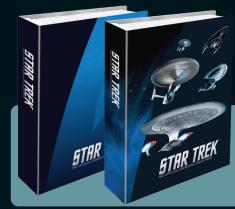
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- In-depth profile of the Federation Holoship, a 24th-century vessel that had enough holoprojectors to recreate an entire Ba'ku village
- How illustrator John Eaves went through several different looks for the Federation Holoship before he hit on the right design direction
- A look at how the script for STAR TREK: **INSURRECTION** evolved from first ideas to the finished article



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