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LAUNCHED: 2063

CREW: THREE

LENGTH: 20 METERS

MAX SPEED: WARP 1

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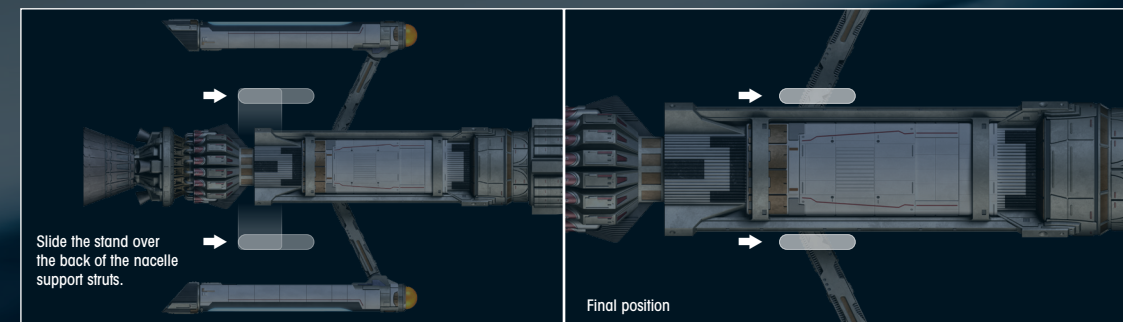
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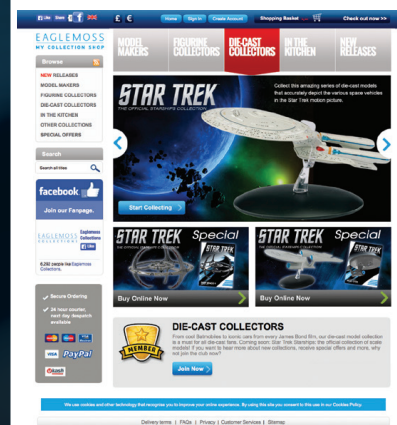
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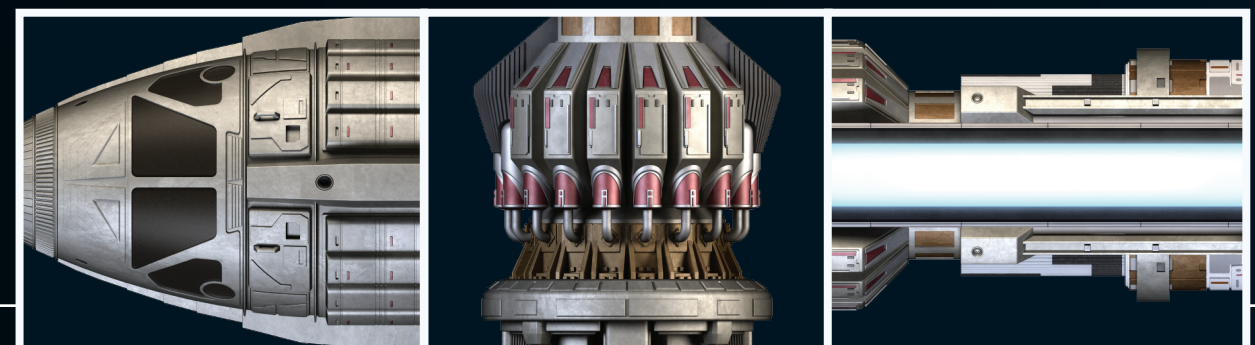
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PHOENIX



TYPE:	EXPERIMENTAL WARP SHIP
INVENTED BY:	ZEFRAM COCHRANE
LAUNCHED:	APRIL 5th, 2063
LENGTH:	20 METERS (WITHOUT ROCKET)
CREW:	THREE
MAX SPEED:	WARP 1



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PHOENIX

► The *Phoenix* was constructed largely from salvaged parts, but despite its makeshift appearance, the two rudimentary warp nacelles were not that different than the ones used in the 24th century.

PHOENIX

The *Phoenix* holds a special place in Federation history as the first warp-capable ship to be built by mankind.

► In the mid-21st century, humanity was teetering on the edge of a second dark age after a third world war. Amid the chaos, a visionary scientist, Zefram Cochrane, and his colleague, Lily Sloane, designed and built the *Phoenix* out of a nuclear missile. This was humanity's first manned warp-capable spacecraft, and it changed history forever.

The *Phoenix* was the first manned vehicle designed by a human to successfully break the speed of light. It was designed and constructed in the middle of the 21st century by a ragtag team of scientists and engineers led by Dr. Zefram Cochrane and Lily Sloane from inside a missile complex in Bozeman, Montana.

Cochrane finished work on his revolutionary vessel in April of 2063, approximately 10 years after the end of World War III.

In an irony that was not lost on historians, Cochrane used an instrument of mass destruction – a modified nuclear missile – for the fuselage of the *Phoenix*, and replaced the nuclear warhead with a four-meter cockpit module. Materials were extremely hard to come by in the devastated world that existed following the nuclear world war, and his team took six months to scavenge enough titanium to build the cockpit.

STRAPPED IN

Inside the module were three astronaut-type chairs, one right at the front and two in alignment at the rear; all three chairs faced toward the front windows. In flight, Cochrane piloted the craft from the forward seat. Unlike later Federation starships, the *Phoenix* was equipped with seat restraints, as the initial journey out of the Earth's atmosphere was made using the rockets of the missile.

Despite its advanced technology, the *Phoenix* looked more than a little jury-rigged; most of the materials had not been specifically built for the ship but had been modified from various sources. The walls of the module were lined with





◀ The actual launch vehicle that blasted off was more than 35 meters long. The bottom third was made up of conventional rockets, and these allowed the ship to break free of Earth's atmosphere.

▶ Once in space, the booster rockets detached, while the outer casing of the *Phoenix* also fell away, exposing the two warp nacelles. These then extended ready for warp flight.



◀ Once the warp nacelles were in position, the warp core and plasma injectors were brought online. It took several seconds before there was the familiar flash of energy that could be seen with later starships, as the *Phoenix* accelerated to warp speed. Displays in the cockpit showed the condition of the structural integrity field, and the relative speed.



▲ The *Phoenix* was essentially an intercontinental missile, with added warp nacelles and a custom capsule fitted over the original nose cone. As Data noted, it was an example of supreme irony that Cochrane used what had been an instrument of mass destruction to inaugurate an era of peace and prosperity for mankind.

many different kinds of controls. One of the most important devices, at least as far as Cochrane was concerned, was a music system that allowed him to listen to his beloved rock'n'roll.

Due to the extreme noise of the engines – compounded by Cochrane's dashboard-mounted music player – communication was carried out via personal microphone headsets worn by all the crew. These allowed them to talk to each other and their ground control support.

The ship was fitted with an intercooler system, and versions of many other systems that became common on warp-capable ships. These included an intermix chamber, a warp plasma conduit and a fuel manifold.

Cochrane assembled the *Phoenix* inside a missile silo that was dug deep into the Montana mountains. A metal staircase led through the large concrete door that covered the silo entrance.

The launch area was at least 30 meters deep, with a control room at the top, and metal catwalks that allowed technicians access to the ship descending to the bottom of the spacecraft.

HISTORIC FLIGHT

Despite the revolutionary propulsion systems on board the *Phoenix*, the ship relied on conventional rocket engines of the time to lift it clear of the Earth's atmosphere.

Once the fuel in the first-stage booster had been exhausted, the entire lower half of the rocket was jettisoned. Immediately after this, metal covers on the sides of the ship fell away to reveal the two warp nacelles. After the *Phoenix* was clear of its discarded components, the warp nacelles extended on struts until they were held parallel to the ship's hull. Following this, Cochrane brought the warp core and plasma injectors on line.

As the ship approached warp 1 – the speed of light – the roar of the engines increased, and severe turbulence built up, shaking the hull, as if the *Phoenix* were moving through an atmosphere.

Although a structural integrity field and inertial dampers protected the ship, when the *Phoenix* crossed the light barrier, the occupants were thrust back into their seats by the force of the acceleration. The ride became much smoother after the *Phoenix* had established lightspeed.

At approximately 11 a.m. (Mountain Standard Time) on 5th April 2063, a Vulcan survey ship, the *T'Plana-Hath*, passed through Earth's solar system. They intended to ignore Earth as being too primitive to warrant further study, but then something caught their interest.

The warp signature from Cochrane's experimental ship registered on the Vulcans' sensors. This chance occurrence led to one

of the most important moments in human history – the first official contact with an alien race.

This momentous meeting prompted not only the interstellar expansion of humanity, but to an extended period of peace and prosperity, which eventually culminated in the birth of the United Federation of Planets.



DATA FEED

Less than 48 hours from launch, a group of Borg from the 24th century tried to destroy the *Phoenix*. They caused significant damage to it, but fortunately it was repaired in time with help from the crew of the U.S.S. *Enterprise* NCC-1701-E, who had pursued the Borg from the future.

COCKPIT CONTROLS

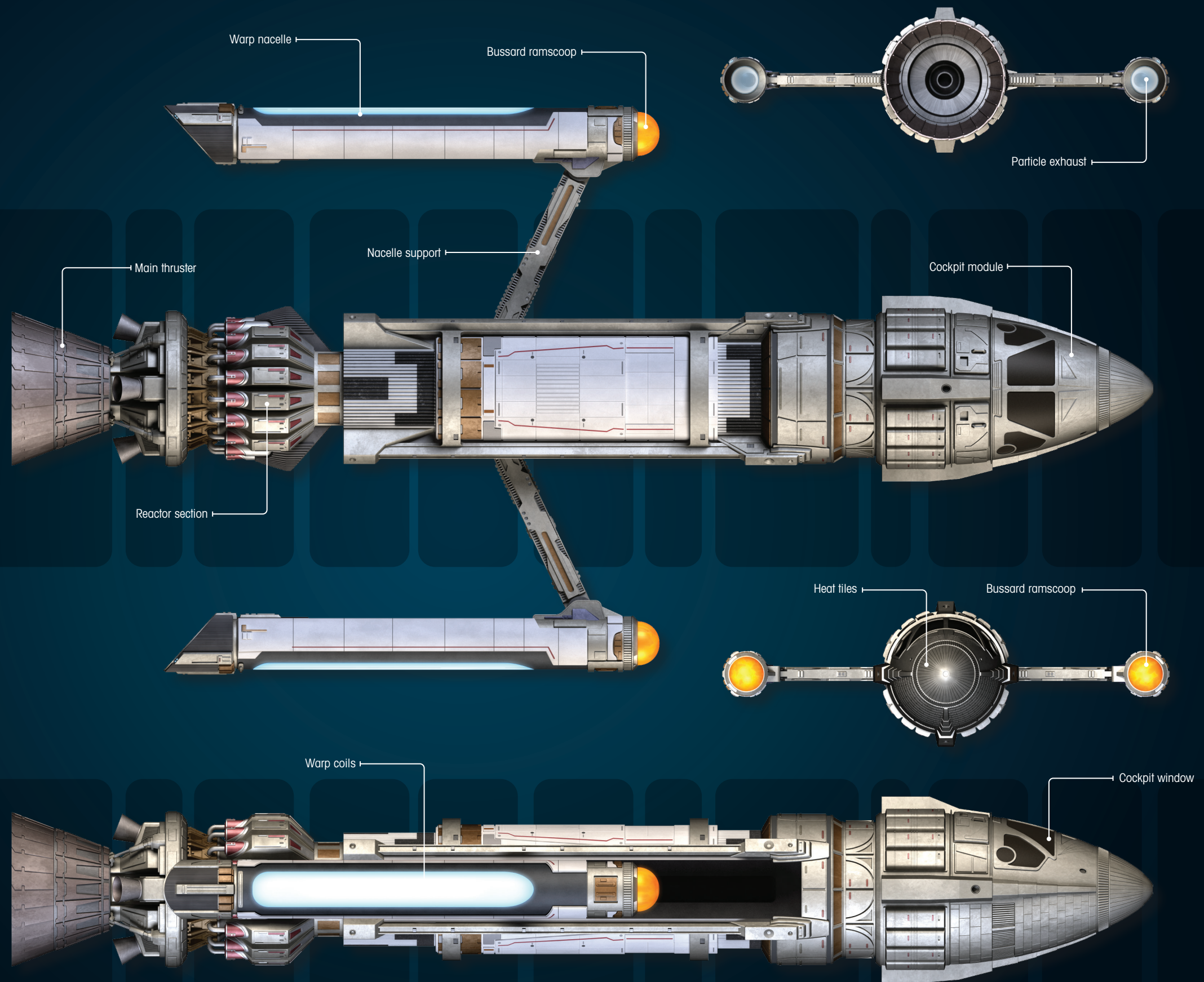
The *Phoenix's* cockpit was extremely cramped, squeezing in vital control systems and secure seating for just three crew members. As movement was limited, controls were within arm's reach of the crew. The majority of the controls consisted of two-way toggle switches with red flip-up security covers. The pilot had a computer graphic monitor set into the bulkhead directly in front of him, with a smaller rectangular readout display set in the roof. This acted as a chronometer at launch, with green numerals counting down the elapsed flight time. Another display, showing the condition of the intake valves, was located on the upper control bank shared by the copilot and engineer. This unit also housed controls to eject the shell around the warp nacelles and to close down the launch rockets.



▲ The cockpit of the *Phoenix* was approximately four meters long, and was the only part of the ship that was capable of supporting life.

DATA FEED

Posterity recorded Zefram Cochrane as a hero and a visionary. In the years following his warp flight, his theories were taught in schools, and Geordi La Forge even went to Zefram Cochrane High School. The reality was somewhat different as Cochrane was often drunk, and claimed his motives were purely to make a buck off a scientific discovery. He said he merely wanted to "retire to a tropical island where native girls ran around naked."

**WARP DISPLAYS**

Inside the *Phoenix's* cockpit, there were two computer displays that referred to the warp drive as the "space warp generator." The speed of light is 1,080 million kilometers per hour.

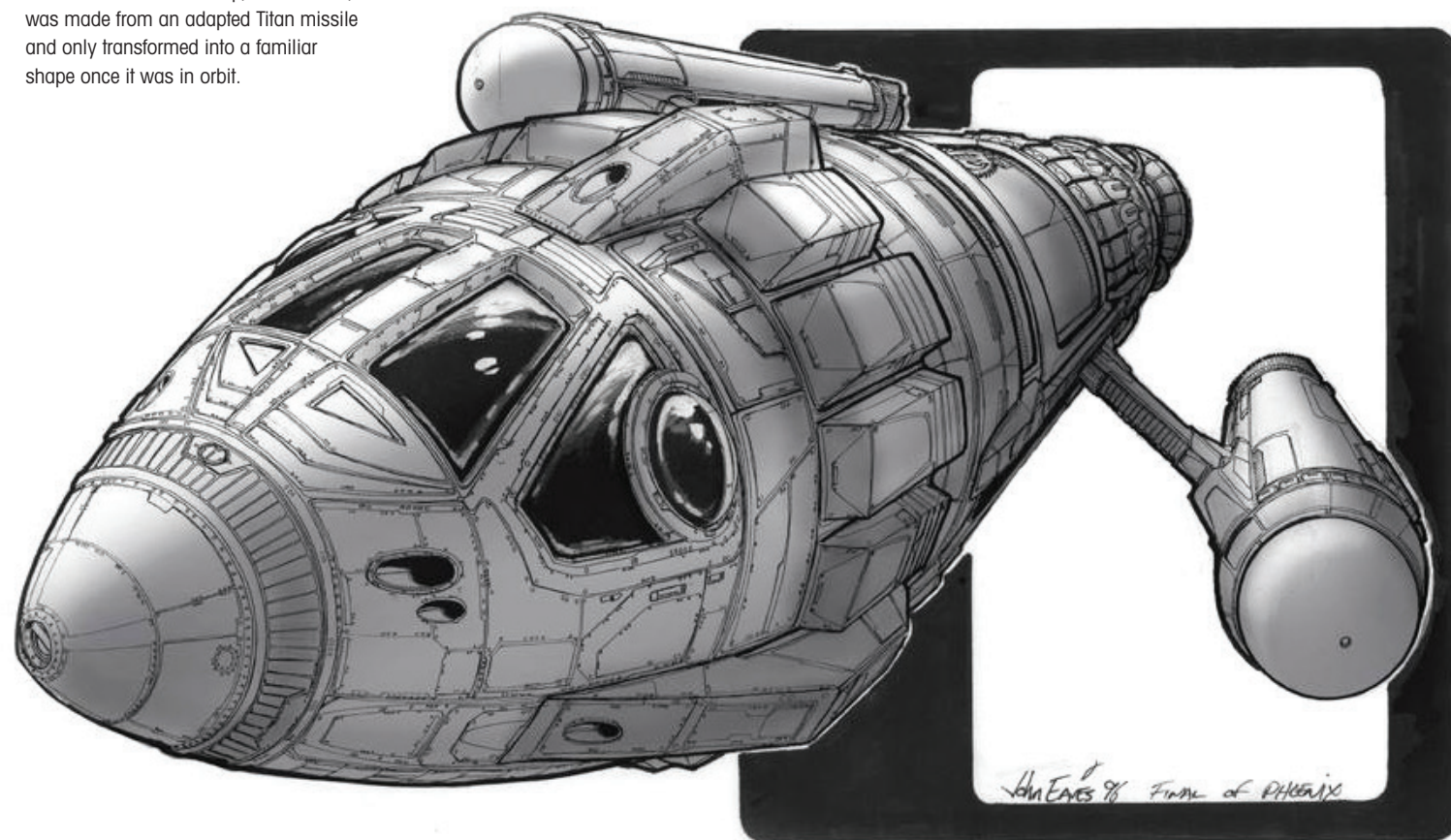
MUSEUM PIECE

By the 24th century, the *Phoenix* was on display in the Smithsonian Institution. Captain Picard had seen the exhibit many times as a child, but he was never allowed to touch it, something he always wanted to do.

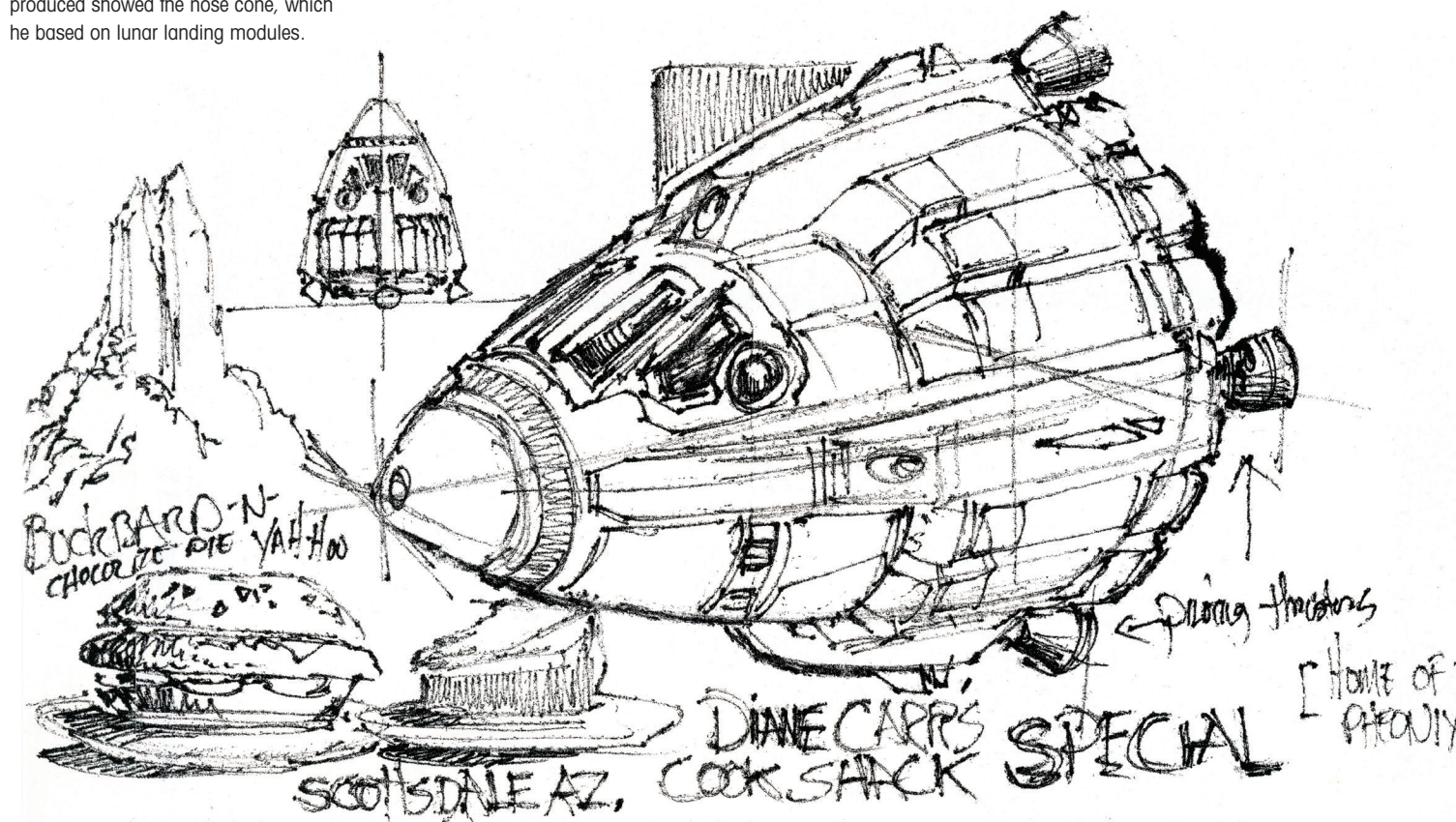
INHABITED MOON

According to Commander Riker, the moon in the 24th century had 50 million people living on it. He told Zefram Cochrane that on a clear night, you could see Tycho City, New Berlin and Lake Armstrong.

▼ Zefram Cochrane's ship, the *Phoenix*, was made from an adapted Titan missile and only transformed into a familiar shape once it was in orbit.



▼ The first sketch that John Eaves produced showed the nose cone, which he based on lunar landing modules.



DESIGNING THE PHOENIX

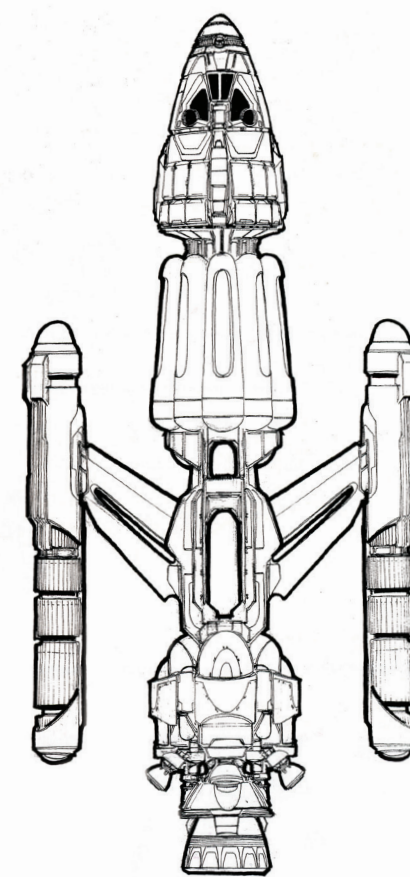
The *Phoenix* was the most important ship in *STAR TREK*'s history and the design had to provide a bridge between today and the future.

When concept artist John Eaves began work designing Zefram Cochrane's famous warp ship, the *Phoenix*, he found himself faced with multiple challenges: he had to come up with a design that would be convincing as mankind's first faster than light vessel, that looked as if it was designed in the present, but that would also suggest the design of Starfleet vessels in the future. On top of that he

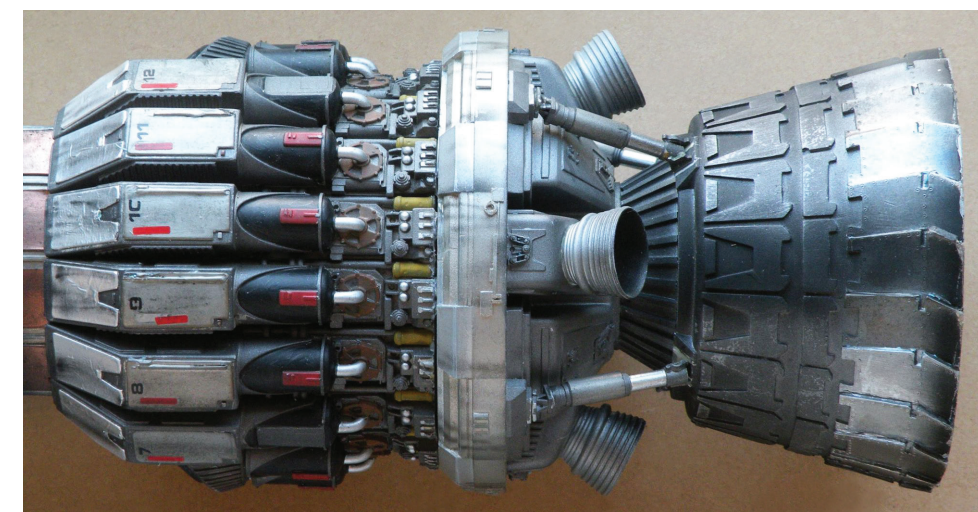
knew that it had to be adapted from a Titan missile. The production had even found a real Titan missile in a silo that they would redress for the movie and Eaves began work by getting to know it. As he recalls, "I think I climbed about every ladder and poked through every hole I could find. The missile had been decommissioned. It had been stripped back and the main thrusters removed from the bottom. There were holes in

the center of the body and you could peer right in and see that the whole thing has been dismantled. The hatch on the top of the silo was half glass and half solid so a satellite could fly over and tell that there was no nozzle on the bottom. So straightaway we knew that we were going to have to fill in the holes."

It helped that scenic artist Mike Okuda had an extensive library of books



▲ In early versions of the design the *Phoenix* had a much more involved shape under the missile's plating but this was rejected in favor of a simpler approach.

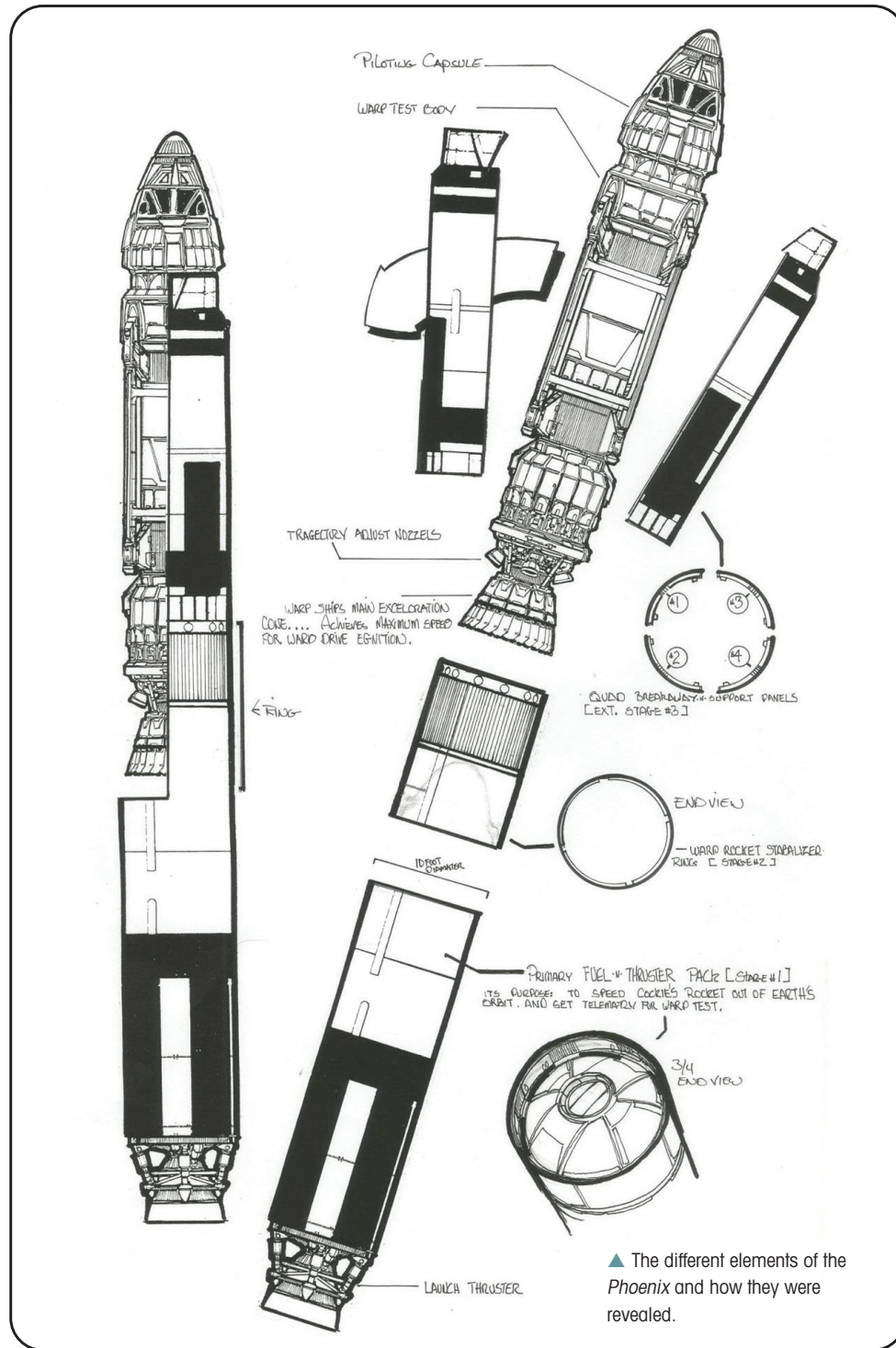


▲ The exhaust nozzle on the real missile had been removed so this had to be designed and built from scratch.

about NASA that detailed just about every rocket ever made, including one that showed the dimensions of an intact Titan missile. Eaves decided that there were three major factors that needed to be addressed. "We needed a nozzle that could go down the tiny elevator and be built on the bottom of the missile, because basically there was nothing down there. And then in the very center there were huge holes cut

all the way round in a circle, so we had to build a centerpiece to fill it in. Once that was done, we built a cone to go over the existing one, or at least what remained of it. I actually made the new cone longer than the original one and gave it an outward curve as well as adding four ribs that ran from the wider base right up to the nose."

Eaves also wanted the capsule to look as if its creators had used existing

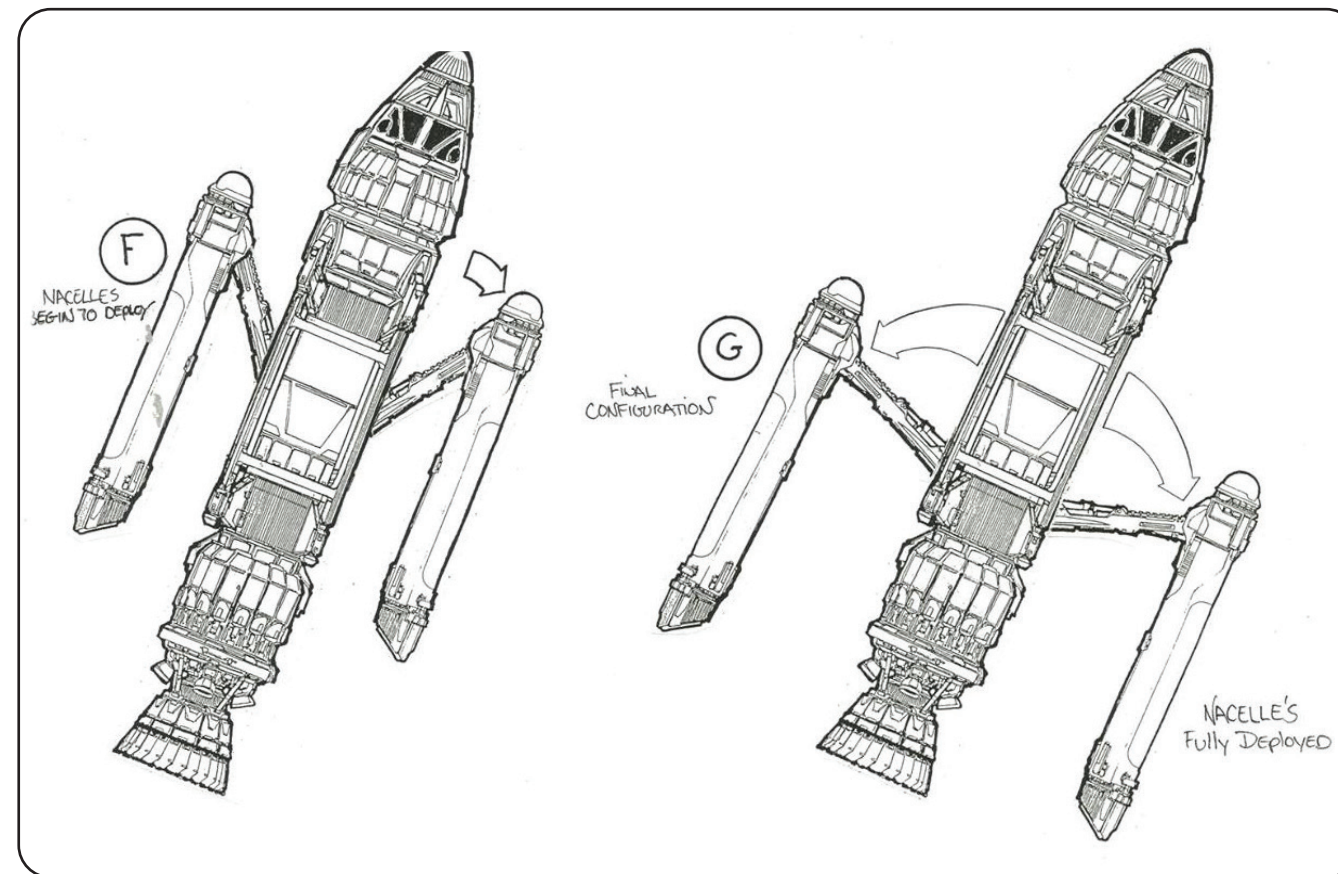


technology that happened to be at hand and that over time extra bits had been attached as needed. A 'bubble' window was added to enable the crew to look out and around.

After Eaves' design was approved, a model of the cone was constructed by Cleto Cetrone using sketches which showed the top, side and a

three-quarter view, together with the actual specs of the original nose cone. He also added detailing to the surface. This dealt with what the missile would look like in the silo, but it was clear that the *Phoenix* would change shape once it had been launched.

Mike and Denise Okuda and Rick Sternbach had actually come up with



an idea of what they thought the *Phoenix* would look like years earlier when they wrote the *STAR TREK Chronology* and Greg Jein had even built a model for them. "We started working with that design originally," explains Eaves. "But, after some thought, (VFX producer) Peter Lauritson decided it would be a struggle to fit that ship into what was obviously a pretty confined place. For me it was a real wrench as the stuff they'd done was beautiful but in the end we agreed it just wasn't going to pan out."

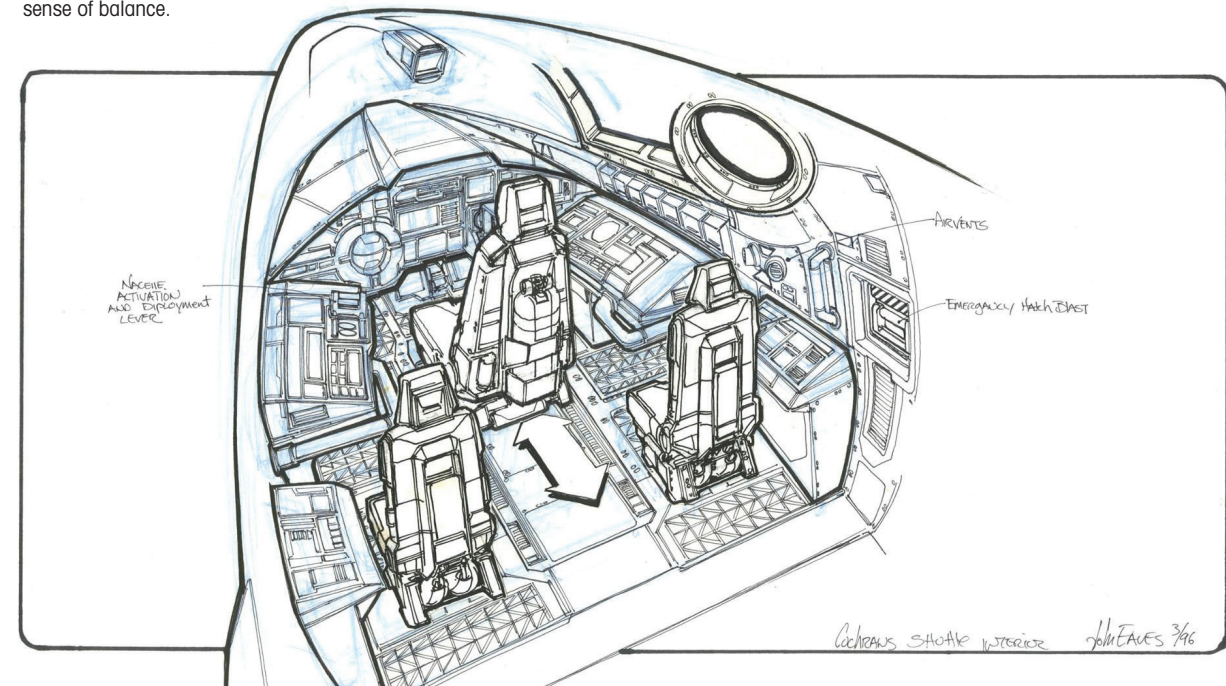
NEW DIRECTION

Eaves went back to the drawing board in particular concentrating on how the ship, which the script described as having nacelles, would actually fit inside a missile and how, having broken loose, it would then convert into a vessel capable of warp speed.

"I took the plans of the missile and tried to work out what a good length of

rocket versus a solid rocket fuel base would be. From there I pulled the *Phoenix* idea out and tried to figure out the details."

Eaves came up with a design, which featured large thrusters on the bottom and a solid fuselage with an open



framework. The nacelles would then fold out of the sides of the missile. Eaves made a point of making them as big as possible within the extremely narrow of the real-world missile. Production Designer Zimmerman wanted the ship to look as if it had been built from parts that had been salvaged so it would also have areas that looked almost skeletal. Finally, Eaves worked on both a longer and shorter version of the missile paying special attention to the warp drive.

"I saw a documentary about the atom bomb and one of the early bombs had a ring of triggers. They all had to go off simultaneously for it to work. I thought wouldn't it be cool if that is the premise behind this unit - that all these triggers needed to fire to make the warp action come into play."

All that was then left to do was fashion the nacelles to look similar to the versions on the original *Enterprise* in a bid to make a visual connection between the time periods before the designs were submitted to Zimmerman and producer Rick Berman, who picked the shorter version of the ship, and moved the nacelles a little further to create a more balanced (if mechanically challenging) design.

◀ Eaves also designed the interior of the nose cone. He remembers being surprised that the script called for three people to be seen in it. The solution was to put Cochrane's seat in front with two seats behind, which could be occupied by Riker and Geordi La Forge.



CREATING THE COSTUMES FOR FIRST CONTACT

Costume designer Deborah Everton discusses her designs for the civilian outfits worn by the Starfleet crew and the Vulcans' robes.

▲ Everton created all the non-Starfleet outfits for *STAR TREK: FIRST CONTACT*, including the 21st-century outfits for the senior crew and the elaborate costumes for the Vulcans who visited Earth.

Deborah Everton described how she saw the townspeople of Montana on 21st-century Earth as being "romantic and yet sort of basic." However, for the crew of the *U.S.S. Enterprise NCC-1701-E* who visited the Earth's surface she wanted to come up with a subtle differentiation.

"I had to make them almost like, but not quite

like, the Earth people," Everton said. "What I did there was exactly the opposite of what I did for the 1940s segment (the holodeck scene), where I wanted everything to look authentic; here I wanted their clothes to look like their interpretation of what the people were wearing. So they were in costume, they were going down there - 'Let's dress like the natives' - but it was a 24th-century



interpretation of what they thought the people were wearing. They were almost there in terms of fitting in, but not quite.

TRYING TOO HARD

"They were a little bit overdressed," continued Everton. "Their stuff looked a little new; they tried to age it but it was not quite right. But they couldn't see the difference - they thought they'd done a pretty good job.

"They (the actors) were happy to wear their civilian outfits because it gave them a chance to express themselves as individuals, as opposed to

Starfleet, where they looked like everybody else. They liked what they were wearing. Jonathan (Frakes) had me take some of the embellishments off his jacket - he wanted it a little more simple. They were happy, as far as I know - if anybody was unhappy I didn't hear about it. They were kind enough to not let me know!"

VULCAN ROBES

In contrast, a final touch of glamor came with the robes for the Vulcans aboard the *T'Plana-Hath* who came to Earth after detecting the *Phoenix's* warp signature. Everton said they were among her

▲ The clothes worn by the senior crew were designed to look a little too new and perfect, and did not quite have the authenticity of the outfits worn by the real 21st-century humans. The actors, however, were happy to wear something different than their normal Starfleet uniforms.



favorite costumes for the movie. "I actually went back to the original Vulcans," she said. "They were sort of grand and had their robes, and I used gorgeous fabrics on them. Their costumes were very expensive, and very sumptuous. I figured they were the regal people of the universe. The Vulcan female costume was the one I really liked. I had



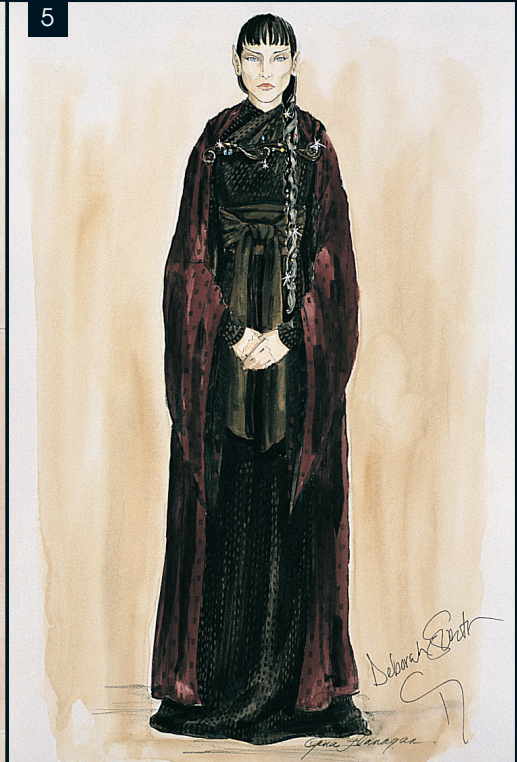
made a beautiful braid that came down to her waist, but Rick (Berman) wouldn't let me do it, because we hadn't seen a Vulcan with a braid before. "I wish we'd seen more of the Vulcans. Their costumes were so elaborate and textural - they had so much depth - and there was a little bit of



a metallic glow that emanated from them. They were just beautiful."
WELL RECEIVED
Everton loved working on the movie, and overall her designs got a good reception from director Jonathan Frakes and the producers. "It was a



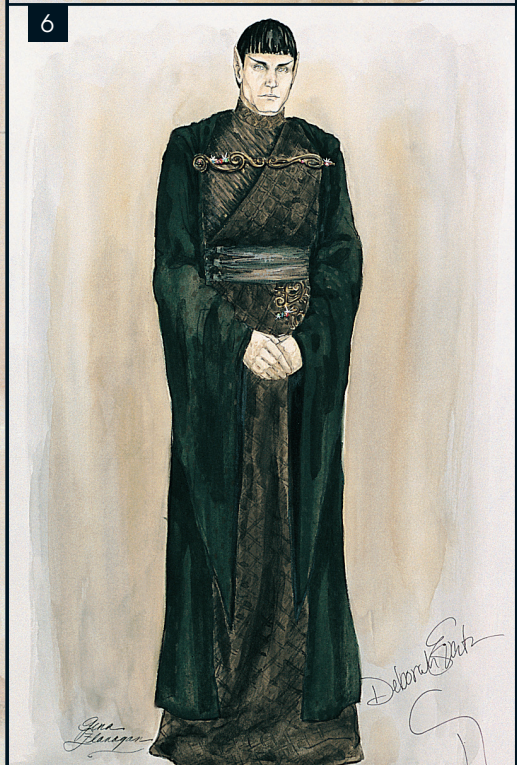
fantastic experience to work on *STAR TREK*," said Everton. "I didn't get a lot of things rejected. I would worry about it when I had to take a drawing over to the producers to get it approved. I'd go in there nervous, with my heart pounding, hoping that they'd like it, and fortunately I'd come back all smiles."



◀ 1 Like the rest of the senior crew, Dr. Crusher's civilian outfit matched the clothing of the townspeople of 21st-century Earth a little too well, and was too perfect to be completely authentic.

◀ 2 Brent Spiner was particularly pleased with his costume, as it was a rare chance for Data to wear 'normal' clothes. Like the rest of the outfits, it was largely made up of dark, earthy colors.

◀ 3 Everton said that LeVar Burton as Geordi La Forge was especially happy with his "big, clunky boots." All the actors were excited to wear clothing that was a little more individual than their Starfleet uniforms.



◀ 4 Originally, Everton had designed a different costume for Counselor Troi, but realized that it was "too fancy," so she pared it down to this more practical look that featured boots and a dark jacket.

◀ 5 Everton had wanted the female Vulcan to feature a beautiful braid that came down to her waist, but it was felt that this was not in tune with the logical Vulcans. Her outfit was nevertheless Everton's favorite.

◀ 6 Everton wanted the Vulcan clothing to look "regal," so she used very expensive material to make up their elaborate costumes. To her regret, the Vulcans appeared only briefly on screen.

ON SCREEN



TRIVIA

The actual launch vehicle seen in the silo that powered the *Phoenix* through the atmosphere and into space was a Titan II missile. It was renamed as the Titan V rocket for *STAR TREK: FIRST CONTACT*, even though no actual rocket of that name ever existed. *STAR TREK* technical consultant Mike Okuda explained, "I had a couple of sets of lettering made up to label the ship as a Titan V vehicle. I picked Titan V because the Air Force officer assigned to the film told me that there were no plans to build a vehicle by that name, but I wanted to keep the legacy of the Titan name."



FIRST APPEARANCE: STAR TREK: FIRST CONTACT

DESIGNED BY: John Eaves

KEY APPEARANCES

STAR TREK: FIRST CONTACT

Six years after their last invasion, the Borg return in an attempt to conquer Earth. Starfleet orders Captain Picard to stay away, as they believe his previous experience with the Borg make him an "unstable element (in) a critical situation." But, when the Starfleet task force fails to stop the Borg cube, Picard and the crew of the *U.S.S. Enterprise* NCC-1701-E disobey orders and join the fight. With Picard's knowledge of the cube's weak spot, they destroy it, but not before a sphere escapes and creates a time distortion that allows them to travel to the mid-21st century.

The *Enterprise* follows it, and Picard realizes that the Borg are attempting

to prevent warp-drive inventor Zefram Cochrane from completing humanity's first ever faster-than-light travel in his experimental *Phoenix* spacecraft.

Picard also realizes that if Cochrane doesn't make his historic flight, a Vulcan mapping mission will not detect the warp signature, and humanity's first contact with aliens will not be made.

As Picard and some of his crew fight the Borg on the *Enterprise*, Commander Riker and his team try to ensure the *Phoenix* takes off at the scheduled time. Riker and his team's efforts are hampered by the fact that Cochrane is nothing like the hero painted in history books, but an eccentric drunk, who appears to be only in it for the money.

Modelmaker Greg Jein built a conjectural model of Zefram Cochrane's warp spacecraft for the first edition of *STAR TREK* Chronology in 1993, where it was known as the *Bonaventure*. This model (minus its warp nacelles) appeared on a Malon ship in the *STAR TREK: VOYAGER* episode 'Juggernaut.'



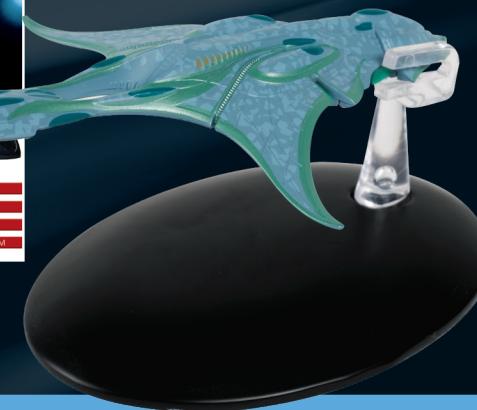
The *Phoenix* was, of course, a bird from Greek mythology that dies in a show of flames before arising from the ashes of its predecessor. Zefram Cochrane painted this creature onto the hull of his warp ship.

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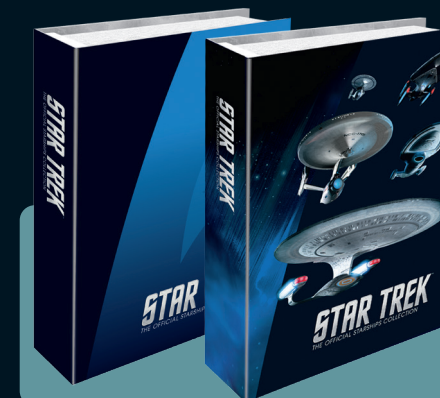
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- In-depth profile of the 22nd-century *Xindi-Aquatic cruiser*, the largest and most technically advanced craft of the five Xindi species
- Illustrator *John Eaves* talks about how he designed a giant flying aquarium for the *Xindi-Aquatic cruiser*
- A look behind the scenes at how the Xindi-Aquatic creatures were created using CG effects

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