STAR TREK
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GOLD
U.S.S. ENTERPRISE™
NCC-1701

SPECIAL ISSUE
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The U.S.S. Enterprise has been redesigned and reinvented a dozen times, proving the strength and versality of the original design.
Since STAR TREK: THE MOTION PICTURE the ship has regularly included a display showing the different vessels named Enterprise. By the time we reached FIRST CONTACT, the Enterprise’s history was shown with a series of gold-plated models. In the real world, each version of the Enterprise wasn’t designed in order but were created and updated as the story called for them. The challenge facing the designers was always the same: how to make something that looked different but was still recognizably an Enterprise. The basics have always stayed the same – a flat saucer section, with a neck connecting it to an engineering hull, which in turn has twin pylons that connect it to the engine pods, or nacelles. Like all good design it seems inevitable, but back in 1965 things were very different. The first Enterprise was designed by Walter M. Jefferies, though everybody called him Matt. Like Gene Roddenberry, he’d flown on bombers during...
World War II, and the two men wanted their ship to feel like a practical vessel. Roddenberry started by telling Jefferies what he didn’t want - no flying saucers, no fins, no flames or smoke trails, no Flash Gordon rocket ships. In short, he wanted something no-one had ever seen before, and that was about it. He did tell Jefferies that the ship would have a crew of 150 or so, that he didn’t have to worry about gravity and that the Enterprise should look as if it could travel incredibly fast.

INSPIRED DESIGN

This gave Jefferies a few ideas to work with. He figured that if the ship was going to move very fast, it would need to have a simple shape that could be recognized instantly. He also reasoned that to attain those kind of high speeds, the Enterprise would need powerful engines. And, if they were powerful, the engines would probably be dangerous, so they should be kept away from the main body of the ship somehow. Jefferies’ aviation experience came into play here – his idea was that the engines would be separate modules that could easily be swapped out. Working with these principles, Jefferies started to produce sketch after sketch.

Roddenberry would drop by at regular intervals and pick out things he did or didn’t like and slowly the ship started to emerge. The early designs featured ring-shaped engines that were connected to a long, dart-like ship. These were eventually rejected because Roddenberry felt they looked too fragile. The ring-shaped engines were replaced by the familiar engine pods, and Jefferies produced dozens of drawings showing different possible arrangements. At this stage he wanted the main hull to be a sphere, since its shape distributes pressure evenly in a vacuum. But, the sphere was just too awkward in design terms, so Jefferies flattened it out, ending up with the Enterprise’s famous saucer. Finally, he had a basic shape everyone was happy with, so he produced
detailed drawings for the model shop. He was particularly insistent that the Enterprise should have a smooth exterior. The way he saw it, no one wanted to go outside the ship if they could avoid it, so anything that needed maintenance would be on the inside.

Jefferies also gave the ship its registration number. Ever practical he wanted something that could be recognized quickly, which meant ruling out the numbers 3, 6, 8 and 9. He just took four of the remaining numbers and picked 1701.

When STAR TREK was cancelled in 1969 everyone assumed that would be the end of the road, but repeats of the series proved incredibly popular and within a few years the dead series had become a phenomenal success. It was inevitable that STAR TREK would return. Plans kept changing – at several points there was going to be a movie, at others there would be a TV series.

One of the more serious attempts was a movie called STAR TREK: PLANET OF THE TITANS. Work actually started on this in 1977 and production...
designer Ken Adam, who is famous for his work on the Bond movies, designed an entirely new Enterprise. The basic shapes are familiar, but Adam’s Enterprise has a startling triangular engineering hull. Ralph McQuarrie, who was fresh from ‘Star Wars,’ also worked on this design. But the studio was uncomfortable with the direction the script was taking and by June 1977 the plan was to bring STAR TREK back as a TV series, dubbed STAR TREK II. Roddenberry wanted Jefferies to work on the series but by now the designer was working on ‘Little House on the Prairie,’ a job he absolutely loved and had no intention of leaving. However, he did agree to take on some consultancy work and to subtly redesign the Enterprise.

The idea behind the series was that the Enterprise had returned to spacedock at the end of Kirk’s mission for a refit before heading off into space again. Jefferies had always seen the Enterprise design as modular with components that could be replaced easily, so he figured Starfleet had removed the original tubular engines and replaced them with flatter, more powerful models. He also updated the design of his support struts but left the rest of his ship almost unchanged. Don Loos built a new model, but it would never be used. By late 1978, plans had changed again. By now the studio had seen the incredible success of ‘Star
Wars,’ and decided that STAR TREK’s future was on the big screen after all. Robert Wise was recruited to direct and he brought in VFX designer Richard Taylor. There was some talk of using the Loos model, but Taylor insisted they needed a new, more detailed model that would stand up to the scrutiny it would get on the big screen.

BIG SCREEN ENTERPRISE
Taylor started work himself. In particular he concentrated on the design of the nacelles, giving them an art deco look, but much of the work on the Enterprise was done by a young illustrator called Andrew Probert. As a fan, he wanted to address some specifics. For example, he took care to establish exactly where the photon torpedoes were fired from and to identify the impulse engines at the back of the saucer.

Probert was also the first person to show how the ship could separate into two pieces. He remembered a line from one of the episodes, ‘The Apple,’ in which Kirk had told Scotty that if the worst happened he should “crack out of there with the main section”. Fans had long taken this to mean that the Enterprise’s saucer section could be separated from the rest of the ship and Probert went to the trouble of working out exactly how this would work, even going as far as to build four landing pads into the underside of the saucer. The movie Enterprise however, would never perform this maneuver on screen, and the storyboards Probert prepared for his own amusement remain the only thing that show how it worked.

The shooting model of this Enterprise was built by Magicam. At eight feet long it is stunningly detailed and had an extraordinary pearlescent paint finish that was almost impossible to replicate. It was used in the first six STAR TREK movies, becoming the Enterprise-A with the addition of a single letter to its registry number.

Technically speaking, the next Enterprise to be designed wasn’t an Enterprise at all: it was the U.S.S. Excelsior – an experimental starship that was going to replace the Enterprise in STAR TREK III. Years later, the designers of STAR TREK: THE NEXT GENERATION would put a display in the observation lounge of the Enterprise-D, establishing that the second Enterprise belonged to this class.

▲ The Excelsior class was designed to be a leap forward in starship design that would replace the ageing Constitution-class Enterprise. The design was created by Bill George, who built this study model for STAR TREK III.

▼ A display on the Enterprise-D had established that the Enterprise-B was an Excelsior-class ship. The producers wanted it to have its own unique look so John Eaves designed some modifications.
But in 1983, when ILM started work on the Excelsior no-one had a clue this would happen. As far as they were concerned they were just designing a brilliant, futuristic looking ship that would put the original Enterprise to shame. The first sketches were done by ILM’s David Carson and freelance designer Nilo Rodis.

ADVANCED DESIGN
Rodis’ idea was that the Excelsior would be very much an evolution of the original Enterprise so he retained Matt Jefferies’ basic layout but stretched it out to make it look longer and thinner. Since it was more powerful he added an extra set of nacelles. Rodis’s sketches, weren’t detailed construction drawings, they were more of a design direction. Several different versions were given to Bill George in ILM’s model shop and he produced a handful of study models for director Leonard Nimoy to choose from. George completed his models in good time so David Carson told him he might as well build another model using his own ideas.

At the time, Japanese design was becoming very influential so George took the idea of designing a “Japanese Enterprise” as his starting point. He gave his new study model a little extra depth, dropped two of Rodis’s four nacelles, and reintroduced echoes of Matt Jefferies’ original design. To his delight, Nimoy chose his version.

When the Enterprise-B finally made its screen debut over a decade later in 1994, the producers wanted the ship to look unique so they tasked illustrator John Eaves with subtly altering the design.
He added an extended section of decks to the bottom of the main hull, altered the design of the impulse engines, and added caps to the nacelles, but the ship remained essentially the same.

**BACK ON TV**

By the late 1980s, the studio felt that it was time to bring *STAR TREK* back to the small screen. They asked Roddenberry to create a new show with a new cast that despite all the differences would still be unmistakably *STAR TREK*. Probert was one of the first people hired to work on the new series. He didn’t know if he would be asked to design the new *Enterprise*, but he was so excited he started sketching as soon as he got home.

He knew that the new series would be set 100 or so years after Kirk’s time, so all the technology would be more advanced. He reasoned that this meant the *Enterprise* should be faster and therefore sleeker. He also wanted to make it more ‘elegant.’ The saucer had always been the dominant part of the ship, but on Matt Jefferies’ *Enterprise* it was much the same size as the engineering hull, so Probert made it larger. He also thought that the way the warp nacelles stood up above the saucer pushed them away from the ship’s center of gravity so he pulled them below the saucer. And, because he wanted his ship to look faster, he changed the angle of the support struts so they pointed forward instead of backward.

From the front, the saucer looked distinctly oval. Probert liked this so he started to work this shape into the other elements, compressing the oval to make things more interesting. All this was before he even got the job.

When Probert actually started work at Paramount studios, the producers told him to work on the ship’s interiors first. He set up his drawing board, and, thinking that he wanted to use the same design approach he’d developed for the exterior, he pinned one of his *Enterprise* drawings on the office wall for inspiration.

One day one of the writers, David Gerrold, was
visiting the art department on his way to a meeting with Roddenberry. He saw Probert’s drawing of the ship and asked if it was the new design. Probert could only shrug, and say that he hoped so but he hadn’t shown it to anyone yet. Gerrold unpinned the drawing and took it with him to his meeting. When he returned, he slapped the drawing down on Probert’s desk and told him it had been approved.

Probert says that he was absolutely ‘flabbergasted’ and that, although he refined the design, there were very few significant changes – with one major exception. Probert didn’t know that the producers wanted the ship to separate into two sections and his design really didn’t lend itself to being broken apart.

Probert admits to being daunted by the challenge but he eventually he came up with two shapes he liked by carving a serpent head shape out of the bottom of the saucer to give the engineering hull a pleasing outline.

Roddenberry made two final contributions to the design before it was approved – he told Probert to make the engines longer and to put the bridge on top of the saucer.

While the STAR TREK THE NEXT GENERATION art department was working on the sets, the decision was made to put a set of models in the observation lounge showing the different Enterprise vessels from the past. Jefferies’ original was there of course, and it was quickly decided that the Enterprise-B would use Bill George’s Excelsior-class design. This left the Enterprise-C. The model would be very simple, little more than the basic outline of the ship, but something still had to be designed.

MISSING LINK
Probert wanted the display to show how starship design had evolved, so he figured that the Enterprise-C would be a halfway house between the Excelsior and his own Enterprise-D. To work out the design he took drawings of the two ships and put them next to one another on a piece of paper. Then he drew lines between the two linking the most interesting points to create a design that was a midpoint between the them.

Probert left the series at the end of the first season and the only evidence of his design for the Enterprise-C that was left behind was the very simple model in the observation lounge and an unlabeled color sketch.

Such an important part of STAR TREK’s history
was unlikely to be ignored forever and sure enough in STAR TREK: THE NEXT GENERATION’s third season the episode ‘Yesterday’s Enterprise’ called for the Enterprise-C to make an appearance. Illustrator Rick Sternbach, like Probert a long-time fan who had worked on the first STAR TREK movie, got the job of designing it. He liked the idea of the ship being a hybrid between the Excelsior and the Enterprise-D and could see a lot of promise in Probert’s sketch, but because it was a fairly impressionistic three-quarter drawing, it left a lot to the imagination.

Sternbach created profile drawings based on Probert’s design, filling in a lot of the detail that was missing. As he worked he became concerned that Probert’s ideas were too complex for a ship that had to be made at short notice on a TV show’s budget, so he simplified it, making the saucer and the cross section of the engineering hull circular rather than oval, in the process making the ship look more like Matt Jefferies’ original design.

The shooting model was built by Greg Jein, and knowing that Jein was a master modelmaker and an expert on STAR TREK’s ships, Sternbach left him to finalise a lot of the surface detail and describes the model he produced as a “wonderful blend of two eras.”

Eventually STAR TREK: THE NEXT GENERATION graduated from TV to the movies. The original model of the Enterprise-D had done sterling service on television but had never been intended for the big screen – it simply didn’t have the level of detail you’d expect to see at that scale, and it’s proportions were more suited to a square TV screen than the long, thin shape of cinemascope. Equally importantly, the producers felt that the movies should have something new, so in STAR TREK GENERATIONS, they destroyed the
Enterprise-D knowing that they would replace it in the next movie.

**FASTER AND TOUGHER**

The job of designing the Enterprise-E was tackled by production designer Herman Zimmerman’s art department. At the time they were already working on *STAR TREK: DEEP SPACE NINE*, so Zimmerman stopped by illustrator John Eaves’ desk and asked him to start producing sketches for a new Enterprise as soon as he could. It was only when Eaves got home and started drawing that he realized quite what a responsibility he had been given.

Eaves had started out as a model maker. He had actually worked on the shooting model of the Enterprise-D and was aware that while it looked fantastic from several angles, there were others that were best avoided. There was no question that the basic layout would be the same and that the ship would have Jefferies saucer section, engineering hull and warp nacelles, the trick would be finding a new way of stretching or arranging them. On *STAR TREK GENERATIONS* Eaves had been responsible for modifying the Excelsior to make it into the Enterprise-B and he was a big fan of Bill George’s long, thin design. So he took the existing design and stretched it. In order to emphasise the ship’s length and low profile he rotated Probert’s saucer section so that although it’s still oval it was now long rather than wide.

Zimmerman and producer Rick Berman approved the basic approach and worked with him on the design over the following weeks. During this time, the warp nacelles were made longer and the overall shape became more compact. Berman’s brief was that this was to be much more of a fighting ship than its predecessor and that it had to have a distinct identity, so he pushed Eaves to take out anything that looked vulnerable and to avoid too many familiar design elements.

In an effort to make everything look as fast as possible, Eaves included lots of elements that point forward and triangles feature heavily on the
surface of his design. For a long time the nacelle support struts pointed forward, but when Zimmerman’s son, Fritz, who also worked in the art department, pointed out that this made the ship look like a turkey everyone realized this was a mistake and the struts were angled right back, something Eaves describes as the pivotal breakthrough.

The model was built at ILM, where appropriately enough Bill George was part of the team working on it. As they built the Enterprise-E, they would suggest modifications and Eaves credits them with having a major influence on the design.

**BACK TO THE BEGINNING**

The next Enterprise would present the STAR TREK art department with one of the greatest challenges it had ever faced. The new Enterprise, the NX-01,
Passaro made several changes to the design of the underside of the saucer section. He added the aeroshuttle, which was on the blueprints. Sternbach then worked with him to get the right level of detail in the surrounding area.

had to be a very old Enterprise. In fact, it had to be the first Starfleet ship to bear the name. Zimmerman and the producers began by having John Eaves produce some drawings but, although his designs were beautiful, the feeling was that they were too close to Jefferies’ original design. It was also clear that 21st century viewers expected the ships to look more detailed than they had in the 1960s.

Eaves produced dozens of drawings but no one could quite settle on the right approach and there was a lot of work for him to do helping to conceptualise the ship’s interiors. So Zimmerman turned to a former member of his team – Doug Drexler, who was now working as a computer modeler at Foundation Imaging.

Drexler couldn’t leave Foundation at once, so every evening Zimmerman would come to his house and they would fire up his computer. They threw ideas around together, with Drexler creating 3D models, and Zimmerman looking over his shoulder and making suggestions. Drexler, who is
an expert on STAR TREK’s history, initially suggested that they revisit Matt Jefferies’ original, rejected designs and make the ship spherical, but no one was willing to lose the familiar saucer, so he and Zimmerman kept looking at different ways of handling the familiar elements. Eventually they had an approach they thought might work, but ultimately it was decided that it just looked too much like Kirk’s original ship.

The producers decided that this earliest version of the Enterprise should be smaller and more primitive. They decided to base it on a background ship, the U.S.S. Akira, which ILM’s Alex Jaeger had designed for STAR TREK: FIRST CONTACT. This ship had the familiar saucer and warp nacelles but barely any engineering hull.

Drexler says that taking the Akira and somehow twisting it into Jefferies’ original design was a frustrating but ultimately exhilarating process. He drew a lot of inspiration from the industrial designer Raymond Lovey, who specialised in taking long-standing designs and restyling them. Drexler’s CG model went through enormous changes as he worked on it. He describes it as being “pulled, stretched, cut and pounded” before the shape was finally approved.

Once the NX-01 reached this stage, Drexler started to really enjoy himself, going over the surface of the ship adding details and deciding exactly how everything would work. No detail was

▲ For the 2009 movie, JJ Abrams asked Ryan Church to design an exaggerated version of the ship with bulging curves.

▼ Sean Hargreaves redesigned the Enterprise for the end of STAR TREK: BEYOND, cutting out any vulnerable points and radically altering the design.
DESIGN HISTORY

DESIGNING THE SHIP

Eaves, Schneider and Budge brought a new version of the original Enterprise back to TV in 2018. Their goal was to stay as close as possible to Jefferies’ original design.

too small, he thought about every airlock, every hatch, every antenna.

When it came to the overall look of the ship, Drexler figured that it would need constant maintenance. He took inspiration from Jefferies’ original designs, but made them heavier and added access hatches. Jefferies had been clear that a century or so after, maintenance would be done inside the ship, but Drexler reasoned that this would be a refinement that came later. At this point in time he says, “The NX was maintenance intensive, and took a hardy breed of engineers to run.”

Although Drexler describes the design process as “painful and hair raising” he was delighted with the finished ship. “There isn’t a frivolous line on it,” he says, “Every bit of it has a purpose and is thought out.” In his mind the design of the NX-01 would have continued to evolve as it pursued its mission with Starfleet upgrading various components as technology advanced. He even suggests that Starfleet would eventually have added a much larger engineering hull, bringing the design of the ship even closer to Matt Jefferies’ original – the starting point for every Starship

Enterprise.

SLEEK AND CURVY

In 2009 STAR TREK was revived in a series of big budget movies, under the control of JJ Abrams. In these movies the timeline is altered and we see STAR TREK history play out differently as a troubled Kirk rises to command of the Enterprise. In this version of history we saw the ship being built on Earth, years before it entered service. Abrams updated the entire look of STAR TREK and brought in Ryan Church, famous for his work on the ‘Star Wars’ films, to rework the Enterprise. He told Church he wanted the new Enterprise to “look like a hotrod.” Church kept all the original components of Jefferies’ design but exaggerated all the shapes, making them more organic, curvier and more bulbous. The design was further refined at ILM, where the team, under the direction of Alex Jeager, slimmed the nacelles down and added much of the surface detail to the ship.

This Enterprise was given a refresh in the third film in the series, STAR TREK: BEYOND, when Sean Hargreaves had a chance to redesign it. He had
The DISCOVERY art department went to enormous trouble to link their version of the Enterprise to the original model, right down to how the Bussard collectors animate. Always felt that the nacelles on this version were out of proportion, so he rebalanced them making them smaller and pulling them further away from the saucer. Director Justin Lin wanted to emphasise the ship’s fragility so he asked the VFX team at DNEG to subtly alter the design to make the neck thinner and longer.

The film ends with a new Enterprise being built and launched. This version was also designed by Hargreaves. The goal with the previous redesign had been to make the Enterprise look more fragile, this time the idea was to make it more robust. Again Hargreaves kept the basic design intact, but he extended the back of the neck to make a triangle as it connected to the engineering hull and he converted the nacelle pylons into triangular wings that offered much more support.

CLASSIC DESIGN

In 2018 the original Enterprise returned to TV in STAR TREK: DISCOVERY. The ship, made its debut at the end of the first season, when it drops out of warp and hails the U.S.S. Discovery. The time period placed the Enterprise’s appearance between ‘The Cage’ and Kirk’s first voyage in ‘Where No Man Has Gone Before’, but the producers wanted the ship to look as sophisticated as everything else on DISCOVERY so they asked John Eaves to create a modernized take on Jefferies’ classic design.

Eaves worked with Scott Schneider and William Budge to make a version of the Enterprise that was as true as possible to Jefferies’ original design but still looked at home in a modern TV show. Together the three men pored over Jefferies original design and looked for ways to update it without really altering it.

Since Jefferies day, various designers had added a lot of small details to the surface of STAR TREK’s ships such as transporter emitters and RCS thrusters. They added all of these and detailed the surface with more distinctive panels that tied it into other ships from the DISCOVERY era. They also included subtle nods to other designs such as the NX-01 and the Enterprise-B. Their goal was to create a ship that could logically evolve into the version that had appeared in STAR TREK’s first season. After more than 50 years and a dozen redesigns, the Enterprise had come full circle.