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SPECIAL ISSUE

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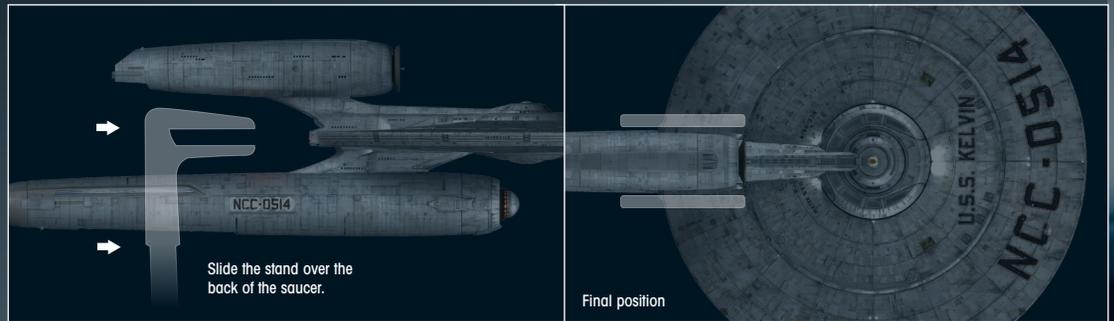
CAPTAIN: ROBAU

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U.S.S. **KELVIN**

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U.S.S. KELVIN

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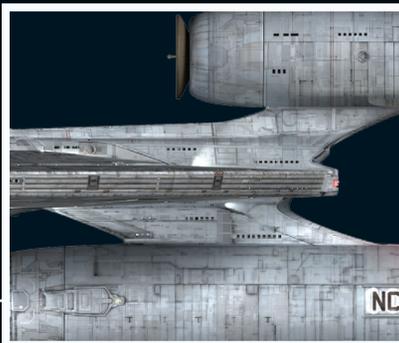
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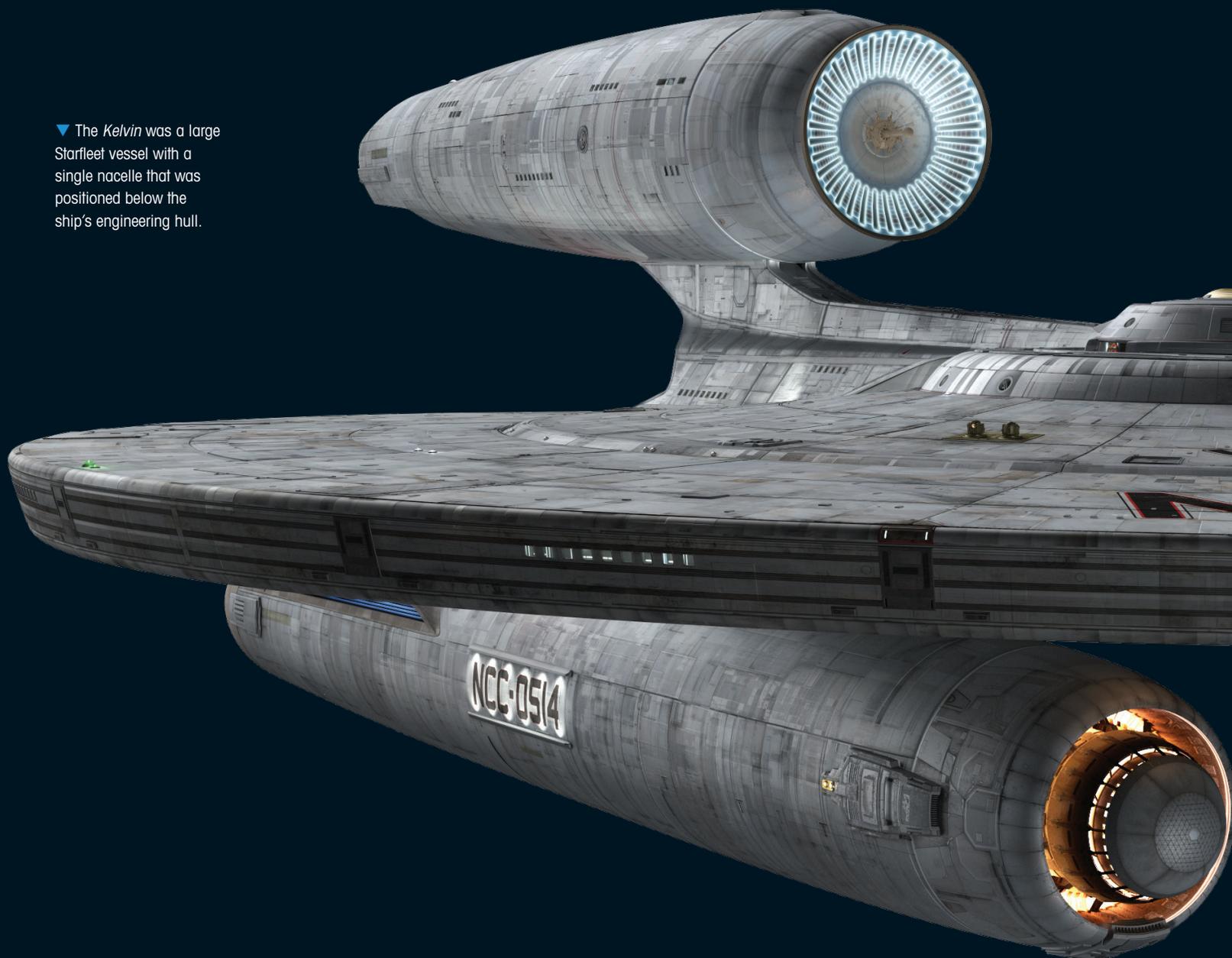
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WEAPONRY: PHASER EMITTERS

PHOTON TORPEDOES



▼ The *Kelvin* was a large Starfleet vessel with a single nacelle that was positioned below the ship's engineering hull.



U.S.S. KELVIN

The actions of the *Kelvin*'s first officer Lt. George Kirk earned the ship a place in history.



The *U.S.S. Kelvin* NCC-0514 was destroyed confronting a mysterious ship on Stardate 223304. The *Kelvin*, under the command of Captain Richard Robau, was patrolling the Klingon Neutral Zone when it detected a ship emerging from a massive gravimetric disturbance. The vessel was the *Narada*, a Romulan mining vessel from 2387 that had been thrown back in time, following Spock's failed attempt to save Romulus.

The *Narada*'s commander Nero instantly turned its weapons on the Starfleet vessel. His superior firepower rapidly overcame the *Kelvin*, and Nero demanded Robau's surrender. Robau put his first

officer Lt. George Kirk in command and took a shuttle over to the *Narada*, where Nero interrogated him. As soon as Nero realised what had happened to his ship, Nero killed his captive and launched another assault on the *Kelvin*.

Kirk gave the order to abandon ship. In order to cover the crew who were leaving in shuttles, he set the ship on a collision course with the *Narada*. Since the autopilot had been damaged Kirk opted to remain onboard to operate the controls and sacrificed his own life ramming into the *Narada*. Kirk's sacrifice achieved everything he had hoped for: the vast majority of the *Kelvin*'s crew survived and the *Narada* was damaged so badly that it had to retreat. His actions saved the lives of 800 people including his wife and newborn son James, who would go on to play a vital role in history.



◀ George Kirk assumed command of the *Kelvin* after Robau surrendered himself to Nero. He commanded the ship for twelve minutes but managed to save the lives of the entire crew.



DESIGNING THE KELVIN

The first ship to appear in the re-imagined *STAR TREK* had to be instantly familiar but also had to have a unique design.





J Abrams 2009 *STAR TREK* movie opens with a closeup of a starship. The camera moves quickly across the surface as we hear the familiar pinging sound of a Starfleet bridge. For a second we think this must be the new *Enterprise*, but then the camera pulls back and we discover that it is actually the *U.S.S. Kelvin*, a ship that will literally play a role in changing history.

Designing the Kelvin posed the *STAR TREK* art department, and in particular Ryan Church, who

designed the exterior, with several challenges. "It was imperative," he explains, "that nobody confuse this ship with the *Enterprise* but everyone know that it was a 'good guy' *STAR TREK* ship. It also had to look kind of 'inferior' to the *Enterprise*, so that when we do see the *Enterprise*, we know it's the flagship."

When Church first heard about the *Kelvin* it was actually called the *Iowa*. This was a nod to Kirk's line in *STAR TREK IV* when he tells Gillian Taylor that



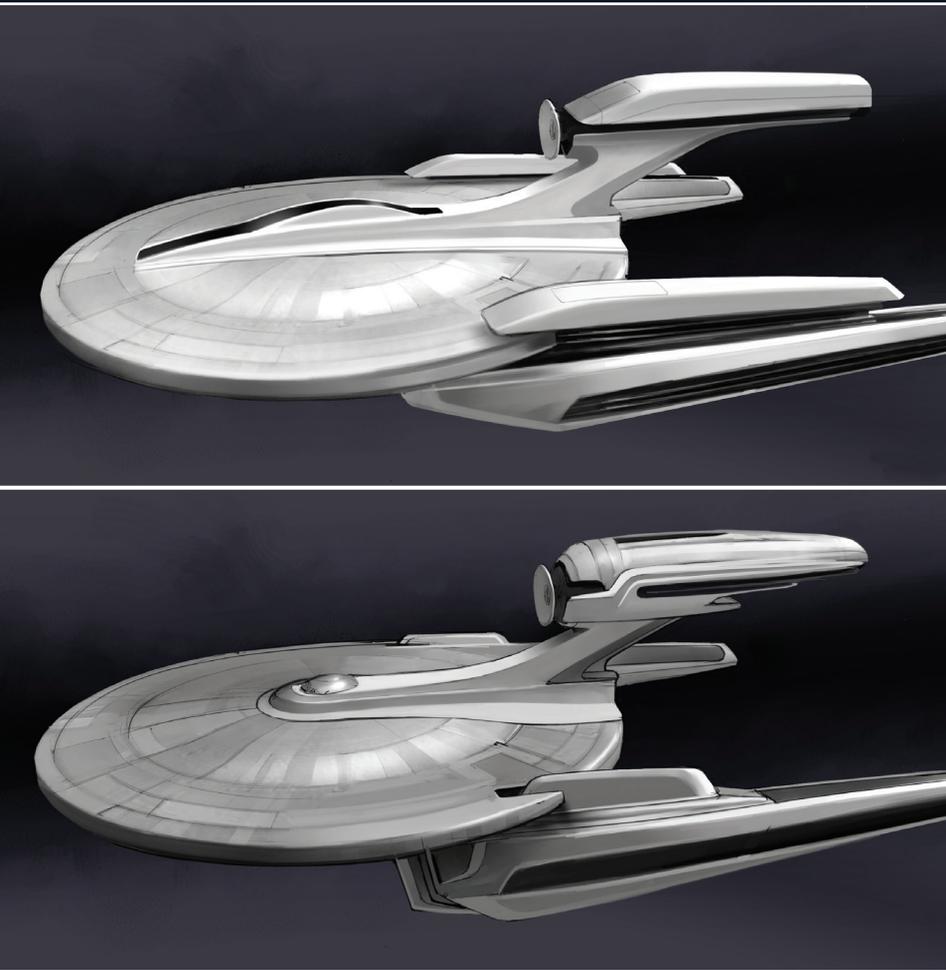
he is from Iowa and only works in outer space. Church was busy working on the *Enterprise* when director JJ Abrams and Production Designer Scott Chambliss called him in to talk about this second Starfleet ship. As he remembers it, they had a fairly clear idea about what they wanted from the *Iowa*.

"Scott and JJ had a lot of discussions about it before getting me to start sketching. We knew we wanted something like the *Reliant*. That was the target early on. In *STAR TREK II* it serves a very similar

function to the *Iowa* - it's a foil to the *Enterprise*, it looks less majestic and sexy, and it's instantly distinguishable from the *Enterprise*."

The design of the *Reliant* had taken the familiar elements of the *Enterprise*, cut them down and rearranged them to make something new and the idea with the *Iowa* was to do something similar. By this point, Church says the design of the *Enterprise* was fairly advanced so he knew what approach they were taking to Starfleet design.

▲ Ryan Church's first two passes for the design of the *U.S.S. Iowa* generated 12 drawings. The basic layout stayed the same, but the surface details and some of the shapes varied. Several of the 'sketches' including the one in the bottom right corner are labelled 'TOS'.



▲ Church's third round of drawings involved a new approach where the nacelles were dropped under the saucer and connected directly to it. There were only two drawings in this round, but director JJ Abrams and production designer Scott Chambliss saw a direction they liked.

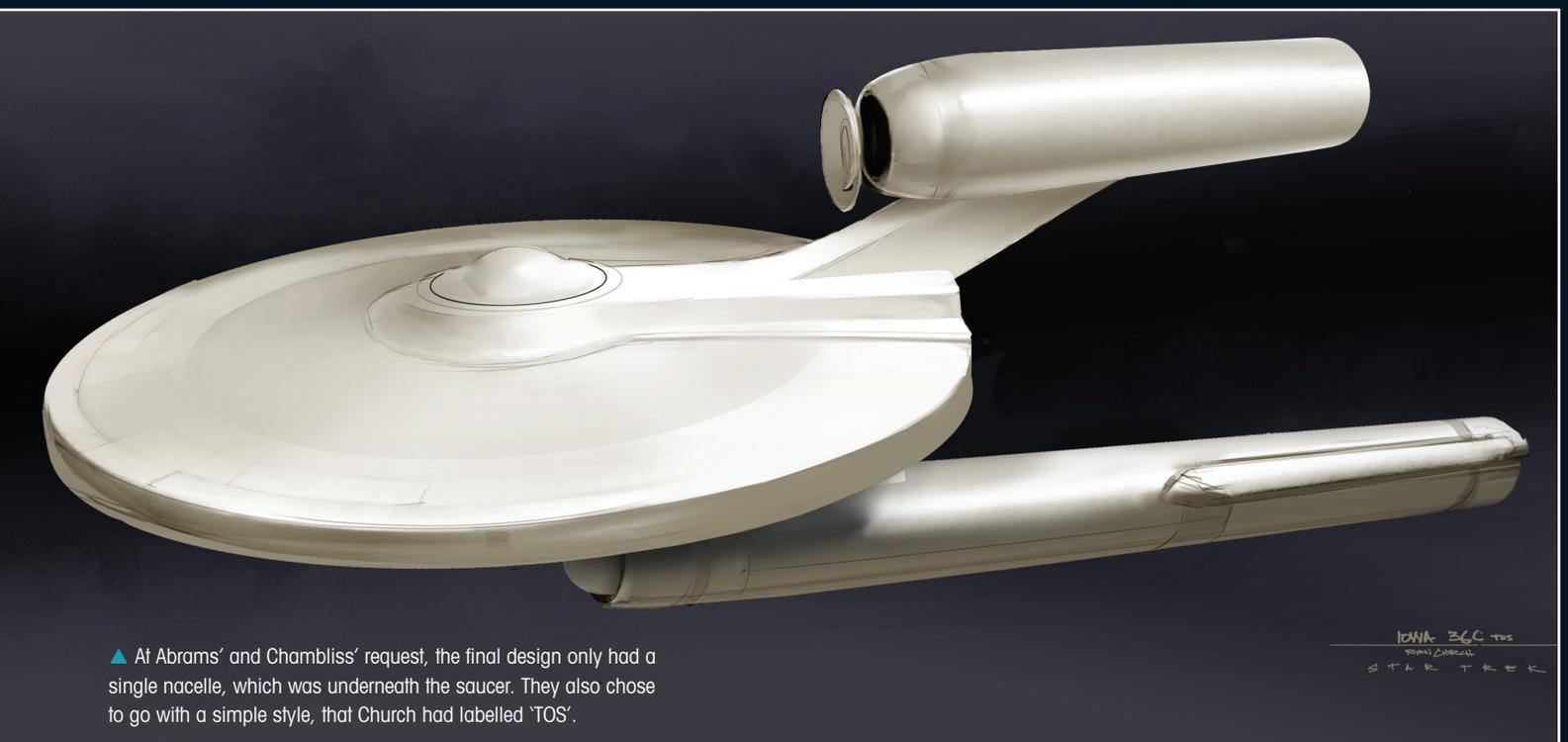
Abrams and Chambliss were also able to give him something else to work with: James Clyne, who had already started work on the *Iowa*'s bridge. As Church explains, Abrams wanted it to look very different from the *Enterprise*, "JJ wanted it to be very military and almost submarine like in contrast to the *Enterprise*. So that was one of our jumping off points for the *Kelvin* exterior."

A DIFFERENT ERA

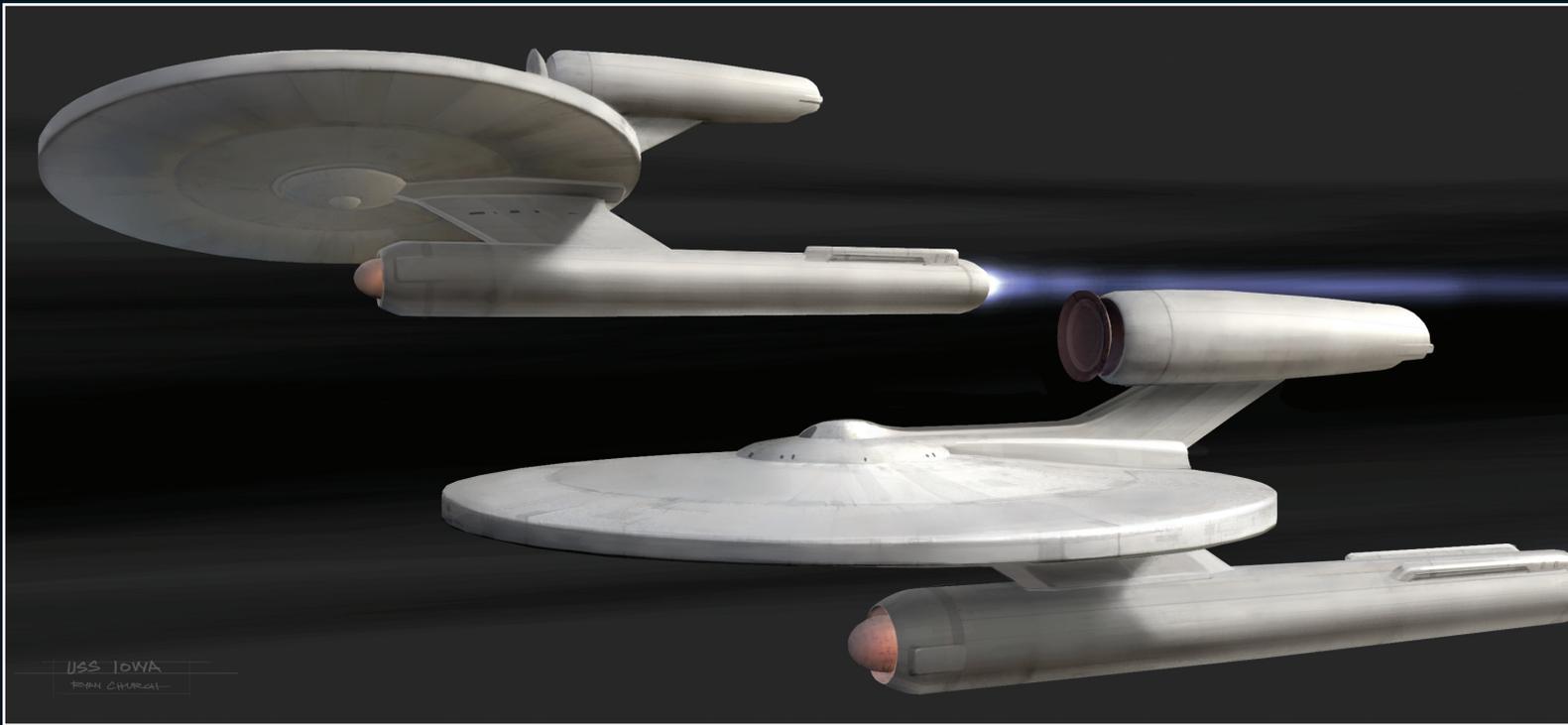
Another consideration was that the *Iowa* was destroyed nearly 30 years before the *Enterprise* was launched. Abrams felt that even then it was an old ship that had been in service for years. "So," Church says, "it was an older model, something next to which the *Enterprise* would look that much more impressive, modern, and beautiful. It was an early JJ call that the engineering hull go on the top, probably to further differentiate it from the *Enterprise*."

Church's first round of sketches all follow the same basic layout, which has clear echoes of the *Reliant*. The nacelles have been pulled in closer to the saucer, which they are directly connected to, and a truncated engineering hull has been moved inbetween them on the top of the saucer.

"It would be hard to find a design that distills the Federation form language any more than the *Iowa*



▲ At Abrams' and Chambliss' request, the final design only had a single nacelle, which was underneath the saucer. They also chose to go with a simple style, that Church had labelled 'TOS'.



does,” Church says. “If you add anything it becomes needlessly complex, if you take anything away you are no longer a totally ‘STAR TREK’ ship.”

The sketches only show minor changes to the layout, with Church concentrating on the surface details and the exact shapes of the different elements. “It was like casting actors with me providing different looks,” he says. “They are all sketches over a basic saucer CGI I threw in there because I knew that would be the constant and I didn’t want to keep drawing the ellipses each time.” Some of the design elements were taken from rejected *Enterprise* concepts, and most of the sketches show a heavier detailing than would be used elsewhere in the movie.

CHUNKY, MILITARY DESIGN

“I started out with kind of odd, non-*Trek* looking surface details,” Church remembers. “I thought of them as kind of early – but linear – predecessors to the *Enterprise* aesthetic. They were chunky, functional details, what I call the ‘military greeblie’ look. That was something that was implied by what James Clyne was doing with his interior at the time which was very military, chunky looking.”

Church also threw in an incredibly smooth version labeled ‘TOS’ that could have come straight out of the original 1960s series, reasoning that this was another form of ‘primitive’ design.

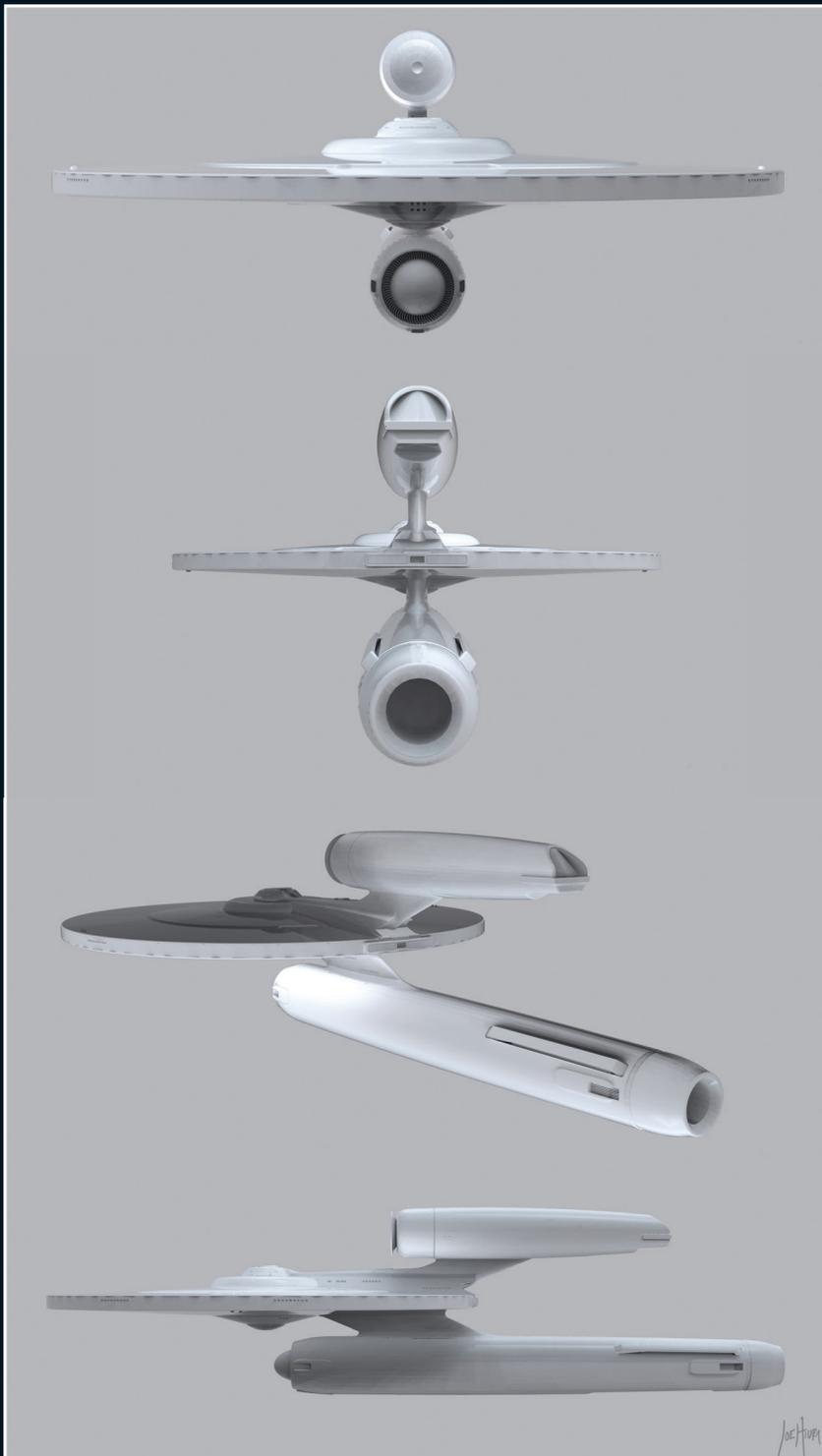
The drawings were well received, but Church remembers that when he presented them there wasn’t a clear favorite. “Sometimes – and this was one of those times – JJ won’t give a lot of feedback, he’ll just say, ‘Keep going!’ This is always a little disconcerting to hear and it either means you, as a designer, are doing a really good job or a really bad job. The problem is that you don’t know which one it is at the time! It’s a great challenge and you have to do exactly that – keep going.

“In this case, that meant refining the ideas I’d already presented and then going off in some new directions as well. JJ and Scott did have the note that I should back off on the military greeblie look that is in some of them. There was a drive even at that early time towards smoother, more streamlined shapes.”

SINGLE NACELLE

The next round of drawings consisted of eight concepts, all of which kept the same basic layout but showed more options for the surface details and the exact shape of the nacelles and engineering hull. Again Church threw in several drawings that had a very definite original series aesthetic. The design still wasn’t quite there and for the next round of drawings he dropped the nacelles under the saucer, but kept them very close to it, while the engineering hull stayed on the

▲ After the basic approach to the design was approved, Church worked up a drawing that showed the Iowa in more detail and from different angles.



CG Design

One of the innovations on *STAR TREK* was that the art department used their own 3D modellers, who would work up simple CG versions of the ships so that the designs could be looked at from every possible angle. Joe Hiura was given Ryan Church's initial drawings of the *U.S.S. Iowa* and produced this model, which was shown to JJ Abrams and Scott Chambliss. When the design was sent over to ILM they built an entirely new version of the model that was suitable for filming.

top. When they saw these drawings, Abrams and Chambliss hit on what they wanted and asked Church to prepare another version with a single engine underneath the saucer, and told him to go with the smooth original series approach. "JJ and Scott thought I should try a version with one engine and one fuselage and that was the one that was chosen. I think it's the right call: we didn't want the shape to be anywhere near something that could be mistaken for the *Enterprise*, from any view- front, side, rear, partially obscured by smoke. And the *Iowa* fits that bill nicely."

TRADITIONAL LOOK

It wasn't the original intention when Church started sketching, but he says the design that was chosen has the most in common with the traditional look that had been established in the original *STAR TREK* movies. "JJ ended up picking the simplest design and one that looked like it came right out of the 1979 movie, which makes a lot of sense in terms of the story. It seems like a no brainer when you look at it now but the ship fits perfectly into the pre-changed timeline. It makes complete sense but it also makes sense that JJ wanted to see a bunch of options before making that decision – he'll often do that with designs: make sure he's considered every possible option. That's the fun of presenting a bunch of designs to him, you can see the wheels turning as he considers how the end product will look in his movie."

Church worked with the art department's in-house CG artist Joe Hiura to produce a relatively simple, virtual study of the model so they could work out any kinks in the design and to see how it looked from a variety of angles before it was passed on to ILM, who would build the final model that was used in the film.

ENTER ILM

As VFX art director Alex Jaeger remembers, ILM got Church's drawings for the *Iowa* and the *Enterprise* at about the same time. (By now the *Iowa* had been renamed the *Kelvin* in honor of the physicist Lord Kelvin and JJ Abrams' grandfather Harry Kelvin.) "The look of the two ships played off of each other," Jaeger says, "We had to make sure that we made the *Kelvin* look old and the *Enterprise* look new."



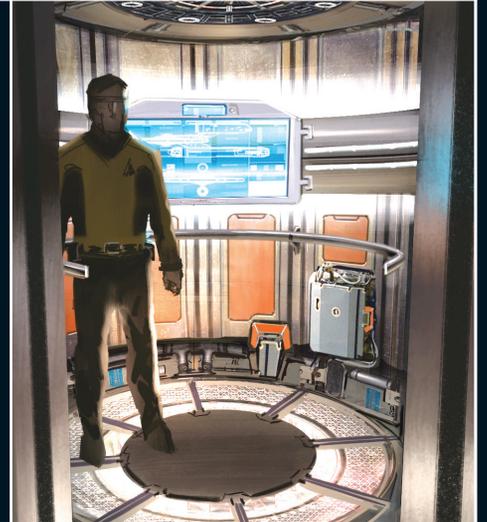
Inside the **U.S.S. KELVIN**

Concept artist James Clyne, who also designed the *Vengeance* and the Klingon fighter, started work on the interiors of the Kelvin, before Ryan Church was briefed about the exterior. And his designs had a very definite influence on the way that Church thought about the ship.

The brief that Clyne was given for the interiors was to make them look as if they belonged on a submarine, and he amassed a large folder of reference showing the gauges and other

instrumentation on real-world, 21st-century submarines. Handrails around the set gave the impression that it wasn't entirely stable, and all the elements were deliberately distressed to give the impression that the Kelvin had been in service for years.

Equally importantly, the design of the bridge was much more like that of a traditional STAR TREK ship. This meant that audiences would start out feeling comfortable before some of the radical changes they saw later in the movie.





Of the two ships, ILM were clear that the *Kelvin* should be much more like the traditional *STAR TREK* ships they had worked on in the past. However, Jaeger adds that VFX technology had moved on considerably since the last time ILM had built a *STAR TREK* ship and they were determined to make their CG model of the *Kelvin* as sophisticated as possible. “We looked back at anything that had bugged us before. We’d say, ‘Okay well that looks cheesy and that looks hokey. How can we fix that so that it looks a little more believable to the more modern audience?’ We made sure that if there

was a big lit up dome on the ship that it looked like it had some sort of function and it wasn’t just this bac-lit Plexiglas dome. You could tell that there were different light sources in there, something shadowed inside.”

MOVING WEAPONS

Abrams was also clear that the *Kelvin* should be a primitive ship than we were used to from previous *STAR TREK* films. “JJ’s brief for the *Kelvin*,” Jaeger says, “was to make it feel more like a like a submarine kind of ship. He wanted it to have kind



of a World War II sort of hardware feel to it.” Jaeger’s colleague, ILM digital model supervisor Bruce Holcomb goes on to explain that at Abrams’ request they gave the *Kelvin* a chunkier design of weapons systems. “The phasers were like these little pop up guns inside the phaser strip. We did the same thing on the *Enterprise*, but then we had these really slick little design balls; these were just these kind of square boxy type of thing that were more like laser cannons than anything else. Then it had like cobalt projectile items that would pop up and those were those little blue things that kept

shooting out. So it definitely had some old technology in it.”

The Bussard collectors at the front of the nacelles were also given a more primitive design that harked back to the 1960s TV series rather than *STAR TREK: THE MOTION PICTURE*.

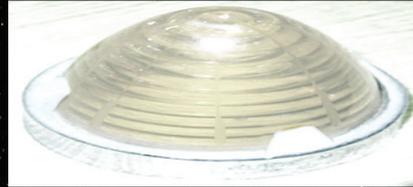
OLD AND BATTERED

The biggest differences though involved the surface texture. Church’s drawing showed the ship looking smooth, but Abrams was clear that he wanted ILM to give the impression that the *Kelvin*

▲ Church also produced this large digital painting of the *Iowa* that showed much more detail, including the position of the Starfleet pennant. This was sent over to ILM to give them an idea of what the final ship should look like.



Something like this in sunlight



like this in darkness

like this in partial light



Dome is a semi-transparent dome cover for sensor array, small light sources inside the floor of the sensor bay are what illuminate the dome.

► ILM looked for lots of ways of adding detail to the model of the *Kelvin*. One of the changes they made involved upgrading the louvered doors of the shuttlebay, giving it a more complex look, as if it could fold open.



► The finished shot of Robau's shuttle leaving the shuttlebay at the back of the engineering hull.

▲ Although the *Kelvin* was an 'old-style' ship, ILM were determined to upgrade the level of detail in the model. One of the ways they did this was by adding multiple lights inside the sensor dome.

was an old and battered ship. "JJ was really keen to make this thing look like it's been around for a while," Jaeger remembers. "On the *Enterprise* all the panels sort of blended together, we wanted the *Kelvin* to look like some of the panels had been blown off in previous battles and then patched over."

"It was a lot of fun for us," Holcomb adds. "It was supposed to be really beaten up, it had been through a lot of adventures already. There was nothing flush about it. The dish itself was really thick - it wasn't streamlined. We had to do a lot of plates that didn't really fit. For us that was a pretty easy thing - not going towards a *Star Wars* level but staying still within the *STAR TREK* Universe."

In order to achieve this effect, Jaeger explains that ILM made sure that none of the edges of the panels were absolutely perfect and then for selected panels they added a hint of damage

that had been repaired. "You leave a little bit of scorching on the panels around it and then you put the new ones on top. It looks like that one was repaired because something happened there before and you could see just a little evidence of it on all the edges. In the paint they would have put a slight displacement map on those panels so they raised it a touch."

ILM also took great care with the Aztec pattern on the surface of the Kelvin's hull, altering the amount of reflection in parts of the pattern so that no two panels were exactly the same.

They also devoted time to working out exactly what color the *Kelvin* should be. They ran a series of different tests showing it with a traditional light blue hull that was similar to the *U.S.S. Excelsior*, and even a dark brown, almost red coloring before finally settling on a light tan color that Holcomb describes as warmer than anything they had done in previous *STAR TREK* films.



DAMAGE CONTROL

One of the biggest challenges though had to do with destroying the *Kelvin*. During the opening sequence of the movie it takes an enormous amount of damage as it is attacked by the *Narada*. Traditionally, this would have involved building many different models of the *Kelvin*, each of which showed a different amount of damage. This time, Holcomb says, ILM wanted to try something new. "It's a difficult procedure trying to

wrangle that many different levels of damage," he explains. "I think it rolled over almost sixteen different shots. Sometimes you'll have multiple models in one scene and you'll make one invisible and the other one not. But we developed a system here where you could tag different categories of damage. The neat part about it was that it would swap in pieces of the ship not the entire model. Let's say the *Narada* was shooting the *Kelvin* and the whole front of the dish blows off, then that

▲ In particular ILM wanted to make the collector at the front of the single warp nacelle as detailed as possible. The final design has echoes of the original TV series where the nacelle caps had rotating components inside them.



CHQ SWEET JUDY | Weathering Concept [side view] | 3/6/08 | A. Jaeger: ILM

▲ A lot of effort went into the exact colouring of the Kelvin's hull and the surface textures. Jaeger says that they 'smeared' it with virtual grease to give the impression that it had been in space for a long time. The colour of the hull was originally much closer to the traditional Starfleet blue.

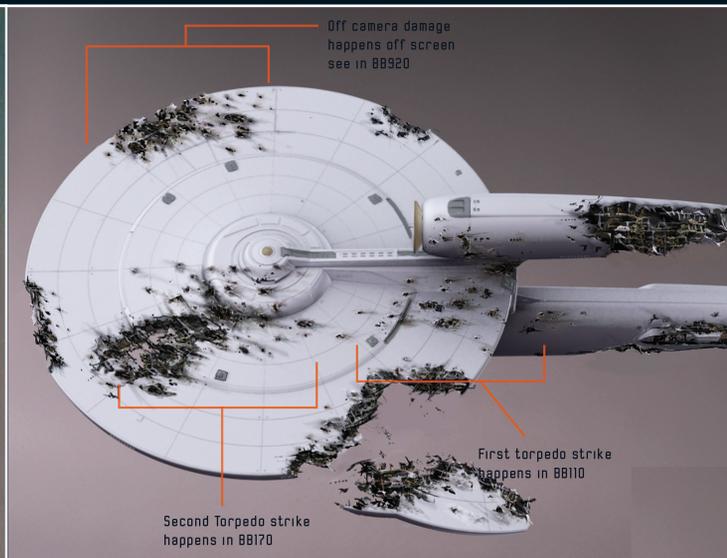
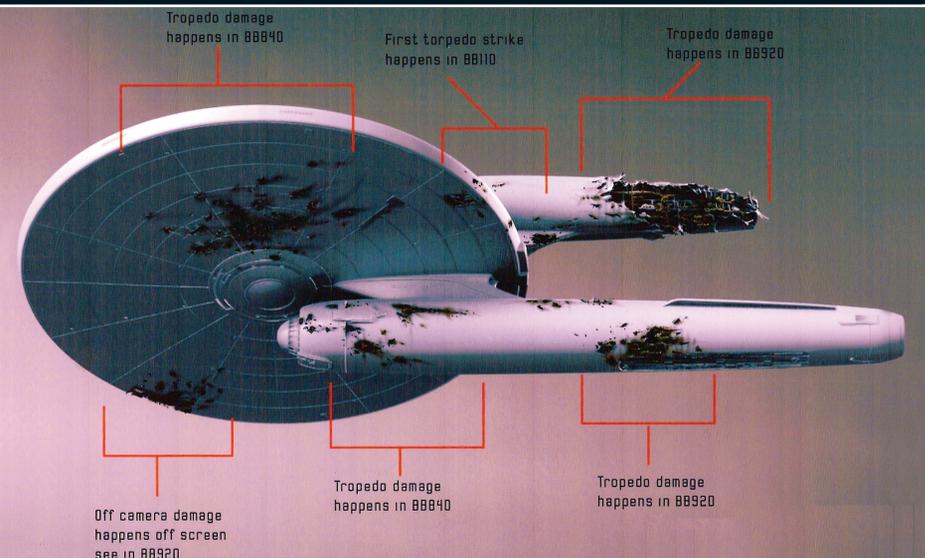


▲ ILM worked their way through several different color treatments for the hull, including this very 'red' version. The final version was a warm grey. This render also shows how the panels were carefully distressed to give the impression they were old and had been repaired.

whole front part of the dish would come in as a separate model and it would hide the geometry that's there.

"The people who were running the shots would be able to load and unload the damage depending on the tag. We had this whole graph that showed if you had this shot number you would load this asset. It turned out to be a good way to deal with that whole final battle with the *Narada*. And actually we kind of ended up using that system for a lot of the films after that."

As Abrams was working on the edit of the movie, he decided to start with a massive closeup of the *Kelvin*, with the camera completing a complicated 720 degree roll as it passes over the surface of the ship. As Jaeger says this meant that ILM had to build the *Kelvin* in much more detail than they might have expected. "The very first shot of the film sort of played right up to the window of the *Kelvin*, so we had to 'plush' that out, so we could go closer than we would even with most physical models."



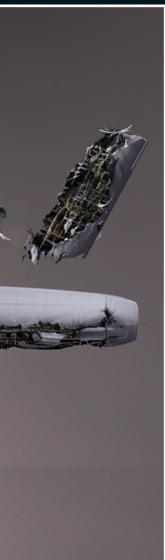


When Church saw what ILM had done with his design, he was delighted. "I was afraid the *Kelvin* configuration would look too wimpy in the film but when it was detailed out JJ shot it in such a way that it looks great, I could tell even by the early animatics that it was looking sleek and heroic in its own way and really an underdog in that sequence at the beginning of the film." He was also pleased with the way it harkened back to earlier *STAR TREK*'s while also doing something new. "I would say that the look of the final product is 90% *STAR*

TREK THE MOTION PICTURE and 10% harder and more militaristic. It also helps that, because it appears in the opening sequence, it's conservative design allowed JJ to ease the audience in to his new vision of *Trek*, to concentrate on the storytelling first off and then let the *Enterprise* reveal to be that much more impressive."

In short, the *Kelvin* had accomplished its mission: it reminded us of *STAR TREK*'s past, while ushering in new era that took us all in a bold new direction.

▲ In a departure for *STAR TREK*, Abrams asked for the *Kelvin*'s phaser emitters to be small turrets that popped up out of the hull. Other hatches on the hull were used to fire projectiles.



◀ One of the major innovations in the movie involved the way ILM showed and controlled the damage the *Kelvin* took in its battle with the *Narada*. After they chose where the damage would take place and what it would look like, they modelled a series of sections that could be switched out with the pristine versions as required. A series of tags allowed them to keep track of what damage was needed at each stage of the battle.



◀ Long after he had finished his work on the ship, Ryan Church revisited the *Kelvin* to design these *Kelvin*-inspired salt and pepper shakers that were used in the bar in Iowa. If you look carefully, you can see the holes for the shakers and the 'S' and the 'P' that show which parts are which.

STAR TREK™

