

EAGLEMOSS  
COLLECTIONS

# STAR TREK™

THE OFFICIAL STARSHIPS COLLECTION



U.S.S. RELIANT  
**NCC-1864**  
SPECIAL ISSUE

MIRANDA CLASS

LENGTH: 233M

DECKS: 11

CAPTAIN: CLARK TERRELL

U.S.S. RELIANT

NCC-1864

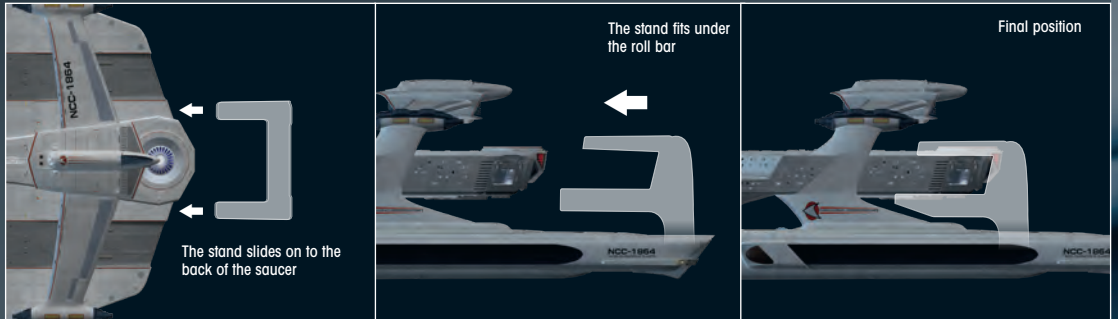
# Contents

P04: SECOND CHANCE: MAKING STAR TREK II

P14: MAKING CETI EELS

P16: THE CG EFFECT

## Stand assembly:



SHOP ONLINE

There's more to us than you might think!

Order **XL Starships**, **bonus editions**, **binders** to safely store your magazines **and much more!**



shop.eagleboss.com

## EAGLEMOSS COLLECTIONS

Eagleboss Ltd. 2018  
1st Floor, Kensington Village, Avonmore Road, W14 8TS, London, UK. All rights reserved.

™ & © 2018 CBS Studios Inc. © 2018 Paramount Pictures Corp. STAR TREK and related marks and logos are trademarks of CBS Studios Inc. All Rights Reserved.

STAR TREK – The Official Starships Collection is published fortnightly.

**DON'T MISS AN ISSUE:** place a regular order with your magazine retailer.

**SUBSCRIBE** and receive exclusive free gifts – [www.startrek-starships.com](http://www.startrek-starships.com)  
Call 0344 493 6091

Post the subscription form included with issues 1 to 5

### BACK ISSUES

To order back issues: Order online at [www.startrek-starships.com](http://www.startrek-starships.com) or call 0344 493 6091

UK distributor: COMAG Magazine Marketing

**CUSTOMER SERVICES:**  
[www.startrek-starships.com](http://www.startrek-starships.com)

UK: 0344 493 6091  
[startrek-ship@eagleboss-service.com](mailto:startrek-ship@eagleboss-service.com)

**Australia:** (03) 9872 4000  
[bissett@bissettmags.com.au](mailto:bissett@bissettmags.com.au)

**New Zealand:** (09) 308 2871  
Fax: (09) 302 7661  
[subs@ndc.co.nz](mailto:subs@ndc.co.nz)

**South Africa:** (011) 265 4307  
[service@jacklin.co.za](mailto:service@jacklin.co.za)

**Malaysia:** (03) 8020 7112  
[sales@allscript.com](mailto:sales@allscript.com)

**Singapore:** (65) 6287 7090  
[sales@allscript.com](mailto:sales@allscript.com)

**OVERSEAS BACK ISSUES**  
Place your order with your local magazine retailer.

Recommended age 14+.  
Warning! Collectable models.  
Not designed or intended for play by children.  
Do not dispose of in domestic waste.



Find us on **Facebook**

Join us online for competitions, updates and more!

[www.startrek-starships.com](http://www.startrek-starships.com)

# *U.S.S. RELIANT* NCC-1864

## SPECIFICATION



FIRST APPEARS: STAR TREK II: THE WRATH OF KHAN

CLASS: MIRANDA

LAST SEEN: STAR TREK II: THE WRATH OF KHAN

DESIGNED BY: MIKE MINOR AND JOE JENNINGS

CAPTAINS: CLARK TERRELL





# SECOND CHANCE

After a rocky start, *STAR TREK* was ready to make its second trip to the big screen, and this time it would have to get everything right.

▲ The story for *STAR TREK II* forced Kirk to deal with the consequences of his actions in the original series. It was a direct sequel to the episode 'Space Seed' and pitted Kirk against the genetically-engineered Khan Noonien Singh for a second time.

The first *STAR TREK* film left Paramount Studios with a dilemma: it had been the highest grossing film of 1979 and the opening weekend had broken box office records, but it had cost a fortune to make and the production had been plagued with difficulties. The critics hadn't liked it either. So it was far from certain that there would ever be another *STAR TREK* movie.

Charlie Bluhdorn, the chairman of Gulf+Western, the company that owned Paramount Studios, began floating the idea of a sequel in early 1980.

His executives, Michael Eisner and Jeffery Katzenberg were less than keen, but Bluhdorn insisted, so it was agreed that the second *STAR TREK* would be a TV movie and made for significantly less money than its predecessor.

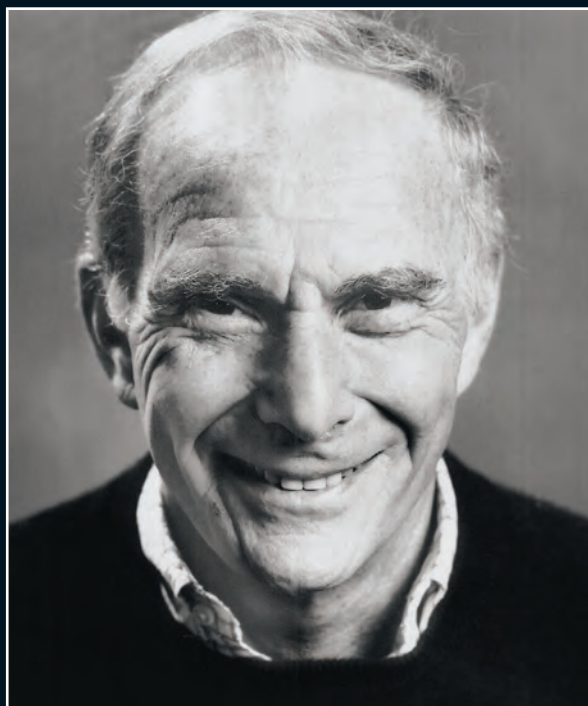
Roddenberry wasted no time in penning a story that featured Klingons and the time-travelling portal, the Guardian of Forever, which had been introduced in the original series episode 'City On The Edge Of Forever.' In his story the Klingons kill John F. Kennedy, which leads to a corruption of

the timeline, which Captain Kirk and the crew of the *Enterprise* must fix.

However, Roddenberry had overlooked the fact that the studio held him responsible for many of the previous production's problems, not least his constant script revisions, some of which had happened while actors were standing on set, and the budget, which had spiraled to \$45 million dollars, making the film one of the most expensive in history. Roddenberry was therefore informed that, although he would still receive an executive producer credit, he was being relieved of any hands on involvement with the project.

### NEW LEADERSHIP

With Roddenberry gone, Bluhdorn and senior executives Barry Diller and Michael Eisner arranged a meeting with TV producer Harve Bennett. Bennett had previously worked at Columbia Pictures TV and was only a few weeks into his contract with Paramount's television production division. During that meeting, Bennett was asked what he thought of *The Motion Picture*. His response was that he had found it "boring." Bluhdorn then wanted to know if Bennett felt he could make a better film for less than \$45 million. When Bennett answered that he could make five



◀ Harve Bennett was a veteran TV producer who had worked on *The Mod Squad* and *The Six Million Dollar Man*. He was determined to make a movie that felt both like a cinematic event and the original series.

good movies for that kind of that money, he was hired. Around this point, it was agreed that the movie might actually get a theatrical release.

As Roddenberry's story idea had been rejected, it was up to Bennett to find and develop a script, which could be filmed on a budget of \$8.5 million. Having never actually seen a single episode of the TV series, he set about bringing himself up to



◀ Bennett began his work by watching every episode of the original *STAR TREK*. He was struck by the episode 'Space Seed', which had a strong villain played by Ricardo Montalban – a powerful and underrated actor who could be available to star in a modestly-budgeted movie.

► Bennett saw the triumvirate of Kirk, Spock and McCoy as an essential part of STAR TREK's appeal. He had to work hard to persuade DeForrest Kelley to return as McCoy, promising him that McCoy's role would be essential. Leonard Nimoy only agreed to return when it was suggested that Spock could die.



speed by commandeering a projection room on the studio lot and screening all three seasons back to back, while making copious notes. He came to two conclusions – that the grandiose style of *TMP* did not accurately reflect the spirit and intention of the TV series, and that *TMP*'s greatest weakness lay in the absence of an obvious villain.

Bennett found himself particularly drawn to the second season episode 'Space Seed.' In the story the genetically-engineered Khan Noonien Singh had attempted to hijack the *Enterprise* before eventually being overpowered by Kirk and his crew, who then left Khan and his followers on an uninhabited planet.

Bennett thought that Khan, as played by Ricardo Montalban, possessed the qualities needed to make a big movie villain and that the question of what had happened to Khan and his people in the years following Kirk's decision lent itself to a sequel. At the same time, Bennett also wanted Kirk and his crew to deal with the issues of aging and their own mortality.

By November 1980 Bennett had written a one-page story outline entitled 'The War Of The Generations', which had Kirk and the crew of the *Enterprise* investigating a rebel uprising on a distant planet that was apparently masterminded

by Khan – only for Kirk to discover that the rebel leader is none other than his own son. Kirk and son then join forces against Khan in order to vanquish the threat. Meanwhile, McCoy is preoccupied with his attraction to a much younger woman. Bennett's story outline made no mention of Vulcan First Officer, Spock. Before he started work on the idea, Leonard Nimoy had made it clear that he had no interest in the studio's plans to make a low budget TV movie and declined to be involved.

#### GETTING UNDERWAY

Bennett hired screenwriter Jack B. Soward to turn his one-page outline into a script. An avid fan of *STAR TREK*, Soward had previously worked on the TV series *Bonanza* and *The Streets of San Francisco*. While Soward got to work expanding Bennett's outline, Bennett began assembling other key members of his production, including commercials director Robert Sallin, and art director Michael Minor who had worked on *TMP*. While Sallin took on the duties of line producer with the aim of keeping the film firmly within budget, Minor's job was to start thinking about the look of the film.

Right from the outset, Soward and Bennett were keen to include the character of Spock in some capacity. To overcome Nimoy's concerns, Soward

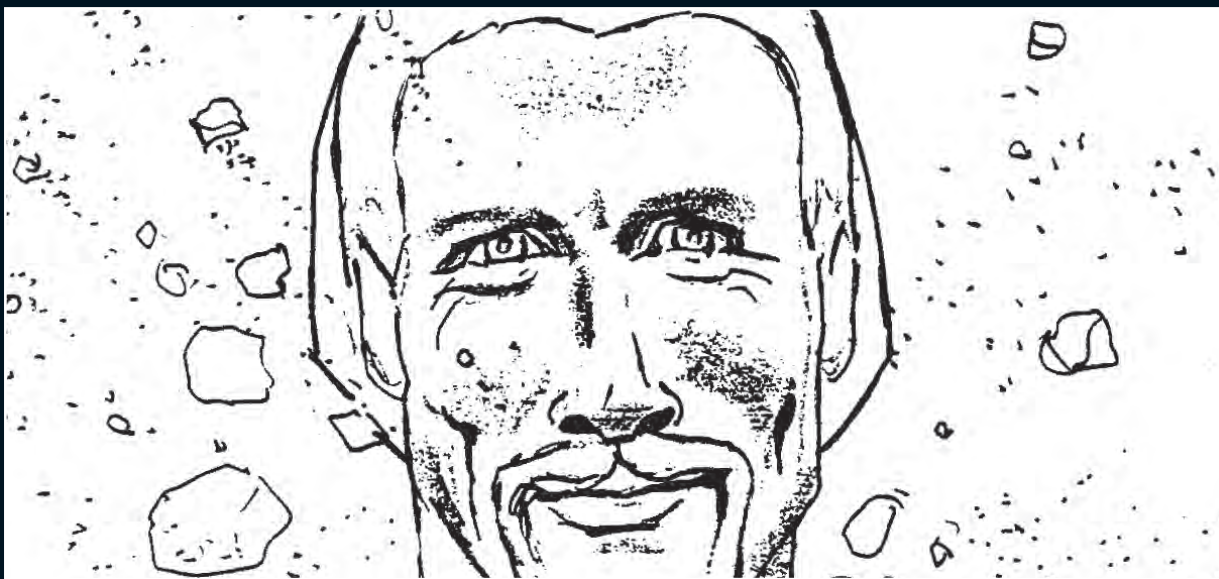
hit on the idea of having Spock die early on in the film. Bennett immediately embraced the idea, believing it would give Spock's death the same shock value as Janet Leigh's death in *Psycho*. He also guessed that it would be too great an opportunity for Nimoy to pass up. Bennett's instincts proved correct when, attracted by the idea of his character finally meeting his end, Nimoy agreed to come on board.

Soward got down to work first expanding Bennett's outline into a nineteen-page treatment and then into a first draft script. Along with the regular crew, were a number of supporting characters: Kirk's ex-lover, Diane, who was also the mother of his son; a Vulcan science officer called Mr Wicks, who would act as an eventual replacement for the deceased Spock; another of Kirk's old flames, Dr. Janet Wallace from the episode 'The Deadly Years'; and Khan's wife and former Starfleet officer, Marla McGivers.

In Soward's outline, Kirk encounters Diana after she is found on a refugee ship from Omega Minor IV where a rebellion is in progress. Kirk later discovers that Diana gave birth to his son. Soward's first draft script, now entitled '*STAR TREK - The Omega System*,' also focused on the Federation's decision to test the newest and most deadly addition to its arsenal - the Omega system. While on a mission to do exactly that, Captain Clarke Terrell and his first officer, Pavel Chekov of the *U.S.S. Reliant*, land on what is considered to be a desolate planet, only to encounter Khan, his wife Marla McGivers and what is left of Khan's



◀ Bennett and Soward's early story ideas involved two other characters from the original series: Dr. Janet Wallace, who would eventually morph into Dr. Carol Marcus, and Khan's wife Marla McGivers who was dropped because the actress who was to play her was suffering from multiple sclerosis.



◀ Bennett was unconvinced by Soward's version of the story and asked veteran *STAR TREK* writer Samuel A. Peibles to take a pass. He replaced Khan with an alien called Sojin and created a host of new characters.



people. Hearing that the weapon is to be used against the Klingons, Khan takes control of the *Reliant* and the Omega System. This leads to the Omega System's creator, Janet Wallace, summoning assistance from the *Enterprise*. On the approach to the planet, the *Enterprise* suffers major damage to its engines, leading to Spock sacrificing his life to repair them. This allows Kirk to continue fighting off the threat from Khan and the *Reliant*.

### REBIRTH AND DESTRUCTION

A copy of Soward's draft script was leaked and ended up in the hands of fans who wasted no time voicing their displeasure at the decision to kill off Spock in the first third of the film. At the same time, Bennett was not wholly convinced by Soward's Omega System, which he felt was nothing more than a simple weapon and didn't feel like the kind of thing the Federation would create. But neither he nor Soward could come up with an alternative. After a number of story conferences and discussions, it was art director Minor who finally provided the answer. He suggested that the device could be a terraforming tool capable of bringing life to desolate planets. However, in the wrong hands, it could be used as a powerful weapon of destruction. Bennett loved the idea and Soward pushed ahead with his second draft now titled '*STAR TREK - The Genesis Project*'. It contained a number of changes - Mr Wicks became Captain Spock's first officer, Dr Savik; Janet Wallace became Carol Baxter; and Spock's death occurred deep into the story rather than near the start.

Despite these changes, Bennett was dissatisfied with Soward's script, feeling it lacked the necessary ingredients of what Bennett felt should be an epic movie. Bennett hired *STAR TREK* alums Samuel A. Peeples and Theodore Sturgeon to come up with alternatives. Peeples quickly wrote a story outline called '*Worlds That Never Were*' followed by a script draft called, '*The New STAR TREK*.' In it Khan is replaced by Sojin and Moray,

◀ The character of Savik appears from early on in the story development. The original idea was that she would be Spock's daughter, who had been sent to the Federation by her mother the Romulan Commander from the episode '*The Enterprise Incident*.' This element was dropped in Nicholas Meyer's rewrite.



two powerful beings from another dimension, who take control of the *Reliant*, along with Captain Sulu, First Officer Chekov and the Genesis device. In the process they come close to destroying the Earth.

Meanwhile, on board the *Enterprise* Spock hides the fact that the now female, half-Romulan, half-Vulcan Savik is his daughter. Savik and Kirk ponder the Kobayashi Maru test while Kirk meets David, the son he did not know existed, and battles Sojin and Moray, losing both Carol and Spock in the process. Bennett's view of Peebles' work was that it was too much like an episode of *TOS* and that too many aspects of the story were derivative.

#### NEARLY OUT OF TIME

Bennett was aware that they were running out of time. Minor and Sallin had started storyboarding, while the deadline for work to begin on visual effects was looming. If work did not begin soon, the necessary effects could not be done in time to meet the film's release date. Nicholas Meyer had been hired to direct. Meyer was fresh from the success of his previous film, *Time After Time*, and had earned an Oscar nomination for his screenplay for *The Seven-Per-Cent Solution*. With the scheduled start of production a matter of weeks away, Meyer had no script to work from. After speaking with Bennett, he received a copy of Peebles' script. Meyer agreed with Bennett's



◀ Originally, Nicholas Meyer was only going to direct *STAR TREK II*, but when it became clear that the script wasn't going to be ready, he agreed to take a pass at it. He was already a well-regarded novelist and screenwriter who had won an Oscar nomination for his script for *The Seven-Per-Cent Solution*. What he produced is widely regarded as the best of all *STAR TREK* films.

opinion that the script was indeed unfilmable, and arranged a meeting with Sallin and Bennett, requesting they bring all the different versions of the script with them. Over the course of the meeting the three men made lists of the various lines of dialogue, characters, scenes and subplots that worked and the ones that did not. In order to make sure that there would be a film to direct, Meyer agreed to write a new script that would incorporate all the best elements of the work that had been done so far. According to Meyer, he knew next to nothing about *STAR TREK*. His main aim was to inject a sense of humor and to bring a

▼ Meyer was responsible for casting Bibi Besch as Carol Marcus (far left), who he felt was an equal for Kirk; Merritt Butrick as David Marcus (center), who he felt looked as if he could be Kirk's son; and Paul Winfield as Terrell (right) because he admired his work in the film 'Sounder.'



truth to the project, which would resonate with a 20th century audience. Meyer also embraced Gene Roddenberry's original idea of *STAR TREK* being an outer space version of C.S Forrester's series of nautical novels, *Captain Horatio Hornblower*.

### MOVING FORWARD

In twelve days, against all odds, Meyer had completed a draft of the script and the production was ready to move onto the next stage – casting.

Ricardo Montalban was already on board to reprise his role as Khan. However, Madlyn Rhue, who had played Khan's wife, Marla McGivers had contracted multiple sclerosis and was now confined to a wheelchair. In Soward's second draft script, it was established that the character had contracted an incurable disease and died. It was, however, up to Meyer to cast the roles of Carol Marcus, Kirk's son David Marcus, Captain Terrell and of course Saavik.

For Carol Marcus, Meyer wanted woman who was good looking enough to have caught Kirk's attention and obviously intelligent enough to have created the Genesis device. TV and film actress Bibi Besch fitted the bill. In fact, Meyer was so impressed with her portrayal of the character that he would go on to cast her in his next project, TV movie, *The Day After*.

Similarly it was Meyer's desire to work with Paul

Winfield after being impressed with his performance in the acclaimed 1972 film *Sounder* that led to him being cast in the role of Captain Terrell. When it came to Merritt Butrick, Meyer was swayed by the fact that with his blond, curly hair, on a physical level Butrick could genuinely pass for Kirk and Carol's son.

Casting the role of Saavik was a bigger challenge. After auditioning a number of young actresses, including Kim Cattrall, who would later appear in Meyer's final film of the franchise, *The Undiscovered Country*. Meyer eventually settled on Kirsty Alley, a self-professed *STAR TREK* fan who avidly studied Nimoy's portrayal of Spock and used it as the basis of her portrayal of Saavik.

When it came to the sets for the *U.S.S. Enterprise*, designer Joseph Jennings discovered that the studio had expected them to simply reuse those from *TMP*, which had been left standing after that movie had wrapped. Although Meyer felt the design of the sets looked too grey and cold and furthermore made no logical sense, time and budgetary constraints meant Jennings was confined to using lighting to make the sets look warmer as well as using a moveable panel of blinking lights to break up all the grey.

The *Enterprise* bridge also did double duty as the bridge of the *Reliant*. It was the same with new sets such as the torpedo room, which was a redressed version of the Klingon bridge from *TMP*. Ship miniatures were also reused as was the orbital

► Meyer had nothing but praise for Ricardo Montalban who he considered to be criminally underused as a result of his Hispanic background. However, on the first day of shooting, he asked him to always hold something back, giving the audience the sense that they had never seen his full fury.





◀ The *U.S.S. Reliant* was designed to look as different as possible to the *Enterprise*, while clearly being a Starfleet vessel. The same set was used for the bridge of both ships.

office complex, which was turned upside down and redecorated to become the Regula I space station. Meanwhile, sets, bulkheads and railings from the cancelled *STAR TREK Phase II* TV series were pulled apart and rebuilt. Jennings did create new sets for Starfleet headquarters and Kirk's apartment, which featured a variety of nautical themed antiques, together with a fireplace, fitting in with Kirk's desire for a cosy home, and his interest in history.

### NEW UNIFORMS

Although Sallin had been determined they should have new uniforms in order to stay within budgets, jumpsuit uniforms from the *TMP* were dyed and assigned to fleet cadets and enlisted crew, while designer Robert Fletcher worked with Meyer to come up with new uniforms for senior officers using what was left of the old uniforms. Dye tests showed the material reacted well to blood-red. Several designs were then considered, some featuring a high stiff black collar, before Fletcher and Meyer settled on blood red jackets and trousers against a white turtleneck and featuring an insignia on the shoulder. In contrast, Meyer wanted Khan's people to look as if they had cobbled their outfits together from old life support suits, rags, upholstery and wiring. In fact whatever happened to be available, in order to adequately demonstrate how tough life had been for them since Kirk's decision to maroon them.

Principle photography took place between

November 9, 1981 and January 9, 1982. Meyer and his camera department used a number of tricks to make the sets look larger and more expensive, while corridor pieces were wheeled in and out of shot to give the illusion of the turbolift moving between floors. Props such as phasers and communicators were reused from *TMP*. The desolate sand-blown surface of Khan's planet, Ceti Alpha V was recreated on a sound stage



◀ Everyone was keen to redesign the costumes. Meyer asked Robert Fletcher to develop something that was inspired by the 19th century British navy. The uniforms were made red at least in part so that the comparison wouldn't be too obvious.

► *THE WRATH OF KHAN* was the first *STAR TREK* film that ILM worked on. (They hadn't even existed when *TMP* was made.) They reused the existing models, but created separate sections that could be used to show damage being inflicted on the ships.



using tons of colored sand and a number of industrial fans.

Meyer tried to keep Spock's death as closely guarded as possible, and during filming visitors were banned from the sets. However, fans alerted by the leaked script wrote numerous letters in protest, trade press ads were taken out in an effort to reverse the decision, and Nimoy was subjected to death threats. Early test audiences also reacted badly to the death, which they labeled dark and depressing, prompting Bennett to ignore Meyer's objections and add a scene showing Spock's casket on the Genesis planet along with an uplifting monologue.

Visual effects were provided by Industrial Light and Magic (ILM) along with models of the Regula planetoid and the *Reliant*. ILM were under strict

instructions to make the *Reliant* look as different to the *Enterprise* as possible to ensure that the audience couldn't mistake one ship for the other and to come up with a way to show the *Enterprise* and *Reliant* shooting chunks out of each other without actually damaging the models themselves. To achieve this ILM built separate damaged pieces of both ships out of aluminum with damaged areas that could be pulled off when necessary.

When it came to construction of the Mutara Nebula, the effect of the swirling phenomenon was achieved by injecting a latex and ammonia mixture into a water-filled tank which was then lit using a number of colored gels. Small models of the ships were then used to recreate the battle scene within the nebula, as they were easier to

► The Mutara Nebula was created by filming a tank that had a plastic material injected into it. This could be stirred by the team at ILM to create interesting patterns. A series of lights were used to give it color. The ships were added later using motion control photography.





◀ Meyer planned the whole film to lead up to Spock's death. He remembers that filming was an emotional experience and he saw the camera operator tear up.

maneuver around than the larger models.

The team also built models of the Ceti eels, used by Khan to control the thoughts and actions of Captain Terrell and Chekov. Additional effects such as phaser beams, the *Enterprise* reactor and transporters were provided by Visual Concept Engineering, who had also provided effects for *The Empire Strikes Back*.

The tight budget made it impossible for Meyer to hire either Jerry Goldsmith, who had composed the music for *TMP*, or Miklos Rosza, who had worked on Meyer's *Time After Time*, and Meyer's other suggestion, Jonathan Morgan, was deemed to be too inexperienced. Paramount vice-president of music, Joel Still suggested a young composer called James Horner. Meyer, a classical music fan, had two requests: Horner was to avoid

using music from *TMP* and that his compositions should have a nautical feel.

The movie opened on June 4, 1982 making \$14,347,221 in its first weekend and breaking the record for the fastest opening gross in history. It garnered praise from a variety of quarters with the Entertainment Weekly dubbing it 'the film that saved *STAR TREK*.' Montalban's portrayal of Khan also came in for special praise. The film eventually grossed \$97,000,000 worldwide making it more profitable than its predecessor. It also went on to win two Saturn Awards, was nominated for a Hugo Award, and spawned a further four direct sequels. It firmly established *STAR TREK* as a movie franchise, and ensured that the series was successful enough to return to TV – meaning that it is, perhaps, the most important of all *STAR TREK* films.



◀ The film ends with Kirk feeling renewed. This time the studio was delighted with their *STAR TREK* film and they greenlit a sequel before the movie was even released.

CETI EEL  
#11



# MAKING CETI EELS

*The Ceti eels that Khan uses to control Chekov were a low-tech effect, and involved creating a surprisingly large model of Chekov's ear.*

► Ken Ralston had plenty of experience creating alien creatures in ILM's model shop. He came up with the design for the Ceti eels, built them himself and operated the puppets when they filmed the sequence.

The eels and their mother were designed, built and operated by Ken Ralston at ILM. Ralston sketched up a dozen or so alternative designs for the mother, with the producers choosing design number 11. He then sculpted the creature in clay before casting a foam version, which he glued a hard outer shell (made from Bondo) on to. This was a life-size puppet that was controlled from underneath. The jaws were actually operated by a tea strainer

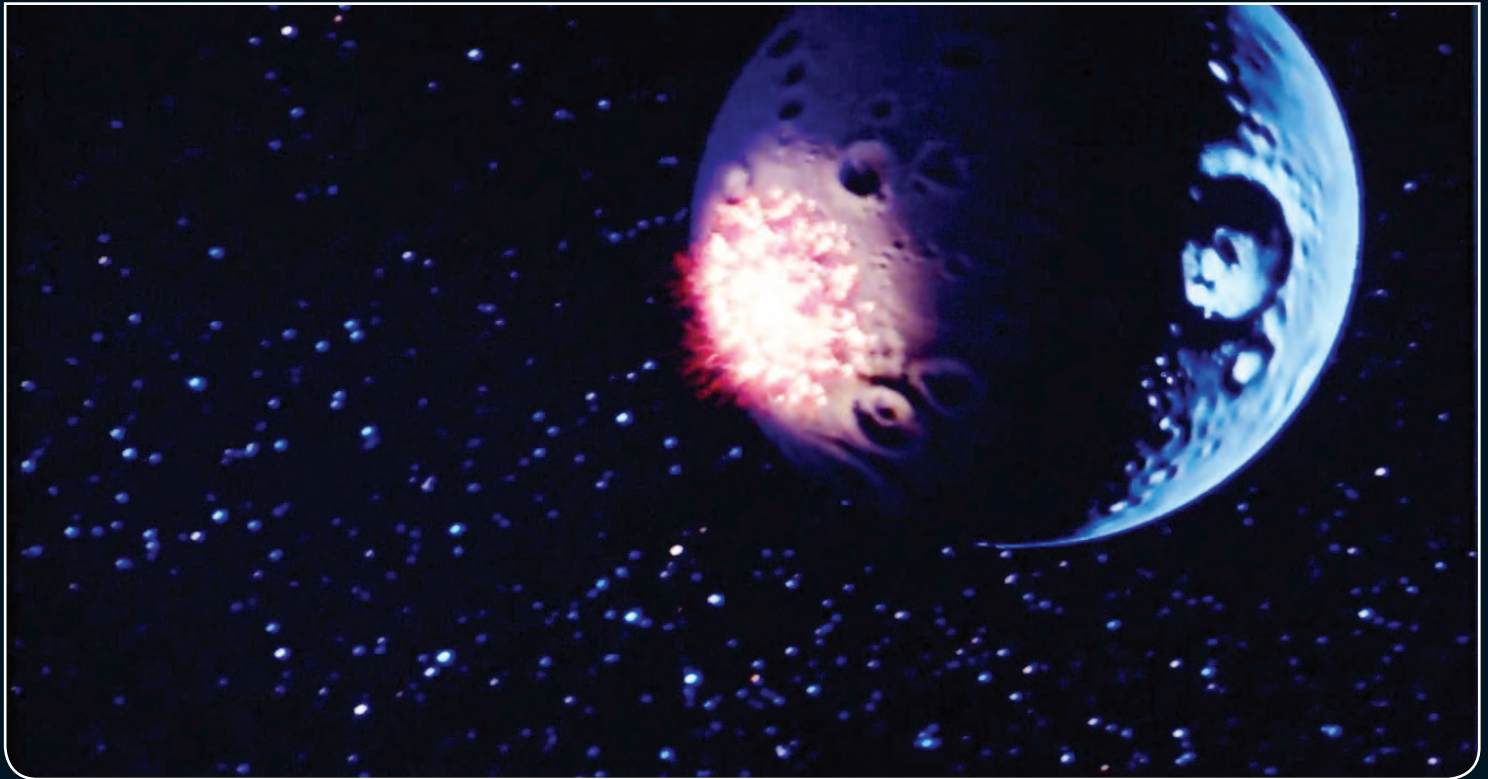
and the tongue was made of wire which Ralston literally pushed in and out of the shot. The tail was moved by a rod.

The sequence where Khan removes the slug-like larvae from the creature's body was shot at ILM with the puppet being controlled from underneath the glass container. The baby eels were simply little off-cuts of foam that Ralston shaped with fingernail scissors. They were dipped in a thick, slimy material and pulled across the actor's face with fishing wire. Fortunately, the slime acted like a glue, making them move unevenly, which made them look convincingly organic.

When it came to the larger eel that emerges from Chekov's ear, the team created a six-inch-long model of the eel and a giant foam model of the ear itself. This was used for a single close-up shot. For this Ralston pushed the puppet through the giant foam ear, while ILM's Ray Gilberti squirted fake blood in at the appropriate moment.







# THE CG EFFECT

The Genesis demo has an important place in history: it was the first fully CG sequence ever made for a movie, and would give birth to Pixar.

▲ Even in the movie, the sequence showing the Genesis effect was meant to be a computer simulation, so it didn't have to be completely photorealistic. The team that created it out set out to make sure it did several things that would have been impossible using traditional techniques.

The demo for the Genesis effect that Kirk, Spock and McCoy watch was the first completely computer-generated effect to feature in a major movie. It was made by ILM's computer graphics group, which would eventually morph into Pixar.

George Lucas had recruited a team of computer experts to work at ILM. He wanted them to work on digital techniques for editing, optical printing and audio synthesizing. According to the team's leader, Dr. Alvy Ray Smith, it didn't occur to him that they could also create computer graphics. Smith was keen to get Lucas's attention so when the producers of *STAR TREK II* asked ILM to use computers for the Genesis effect, he leapt at the chance.

"They wanted this effect that instantaneously turned dead matter into living matter. Their idea was that there would be an aquarium with a rock

floating in it and somehow things started to grow on this rock. I said, 'You guys know what you can and can't do with computer graphics?' And they said, 'No.' I said, 'Well, I do, so let me go home overnight and think about this, and I'll come back with a proposal for something we can actually execute.'"

At the time nobody had ever made a major effect in CG. There wasn't even any software to work with – Smith's team were literally writing it as they went. So the effect was created using techniques and routines that were still being invented. "I threw in everything that my guys could do," Smith recalled. "I'd just been working with Jim Blinn down at JPL, where he'd done the Voyager flyby movies, so I had that in my mind. Loren Carpenter had just joined us; his specialty was fractal mountains, so we put those in. Bill Reeves had just discovered these things called



particle systems, so we threw in some particle system fires. Tom Duff knew how to make craters, so we threw in craters, and so forth."

Smith drew up a series of storyboards and to his delight they were approved. He returned to his team and told them the good news. "I said, 'We've got this great break here. We've got a chance to be in the movies. We're going to do a 60-second piece that makes sense narratively, and it won't be gratuitous 3D graphics, but what I really want to do here is create a 60-second commercial for George Lucas so that he'll know what he's got.'

The main part of the sequence consists of several different elements. It begins with a shot of the dead planet in a starfield. The planet is a simple sphere, with craters made by a technique known as bump mapping, which was handled by Tom Duff. As Smith remembers, the stars themselves were rather more complicated than they actually needed to be. "The starfield wasn't just a random set of dots; it was a real starfield that Loren had got from Yale. It was an astronomical starbase, with actual correct star placement and star colors. Loren spent a long time flying around through this 3D database of stars. What he came up with was a star called Epsilon Indi. We put in all this detail to keep ourselves entertained; if you're spending six months working on it, you don't want to be bored."

Next, the Genesis Device strikes the planet, creating a shockwave. Then we cut to the surface of the planet for the flyby sequence. The original idea was that we would see volcanoes erupting as the Genesis wave spread. Tom Porter started work on a routine for this, but before he finished, Bill Reeves came up with an alternative approach. He suggested creating a wave of fire that was made up of thousands of particles.

"In 1981 particle systems

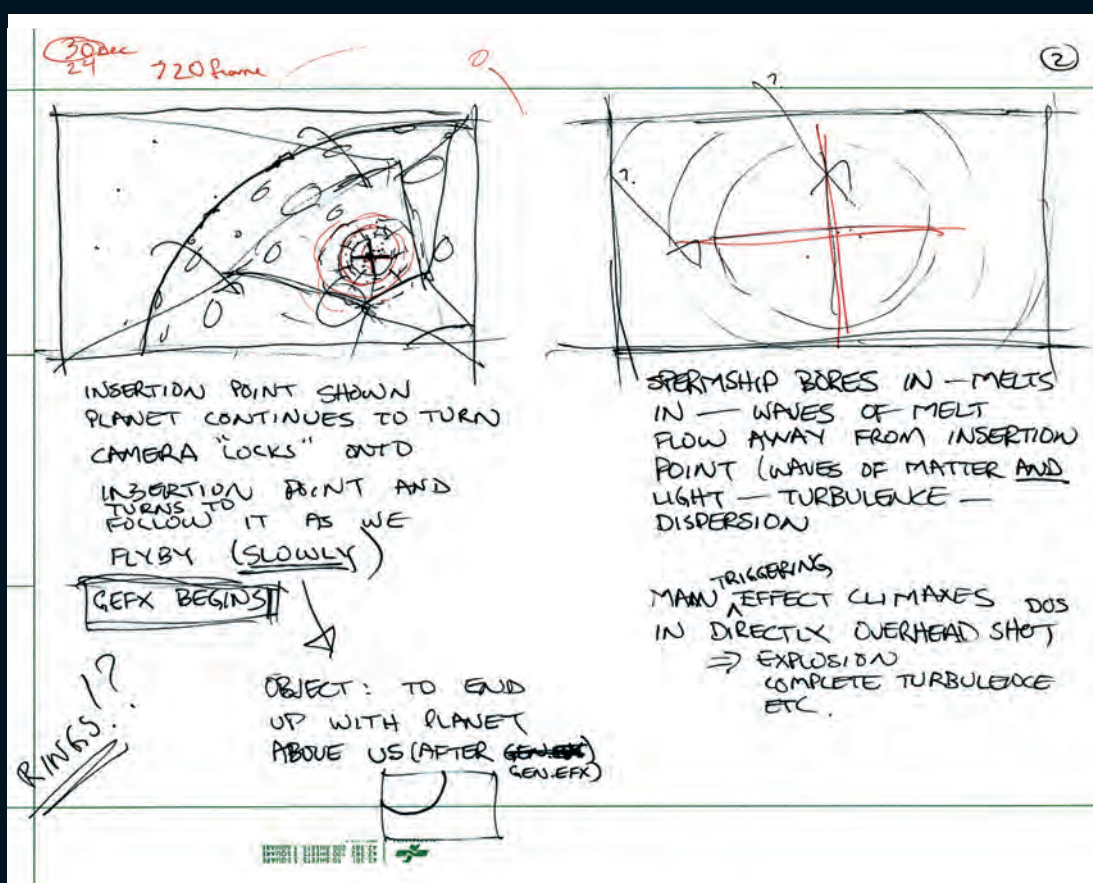
were a simple, powerful, new idea," Smith said.

"That sweeps over the planet, and there are texture changes on the surface. Then we cut into the growing fractal mountains. A lot of the impact of that scene comes from the increasing complexity of the way the mountains grow and the color changes that take effect. Then, as we pull away from the planet, which is now Earthlike, there are clouds and an atmosphere that have been added. They were painted by Chris Evans at ILM, using Tom Porter's paint program."

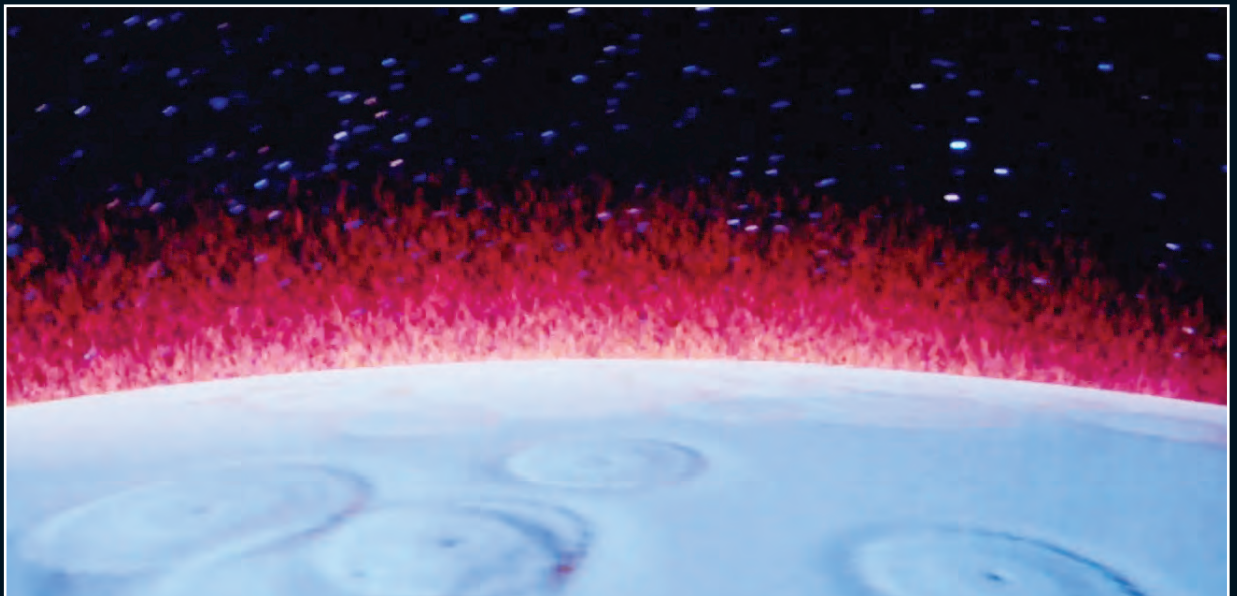
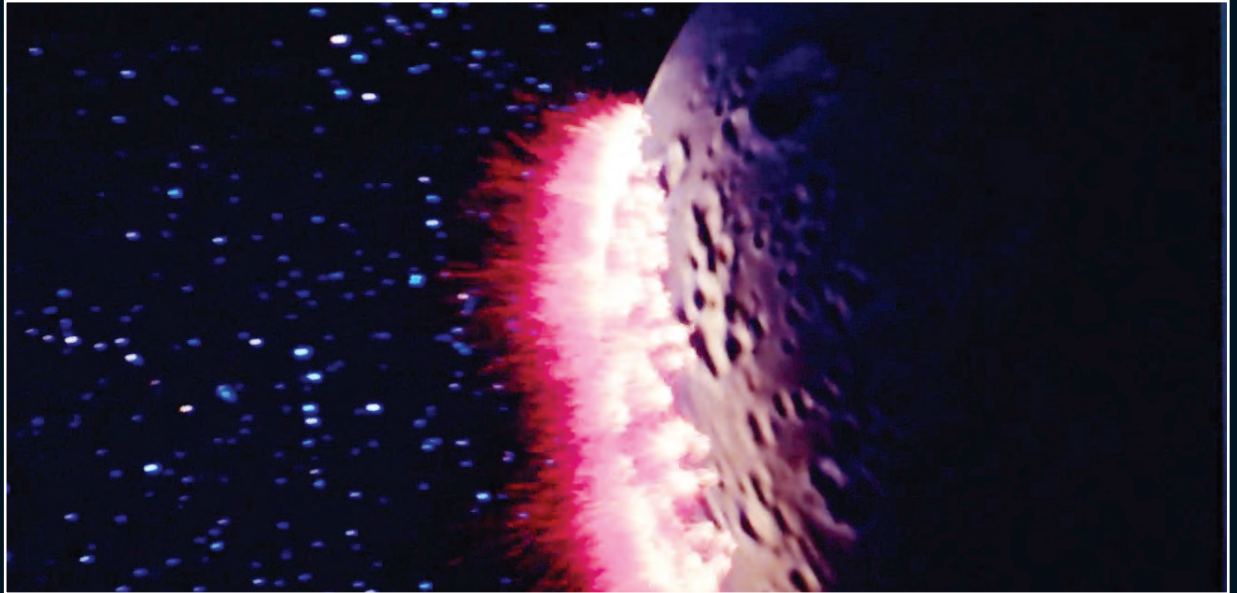
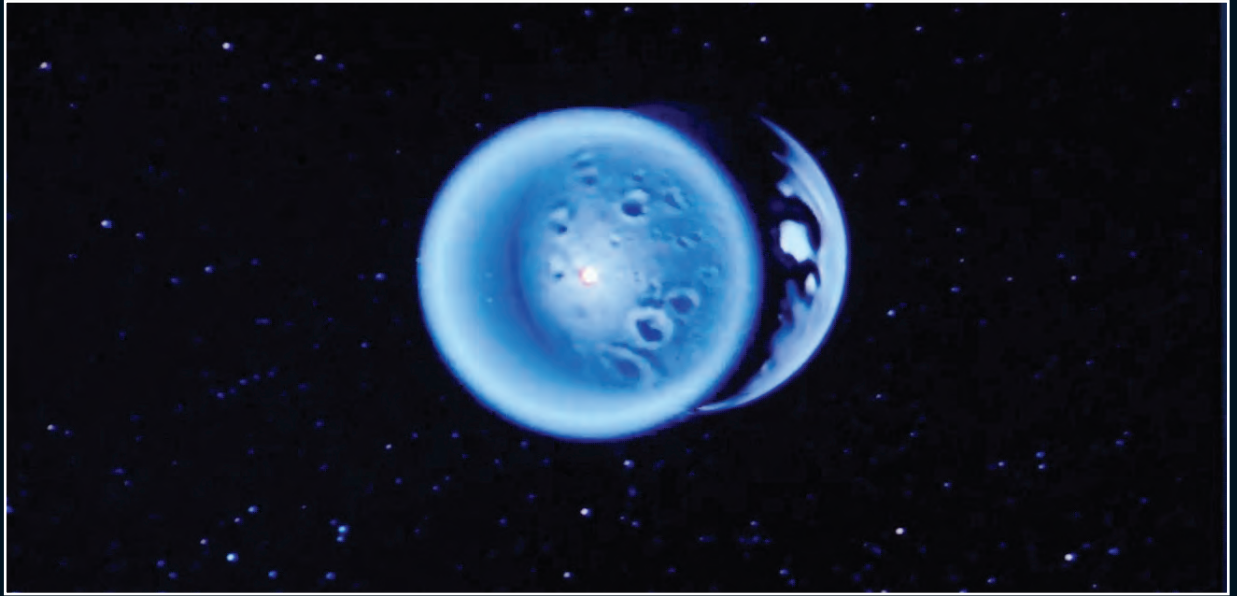
The earliest renders had some problems – there were moire patterns in the craters, some stars disappeared, the fire looked unconvincing, and the fractal mountains didn't always render properly – but these flaws were all ironed out in time for delivery.

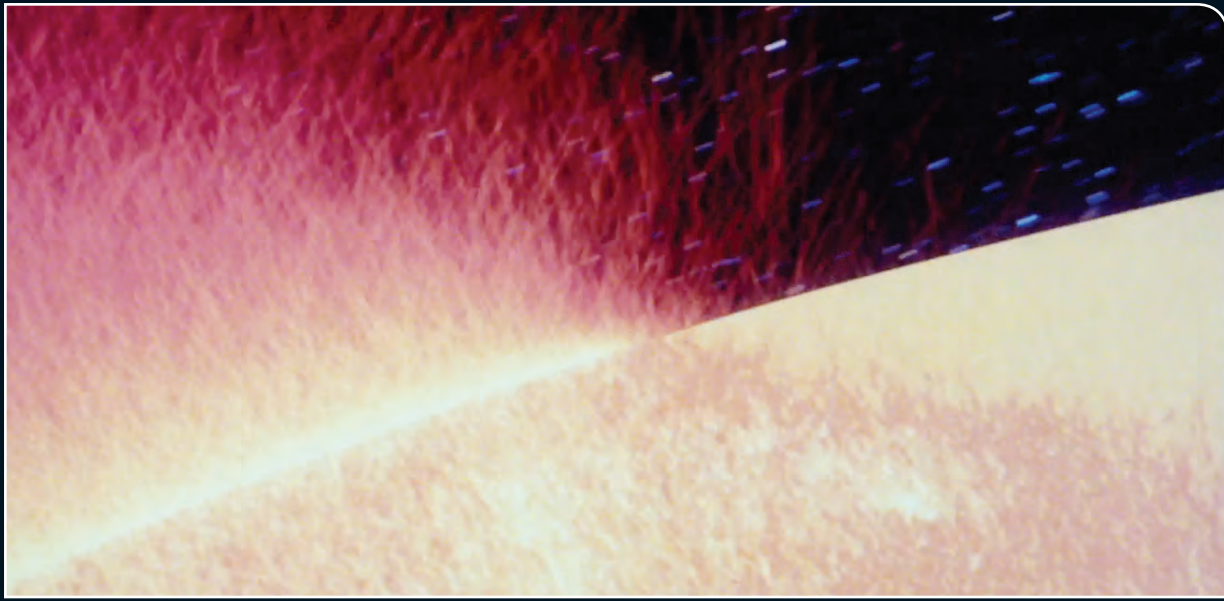
Smith has no doubt that the effect was the key that opened the door to the movies for his team, years before they founded Pixar. "This was our beginning on the big screen. It showed that you could actually use computer graphics in a real production that makes money. In the computer graphics community it was revolutionary; we were heroes of the first order."

◀ Dr. Alvy Ray Smith completely reinvented what was shown in the demo for the Genesis effect so that it took advantage of the different things that his team could produce. This is one of the original storyboards that he pitched to the STAR TREK team.



► The Genesis demo was a completely computer generated effect that shows a planet being transformed. It features a continuous shot that could only be created using cutting edge CG techniques that are commonplace today.





# STAR TREK™

