



STARLOG

ORIGINAL STUDIO SFX BLUEPRINTS!

CREATING THE SOUND OF SUPERMAN!

# SPECTACULAR

DGS £2.95 U.K. #4  
MARCH 1992 K47936

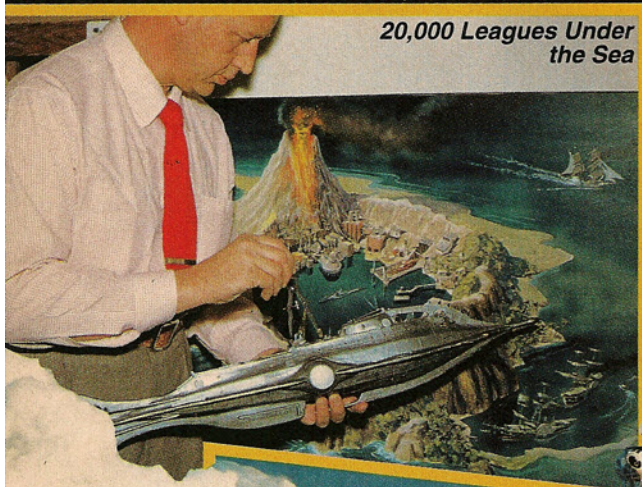
## FANTASTIC SHIPS OF THE GALAXY



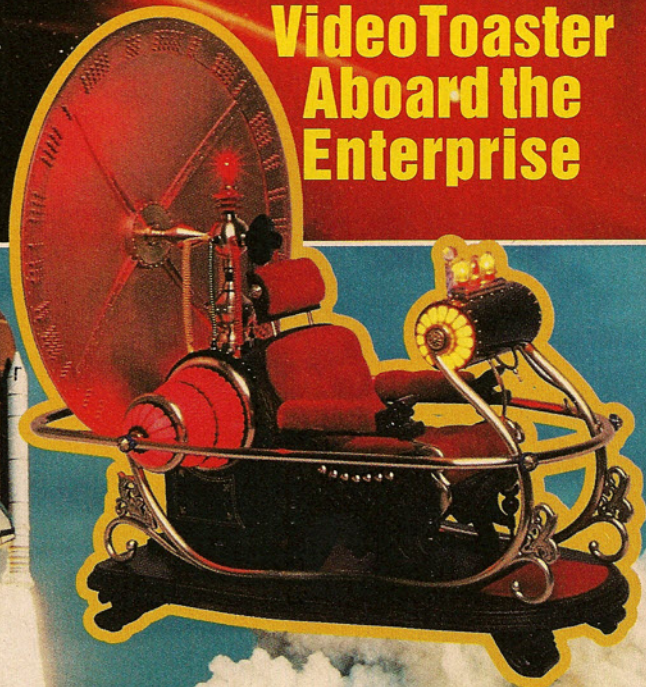
**Fantasia Becomes Fantastic Again**

**NewTek's VideoToaster Aboard the Enterprise**

**—IN SPACE!  
UNDERSEA! THRU TIME!**



20,000 Leagues Under the Sea



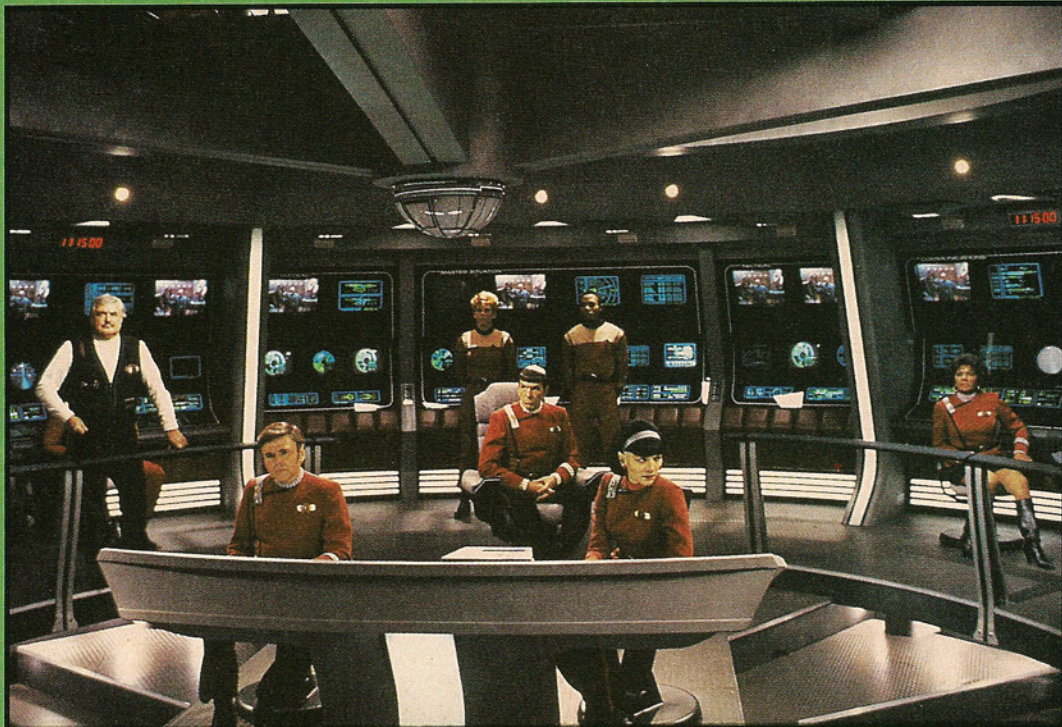
**George Pal's ClassicTimeMachine  
The Nautilus, Jules Verne's Dream**

**Visit  
Star Tours  
Japan**

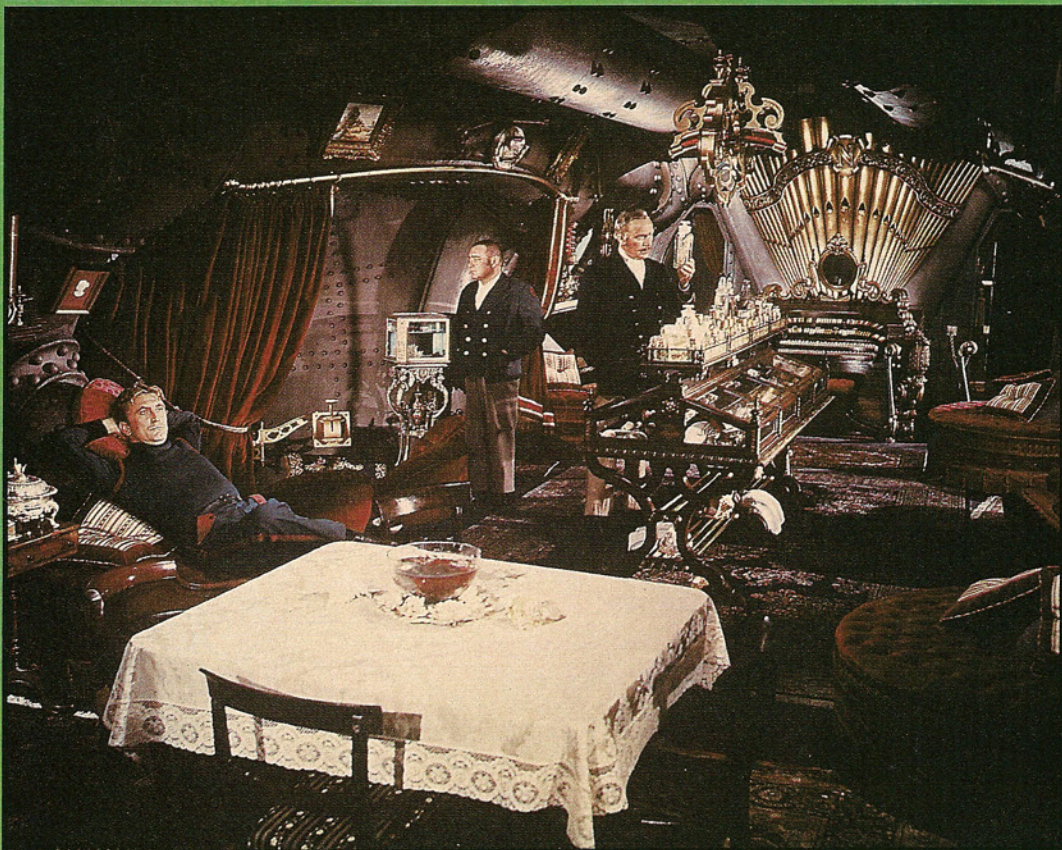
\$4.95 U.S./\$5.95 CANADA



# SHIPS OF THE GALAXY:



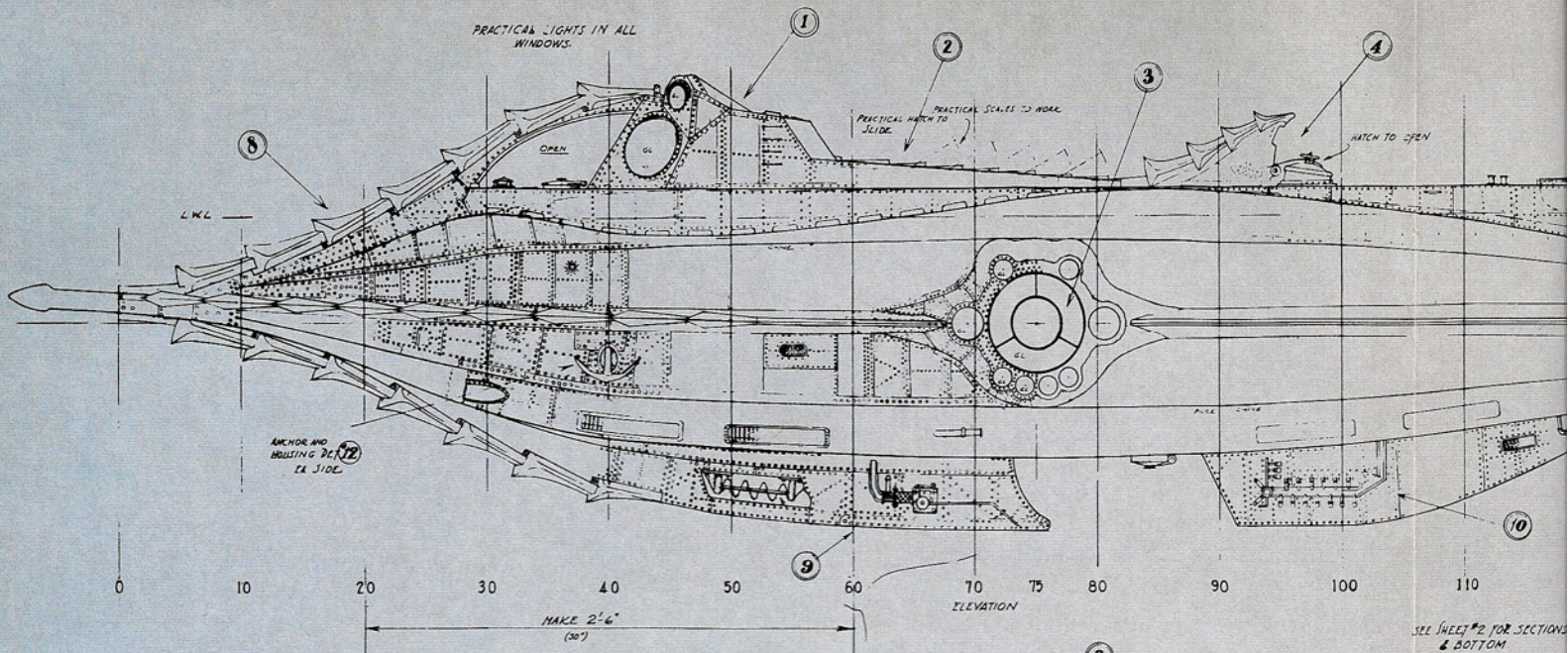
## ENTERPRISE



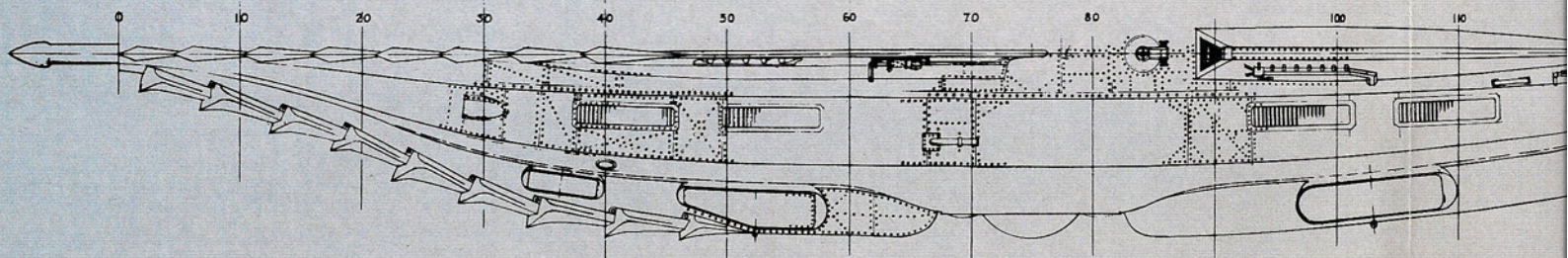
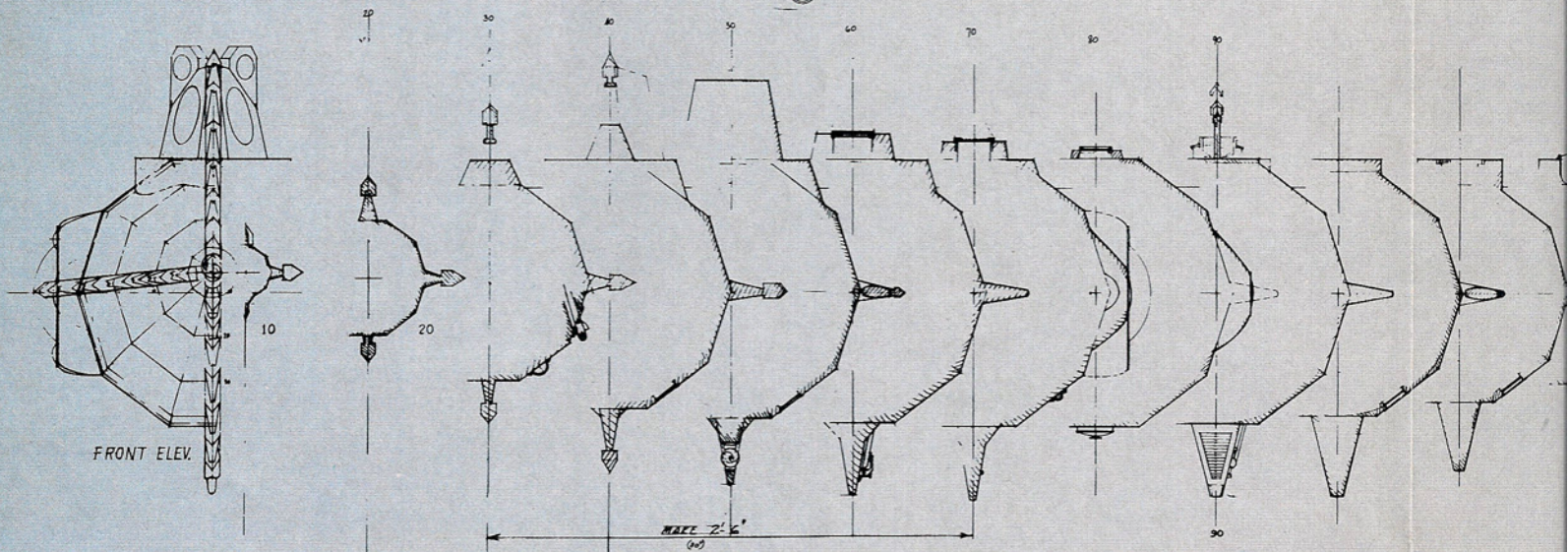
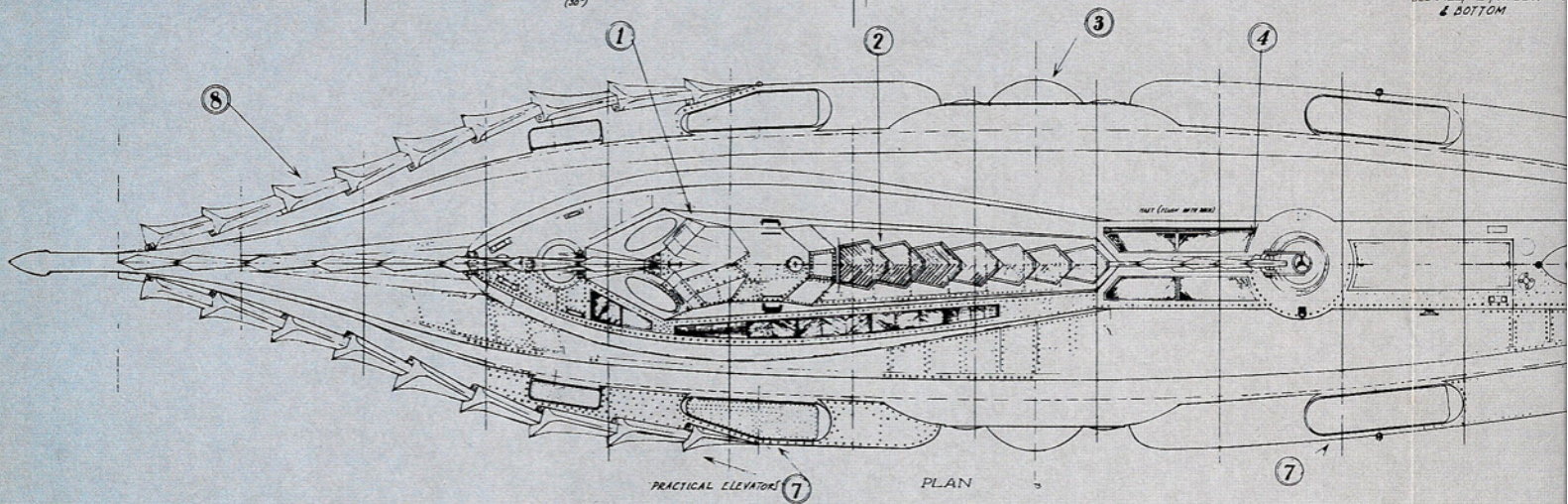
## NAUTILUS



PRACTICAL LIGHTS IN ALL  
WINDOWS.

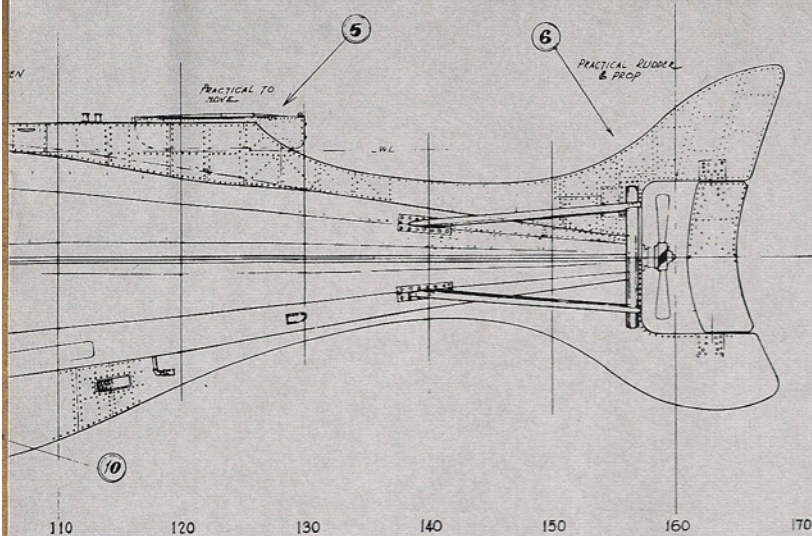


SEE SHEET #2 FOR SECTIONS  
& BOTTOM

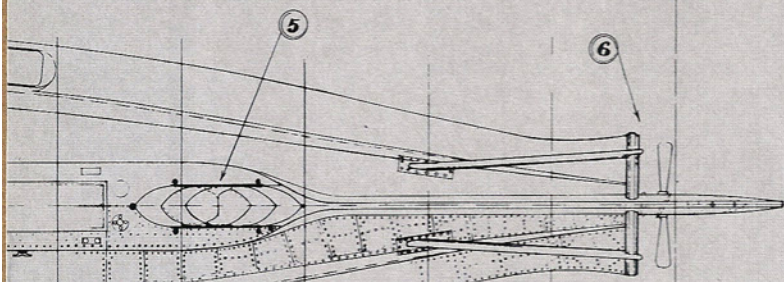


1/2 BOTTOM



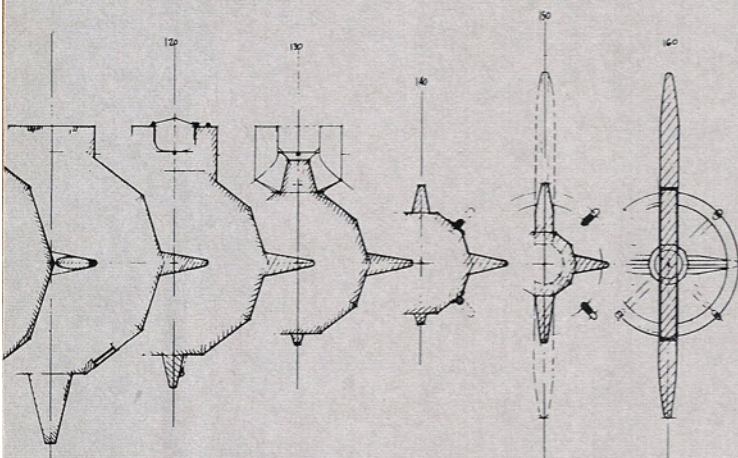


SEE SHEET #2 FOR SECTIONS  
& BOTTOM



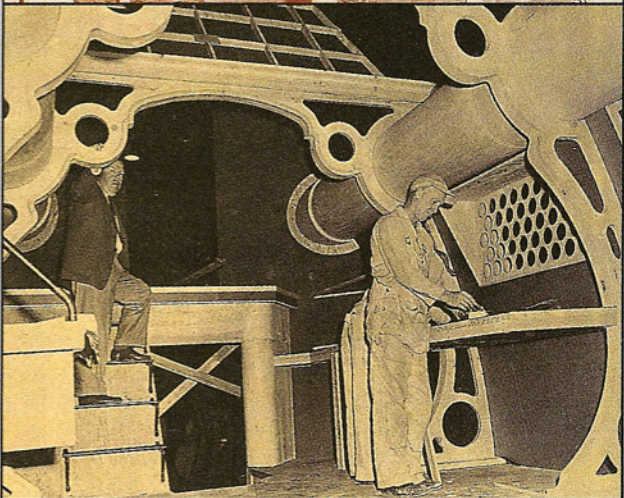
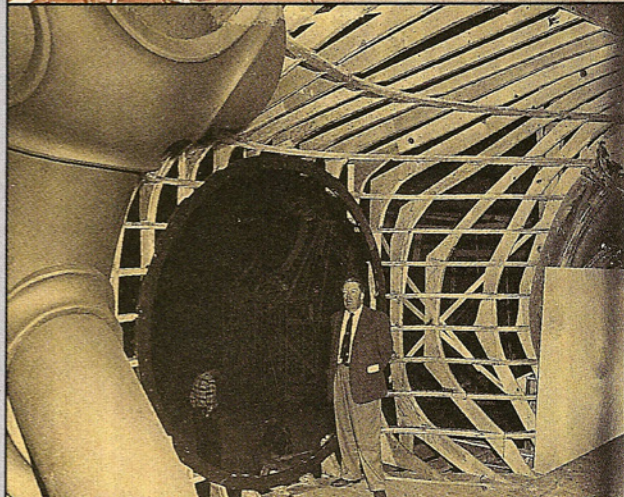
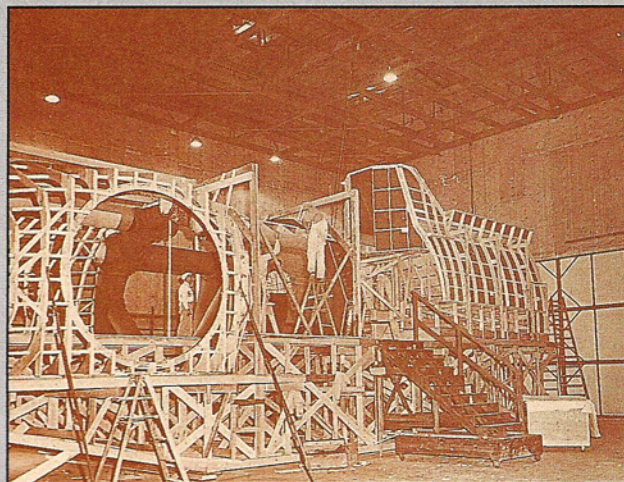
PLAN AND ELEVATIONS

WALT DISNEY PRODUCTIONS	
MOD NO. 2762-100	SET NO.
PICTURE: 20,000 LEAGUES	
SET: EXT. NAUTICAL	ART DIRECTION: JERRY MCGEE
SCALE: 3/4" = 1'-0"	DATE: 11-22-33
APPROVED: [Signature]	DIRECTOR: [Signature]
NO. OF REVISIONS: [Blank]	
NO. OF ADDITIONAL PAGES: [Blank]	
DATE: 11-22-33	



SECTIONS & BOTTOM

WALT DISNEY PRODUCTIONS	
MOD NO. 2762-100	SET NO.
PICTURE: 20,000 LEAGUES	
SET: EXT. NAUTICAL	ART DIRECTION: JERRY MCGEE
SCALE: 3/4" = 1'-0"	DATE: 11-22-33
APPROVED: [Signature]	DIRECTOR: [Signature]
NO. OF REVISIONS: [Blank]	
NO. OF ADDITIONAL PAGES: [Blank]	
DATE: 11-22-33	





Walt Disney displays Goff's early version of the *Nautilus* submarine. It was Goff's remarkable vision of an iron-riveted ship built with tools of the 19th century that eventually swayed Disney away from a sleek modern exterior. Minor differences in this model include the lack of a dorsal fin, which was added later to give Aronnax, Land and Conseil something to cling to when Nemo submerges, leaving them stranded on the deck.

Bottom: The *Nautilus* heads for its home port in one of Peter Ellenshaw's mattes created for the film. The water and the submarine were painted at a later date by artist Albert Whitlock and used for display.





# Aboard the Nautilus

BY DAVID HUTCHISON

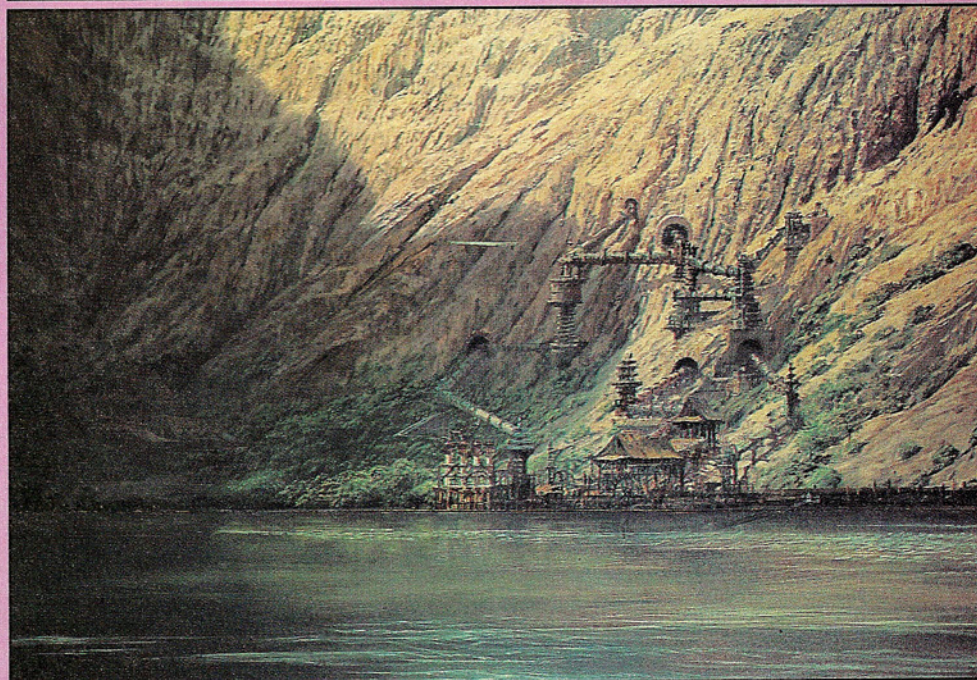
*Designer Harper Goff pilots Jules Verne's voyage of the imagination.*

Adapted from the Jules Verne novel, *20,000 Leagues Under the Sea* was Disney's first live-action film to be made in this country and the second CinemaScope feature ever to go into production. Though Disney's first thoughts were to make the Verne story as an animated feature, after a few months of development, he decided that the story would be cheaper, easier and faster to make in live action. *20,000 Leagues Under the Sea* would be the showcase effort of his Burbank studio's first all-live-action feature film, with a \$4.5 million budget.

The film, which won Academy Awards for art direction and special effects, was directed by Richard Fleischer, and is principally remembered for James Mason's definitive portrayal of Captain Nemo, a number of exciting underwater sequences and the *Nautilus* submarine designed by Harper Goff.

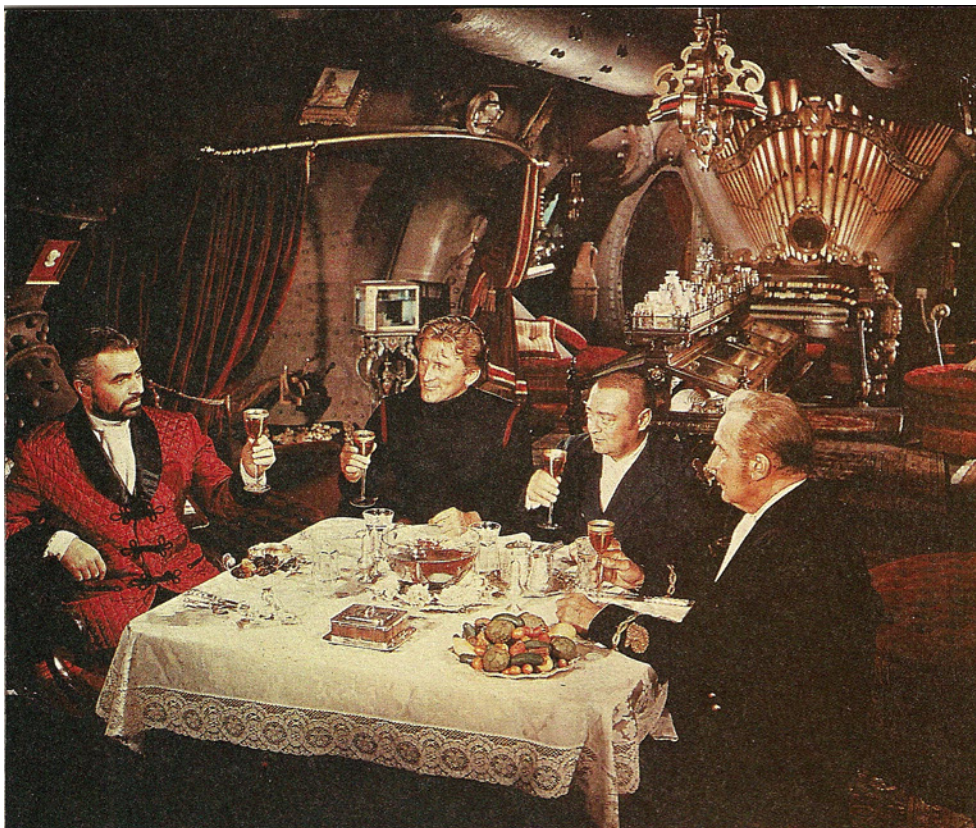
"It all began," remembers Goff, "with some exceptional footage shot in a laboratory aquarium by Dr. MacGinnitie of Cal Tech's marine biology lab in Corona Del Mar. I was assigned the task of putting together a 'true-life adventure' using the footage. Walt thought that inasmuch as *20,000 Leagues* was in public domain, we might do worse than to use the title for our true-life adventure short subject. While Walt went to England, I stayed in Burbank storyboarding a live-action version of the classic, using MacGinnitie's footage as a sort of ballet episode in which Nemo shows Professor Aronnax the wonders of the deep. Walt liked the storyboard well enough to give me an 'A.R.I.' (audience reaction inquiry) to a group of exhibitors who were in town. They were enthusiastic, and the rest is history."

Co-starring with James Mason as the lonely and embittered Captain Nemo were Kirk Douglas as harpooner Ned Land, Paul Lukas as the truth-seeking Professor Aronnax and Peter Lorre as his assistant, Conseil. Cameras rolled on six months of principal photography after more than a year of pre-production planning.



Nemo's secret base is the island Vulcania, as designed and painted by Harper Goff. In the Disney film, Ned Land sends messages revealing the location as latitude 12° 19' and 169° 28' W. longitude. For the shot, the hand writing the messages is Goff's. Bottom: A number of glass shots were painted by Peter Ellenshaw for the Disney film. This detail from one of the matte paintings shows Nemo's secret base from the point-of-view of the approaching *Nautilus*.



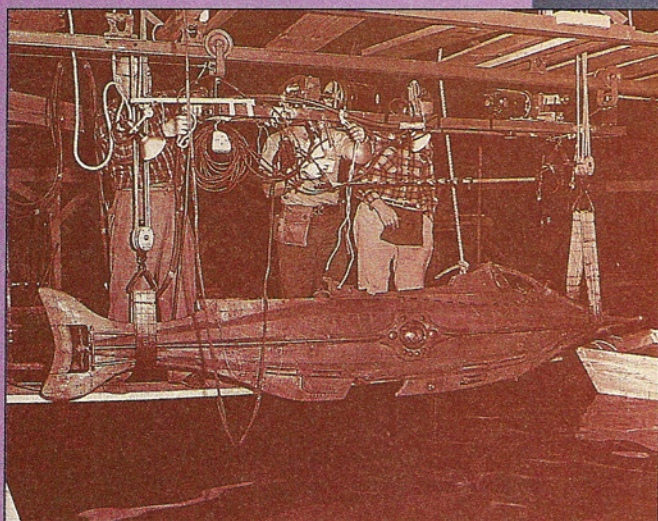


Captain Nemo treats his "guests" aboard the *Nautilus* to a dinner featuring foods from the sea. Having abandoned the surface world, Nemo reaps a bountiful harvest from the oceans of the world. Even his cigars are made from seaweed.

Most of the remarkable underwater sequences were filmed on location 3,000 miles from Hollywood, near Nassau in the Bahamas. Visibility, even 30 feet down, frequently extends to 200 feet in that part of the Atlantic. Here, for eight weeks, a 54-man troupe lived and worked. The crew shot more underwater footage than had ever been seen in a film up to that time. Systems were developed to stage intricate underwater scenes with the same care and precision

that is possible on a soundstage. One sequence—in which Captain Nemo and the crew of the *Nautilus* raise a coral cross at the underwater grave of a slain companion—set a record for its day as the biggest sub-surface scene ever attempted. For this one shot, there were 42 men working simultaneously on the ocean floor: 20 actor-divers in front of the camera and 22 technicians behind it. In this latter group were director Fleischer, cameraman Till Gabbani,

An 11-foot miniature of the *Nautilus* was built and used for the underwater sequences. Howard and Theodore Lydecker, whose special effects work had graced many a Republic serial, were hired to "fly" the *Nautilus* on wires, while it was being filmed in a tank.



diving master Fred Zendar, prop men, special FX men, camera assistants and water safety personnel.

## Underwater Lensing

A slow, laborious process at best, making a movie on the floor of the ocean presents four special headaches:

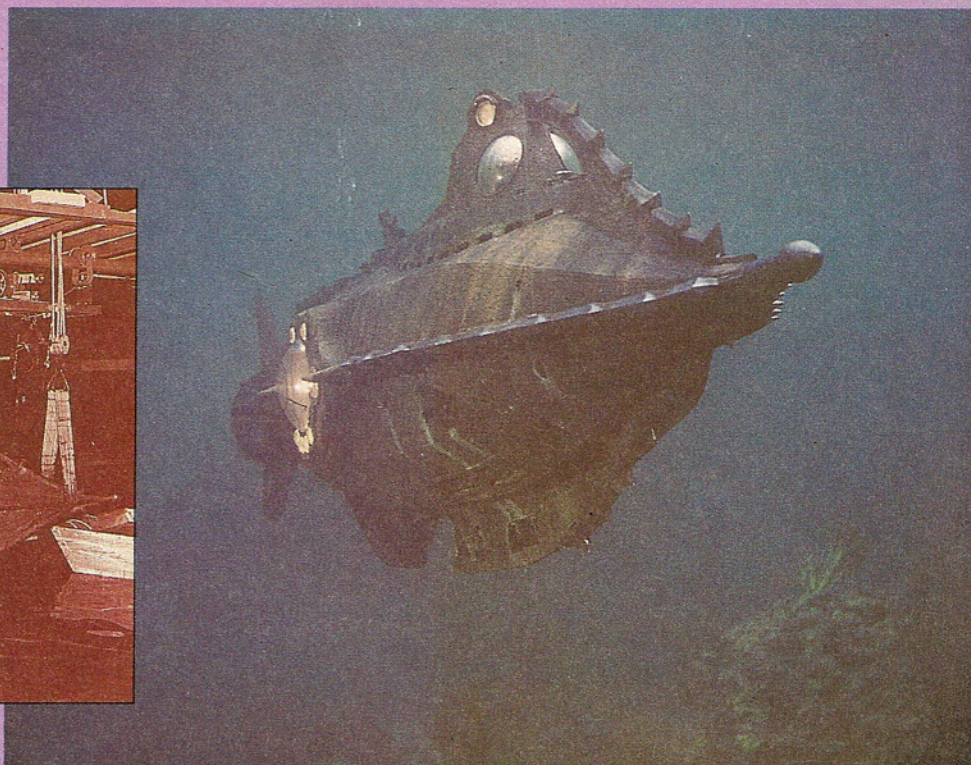
1. You need a perfect combination of three factors before you begin: bright sunlight, clear water and calm water. Any two of three is not sufficient. The slow film emulsions in the early '50s demanded nothing but the finest of conditions for clear photography.

2. You are literally "out of your depth." You must wear strange apparatus and breathe compressed air, or you can suffer from exposure and fatigue.

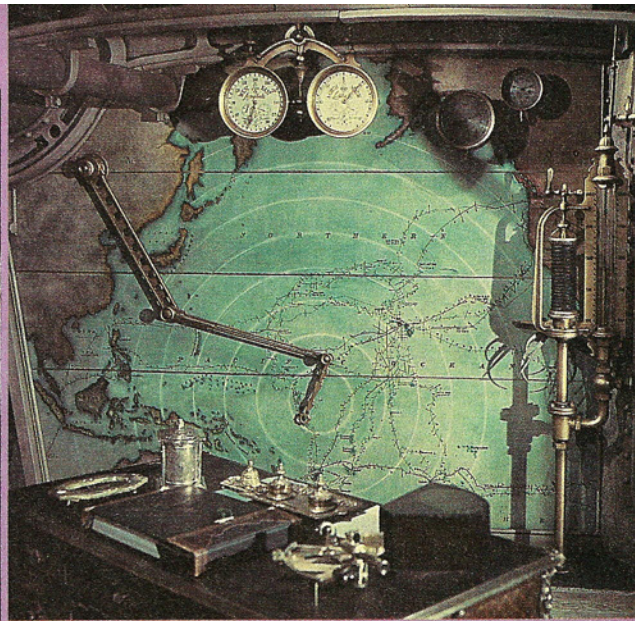
3. It is virtually impossible to communicate once you are underwater. The troupe invented a series of 12 hand signals which covered such basic commands as "Cut," "Action," "Repeat Scene" and "Emergency—get me out of the water!"

4. Your actual working time is very limited. The unit could allow no more than 55 minutes from the time the first man "went on the air" on the deck of the boat until the last man was back aboard the boat. It took 10 minutes to lower everyone to the ocean floor and another 10 to bring them up.

To make certain that the time underwater would be used to the fullest, every scene was first diagrammed on a blackboard and then rehearsed "dry," either on the boat or on land, until cast and crew alike knew each gesture and each step that would be made. The burial se-







quence took two days to plan and three days to shoot.

"The self-contained diving suits," Goff explains, "were developed by Fred Zendar and myself. The helmets were based on Japanese pearl diving equipment. We spent nine hours a day, seven days a week for eight weeks at Lyford Cay in the Bahamas, underwater and never lost a man."

Certain underwater sequences, however, had to be shot under controlled conditions in a studio tank. Accordingly, Stage #3 was constructed at Disney's Burbank studios, which houses an enormous 90' x 125' tank, ranging in depth from three to 12 feet.

### Nemo's "Nautilus"

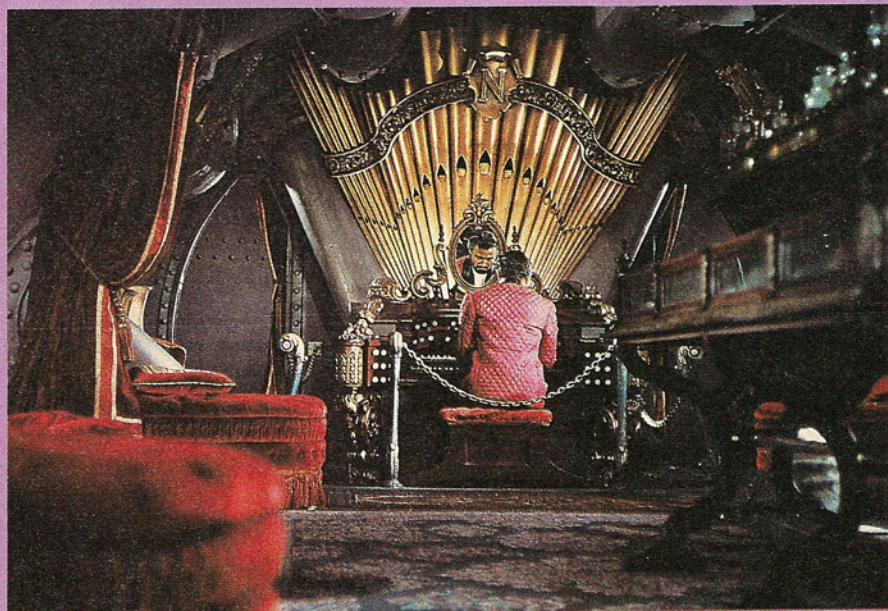
The design of the *Nautilus* itself, however, proved to be one of the most interesting challenges of the movie. "Jules Verne," explains Goff, "while foreseeing brilliantly the atomic submarine of today, did not at that time invent the periscope, the torpedo tube or sonar. He did not predict closed-circuit television."

In a way, it was the personality of Nemo that determined a good deal of the design. "According to Verne," Goff continues, "if Nemo wanted to see what was happening on the surface, he simply poked the glass ports of the wheel house out of the depths and took a direct look. Nor would it have been true to Captain Nemo's nature to skulk along and fire an armed torpedo at his enemy. He risked his vessel and himself and crew by ramming the enemy at frightening speed. If he wanted to study the marvels of life beneath the surface, he reclined in his elegant bay window lounge and passed the hours studying the marine life outside of his luxurious salon. These items dictated much of the direction of my design."

Nemo's stateroom is the only cabin on the *Nautilus* that has painted walls. Every other room has a natural metal and rust finish. The daybed on the left features a nook for books and a brass bellpush to call the steward. On the right is a small laboratory bench and a microscope that Nemo used for his research. The map on the opposite wall shows the location of Nemo's secret island base.

In the book, Verne takes the reader on a very detailed tour of the *Nautilus*. A similar tour that was scripted for the Disney film was eventually eliminated to keep the running time down to two hours. Nemo explains to Aronnax that the submarine is 70 meters long and eight meters wide at its maximum. Moving from amidships towards the bow is a dining room about five meters long, and then, after passing through a water-tight bulkhead, the library, which is also about five meters long. The well-stocked library has 12,000 volumes and

is a room in which smoking is permitted. Adjoining the library is a vast salon—30 feet long, 18 feet wide and 15 high. A veritable museum, the salon was decorated with paintings, sculptures and various biological specimens; a large pipe organ filled one end of the hall. Moving forward and after passing through another water-tight bulkhead, the salon connects with a passageway that leads into Nemo's cabin—about five meters long—and an adjoining state room that was assigned to Professor Aronnax, which was about two-and-a-



At one end of the salon is a large organ console. The decorative pipes were sculpted by Chris Mueller. The actual location of the wind chest and the many ranks of pipes that are indicated by the presence of several draw knobs controlling the stops on the console is not revealed. This suggests that Nemo's instrument may have been a reed organ, which could easily have been self-contained and was common in the period. The placement of an oval mirror where a music rack should be, may suggest something about the character of its owner.





Opposite Nemo's organ, at the other end of the salon, is a small decorative fountain. Set decorator Emile Kuri borrowed it from MGM, where it had last appeared in *Quo Vadis*; the Greek border design was added at Disney. The desk at the left rear was banker Lionel Barrymore's in *It's a Wonderful Life*, another film that Kuri decorated.

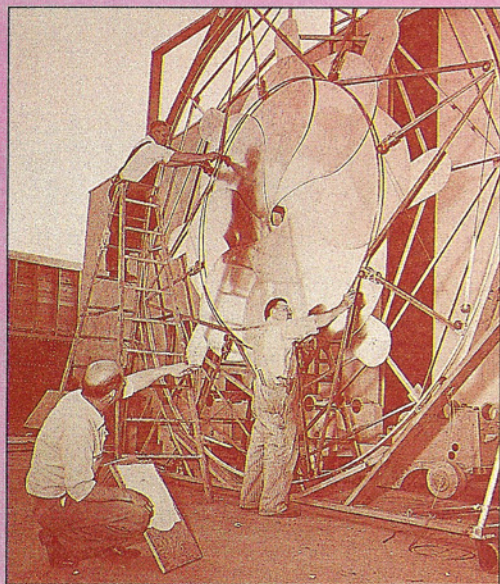
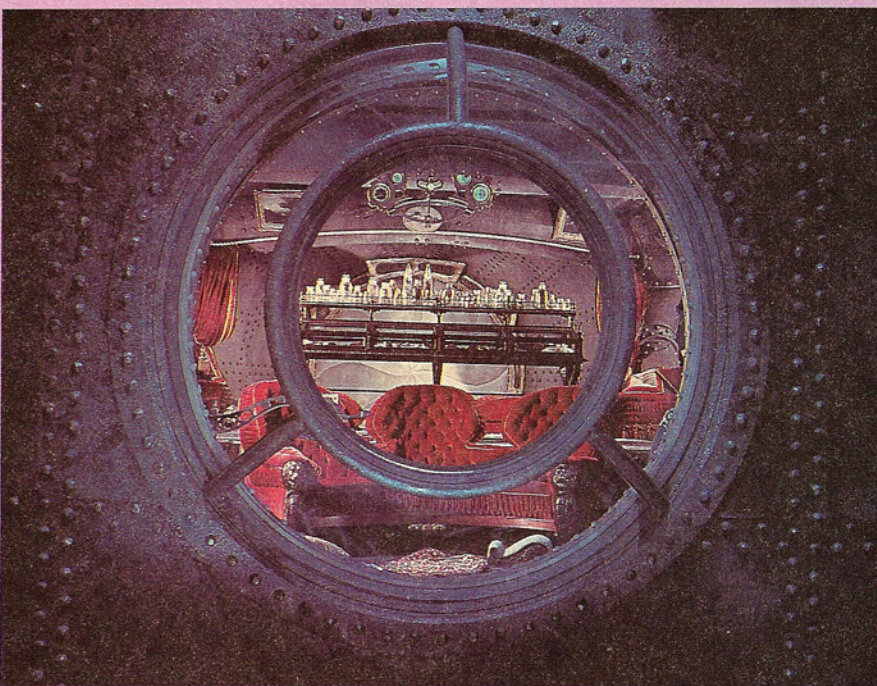
estimates the cost of construction at two million francs and another two or three million for the furnishings, art and collections. But for Nemo, this is all petty cash. "I could pay off the national debt of France—12 billion francs—without any embarrassment," he brags.

For the Disney re-creation, designer Goff strove to be as faithful to the Verne description as possible—positioning the various rooms and cabins roughly as Nemo described them with some slight rearranging and additions.

half meters long. In front of Aronnax's cabin was an air tank that extends about seven-and-a-half meters to the bow.

From the center of the ship moving towards the stern is an iron stepladder that leads up to the submarine's dinghy. Further back is the two-meter cabin shared by Conseil and Ned Land, then the kitchen (all electric, of course). Behind the kitchen is the crew's quarters, about five meters long; and finally, behind a fourth watertight bulkhead, is the brightly-lit engine room, about 20 meters in length. Nemo explains that his electric engines can propel *Nautilus* at up to 50 knots.

The cost? Fabulously rich, Nemo



Another Goff innovation is the giant mechanical iris that was built by mechanical FX supervisor Bob Matthey and his crew for the full size set. The Verne novel merely mentions shutters that open and close over the large salon viewport. But the elegant iris is much more in keeping with the spirit of Goff's overall design.





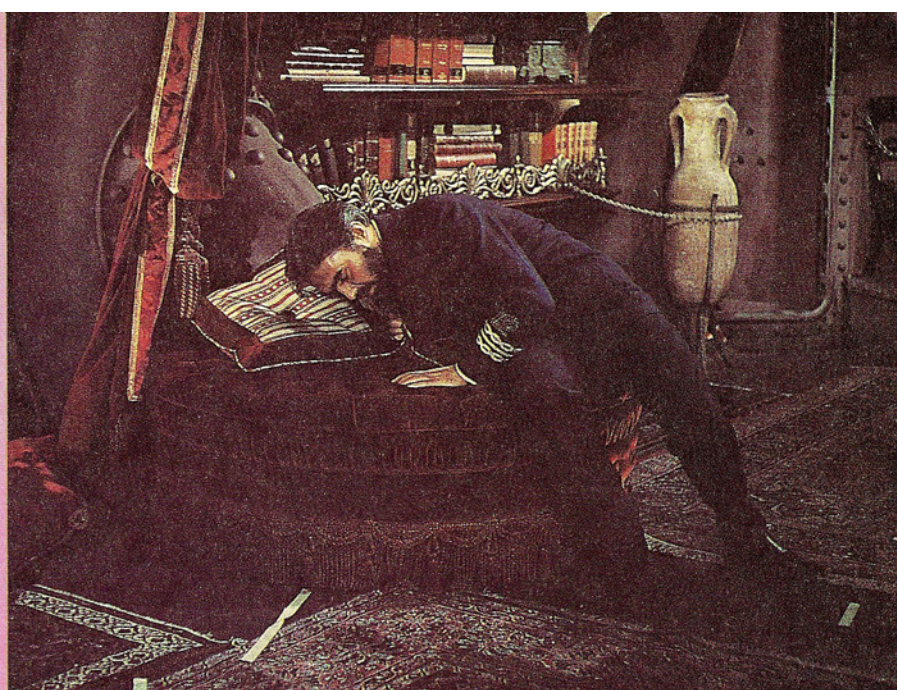
"It is not sound economics to study and design obviously unnecessary parts of the *Nautilus*," Goff explains, "if they will not appear on screen. The crew quarters, for example, were not accounted for. In Verne's original text, Nemo, from time to time, leaves the chart room and steps directly into several other widely diversified areas of the submarine. Directors do not like to slow down action and clutter up a dramatic moment by showing actors leaving a room, turning right, walking two paces down a corridor, climbing up a companionway and lifting a hatch, just to enter another room."

As in the book, the main lounge of the *Nautilus* for the Disney film featured a pipe organ, a library (with rare volumes borrowed from the Library of Congress by set decorator Emile Kuri), great art, comfortable sofas and chairs, soft carpets and aquariums filled with unusual fish.

Though some of the furnishings were built in the Disney shops or borrowed from other studios, many of the pieces of furniture and set dressings came from local antique shops. Sometimes the hunt for Victorian furnishings for the submarine brought startled looks of wonder from the shop owners. Goff explains:

"At the time, I owned my own boat. One Sunday afternoon, I went browsing through antique stores with my wife instead of going out on my boat. It

Goff's layout for the *Nautilus*' interior sets.

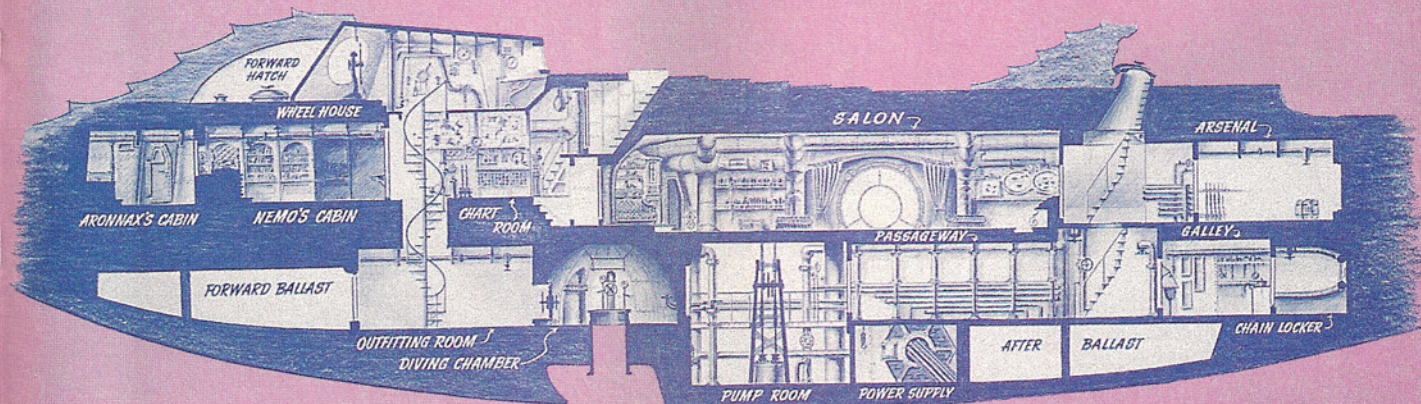


Mortally wounded, Nemo staggers to the viewport as he prepares to scuttle the *Nautilus*. Another Emile Kuri touch is the Greek amphora in the background. Goff emphasizes that Nemo's treasures are taken from undersea wrecks, while Verne suggests that the art work was purchased from museums and dealers on land when Nemo was outfitting the submarine.

seemed appropriate to be looking for Captain Nemo's set dressings, while wearing my captain's cap. One shop had these bronze dolphins on display. I called my wife over to look at them. 'What would you do with them?' she asked. 'For my submarine...' I said. 'You know, when you walk around the edge where the big davenport is by the viewport? Well, I need something right at the edge that you can put your hand on or a chain across. And if I need it for

the viewport on the other side, we can make *castings* of them!' Well, at that point I happened to look up—at a number of open-mouthed people who were listening in gaping wonder to the explanation of my submarine's furnishings."

The sets for the interior cabins of the *Nautilus* were built exactly to scale, with ceilings. Though this technique heightened the illusion of being underwater and added to the reality of the film, it meant that many of *Nautilus*



Two of Goff's storyboards for the Disney film. Goff worked as a sketch artist at Warner for many years, working on such films as *Captain Blood*, *The Adventures of Robin Hood* and *Casablanca*.





Goff (an accomplished banjo player) and Douglas take a break during production.

cabins measured a scant 8' x 10'. Into these had to be placed several actors, a camera and crew, microphones and other sound engineer's gear, and the usual array of technical equipment.

Cinematographer Franz Planer spent many days tucking his lighting instruments into every nook and cranny of the set so that no interior lighting source would be evident—a tribute to another bit of Nemo magic. Verne specifies in the book that the *Nautilus* runs on electricity generated by chemical means, and that the lighting, too, is electrically generated through luminous ceilings.

### The Sea Monster

Goff comments on the exterior design of the *Nautilus* in its "sea monster" guise: "Early reports of the destruction of ships described a so-called sea monster of terrible speed and tremendous power, with great glowing eyes, a great dorsal fin and a tail which churned the sea into a froth when it attacked its victims. It would ram ships with such speed that it passed clear through its prey—usually leaving the broken hull in two parts.

"My idea has always been that the shark and the alligator were the most terrifying monsters in the water. I therefore borrowed the scary eye of the alligator that can watch you, even when the alligator is nearly submerged. The disgusting rough skin of the gator is simulated by the rivets and barbed protuberances that cover the sub. As Verne insisted that the *Nautilus* drove its way clean through its victim, I designed a

protective saw-toothed spine that started forward at the bulk of the ram and slid around all the out-jutting structures on the hull. These include the conning tower, the diving planes and the great helical propellor at the stern.

"At the time Captain Nemo constructed the *Nautilus* on Mysterious Island, the iron-riveted ship was the last word in marine construction. I have

always thought that rivet patterns were beautiful, and this is reflected in the exterior detailing."

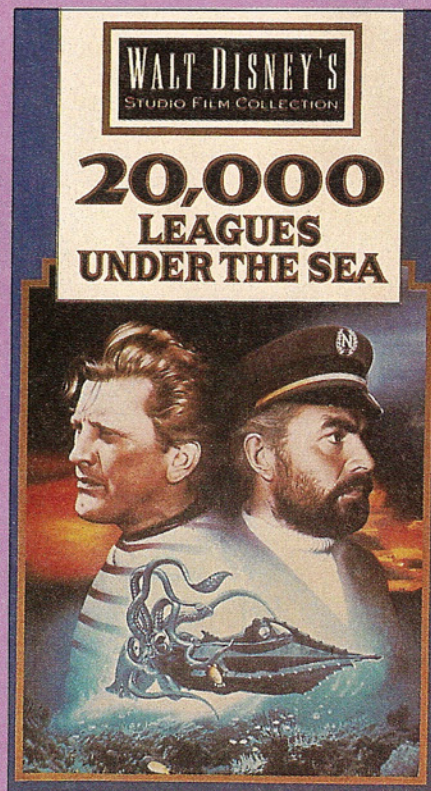
Disney's first thoughts for the *Nautilus* design were ultra-modern. He showed Goff one of the smooth aluminum cylinders that are used to package cigars. This was not what Goff had in mind at all, and so he cobbled together a model with a riveted iron plate exterior over a long weekend.

"I wanted no slick-shelled moonship to transport Captain Nemo through the emerald deep, and so I fought and somehow got my way. On Mysterious Island, Nemo had the white-hot heat of the volcano to help him build his dream ship, but I am sure that flat iron plates—profusely riveted—would have been his way. His stock pile of material was always the countless sunken ships uniquely available to him alone. Even the Greek amphora and the works of art that graced his great salon were salvaged from wrecks, some lost for centuries."

Goff's version is a much more romantic conception than the one described by Verne, in which the *Nautilus* is constructed piecemeal by dozens of different contractors around the world, with no one manufacturer knowing what the others were doing or how a given part was to be used.

Verne's *Nautilus* is a traditional

Two of the many tellings of Verne's most famous story have recently been re-released on videotape. The Disney version is now available in a new package for \$19.95; and the long thought lost 1916 silent film \$29.95 from Kino.





double-hulled craft with ballast tanks for air and water, but Goff went for a unique design that was much more in keeping with the concept of 19th-century science fiction.

"One of the most awe-inspiring iron engineering structures in the world is the cantilevered bridge across the Firth of Forth in Scotland. One of the world's greatest railroad bridges, it was constructed of giant tapered iron tubular columns and trusses. These hollow tubes were easy to erect, lightweight in proportion to strength and could be filled with rock to become heavy enough to ward off the channel winds.

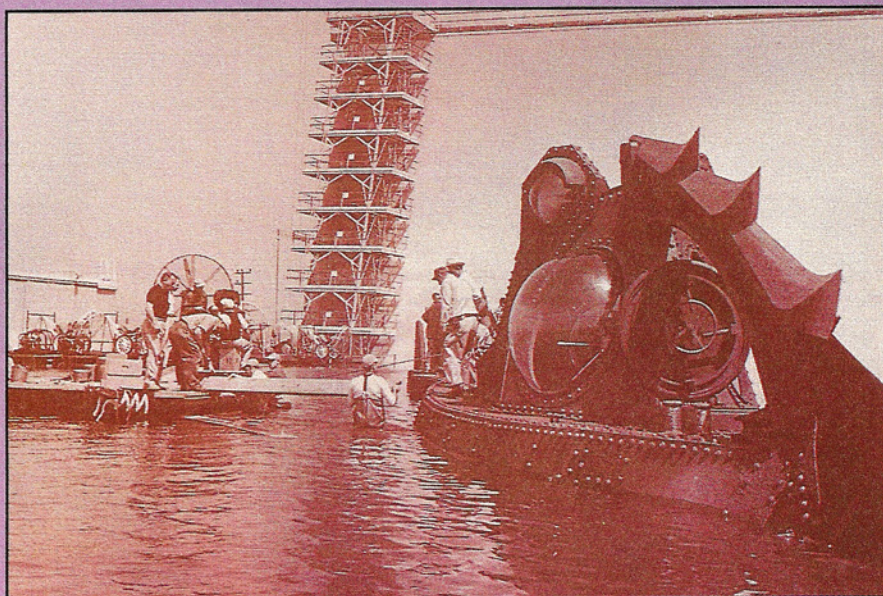
"I designed the tubular skeleton of the *Nautilus* with similar "unions" joining the tubes. Provision was made for the upper spaces in this hollow structural frame to be used for air storage, while the lower voids would be water ballast. An interesting sequence in which this all was explained to Aronnax by Nemo was eliminated as too time-consuming. Alas."

### An Unexpected Shot

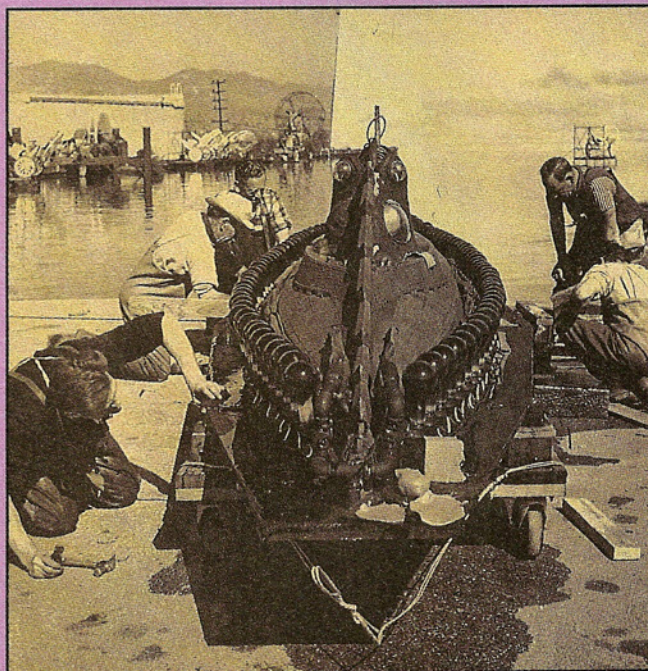
There was another scene that turned out differently from the way it was planned. In the film, Kirk Douglas and Peter Lorre ask permission of Captain Nemo to go ashore. The submarine is hung up on a coral ledge and must wait for the tide to float it free. Kirk Douglas as Ned Land is looking for a means of escape and tells Lorre to explain to Nemo that they are only going ashore to collect specimens for Professor Aronnax, and that Ned would be willing to row. Nemo looks at them suspiciously and warns them that the island is inhabited by cannibals who eat liars with the same relish that they eat honest men! They take the captain's dinghy, which fits into the rear of the submarine, and row for the island. Land ignores Nemo's warning to stay on the beach and heads for the jungle, and freedom.

Not very far along, he is discovered by the cannibals, who are intrigued at the idea of a little variety in their diet. Ned declines their invitation to dinner and runs for the beach. He and Lorre were *supposed* to leap into the boat and row for the submarine.

Unfortunately, the production crew had gotten tired of lugging the dinghy around with all of its ballast. The boat was made of metal and wood, but painted and riveted to look like iron. In order for it to ride low in the water like an iron boat, sand was shoveled into the bottom. Kirk Douglas had gotten used to rowing the dinghy with its ballast at a certain level during rehearsal.

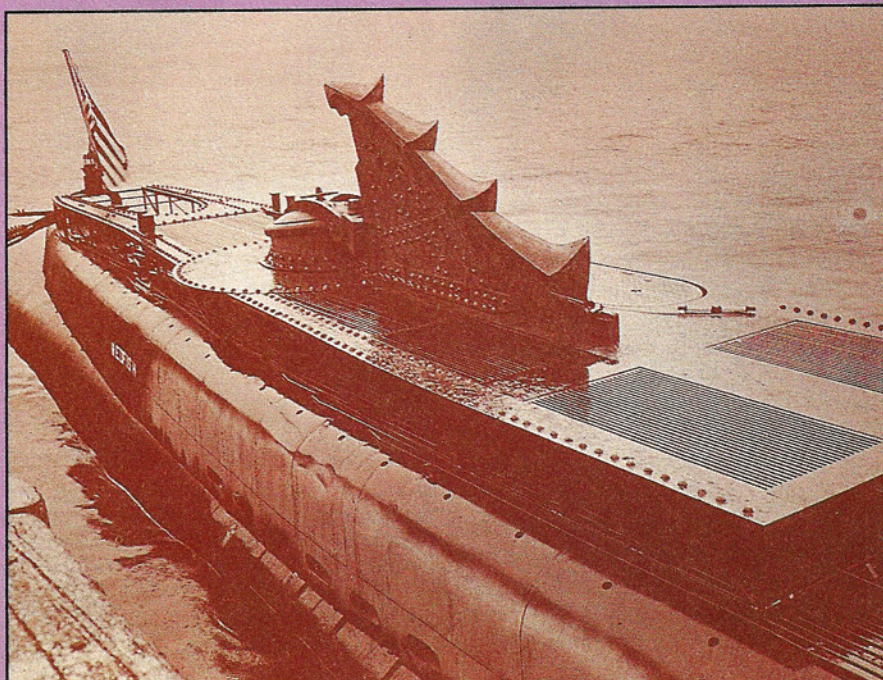


The 22-foot version of the submarine's top section has been rigged with electric lights to create a strange glow around the *Nautilus*.

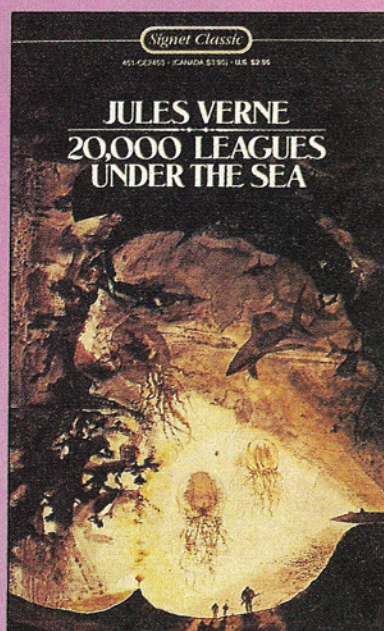
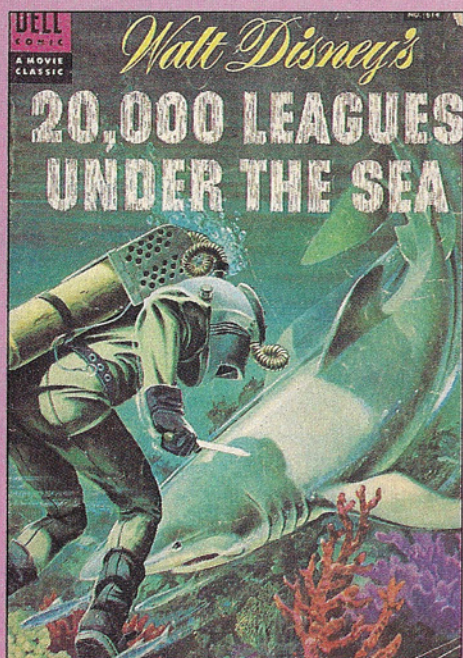


A section of the wheelhouse set visible at Sersen Lake on the Fox lot. The tank is about three feet deep, but there is a 20-foot deep pit in the middle that was used for the story of the *Titanic*.

The dorsal fin and a portion of deck was mounted on the U.S. submarine *Redfish* for the sequence in which Land, Aronnax and Conseil cling to the submerging *Nautilus*.



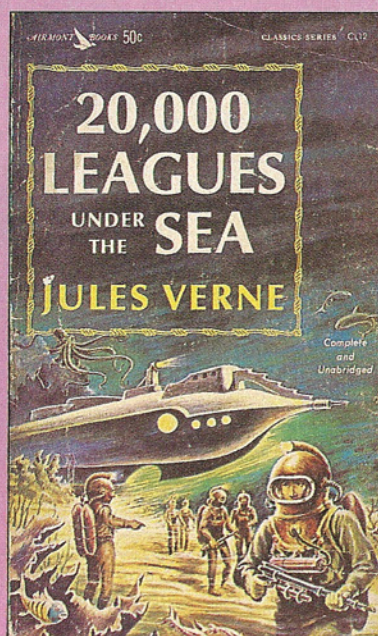




"But during the lunch break," says Goff, savoring the story, "the crew shoveled out a lot of the sand, because they had gotten tired of lugging it around. So, during the take, Kirk dashes for the dinghy pursued by cannibals; he leaps in, grabs the oars and tries to row to the sub. But the boat was so high in the water that the oars didn't quite touch the water at the same angle that Kirk had rehearsed it. Kirk fell backwards into the dinghy on the first stroke of the oars. He was terribly angry, but Dick Fleischer, the director, thought it looked so funny that he left it in.

"The captain's dinghy had its own close-fitting birth aft on the main deck. The dinghy was fitted with sliding covers or hatches which could be tightly sealed. Originally, it was my intention

Verne's story exists in many translations and editions; the Disney script takes three sequences most remembered in Verne's story—the squid, the cannibals and the burial at sea—and creates its own story.



to have a sequence in which Nemo returns to the *Nautilus* in the volcanic lagoon at his base after setting machinery in motion to destroy the island and the base. The *Nautilus* was to start moving on the surface. Nemo's dinghy would overtake it and slip into its own dock. The hatches on the dinghy would slide shut and seal—clamps on the edge of the the dock would lock onto the dinghy, and then, Nemo and his men would be down the hatch and bolt

it shut just as the waters of the lagoon closed over the deck."

Goff pauses with a smile as he remembers the action and then sighs. "Length of sequence: three-and-a-half minutes. Cost of sequence: \$60,000. It was never shot."

In Verne's book, the captain's dinghy has even more remarkable capabilities. Nemo explains to Aronnax that he can access the dinghy through a watertight compartment while the *Nautilus* is submerged. When released from its docking on the deck, it bobs to the surface, whereupon Nemo can open the covering hatches, raise a sail, set oars and be on his way. When he wants to return to the *Nautilus*, he transmits a message for them to pick him up on the surface.

It is no surprise that the Academy Award-winning *20,000 Leagues Under the Sea* has continued to delight and intrigue audiences since its Christmastime release in 1954. The film has become a well-loved classic, and for Harper Goff, its designer and driving force, it was the work of a lifetime. He expresses his devotion for the project:

"...In motion pictures, the text of a classic like this is sacrosanct, like the Bible. The 'word' of Jules Verne is not to be made light of. The duty of the designer like myself is to take the sometimes arbitrary descriptions of the *Nautilus* as recorded by Verne and 'make them work.'"

Nearly 40 years later, they still work—thanks to the talent and dedication of the Disney team. ☆



STARLOG is grateful for the generous assistance of special effects artist and modelmaker Tom Scherman for supplying many historical facts and illustrations used in this article. Mr. Scherman's devotion to Harper Goff and the Disney telling of Verne's story is so complete that at one time he decorated his Hollywood apartment to appear as a cabin aboard the *Nautilus*.