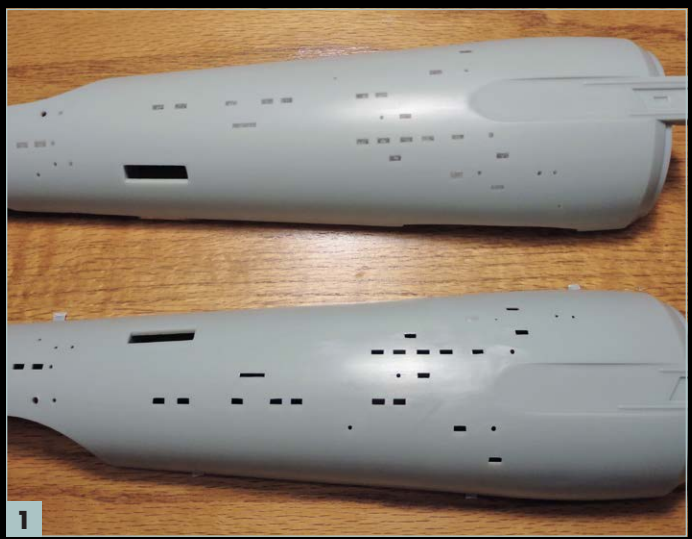
ENTERPRISING BUILDS

- **Reviewing and building Polar Lights' kit**
- **Recreating a movie-scale starship**

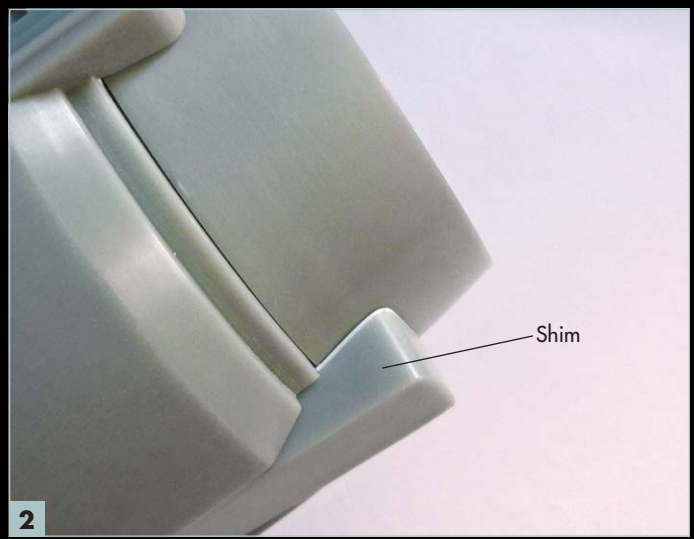
FineScale Modeler

Piloting TV's starship ENTERPRISE



1

The first filming miniature had no internal lighting, and the windows were represented by painted rectangles and circles. I filled all of the kit's windows with slow-setting super glue and sanded them flush.



2

Styrene shims improve the fit of the assembly around the front of Part 13, the sensor area at the bow of the secondary hull.

FineScale Modeler MAGAZINE

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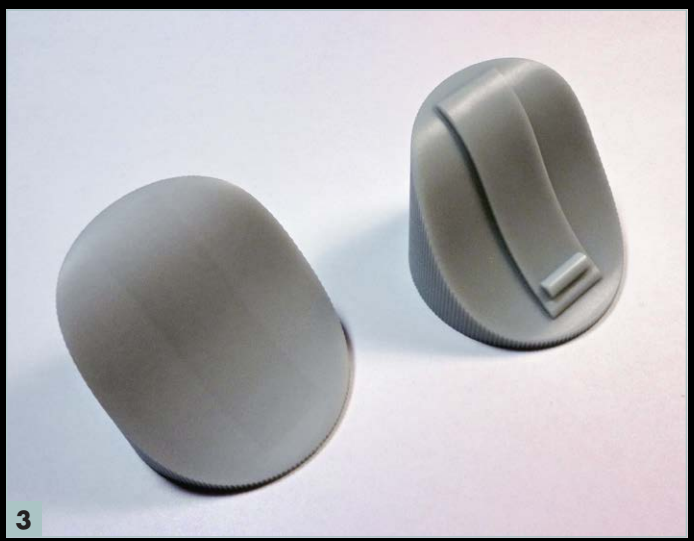
How to boldly, but easily, convert Polar Lights' 1/350 scale kit to the ship's initial version

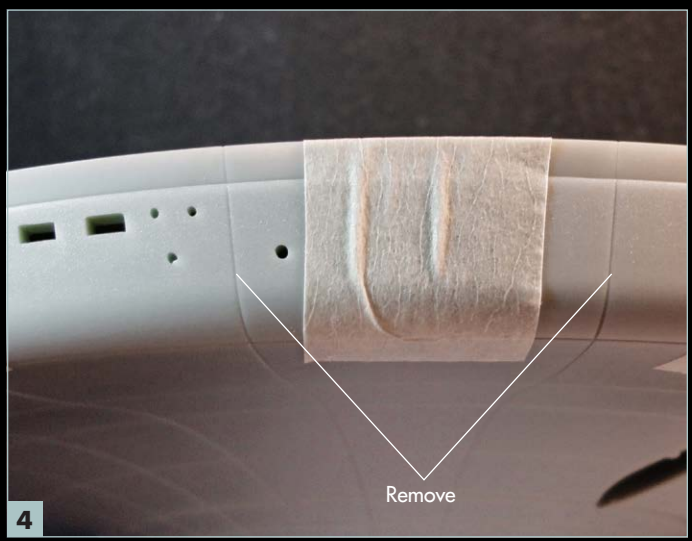
• BY PHILLIP GORE

Polar Lights transported "Star Trek" modelers beyond happy with a 1/350 scale original-series USS *Enterprise*. It is big, fairly easy to assemble, and, most importantly, it is accurate. In addition to the ship, Polar Lights released an aftermarket lighting set, special decals, and several accessory sets.

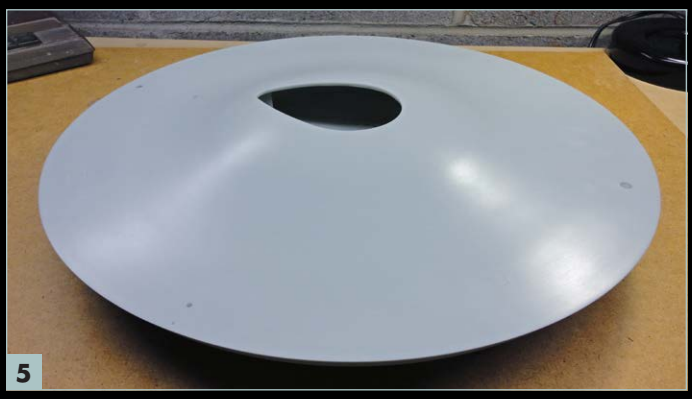
Having built several models of the *Enterprise* in its production configuration, I decided to build this kit as the 11' filming miniature shortly after it was completed in late December 1964. This version was used to film the first pilot episode, "The Cage," and is commonly referred to as the first-pilot configuration. (The filming miniature was subsequently modified for the second pilot, "Where No Man Has Gone Before," and again for the show's production run, which is what Polar Lights' kit represents out of the box.) The conversion to the first-pilot version doesn't require major surgery, just minor changes. All of the necessary bits can be found in the Supplemental Parts Pack (MKA004). This set also includes accurate decals for the first-pilot version.



To accurize the nacelle end caps (parts 50B), I removed their molded rectangular strips. The two raised bumps on each nacelle control reactor (parts 47) also were removed.



Polar Lights' engraved panel lines on the primary hull need to be removed because they were not seen on the first-pilot vessel.



I eliminated the lines with 150-grit sanding film, then smoothed scratches with progressively finer sandpaper. Super glue filled the light openings.

The lower half of the saucer section received the same sanding treatment. This was the least fun part of the project, requiring 38 *very* tedious hours.

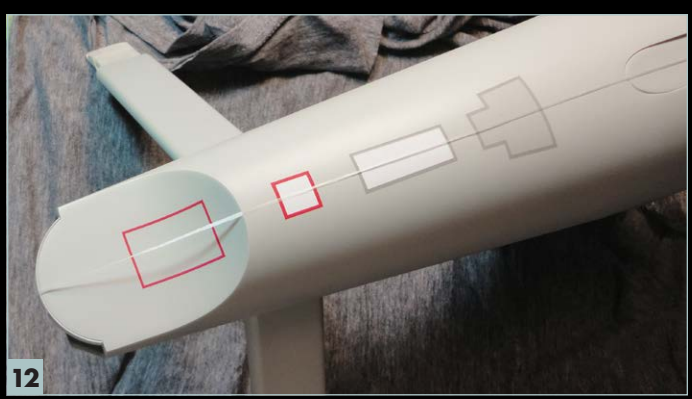
Once the grid was gone, I filled six incorrectly located light openings, sanded the super glue smooth, and drilled new ones at the correct spots.

Some of the running lights on the saucer had to be relocated after I filled the larger production-version light locations.

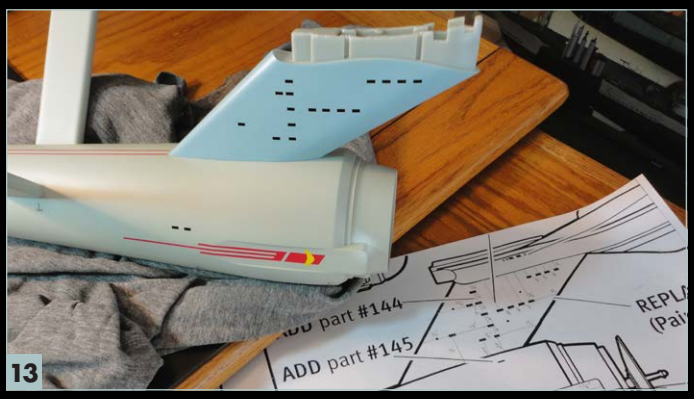
I mixed 5 parts Testors Model Master SAC bomber green, 41 parts Model Master light gray, and 31 parts Testors white (No. 1168) to paint the ship.

I sprayed the subassemblies with four coats, buffing between each layer with a soft cloth.

After painting the neck with Model Master USSR Flanker medium blue, I applied several coats of Pledge FloorCare Multi-Surface Finish. The light blue neck was unique to the first-pilot *Enterprise*.



To center decals, I stretched dental floss across the secondary hull and saucer subassemblies. Trimming most of the carrier film from the markings before application reduced the risk of silvering.



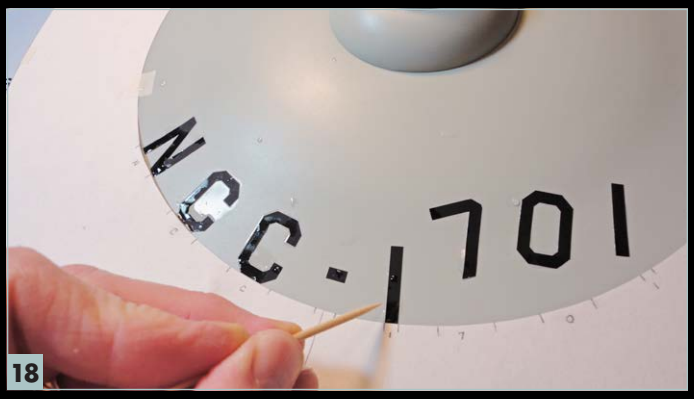
I enlarged the instructions to match the model and accurately measured the spacing and alignment of windows before I cut each from black decal.

I sealed the decals with several light layers of Testors Dullcote. I left the neck with a semigloss sheen to match the filming miniature.

I attached the nacelles to the struts before adding details.

The supplemental kit's crystal-clear engine domes were painted dark red on the inside, giving them a high gloss.

I glued the enlarged instructions to heavy construction paper, making a template to place each character in the registry number on the saucer.



Taping the template on the hull made applying each number easy. I used a toothpick to fine-tune the locations.

I made another template for the ship's name and separated the letters to minimize silvering.

Once all of the markings were on — a whopping 267 decals! — I airbrushed light coats of Testors Dullcote to knock down any remaining gloss. Finally, I attached the primary hull. **FSM**

Enterprising Polar Lights goes where no kit maker has gone before

Arguably the most recognizable spaceship in the history of television, the USS *Enterprise* has been around in model kit form since the first season of "Star Trek" in 1966. Since then, modelers have wanted newer, more-accurate, and bigger models. A 1/350 scale *Enterprise* made it to the fifth spot in *FSM*'s "most-wanted kit" poll in 2010.

Polar Lights answered the call with a 1/350 kit, and it's pulled out all the stops to create a model that builds well and looks awesome — the finished ship is 32" long. As if that's not enough, the company has several aftermarket sets to finish your starship as you like. I added the lighting set.

The big, heavy box — and I love the box art— is slam-full of plastic. At first glance, most of it appears to be molded in the same shade of gray. But there are subtle differences; the parts are in a color close to their final appearance.

The sensor dish and its housing are molded in copper, and the windows are supplied in clear, white, and dark-tinted plastic. The latter can be combined to replicate the lit and unlit windows seen on the show's miniature.

Clear parts are provided for running lights, domes on the primary hull, and the Bussard collectors on the warp-engine nacelles.

The kit includes a detailed bridge and shuttle bay, with optional doors for the latter to be open or closed.

The kit builds into the ship seen during production of the series, but Polar Lights produces a supplemental parts pack (No. MKA004) for either of the pilot versions.

A sturdy metal tube with a black hemispherical base rounds out the parts. Decals provide markings, including screens in the bridge, placards in the shuttle bay, and two shuttles. Painting and decaling instructions are on the sides of the box's lower tray. This is the weakest aspect of the kit for me; I found it difficult to use the drawings when the box was full of parts or subassemblies.

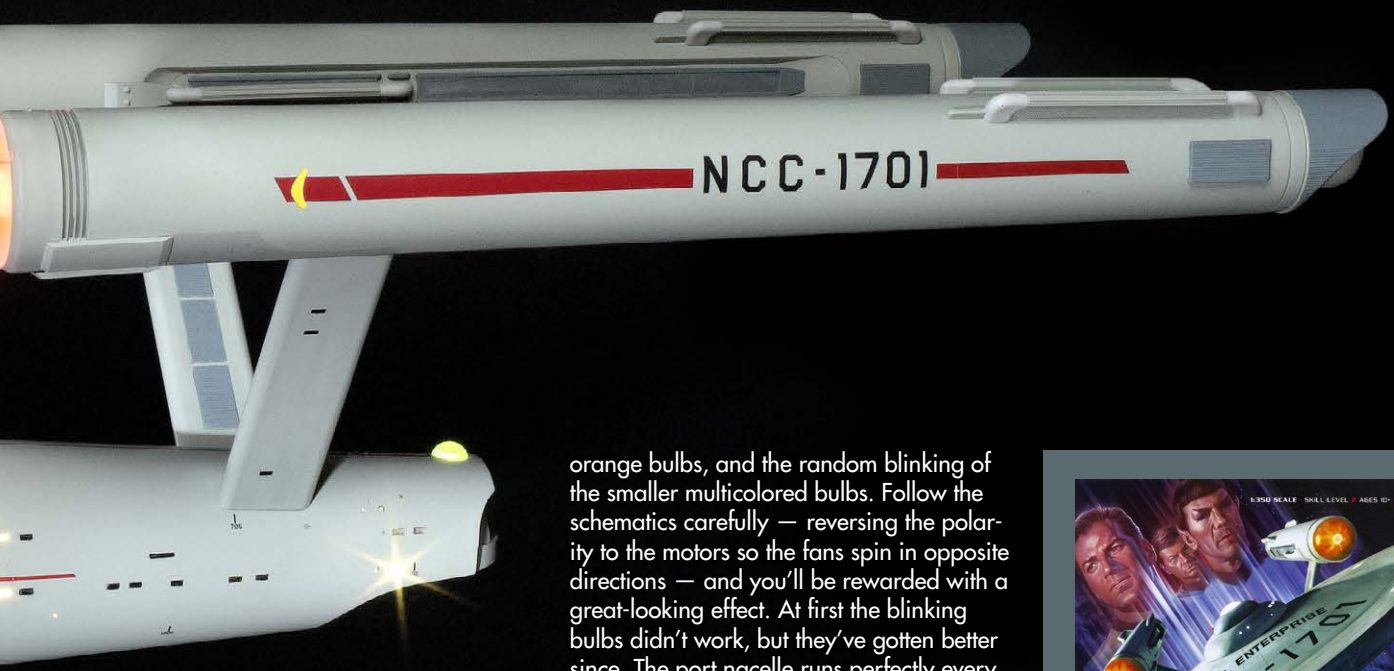
The lighting set reproduces many of the clear parts in the original kit in translucent red, blue, orange, and green for various effects. There are two motors to spin the Bussard collector fans, 95 LEDs, four circuit boards, and an AC/DC power adapter. The instructions accommodate people like me who don't know electronics; keep them handy for both sets, because parts from the lighting set, especially the clear bridge and shuttle bay, replace kit parts.

The lighting set offers the option of lighting the intercooler grilles on the warp engines' inboard sides and the impulse engines. These were intended for the filming model but ended up cut from the budget.

The basic kit is beautifully engineered, and the sturdy locating pins simplify construction. The kit accepts the lighting set with mounting pins and locators for wiring and LEDs. Major components have a tongue-and-groove join to prevent light leaks.

After painting and decaling the bridge (with a choice of three view-screen images) and shuttle bay, I installed the windows. They attach in groups from inside; I referred to the box images to form a pattern of clear and dark windows to match the studio ship. This meant cutting some of the inserts apart. This isn't difficult, but the plastic is brittle and can crack if you aren't careful. Since I was lighting the model, I painted the inside of the dark windows black to block light. I sprayed the inside of the clear windows with Testors Dullcote to soften and disperse light. If I hadn't been lighting the ship, I would have used the white plastic to represent lit windows.

I had a problem installing the strip LEDs in the primary hull (due to my electronics inexperience, not the kit). The strips are polarized, so they won't work if they're backwards; the instructions clearly state this. What isn't clear is which side of the connectors is positive. The LED strips were clearly marked, but the connectors on the wires were not. From the instructions, the darker (black) wire connects to the positive



side of the strips, but it should be the lighter (red) wire.

The connectors slip onto the ends of the strips but need to be wiggled to find just the right spot for current. This was a tad frustrating when installing a long series of LEDs. Joining the hull halves jostled wires enough for some LEDs to go out, so I retested at every step before gluing.

Most of the lights fit easily, but the LEDs around the shuttle bay were more difficult. The secondary hull's stern is narrow, and there's a lot to fit. I had to grind out part of the inner hull, the outside of the shuttle bay, and even some LED bulbs before the hull would close. Styrene and putty shims filled gaps.

I neglected a note in the light set and painted part of the outside of the clear parts for the shuttle bay. So, light doesn't transfer as well as it should and the bay is a tad dark.

The Bussard collectors have individual plastic bulbs. These are clear in the base kit and need to be painted to match the orange glow of the real thing. The lighting set provides colored bulbs.

This is where the light set truly stands out. Each nacelle has a disc-shaped circuit board with 10 LEDs that fit around motors that spin the fan sections. These boards control the motor spin, the constant glow of the orange bulbs, and the random blinking of the smaller multicolored bulbs. Follow the schematics carefully — reversing the polarity to the motors so the fans spin in opposite directions — and you'll be rewarded with a great-looking effect. At first the blinking bulbs didn't work, but they've gotten better since. The port nacelle runs perfectly every time; the starboard takes a few minutes.

The ship's sleekness rates the time I spent filling and sanding the long seams on the nacelles and secondary hull. The gap around the saucer needed careful attention — lots of windows to avoid.

I painted subassemblies with the kit's suggested body color: Tamiya Japanese Navy gray (XF-12) lightened slightly with flat white (XF-2). This greenish gray looks just right compared to pictures of the original at the Smithsonian National Air and Space Museum.

Hand-painting details gave me an appreciation of the ship's elegance.

Bringing the four subassemblies together is simple for the basic model. Locating tabs and holes are large and hold the parts firmly, a nice touch given the vessel's top-heavy design. However, the wiring complicates matters: As I threaded the pylon wires through the small opening in the mounts and out the front to the secondary hull, I wished I had three extra arms and a larger vocabulary of curses.

But all problems went out the window when I plugged the model in and everything worked — well, almost everything. There are a couple of LEDs in the secondary hull that stopped working during construction. But the thing is lighted well as it is.

Size alone makes the finished model impressive. But the attention to detail — I've noticed stuff I'd never seen before — makes it a winner. I spent about 35 hours on my *Enterprise*, although only about 10 on construction. I had a few problems installing the lighting set (some of my own making), but nothing I couldn't overcome. Now all I need is Polar Lights' 1/350 scale refit *Enterprise* to display next to it.

— Aaron Skinner

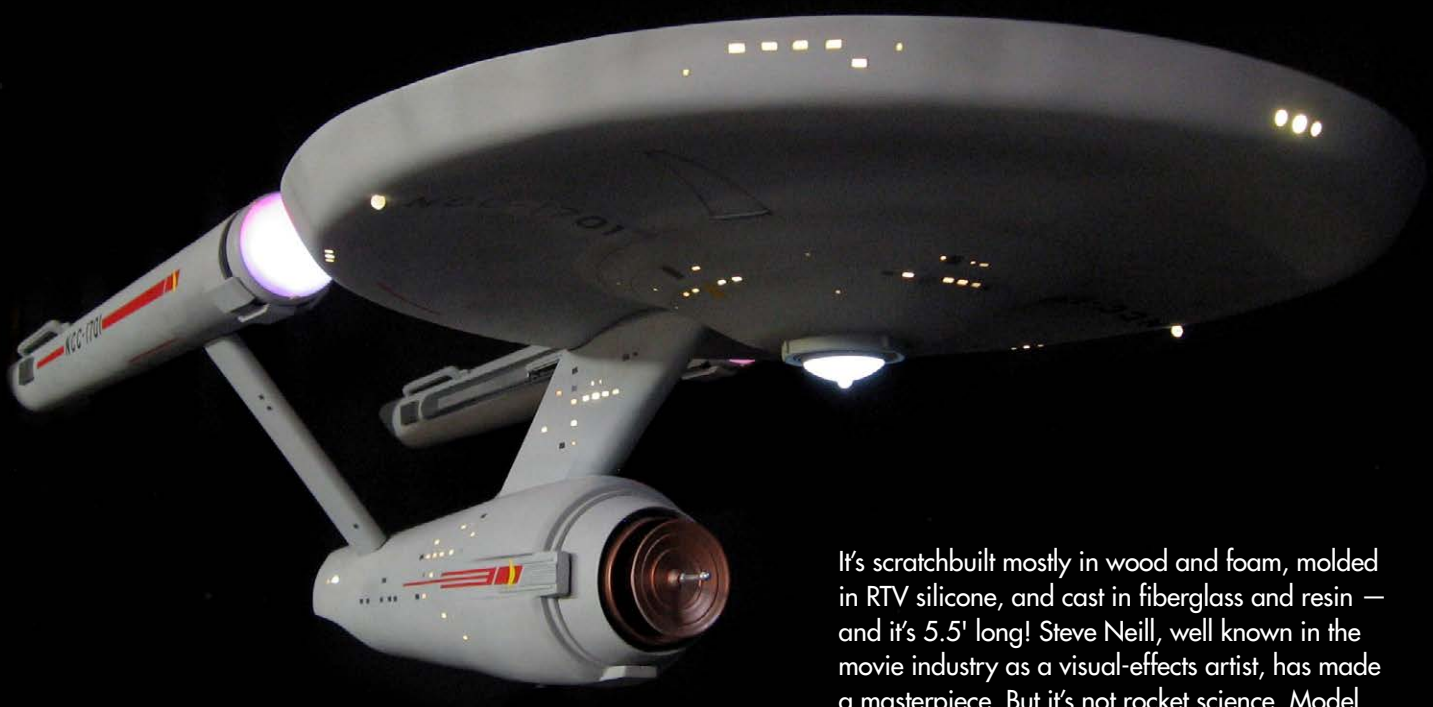
Kit: No. POL880/04 **Scale:** 1/350
Manufacturer: Polar Lights, 574-243-3000, www.round2corp.com
Price: $139.99 **Comments:** Injection-molded, 218 parts (1 metal), decals
Pros: Ease of construction; sturdy parts; optional windows; set up to be lit; accurate shapes **Cons:** Paint and decal instruction only on box

Kit: No. MKA007/06 **Scale:** 1/350
Manufacturer: Polar Lights
Price: $149.99 **Comments:** Injection-molded, 171 parts (95 LEDs, 39 wires, 4 printed circuit boards) **Pros:** No experience necessary; plug-and-play wiring
Cons: Connectors need wiggling to work; instructions could confuse novices

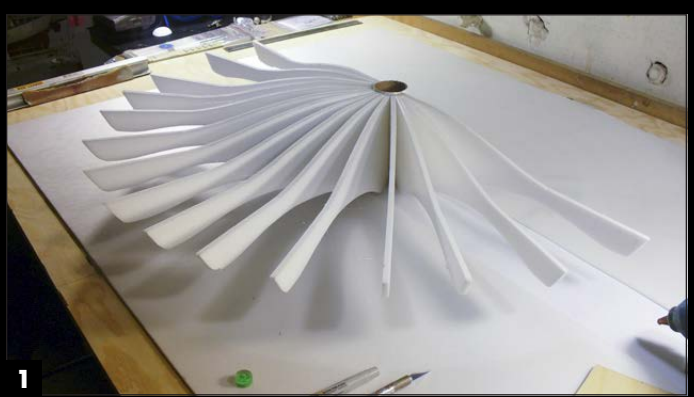
66" ENTERPRISE!

Steve Neill's 1/2 scale model of the original NCC-1701 is no small matter

BY MARK HEMBREE



It's scratchbuilt mostly in wood and foam, molded in RTV silicone, and cast in fiberglass and resin — and it's 5.5' long! Steve Neill, well known in the movie industry as a visual-effects artist, has made a masterpiece. But it's not rocket science. Model aircraft fliers will recognize the materials and techniques he used to build a replica of the original series (aka TOS) "Star Trek" USS *Enterprise* 11' filming miniature displayed at the Smithsonian's National Air and Space Museum.



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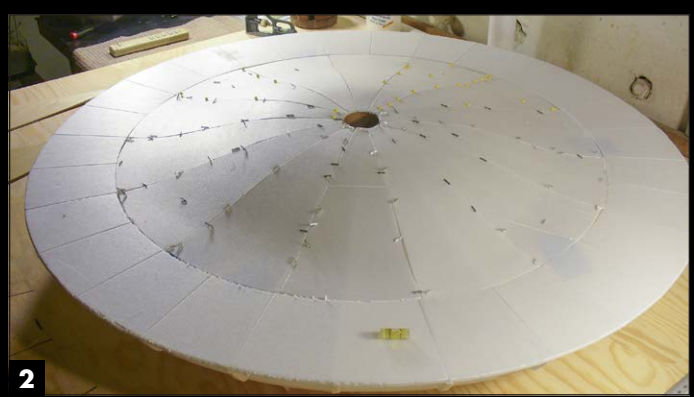
Steve's *Enterprise* begins with 28 ribs of Depron foam, often used for R/C aircraft. A hub centers the construction and comes in handy later, too.



2

Sheets at the circumference lock the ribs at the edges. Formed foam sheets cover each section, tacked in place with white glue and dressmaker's pins. This construction is repeated underneath.

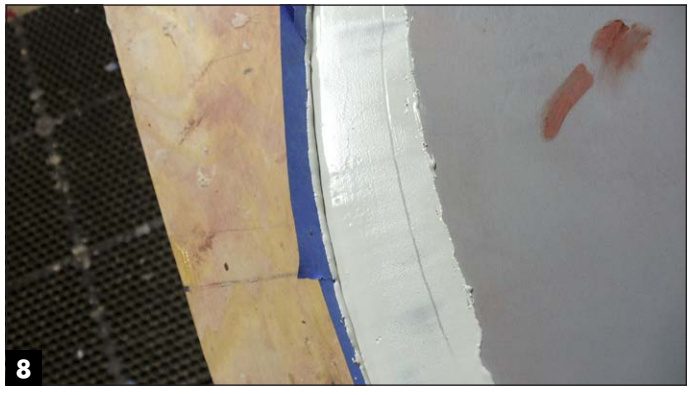
Micro-Fill balsa filler smooths the seams before Steve applies 4-ounce fiberglass cloth …

… and follows with a saturating coat of epoxy resin. "This layer is what gives it strength," Steve says. "And the cross section is absolutely in scale to the one in the Smithsonian, based on Gary Kerr's plans."

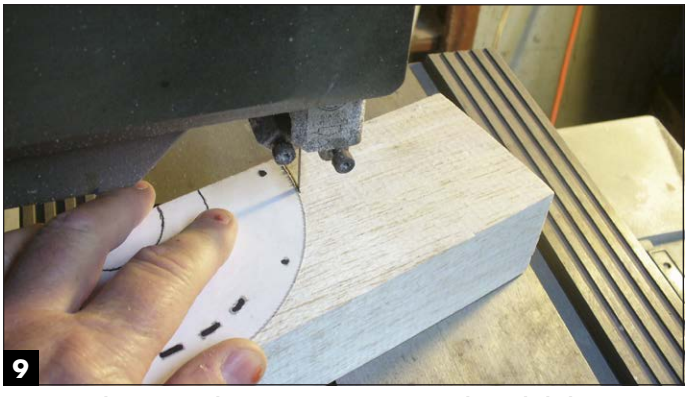
Evercoat Metal Glaze, a two-part polyester blending and finishing putty, "is the resin car-body guys use after they use Bondo," Steve says, "but it sands and carves much easier, and thins down at a much nicer rate."

A rib template attached to a brass-tube arm checks the contour. Steve says this method "is not too different from the original. They put plaster on a Lazy Susan and turned it until they had the shape, then sanded it. Then they used the plaster form to vacuum-form the upper and lower hull."

Two-part air-curing Bondo spot putty dapples the surface. Steve says, "I do it over and over until you can't see or feel any more problems. Then the primer comes."



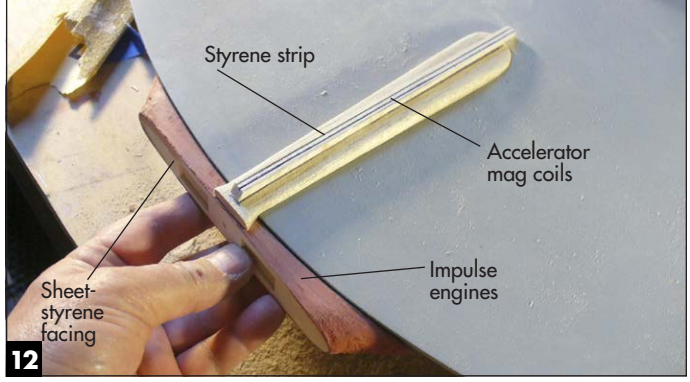
Steve applies more Evercoat, "because the saucer edge just wasn't quite perfectly round. It's really hard to do." Blue painter's tape helps set the edge, which is sharper and much more uniform after this step.



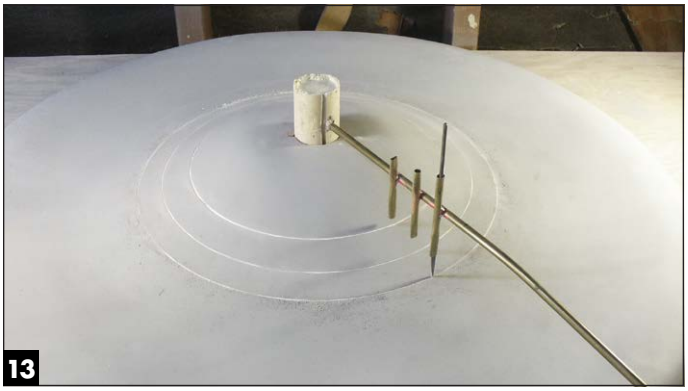
Turning to the command superstructure, Steve taped a scaled plan copy to a balsa block and roughed out the shape with a band saw.

He used a contour gauge and doggedly sanded the balsa to shape. "I'm a sculptor," he says, "so I have an eye for contours. Doing it this way drove some of my friends nuts, though."

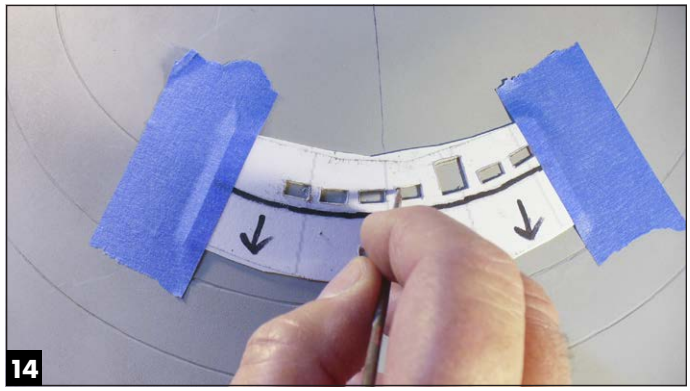
Steve attached balsa to a drill press, sandpaper to a contour gauge, and spun out the bridge module. "A couple of weeks later I went out and got a lathe," he says.



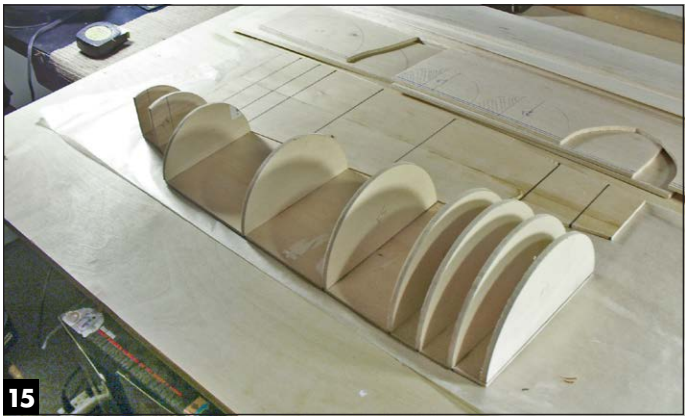
Shaped wood and a sheet-styrene facing serve for the impulse engines and accelerator mag coils. "No 3-D printers here," Steve says.



The hub and brass tubing form a beam compass to scribe lines and accurately place other features; a sharp rattail file does the circular scribing. "It's a crude rig, but it worked like gangbusters," Steve says.

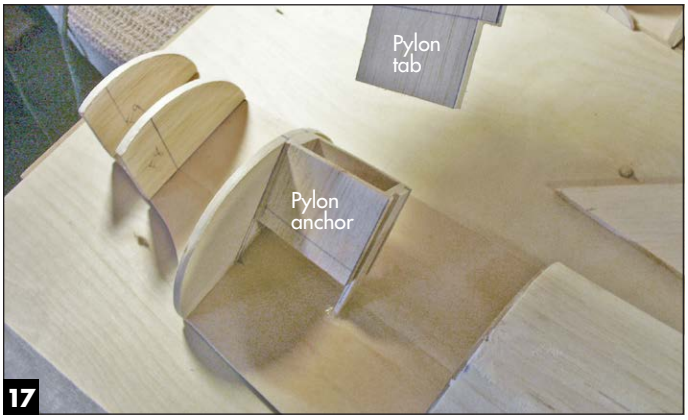


Scribing windows and bays from Kerr's plans; the black line matches the scribed line underneath, showing the template is on course. As on the original TV model, radial lines are penciled, not scribed.

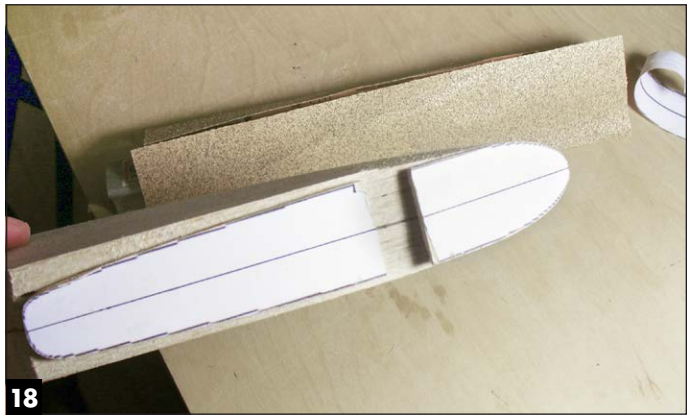


Steve used the plans to profile the engineering section in halves, and a scroll saw to cut formers from model-aircraft plywood.

Ammonia water makes wood sheet pliable for the assembly's skin. Then Steve wraps rubber bands around and lets the wood dry to shape.



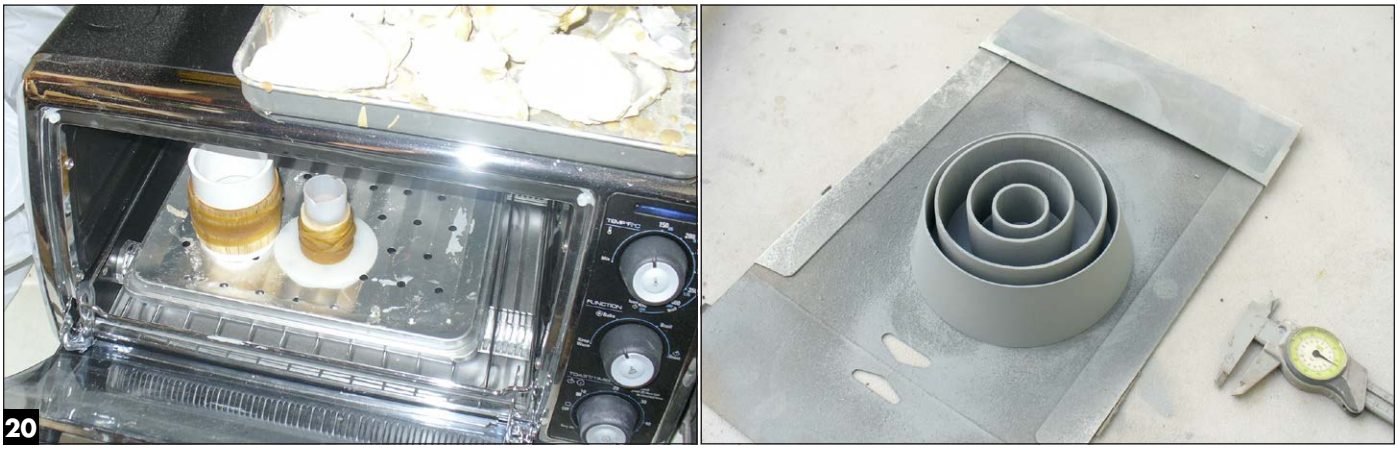
Steve built a firm anchor for tabs on the nacelle pylons to ensure they were angled correctly and would not sag. He sanded the pylons to shape.



More templates, more sanding as Steve shapes halves of the hull-connecting pylon.

19

Ribs on the shuttle bay door are blue painter's tape. After multiple coats of primer, removing the tape left grooves to replicate the bay door.

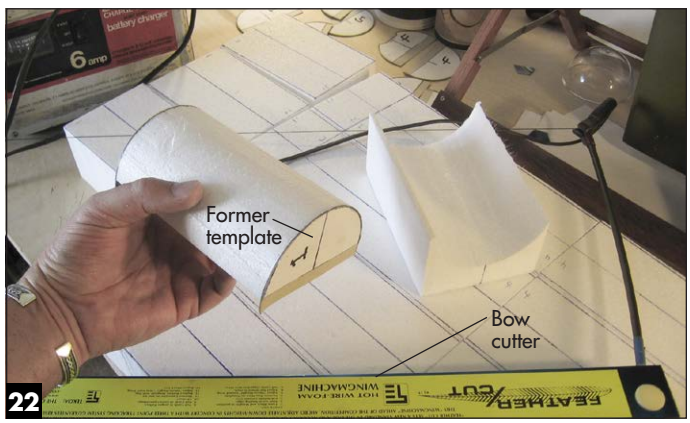


20

Ammonia water, rubber bands, and a little heat provide persuasion as balsa is formed into the deflector's concentric rings.

21

After trying wood, Steve switched to plastic foam for the engine nacelles. The foam is sectioned according to the plans …



22

… and cut to form with a Wingmachine hot-wire bow cutter. Steve cut the formers in cardboard and stiffened them with a coat of super glue.

23

The mag-flow shielding cowl (aft end of nacelle) is shaped wood wrapped in ribbed sheet styrene with rings of styrene on the end. The wood ball came from Kit Kraft, a hobby retail fixture in Studio City, Calif., since 1946.

24

Steve covered the nacelles with 3M Super 77 spray adhesive and applied fine fiberglass cloth, then coated it with epoxy resin, primed, puttied, and sanded smooth.

25

Various styrene structural stock was used for intercooler details. Later, these areas would receive photo-etched grilles.

26

Firing up his new lathe, Steve turned a deflector dish and its horn from hardwood. He says, "There was no way I was going to turn these parts on a drill press!"

27

Go time: Steve pours RTV silicone over the lower half of the saucer to make the first of many molds. The mold flask is water-based sculptor's clay.

28

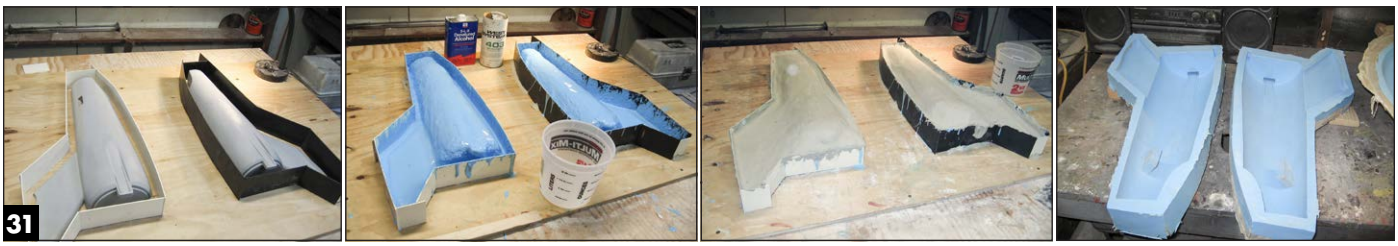
UltraCal 30, a fast-acting gypsum cement, gives the big silicone mold rigidity. "We use it for making molds in creature shops," Steve says. "It's much harder than plaster." He reinforces it with burlap fiber; wood staves are embedded to make the mold easier to handle.

29

Into the saucer molds go a gel coat of epoxy resin (tinted black to block light), a layer of fine fiberglass cloth, and fiberglass mat. "It's not the prettiest thing in the world, but we won't be looking at this side," Steve says.

30

Shaped plywood cross members reinforce the saucer as well as the connection to the hull connector.



31

The engineering hull and the hull connector halves are consolidated and placed in mold flasks made from thick styrene sheet. Then RTV silicone is poured, followed by UltraCal 30 to keep the silicone molds from flexing. Finally, the molds are ready to receive resin and fiberglass.

32

Plywood stiffens the engineering hull and connector. Steve will cut channels to allow electrical wiring to pass through.

33

He used the molds to cast smaller parts in white Alumilite casting resin, rather than fiberglass.

34

The hull color is a 2:1 mix of Testors Model Master Acryl paints, flat white (4769) and light ghost gray (4762), respectively. Windows are filled with acrylic dental resin, which glows more realistically than clear parts.

35

Bussard collectors on the TV model "had Christmas tree lights and broken pieces of glass," Steve says. "I used aluminum foil and blinking green, blue, red, and yellow lights. I have 12-volt gear motors that can revolve at 60 rpm or slower, depending on the power supplied. They turn very smoothly and make a lot less noise."

At the end of a years-long mission, Steve's *Enterprise* has a permanent place of honor in his home. Another, produced from the same molds but with interior detail and lighting, is headed to the Museum of Science Fiction in Washington, D.C. — but not before a christening party where members of the original "Star Trek" cast will sign the base of the model before it sails to further fame. And there's more — much more — at sneillfx.net. **FSM**