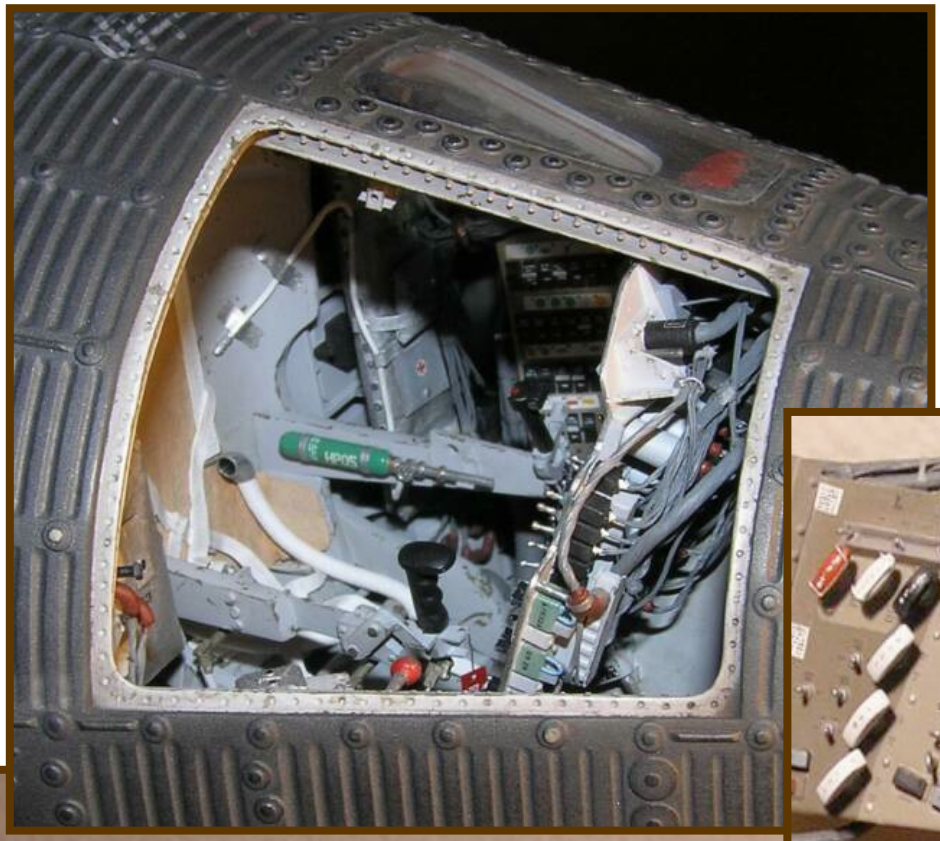
FRIENDSHIP 7

Building and Detailing the 1/12 Atomic City Mercury Scale Model



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INTRODUCTION

This booklet describes how I built and detailed the 1/12-scale Mercury spacecraft model kit produced by MRC/Atomic City.

I am thankful that a model kit of this historic subject in this scale is available. Other kits, some of which were produced in the 1960s and 1970s, are in smaller scales and are of relatively poor quality. The Mercury capsule is a small vehicle, essentially a spacecraft built around a man. As such, it lends itself well to being represented in kit form at a larger scale, and 1/12 is ideal.

In terms of a review, the MRC/Atomic City kit is generally well produced. The outer hull, with the exception of the hatch, is molded in black, while most of the interior parts are molded in light gray. The instrument panel parts are cast in a hard clear plastic, which is a nice touch for those interested in back-lighting the dial faces and switches. The escape tower parts are molded in red. An astronaut figure is included, cast in vinyl, and is of excellent quality. A major drawback is the model's lack of interior detail. It lacks, for instance, the forward bulkhead with hatch, helium tanks, tape recorder, interior hull details, and other parts. The interior arrangement that is provided is generic; though, it would have to be for simplicity sake in that each Mercury had a different capsule arrangement. Still, it is a marvelous kit to work from. In the end, however, I ended up only using four kit parts: the outer hull, the forward recovery compartment hull piece, the backshell piece, parts of the seat, and a section of the kit's aft bulkhead part. The rest of the model is scratch-built.

I have built this kit twice, both concurrently. One was built for a client as *Sigma 7* as it would have appeared at launch, complete with escape tower and astronaut Wally Schirra. The complete model is impressive straight out of the box, to be sure. For my collection, I built a representation of John Glenn's *Friendship 7* as it appeared shortly after reentry. I selected this subject because of its historical significance, and chose a post-flight configuration because of the opportunity to explore weathering and distressing techniques.

GETTING STARTED

Oddly, there is not much data on *Friendship 7* readily available online. But the most important resource (beyond the actual vehicle, located at the Smithsonian National Air and Space Museum in Washington, DC) is the NASA Project Mercury Familiarization Manual (NASA SEDR 104), November 1961. This document is similar in some ways to the kind of manual you might find for a car in that it contains many drawings of individual components and their placement, plumbing and wiring diagrams, and various other interesting elements that are invaluable to a modeler wishing to build a *Friendship 7* model. Essentially, this was the only resource I used, occasionally supplemented by photos found online.

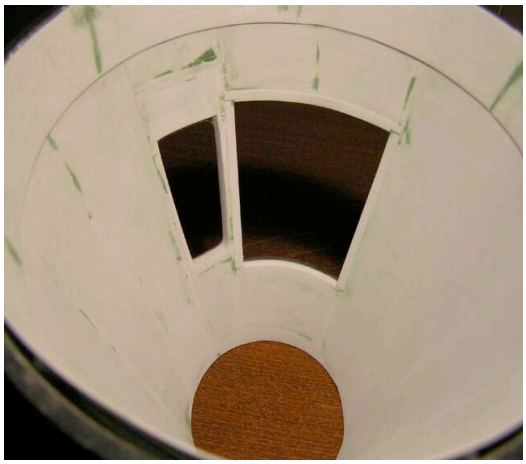


Figure 1.

PHASE I - THE INNER HULL

Obviously, a spacecraft will have an outer hull exposed to space and an inner hull. Between these are support ribs, insulation, cabling, and other hardware. I also wanted to light the model with

two LEDs, so I needed this gap to run wires to a power source. More on that later. I built frames around the window and the hatch of about 1/8" thickness using plastic square rod. I then added stringers using the same stock throughout. Upon this, I cemented sheet plastic. This is a bit of a challenge given the cone-shape involved, and gaps here and there are inevitable. Fill these with spare plastic sheet bits and putty. When dry, sand smooth (Fig. 1). At this time I also sanded the exterior smooth, removing mold seams and the softly molded rivets. I was determined to replace these much later anyway.

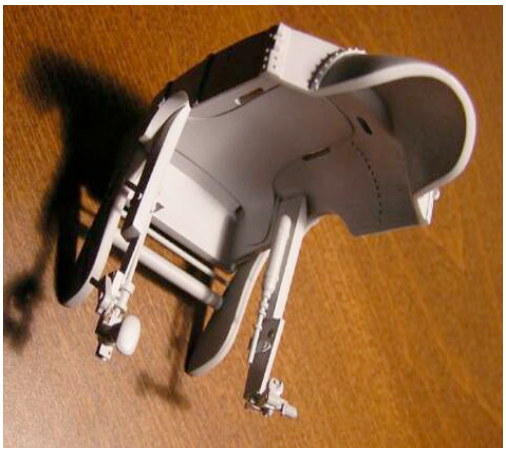


Figure 2.

PHASE II - THE SEAT AND AFT BULKHEAD

For some reason, I started work on the seat. Basically, the Mercury Program used two types of seats, each molded to the shape of the particular astronaut who would use it. The major difference between the two seats involved the leg restraints. The type used for John Glenn's flight included leg restraints; the later flights did not. Unfortunately, I made an error in research and ended up making one of the later versions without the restraints. A sharp eye will pick up this omission in my model. The lesson here is to pick you subject, then carefully note the type of seat and, as we will see later, the instrument panel configuration.

The seat is straight forward. I used the kit's seat, but cut it up significantly and added components. For instance, I fashioned new arms. These arms include the pitch, roll, and yaw controls (for the right hand) and the abort stick for the left hand. It is important to note that the attitude controls will physically link with valves controlling the reaction control thrusters. This means that later on, the seat will need to be linked with actuators - we'll get to that later. In any case, all the parts are plastic bits, with rivets made from the smallest diameter styrene rod available from Evergreen Plastic, chopped up like you would a sausage, then applied by poking with the tip of a sharp knife. The attitude handle is a plastic rod bit carved to look like a hand grip, whereas the abort handle is more of a straight stick. An oxygen bottle is attached to the left arm, and is apparently used to supply air directly to the astronaut's helmet as required. I also cut six slots in the seat shell for the harnesses. A coat of Tamiya Gray Primer was applied, straight out of the rattle can (Fig. 2). It turns out the color is ideal for the interior gray of the Mercury capsule, so I left this color as is throughout.

Next up is the aft bulkhead, where all manner of components are affixed (Fig. 3). Like the actual spacecraft, these components are situated on shelves attached to the aft bulkhead. Behind the aft bulkhead are a few other components and wiring, then the heat shield. So, I cut a circle of sheet styrene the diameter of the inner lip of the kit's heat shield part, then cement that

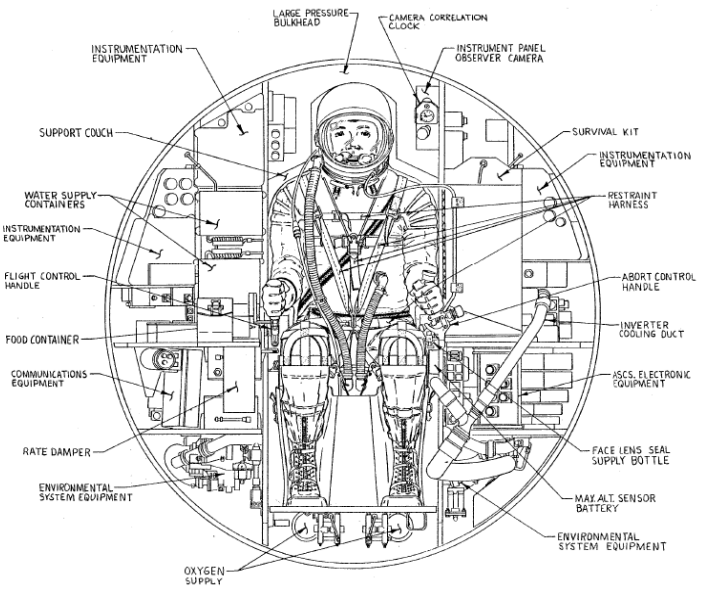


Figure 3.

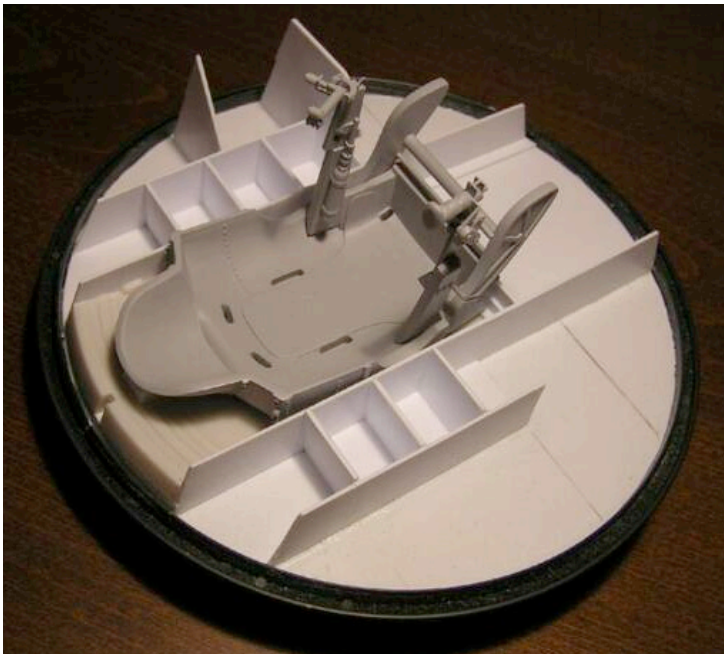


Figure 4. Shelves going in! While the shelving seems to remain unchanged from craft to craft, the instruments that were placed upon them did vary for each mission. Details about the differences in each craft can only be determined by visiting the actual article, because this information is not easily found online or in reference materials. In any case, all Mercury vehicles had six batteries immediately to the left and right of the astronaut. Often, items like emergency rafts and survival kits were attached in front of these batteries, obscuring them from view. Most of the components described in the NASA Familiarization Manual appeared "standard", so I just went with that and added a bit of artistic license here and there.

in. Upon this, I draw plumb lines and find the seat location. From there, I am able to determine where all the shelves go. The easiest shelves to fashion are those for the batteries (fig. 4), which are square in shape. The other shelves had different shapes to accommodate the curvature of the hull and facilitate routing of cables.

Figure 5 shows the aft bulkhead with all shelves in place. Note the different shapes of the shelving. Note also the small portion of the kit's aft bulkhead (beige-colored) used as a rear base for the seat. It is important to constantly test fit between the aft bulkhead shelving and the main hull piece to ensure a snug fit. Indeed, test fitting the aft and forward pieces will be required throughout the build process in order to avoid nasty surprises. I also added "rails" along the inside walls of the battery compartments, using a small gauge of Evergreen Plastic channel stock. Once assembly was completed, I sprayed this with Tamiya Gray Primer. I then attached the seat.

Next, I fashioned the myriad components, beginning with the amplifier-calibrator (complex box in the lower shelf seen in Fig.6). Again, the NASA Familiarization Manual is key to making these components, as

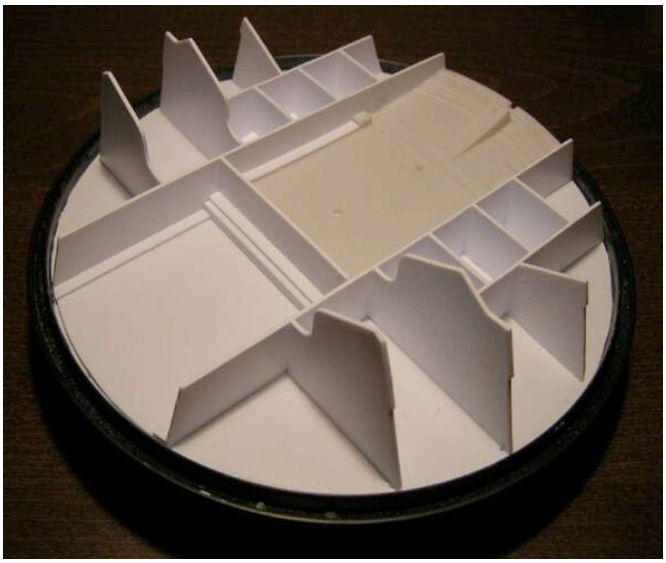


Figure 5.

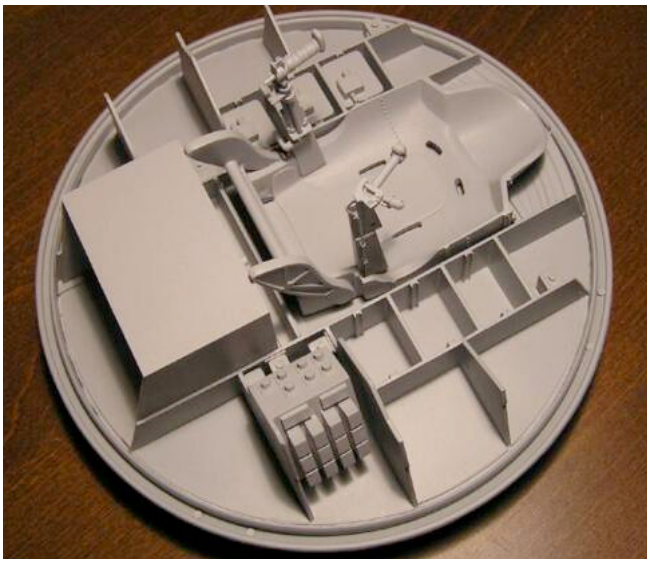


Figure 6.

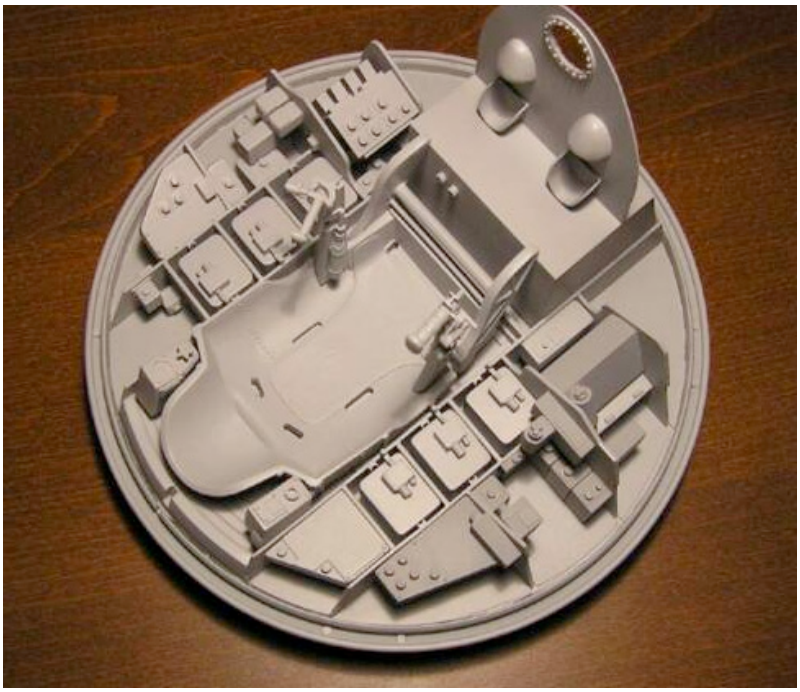


Figure 7.

in many cases the shape is very clearly understood. I also built a box structure under the seat. Within this compartment on the actual craft there are environmental hardware, including plumbing, filters, and pumps. The tubing that supplies the astronaut with air comes from this compartment, for instance.

In addition to the amplifier-calibrator, I needed to build six batteries, transducers, gyroscopes, inverters and other "boxy" equipment. These are easy to build as most are simple six-sided boxes. Others have irregular shapes, apparent in the diagrams, but equally easy to fashion. I basically cut pieces and measured them against the shelves to make sure clearances were maintained. I also glued on circular bits cut from plastic rod - these will be the cable connectors, which are tackled later. All components are then sprayed with Tamiya Gray Primer before being glued in place with super glue.

Soon, you will get something that looks like Figure 7. In this photo, you will notice the floor piece has been added. I could not find good resources on how this floor piece looked, and you will see later on that I dramatically alter it from what you see here, based on fit issues and aesthetics.

PHASE III - THE INSTRUMENT PANEL

For now, I put the aft bulkhead way and began work on the instrument panel. The instrument panel is perhaps the most unique feature on a Mercury spacecraft because of its complexity, the colors used, and the fact that you can easily see the guts from the outside. For a model-maker, this is an interesting challenge. It is critically important that you have a good understanding of the instrument panel for your particular subject because this piece of equipment is different from vehicle to vehicle. If you screw this part up, an astute his-

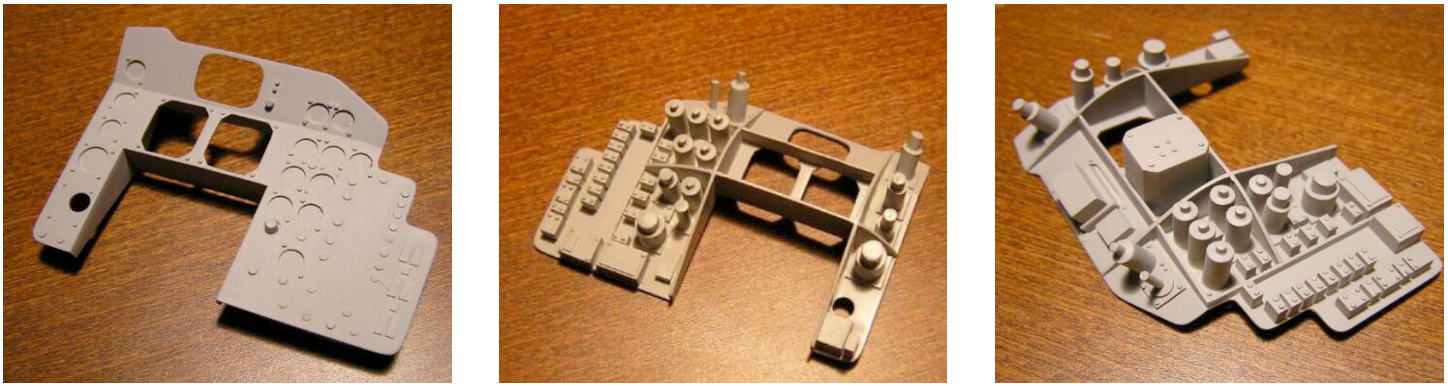


Figure 8. Various views of the instrument panel in progress. Much of the internal arrangment is conjecture - I was aiming for a certain aesthetic here - "busy greebly". I would often airbrush the assembly with Tamiya Gray Primer at the conclusion of each phase, as it helped me see how "clean" the build was going. One must be careful not to over do it, lest detail get obscured. Each component will have a cable attached, which at the time I was dreading...

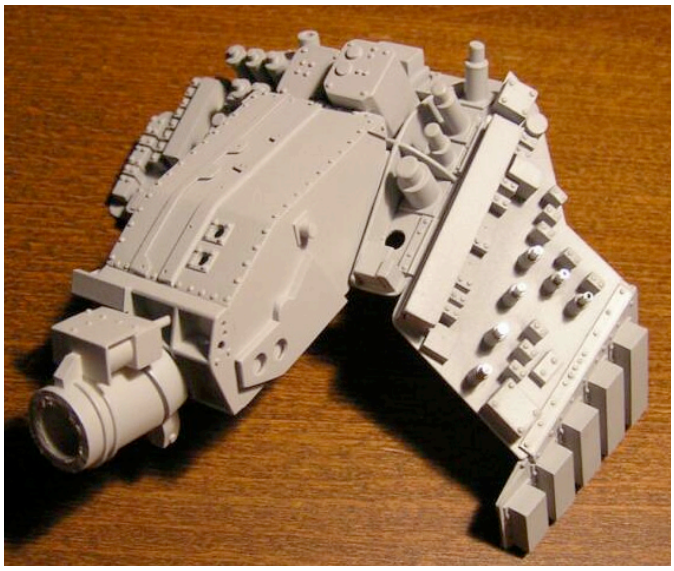


Figure 9.

torian of spaceflight will know it! I begin by cutting out the main sections from sheet styrene using the kit's parts as templates. I then carefully cut out holes where the dial faces will go using a punch and die set. Following this, I build up the frame behind the panel, some of which will be seen when the model is completed (Fig. 8). The frame also adds strength and structure to the panel, as it does on the real thing. I glue plastic sheet squares behind the holes for the dials, then glue in the avionics boxes and cores of each instrument (like an aircraft of the era, each round dial more or less translates to a cylindrical avionics box). The three center instruments are box shaped and large compared with the other instruments. I also add random boxes back there, representing switch relays and the like. The idea is to make this area look super busy.

Next up comes the periscope housing, upon which the instrument panel will affixed. This oddly-shaped compartment is easy to construct, though time-consuming, because drawings in the NASA Familiarization Manual are clear and understandable. A bunch of rivets are required, and as before are made by slicing the thinnest round stock available by Evergreen Plastic. These were glued in place by poking each with a sharp knife, dipping in cement, and sticking to the part. The nice thing is that these can then be manipulated while the glue is drying, at least for a minute or so. There are about 100 rivets on the compartment, but the end result is worth it. In figure 10, you see the other side of the completed assembly, showing the tilt of the periscope viewer. At this point, I found it necessary to do a fit test with the instrument panel, aft bulkhead, and spacecraft hull piece, making sure all the assemblies more or less fit well. This process revealed a problem with the floor section, so I significantly modify this. A slot is cut and "decorated" with rivets and instrument boxes - this will allow me to slide the aft section forward into the spacecraft, since I decided the instrument panel was going to be glued to the forward section, unlike the kit engineering, which called for the entire assembly to plug right into the forward section.

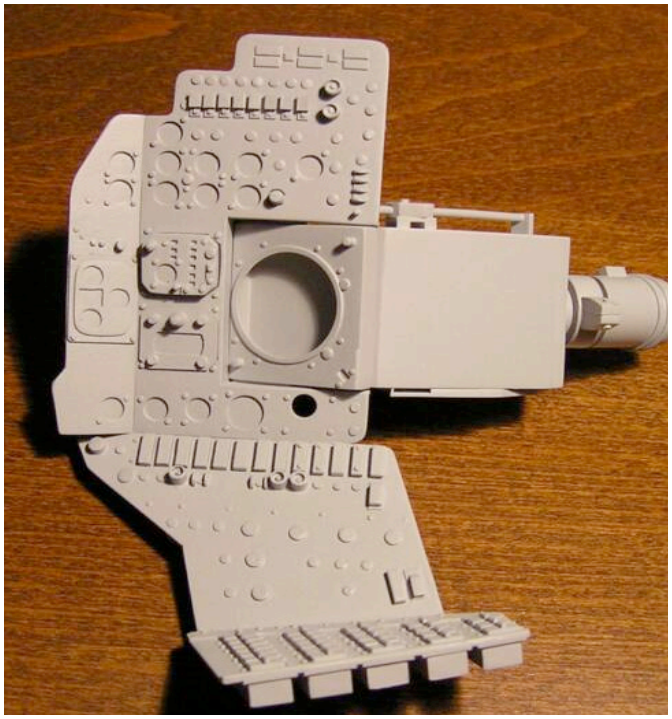
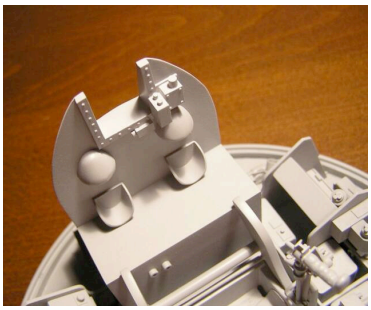


Figure 10.

Next, I painted the various color sections of the instrument panel. Apparently, it was Glenn's idea to color code sections of the instrument panel to clearly define controls for communications, navigation, environment,

Figure 11. Slot for periscope fit when the time comes.



and so on. I mixed the paints to approximate the actual colors, using Poly-Scale Acrylic paints. Figure 12 describes the mix. Masking these areas off was a major challenge, but worth the patience. I find the best masking tape is Tamiya's yellow tape.

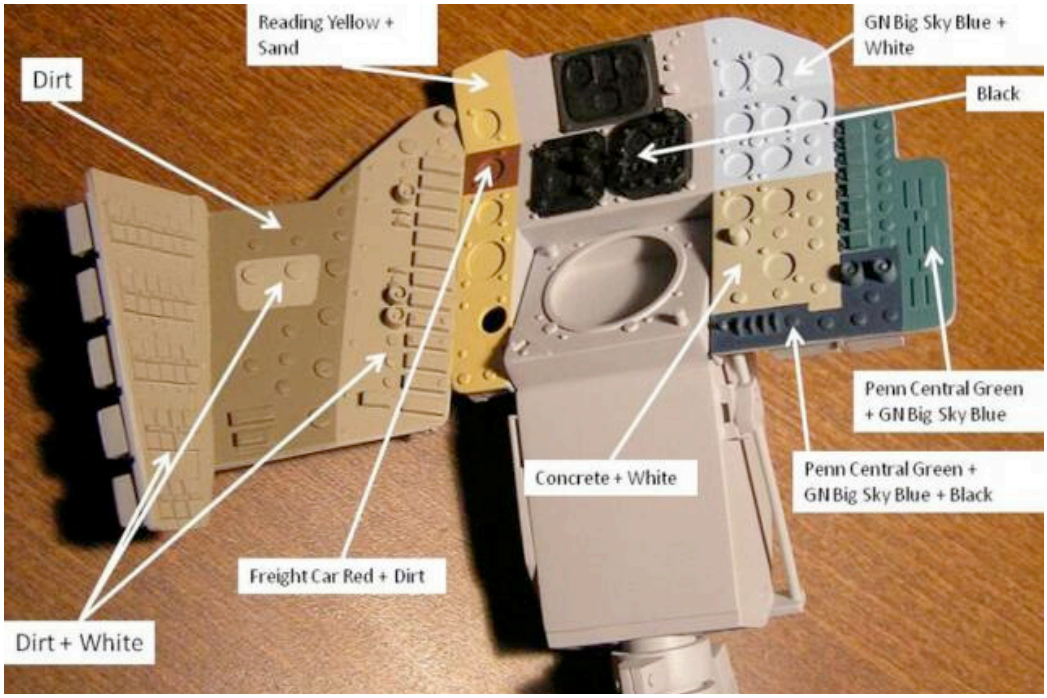


Figure 12. Colors used for the instrument panel.

Once general painting was completed, I added the details. Examples are the charts pack on the front of the periscope compartment (made with sheet styrene and Milliput with tape fasteners), dials and knobs, and clear plastic finger guards (probably the most difficult thing to deal with!). The periscope viewer includes several layers of clear plastic (with a layer of clear yellow), to provide some interesting depth. The inner-most layer is scribed to simulate reticles.

I then sprayed the assembly with Future and added decals. These decals were made by using the instrument line drawing in the NASA Familiarization Manual. This image was resized in Power Point, then printed to decal paper. All the instrument dials were reproduced in detail, as was the stenciling for each switch. These are applied, and the unit sprayed again with Future, then with a dull coat. All the dial faces were then covered with clear plastic discs cut out using a punch and die set, finished off with a drop of Future.

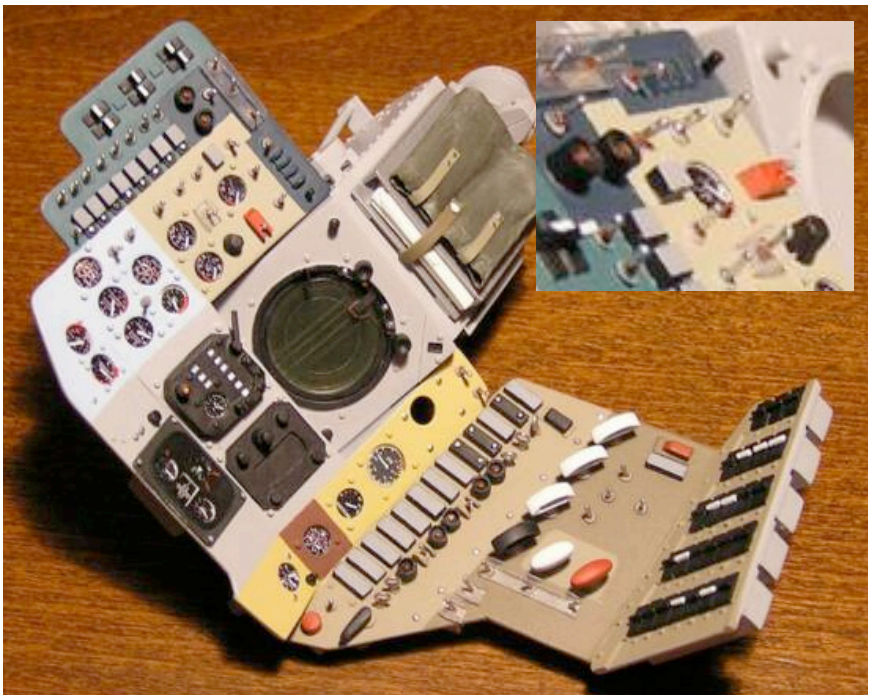


Figure 13.

Finally, I added toggle switches - copper wire painted with Testers Chrome Silver. To get the toggle look, a bead of Chrome Silver was added to the tip and repeated until the desired effect was achieved (inset).

Now comes the fun part - adding the cables and wires. I more or less had fun with this, but made sure that generally speaking the cables went in the right directions based on photography (the NASA Familiarization Manual has nothing on wire harness placement, sadly). So, I drilled small holes wherever cables

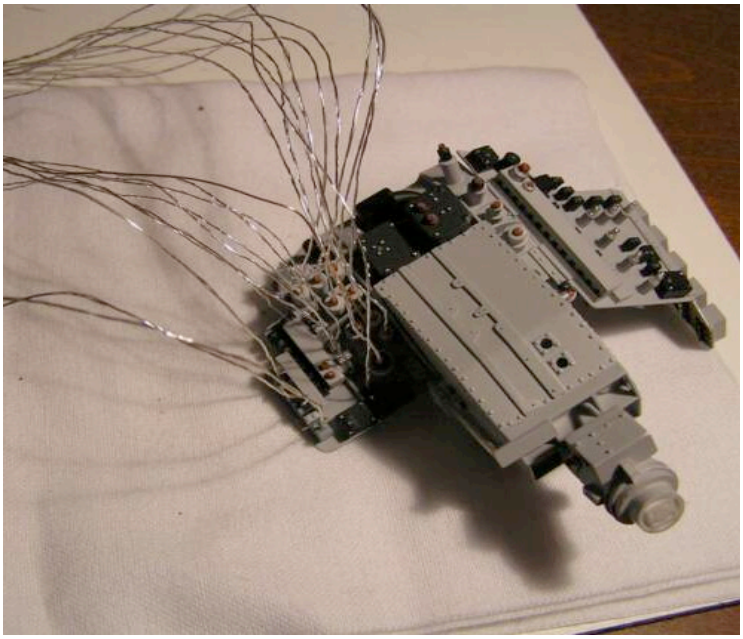


Figure 14.

needed to go. I then braided several very thin metal wires together and plugged them into the holes. A drop of super glue seals them in (Fig. 14). Repeat until all the instruments are "wired". Route them carefully, with all going more or less away from the hatch. Tie bundles together using thin strips of waxed dental floss and trim (this effectively simulates the string used to bundle these - cable ties were only two years old at the time, and I do not think they were used yet). For the real thing, the idea behind this is that the astronaut should be able to bend the instrument panel 90 degrees to facilitate egress through the front hatch in the event the side hatch cannot be freed. The cables need to be going in one direction if this is going to work! Anyway, Figure 15 shows how this looks.

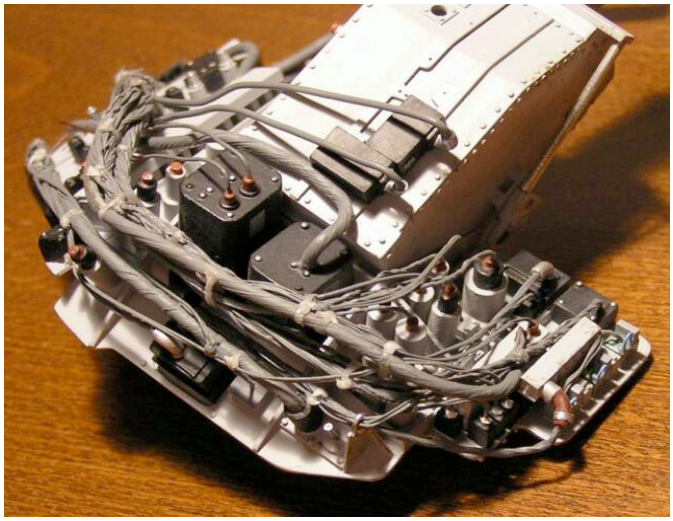


Figure 15.

Final touches include small serial number placards for various instruments (these were dry transfer decals from my stash and can be found online), and the handwritten and typed "post-it" notes Glenn stuck all over the panel. I replicated these as best I could by typing random nonsense into text boxes in Power Point, then reducing the font size, and printing to decal paper. I transferred the decal to bits of painted aluminum foil, then glued them in place.

I added lockwire to the visor compress/decompress valve actuators (the upper red and white knobs on the center left panel) and various scratch marks around the periscope compartment. Apparently, the actual vehicles were used for training before flight, and this is apparent in the wear and tear. Figure 16 shows the completed instrument panel. In many ways, this is a finished model in its own right!

PHASE IV - THE INTERIOR

Following completion of the instrument panel, I proceed to fuss with other elements of the interior. These include the forward bulkhead with hatch, helium tanks, tape recorder, various instrument boxes, attitude actuators, wire harnesses, and a bunch of rivets. First, I built up the helium pressurization system, which supports the reaction control system. This consists of two wooden beads collected from a craft store, and a bunch of copper wire and plastic bits. (Fig. 17). Even though I knew that 90 percent of this work would not be seen, it felt necessary to be complete.

Next, I worked on the forward hatch. The hardest part was finding something with the correct concave

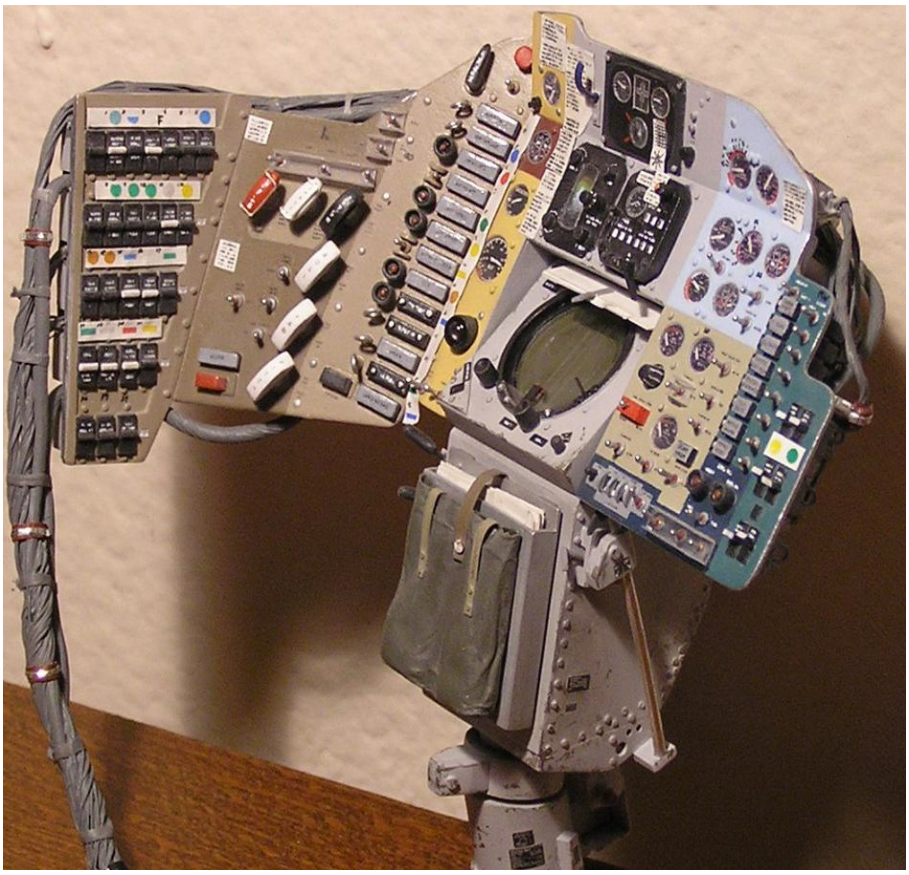


Figure 16.

shape, which I eventually found in the rounded plastic part of one of those battery-powered tap-lights for closets one can buy almost anywhere. After cutting the plastic to the right circumference, I built up the hatch parts using plastic sheet and various bits. This was then painted with Tamiya Gray Primer (fig. 18).

With these elements complete, I began work elsewhere on the interior. A window frame was added with many rivets, and various equipment boxes were added, including the right console just below the hatch opening. I also added the reaction control thruster actuator linkage system using plastic rod and small bits. Wiring and an air hose were also added. The air hose, which comes off the environmental control system below the astronaut's seat, extends into the instrument panel and is designed to cool instrumentation. This was made with a thick solder gauge wrapped with copper wire. When painted, this gives the effect of a ribbed hose. See Figure 22 on the next page to get a sense of what this looks like.

At this point, I decided to add two lamps using ultra-bright white LEDs powered by a 9-volt battery whose current is reduced by a 350-ohm resister. I built small housings for each LED, and capped both with clear blue plastic rod sliced in half down the long axis. The resultant glow looks like a florescent bulb, producing a

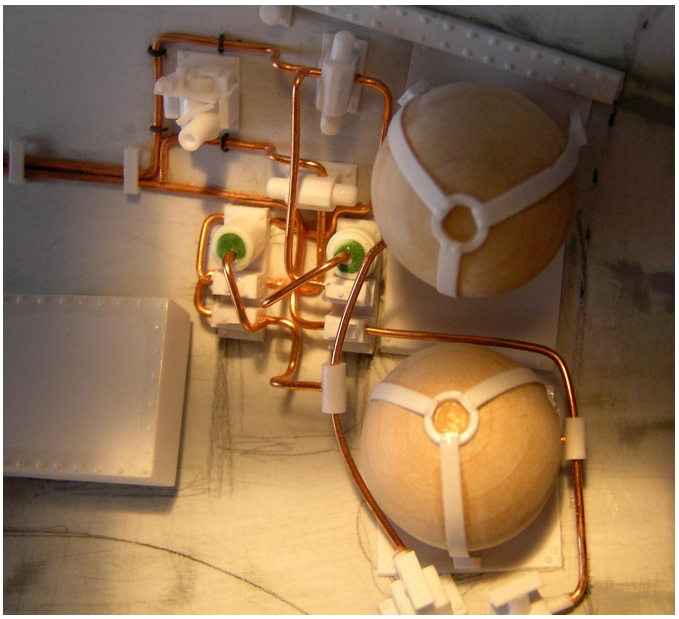


Figure 17.

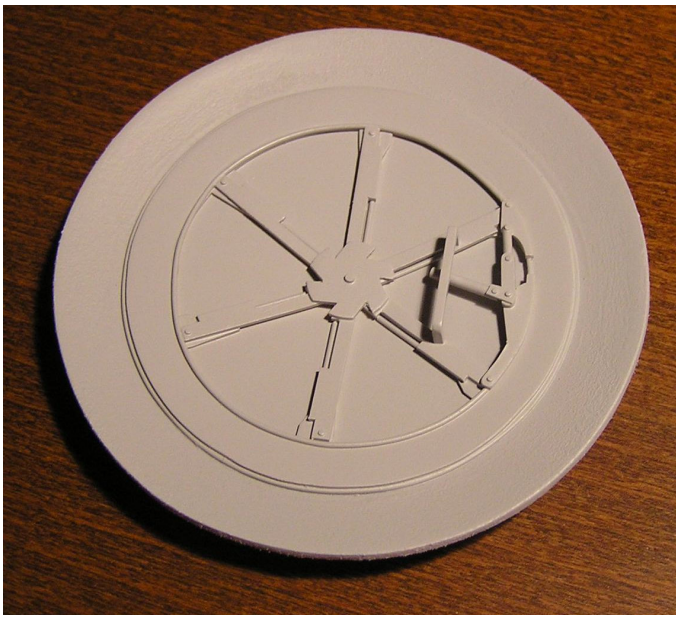


Figure 18.

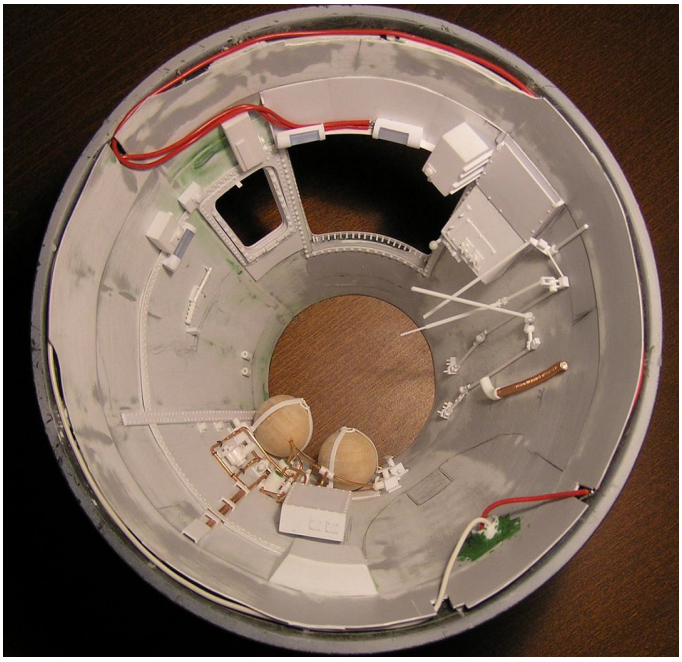


Figure 19.

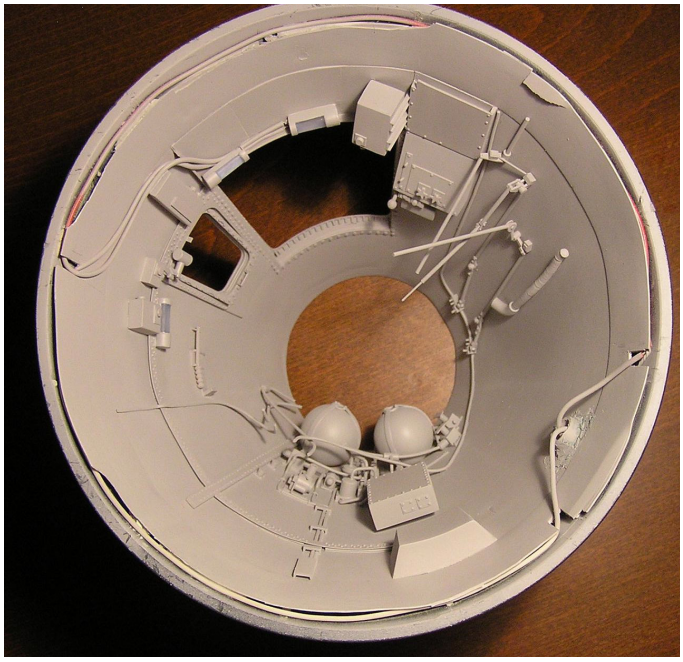


Figure 20.

faint bluish-tone that is perfect. The wires were routed through an opening that will be covered by the seat and environmental housing. The ends of the wires were tipped with pins, which will be received by the female connector when the model is complete. During the remainder of construction, the leads were taped to the side of the hull so they were out of the way. Figure 19 shows what the interior looks like when construction is complete, and Figure 20 shows the same after it was sprayed with Tamiya Gray Primer. Figure 21 shows a closeup of the light housing and other subassemblies before painting. Parts of the wires were subsequently covered by various equipment boxes and greebly. The third light (on the left in Fig. 21) is non-functional - two LEDs are plenty to light up the interior (inset).

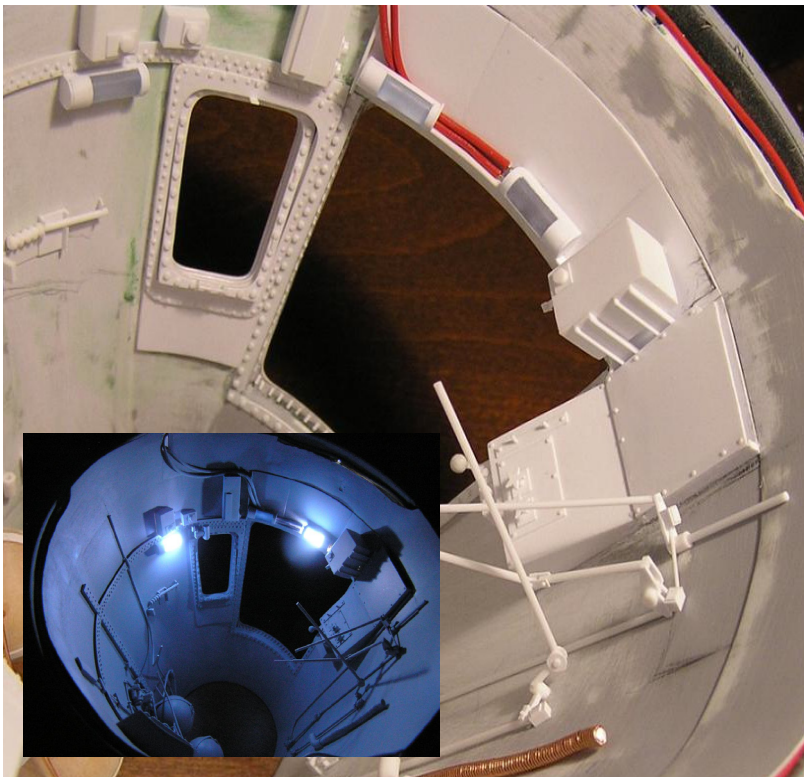


Figure 21. View of interior showing location of lights and other components.

Figure 22.

PHASE V - PAINTING THE INTERIOR

With a base coat of Tamiya Gray Primer, painting various components was relatively easy. Only a few colors were used - Flat Black, Flat White, Flat Tuscan Red, Jet Exhaust, Bright Orange, Flat Dark Green, Flat Tan, Copper, and Chrome Silver. The helium tanks received a coat of Dark Green, and various components were painted black. Seat padding was added using chamois from my stash of rags, then painted Flat Tan. This helped provide the right kind of texture. Helium lines were painted copper, mainly to add a bit of color. The emergency flashlight was painted Bright Orange, and various small parts received a touch of Chrome Silver. Wire harnesses were painted Flat White, and where cables or wires connected a bit of Flat Tuscan Red was added to simulate anti-arcing compound (sometimes called potting compound). Finally, paint chips were added using Testors Jet Exhaust, and weathering with gray and black chalk powder completed a "used look". Below are figures showing the completed interior.

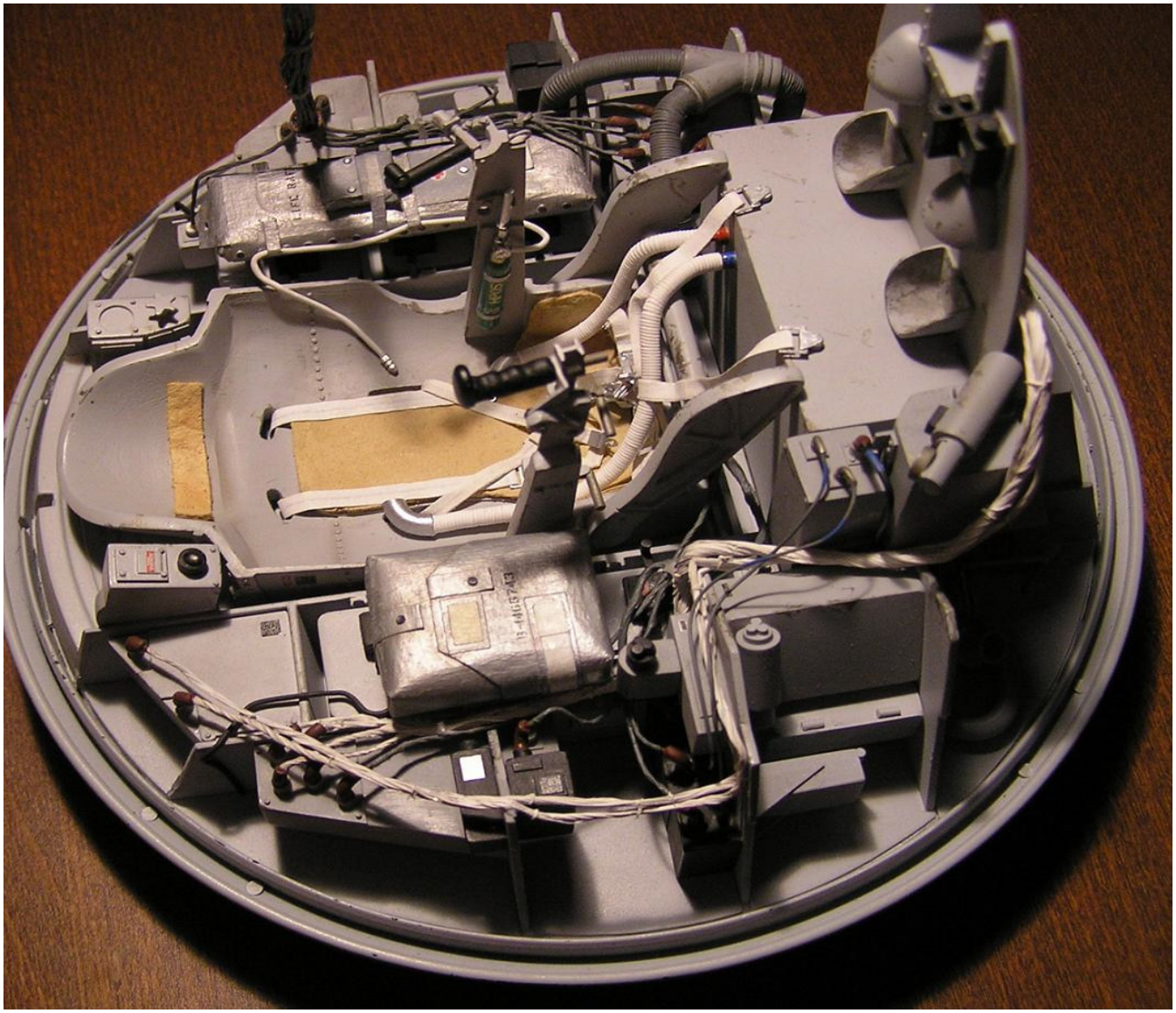


Figure 23. Note ribbed hoses, all of which are made the same way as depicted in Figure 22. Life raft and first aid kits are made by covering bits of scrap wood with masking tape, painted with Chrome Silver. The result is something similar to a dusty aluminum color, just what I was looking for. Harnesses and belts were also fashioned from masking tape, all painted white. Finally, small placard decals were added here and there.

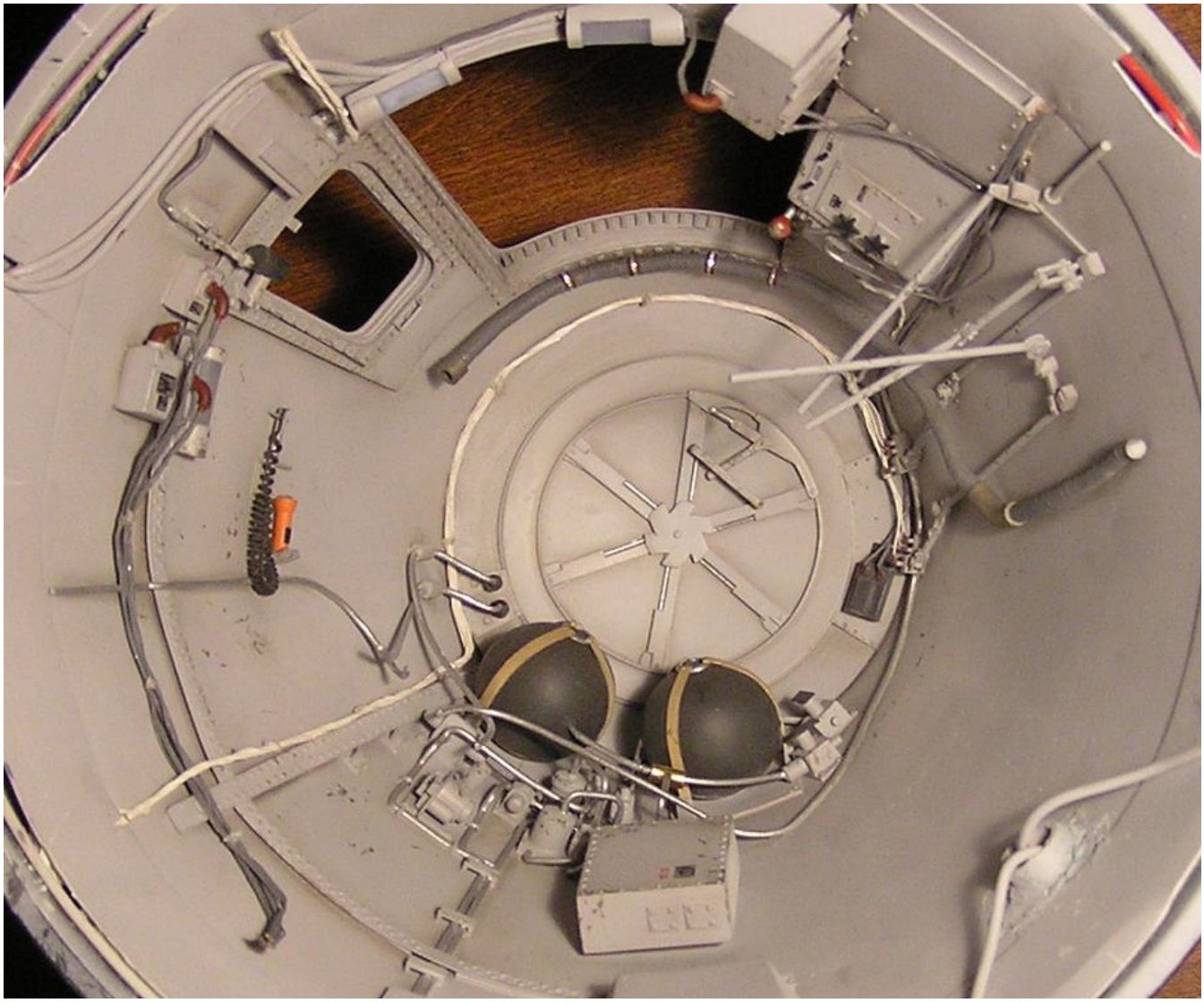


Figure 24. The attitude control linkages are evident to the right. These will ultimately be connected to the pitch, roll, and yaw control stick on the seat, so obviously a good deal of test fitting was required to make sure that final assembly woudl result in these parts merging properly. The right console is more or less accurate (this unit also changed dramatically from mission to mission), but the equipment boxes on left near the window are made up - sometimes I added small details to increase the sense of clutter int he cabin.

PHASE VI - ATTACHING INSTRUMENT PANEL TO INTERIOR

It may seem strange to characterize the gluing of two parts a critical phase in the assembly of this model, but if this did not go well, it was unlikely I would continue with the build. These tow pieces had to come together just right. Once installed, further detailing could take place. Then, of course, the aft bulkhead with all the components and the seat would slide right in, fitting like a glove. At least, that was the hope.

Figure 25 shows the instrument panel installed in the interior. It also shows additional detail added to the window area, including sun shades, a mirror, one pane of glass (clear sheet plastic, of course), and other elements. All of these are clearly detailed in the NASA Familiarization Manual. Needless to say, this step went very well! At this point, I was excited the project was progressing into something recognizable.

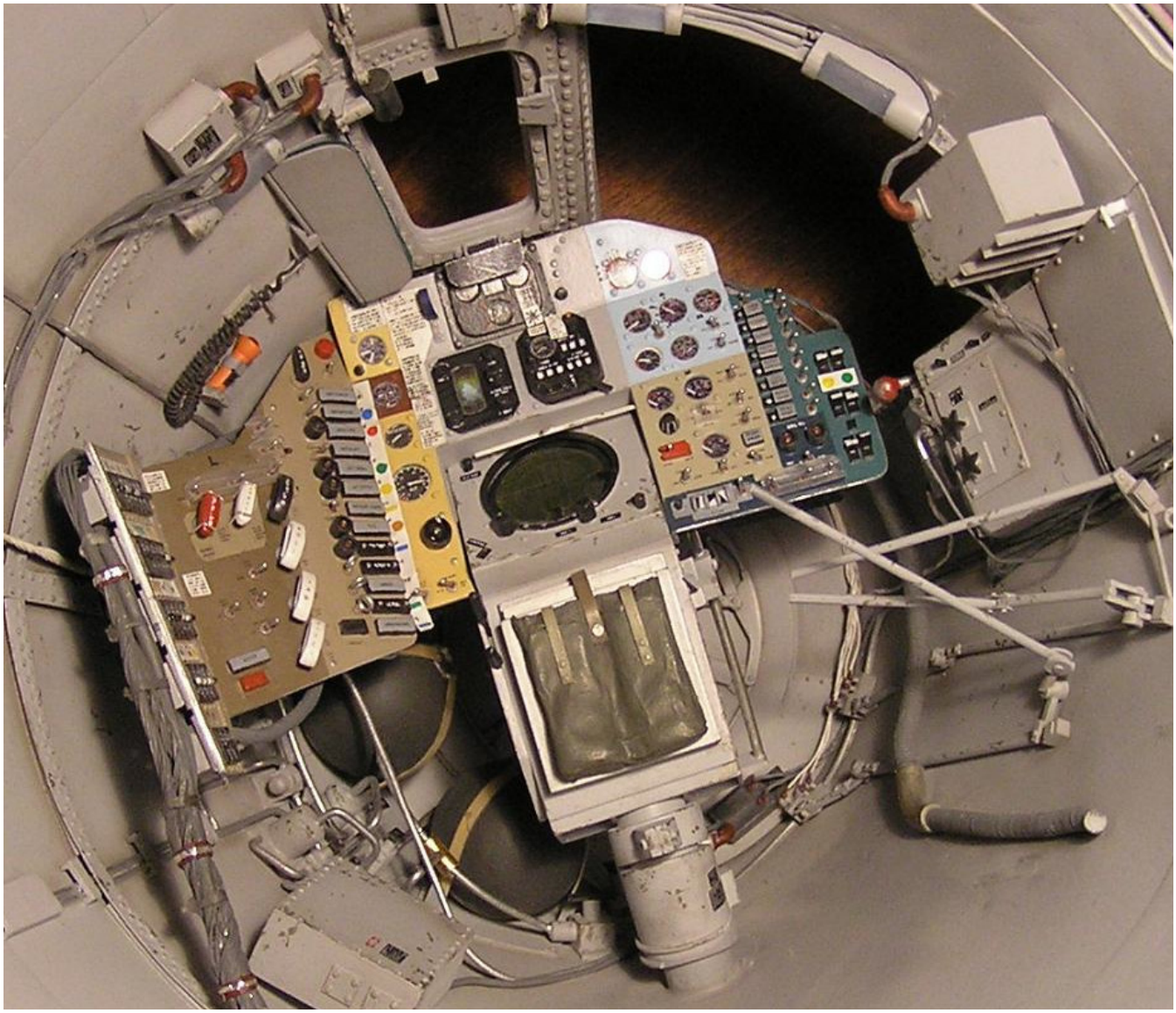


Figure 25.

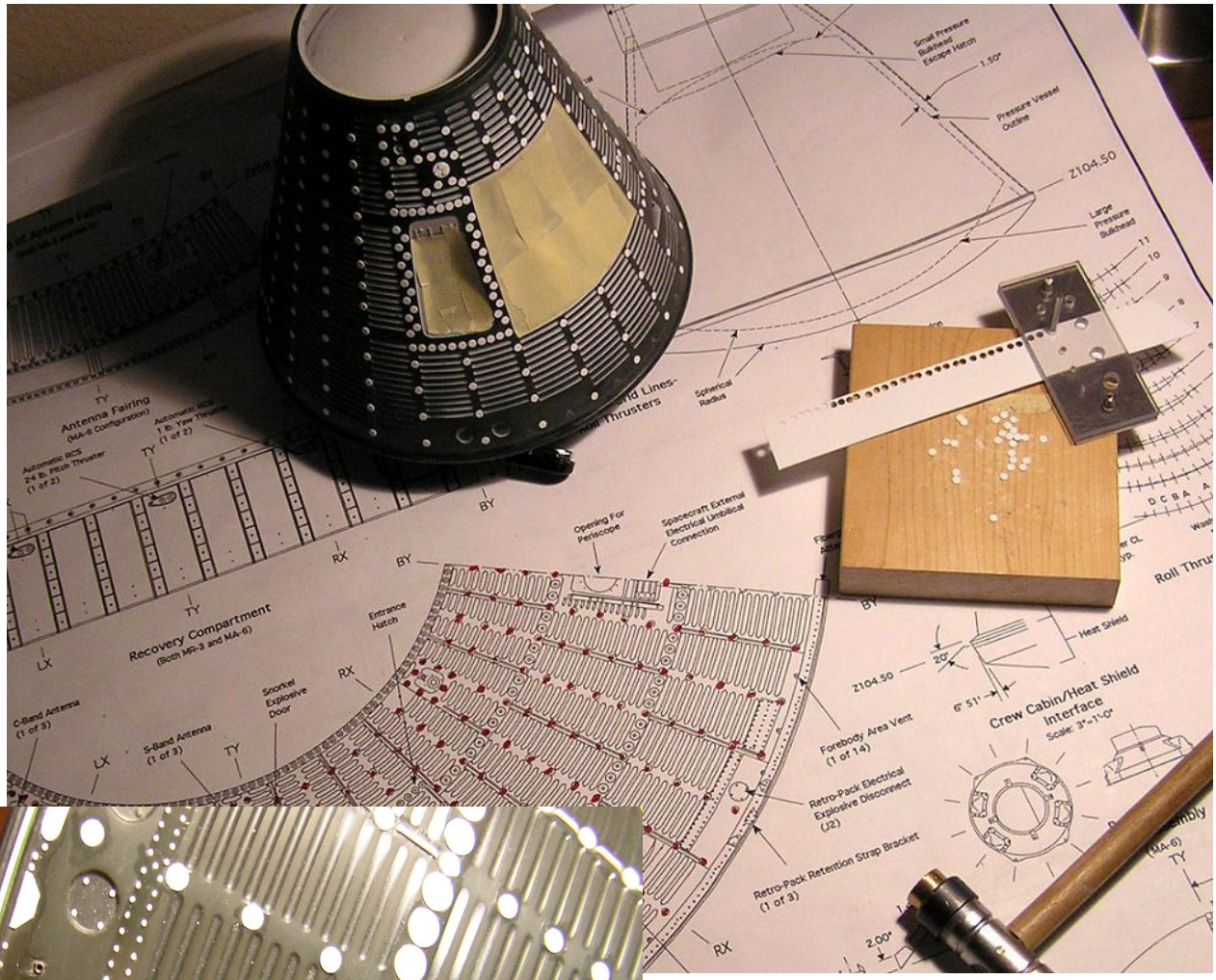
PHASE VII - ATTACHING THE AFT BULKHEAD TO FORWARD SECTION

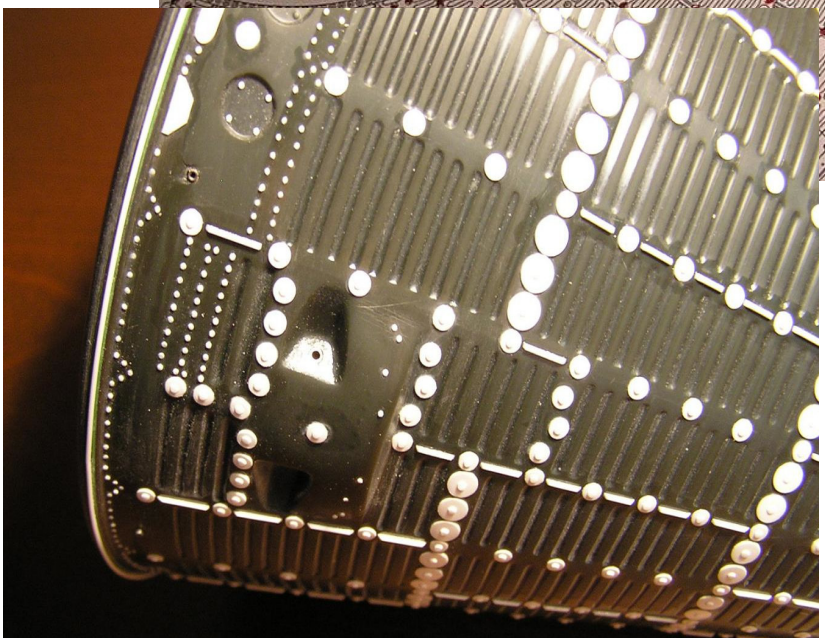
Again, this is a critical phase. Attachment of the aft bulkhead to the forward section was a carefully orchestrated affair, because the cables from the aft had to run through a hole just above the center left instrument panel, and the cable running along the left instrument panel had to have enough clearance. Further, those reaction control linkages had to meet up with the seat control stick. Finally, the wires leading to the LEDs had to still work once the parts were mated. After a bit of wrestling, the two major parts came together, but very tightly. This was worrisome, because I needed a solid weld between the two. To insure the weld, I carefully added weights to the top of the model, effectively pressing the top half down on the aft bulkhead piece. I left it like this for two days while the cement did its thing. In the end, the weld was very strong and has held up ever since.

Once the weld dried, I fiddled with the attitude control linkages and the cabling to make sure everything was just right. When it was, I sealed up the hatch and window with masking tape to begin work on the exterior.

PHASE VIII - EXTERIOR PREPARATION

As you recall from Phase I, I had sanded the exterior of the hull smooth. After I sanded the weld between the forward section and the aft bulkhead/heat shield, I polished the model. Upon this surface, I added washers and rivets. It was necessary to purchase David Weeks' excellent 1/12 scale drawings of the Mercury spacecraft, which clearly describes where the washers and rivets are located. The washers were cut out using a punch and die set, and the rivets were produced using the old "cut the plastic rod like a sausage" process. While it may look tedious, the process only took a few hours. At this point I also added the periscope door, which closes before reentry to protect the periscope window and prevent burn through.





Figures 26 and 27. The washers come in two sizes, as do the rivets. This becomes apparent when studying Weeks' drawings and photos of the actual craft. These were installed with Tamiya's low viscosity liquid cement - the best adhesive for rivet attachement! Note the stringers in between many of the rivets. I think these were some sort of joiners between shingle plates. These also had to be added using square rod beveled on each end.

PHASE IX - RECOVERY MODULE CONSTRUCTION

Putting the main component of the spacecraft aside, I proceeded to the recovery module. Since the model was depicting *Friendship 7* shortly after reentry, the top portion of the recovery module is exposed, revealing a complex mixture of components. Only the kit's black recovery module housing part was used, with the internal arrangement scratchbuilt.

First, like the main section of the spacecraft, I added stringers on the inside and added an interior hull wall. I then divided the unit into quarters to make sure symmetry was preserved while assembling the interior walls dividing the parachute compartment from the equipment bay, and three channels were built into the cylinder's interior wall to accept these dividers. This was done to allow for easier painting.

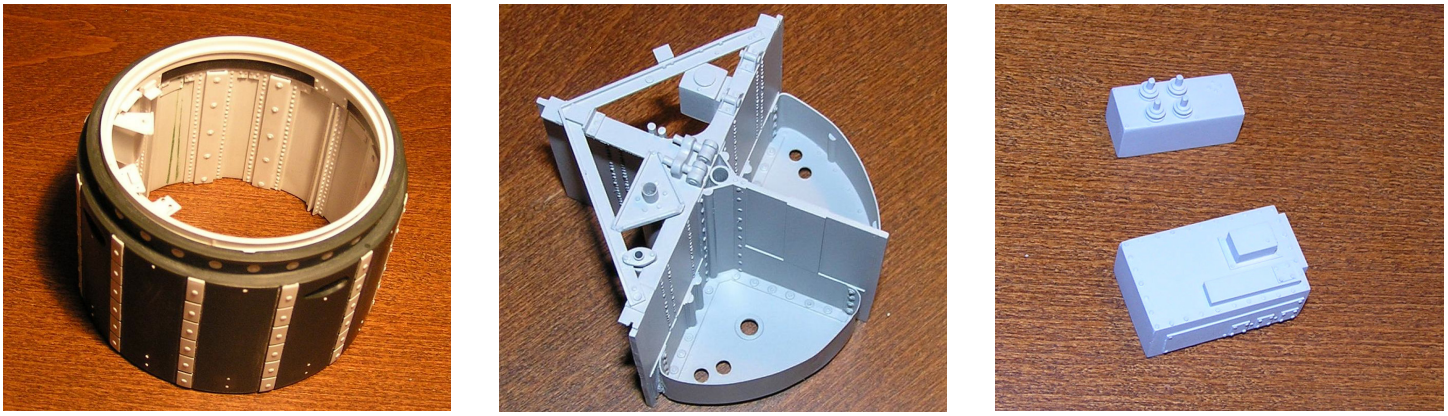


Figure 28. The left image shows the kit part with new interior wall and rivets all over the place. I estimated that about 1,000 rivets were added to this piece along. The second image shows the cruciform structure upon which the components are attached. The parachute compartment is to the right, and is empty after recovery because the chutes have deployed. The right image shows a sample of some of the equipment boxes. Much of the equipment opposite the parachute compartment are made up, as detailed information about what's in here doesn't seem readily available. Good photos of the top portion did help in at least trying to make this section look mostly accurate. It was fun to create the equipment boxes and hook them all up to wiring harnesses.

The interior wall of the recovery compartment was painted Flat Interior Green (as far as I can tell the only component painted in this way on the spacecraft). The parachute compartment was painted Chrome Silver. Component boxes were painted either Flat Black or Flat Interior Green. Figure 29 shows the completed assembly, attached to the rest of the model. The entire model at this point received a coat of Tamiya Gray Primer.

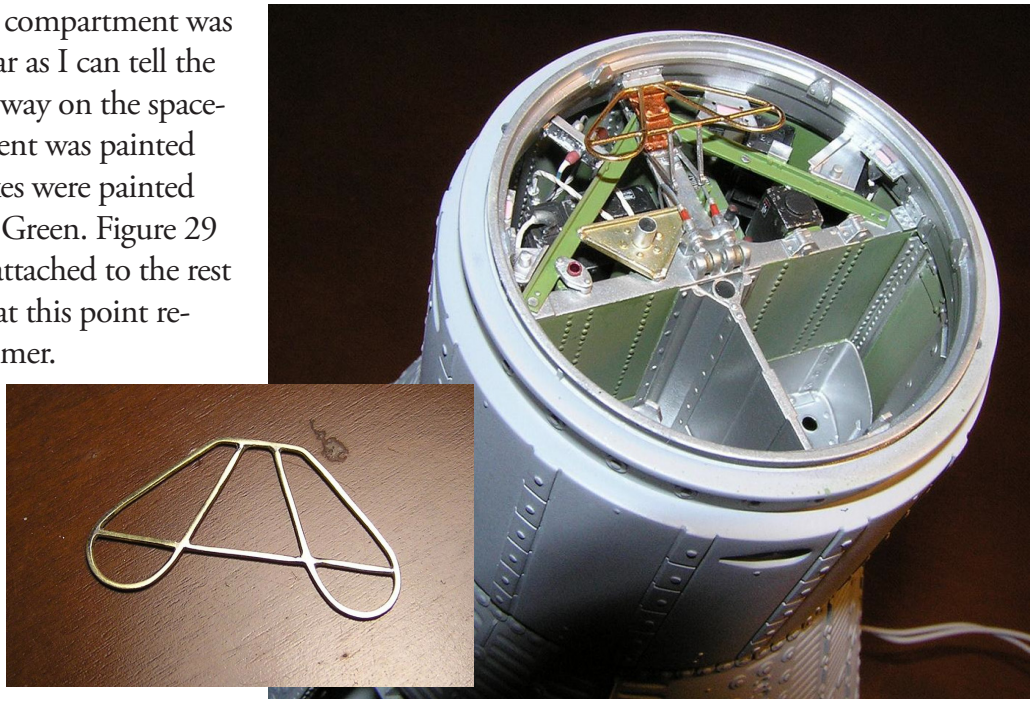


Figure 29. Completed recovery module glued to main section of spacecraft. Inset shows closeup of UHF antenna made from brass wire soldered together and sanded.

PHASE X - EXTERIOR PAINTING

The Mercury capsule is not a challenge in terms of painting, to be sure. However, since this is a post-recovery depiction, a little thought was required to reproduce the effect of reentry upon the hull surface. For instance, the recovery module shows significant discoloration, from black to a sort of burnt metal. The heat shield is also heavily weathered, taking the brunt of reentry.

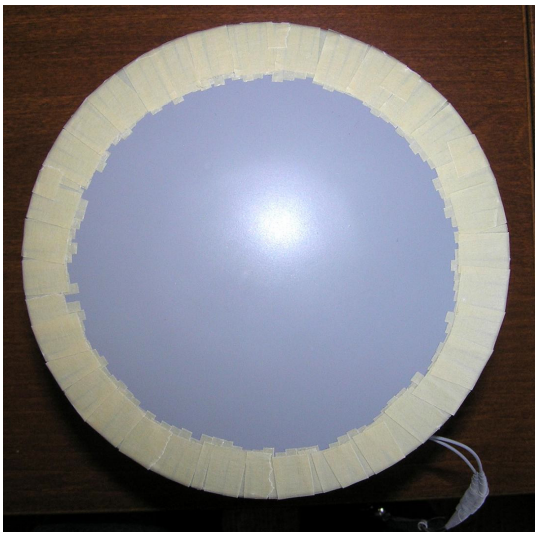


Figure 30.

The first step was to build up the heat shield in layers to simulate the ablation. I used strips of masking tape, applied in a concentric circle (Fig. 30). Then I painted on primer thickly. Upon this I would add another concentric ring of tape strips, and paint again. I repeated this process over and over again until I got more or less to the center. When all the tape was removed, which was not easy as it turned out, a subtle pattern of strip-like ablative texture was revealed (Fig. 31).

Once that was done, I airbrushed the entire model with Testors Metallizer Burnt Metal (Fig. 32). I then sealed it with Testors Metallizer Sealer. The next step was designed to facilitate a weathering technique I have read about but never tried - using hairspray followed by paint followed by scrubbing with water-drench bristle brush. I lightly sprayed hairspray (do not use a pump, only the aerosol can) over the Burnt Metal. Once dried, I painted the model Flat Grimy Black. Once dried, I scrubed the recovery module with a small bristle brush, being careful to reproduce the pattern apparent in photos of the actual vehicle at the Smithsonian. I sprayed the model once more with hair spray, then airbushed Flat Black over that. I repeated the scrubbing technique. The effect was marvelous - discolored metal with a boundary grading from Grimy Black to Black!

Figure 31.

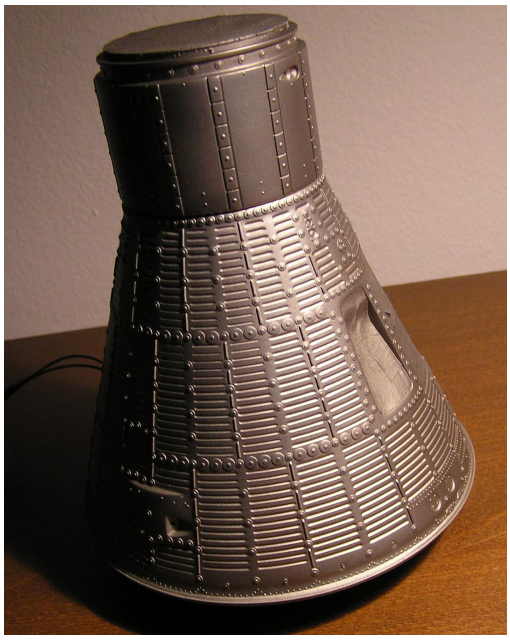


Figure 32.

I then painted the heat shield with a mix of Flat Tuscan Red and Copper to produce the dark, somewhat metallic ablative material. When that was done, the model was airbrushed with Future to prepare it for decals.

PHASE XI - DECALS AND WEATHERING

The decals used are from Rick Sternbach's Space Model Systems and are highly recommended. Some care is required to handle the larger "United States" and flag decals, because once Micro Sol or some equivalent is used (essential to make the decals conform to the highly irregular surface), many bubbles and some distoration will take place. Once these are in place, it will require touchup with white, red, and blue paint. Following these decals, I added the various stencils and, of course the *Friendship 7* logo. Once completely dried overnight, I lightly sanded all decals as part of the distressing process. On the actual hardware, the paint used for insignia and stenciling was burned off on raised surfaces and protected in recessed surfaces. Once I was satisfied with the effect, I sealed the model with Future followed by a dull coat.

The heat shield was next, and I must confess that it took me several days of thinking before I settled on a technique to reproduce the ablative weathering on the heat shield. I ended up using a combination of watered down acrylic paints (Flat Black and Flat White) and, more importantly, oil-based crayons. Basically, the technique involved pressing down on the surface with the crayon and lifting up, leaving behind a small crumb of tacky pigment. Then, you apply your finger over that and drag outwards toward the edge of the shield. Repeating this with black and white crayons will begin to produce the desired effect. Over this, I did several black and white acrylic washes. In time, the effect I was looking for was achieve. I then sprayed a considerable flat coat so that when it dried it would produce many small cracks (almost invisible, but not quite). This sort of worked, adding another layer of weathering.

With the heat shield completed, I rubbed down the black parts of the model with graphite powder to simulate the Beryllium skin. Powdered chalks were also used to add additional weathering.

Finally, the outer window pane was added, glued in place with white glue and Future. The model was then attached to a stand I made from a small lamp (which already had a weight in the base). The wires were connected and run to a 9-volt battery. Sadly, shortly after completion of the model, the circuit developed a short and stopped working. I was very disappointed with that development, but there was nothing I could do.

WHAT YOU NEED

- 1/12 MRC/Atomic City Mercury model kit.
- NASA Mercury Familiarization Manual (NASA SEDR 104), November 1961.
- Space Model Systems 1/12 Scale Mercury Decal Set (www.spacemodelsystems.com).
- David Weeks' 1/12 Scale Mercury Drawings (www.realspacemodels.com).
- Rick Denatale's Mercury Spacecraft Exterior Data Markings, 2003.
- Styrene plastic sheets and rods (Evergreen Plastic or Plastistruct).
- Oil-based crayons, 3/4" wooden craft beads, various gauges of wire and solder.
- Two ultra-bright 3mm white LEDs, 350-ohm resister, 20-gauge insulated wire, and 9-volt battery.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