MATTHEWS MODEL MARINE

B15F Corvette -- Fittings Replacement Sets -- General Instructions

1. **Important!** For working with Shapeways "Frosted Detail" plastic 3D Prints, read the How-To section at the end of this document.

2. These instructions apply to parts found in several available sub-kits.
   See the parts index below to see the contents of each sub-kit.
   Some of the Sterling kit parts are NOT included:
   - Propellers: 2" diameter, 3-bladed props; many much nicer brass props are available.
   - Rudders: Fabricate from brass sheet and rod, referring to the outlines on your drawings.
   - Miscellaneous screws, and stub shafts for the display props.

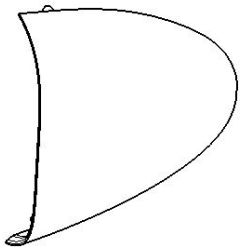
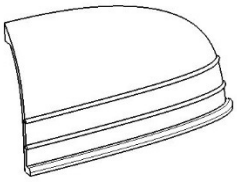
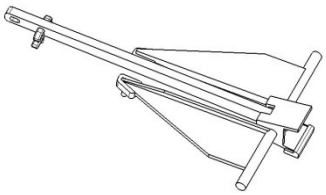
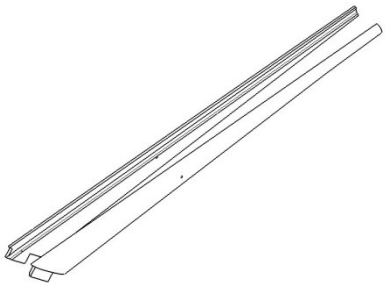
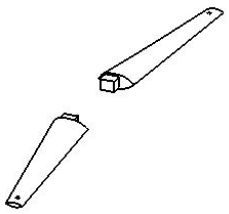
3. Select parts are offered separately as brass investment castings.

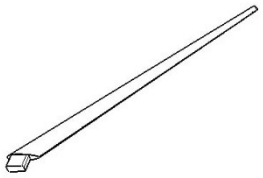
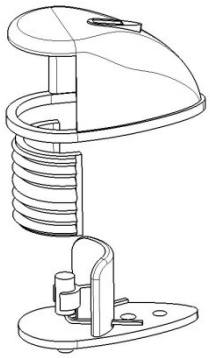
4. It is assumed that you have a copy of the plans for the Sterling B15 42' Corvette. These show the correct locations for all fittings.

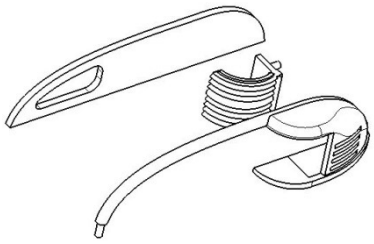
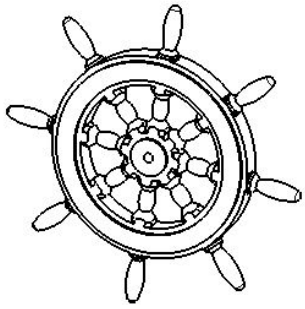
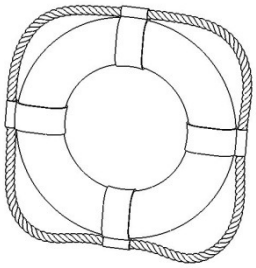
5. **"Chroming" instructions** (plastic parts with Alclad II chrome paint):
   a. Clean and smooth the surfaces as well as you can manage;
   b. Paint with gloss black-- acrylic, enamel, or lacquer will work; all are best if air-brushed.
   c. For best results, further polish the black undercoat to a high gloss… for example, using MicroMesh abrasive products. *I didn't say this would be painless*.
   d. Airbrush the parts with Alclad II chrome lacquer. See the Alclad site for more information.

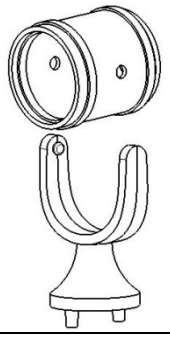
6. **"Chroming" instructions** (brass parts with nickel plate):
   For a good tutorial, see: http://www.rcgroups.com/forums/showthread.php?t=1221282
   Briefly:
   a. Polish the "raw brass" parts to a mirror finish;
   b. Or purchase the polished brass option from Shapeways;
   c. Clean;
   d. Nickel plate with dip or brush plating processes. Books have been written, I won't replicate them here.

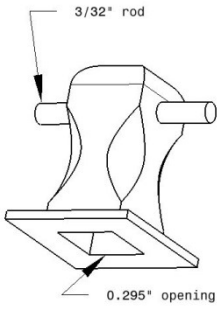
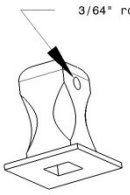
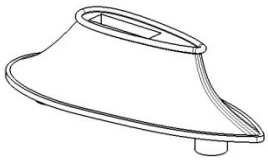
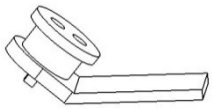
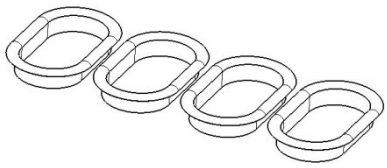
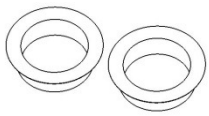
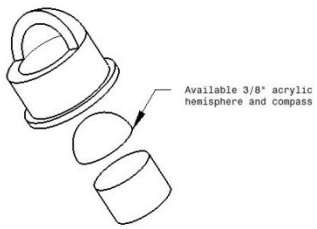
Specific Part Instructions & Notes

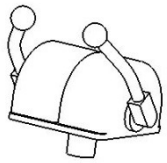
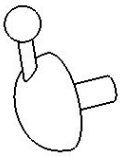
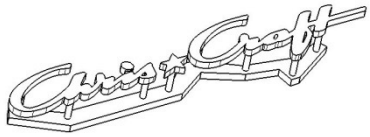
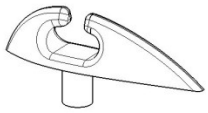
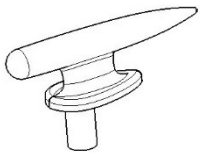
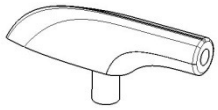
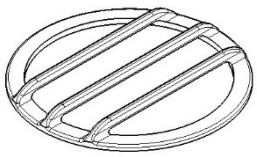
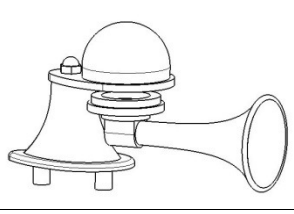
Sub-Kit	Item	Image	Notes
Vent Set	Vent, large (L/R pair)		Brass: Saw the pair apart at the tabs, grind/file the tabs smooth. Plastic: Parts are ready for paint prep. The arrow inside points up. Improvements: Slightly more rounded sides than Sterling's rather flat part.
Vent Set	Vent, small (L/R pair)		As above. Improvement: Adds the correct flange lip to the bottom of the vent.
Anchor Set	Anchor		Includes integral deck mounting clips, with pegs for mounting to your deck (requires drilled holes in deck). Improvements: Corrects shape of anchor base; shank at correct angle for lying on deck; added the deck mounting clips.
Mast/ Staffs Set	The mast and staffs are offered separately, as some modelers will prefer to carve these from real wood. The mast's fittings are found in the Deck & Cabin Fittings set. See the mast assembly image and spar templates later in this document.		
Mast/ Staffs Set	Mast		Groove down the center of each half allows installation of wires to the anchor lamp, if desired, and/or insertion of a 1mm steel rod for stiffening. Tenon at lower end is required for mounting to the mast base. A through-hole may be drilled at the upper end to accept upper ends of the mast shrouds; avoid drilling through any wires! Should be painted to simulate varnished mahogany.
Mast/ Staffs Set	Yard arm (pair)		Tenons fit into the mast ring. Paint to simulate varnished mahogany.
Mast/ Staffs Set	Fore Staff		Tenon fits into bow lamp housing. Paint to simulate varnished mahogany.

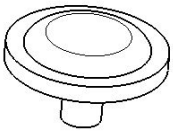
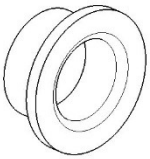
Sub-Kit	Item	Image	Notes
Mast/ Staffs Set	Aft Staff		Mounts on transom. Has large 1/8”x 5/16” mounting tenon, and starter holes to accept small eye pins for the ensign’s halyard. Paint to simulate varnished mahogany.
Lamps Set	This group includes the bow and side navigation lamps. The housings are designed to accept 3mm (1/8” dia.) LEDs, but incandescent bulbs can also be used. For the LEDs, use the “inverted cone tip” style, which are found in many new Christmas light strings. The special tips on these LEDs causes light to shine out in a 360° circle, rather than just out the tip. Note that LEDs require a resistor in series with each LED. For use with available LED calculators, and when using the common bright white LED, assume a forward voltage of 3.2v; or just try these resistor sizes (assuming LEDs are wired in parallel, with the listed applied voltage source): 1.5 - 3v: Not recommended 6v: 150 ohm 7.2v: 220 ohm 9v: 330 ohm 12v: 470 ohm Lenses: The lenses are printed in the same type of plastic as the other parts, which is clear but with a frosted skin. It is possible but not easy to polish the plastic to glass-clarity. I recommend buffing off any rough frosting, then relying on a color or clear coat to make a smooth skin. For red and green color, look for faux-stained glass paints, which dry to a shiny transparent colored surface. You’ll need to clean any paint off the mounting surfaces of the lens. Improvements: They can be lit up, which is big. But they also have the correct shape now.		
Lamps Set	Bow lamp		Use with clear lens and white lamp. A small screw can secure the base, use the forward hole. The rear hole is for the wires. Make sure to insulate at least one LED lead to avoid shorting across the screw head! Hint: Very fine “wire wrapping” wire can help when fitting everything together.

Sub-Kit	Item	Image	Notes
Lamps Set	Side Lamp (pair)		Port side = red, starboard = green! Use the included plastic back-board and paint it to simulate varnished mahogany, or make a copy from real wood. Housing and grab rail extension are chromed. A straight grab rail extends aft from each housing; the hole is sized for 3/32" rod (just under 1" for a 1:10 model). The kit recommendation of 1/16" is just too small. Take care removing the lower sprue from the housing… saw through it, then nip off at both ends. Paint the back of the lens/LED holder to prevent light coming out of the "gill slits".
Steering Wheel Set	Steering Wheel		Offered separately, as it's a big chunk of 3DP plastic, and there are many options out there. 2-3/32" OD over the spokes, 1-3/8" OD over the rim. Your choice of pins to secure the wheel. CC wheels have a chromed facing on the rim; paint the rest to simulate varnished wood.
Life Ring Set	Life Rings (pair)		Offered separately, because some modelers like to make their own. And it's a big chunk of 3DP plastic. Mount with the pegs to the cabin side, or fabricate realistic metal hanger hooks as desired. Also consider a coil of retrieval line hanging with the life ring. Improvements: More realistic, with the "floppy" grab line and correct bands securing the grab line.
Struts Set	TBD		
Searchlight Set	Duplicates the Sterling light with no improvements. Make your own lens, add a lamp. Should be a chrome finish. Modify to accept a control rod going back to the flybridge dash; use the rail standoffs to support the rod.		

Sub-Kit	Item	Image	Notes
Searchlight Set	Searchlight body & base		

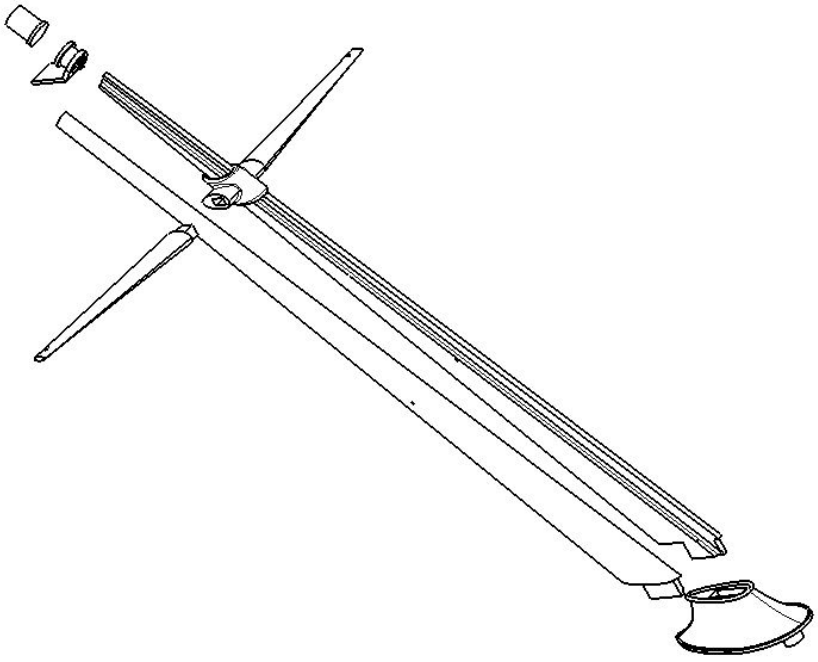
Deck & Cabin Set	The Deck & Cabin set includes all the other fittings not found above.		
Deck/Cabin Set	Bitt, large		Fits on a 0.295” square peg; or use a 5/16” dowel with flatted sides. Accepts 3/32” rod for the cross bar (supplied by modeler).
Deck/Cabin Set	Bitt, small (pair)		Fits on 0.100” square peg. Accepts 3/64” rod.
Deck/Cabin Set	Mast base		Brass version can be tapped #2-56 in the bosses. Plastic version should simply glued in place.
Deck/Cabin Set	Mast collar		See the mast drawings for the correct position… some fitting of the mast and collar ID may be required.
Deck/Cabin Set	Mast lamp base		Use a 3 or 5mm LED as a lamp, even if you choose not to make it work.
Deck/Cabin Set	Port, oblong (4)		Fit into the hull forward, per the drawings. Add your own glazing inside. Can be painted or “chromed”.
Deck/Cabin Set	Port, round (2)		As above
Deck/Cabin Set	Compass housing		Use the included dome, or look for clear acrylic hemispheres online (3/8” diameter). Also look for available 3/8” [9.2mm] dia. working compasses. Can be black or chromed.

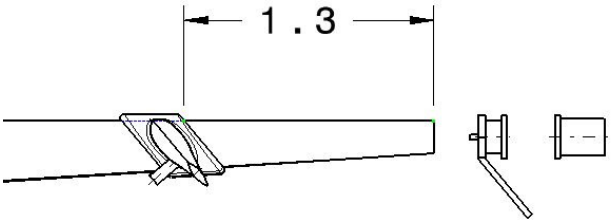
Deck/Cabin Set	Throttle		Twin throttle unit; levers aft = STOP, levers fwd = GO
Deck/Cabin Set	Reverse lever (2)		One lever on each side of the steering station.
Deck/Cabin Set	Hand wheel		For searchlight control rod
Deck/Cabin Set	C*C logo		An experimental extra to replace the kit's decal. Chrome finish.
Deck/Cabin Set	Chock (2)		Mounted on foredeck.
Deck/Cabin Set	Cleat (6)		Corrected the baseplate shape of these nifty torpedo cleats.
Deck/Cabin Set	Rail end (4)		Pre-bend your rails, don't put any load on these plastic fittings. Hole is 1/16", but the rail is better at 3/32". The end will be weak if drilled out to 3/32"… so consider turning down the ends of 3/32" rod, or slip 3/32" tube over 1/16" brass rod.
Deck/Cabin Set	Grate, hatch		Consider setting this grate into a cutout in your hatch to hide the thick base. Chrome finish. Has the correct 3D shape in place of the kit's flat stamping.
Deck/Cabin Set	Horn, base & trumpet		Assemble the two parts. Chrome finish.

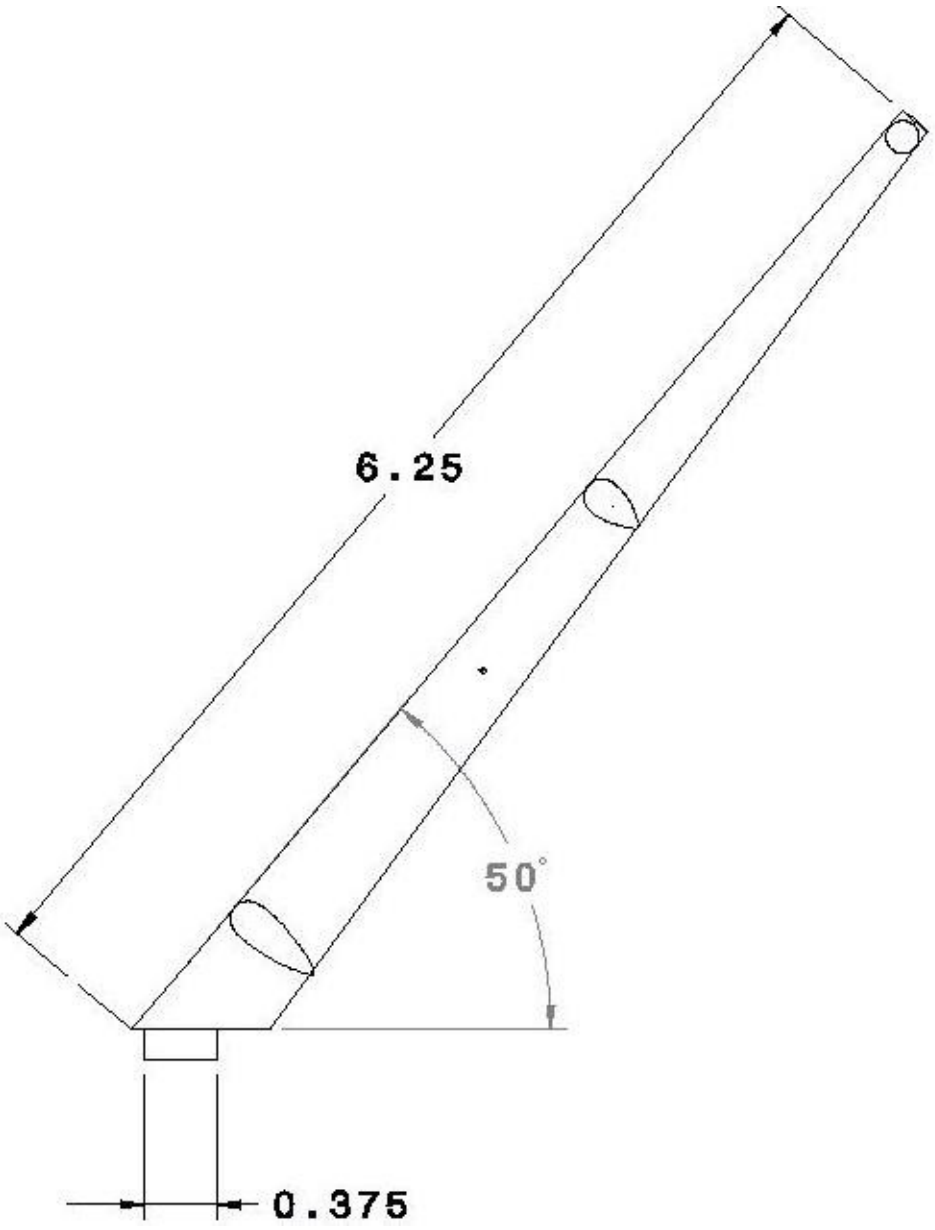
Deck/Cabin Set	Standoffs, rail (6)		For use with the searchlight control rod and the toe rails on the foredeck. Sized for 3/32” rod.
Deck/Cabin Set	Fuel cap (2)		Can be weathered bronze, or chrome plated. Consider setting into a cutout in the wood deck.
Deck/Cabin Set	Exhaust (2)		Can be weathered bronze, or chrome plated. Set into transom, but make sure the hole is sealed!

Mast Assembly & Templates

- You can use the 3D printed plastic mast and spars, but carved wood will be stronger and will look more like, well, *wood*.
- But note the tenons on each spar, which are recommended for securing the pieces.
- If you choose to make the masthead light function, then consider making the mast in two halves with a groove for the wires… just like making a wood pencil.
- The 3D printed yard arms and mast have holes for the mast bracing (or guy) wires, except at the masthead. If you install electrical wires, some care is needed to install the guy wire without fouling the electrics. You might prefer to install pieces of straight brass or steel wire instead of placing tension on the mast parts with tightly secured thread.

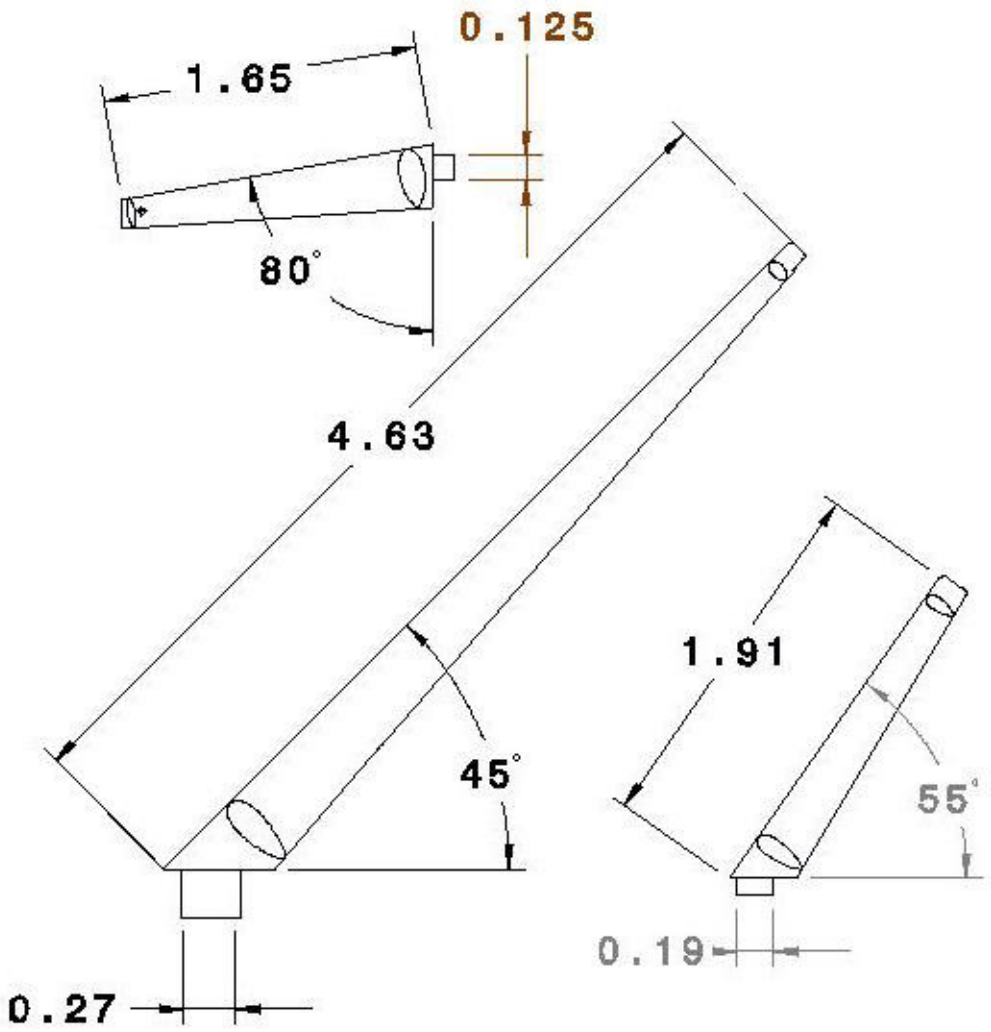






Main mast Template

Check the scale of any printed copy!



Templates:

- Yard arms (2 required)
- Aft jack staff
- Forward jack (or burgee) staff

Check the scale of any printed copy!

Working with Shapeways' "Frosted Detail" Plastic

for use with Frosted Detail models from Matthews Model Marine, a shop at Shapeways

The "Frosted Detail" plastics from Shapeways are not the same as the molded styrene in your typical plastic model kit. In fact, the Shapeways material is harder to work with, and requires some special handling. But this is the price we pay for custom parts that can't be found anywhere else.

First: How is my part made?

Two things make this type of 3D printing possible:
1. A liquid "photopolymer" acrylic resin that can be hardened with ultraviolet (UV) light;
2. A device- a print head- which can deliver drops of the resin to particular places on the print platform.

So basically, the process is like an inkjet printer head, sweeping back and forth, spritzing out droplets of resin which are then flashed with UV light to harden them in place. Do this in layers… layer after layer… and you build up a three dimensional part. Easy!

But there is an additional trick required:
If a new layer's edges overhang the layer below it, the droplets will fall out of place, just as surely as what happens to Wile E. Coyote after going off a cliff. So some support is required. The printer does this by printing out droplets of a waxy material wherever an overhang is planned, providing a soft platform for the next layer of resin.

OK, what do I have to do special?

1. Be careful with your parts. Very careful.
The parts are very brittle, nothing like the rather flexible styrene in model kits.
– Snipping a part off a sprue, when it's retained in multiple places, can shatter it. I use a very fine tooth saw while carefully supporting the part.
Hint: Look for "EXCEL" #13 saw blades, which are super fine, and can be mounted in an Xacto handle.
– Drilling a hole can split the part open, or shatter chunks off.
– Even normal handling can break smaller parts.
– Test fit parts, but never force them… file as needed to get a happy fit.

2. Wash your parts.
The support wax has been *mostly* washed off. Get the rest of it with warm water and detergent, or

Simple Green or similar; scrub gently with a toothbrush. An ultrasonic jewelry cleaner can be helpful when doing lots of parts.

3. Post-cure your plastic.
This should be taken care of by Shapeways, but it isn't. The flash of UV light that cures each layer doesn't get 100% of the resin. And traces of uncured resin in the plastic matrix will lead to problems with paint. The cure? Post cure with a good dose of UV light… a few hours in the sun, or under a UV-A lamp, should do the job. The real test is whether enamel primer cures on the part. If it doesn't, wash with paint or lacquer thinner, and post-cure some more.

4. Scrape and sand your parts.
After washing and drying, you will see "frosted" surfaces wherever the support wax contacted the plastic, while areas that were on top in the print process may be almost optically smooth. The frost and other print line artifacts can be scraped and sanded off. Instead of just cleaning mold marks and seams, as with a commercial plastic kit, you'll need to clean the entire surface on about half the part. Please enjoy this time spent bonding with your new model!

5. Glue with epoxy or CA (cyanoacrylate). You may need to use CA "kicker" to get the CA to set.
Note: This is an acrylic plastic, and solvent glues for styrene models won't work. Possibly solvent glues meant for Plexiglas would work– I haven't tried them. Also note that solvent cements work best when the joint can be held under pressure while setting.

6. If you post-cured the parts, you'll be able to paint with your choice of paints. I recommend enamel primer in all cases.

for use with Frosted Detail models from Matthews Model Marine, a shop at Shapeways