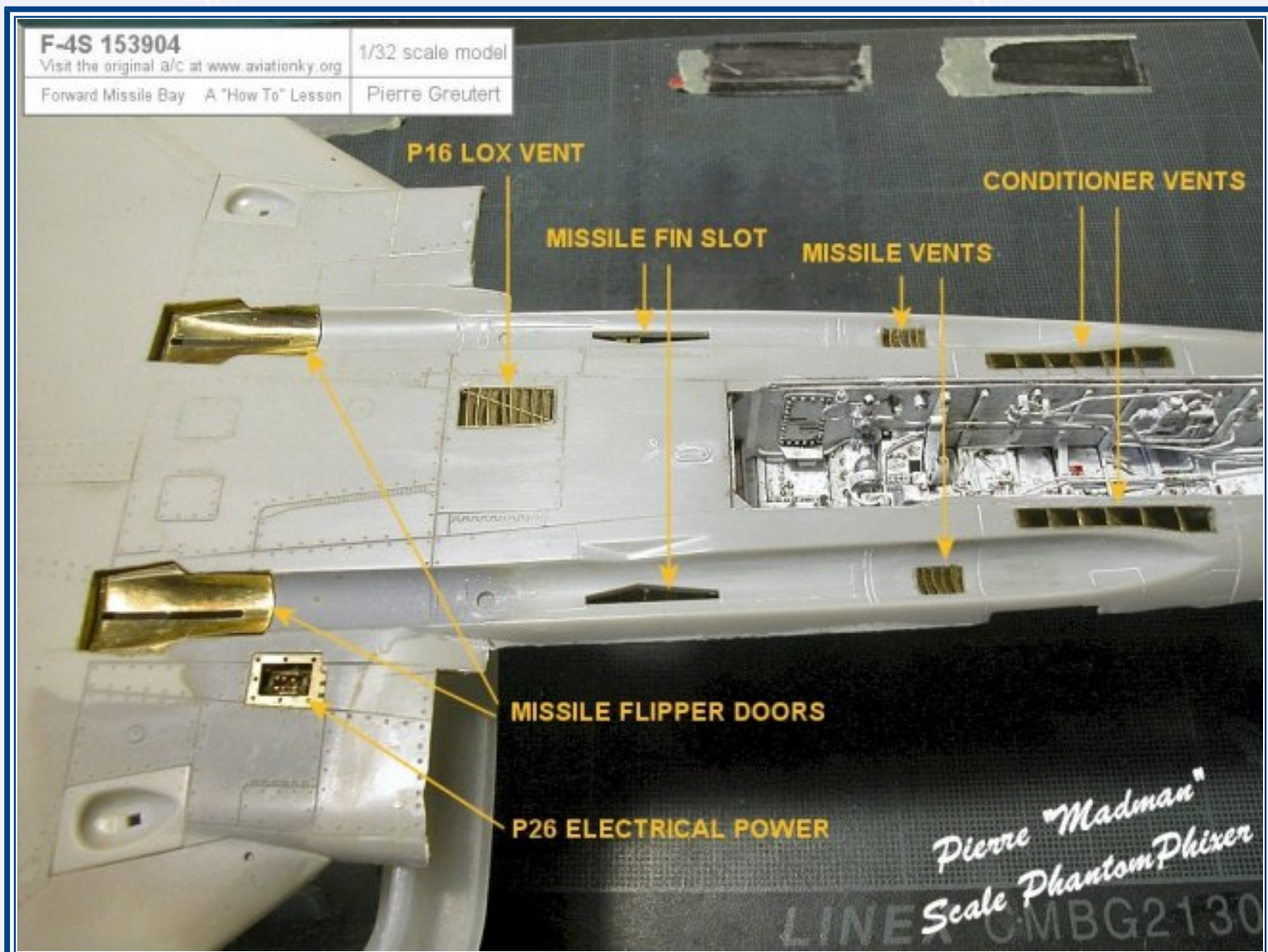


# 1/32 F-4S Phantom, based on Tamiya F-4J kit (Part 3)

## THE 'FLIPPER' MISSILE DOORS

by [Pierre Greutert](#)

.....



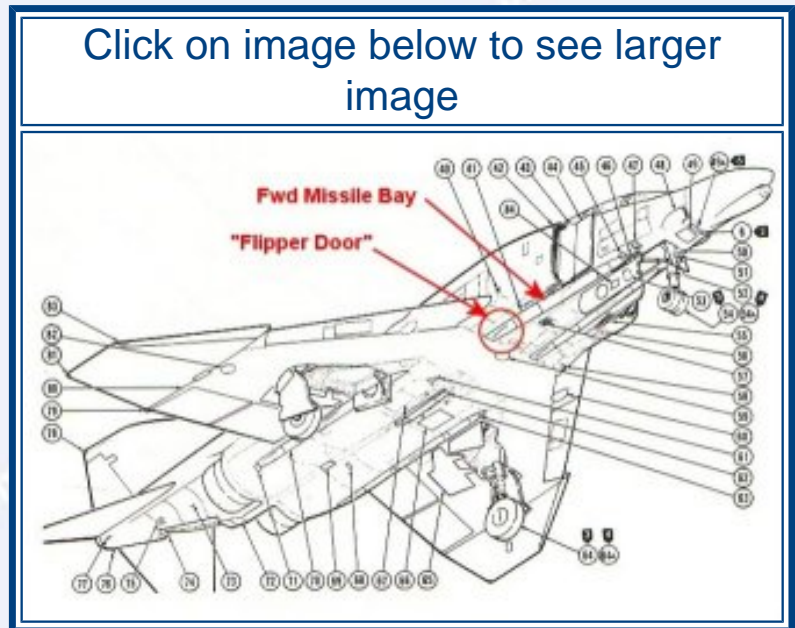
This is the third article of the series about my museum-quality 1/32 scale Tamiya F-4 Phantom. The original model F-4J is converted into an F-4S, BuNo 153904. As much detail as possible is added, wherever possible - aftermarket parts or, most often, scratch-built items.

The series eventually covers all areas of the model - landing gear bays, access panels, cockpit, landing gear struts, exhaust nozzles, intakes, etc. The articles illustrate the conversion process with appropriate pictures, to build a "how-to" guide that every modeler is invited to use as a reference.

## The "Flipper" Missile Doors

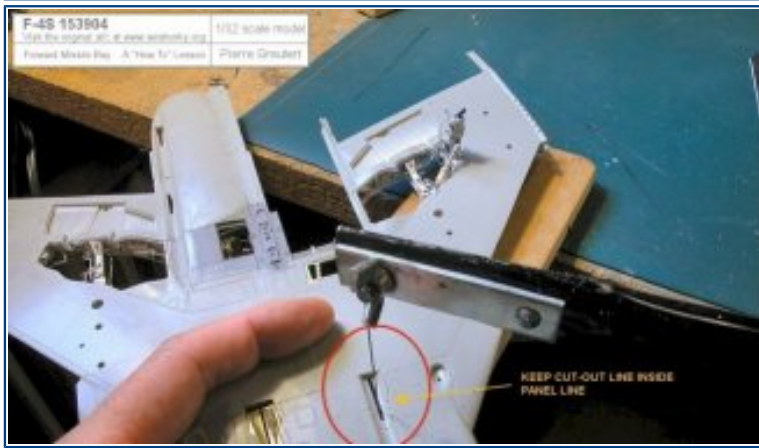
The rear of the forward missile bays have particular mobile doors. They are called "Flipper Doors", since they close when no missile is installed to streamline the rear of the wells. They are actuated by the utility hydraulic system, and tend to open a little bit when the system is depressurized.

Click on image below to see larger image



## Step 1

Click on image below to see larger image



Drill a hole in an edge, or the center, of the panel, and set-up your jigsaw. The panel in the photo is the forward aft missile bay door, also called "flipper door". Cut out carefully the panel, leaving some extra "meat" for later fine-tuning i.e. the hole must remain **INSIDE** of the panel lines). Note the left panel is already completed.

## Step 2



Click on image below to see larger image



Carefully take the panel out. Note that the cut-out line is somewhat so-so, which is unimportant as long as the cut remains INSIDE of the panel lines. Any irregularities can be filed away later.

Please note that this technique applies only if the inside panel is "lost", since the saw takes away about 0.3mm of material.

On the photo, you can see both "flipper" doors, left finished, right freshly cut out.

### Step 3

Click on image below to see larger image

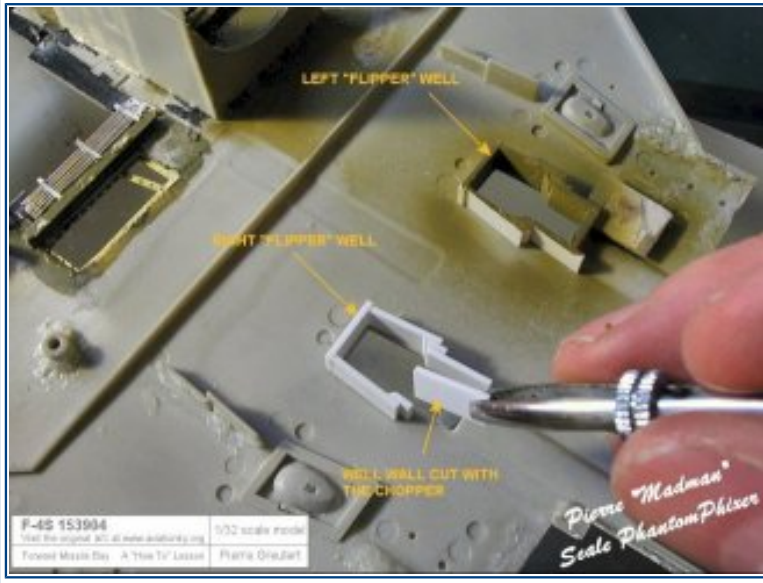


Build the interior walls of the door well. Evergreen styrene strips are best suited for this. You can get them in any good modeling shop, in various sizes and shapes. I measure the length to be cut with a divider, and report the length to the Chopper.

The Chopper is a handy tool allowing you to do neat cuts in styrene, and any angle, or cut series of same length bits in very little time.

### Step 4

Click on image below to see larger image



The door walls, viewed from the backside. Walls are simple pieces of styrene glued together. Note the left well, already painted. In fact the color should be white, I will address this at a later stage.

In the back of the photo, you can see various engine bay parts, and access panels.

## Step 5

Click on image below to see larger image



Things start to get serious. Take a piece of brass sheet (0.15mm thick) which will become the "flipper" door. Measure the dimensions (with the divider again). In this case, 20 x 12 mm would be perfect, allowing a little bit "extra" for try and error.

Brass sheets can be bought at [www.micromark.com](http://www.micromark.com), in various sizes and thickness (I have no interest in the shop!). The best way to trim them is regular scissors.

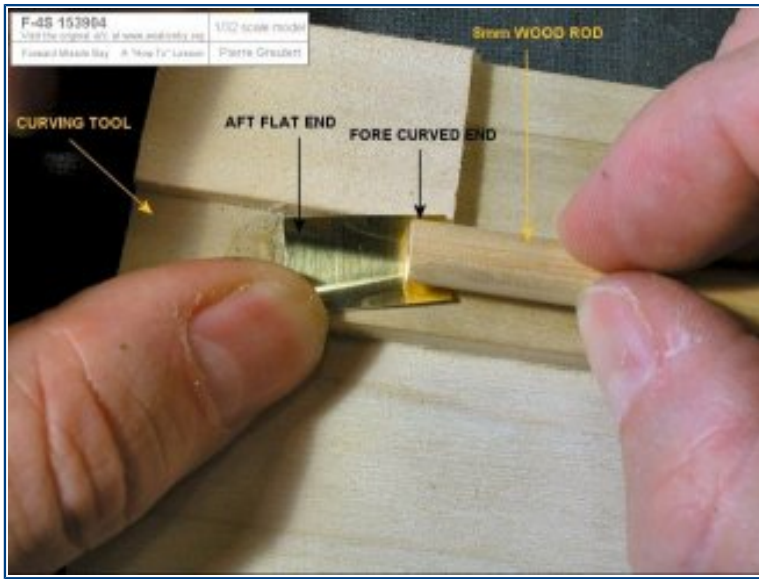
One more hint for today: cut marks are best scribed on brass, since pencil graphite mines

are too thick and do not adhere very well. I built my scriber by plugging a pin into a lead-pencil holder.

## Step 6



Click on image below to see larger image



The flat piece of brass needs its fore end to be curved, and the aft end to remain flat. I used a wooden jig and rods of various diameters. Both came with the "Hold and Fold" tool I bought a couple of months ago at [www.theshop.com](http://www.theshop.com) (again, I have no interest in the company).

Apply the brass piece against the step of the tool, and gently rub the wooden rod over it, to start curving the brass. Remember: one end has to remain flat, that is why I position the brass at an angle. Start the curving job with the thicker 8mm rod. Rub alternatively the left, and the right side of the flipper.

## Step 7

Click on image below to see larger image



As the brass takes its shape, switch to a smaller diameter rod, 6mm in this case. This will help to "over-curve" the brass, since it has some elasticity, and will spring back to a wider curve as soon as you release the pressure. Note how nice the shape becomes.

## Step 8

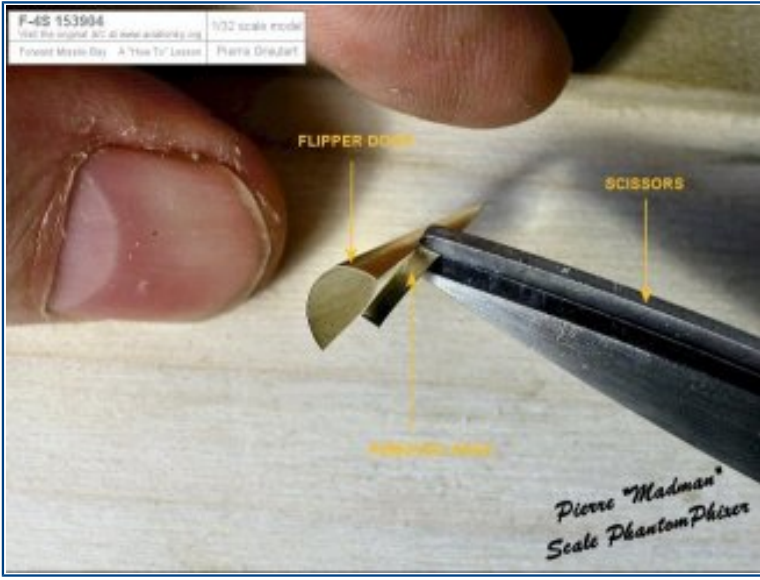
Click on image below to see larger image



The soon-to-be flipper is dry-fitted in the well of the model. A rod helps keeping the fore end in place, and the aft end is fixed with masking tape. I used my hand-made scribe (lead-pencil with a pin) to scribe where material has to be removed, on both sides.

## Step 9

Click on image below to see larger image



The marked area is cut away, with regular scissors. 0.15mm brass is very easy to cut with scissors, although it tends to bend slightly at the end of the cut. You can easily fix this with pliers, or a small hammer and a jeweler anvil. Note that hammering brass leaves nasty bumps, so it is not the best method.

Note the nicely bent fore end? All done with the wood rod and bending tool (see steps 6-7)

## Step 10

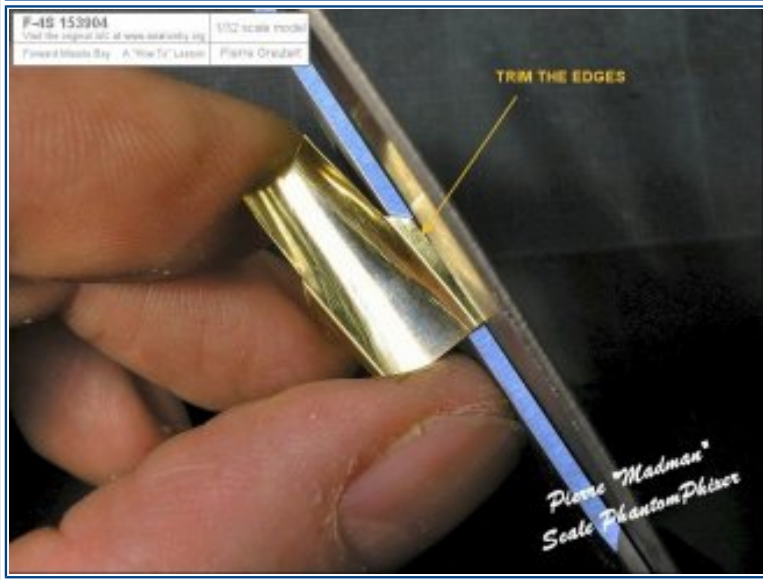
Click on image below to see larger image



The left and right sides of the flipper need to be folded. The best tool to do this is the "Hold and Fold". The area to be fold is pinched into the tool, and the remaining part bent over the edge with my thumb. Use a wood rod to rub gently over the edge, to get a well marked fold.

## Step 11

Click on image below to see larger image



It is time now to trim the edges we folded in the previous lesson. Scissors are the best tool to do this. Note that scissors tend to curl the brass slightly, but you can easily fix this with pliers.

## Step 12



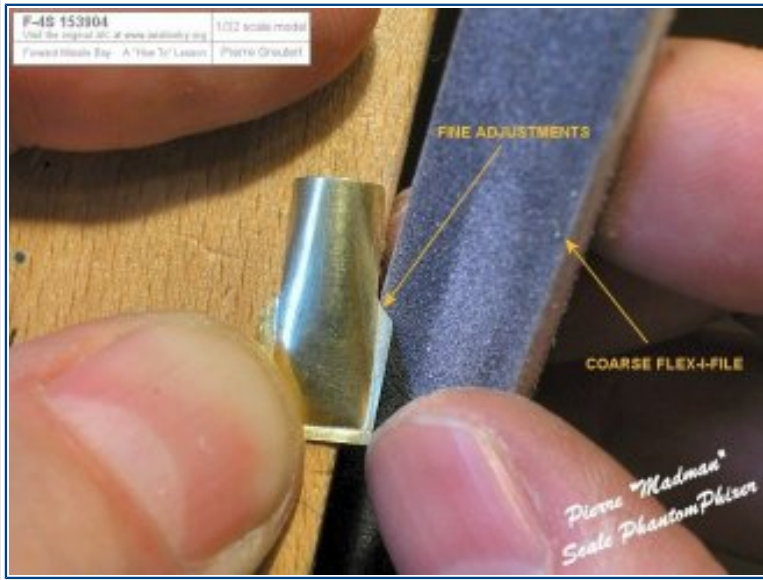
Click on image below to see larger image



Next is the flat aft end of the flipper. Again the "Hold and Fold" tool helps a lot, although you can achieve the same effect with regular pliers.

## Step 13

Click on image below to see larger image

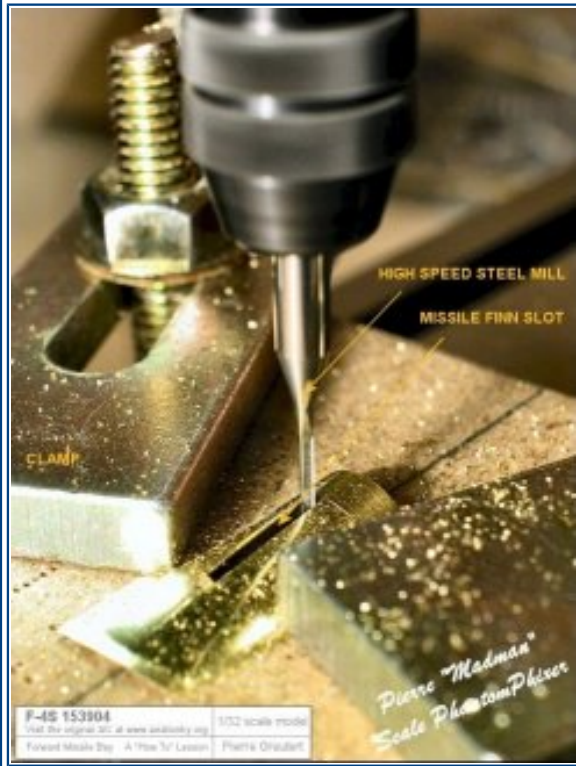


The nearly finished flipper now requires some fine-tuning to fit into the housing. I used a coarse grit Flex-I-File ([www.micromark.com](http://www.micromark.com)), but again, any other filing / sanding system works. Note the nice 3D shape of the flipper? Remember: you started with a FLAT piece of brass!

## Step 14



Click on image below to see larger image



This is the only step that requires a special tool: You need to open the fin slip in the flipper. A milling machine is very convenient for this job. The greatest difficulty is to align the flipper correctly, to have a perfectly centered slot.

Alternatively, you can drill two small holes at each end, and cut the slot open with a jigsaw. Sanding / filing will be required then, to obtain a neat slot.

## Step 15

Drool over beauty you just crafted. Don't they look like old-fashioned ink-pen tips? Sweet memories :-)

I hope the serie entices some of you to give it a try. This was a sophisticated 3D piece indeed, so start with an easier one if you prefer, such as a 2D curved panel door. It is very easy, and every modeler should be able to achieve similar, if not better results.



Click on image below to see larger image



## Bonus Photo

Your devoted Scale PhantomPhixer  
Phixing Phings

Enjoy your modeling!

**Pierre** – Scale PhantomPhixer

Photos and text © 2002 by