

# ROC CITY

## THE JOYS OF PHOTOETCH

LEARN TO LOVE FIDDLY BITS  
WITHOUT REALLY TRYING



*Bill "Navy Bird" Gilman*

# WHY PHOTOETCH?

To provide parts that are very small or too delicate to make with injection molding

- Due to mold release issues – draft angles, fillet radii, etc.

To make parts stronger than similar pieces made from cast resin

- “But it’s wafer thin...”

To create hollow parts by folding or bending

- Boxes, radio and avionic sets

To make complex assemblies using just one part at the correct scale thickness

- Ship rigging, ship’s rails, radar antennae

And, of course, to infuriate the modeler and feed the carpet monster...zing!

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# HOW DO THEY MAKE THIS STUFF?

## “Photo”

- Design on film (artwork) is exposed onto a substrate coated with a photo-sensitive emulsion (photoresist) creating an image on metal, usually brass

## “Etch”

- Image is then “developed” using chemicals, followed by a strong acid to etch the image into the substrate
- Depth of etch is determined by transparency of image

...or something like that – what do I know? I just use this stuff!

Little known fact: Eduard releases a new photoetch set every 37 seconds

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# TOOLS OF THE TRADE

AND A FEW THINGS TO REMEMBER

## SAFETY FIRST

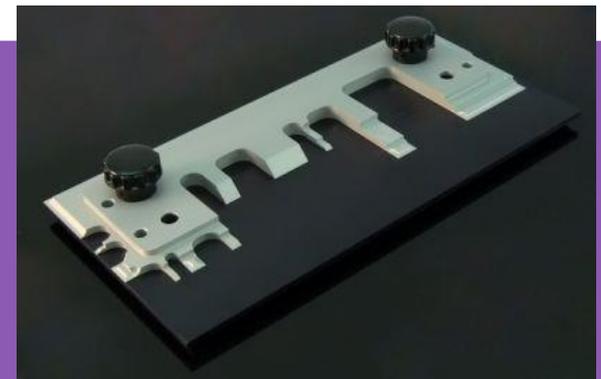
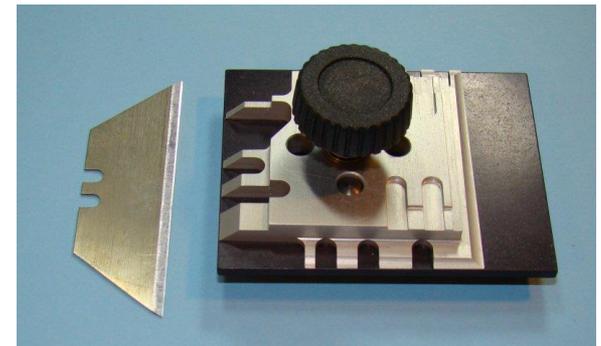
- Cutting tools are sharp!
- Wear eye protection
- Beware of dropped PE parts – they HURT if you step on them without shoes

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# YOU COULD SPEND A LOT OF MONEY

- Fancy cutting surface
- Specially made photoetch shears
- Multiple kinds of scalpels and blades
- Elaborate 2 or 3-D folding tools
- Several different styles of tweezers
- Variety of pointed tip pliers
- Selection of adhesives and epoxies



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# BUT YOU DON'T HAVE TO

Here is all I use:

- Same tools I use for “normal” models
- Single edge safety razor blade
- Needle nose pliers with smooth grip
- Tweezers with pointed tangs
- Tweezers with paddle tangs
- Fiskars scissors
- Cyanoacrylate or Gator’s Grip Thin Blend adhesive
- Pledge Floor Polish “Future”



Disclaimer: I work exclusively in 1:72 scale. Photoetch parts in larger scales may require different tools, especially for folding.

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# REMOVING PARTS FROM FRET

- Place the cardboard sheet that came with the package onto a hard surface
- Place the fret onto the cardboard – the cardboard provides a cushion for the tip of the blade
- Some people like to use a #11 scalpel blade, but I find that this lowers the force applied to the cutting – because your hand is a distance away
- Hold a fresh single edge safety razor blade with the razor edge at a 45° angle to the fret
- Place the tip of the blade at the juncture of the part and the fret
- Cut through the juncture – you'll hear and feel a slight click
- To avoid a part zinging into the ether when it's free, you can place masking tape across the back before cutting – this will hold it in place

De-burr by holding the part with needle nose pliers (smooth faced, not serrated) and lightly sand with a sanding stick



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# ANNEALING PHOTOETCH

- Annealing is the process that softens the metal, making it easier to bend
- I find this necessary only for making a curved piece, to ensure the curvature is consistent
- Annealing is not required for folding operations where part is pre-scored
- To anneal, heat the photoetch part (using appropriate safety devices) and allow to cool naturally – do not force cool by immersing in water, this will actually temper or harden the metal



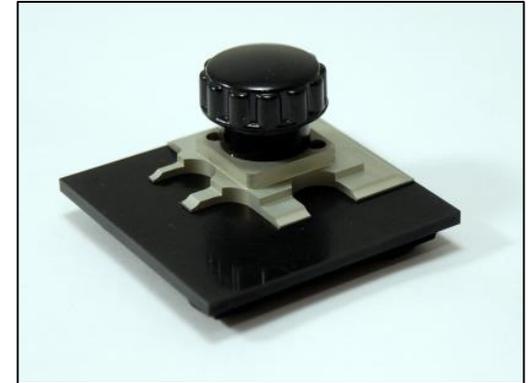
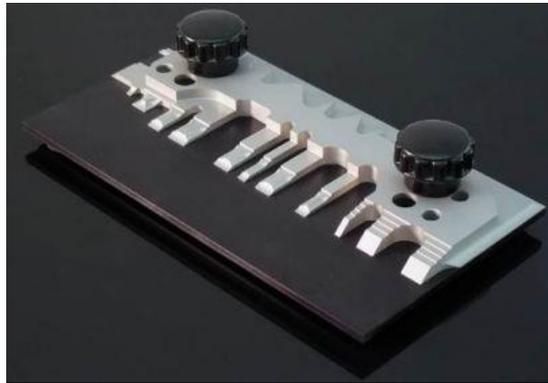
Photoetch frets get red hot during the annealing process – be careful! Annealing pre-painted photoetch will usually damage the paint

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# ROCKING FOLDING AND ROLLING

- Folding and rolling tools are designed specifically for photoetch parts
- These are especially good for large photoetch parts
- I typically use needle nose pliers and tweezers to fold 1:72 aircraft photoetch
- For rolling, I've used paintbrush handles, wooden dowels, etc. – whatever is the right size

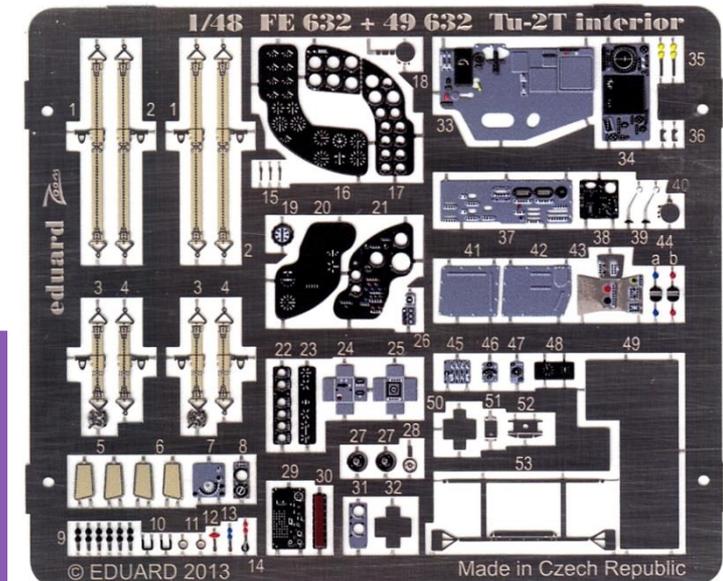


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# PAINTING

- Parts can be painted on or off the fret
- Removing a painted part from the fret can cause small paint chips if you're not careful, even if you've primed the part first
- I never use primer, metal sealers, or other surface preparation techniques – I live on the wild side (your mileage may vary)!
- I use GSI Creos (formerly Gunze Sangyo) Mr. Hobby Aqueous almost exclusively and have not had paint adhesion problems – again your mileage may vary – it's always best to test first
- Pre-painted photoetch frets save a lot of work and have great detail



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# GLUING

- Typical styrene adhesives and solvents do NOT work with photoetch metal
- Due to the part being metal, cyanoacrylate (CA or Superglue), “5 Minute” epoxies, and Gator’s Grip Thin Blend work well
- Always prepare the adhesive on a gluing board, and apply a small amount of adhesive to the part
- Gator’s Grip or epoxy give you more time to position the part; CA tends to stick very quickly
- Pledge floor polish (Future) is my choice for gluing detonator cords to clear canopies (see photo)



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# PROJECT

SPITFIRE COCKPIT IN GLORIOUS 1:72 SCALE

## OBJECTIVES

- Add more detail
- Preserve scale fidelity
- Improve realism
- Annoy SWMBO
- Support ~~global~~ Eastern European economy

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# THE RAW MATERIALS

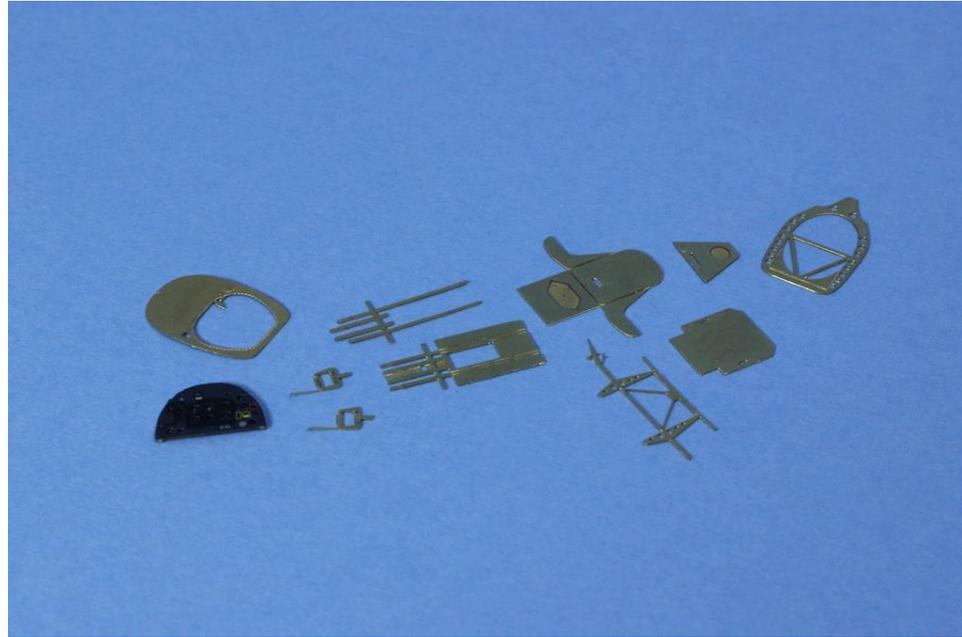


Eduard pre-painted Spitfire cockpit detail set (CZ)  
Marabu Design Spitfire cockpit (CZ)  
Yahu Models pre-painted instrument panel (PL)

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# PARTS REMOVED AND DE-BURRED

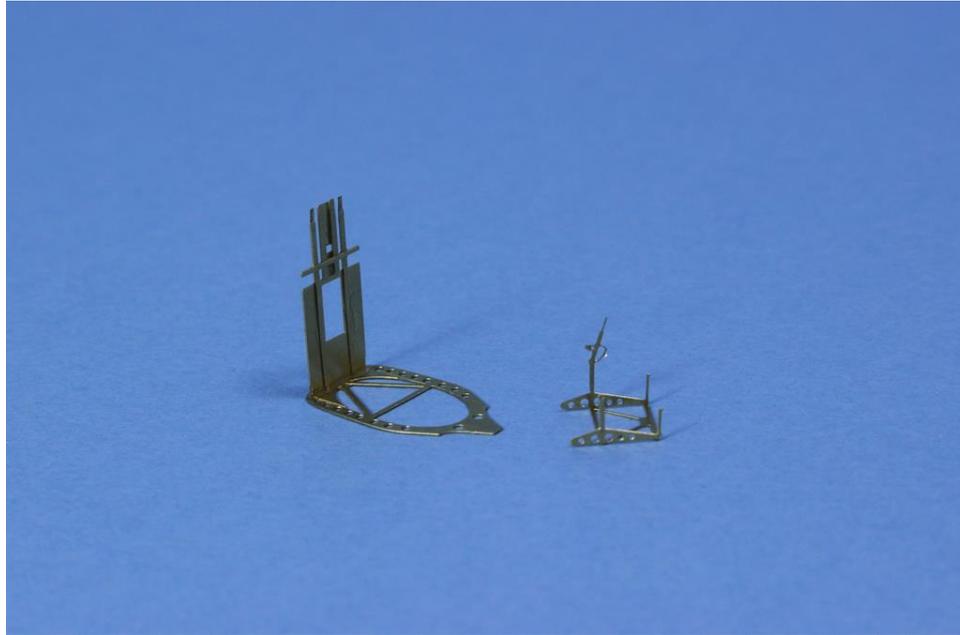


This is an entire Spitfire cockpit, including bulkheads, seat, seat support, armor plate, headrests, rudder pedals, foot boards, and instrument panel.

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# FOLDING – FROM FLAT TO 3-D

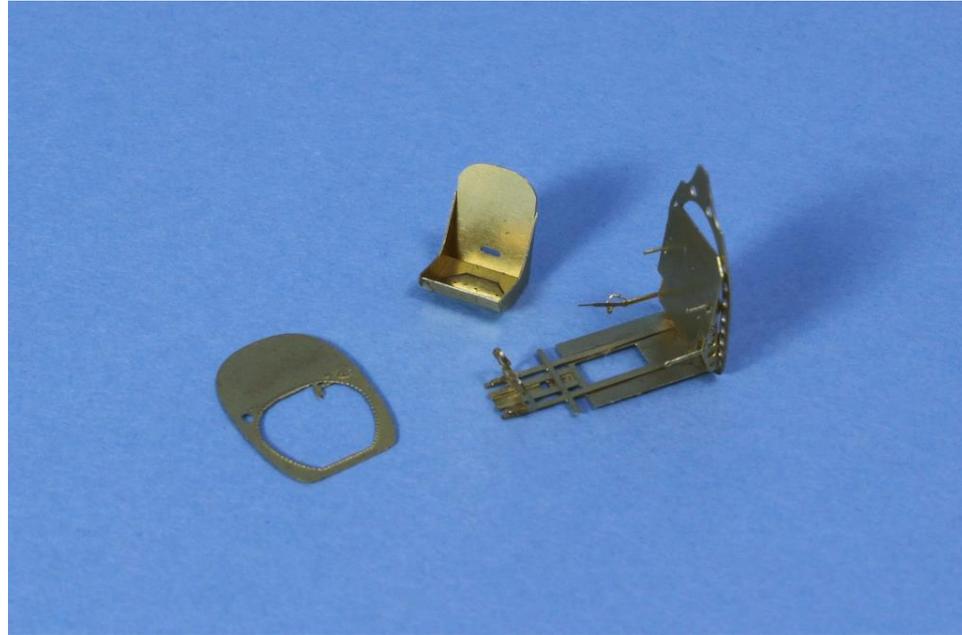


Clamp the part with the needle nose pliers, aligning the score line with one edge of the pliers, and fold as required. Always keep the score line on the inside of the fold.

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# MAIN COMPONENTS ASSEMBLED

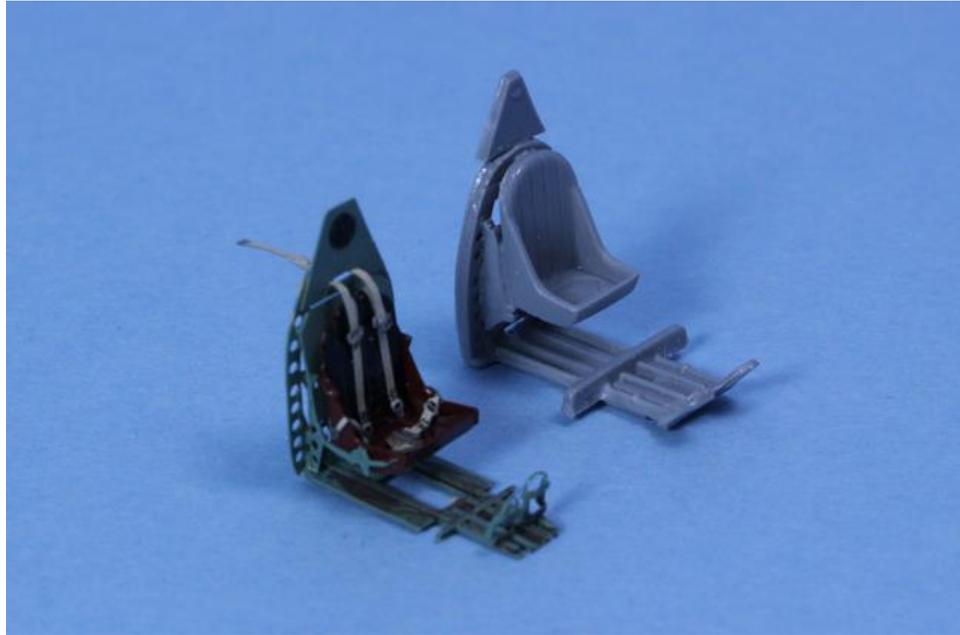


Cyanoacrylate (CA or Superglue) is used. Always use a gluing board, and apply adhesive with a toothpick or other appropriate method.

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# FINISHED COCKPIT COMPARED TO KIT PARTS

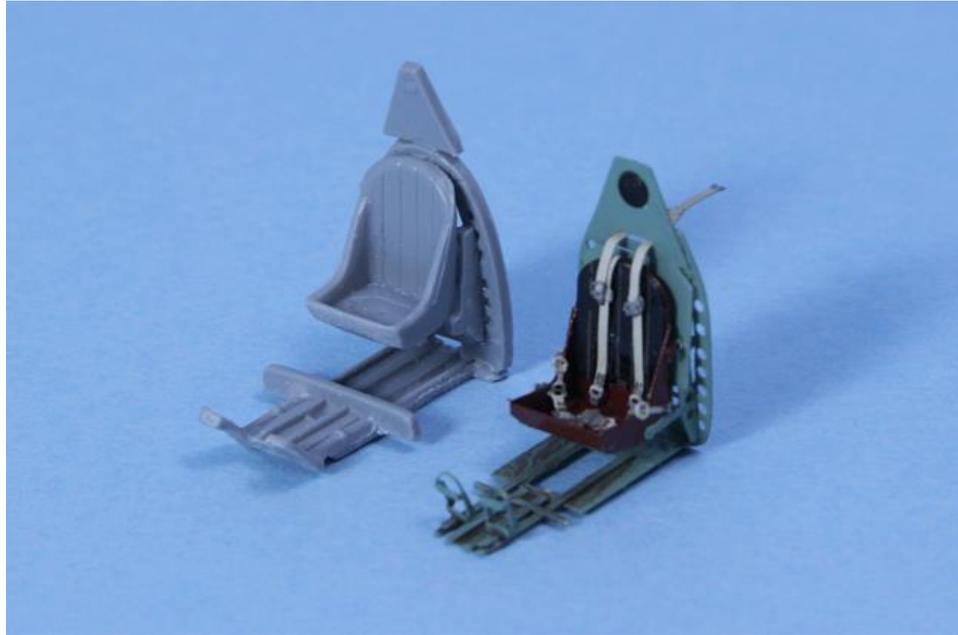


The handle of a paintbrush can be ideal when “rolling” photoetch pieces to make round parts such as the straps of the rudder pedals.

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# SCALE FIDELITY ENHANCED



Note also how the thicknesses of the photoetched parts are much more realistic and “to scale.” Side panels of the injected molded seat are a scale *three inches* thick!

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# DON'T FORGET THE COMPASS!

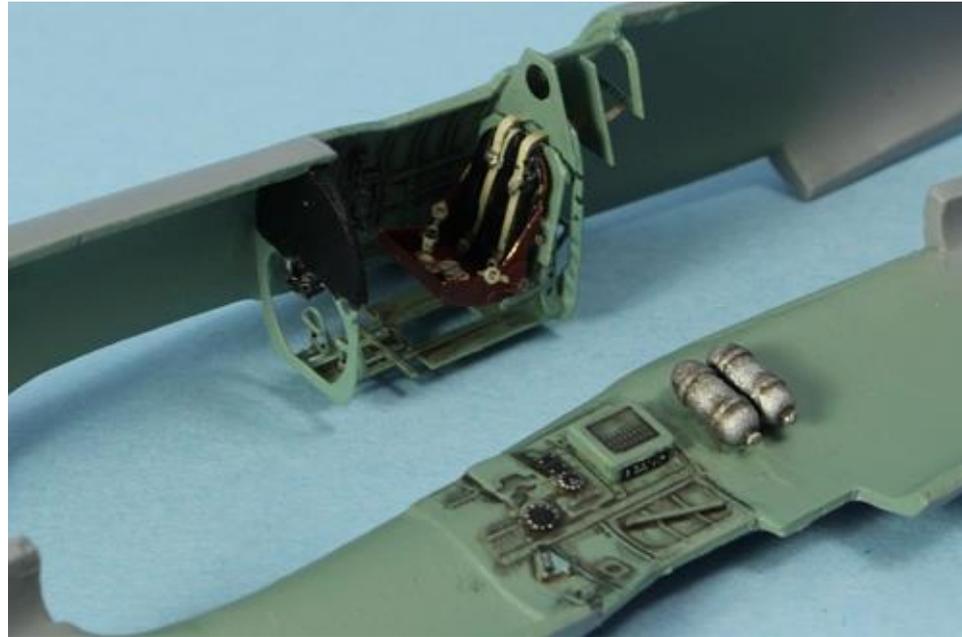


The compass shown here, relative to a Euro coin, consists of three parts – a folded photoetch base with brackets, a short piece of styrene rod, and a compass face decal. Yikes!

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# IN SITU



This is magnified about a gazillion times, but you get the idea. And yes, that is an extra armor plate behind the headrest.

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# “GINGER” LACEY’S SPITFIRE F.MK.XIVE



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# PROJECT

COCKPIT AND GEAR BAYS IN 1:72 SCALE PB4Y-1 LIBERATOR



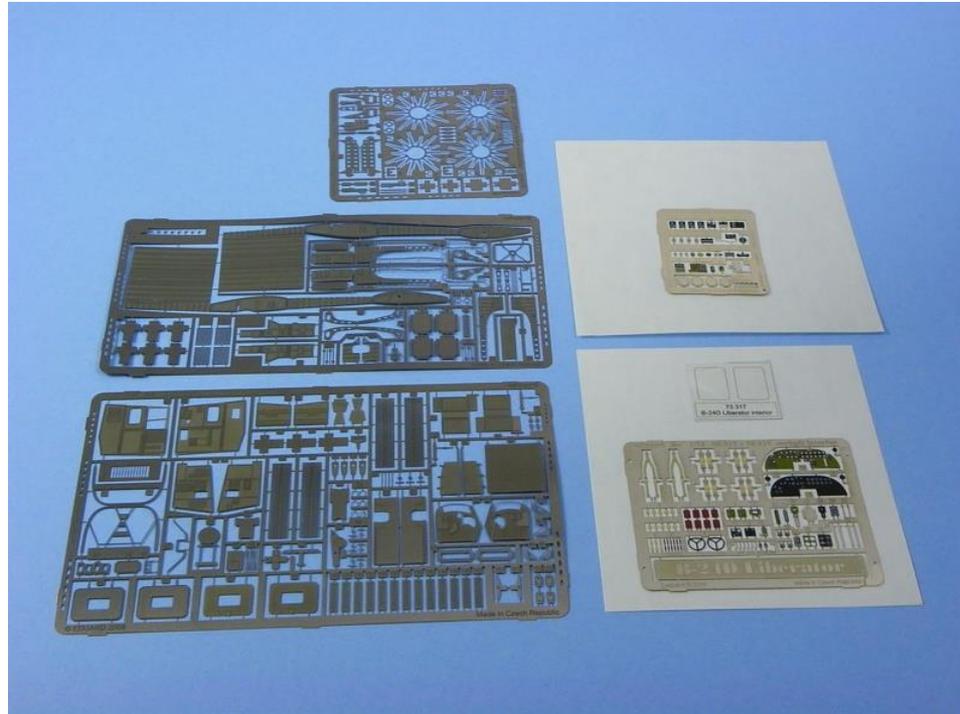
## OBJECTIVES

- Add more detail
- Preserve scale fidelity
- Improve realism
- Make people think this ancient 1966 Revell kit is really a modern Hasegawa product!

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# THE STUFF OF DREAMS

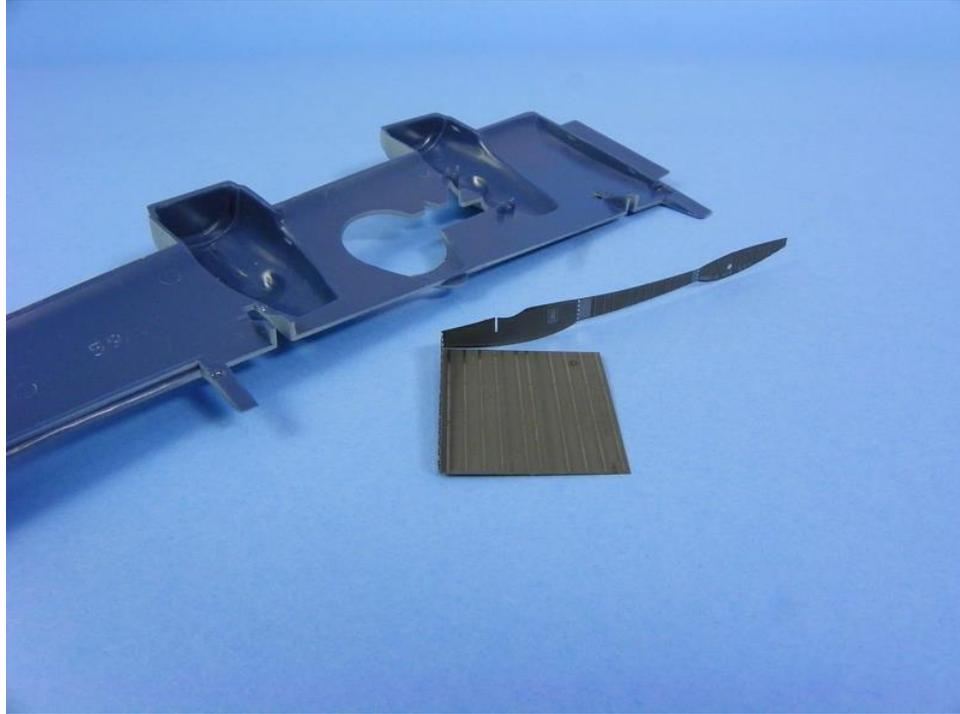


Believe it or not, there is a set of three dimensional gear bays on this flat fret. Plus most of the cockpit, engine wiring harnesses, ammo belts and boxes – amazing detail.

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# GEAR BAY FLOOR AND SIDEWALLS

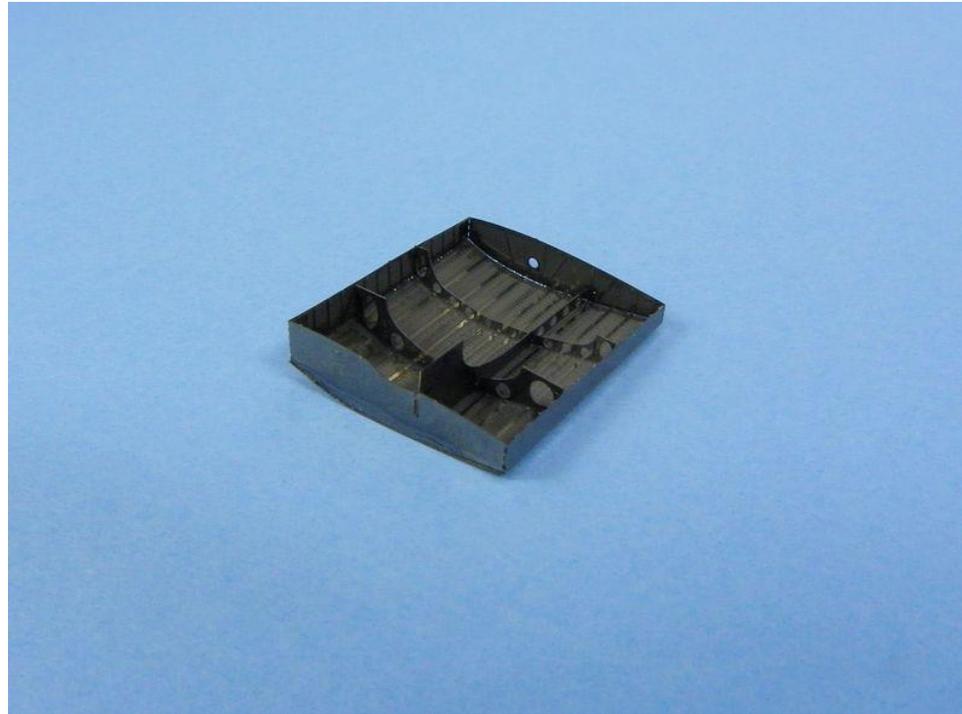


The floor of the gear bay will be gently curved to conform with the shape of sidewall – on the actual aircraft this is the airfoil of the wing.

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# COMPLETE WITH STRUCTURAL MEMBERS

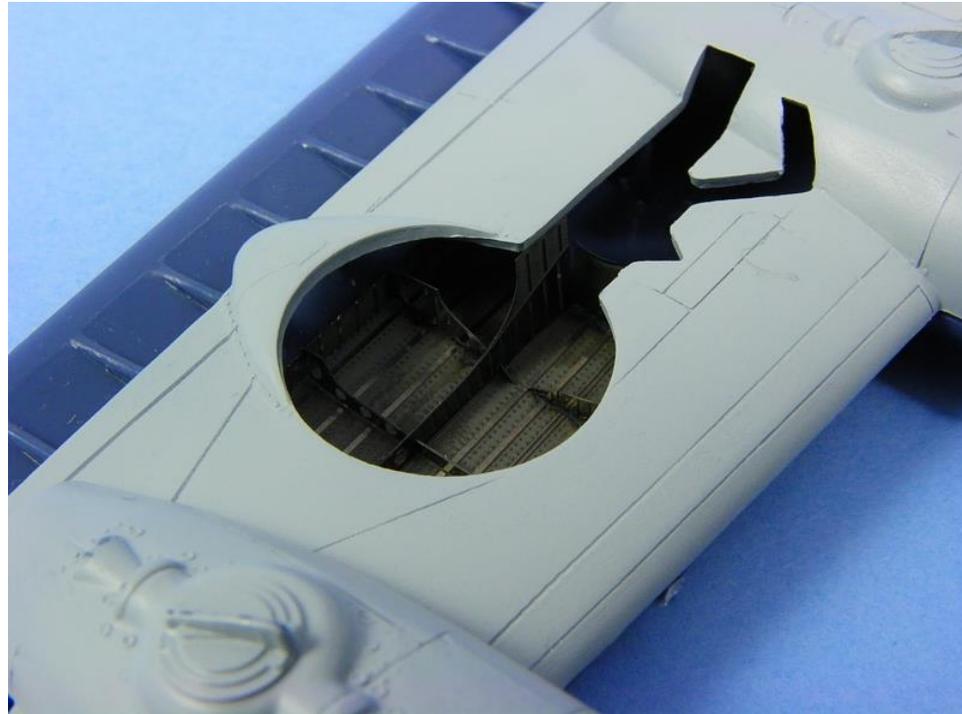


Not only are the structural members the correct scale thickness, but even include the lightning holes.

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# TEST FITTING IN WING



This photoetch set was designed for the Hasegawa kit, but fits well in the old Revell dinosaur. Just a few modifications necessary.

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# READY TO GO



Note the addition of a few more components  
– these boxes were folded up and added to  
the bays.

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# PHOTOETCH BRAKE LINES

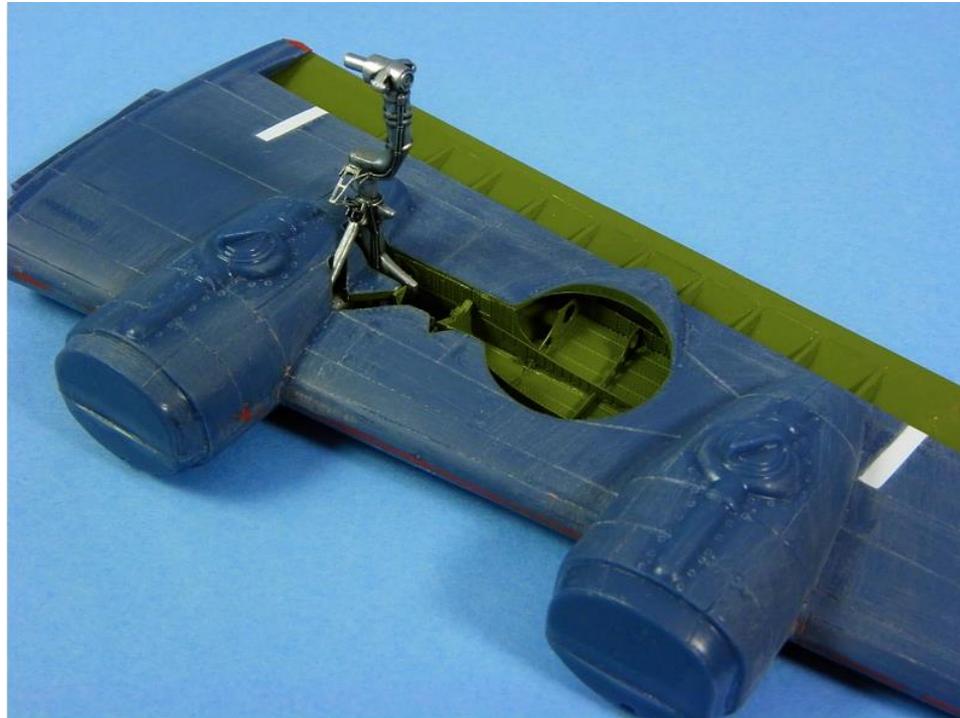


These are very fiddly, especially in 1:72. My process is to glue at one end, and once that is cured – start bending and gluing a little at a time. Work your way slowly down the length of the brake line.

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# THIS MIGHT JUST WORK

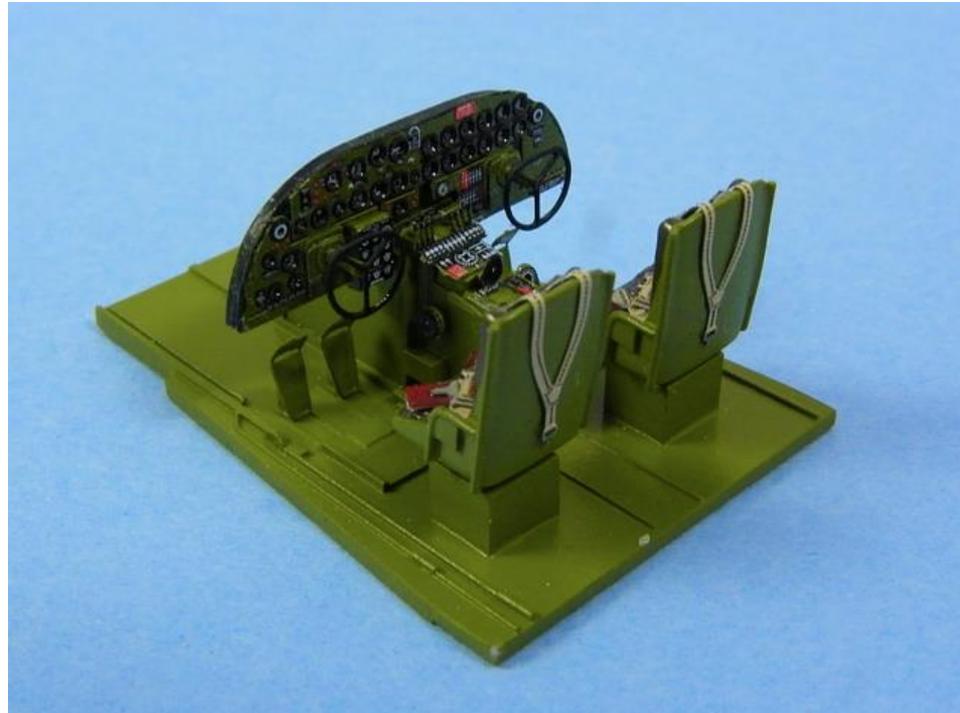


Completed gear bay and main gear leg assembled in wing. A little zinc chromate green and it's starting to look like an airplane.

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# 1:72 PB4Y-1 LIBERATOR FLIGHT DECK

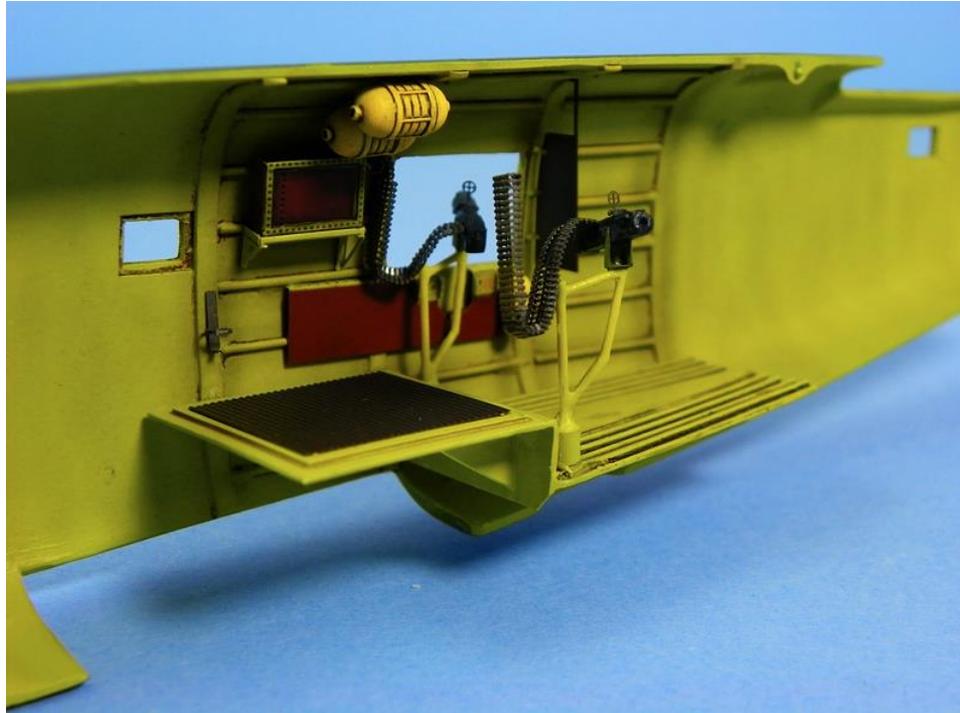


Photoetch parts include instrument panel (pre-painted), throttles, rudder pedals, harnesses, yokes, and other instruments on console.

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# WAIST GUNNER STATIONS

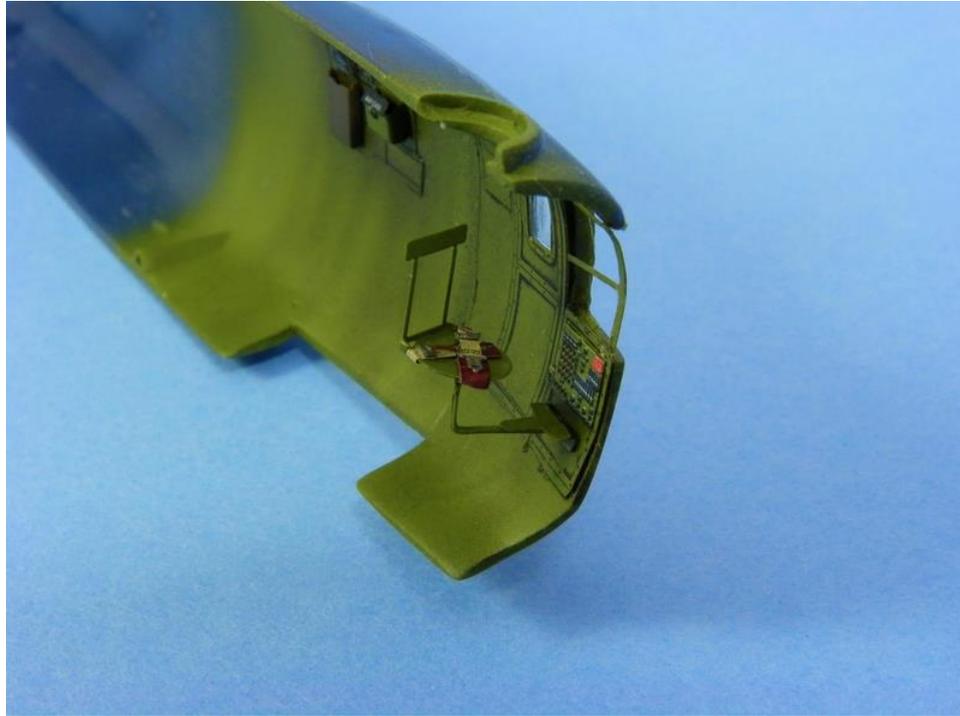


Photoetch ammo belts and gunsights really make this scene. But many other parts here are also photoetch – can you spot them?

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# JUMP SEAT AND CHEEK WINDOW FRAMES

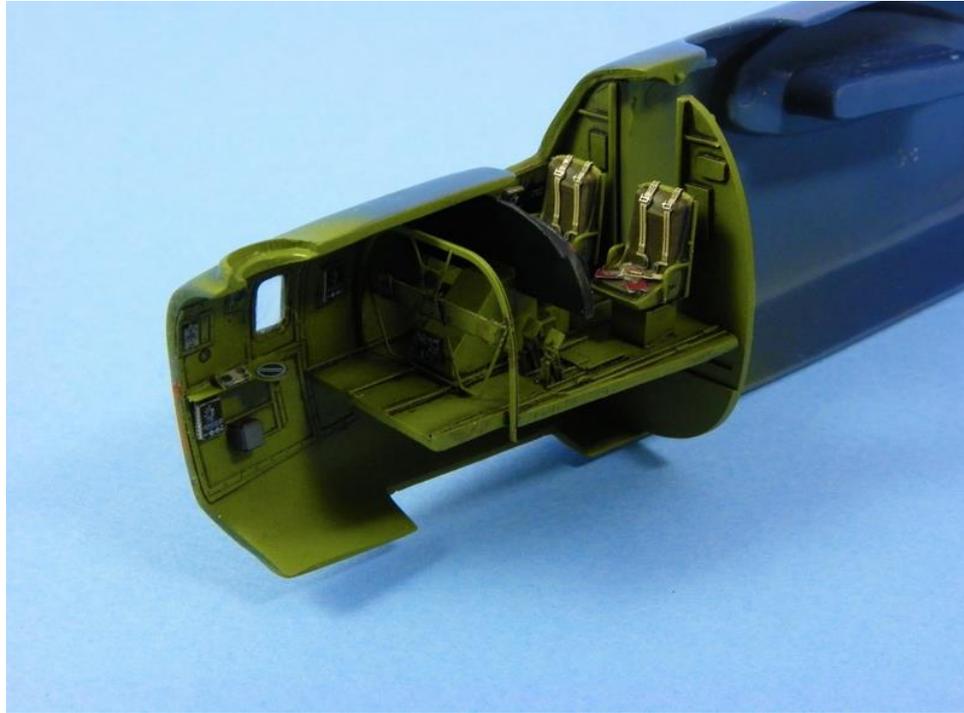


Some interesting folding operations to construct this jump seat – but it adds just the right amount of detail as seen through the greenhouse.

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# MORE DETAILS UP FRONT

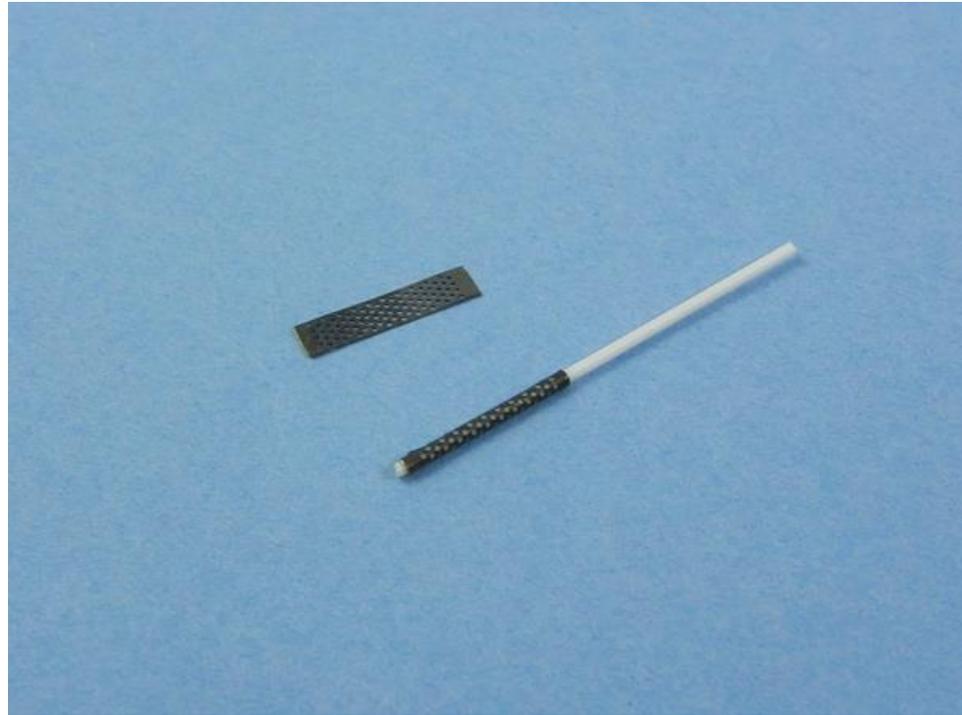


Before we close up the fuselage, the photoetch set adds a lot more small details to the nose gunner's station, including the frame in front of the flight deck.

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# VENTILATED GUN BARRELS



Without annealing, these were rolled around a mandrel made of plastic rod – it can be done and they look great!

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# “SUBDUER” PB4Y-1 LIBERATOR

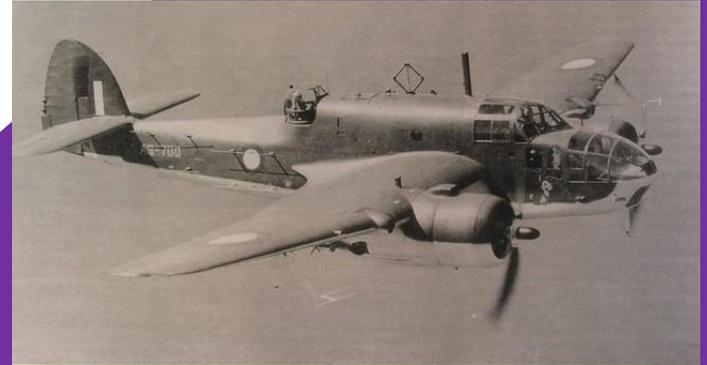


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# PROJECT

1:72 DAP BEAUFORT MK.VIII



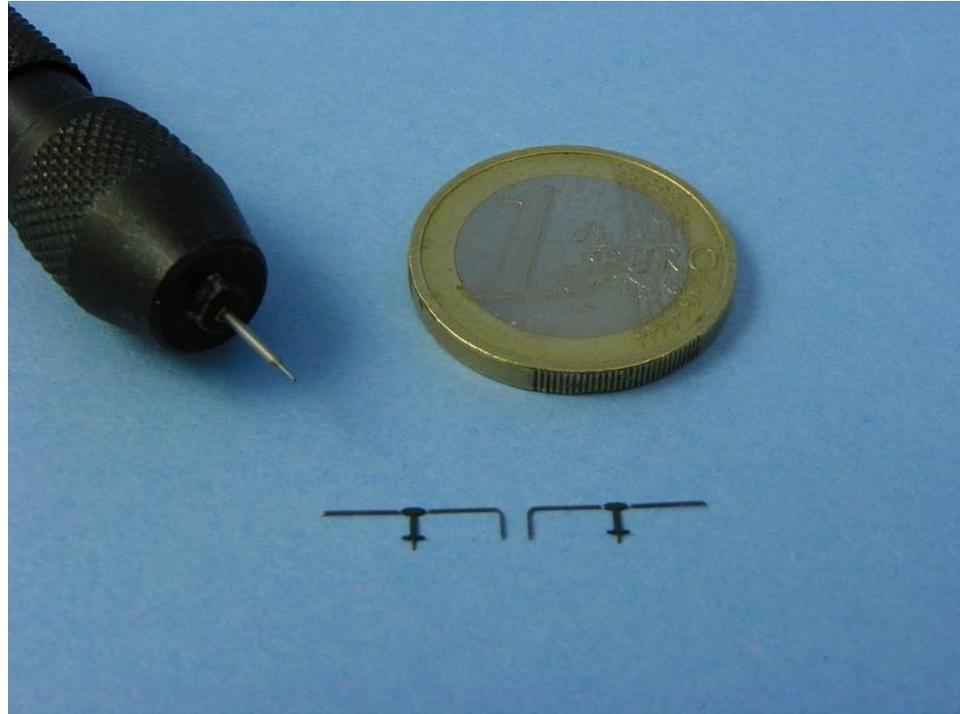
## OBJECTIVES

- Figure out some way to put on all those antennae!
- Thank goodness all this stuff gets hidden behind a radome nowadays

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# A MYRIAD OF ANTENNAE



In this case, the “stub” was left on each antenna, and a hole drilled in the model to accept them. Drill is 0.005”

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# IN PROGRESS – THE FUSELAGE FOREST

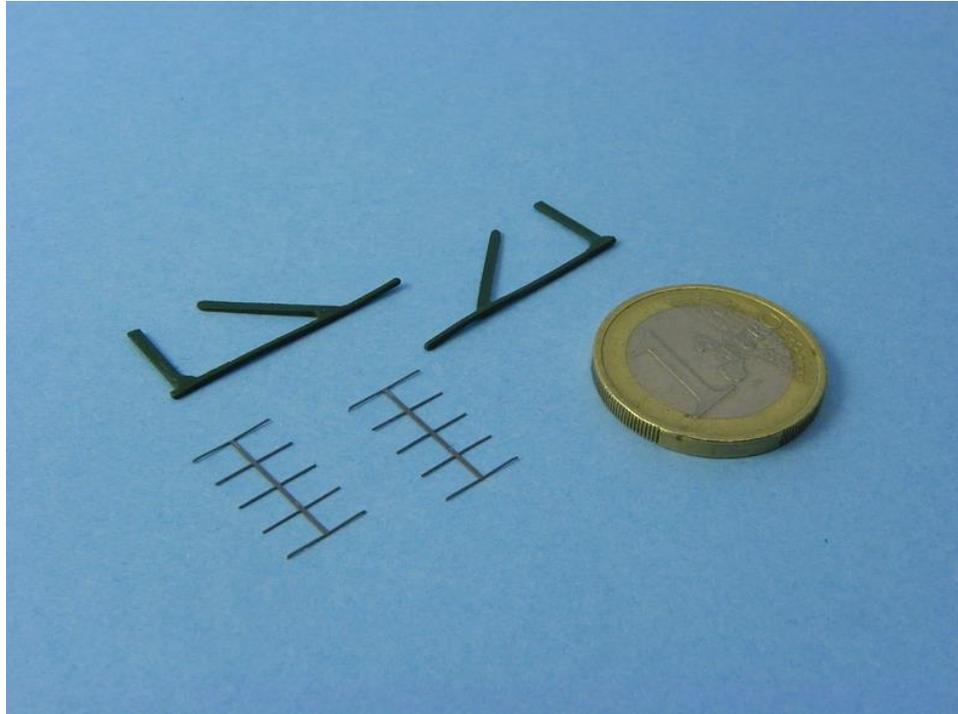


Each hole get a tiny bit of CA adhesive,  
and the antenna stub inserted. Getting  
them all aligned properly was...fun.

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# UNDERWING TV ANTENNAE?



These were even fiddlier than the fuselage antennae. These puppies bend just by looking at them. But they're to scale!

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# DAP BEAUFORT MK.VIII “SNIFTER”



At the end of the day, I think the work paid off.  
The photoetch antennae look so much more  
realistic than injection molded examples.

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# ROC CITY

**QUESTIONS?**  
I'M HERE ALL WEEK

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*Bill "Navy Bird" Gilman*