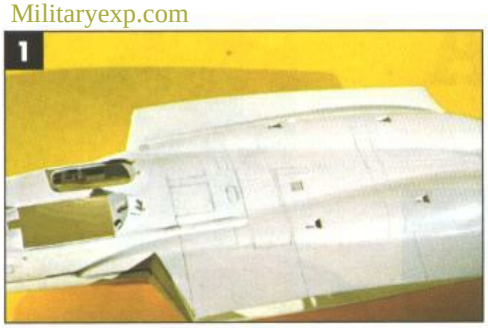
FineScale Modeler®
The essential tool for model builders

Folding a Sea Vixen

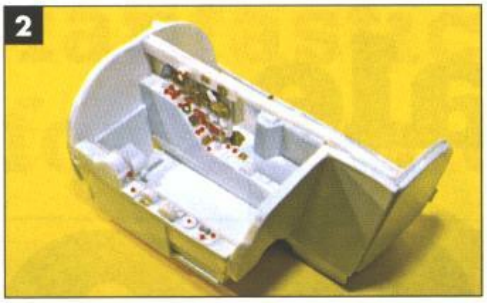
Wayne's model depicts Sea Vixen FAW. 2, XP924 during its last days aboard HMS *Eagle*. This aircraft was saved from the scrap heap and restored to flying condition.

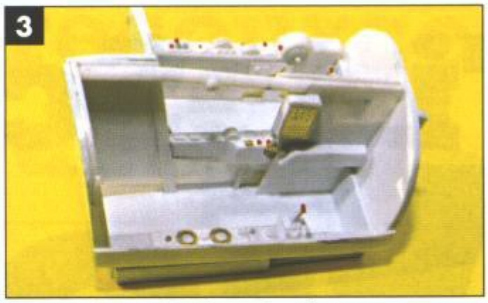
Successfully detailing a vacuum-formed kit hinges on careful construction

By Wayne Holmes



Wayne rescribed all the panel lines on the vacuum-formed parts.





The cockpit was built up with sheet styrene, plastic bits, and photoetched-brass details.

I'm afraid that I've fallen into a modeling trap. My first attempt, folding the wings of a 1/48 scale Dynavector vacuum-formed Westland Wyvern, was so addicting that I just had to do another.

This time, I tried folding the wings and exposing internal details on Dynavector's de Havilland Sea Vixen. Vacuum-formed kits can be difficult to build and can lack detail, but in this scale, those aspects were offset by Dynavector's good fit and fine detail.

Rather than give you a blow-by-blow of basic vacuum-formed kit construction, I'll concentrate on my techniques of building the wing-fold hinges and other improvements.

Preliminary work

After cutting each part from the backing sheet and sanding the edges, I rescribed all the recessed panel lines to ensure they would be deep enough to be visible after the model was built and painted, **1**.

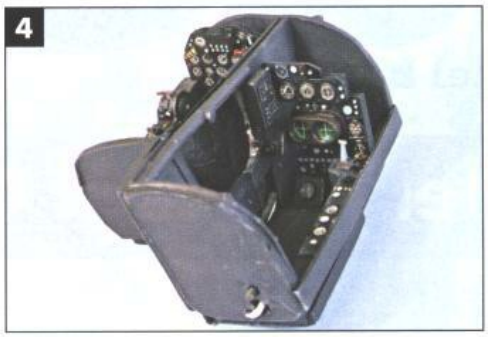
I opened up the pilot's cockpit area and carefully removed the navigator's hatch and side window. I cut away the forward nose gear door and used the separately molded one, then opened the outside main-gear doors – the inner ones stay closed except during retraction/extension.

Photos of parked Sea Vixens show drooping speed brakes and tail hooks, so I opened them on the model, too.

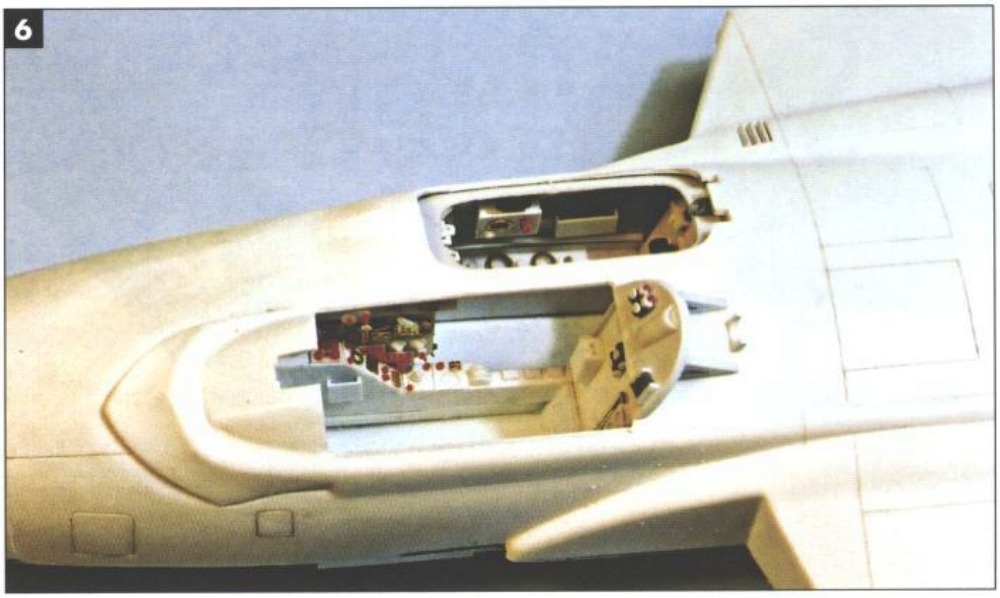
Dynavector's cockpit is too shallow, and as a result, the seats are too short. I found correct aftermarket Martin Baker seats and made a new cockpit tub to fit them, **2** and **3**. I didn't use the kit parts, rather lots of generic photoetched details and styrene stock. After painting, the new cockpit looks the part, **4** and **5**.

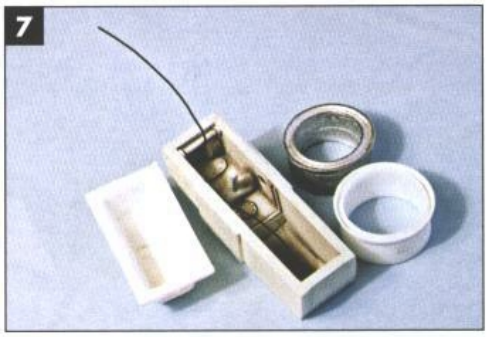
Before finishing the cockpit, I checked its fit inside the top fuselage half, **6**. I noticed that the inside of the intakes' boundry-layer splitters could be seen in the cockpit, so I covered them with sheet styrene walls.

The deeper cockpit has to fit inside the nose with the nose-gear bay, so I made a new bay with sheet styrene, **7**.



After painting, the cockpit has a utilitarian appearance. The radar operator in the right seat had a claustrophobic existence.





Test fitting the unfinished cockpit showed that the insides of the intake splitters could be seen. Sheet styrene baffles covered them.

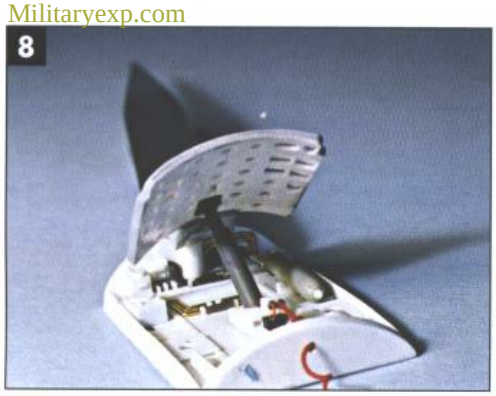
(Left) The kit's nose-gear well was too short, so Wayne made a new one from sheet styrene and wire. Next to it is one of the kit's metal exhausts and Wayne's improved exhaust cut from tubing.

Down below

I also boxed-in the main landing gear, speed brake, and tailhook bays before closing the fuselage. After detailing the brake bay with styrene and wire bits, I installed a telescoping hydraulic cylinder and hinges, which allow the brake to be posed in any position I choose, **8**.

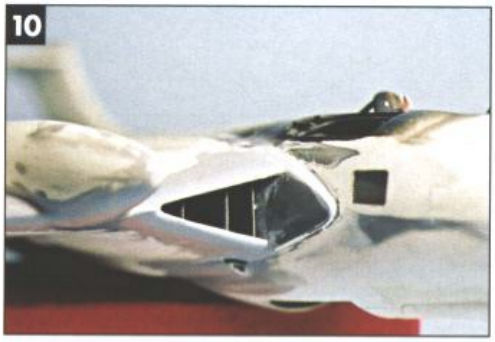
The kit's main gear bays cover only the area exposed with the outer door open, but even with the inner doors closed, you should see detail farther inboard. I tossed the kit bays and made extended ones for my model.

I was disappointed with the shallow white-metal engine nozzles, so I made



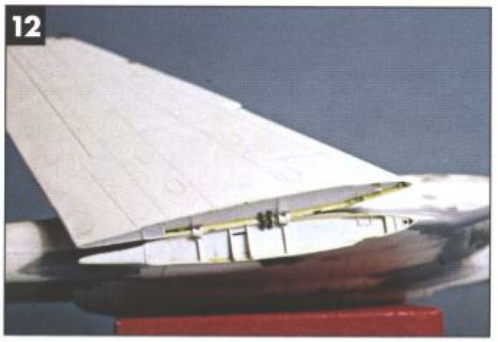
Deploying the prominent speed brake meant detailing the bay inside.

(Right) Here are the new exhaust cones in place. Note the support braces for the folded wings.



Wayne refined the splitter plates on the fuselage, and added thin airflow vanes to each intake.

Not even the landing gear escaped detailing. The disc is the brake, and the strut was detailed with styrene and wire.



The first step in folding is to install bulkheads. Each hingepoint actually works. The black "hoses" are stiff wires that help support the folded wings.

new ones from plastic tubing, then cut holes in the rear fuselage bulkhead to accommodate the longer nozzles. The outer flanges were cut from 1.5mm-thick sheet styrene and formed into rings that were smoothed into the kit tail cone, **9**.

I ground out the tail hook from the metal tail cone, and made a new one from styrene to pose in the dropped position.

Cleaning up the intakes was next. I did most of the filling and sanding work first, then fished in the thin sheet styrene guide vanes and splitter plate later, **10**. The dust from cleanup would have been difficult to remove if I had installed the vanes first. To keep most of the dust out, I stuffed each intake with wadded tissue.

Despite the fact that I was going to fold the wings, I added the full wings to the fuselage/boom assembly to make it easier to align everything. If the wings and tail were not straight and square, the appearance of the entire model would have been ruined.

Checking the landing gear fit revealed that the main struts were a bit too long, making the model sit tail-high. I shortened each main-gear strut 1mm, then added plastic and wire details, **11**. I also fashioned wheel brakes and gear door details from thin sheet styrene.

Now the scary part

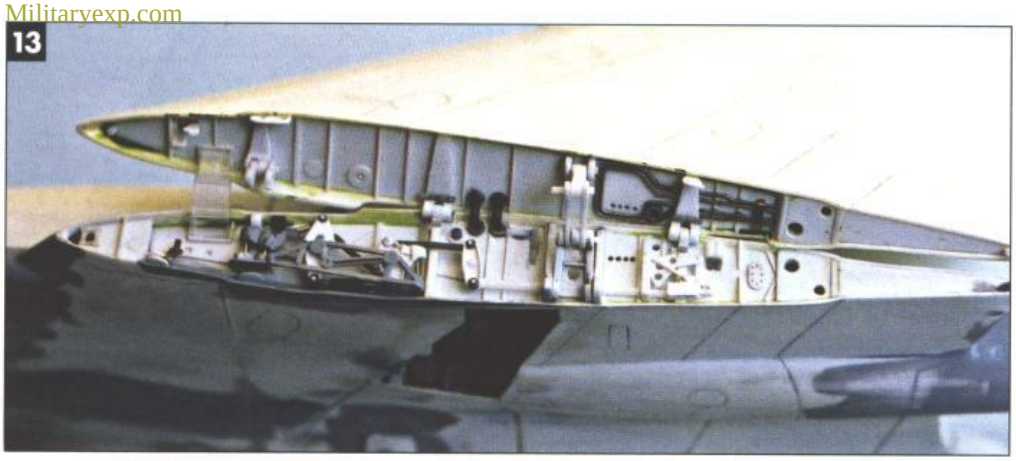
After taking a long look at the beautiful shape of the Sea Vixen, I summoned the fortitude to begin transforming it into something that looked more like origami. With a sharp No. 11 blade guided by a flexible metal edge, I scored along the fold lines in the top and bottom of each wing. The vacuum-formed plastic was soft and thin. After making a number of passes, the outer wings separated from the inboard section. Now I had two outer wings and something that looked like a weird hydroplane racer.

The next step was to make inner faces of the outboard and inboard sections. I shaped sheet styrene for these, noting the front and rear of the inboard faces were nearly flush with the wing surface, with the center section recessed. The outboard section was nearly all recessed. Strips of styrene serve as reinforcements for the faces, **12**.

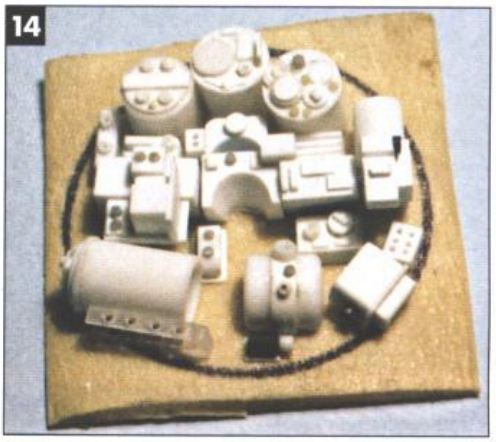
More styrene stock was used to make the hinges. They were glued in with tube glue, and when dry, were drilled out to hold short sections of steel wire. For the time being, these became working hinges, but eventually I would glue the wings in the folded position. This allowed me to be sure the added detail interfaced properly with each section of the fold.

The dark hoses in the middle of each fold were actually two pieces of steel wire folded into rounded L shapes. Obviously, they had to be folded at just the right angle. They were the main reinforcement of the wing folds and could be removed easily as I checked my work.

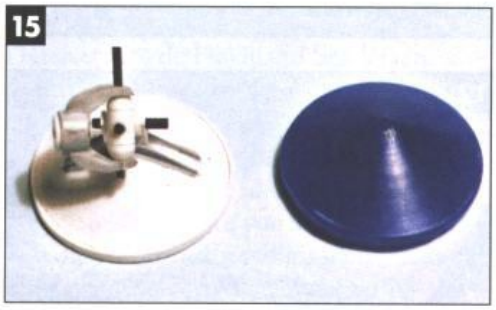
Photo **13** shows most of the wing fold detail installed. I sorted out the complex locking mechanism on paper first, then cut styrene to fit. The bridge-like part forward of center was made from styrene strips and small circles punched from thin sheet styrene. The main double hinge in the center was made with plastic strips glued to punched disks that were drilled in the center. See the plastic rods sticking out of the sides of the hinge? They pin the three sections of the hinge together so that it can operate. After painting and assembling, I



More wing-fold detail was added from styrene and wire bits. Wayne studied photos in his references, then drew out the detail locations on paper before adding the tiny items.

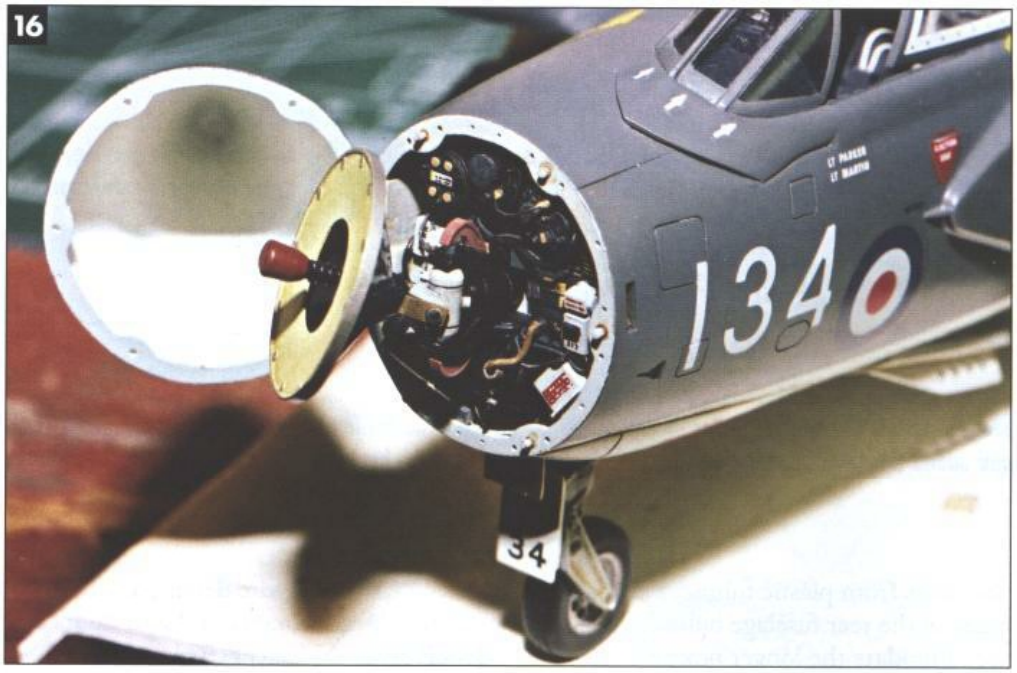


We may never know what each item is, but Wayne packed the exposed radar bay with parts made from styrene rod, sheet, and discs cut with a punch-and-die set.



The master for the vacuum-formed radar dish was turned from blue jeweler's wax (right). On the left is the copy with its working universal mount.

(Right) The finished radar is spectacular. The diameter of the nose is only about 1".



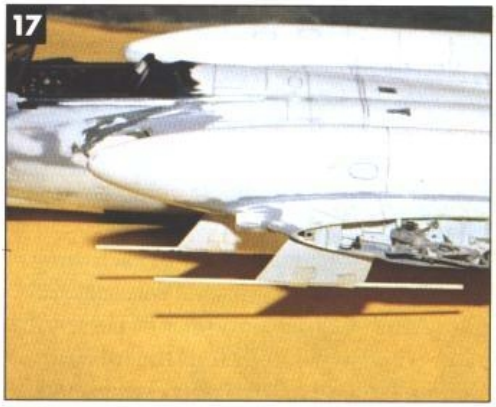
could add this main hinge last, position it at the appropriate angle, and flow liquid glue into it to permanently set it. The eight holes beside the hinge were for wiring that was added after painting.

Radar nose

Sometimes too much information can be a dangerous thing. I came across some wonderful pictures of a Sea Vixen on the Internet that had its nose swung open, and shots of the radar unit were taken from many angles. With a few strokes of my razor saw the nose was off, and my Sea Vixen got a lot uglier.

I made the nose-cone hinge operational to help align the locking pins with their corresponding holes and to make sure all the details fit. After adding a bulkhead to the nose cavity, I drew the various components on paper first, then made each item from styrene stock and disks punched out from sheet styrene, **14**.

The radar dish was vacuum-formed over a mold that I turned from a rod of blue jeweller's carving wax, **15**. This wax melts at a high enough temperature that vacuum-forming over it holds little risk. The styrene parts for the dish's universal swivel joint allow the dish to move in any direction. After installing and painting the components, I added various hoses and wires in predrilled holes, **16**.



Here's a good trick: Tack on long styrene rods to help align short underwing pylons.

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Scale Aircraft Modelling Vol. 14 No.1, Vol.16 No. 8, Vol. 18 No. 8, Vol. 19 No. 12
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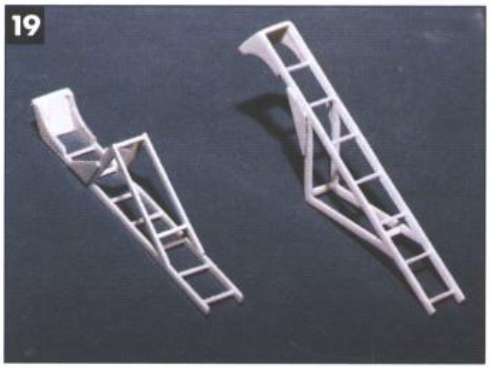
Aircraft Illustrated October 1996
Air Enthusiast Quarterly No. 80
Scale Aviation Modeller Vol. 5 No. 10
Model Aircraft Monthly Vol. 2 No. 10, Vol. 2 No. 11

Things under wings

I replaced the cast-metal underwing pylons with new ones made from thick sheet styrene. When attaching the pylons to the wings, I taped a length of straight rod to the underside of the pylons to help see the pylons were straight and parallel, **17**. Instead of using the kit's Red Top



The finished model shows off its wing-fold detail. The rocket pods came from an Airfix Harrier.

The last detail was a pair of boarding ladders, scratchbuilt from sheet and strip styrene.

Everything about Wayne's Sea Vixen is perfect, garnering the coveted "Best Aircraft" award at the 2004 IPMS/USA National Convention contest in Phoenix.

missiles, I borrowed Matra rocket pods from an Airfix Harrier GR.3 kit.

The kit's vacuum-formed drop tanks were used, but the overly thick wing fences were replaced with thin sheet styrene, **18**.

I built up a pair of boarding ladders from sheet styrene, **19**, and folded-wing braces from styrene rod.

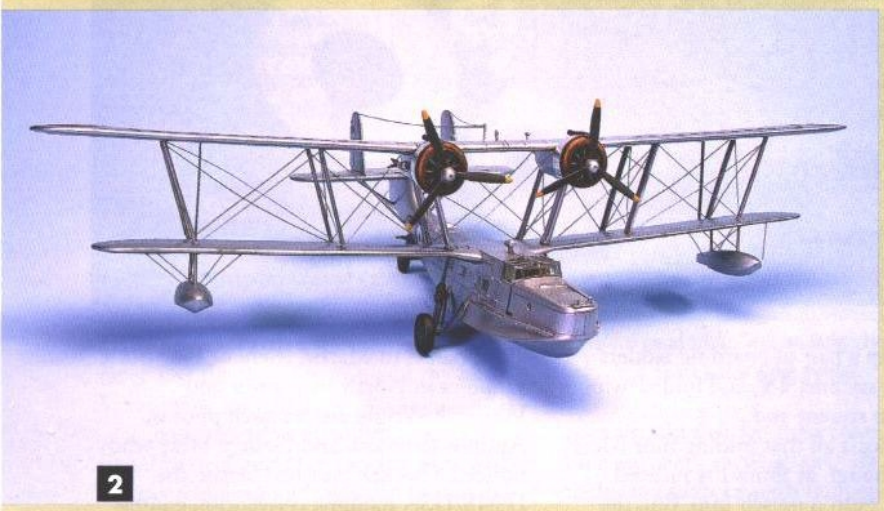
Now, wasn't all that folding fun? Most of it was, though at times I wondered what I had gotten myself into. But, the effort paid off; my model was judged "Best Aircraft" at the 2004 IPMS/USA National Convention contest. Now *that* was fun! **FSM**

[Thanks to Martin Riehl of Fine Scale Hobbies in North Vancouver and Warwick Wright for research photos, Andrew Birkbeck and George Stray who noticed a broken part just before the IPMS/USA national convention contest judging, and my wife, Patti, for putting up with this project and my grumbling for close to three years.]

Show Gallery

British military models seen around the world

1



2

Modelers from around the world show their appreciation for the British armed forces with exquisite models of some of the country's most honored military vehicles and aircraft. Below are just some models that pay tribute to Britain seen by FSM photographers on their journeys to model shows in England, Scotland, and the United States.

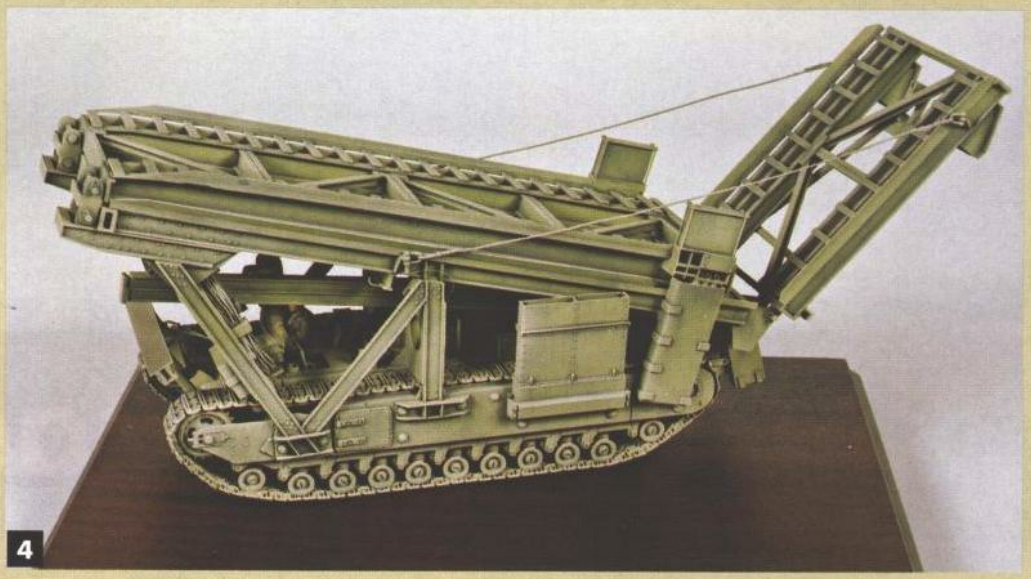
1 Milt Poulos
Santa Clara, California, USA

The markings on this 1/32 scale Revell Tornado GR.1 represent the 617 Squadron "Dambusters." Milt added fabricated switches and brake lines, among other details. His handiwork was seen at the 2004 IPMS Nationals in Phoenix, Arizona.

2 John Tarvin
Burnaby, British Columbia, Canada

John added rigging to his 1/72 scale Matchbox RAF Supermarine Stranraer, a unique 1930s era aircraft. His work was seen at the 2005 Seattle Spring Show.

3



4

3 Jan Forsgren
Angered, Sweden
Jan took his 1/72 scale Airfix Vulcan B.2 to the 2003 Scale Modelworld competition in the U.K. The Vulcan B.2, a long-range bomber, has a range of 4,600 miles with its maximum bomb load. It saw sky for the first time in August of 1952.

4 Matthew Farrer
Wakefield, England
Tanks, like Matthew's Churchill "Great Eastern Ramp Carrier," were built to serve as mobile bridges. The Churchill was displayed at the 2003 Scale Modelworld competition in the U.K.

5 Rick Weber
Gilbert, Arizona, USA
It was Rick's love of Spitfires that led him to build this 1/48 scale Spitfire Mk.21. He combined two kits to make sure everything was just right. Rick showed his Spitfire at the 2004 IPMS Nationals in Phoenix, Arizona.

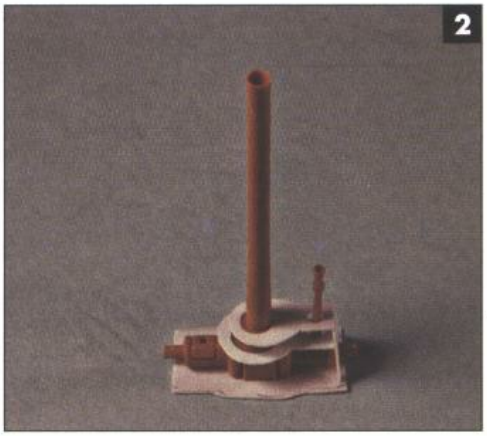
5

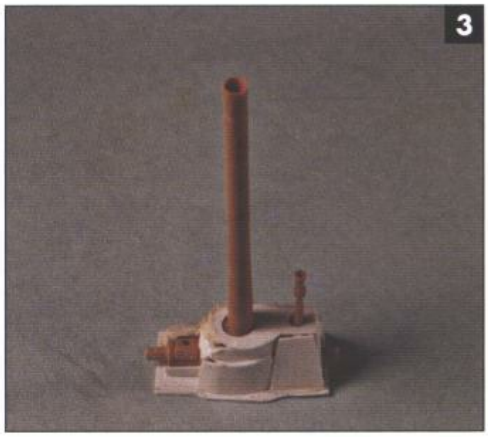
The Great Crusade...r

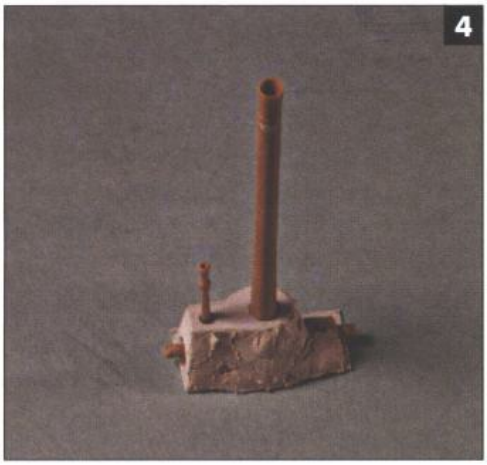
Simple techniques to backdate the 1/35 scale Italeri Crusader kit

by Peter Rasmussen

From time to time, it's fun to model a vehicle that is rare and isn't likely to be offered in kit form. The Crusader Mk.I by Italeri is a nice kit, but I really liked the early version of the Crusader I saw in a book. With this kit as my starting point, I decided to backdate my Crusader. The initial checklist of revisions included wheel plates, a new gun mantlet, a large headlight in the front and some minor alterations to the turret.







Peter backdated the mantlet by removing the center of the kit part, building up the structure with stryene, and filling in gaps with putty. Rough sanding gives the mantlet a cast appearance.

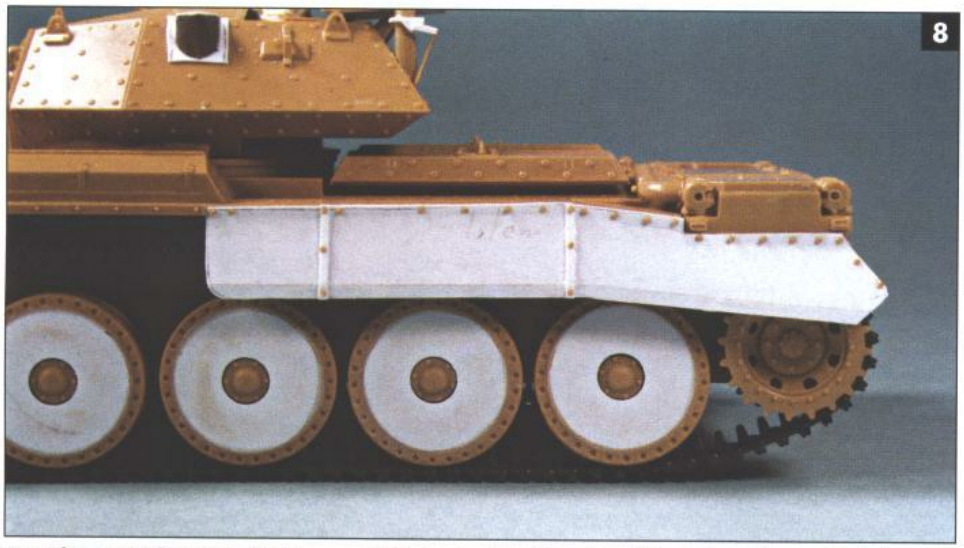
Many of the kit's details were added with parts fabricated from styrene sheet.

I started by altering the wheels. I measured the diameter of the wheel, and drew 10 circles with a compass on .040" sheet styrene and cut them out. Using a paper punch, I made a hole in the middle of each disk. The disks were glued to the wheels, and any gaps were filled with putty and sanded smooth.

Next I turned to the gun mantlet. I created a rough representation of the mantlet in plastic sheet, then sanded and added putty to the part to create a textured surface. I cut away the inner section of the mantlet, leaving just the outer ring, **1**. After studying pictures of the mantlet, I cut two circular pieces of styrene that would form the frame of the new mantlet, **2**. I added bits of sheet plastic to form the new part, **3**. A thin coating of putty was added and left to dry. I formed the mantlet's shape with a motor tool, **4**. Finally, five bolts were added – four around the machine gun and one above the main gun, **5**. After the mantlet was finished, I attached it to the turret. I removed the kit barrel and installed a resin replacement. I relocated the antenna to the rear of the turret, and made the hinge mechanism for the antenna mount from sheet plastic and stretched sprue. I believe that the round tube that protrudes from the left side of the turret may be an antenna mount. I fashioned this part with an old gun barrel from the spare box and glued it to a piece of styrene sheet before I cemented it into place, **6**. I decided not to use the stowage box, which is normally located at the back of the turret.

I built the remainder of the model according to the instructions with the exception of leaving off the large stowage bins and headlight guards. The front fenders have an inaccurately raised section, so I removed it by first drawing a line with a pencil and then cutting along the line with my hobby knife. The resulting hole was plated over with sheet styrene, and

Peter replaced the kit fenders with styrene sheet and thinned them to scale.



Crusaders carried sand sheilds to prevent the tracks from throwing dirt and dust. Peter added these details and replicated the rivets.

Using a compass and hole punch, Peter made the wheel covers from styrene sheet .

The Crusader light tank

The Crusader was an important British tank that saw extensive service in the seesaw fighting of North Africa. The American-designed Christie tank heavily influenced the design of the Crusader. The British were impressed at the speeds that the Christie-designed spring suspension allowed the tank to travel, and incorporated this suspension system into the design of the Crusader. Its rapid service introduction resulted in a less-than-successful operational history. It was mechanically unreliable and its armor was no protection against the German tank and antitank guns of the time. The Crusader was originally fitted with a 2-pounder gun, but this proved ineffective against contemporary German tanks. It was not until the Mk.III arrived at the front that the vehicle could engage enemy armor on equal terms, but even with the improved 6-pounder gun, the Crusader was rendered obsolete by the up-gunned Panzer IV. The Crusader series soldiered in different capacities until the end of the war, mostly in non-combat and training roles.

seams were filled with putty, **7**.

I fashioned the headlight casing from sheet styrene, and I moved the headlight from the turret after I made an opening in the casing with a paper punch. I fashioned the fenders from sheet styrene with rivets made from stretched sprue, and installed the tracks before the sand shields were added. I bent the sand shields slightly by lightly scoring them with a No. 11 blade and bending them until the plastic held the curve. The seam was then filled with putty and sanded smooth, **8**.

After completing all the modifications to the hull, **9**, I primed the model with Model Master gray primer and sprayed Tamiya red brown (No. XF-64) on the corners and edges to simulate shading. I used Testor Model Master Acryl British armor gulf light stone (No. 2137) as a base coat. I normally use Tamiya paint but found the Testor paint goes on nicely and has a wide variety of colors. I dry-brushed the model with Humbrol desert sand and white, and simulated paint chipping with Humbrol gunmetal. I gloss-coated the

model and added the decals., then gave the model a flat coat.

After painting and weathering, I added some helmets, canteens, and personal kit bags to the turret. The recognition flashes on the sides of the turret are from an old Verlinden set of British dry transfers. I ground up pastels and added them with a brush to the lower hull to simulate dust. I placed two German tropical helmets over the headlights, a common practice among British tankers. This was done to prevent light from giving away the tank's position, **10**. I placed a commander figure into the turret as a finishing touch.

The Crusader variant that I modeled accounted for only a handful of the 5,000-plus vehicles produced. I like the look of the early Crusader with the plated wheels, similar to the Christie that so impressed the British before the war. **FSM**

Peter's Crusader is painted with Model Master desert yellow and drybushed with Humbrol enamels.

This Crusader looks ready to roll! With some minor modifications and basic scratchbuilding, Peter created an early version of the venerable Crusader.

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