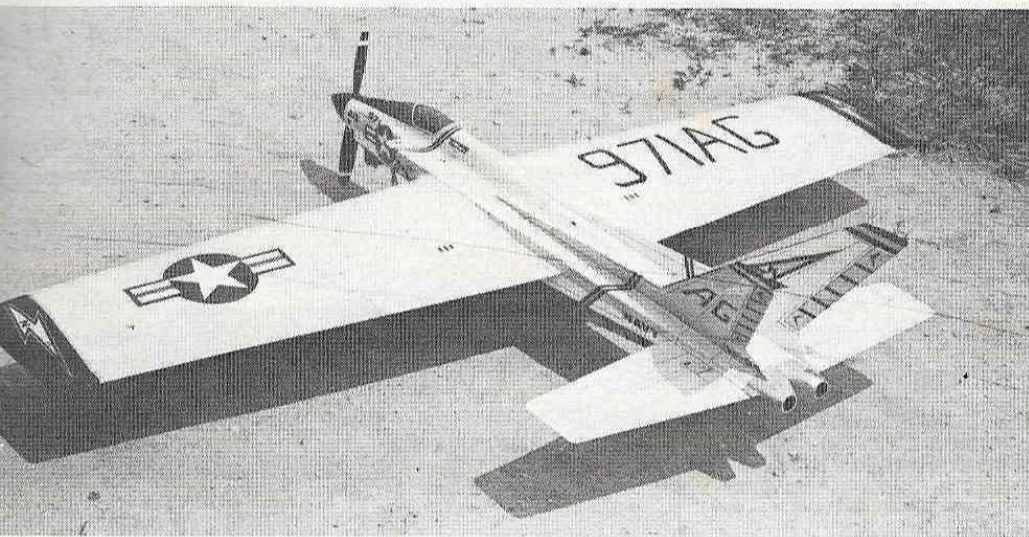
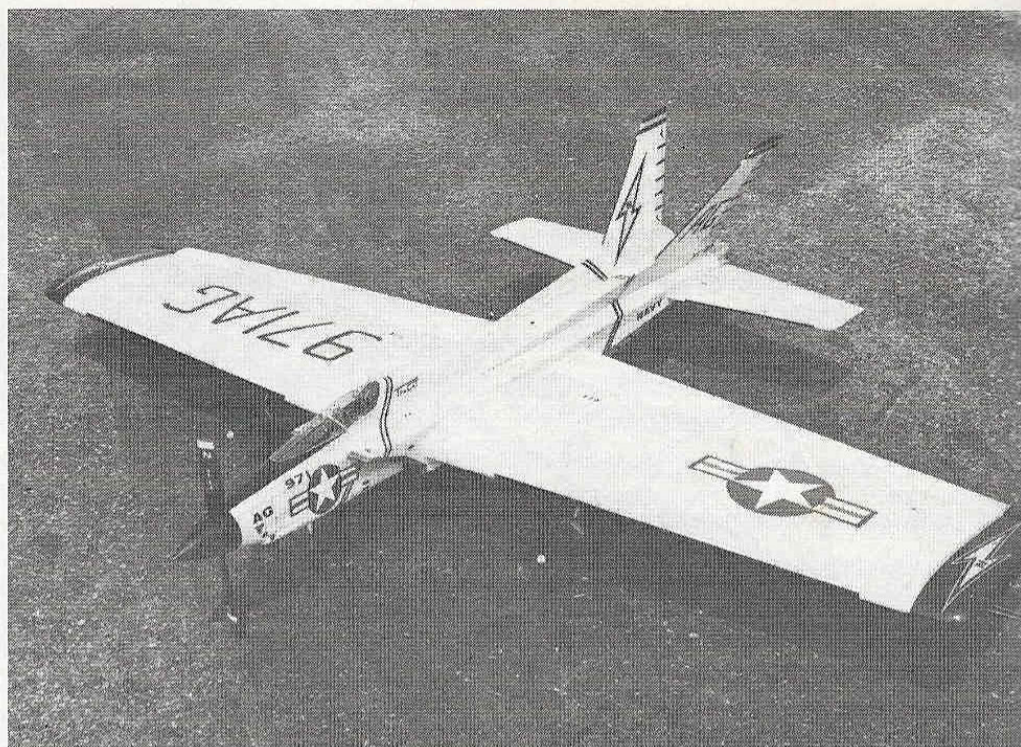


F-14 Tomcat

by Vic Macaluso

The classic lines of Grumman's F-14 "Tomcat" inspired the design of this pure contest machine. A suggestion of scale realism in a ship engineered for competitive performance. An O.S. Max .35 under the hood.



Ample area, good airfoil, well arranged moments and proportions. It's bred for performance with a trace of scale realism. At left: Vic's "F-14" is exotic from every angle. A twin-finned bird.

tion of this plane I got nothing but encouragement from the stunt stars in my area. "It'll never turn! The scoops are too big! Two rudders that big? Are you crazy!" Feeling quite confident with all this approval from my peers, I proceeded to shock even myself with the performance of this stunt ship.

It is the best turning, most positive feeling airplane I have ever flown. The feel of a stunt ship in the air has a great influence on the success of an airplane. It may fly well but if it doesn't feel just right a flyer might have a hard time adjusting to the plane. It's a hard thing to describe, but anyone who flies stunt knows what it is and this plane has it.

I've incorporated many adjustable features into this airplane. When I first started flying stunt, I came out with a new airplane and with the exception of twisting a flap and adding or subtracting nose weight, the way that plane flew was it! I had to compromise my flying to the performance limits of the plane. This is not so today! The plane must fly the way I want it to in order for me to fly competitively. By the addition of adjustable leadouts, adjustable rudders and adjustable wing tip weight, a stunt ship, providing it is built light and without warps, can be made to meet the needs of the most demanding flyer.

The Fuselage

Begin by cutting out all parts from patterns shown on planes. The main fuselage sides are shown by the heavy black lines on the plans' side view. Laminate the 1/16th ply nose doublers and 3/8"x1/2" motor mounts to the 1/8" balsa sides, using any epoxy type glue. Draw a centerline on formers F-1 through F-6. These will be used to line up the fuselage during assembly. Draw a straight line on your work table slightly longer than the fuselage. Using epoxy glue, assemble F-1 through F-6 and the fuselage sides together. Using the

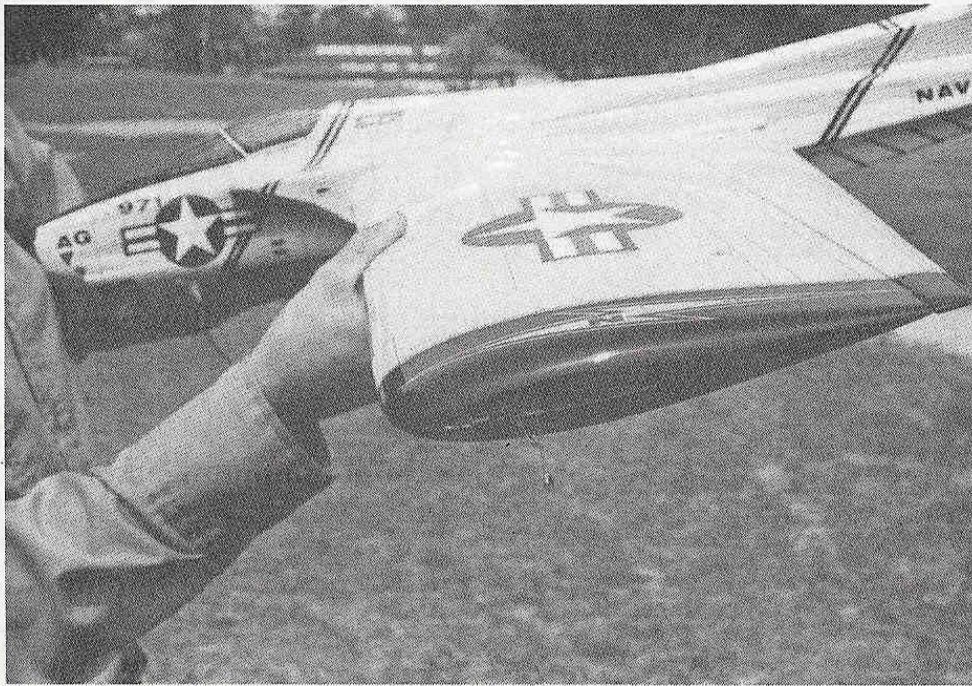
Hey Mister!! Is that a plastic airplane? How much does it cost? Where can I buy one?" Sound familiar? Anyone who flies stunt competitively has heard these questions dozens of times. Lately the stunt flyers from Flushing Meadow Park in New York have heard a new one; "Can I rent one of those at the Boathouse?" At first these questions seem funny, but after a while they drive you nuts and you end up being known as a "prima-donna" stunt flyer! What this all points out is that most competitive Stunt flyers come out with an airplane that not only flies well, but looks as though it really is "plastic."

The F-14 "Tomcat" is the latest in a series of designs in which I have not only tried to build a Stunt "machine" but also an airplane that is as scale-like as possible. Anyone who has seen the June 1971 issue of "American Aircraft Modeler" may recall my F-8 *Crusader*. With that airplane I achieved the effect I was looking for. The "Tomcat" is a refinement of that basic design, with changes in the planform to give it quite a different appearance.

The big differences in the "Tomcat" are the huge air scoops, very wide fuselage behind the C.G. and the twin rudders.

The air scoops being directly in the turbulent prop blast give very little, if any, aerodynamic drag and do not affect the flying trim at all. A very interesting thing happens though when the engine quits. All of a sudden there is no longer a turbulent airflow from the prop and those innocent air scoops become gigantic air brakes. On the first flight this scared the heck out of me when the plane lost airspeed so quickly, but I was equally amazed at how easy the plane was to land. The drag the scoops create kills most of the wing lift when the plane touches down and prevents the ballooning tendency most stunt ships have on a hot landing into the wind.

As most stunt flyers will agree, a stunt ship must turn square corners well or just forget it as a competition airplane. The biggest problem in a square corner is the well known bobble at the end of the turn. Most of this is due to the flyer over controlling or not recovering fast enough and some of it of course is due to the design of the airplane. The reason for the wide fuselage in my "Tomcat" was to try to dampen out the bobbling tendency by presenting a broad area of resistance in the direction of the turn. Throughout construc-



How a model hangs out on the lines is half the battle. Adjustable leadout permits on-field adjustment of line rake. Easy to install, quick to set. At right: Vic has his hands full. It's a fair sized machine, all the area you'll need for cornering, pattern aerobatics. Use a good .35 powerplant.



centerline on the formers and the line on your work table, align the fuselage perfectly and hold or clamp in place until the glue sets. You now have the main fuselage box. Next add formers F-2A to F-6A to the outside of the main fuselage and glue the airscoop sides, tops, and bottoms in place. A little work with a sanding block may be necessary to get the airscoop sides and bottoms to mate properly, because of the angles at which they meet. A little patience here pays off in good wood-to-wood fits. At this point it is necessary to mount your engine and spinner in place to facilitate the next phase of construction.

After you have done this, tack glue the 1/2" top and bottom blocks in place. Next, permanently glue the 2"x2"x25" turtle deck block in place. Make sure you have enough length on this block because the canopy mould will be carved from it also. At this time you should have a balsa box with a 2" diameter spinner stretching out the front end. Now comes the fun!!

Starting from the nose and using the plan side view, carve and blend the blocks and sides to meet the spinner. Working toward the rear, the canopy shape should be carved into the turtle-deck block and then very carefully blended into the top of the airscoops. Careful study of the photographs and a little imagination shouldn't make this too difficult. The secret here is to work slowly and equally on both sides. From the canopy back it's easy. Just carve the top and bottom blocks down to meet the airscoops. A lot of patience pays off in a sleek fuselage, with huge smooth fillets blending the canopy smoothly into the fuselage. Next glue and carve the tailcone block to shape as shown on the plans and you have a completed fuselage. Remove the top and bottom blocks and hollow as much as possible for lightness. At this time, fuel tank and landing gear can be added according to plans.

Wing Construction

The wing must be built either on a jig or

a straight flat board. Make the ribs according to construction notes A-D shown on plans. Lay the plans out on a flat surface. It is not necessary to trace the outboard wing section because it is the same as the inboard section.

Mark all rib locations on the trailing edge and pin in place over plans. Next place 1/4" sq. top and bottom spars in place and pin all ribs to the trailing edge. When this is done, pin the 1/4" sq. leading edge into place. Note that no glue has been used yet. Make sure that the wing is lined up perfectly and free from warps. When satisfied, glue all previously pinned joints and let dry, periodically checking for warps. Next the 1/8" ply bellcrank mount is cut to the dimensions shown on plans and glued in place between ribs W2, W1 and W2. The type of bellcrank and leadouts you use is your choice but add these next.

Plank the leading and trailing sections with 1/16" soft balsa as shown, again checking for warps as you proceed. Next remove the wing from the board and plank the bottom also. The inboard wing tip is made from two 1"x3"x9" blocks laminated and hollowed. An adjustable leadout mechanism is shown on the plans. I strongly recommend you take the time and build it. They are an absolute must in properly trimming a Stunt ship. When done, glue this assembly to a piece of 3/8" sheet and glue this to the wing tip. The outboard wing tip is simply a piece of 1"x2"x9" block glued in place and carved to shape. Before gluing the outboard tip on permanently, insert the 3/4 oz. tip weight. Next add the 3/32" dia. music wire pushrod to the bellcrank and when you are satisfied that everything is working properly, completely plank like the rest of the wing with 1/16" soft balsa sheet. The addition of the flap horn and flaps completes the wing assembly.

One note about the control horns. They must be silver soldered or brazed together because of the high flight loads put on them in a Stunt pattern.

Stab, elevators and rudders are cut from

1/4" balsa and are all sanded to a symmetrical airfoil shape. Try to keep these assemblies as light as possible because of the greater mass behind the C.G. on this airplane.

The ventral fins are cut from 1/8" soft sheet.

The drop tanks are carved to shape as shown on plans. These are optional and if you decide to use them, do not forget to install the drop tank mounts in the wing as shown on the plans.

Final Assembly

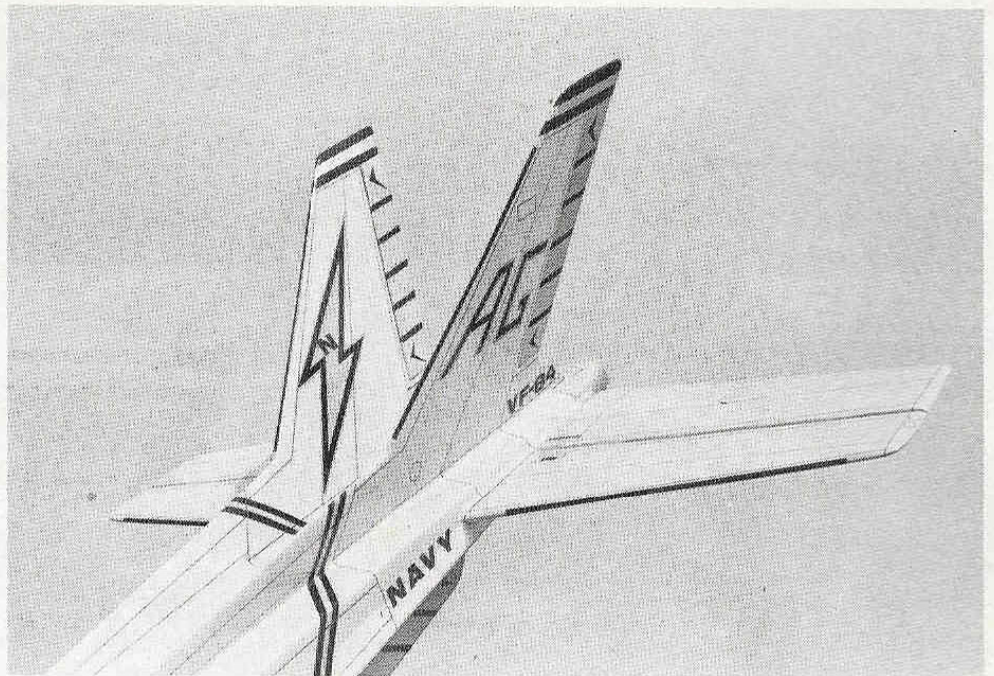
By now you should have five separate assemblies, the wing, fuselage, stab and elevators and the two rudders.

With the fuselage upside down, carefully cut away a section of the fuselage and airscoops just large enough to slip the wing into the cutout shown on the plans. When you have a perfect fit, carefully align the wing square to the fuselage and glue in place. Let this dry overnight. It is very important that the plane be lined up properly. When this is done, replace the fuselage section previously cut away. Next bend the 3/32" dia. elevator pushrod to shape. With appropriate cutouts made in the fuselage, slide the elevator and stab assembly into the location shown on plans, but do not glue it in place yet!

Next install the pushrod into elevator and stab horns and solder retaining washers in place. Now with the flaps fixed in a neutral position, slide the stab-elevator assembly fore and aft until you have a neutral position on the elevators. Now this assembly can be permanently glued in place. Make sure the stab and wing are perfectly lined up with each other!

When you are satisfied that everything is operating properly and that nothing will come apart in the air, you can close up the fuselage by gluing the top and bottom blocks in place. Next glue on the rudders and ventral fins and you have a completed airplane ready for finish.

One note about the rudder angles. The



Above: Simple sheet fins, yet they add a truly distinctive look to the F-14 "Tomcat" Stunter. The aircraft, while modernistic, is easily fabricated from basic sheet material. Below: Enter the jet age. A pair of dummy exhaust nozzles add to the illusion. Easily trimmed, capable on the flying field.

angle at which the rudders tilt from the fuselage is really not critical. Any angle from 75 degrees to 90 degrees is OK. Do not go past 75 degrees because the rudder may blanket the elevators on an outside turn.

Before you proceed with finishing the plane, you still have one small task; the canopy. In the proper location on the turtle deck block, carefully draw the outline of the canopy. (You should have no problem with this because of the fantastic carving job you did when you first shaped the fuselage.) Next using a very sharp #11 X-acto blade, carefully cut the canopy shape away from the fuselage. Be very careful not to ding this as it will be the mould for the canopy. With the mould mounted on a convenient stand, heat a piece of 1/16" plexiglass in an oven until soft and *quickly* draw it down over the mould. It may take several tries to find the right plexiglass temperature.

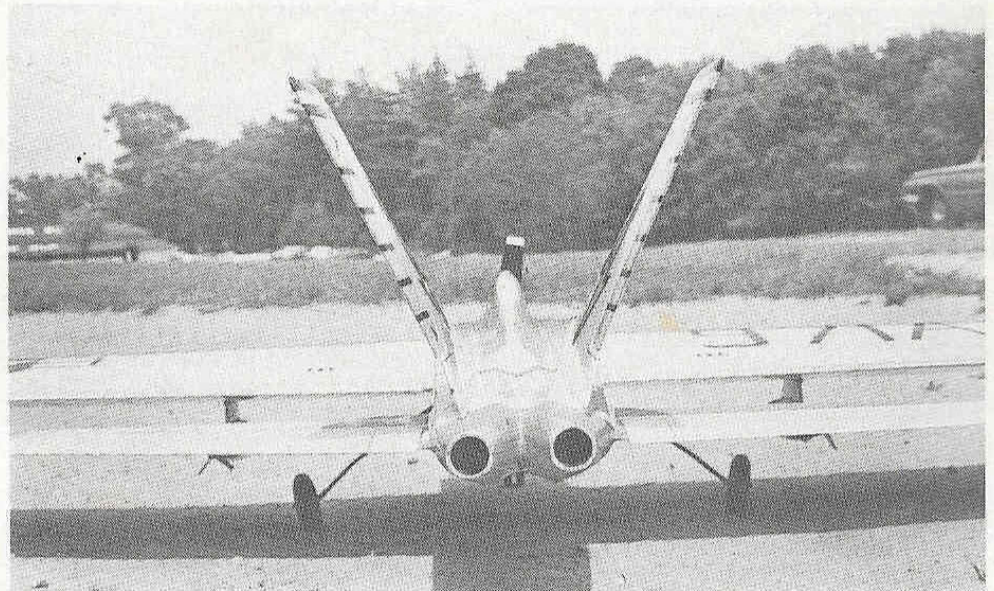
The completed canopy can be tinted by submerging it in Tintex clothing dye until you have the tint you want. When this is done, add a military type cockpit and epoxy the canopy in place.

The plane is now ready for the fillets and final sanding. I used Sig Epoxy-lite for the wing, stab and cockpit fillets. This material is very easy to work with and sands just like balsa.

Finishing the model takes patience because there is so much to do on it. Take your time and don't rush it. The end result will be much better.

There are about as many different finishing methods as there are modelers, so I'll leave the finish up to you. My F-14 was finished entirely with Aero-Gloss products.

In closing I would like to offer my congratulations to two local stunt flyers, Gene Schaffer and Bob Lampione on their 2nd and 5th place wins at the 1971 Nationals, and of course my sincerest congratulations to Bill Werwage, on his first place. (Heard he was glad I wasn't there to step on his solid lines.)



Below: A convenient reel and comfortable handle is all-important. Note the safety thong. Check lines for kinks and such, discard before trouble starts. Always test control system before flying, keep spectators clear.

