Tamecat

ON MORE THAN one occasion, a good friend of mine has been known to say, "There are only two types of aircraft—fighters and targets." Now, while this colorful gentleman's tongue-in-cheek comment may be somewhat questionable, it's still a pretty safe bet that most newcomers to our sport would find far greater inspiration if their first RC models looked a little bit more like modern jet fighters than like one of my friend's proverbial targets.

We all know that fighter aircraft are designed to go fast and kill the enemy, and that these qualities have nothing whatsoever to do with the purpose of RC trainers. Still, if there were such a thing as a truly gentle, yet mildly aerobatic sport/trainer cleverly disguised to create the illusion of a combat-ready jet fighter, wouldn't that make the uninspiring concept of flight training a much less bitter pill to swallow?

Can today's aspiring RC flier find such an airplane? Absolutely . . . It's the F-14 *Tame*cat!

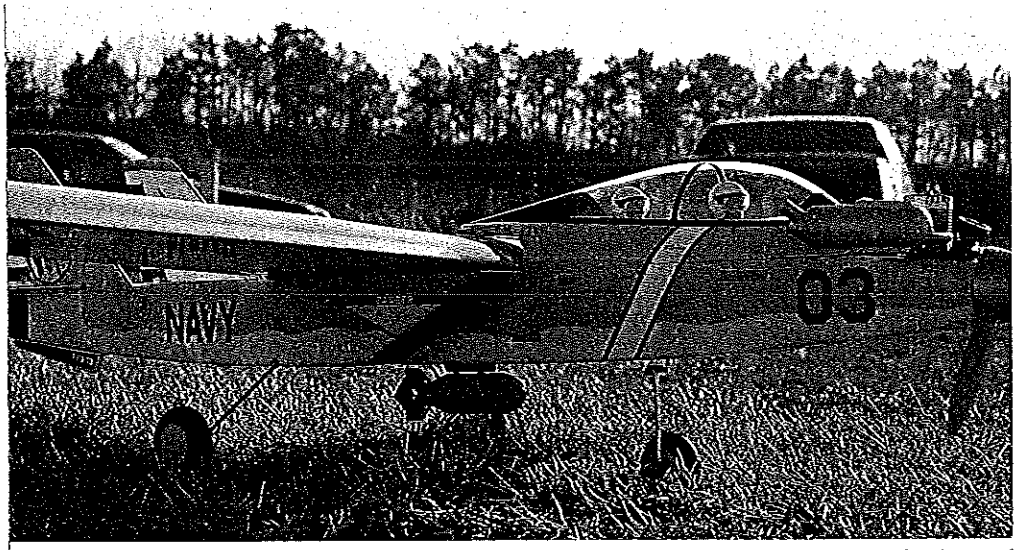
Look closely at this design, and you'll see that the F-14 fighter appearance is just a sham. Beneath the spurious packaging, the *Tame*cat is an extremely stable and versatile RC sport/trainer. The wing features over 670 sq. in. of area, the wide-stance landing gear gives excellent ground handling ability, and the generous tail area provides solid stability throughout the entire flight envelope. The *Tame*cat's long, slender nose is offset by its use of sturdy tail design—and is further rewarded by one of the largest radio compartments found anywhere, making radio installation into the airplane a

pleasure.

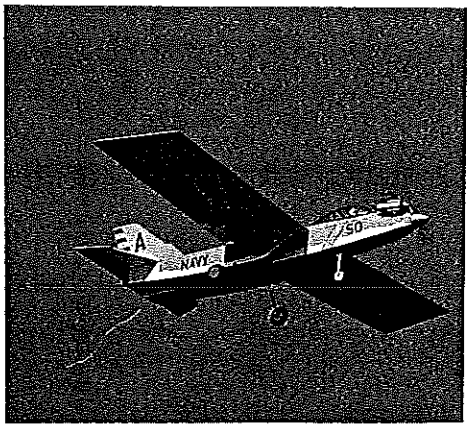
The *Tame*cat's most visible difference from currently available sport models is its second vertical fin and rudder. There's no question that the airborne appearance of those twin tails is most exciting and well worth the small extra effort in building them. In spite of this unique feature, all control linkages—including rudders—are straightforward and surprisingly simple to make and install. Because the radio compartment is in the rear of the model, the elevator and rudder pushrods are short. This feature prevents

Big picture: *Tame*cat ready to go. This facsimile of the F-14 with its optional bomb release looks aggressive, fast, and mean. But it's all an illusion. The aircraft is about as docile a model as one could possibly wish for. It's big but not heavy. It's full of air, not weight. A .40 two-stroke swinging a 10 X 6 prop is all *Tame*cat needs to start the novice pilot on his way to mastering the skills of RC flying in grand style. Above: The author and designer of *Tame*cat posing with his unique creation.

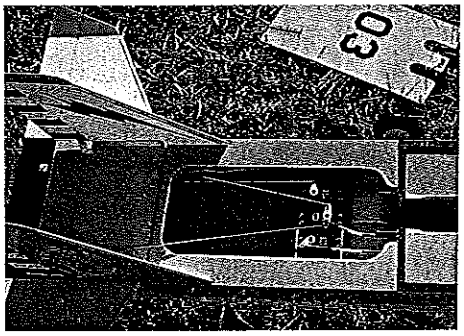
Cleverly disguised to create the illusion of a combat-ready jet fighter, this unique 66-in.-span, .40-.60-powered sport/trainer puts a little stagecraft into learning to fly RC. As the novice pilot's skill progresses, the model becomes a sprightly sportster that'll keep up right into mild aerobatics. Construction is a lot easier than it looks. ■ Jeff Troy



Close-up details in this photo show the optional bomb hanging in its release mechanism and the simple but sturdy landing gear. The pilots are painted Ping-Pong balls. The canopy is by Great Planes (CANF0003). The decals are available from Coverite, Sig, Top Flite, and Major.



*Tame*cat doing what it does best—flying. The model flies slow and steady and is extremely stable and predictable through its entire flight envelope. With its wide-stance main gear, landing the airplane is very easy.



The model has a cavernous radio compartment as can be seen in this photo showing the elevator, throttle, and rudder servos. Note the wood braces holding the foam-wrapped receiver and battery pack in place.

the modeler from having to construct traditional, more complicated three-part pushrods.

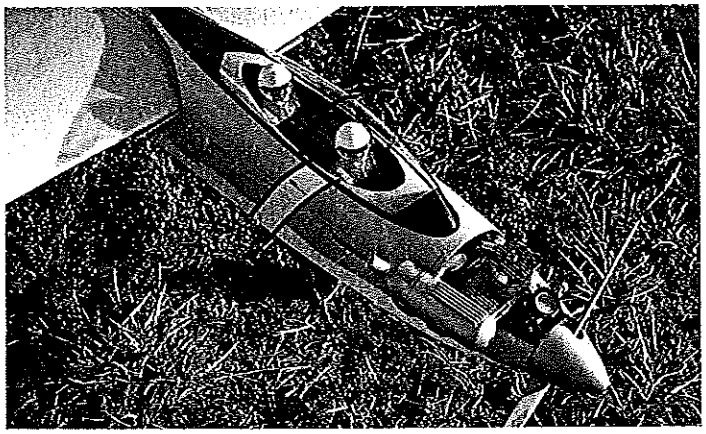
Wing hold-down is through 10 to 12 #64 rubberbands, with the dowels concealed inside the fuselage.

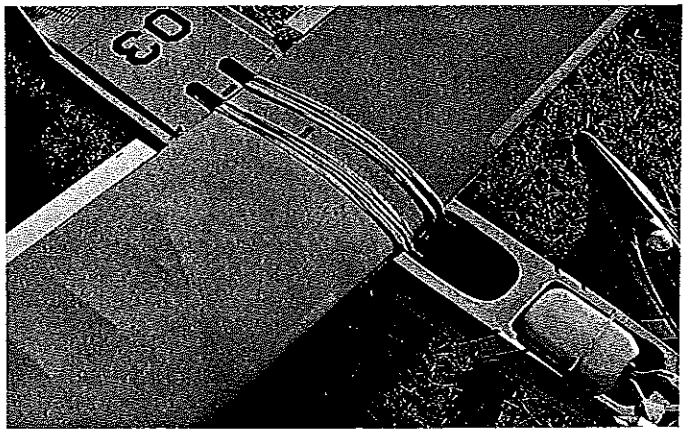
Simple construction is crucial to the success of any sport model, and here the F-14 *Tame*cat really excels. While a few more pieces are needed to give the fuselage its distinctive contemporary shape, they're literally only a few, and they don't make building the airplane any more difficult.

As with any project built from plans, beginners will benefit from the assistance of someone who's already built an RC model or two. Such a person can be of great value in helping the newcomer to understand those unfamiliar words and techniques that we aeromodelers tend to take for granted. However, the fact remains that no aspect of the *Tame*cat's construction is difficult.

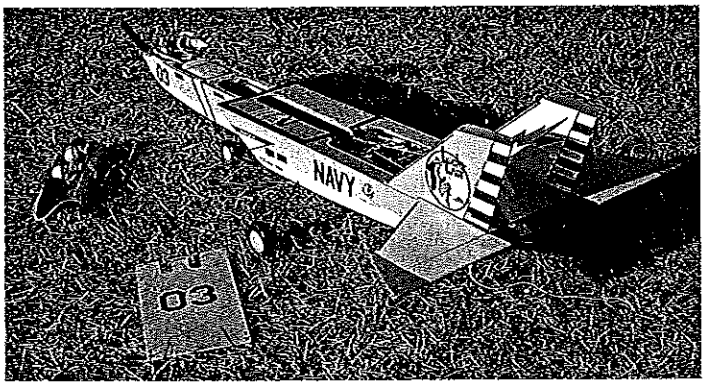
All in all, I think you'll agree that the F-14 *Tame*cat is really quite the impostor—an easy to build, extremely practical, well-behaved RC sport/trainer in exciting disguise.

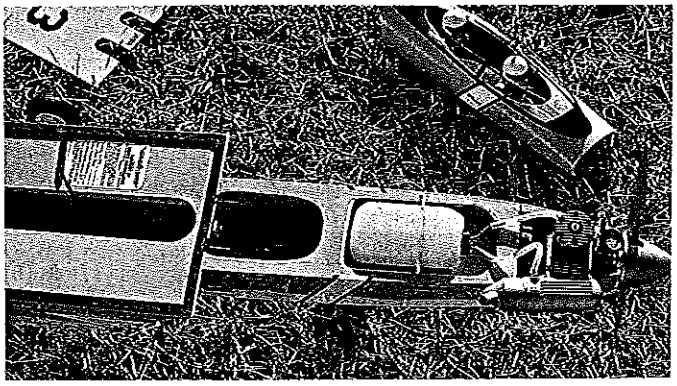
Construction. Begin by cutting out the model's parts using the templates provided



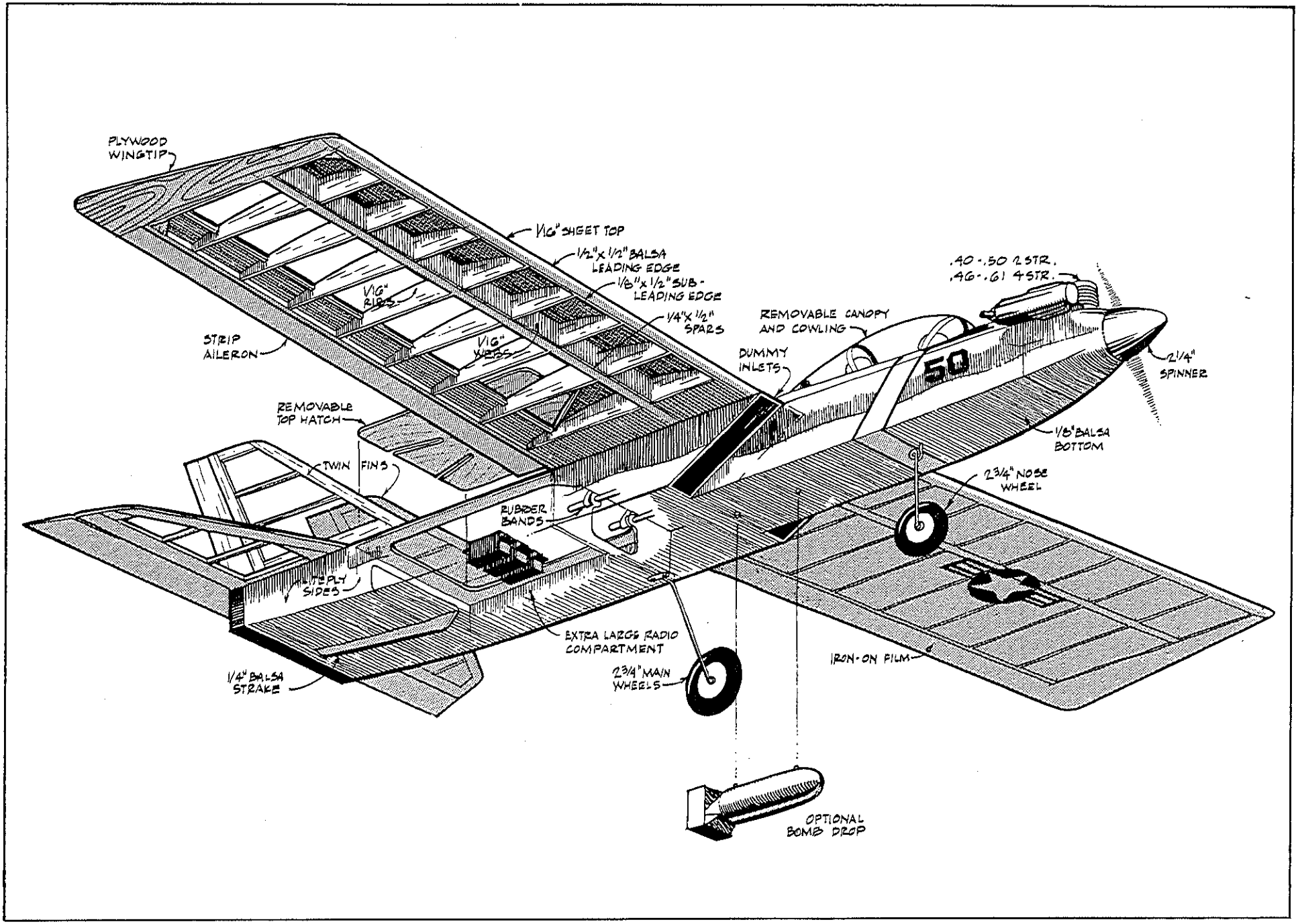


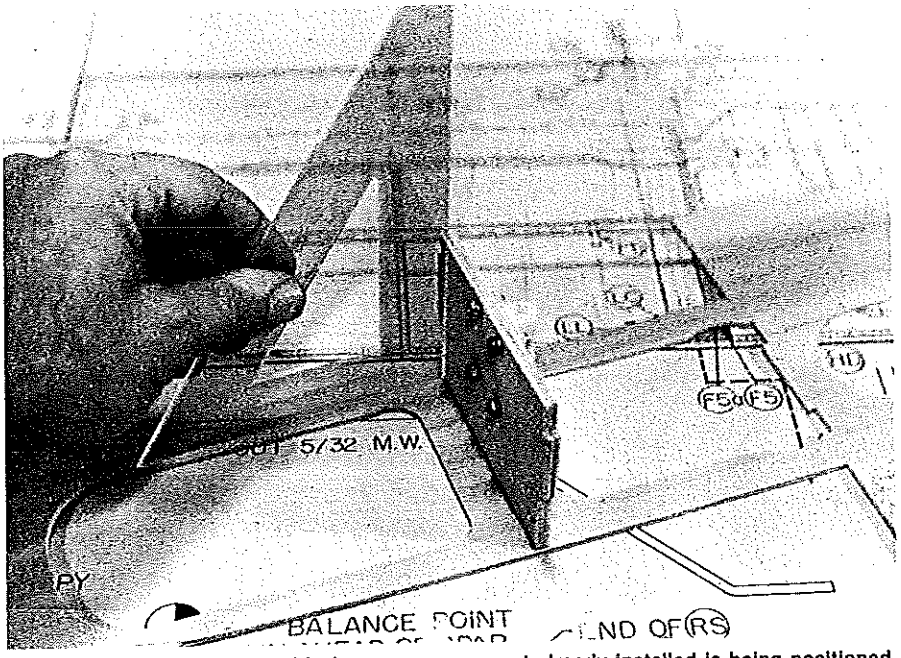
Left: Close-up shot of the nose showing the canopy and the O.S. .40 FP engine. Another prototype is being flown quite successfully with an Enya .53 four-stroke. An O.S. .40 or .45 FSR will liven the plane up considerably without detracting from its "trainer" performance attributes. Williams Bros. pilots can also be used in lieu of Ping-Pong balls if so desired. Right: This photo shows the rubberband-mounted wing in place. The quick-release canopy and afterhatch provides fast and easy access to the wing hold-down dowels hidden inside the fuselage structure.



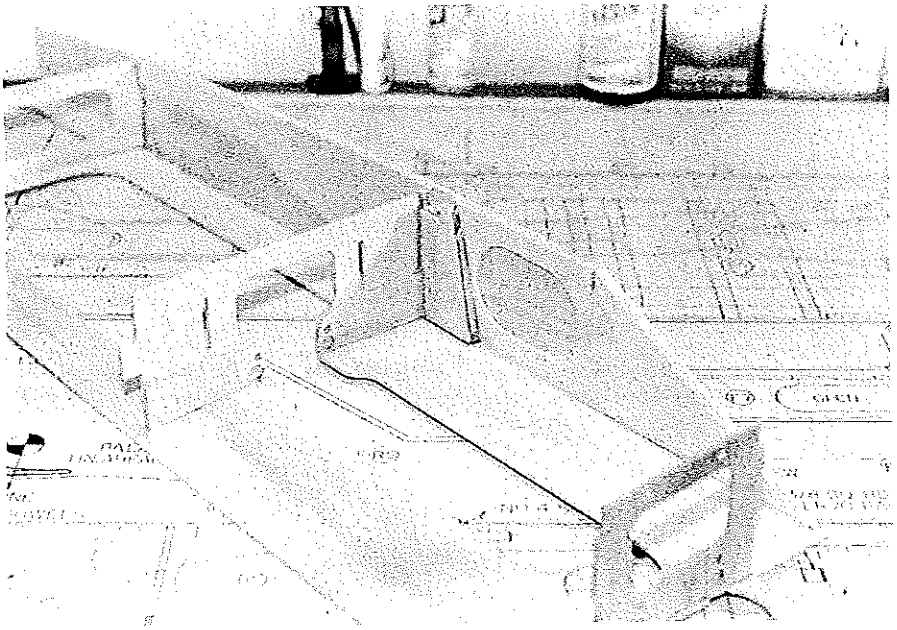


Left: *Tame*cat's fuselage field-disassembled showing access to internal components. Note the wide wing saddle area. Right: Close-up of the fuel tank installation. It simply nests in foam and is secured with a rubberband. The hatch covers are retained with Goldberg flat hold-downs.

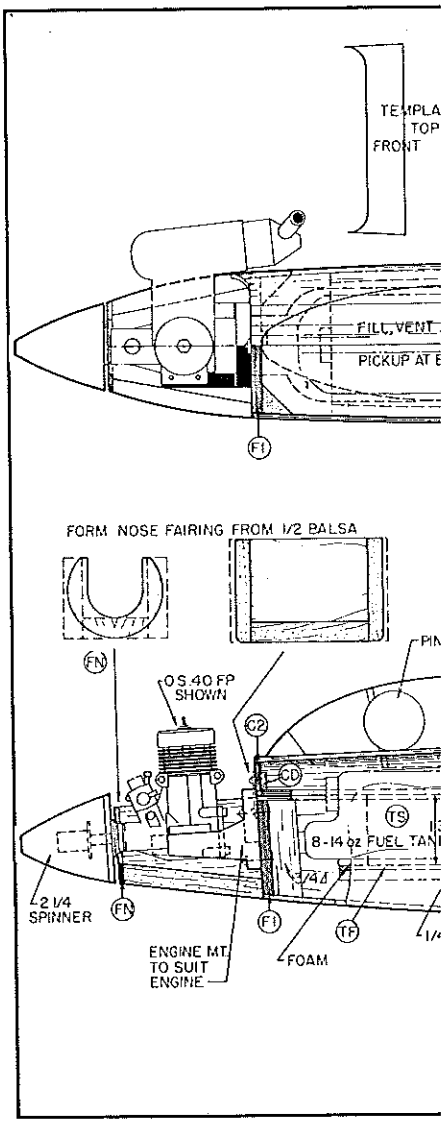

PLYWOOD WINGTIP
1/16" SHEET TOP
1/2"x 1/2" BALSA LEADING EDGE
1/8"x 1/2" SUB-LEADING EDGE
1/4"x 1/2" SPARS
1/16" RIBS
1/16" WEBS
STRIP AILERON
.40-.50 2 STR.
.46-.61 4 STR.
REMOVABLE CANOPY AND COWLING
DUMMY INLETS
2 1/4" SPINNER
50
REMOVABLE TOP HATCH
1/8" BALSA BOTTOM
TWIN FINS
2 3/4" NOSE WHEEL
RUBBER BANDS
1/4" PLY SIDES
EXTRA LARGE RADIO COMPARTMENT
IRON-ON FILM
1/8" BALSA STRAKE
2 3/4" MAIN WHEELS
OPTIONAL BOMB DROP



In this photo, bulkhead F2 with the nose gear mount already installed is being positioned. Construction of the fuselage begins upside down, by adding the bulkheads to the fuselage crutch. Make sure you face each piece in the correct direction as you install it. The triangle helps to get things aligned properly right from the start. Kit all the parts before beginning.

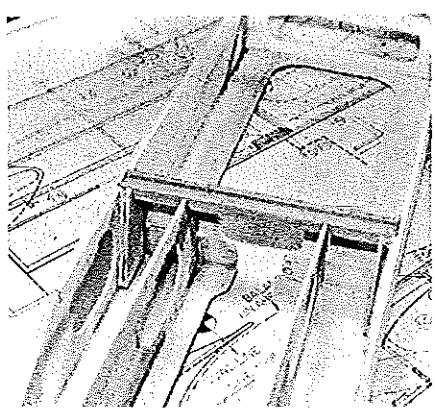


The simple box construction of the fuselage moves along quite rapidly. Here, the bulkheads are installed and the right side, with its doublers already in place, is joined to the crutch.

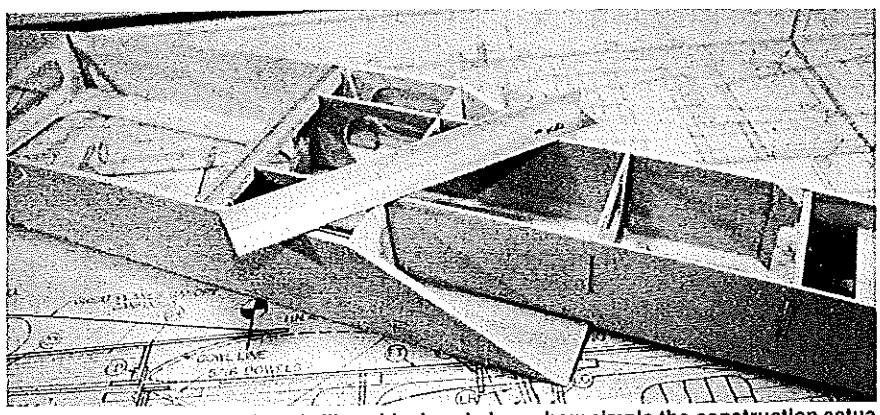


in the plans. Mark the part numbers inside the outline of each piece with a soft lead pencil. Cut parts slightly larger than their outlines, then use sanding tools to bring them to their final shapes. This will ensure that the parts fit together properly when assembled.

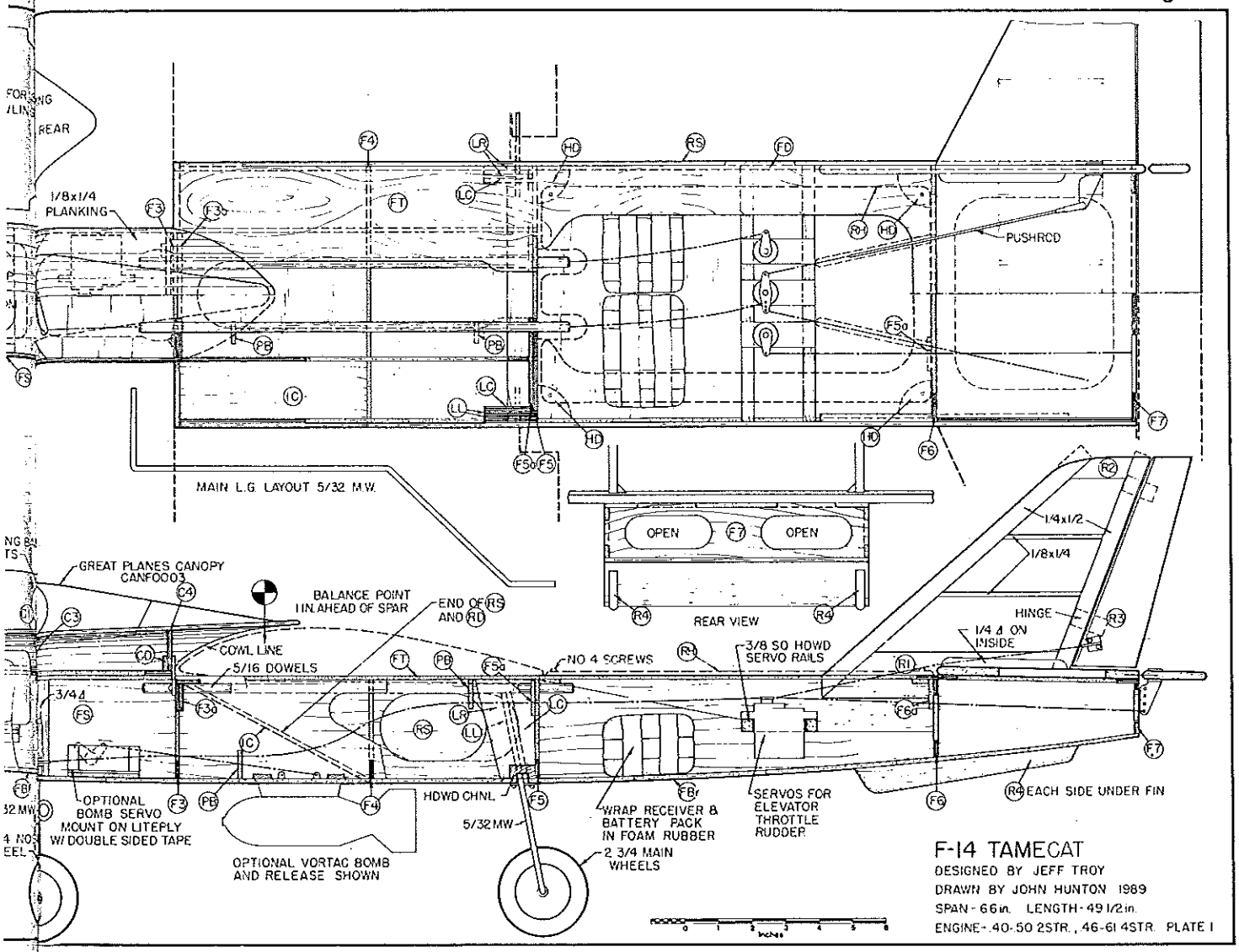
Whenever sticks are to be cut, try to cut the longer ones first. That way, if a mistake is made you can usually use the incorrectly cut stick for one of the shorter pieces. As with the other parts, cut the sticks slightly



The main landing gear block is cut from maple or oak. There's plenty of strength in this structure, but make sure it's firmly glued.



The almost complete fuselage (still upside down) shows how simple the construction actua is. The bottom is being sanded smooth to accept the 1/8-in. balsa bottom sheeting. To ke from catching the edges of the wood as it's being sanded, keep the sanding bar at a 45° ang



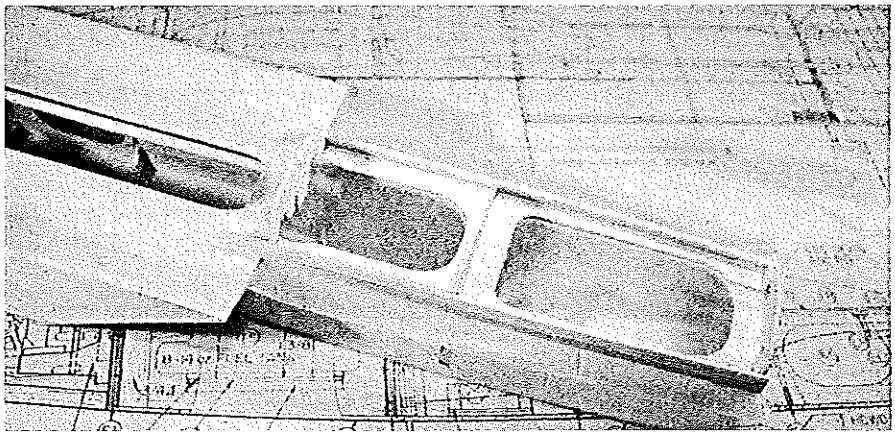
oversize and block sand them to final fit.

Tape the plans to a flat surface that will accept pins easily (I use a hollow-core door), then cover them with waxed paper to prevent the model's structures from becoming stuck to the plans as you build.

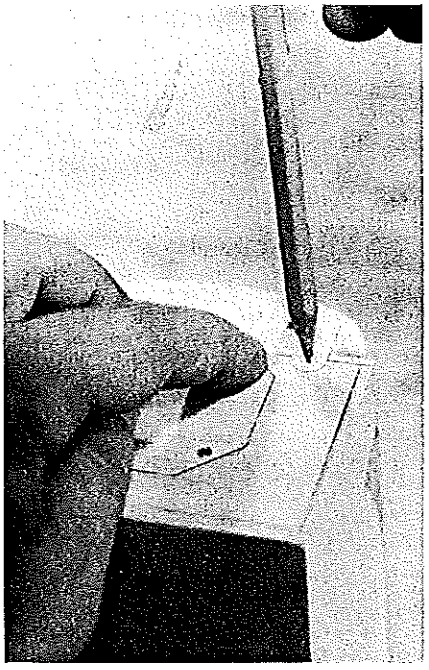
The prototype *Tame*cat models were built entirely with Pacer Technology's Zap-A-Gap CyA (cyanoacrylate glue). Loctite slow-setting epoxy was used on the nylon hinges. While I use and recommend these fine adhesives, other similar products will also yield satisfactory results.

Horizontal stabilizer and elevator. Pin the ¼ x 1-in. trailing edge in place, then fit on and glue the two ¼ x 1-in. center ribs. Add S-1 to the center ribs. Cut and fit the leading edges and tips from ¼ x ½-in. balsa, then glue and pin them in place. Add the six ⅛ x ¼-in. balsa stick ribs to complete the basic stabilizer construction.

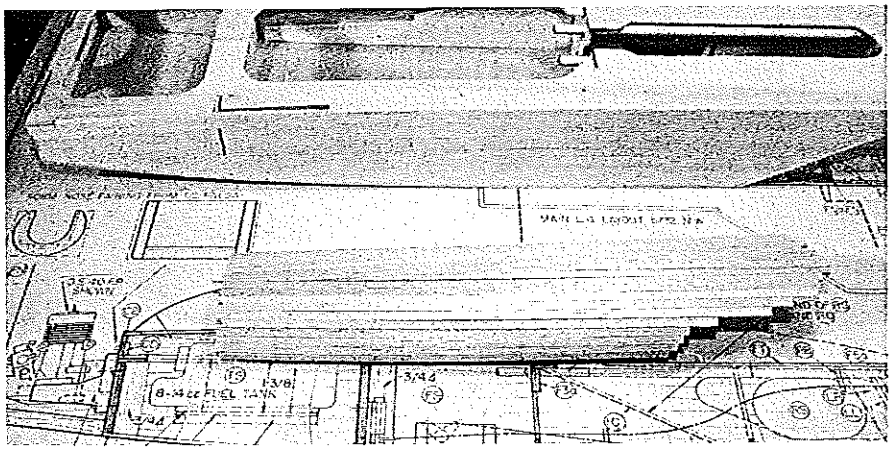
Use a sanding block fitted with #100 paper to sand the face and back of the stab



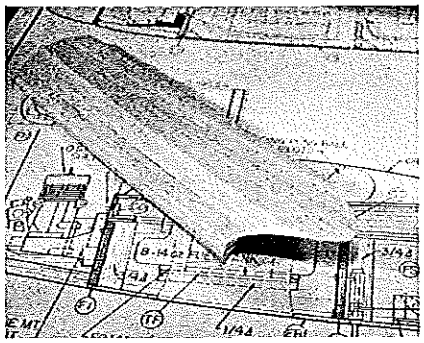
The canopy frame is being fitted to the fuselage in this photo. Note the wax paper between the two structures to keep them from sticking together during the construction process.



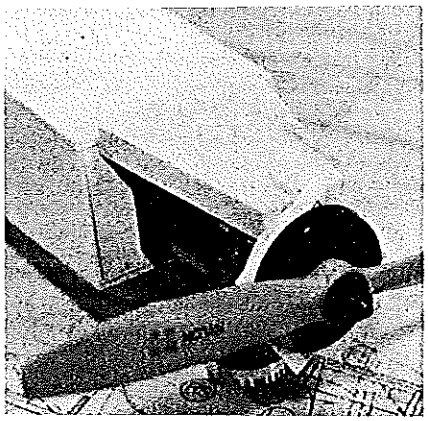
Positioning the Goldberg flat hold-downs (two in front and one in the rear) used for securing the canopy. Be sure to allow for the cowl blocks and engine mount when locating the catch-screw positions for these parts.



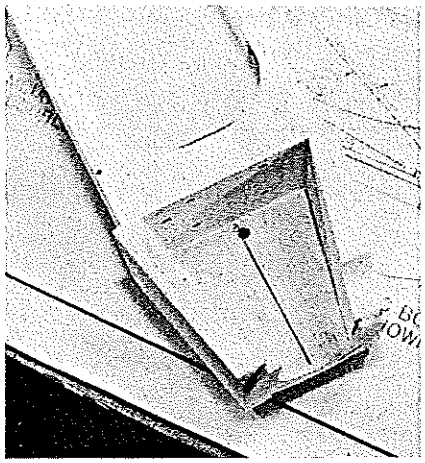
The canopy hatch in the process of being planked with ⅛ x ¼-in. balsa strips. Planking is considered by some to be a lost art, but in fact it's an excellent way to build a curved surface.



The completed canopy hatch. Step-by-step planking instructions are contained in the text. The procedure is quite easy and creates a strong and lightweight structure.



The nose cowling is made from three ½ x 3-in. pieces of soft balsa. The bottom piece, seen in this photo, is positioned first between temporary spacers (explained in text).



In this photo the two side pieces have been added and the engine and mount removed. The nose ring has been aligned and installed and will serve as a guide when carving and sanding the cowling to its final configuration.

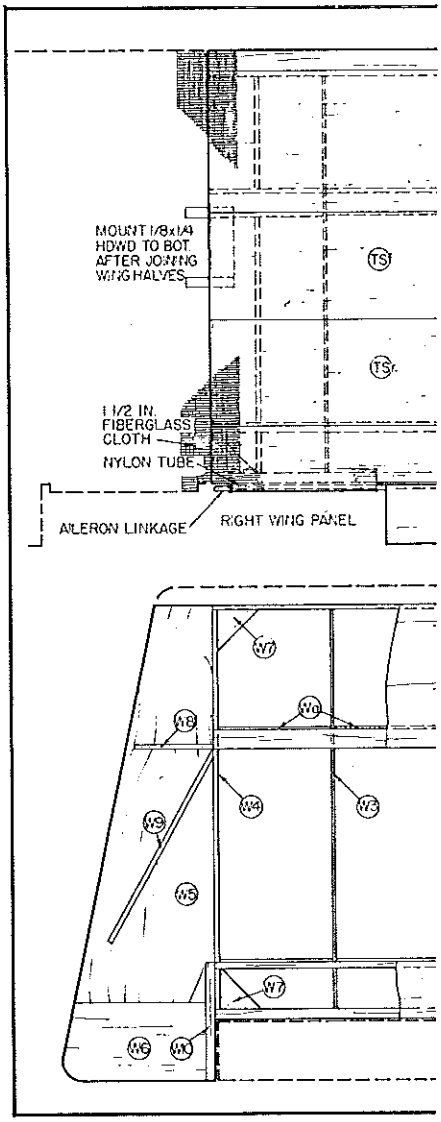
smooth, then bring the outer perimeter to its final shape. Round the tips and leading edges, but leave the trailing edge of the stabilizer flat.

Mark the location of the five hinges on the stab and on the ¼ x 2-in. balsa elevator, then cut the hinge slots in both pieces. E.J. Lind's Digger is a useful tool for this task. After cutting the hinge slots, sand the elevator tips and trailing edge round, then bevel the leading edge to a V shape.

Fit the hinges, using no glue, to make certain there is no binding and that the elevator travels smoothly in both directions. When satisfied, remove the five hinges and set the parts aside.

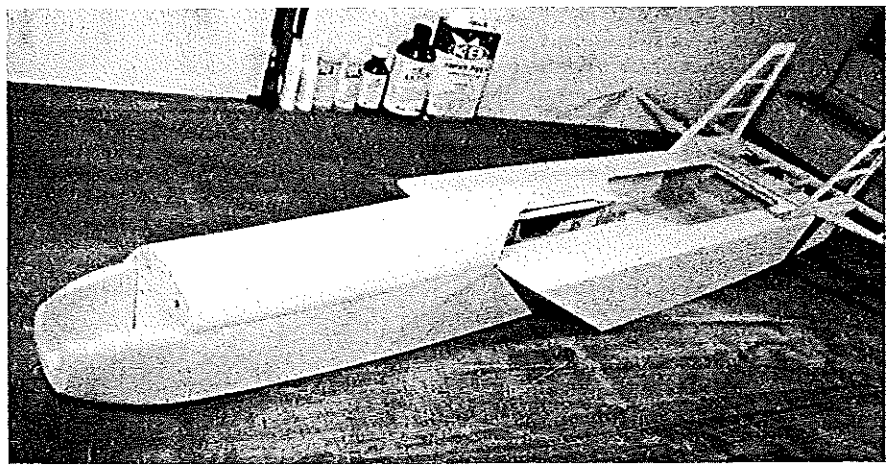
Vertical stabilizers and rudders. The *Tame*cat's verticals are assembled in the same manner as the horizontal stab and elevator. But don't forget to make two of each!

Pin the R-1 fin base in place. Cut and fit the leading edge, trailing edge, and R-2 tip. Complete the fin by adding two ⅛ x ¼-in. balsa ribs.

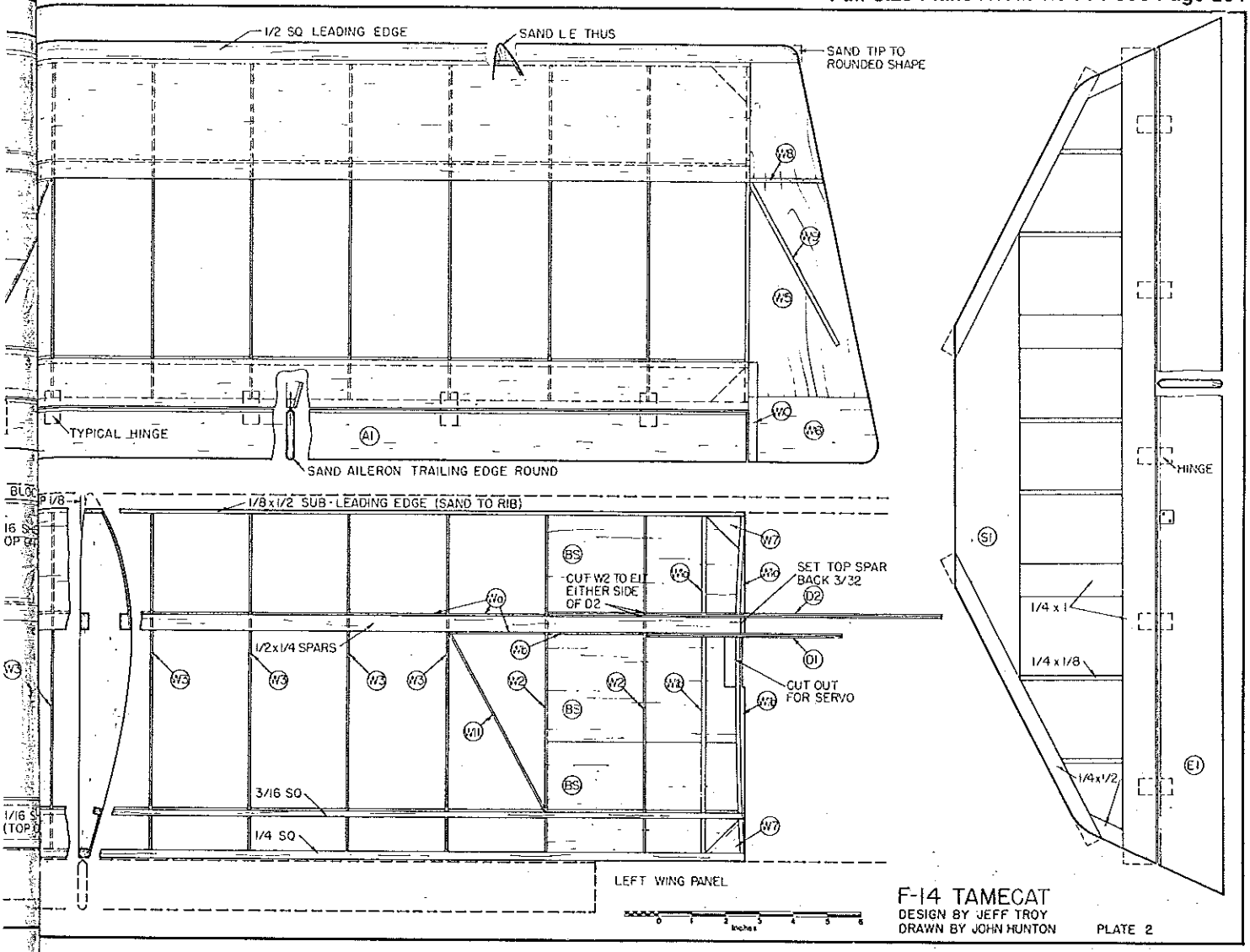


Mark the hinge locations, then cut hinge slots in both fins and both rudders.

Sand the vertical fins and rudders the same way you did the stab/elevator. Remember that the rudder leading edges are beveled to a V shape, while the trailing edges of the fins should be sanded flat.



The structurally complete fuselage with the tail surfaces installed. It's starting to look lik that sleek Navy jet it's intended to emulate. After careful final sanding with #320-grit pape the fuselage can be painted—but paint is heavy. Any lightweight heat-shrink covering lik Black Baron, Super MonoKote, or Oracover would save considerable weight and look grea

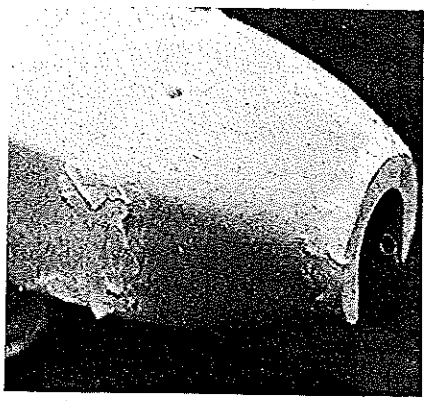


Check for free movement of both rudders with the hinges temporarily installed. When satisfied, remove the hinges and set the parts aside.

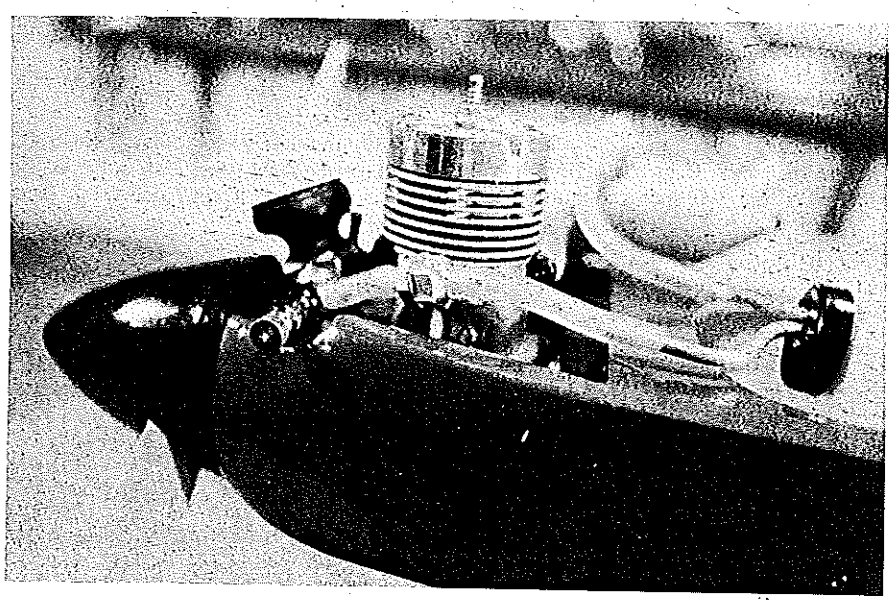
Wing. If you have limited building area, start with the left wing panel. If more room is available, a minimal amount of time may be saved by building both wing halves at the same time. I will describe wing construction as if the panels were being built one at a time.

Begin wing construction by pinning down the ¼ x ½-in. balsa bottom spar, making certain that the end meets the wing centerline exactly. Keep all extra lengths of wood at the tip end of the wing.

Cut and fit three pieces of 1/16 x 4-in. bot-

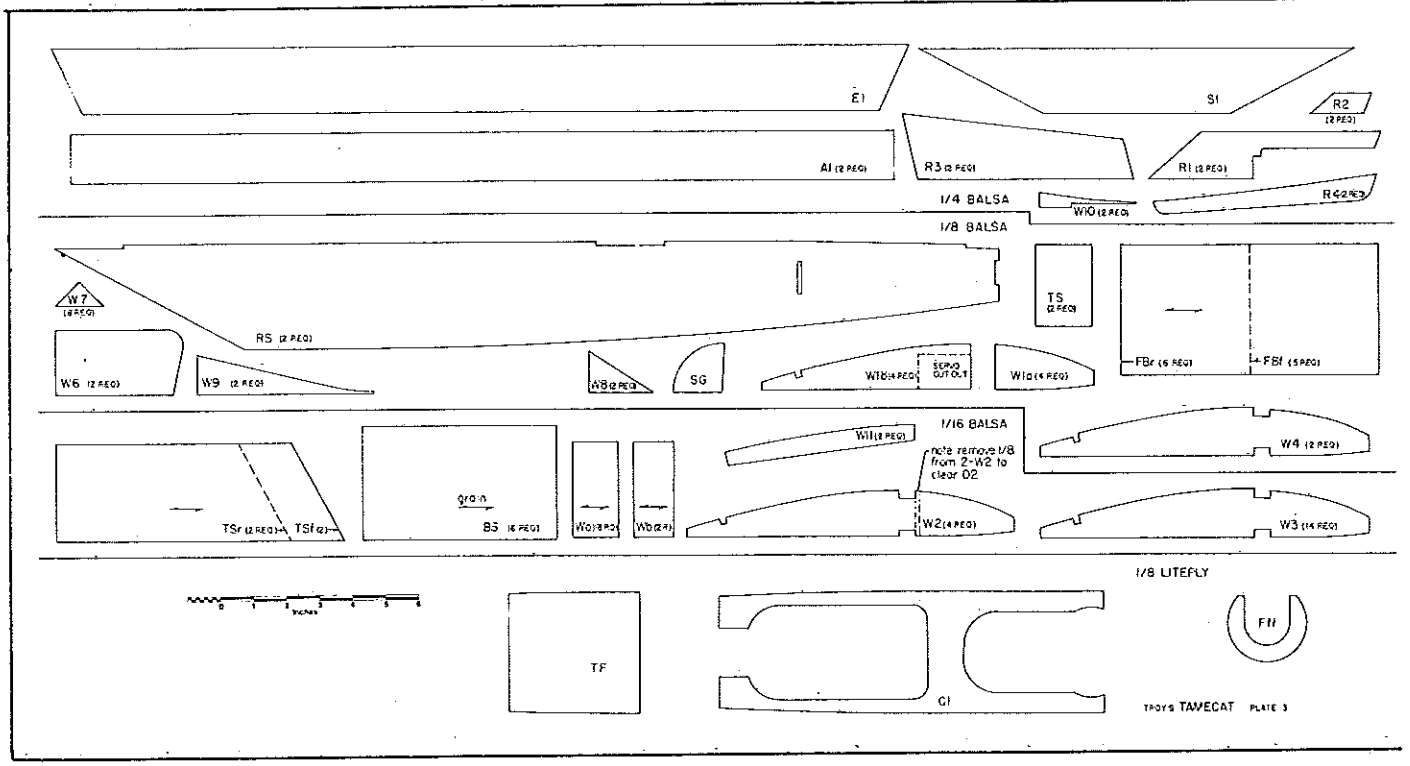


The shaped nose cowling. Model Magic filler is being used to fix any dings and dents. It's lightweight and very easy to sand. Note the drain hole in the bottom of the cowling. The final shape and length of the cowling will vary with the size and type of engine used.



The finished engine installation, with the canopy hatch removed, showing the fuel line routing for the O.S. .40 FP engine. Notice how the cowling has been notched for the needle valve.

Full-Size Plans Available . . . See Page 204



tom center sheeting. Fit two pieces behind the spar and one piece forward of it. Glue and pin the sheets in place with their inner edges flush to the wing's centerline. Block up the front edge of the forward sheeting ⅛ in.

Add the ¼-in.-sq. trailing edge, locating its end accurately on the centerline.

Add the ⅛-in. balsa W-4 tip rib, then the seven 1/16 balsa W-3 ribs, using a small triangle to ensure uprightness. Glue each rib securely to the bottom spar and to the trailing edge.

Add the outer W-2 rib over the bottom sheeting, then fit and glue the ⅛ x ½-in. balsa sub-leading edge to the forward center sheeting and to the noses of all ribs. The bottom of the sub-leading edge should be blocked up ⅛ in. from the work surface.

Add the triangular W-7 gussets at the tip rib where it meets the leading and trailing edges. The rear gusset should lie flat with the wing bottom, and the front gusset should be centered on the back of the sub-leading edge.

Glue the ¼ x ½-in. balsa top spar in place. Use the S-G spar gauge to position the spar's root ⅛ in. back from the wing's centerline, which will allow the wing panels to mate correctly when they are joined at the proper dihedral angle.

After the top spar is glued in place, add a W-a 1/16 vertical-grained shear web between each rib at the front of the spars. These webs should sit with their lower edges flat to the bench. Their surfaces must make good contact with both the upper and lower spars. Shear webs are critical to the wing's strength, and each must be glued in securely.

Remove all pins, and lift the wing panel from the workbench. Trim off all excess lengths of wood extending beyond the W-4 tip rib, then block sand the ends of the spars, trailing edge, and sub-leading edge flush with the W-4 tip rib.

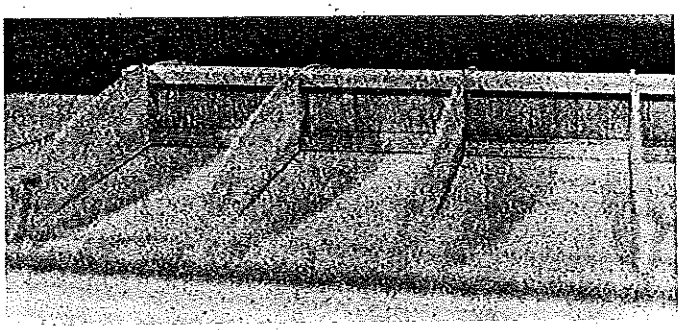
If you've built only the left panel so far, repeat all the prior wing assembly steps described to bring the right panel to the same stage in construction. You will then be ready to prepare the panels for joining.

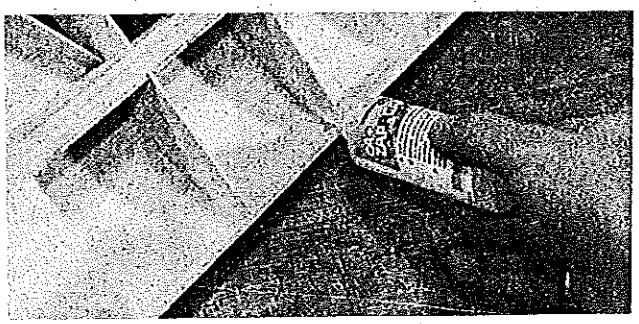
With the left panel pinned down flat, block up the right panel 3 in. at the W-4 tip rib and position it against the left panel. You'll need to sand the mating edges of the wing parts slightly to bring the panels together snugly. A good fit is important, so work at it till it's right. When satisfied, apply glue to the spars, center sheeting, leading and trailing edges and join the two wing halves, making sure that the right panel is still blocked up exactly 3 in. high at the tip rib.

Check the fit of the ⅛-in. plywood D-1 and D-2 dihedral braces, and glue them securely in place. Use clamps to make certain of a tight-fitting assembly. When the dihedral braces are thoroughly dry, add the last two W-2 ribs, cutting them in two pieces at their spar notches, then trimming them to clear the dihedral braces.

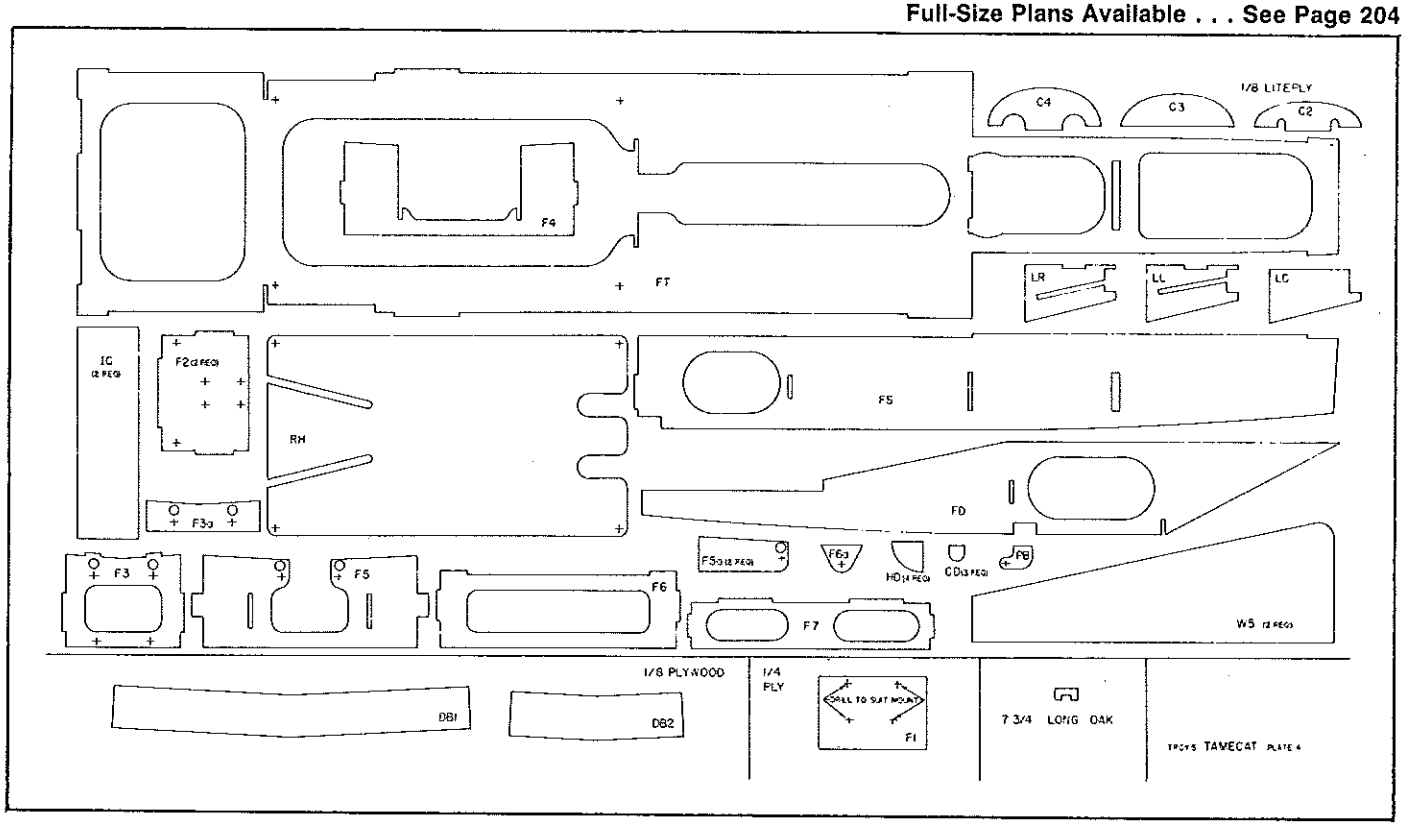
Glue two ⅛-in. W-1a and two W-1b ribs together. These will be the thick center ribs that bridge the upper and lower sheeting. Cut away a portion of W-1 for the aileron servo. Glue these laminated center ribs into the wing, then glue the two remaining W-1a and W-1b ribs into the center section assembly.

Add the remaining 1/16 vertical balsa shear webs, the W-11 top sheeting support rib





Left: Wing construction on *Tame*cat borrows from Sailplane wing design and is very lightweight and strong. This photo shows the vertic grain shear webbing in place between the main spars. Be sure each web is cut and fitted carefully, then firmly glue in place by running an ex bead of glue around each web. Right: To achieve a strong structure, it's important that the leading edge sheeting be firmly attached to the ri by running a bead along the contact surface. The center and leading edge sheeting is installed *after* the wing halves have been joine



and the four remaining W-7 gussets to the wing's center section. Cut out the bottom sheeting for the aileron servo.

Glue the two 3/16-sq. balsa rear spars into the notches in the wing ribs.

Use a sanding block to carefully contour the top edge of the sub-leading edges to match the noses of the wing ribs. This is important, since the forward wing sheeting will later be glued to these sub-leading edges. Take a few extra moments to see that the joints between the ribs and the sub-leading edges blend smoothly.

Fit the top 1/16 x 4-in. balsa front sheeting next. Be sure to sand the root end of the sheet so that its edge matches the contour of the centerline of the two W-1b center ribs. When the fit is good, apply glue along the entire length of the top spar and the top edges of the four forward ribs in the center section. Line up the edge of the sheet with the center ribs, and press it in place all along the top spar. Use the palm of your hand to hold the front of the sheet down onto the ribs in the center section until the glue sets.

Add the 1/16 x 1½-in. trailing edge sheeting in the same manner, gluing it only to the 3/16-sq. rear spars and the ribs over the center section sheeting at this time.

Cut and fit four pieces of sheeting to cover the wing's center section. It's best to glue each set of two sheets together, sand the joint, then glue the pair in place as a single part for each panel.

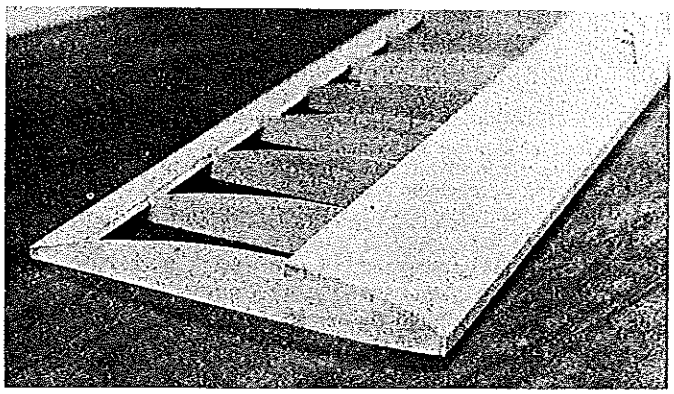
Remove the wing assembly from the bench, and finish adhering the top sheeting to each rib and the leading and trailing edges. Work from the underside of the wing, one bay at a time. Simply run a bead of CyA along the inside of the structure where it meets the sheeting, and hold the sheet down onto the structure until the glue dries. Remember to do only one bay at a time. Because there is no lower wing sheeting (except for the center section), adhering the sheets in this manner is a relatively easy task.

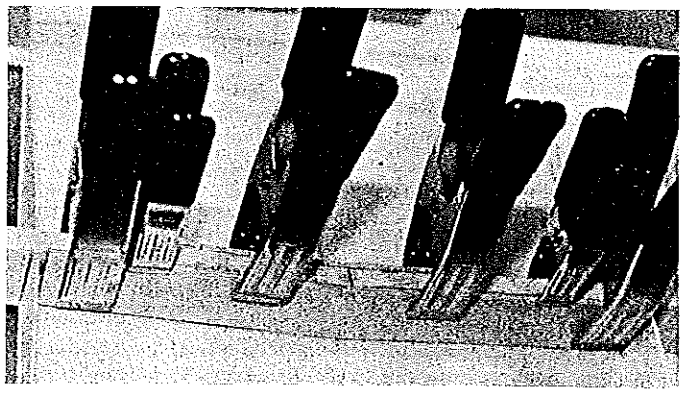
Use a sanding block to bring the overhanging edge of the rear upper sheeting flush with the trailing edges, then the front upper sheeting flush with the sub-leading edges. Trim and sand the ends of the sheets flush with the W-4 tip ribs.

Repin the wing down, one side at a time, and glue the 1/8-in. Lite Ply W-5 wing tips in place. The rear edge of the tip should be pinned down to the work surface, and the front edge blocked up 1/8 in. Add the 1/8-in. balsa W-6 wing tip trailing edge doublers, the 1/4-in. balsa W-10 tip fillets, and the 1/8-in. balsa W-8 and W-9 triangular tip ribs.

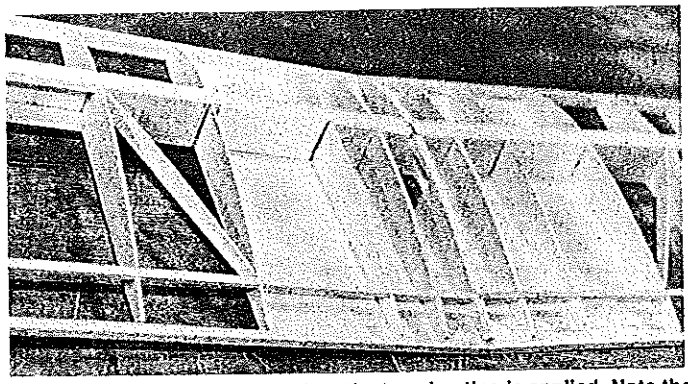
Lift the wing again, and sand the noses of both wing tips flush with the faces of the sub-leading edges. Glue the two 1/2-in.-sq. balsa leading edges in place.

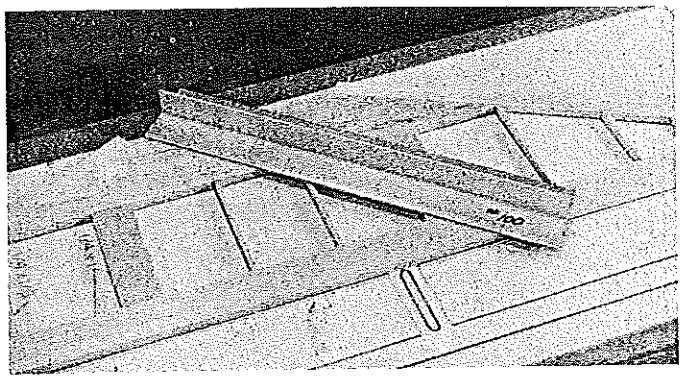
Smooth the wing to final shape using a block fitted with #100 sandpaper. Use a light touch and extreme care. Make every effort to avoid oversanding, which would alter the shape of the ribs. Holding the sanding block at a 45° angle to the spars and ribs



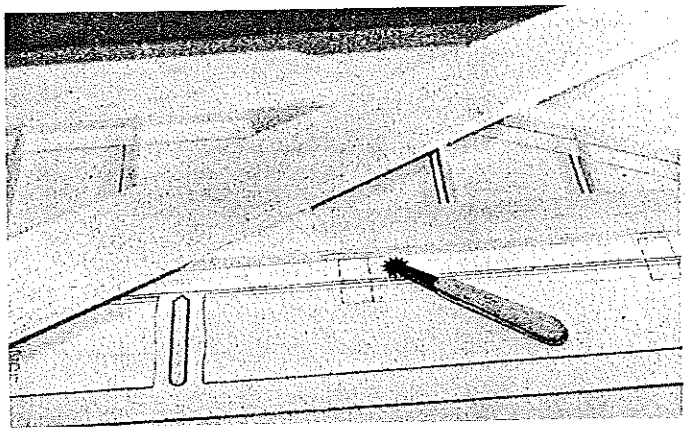


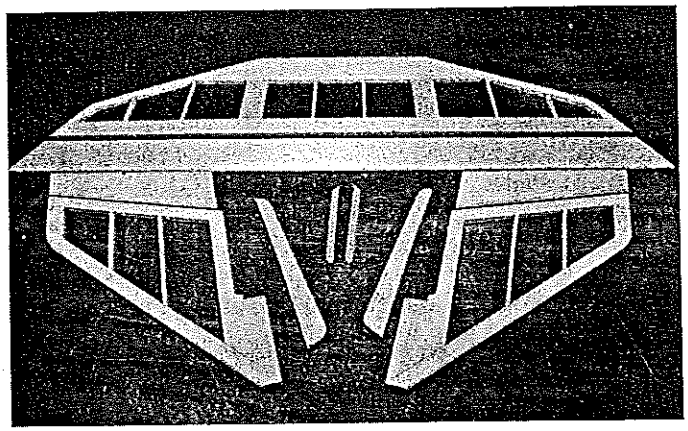
Left: The left wing is finished and ready to be joined at the center dihedral break. Right: After first carefully checking the dihedral angle, the wings are joined together by gluing and then firmly clamping the 1/8-in. ply dihedral braces in place until the adhesive has completely cured.





Left: The joined wing just before the top sheeting is applied. Note the angled rib on each side to support the edge of the center section sheeting. There is no bottom sheeting. Right: The stabilizer is built flat over the plans. In this photo the finished stabilizer is being sanded smooth.





Left: E.J. Lind's Digger hinge-slotting tool will take most of the aggravation out of this otherwise aggravating task. Cut a small slit with a #11 X-Acto blade to start, then rock the digger back and forth as you press it into the wood. When the slot is deep enough, use the tool to remove any excess wood from the hinge pocket, thereby avoiding a lump in the wood when the hinge is inserted. Right: The completed tail structure ready for covering: the stabilizer and elevator, two rudders and fins, two landing skids, and the two small triangular inner rudder braces.

should help keep you from damaging the ribs as you sand. Round the leading edges and the edges of the wing tips, but leave the trailing edges of the wing and the insides of the wing tips flat where they mate with the ailerons.

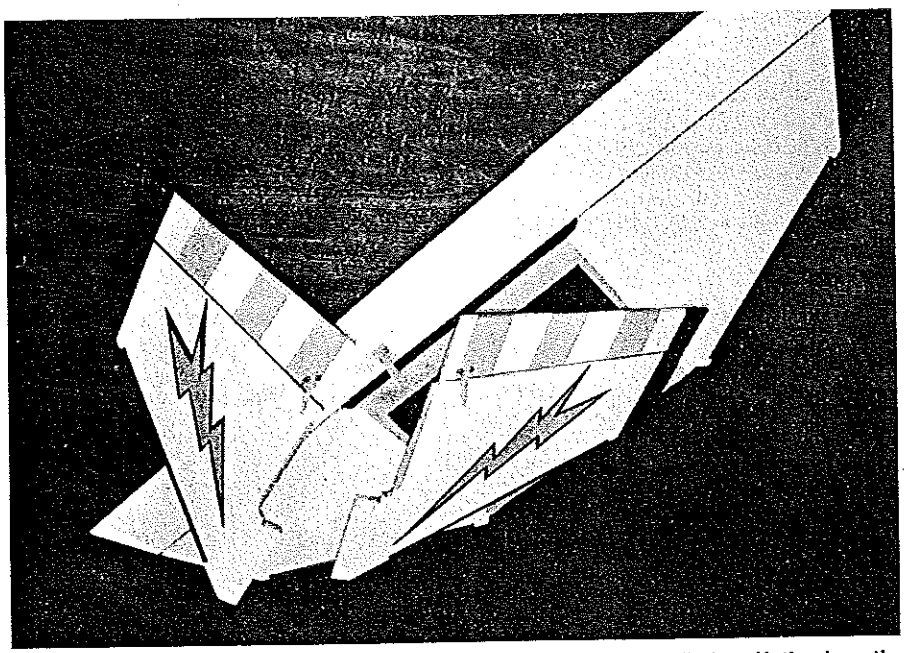
Carl Goldberg Models' ⅛-in. aileron linkage works perfectly to drive the *Tame*cat's strip ailerons. Cut the nylon tubes to length, slip them over the wires, then bend the latter 90° at the point shown on the plans and cut off the excess wire. Use a file to deburr the ends of the wires, allowing them to slip into their holes in the ailerons more easily.

Very carefully notch the bottom of the wing trailing edges to allow the aileron linkage wires room for forward travel.

Glue the aileron tubes in position onto the wing's trailing edges. Apply glue very carefully, adhering only the tubes, not the linkage wires.

Use 1½-in.-wide fiberglass tape to reinforce the aileron linkage tubes and to wrap the wing's center section joint.

Mark and drill ⅛-in. holes in the leading edges of the ¼-in. balsa ailerons to accept the linkage wires, then cut a recess for the wire in each aileron. Mark and cut the hinge slots in the wing and ailerons, then sand the aileron trailing edges round and bevel their leading edges to a V. Leave the inside and outside ends of the ailerons flat. Trial fit the aileron hinges, making certain that both ailerons can move freely. Remove the hinges, and set the wing and the two ailerons aside.



The covered and finished elevator and twin rudders, ready for installation. Notice how the covering material has been carefully omitted from the gluing surfaces. The twin rudders may seem intimidating, but they are actually quite simple to build and attach, and the control linkage isn't really much more complex than that employed for a single rudder installation.

Fuselage. Begin by preparing the bulkheads. Mark and drill the correct holes for the engine mount of your choice in the ¼-in. plywood F-1 firewall. *Tame*cat flies best using a two-stroke engine with .40 to .50 displacement, or a .45-.60 four-stroke. While the mount is still in its correct position, use a soft pencil to trace its outline onto the face of the firewall. Insert 4-40 blind nuts behind the firewall, running a bead of glue around them to hold them in place. Drill a 3/16 hole in the appropriate side of the firewall for a red Sullivan #503 throt-

Continued on page 36

tle linkage guide tube.

Glue the two ⅛-in. Lite Ply F-2 bulkheads together, then drill a 7/16 hole for the throttle pushrod tube and four ¼-in. holes for the Carl Goldberg nose gear bearing mounting bolts. The nose gear bearing should be installed on the back of the bulkhead at this time.

Add the ⅛-in. Lite Ply F-3A doubler to the rear of the ⅛-in. Lite Ply bulkhead F-3. Drill two 7/16 holes for the wing hold-down dowels and two 7/16 holes for the throttle and nose gear pushrod tubes. The guide tube for the nose gear must be located on the side of the fuselage opposite the throttle guide tube.

Add the two ⅛-in. Lite Ply F-5A doublers to the front side of the ⅛-in. Lite Ply F-5 bulkhead. Drill two 7/16 holes for the wing dowels and two 7/16 holes for the throttle and nose gear pushrod tubes.

Prepare the ⅛-in. Lite Ply fuselage crutch by scoring the top of the crutch with several light passes of your razor knife, just behind the location of bulkhead F-6 and completely across the entire width of the piece. Make every effort to cut approximately halfway through the crutch without slicing all the way through. Scoring allows the rear of the crutch to be bent downward ⅛ in. between F-6 and F-7 in a later step.

Glue F-2 into the ⅛-in. Lite Ply fuselage crutch. Be sure the nose gear bearing is facing rearward. Use a small triangle to ensure that the bulkhead is glued at 90° to the crutch. In the same manner, add F-3 with the doubler facing to the rear, then add F-5 with its doubler facing forward. When installing F-3 and F-5, the fuselage crutch will need to be held down onto the tops of these bulkheads until the glue dries. This is to ensure that the angle of the fuselage top will match that of the wing's dihedral. Finally, install F-6. Note that the firewall and rear bulkhead F-7 are not installed until later on.

Build the rear fuselage sides, being sure to make both a right and a left, not two rights or two lefts. Begin by gluing the ⅛-in. Lite Ply R-D doublers to the ¼-in. balsa R-S rear fuselage sides. Two ⅛-in. Lite Ply LL or LR landing gear doublers and the LC retaining plate are then added to each of these side assemblies—two LLs for the left side and two LRs for the right.

Glue the rear fuselage sides to the crutch and to bulkheads F-5 and F-6. Be sure that all pieces mate together tightly. From the scored line at F-6, bring the rear of the crutch down so that it mates with the sides at the rear. When the crutch is properly aligned with the sides, add bulkhead F-7 and glue all tail joints securely.

Trial fit the forward ⅛-in. Lite Ply F-S fuselage sides into the notches in F-5 and along the front of the crutch. Tuck the tabs on F-2 and F-3 into the slots in the fuselage sides. After this assembly procedure is understood, glue the sides in place securely from F-2 through F-5.

Using no glue, trial fit the ¼-in. ply firewall on the forward end of the crutch. Don't forget that the blind nuts must face to the rear of the model. The forward sides will need to be pulled in tightly to the firewall, and the latter must be tilted slightly to match the angle of the sides. When you're satisfied with the fit and procedure, glue the firewall securely.

Add two lengths of ¾-in. balsa triangle stock standing them upright, between the back of the firewall and the forward fuselage sides. It will be necessary to sand the triangle stock slightly to match the angle of the firewall and the sides.

In the same manner, install two additional pieces of ¾-in. triangle stock behind bulkhead F-2.

Glue the ¾-in. hardwood landing gear block in place between the rear sides, over the notches in LL-LC and LR-LC; and along bulkhead F-5.

Gently spread the fuselage rear sides apart, allowing you to slide the F-4 ⅛-in. Lite Ply bulkhead into the notches in the forward fuselage sides. When it's seated properly, glue F-4 in place.

Glue four ⅛-in. Lite Ply H-D hatch corner doublers to the underside of the crutch. Install the two 5/16-dia. wing hold-down dowels.

Working from the open bottom of the model, glue a T-S tank floor spacer to the inside of each fuselage side in the fuel tank compartment. Add the ⅛-in. Lite Ply T-F tank floor, followed by two ¼-in. triangle strip supports, one to each side.

Use the sanding block over the entire bottom of the fuselage, making sure it's flattened enough to accept the ⅛-in. balsa bottom sheeting. Glue the rear sheeting first, starting from F-4 and working toward the rear, then add the front bottom sheeting from F-4 forward. Trim and sand the bottom sheeting flush with the sides, the firewall, and F-7.

Use a straight pin through the bottom sheeting to find the slot for the gear wires in the hardwood landing gear block, then cut the bottom sheeting away from the slot. Use a 3/32 drill bit to drill two holes through the block for the main gear wires. Angle the bit carefully, then drill down through the block and into the slots for the wires in the LL and LR doublers.

Use the straight pin method on the front bottom sheeting to locate the hole in the nylon nose gear bearing. Drill a 3/32 hole through the sheeting for the nose gear.

Fit the two ⅛-in. Lite Ply I-C intake covers. Their top and bottom edges should be sanded to an angle, allowing them to fit snugly between the bottom sheeting and the fuselage crutch. Glue the covers in place, then sand their outer edges flush with the rear fuselage sides.

Round the bottom and back edges of the two ¼-in. balsa R-4 tail skids, but leave the edges that will be glued to the fuselage flat. Set the skids aside.

Sand the edges of the radio compartment cover round, and tape the cover over the radio hatch. Drill a 1/16 hole at each corner of the cover, through the crutch and into and through the four hatch corner doublers. Screw the cover down with #4 sheet metal screws, then remove the screws and set the hatch cover aside.

Put a few drops of glue into each screw hole in the crutch. When the glue is thoroughly dry, screw the four #4 hatch screws back into the fuselage and then remove them. This procedure hardens the threads in the wood to keep them from stripping when access to the radio compartment is needed.

Begin the canopy assembly by laying a piece of waxed paper over the top of the forward fuselage area. Pin the ⅛-in. Lite Ply canopy assembly floor in place on top of the crutch. Glue the three ⅛-in. Lite Ply bulkheads to the floor. Add the three ⅛-in. Lite Ply C-D doublers for the hold-down screws to the C-2 front and C-4 rear bulkheads. Install three Carl Goldberg Models' flat nylon hold-downs onto the canopy bulkheads, and screw their shoulder screws into the firewall and the F-3 bulkhead. Position the two forward hold-downs 1/16 in. outside the outline you drew on the firewall earlier.

It may look intimidating, but actually the easiest way to sheet the canopy assembly is with planking strips. It's really quite simple once you get started. Use ⅛ x ¼-in. balsa strips to plank the canopy area. Start by fitting the first plank on

Continued on page 116

the tube to help line it up with the nose gear arm and the rudder servo. Drill a 3/16 hole in each brace, slide them over the tube, then glue one to the fuselage crutch and the other to the fuselage bottom. Trim the ends of both tubes to extend ¼ in. beyond bulkheads F-5, F-3, and the firewall.

Glue the forward ¼-in.-sq. maple servo rail in place. Note the locations of the rudder, elevator, and throttle servos on the plan. The rudder and throttle servo output arms must line up with the appropriate pushrod guide tubes. Use a servo to measure the spacing for the location of the rear servo rail, and glue it in place. Again use the servo to locate and mark the mounting holes for all three fuselage servos. Drill 1/16 pilot holes for the servo mounting screws into the rails at each of the marks. Install the three servos in the fuselage between the rails.

Complete the assembly of the Sullivan throttle and nose gear pushrods. Attach these pushrods to the throttle lever, the nose gear steering arm, and the appropriate servo output arms.

Make up the linkage rods for the elevator and rudders. Pushrod wires in the 1/16 x 12-in. size are available from Sullivan, Sig Manufacturing, Du-Bro Products, and Carl Goldberg Models. Thread a clevis onto each pushrod halfway down the threaded end, then use a Goldberg Pushrod Connector, Du-Bro EZ Connector, or a Z-bend to connect the pushrods at their servo ends. Before connecting the elevator pushrod, slip the ⅛-in. Lite Ply F-6A pushrod guide over it. After the rod is connected to the elevator servo and control horn, glue the F-6A pushrod guide to F-6 to prevent the pushrod from flexing under flight loads.

An optional Vortac Manufacturing Bomb Release Mechanism and exploding bomb installation is illustrated on the plan. Of course, the bomb doesn't actually explode, but its talcum powder load makes for a great visual effect when the bomb hits a target. If this exciting feature is desired, fit the parts for its installation at this point. A radio system of at least five channels will be required if the bomb release option is to be used.

Cut the slot for the release mechanism into the floor of the fuselage. Glue two scraps of ⅛-in. Lite Ply to the inside of the floor at the mounting screw locations. Drill two holes for the screws, and mount the release mechanism. Use double-sided tape to mount a fifth servo onto a piece of ⅛-in. Lite Ply scrap, then glue this onto the forward fuselage floor. Linkage from the servo to the release mechanism is by a length of radio dial cord or any nonstretching wire or string.

Cut two holes in the rear fuselage side for your radio system's on/off switch and charge jack. Locate the devices on the side of the model opposite the engine's exhaust. Plug the switch, elevator servo, throttle servo, rudder servo, and the aileron extension cable into the receiver (add a second extension cable for the bomb release servo if you've used that option). Wrap the receiver and battery pack in ½-in. foam rubber, and install them in front of the servos, behind bulkhead F-5. Use enough foam to prevent these components from moving about inside the fuselage.

Glue two ⅛ x ½-in. spruce servo mounting rails in place at the front and rear of the aileron servo opening on the bottom of the wing. Drill 1/16 pilot holes for the mounting screws, and mount the servo in the wing. Make up the aileron pushrods in the same manner as you did the elevator and rudder pushrods. Plug the aileron servo into its extension cable from the receiver, and check for smooth operation of both ailerons.

Check the model's control surfaces for sufficient throw, and correct travel direction of each surface. For flight training purposes, the elevator, rudders, and ailerons should all be set to throw ⅜ in. in each direction. Nose gear travel should be about ⅛ in. in each direction.

Confirm the model's center-of-gravity. With an empty fuel tank, the *Tame*cat's nose should tilt down one to two degrees when balanced from a point exactly *one inch in front of the wing's main spar.* Make absolutely sure of this before attempting to fly!

Flying is what the *Tame*cat does best. After successfully completing the customary range check, taxi her out, point the nose to the wind, and apply throttle. As the airplane reaches flying speed, a gentle touch of *up* elevator will lift it smoothly into the air. As you would with any new model, be ready to make minor corrections to the model's attitude. Mostly, though, just relax and enjoy one of the easiest-handling airplanes you'll ever have the pleasure of flying. This model will go exactly where you aim it, displaying its very gentle handling characteristics at every throttle setting.

Landings are what should be expected of any friendly sport plane—an extremely long power-down glide with no tendency toward tip stall. Just point the *Tame*cat at a spot on the runway, throttle back, and glide onto it. Add power if you're short, and be prepared to go around again if you're too steep. You'll really love this model on final approach.

One interesting feature of the *Tame*cat is that it will teach the student the use of elevator trim more efficiently than many other models. All airplanes need pitch trimming as their fuel tanks empty, but the *Tame*cat's long nose lets you see these trim changes a little better than most. I think you'll agree that students can benefit greatly from this extra lesson, especially since the model teaches it so gently.

With the recommended control throws and CG position, the F-14 *Tame*cat will do all the required maneuvers in the trainer envelope, plus a few extras. Loops, lazy rolls, sustained inverted flight, stall turns, Immelmanns, and the split S are all a pleasure to perform. The model stays right on target and never gets squirrelly. Slow flybys are simply magnificent.

If a little more aerobatics agility is desired, just move the model's center-of-gravity back an inch (balance the model from the main spar), crank up the aileron and elevator surface throws, then watch *Tame*cat run with the rest of the pack. This is a model that can teach the very basics, yet grow right along with a flier as he progresses through mild aerobatics instruction.

This sport/training model meets my design goals and even exceeds them. It mimics a jet fighter appearance, yet sacrifices none of the friendly flying stability and easy building qualities of today's top-notch trainers. The first time you see this model in the air, those twin rudders and long nose will prove that a well-behaved model can still sport a fiercely aggressive image.

Sure, *Tame*cat only resembles that supersonic, ducted-fan-powered, accurately scaled-down F-14. It's all bluff, but underneath the facade this is no awkward ugly duckling. This is a sport/trainer that looks as if someone might actually want to own it. Just wait until your flying buddies check it out. One ferocious-looking *Tame*cat, on the prowl for a target . . . "Purr-r-r-r-r!"

Radio Technique/Myers

Continued from page 43

with anybody, we must stop transmitting. On the other hand, if they interfere with us, we have no rights.

Continued on page 156

Tamecat/Troy

Continued from page 37

the left side, from an inch behind the C-4 rear bulkhead to about an inch in front of the C-2 forward bulkhead. Make certain the plank lies flat to the fuselage crutch and against the canopy assembly floor. Add an identical plank to the right side. Sand a slight bevel along the edge of two more planks, and fit them, one right and one left, above the previous ones.

After the first six or eight planks are in place, remove the pins and lift the canopy assembly from the fuselage. Remove the waxed paper, then place the assembly back on the fuselage. This is the time to see how good a job you've done installing the nylon hold-downs. Does the canopy assembly snap on and off firmly? If it doesn't, make adjustments now.

Finish planking the rest of the canopy assembly by adding one right and one left plank in turn to keep even pressure on the structure. The edge of each succeeding plank should be beveled to fit the angle of the previous one. You'll notice that the remaining planks must be made progressively longer at the rear so that the last ones extend about four inches rearward past C-4 and over the wing saddle area. The last two planks will need to be cut to shape before fitting.

Sand the surface of the fully planked canopy assembly to a rounded shape, blending the planks into each other. Trim the ends of the planks at the front and rear of the completed assembly using the paper templates on the plan. Remove the assembly from the fuselage, and set it aside.

Temporarily install your chosen engine and mount, using 4-40 bolts through the mount into the blind nuts previously installed in the firewall.

Tack glue three pieces of 1/16 scrap balsa onto the backplate of a 2¼-in. spinner. Tack glue the ¼-in. Lite Ply nose ring to the scraps. Make sure the backplate and nose ring line up. Put the backplate on the engine with the nose ring facing the firewall.

The nose is made from three pieces of ½ x 3-in. soft balsa, cut to a length ¼ in. longer than the distance between the firewall and the nose ring (length will vary according to engine selection), then sanded to a beveled shape at the front and rear to fit snugly in place between the firewall and nose ring.

Size the bottom nose piece by drawing a line down its center from front to back. Measure and mark from this center 1½ in. on each side at the rear and ¾ in. on each side at the front, then draw a line connecting the marks from front to rear. Cut the excess balsa off along the lines, then glue the nose bottom in place, centered side to side, between the firewall and the nose ring.

The two side nose pieces are glued in place at this point. If necessary, make a cutout in one side nose block for the needle valve. Drill a ¼-in. hole in the bottom block for draining the engine compartment. Carefully remove the spinner backplate and the 1/16 balsa scraps from the nose ring. Remove the engine and mount.

Use a sanding block to contour the side and bottom blocks to transition smoothly from the rectangular shape of the fuselage to the rounded lines of the nose ring. Be careful not to alter the round shape of the nose ring as you sand. Sand the top edges of the side blocks flush with the top of the fuselage crutch.

Carefully sand the entire fuselage assembly, rounding off all corners but leaving the top edges square.

Finishing. Use Model Magic filler to doctor any ill-fitting areas in the wing, fuselage, tail, and canopy assembly. Sand the repaired areas after the filler dries, then smooth all components thoroughly with #320 sandpaper. When every part of the model that will contact the covering material is smooth to both sight and touch, your *Tamecat* should be ready for its final finish.

Pick an authentic Tomcat scheme that turns you on, and use iron-on film to duplicate it. Any good-quality film covering will suit the model nicely. The fuselage may be painted, but considerable weight can be saved if you stick with plastic films. Coverite's Black Baron, Top Flite's Super MonoKote, and Hobby Lobby's Oracover have each been used on prototype models with good results.

Cover each of the model's component parts separately, then glue the finished parts together afterward. Make sure that you don't cover over gluing areas. Glue joints must always be wood-to-wood, never film-to-wood or film-to-film. In some areas you will find it easier to cut the material away from the glue joints after covering.

Once the covering task is complete, epoxy the nylon hinges into the ailerons, rudders, and elevator. When this has thoroughly cured, install these flying surfaces into the wing, vertical fins, and stabilizer, using epoxy again. Install nylon control horns on the rudders and elevator.

Glue the stabilizer onto the rear of the fuselage. Glue the two vertical fins onto the stabilizer and into their slots on the top of the fuselage. Note that the vertical fins are also glued to the inboard sides of the fuselage. Finally, glue the ¼-in. triangle braces against the stabilizer and the vertical fins on the inboard sides.

Remove two thin strips of covering along the rear edges of the fuselage bottom, and glue an R-4 tail skid on each side of the bottom.

Stars-and-bars decals and additional graphics are available from Coverite, Sig Manufacturing, Top Flite Models, and Major Decals. The clear molded canopy is #CANF0003 from Great Planes Model Manufacturing Company. You can use a pair of Williams Bros. jet fighter pilots, or simply glue a pair of painted Ping-Pong balls under the lid.

Form and install the main gears. Use ½-in. nylon straps to hold them in place. Install the nose gear, using the steering arm supplied with the Goldberg Nose Gear set. Mount the wheels using 3/32 collars, then add the engine mount, engine, and fuel tank.

Line the perimeter of the wing saddle area or the fuselage with foam-backed tape to keep out fuel.

Radio installation. Install the Sullivan #503 throttle and nose gear pushrod guide tubes. Use the two ⅛-in. Lite Ply P-B pushrod braces along

Continued on page 115

Engine Vibration Article Corrections

The article authored by George F. Abbott in the May 1990 issue beginning on page 53 suffered from a few lines of type being lost in the pasteup process. The second full paragraph in the third column of page 56 should have read as follows:

Currently on the market is at least one two-cylinder model engine with the cylinders arranged in a V. Assuming that the angle between the cylinders is 90 degrees, such an engine will be in primary, but not secondary, balance. Also available is an opposed twin-cylinder engine with a single-throw crankshaft in which the pistons both move in the same direction—an arrangement which of course offers no vibration advantage.

There was an error in the formula shown in Fig. 4. It should be as follows:

$$Fc = Mc(4\pi^2 r)N^2$$

In addition Fig. 3C and Fig 3D were accidentally ommitted. They are shown here. We regret the errors. *Editor*

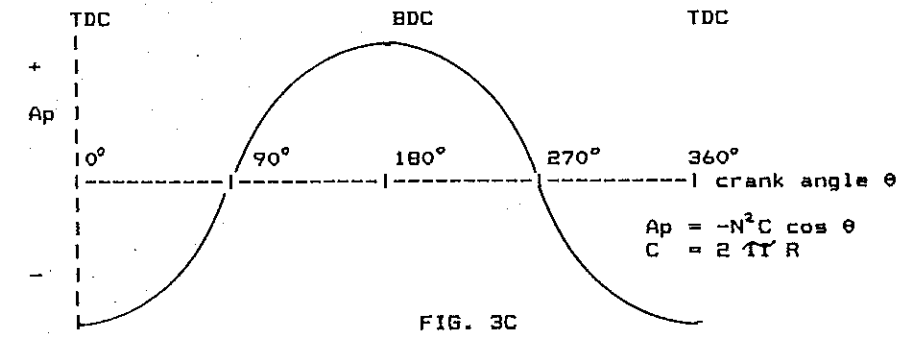


FIG. 3C
PISTON ACCELERATION

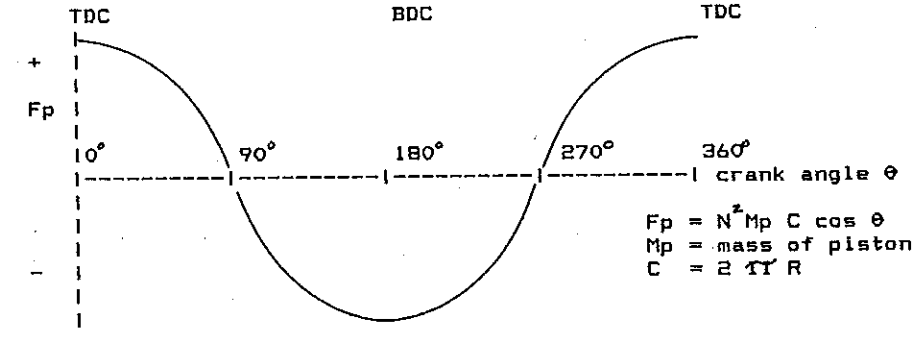


FIG. 3D
VIBRATION FORCES DUE TO PISTON ACCELERATION

Material list for F-14 TAMECAT

1/4" X 2" X 36"	MEDIUM BALSA	3
1/16" X 3" X 36"	MEDIUM BALSA	2
1/16" X 4" X 36"	MEDIUM BALSA	7
1/16" X 2" X 36"	MEDIUM BALSA	2
1/8" X 4" X 36"	MEDIUM BALSA	6
1/8" X 1/4" X 8"	MEDIUM BALSA	3
1/4" X 1/2" X 36"	HARD BALSA	10
3/16" X 3/16" X 36"	MEDIUM BALSA	2
1/2" X 1/2" X 36"	MEDIUM BALSA	2
1/8" X 1/2" X 36"	MEDIUM BALSA	2
1/4" X 1" X 36"	MEDIUM BALSA	1
1/8" X 6" X 12"	AIRCRAFT PLYWOOD	1
1/4" X 2 1/2" X 4"	AIRCRAFT PLYWOOD	1
1/8" X 12" X 48"	LITEPLY	2
3/8" X 3/4" X 7 3/4"	MAPLE GEAR MOUNTS	2
2 3/4" DIAMETER	WHEELS	3
5/32" DIA. X 36"	MUSIC WIRE	1
5/32" DIA.	WIRE NOSE GEAR	1
5/32" DIA.	WHEEL COLLARS	3
ENGINE MOUNT	TO SUIT	1
2 1/4" DIA.	PROP SPINNER	1
3/8" X 3/8" X 16"	HARD WOOD	1
1/4" DIA. X 36"	WOOD DOWEL	1
NOSE GEAR	BRACKET TO SUIT	1
PUSHRODS	TO SUIT	1 SET
HINGES	TO SUIT	15
FUEL TANK	8 – 14 ONCE	1
AILERON TORQUE RODS		1 SET
MISC. CONTROL HARDWARE		1 SET
CANOPY GREAT PLANES #CANFOOOO3		1
¼'x11/2'x36"	MEDIUM BALSA	2

NOTE: THIS LIST MAY NOT BE ALL INCLUSIVE.