

CELERITY AERO-TECHNICAL DESIGN
1131-B BONITA DRIVE
ENCINITAS, CA 92024
619-944-5681

F14A TOMKITTY SLOPE INSTRUCTIONS
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SERIAL NUMBER _____

MATERIALS NEEDED

- RADIO GEAR
- 2 2-56 SNAP LINKS
- 3 2-56 THREADED RODS
- COVERING MATERIAL (Military grey Monocote over 1 part Balsarite recommended. Monocote can be dulled by lightly buffing with fine steel wool.)
- THIN CA, THICK CA, EPOXY(fast and slow recommended)
- RC56 glue
- CLEAR POLY PLASTIC TO PROTECT WING PLAN
- 3M SUPER 77 SPRAY ADHESIVE
- STRAIGHT PINS
- LIGHT CARDBOARD TEMPLATE MATERIAL APPX. 9 X 14"

TOOLS REQUIRED

- #11 X-ACTO KNIFE
- 10" OR LARGER SANDING BLOCKS
- 24" METAL STRAIGHT EDGE
- 10-32 TAP
- 3\64" DRILL BIT
- 5\32" DRILL BIT
- 3\16" DRILL BIT
- DRILL
- SQUARE
- RULER
- A FINE FLAT FILE (MILL FILE)

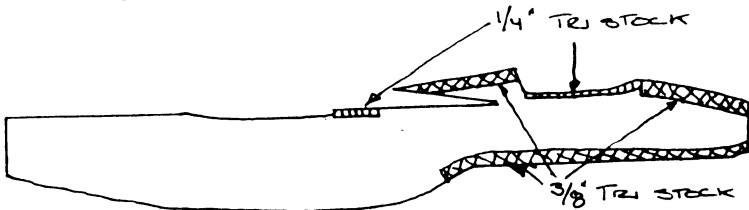
A great deal of development has gone in to bringing you this kit. It is manufactured with care and pride to give you a blend of flyability and looks in an easy to assemble kit at a price you can afford. It is the responsibility of the consumer to determine the safety and use of this product. No liabilities connected with the use of this product will be accepted by the manufacturer except to replace any parts proven to be defective before assembly.

The Tomkitty is still a first generation kit. Each production run incorporates improvements that may be found only in the instructions or change sheets attached. While construction is very basic in nature, the order of construction must be followed to insure success. Therefore it is very important to read and understand the instructions first. WE CARE ABOUT QUALITY, AND WE CARE THAT YOU ENJOY THIS KIT. To make sure of that we offer technical support Monday through Thursday between 4pm and 6pm pacific standard time. We ask that you only call during these hours. Please have your instruction sheet in front of you and the serial number so we know what production run you have. If you have suggestions, please let us know, and we will try to incorporate them in future kits. This will place you on our mailing list for updates such as foam wing retrofits planned for the future.

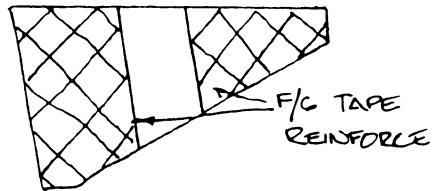
1. Cut out the front and rear top plate templates leaving a slight margin around each. Spray a light coat of 3M 77 on the back of each and bond them to some light cardboard template material. Carefully cut out the template with an X-acto knife.

2. Edge glue the 3- $1\frac{1}{8}$ x 3 x 8 balsa panels together with thin CA. Trace the rear top plate on and cut out. Repeat with the 3 trapezoid $1\frac{1}{16}$ " balsa pieces to form a large trapezoid. Transfer all center lines and engine side locating lines to the one side of the rear panel and to both sides of the front panel. Set the rear panel aside for now. Remove the 6 long triangle ribs from the rolled paper tube. BE VERY CAREFUL AS THEY ARE FRAGILE. Glue on the four center ribs to the front panel as shown on plans. The remaining 2 will be added after the center sheeting is applied. With scraps from the trap. panel, cut the 3 center spars along the trailing edge and glue in place. Locate and edge glue the 3- $1\frac{1}{16}$ x 3 x 6 $1\frac{1}{8}$ " panels together to form the center top sheet. Line up the top sheet with the leading edge. The sides of the panel must not overhang the ribs. DO NOT TRIM THE TOP PANEL TO LENGTH AT THIS TIME. Glue the sheeting in place with thick CA. Slightly sand the bottom of the 2 remaining ribs. This allows the angled paneling to fit flush. (see sec. B) Glue to the sides of the outer ribs. From $1\frac{1}{16}$ scrap, cut the 2 triangle rear spars shown in sec. B and glue in place. Lining up the outer panels so it slightly over hangs the rear of the top view. (will be sanded latter to match the wing.) The edge with the bias grain is along the top paneling. Glue the panel in place. Sand the edges flush and glue on $1\frac{1}{16}$ x $1\frac{1}{4}$ " strips to form LE. ED. Sand edge to shape and trim to length. Add the $1\frac{1}{8}$ x $1\frac{1}{4}$ " LE. ED. and sand to shape.

3. Locate the front and rear sections of inner fuselage. Butt glue the sections together with thin CA to form two halves. Lightly sand both sides of the glue joint. Locate the $1\frac{1}{8}$ x $1\frac{1}{2}$ x 3 balsa doublers in the hardware bag. Epoxy them to the halves in the location shown on the plans. This becomes the inside of the fuse. BE SURE TO MAKE A RIGHT AND LEFT SIDE. Mark bulkhead locations on both fuse. halves. Note change to $3\frac{1}{8}$ tri stock in areas of diagram below.

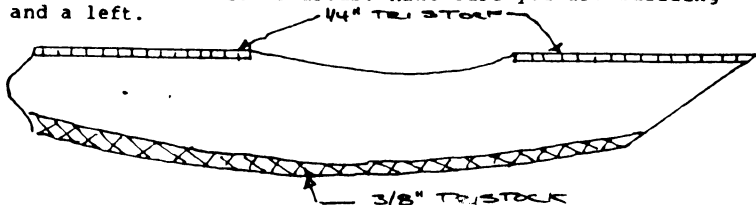


Glue on reinforcing tri stock along indicated edges. It is easier to bend around sharp curves by slicing. Trim out bulk. notches after gluing tri stock on. Sand the rear edge of the fuse. halves and the rear tip of the cockpit section to a bevel so they can be pulled together later. Locate B1, B2, and B3 and mark with center lines. Glue B2 and B3 to one side of the fuse. Locate 1/8 ply elevator bellcrank. Add F/G reinforcing to the unmarked side as indicated in the drawing below.



Flip the bellcrank over and drill two 3/64" pilot hole where the brass bearings will go. Line up the forward pilot hole over the hole in the fuse. sides. With a pin in the forward hole as a pivot and a pen in the rear hole mark an arc on the fuse. halves. Cut access slot in the fuse. for the elevator actuator rod as indicated in the fuse. side view. Measure back from the front of the front plate access slot and mark the leading edge of the rear top plate onto the fuse sides. Cut a temporary 1 1/2" wide bulk. and tack glue in place. Join the 2 fuse halves and glue B2, B3, and temp. bulk to the other side. Pull the nose together and eyeball for a crooked nose. Glue B1 in place with quick epoxy. Gently pull the rear of the fuselage together, eyeball straight and glue together. Repeat with the rear of the topdeck. Edge glue 5 of the 1/8 x 1 3/4 x 3 balsa to form a 15" long 1 3/4 wide cross grain panel for the lower forward fuse. Mark a center line along the panel and glue along the bottom of the fuse, lining the centerline up with the bulk. centers. Repeat with the top sections of the fuse as indicated on plans. Sand top sheet edges flush with fuse. sides. Epoxy on the nose block. Sand the canopy to shape. Do not sand into the arc marked on the bottom of the canopy. Adjust the fit of the canopy to the fuse. Trace a line around the canopy bottom and back onto the fuse. Sand the forward areas of the fuse to shape with out sanding into the canopy area. The area under the canopy can be trimmed open leaving a 1/8" border for the canopy to rest on. Hold down hooks for a rubber band will be fashioned latter from aileron torque rod scraps.

4. Locate the outer engine side and cut the elevator actuator rod accesses the same method as the fuse. Glue the tri stock to the engine tunnel sides as indicated in the diagram below. Note 3/8 has been substituted in lower areas. Make sure you are building a right and a left.



Slide the front top plate into the fuse. Line up, center and glue in place with thin CA. Place the rear top deck near the edge of a flat work surface with the marking lines up. Center the fuse up side down onto the rear plate (The front of the fuse will be hanging over the work surface.) Temporarily hold fuse in place with a weight. Measure that the wing opening is 6" wide and parallel, and the rear top is straight on the fuse. Glue the fuse onto the rear plate with thin CA. Line up the engine sides on the rear plate and glue in place with thin CA. Line up the engine sides to the front plate and glue in place with thin CA. Edge glue the 1/8 x 3 x 6 1/8" balsa pieces to form a cross grain bot-

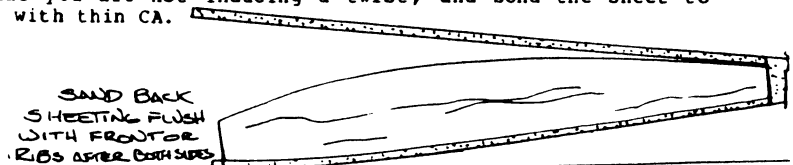
tom sheet. Measure to fit the engine side bottom and cut to form a **PERFECTLY SQUARE** rectangle. Line up and glue to the engine area bottom. I prefer a slow acting epoxy and pins as you can add a nasty twist to the body by going fast here. Cover the rear extending portions of the fuse with scrap $1\frac{1}{8}$ " balsa. Drill elevator pivot holes to $3\frac{1}{16}$ ". Sand Body assembly to Shape.

5. Lay out 2 of the elevator skins and mark locating lines for the brass tubes **BE EXTREMELY ACCURATE AND USE A SQUARE**. The distance between center lines of the tubes must be equal to the distance between pilot holes on your bellcrank. Double check. Okay, **TRIPLE CHECK**. Glue support balsa where indicated. Lightly rough up exterior of br. tubes. Since the tubes are slightly thicker than the $1\frac{1}{8}$ balsa supports, you will have to sand the slots slightly deeper. Glue in tubes. **BE CAREFUL NOT TO GET GLUE ON INSIDE OF TUBE**. Sand $1\frac{1}{8}$ " supports to out lines of elevator. Glue on top sheeting and sand to airfoil shape.

Repeat with the vertical fins. Round opposite edges of $1\frac{1}{8}$ x $1\frac{1}{4}$ " lower braces and glue on. Fill front gap with $1\frac{1}{16}$ " scraps. Sand lean angle into bottom edge. (they will be glued on later.)

6. **WING ASSEMBLY**. The Tomkitty Wing is built in 3 sections, the center section and the two outer panels each panel is built as 1 complete unit sanded to shape, joined together, control surfaces cut into it, and then reinforced with FVG tape and thin CA. During this phase I take a sheet of clear poly plastic and lightly mist one side, and adhere it smoothly over the wing plan. This does an excellent job of giving you a smooth surface that your wing does not stick to.

Start by locating the 9" TR. ED. and pin to the center section with the 90 degree side down. Lay a strip of $1\frac{1}{16}$ x $1\frac{1}{4}$ cap strip about $1\frac{1}{8}$ " forward of the TR. ED. this allows space under the ribs for the $1\frac{1}{16}$ " sheeting. Rib #'s start with the center line and go out. (ribs 1&2, 3&4 are identical) With thin glue, tack the rear of R1, 2, & 3. Remove the temp. cap strip and slide 1 of the $1\frac{1}{16}$ " x 3 x 10 $1\frac{1}{2}$ sheet panels under the ribs and into place. Glue to TR. ED. & ribs with thin CA. With a straight edge, trim another 10 $1\frac{1}{2}$ " panel to slightly over hang the front of the ribs when butt glued to the bottom sheeting. Slide trimmed panel under the ribs and butt glue the panels together with thin CA. Remove the pins in the TR. ED. and Slightly rock the panel forward so the entire front sheeting is in contact with the ribs. Check that you are not inducing a twist, and bond the sheet to the ribs with thin CA.



For the top panel butt glue the remaining 10 $1\frac{1}{4}$ " sheeting together and trim to slightly overhang the front of the ribs. Apply thick CA to the top of the ribs and to the TR. ED. Lay the sheeting on the table and place the wing section onto it, starting contact at the rear of the ribs and TR. ED. rock the panel forward similar to the other side. With a sanding block, sand the LE. ED. of the sheeting back to the front of the ribs. With the glue of choice, glue on the short piece of LE. ED. Trim and sand the sheeting flush with ribs 3 and shape LE. ED.

For the Outer panel the construction method is the similar. Start by pinning the TR. ED. to the plans and place a temporary 1/4" cap strip a bit in front of it. Then select a wing sheet and lay on the plans lining up the rear edge of the sheeting NOTE: This edge has a slight grain bias, the front of the sheeting will slightly overhang the ribs.



Glue on the ribs at the TR. ED. and lightly tack them where they contact the sheeting with thin CA. Repeat the rocking technique you used on the center panel to bond down the sheeting. For the top sheeting flip the wing over. Make sure that the back edges of the top and bottom sheeting are directly over each other as shear web will be applied later. Here it is easier to use thin CA as you can get access to the ribs. Repeat the rock procedure. Sand back the LE. ED. and glue on the LE. ED. sand the sheeting flush with the end ribs. With thin CA, glue on the shear webs and then the cap strips. Sand the webs smooth with the top and bottom sheeting.

The wing tips are in 2 pieces that will be laminated together with the grain running slightly at angles to each other for strength. Bond the laminations together with epoxy. The bond line should meet the center of the LE. ED. and the center of the TR. ED. Epoxy the tips to the wings. Sand all wing panels to shape and mate the panels together with epoxy. Accurately mark out the ailerons and cut them out with a straight edge and X-Acto. Sand the front edge of the cut out aileron back at an angle as per diagram on plans. (monocote hinges will be used) Cut and bend Ail. linkage to length. cut accesses in the Ail. approximately 1/16" deep and set aside the Ail. 's

Cut the slots and accesses in the center section for the aileron linkage. Glue the linkage into the slots. **DO NOT ALLOW GLUE TO SEEP INTO THE LINKAGE.** (A dab of vaseline or a drop of oil at the end of the carrier tube should prevent this.) Apply the reinforcing F/G tape where indicated with thin CA. Trim the back of the center section TR. ED. to the length of your fuse. wing opening. Drill the 3/16" wing screw hole. Trial fit the wing to the fuse assembly. Carefully sand the edges of the front top plate so it fits nicely with the wing. **REMEMBER YOU CAN ALWAYS REMOVE MATERIAL BUT IT IS VERY HARD TO PUT IT BACK. SO GO SLOW!** Glue the small ply piece to the 1 1/4 x 1 1/2" ply wing hold down tongue. Epoxy the tongue onto the wing. Retry your wing to the fuse. The tongue may have to be sanded slightly or some added so that the wing is held securely. Cover wing and ailerons separately. A strip of Monocote should be used to hinge the ailerons on. Now epoxy linkage into the slots in the ailerons and cover with monocote.

Aileron servo mounting depends largely on what sized servos you use. Micros can be embedded in the wing and held in place with blocks and screws or double sided tape. Full size servos, because of the height and resulting linkage angle, work best suspended below the wing by blocks and screws. This may seem a little unusual, but it works better because the servo arms are nearer the same level as the Ail. hook up.

7. Remove the temporary bulk. at the rear of the fuse. access. With epoxy, construct the ply wing hold down. NOT SHOWN ON THE

PLANS IS AN ADDITION 5\8 X 1 1\4" PLY PIECE LAMINATED UNDER THE 1 1\2" PIECE. Refit the wing and mark the drill hole in the hold down. Drill a 5\32" hole and tap with 10-32 tap. Apply a drop to the threaded hole and let cure. Run in the tap to clean out the threads. This will add strength.

Drill out the two pilot holes in the bellcrank to 5\32". Drill the four remaining 5\8" ply squares with a 5\32" hole in the center to form the bearing carriers. Near the bottom end of the line drill 2 small holes for the metal 2-56 rod link in the hardware bag. This link is very unlikely to ever accidentally disconnect. Slide the two shortest brass bearings into the holes but do not glue at this time. The next step is done to accurately align the Elevator pivot rod and bearings. Lubricate the 10" music wire rod with a light coat of vaseline or oil to prevent glue binding. Lightly buff the outside of all brass bearings. Begin by slowly sliding the rod into one side of the fuselage pivot hole. Working through the rear engine tunnels and the access hole in the rear top deck, add the appropriate parts as you continue sliding the pivot rod through. Adjust to center one side of shaft into the center of the 3\16" engine side. Tack glue the bearing parts to that balsa engine side using thin CA. **REMEMBER TACK ONLY. DO NOT GET GLUE INTO THE INSIDE OF BEARING TUBE.** Repeat this on the other engine side making sure the pivot rod is level and straight in the fuse. Next do the same with the fuselage bearings and the bellcrank bearing.

Go back now and reinforce your tacked glue joints with epoxy. **DO NOT GET GLUE INTO THE BEARINGS.** Lube the music wire elevator actuator rod and slide into the fuse. and bell crank. Adjust the rod straight and level. Tack the actuator bearing to the bellcrank and reinforce the bearing with fast epoxy. Once again do not get glue on the rod. Clean up access slots, file and debur bearings to make the assembly move **FREELY WITH NO SLOP.**

Install the elevator servo where it will not interfere with the Ail. servo. Connect to the steel bellcrank link via a 2-56 threaded rod. Adjust so that you have at least 3\8" up and down. With the elevators installed, Neutral is about 1 1\2 to 2 degrees up at the TR. ED.

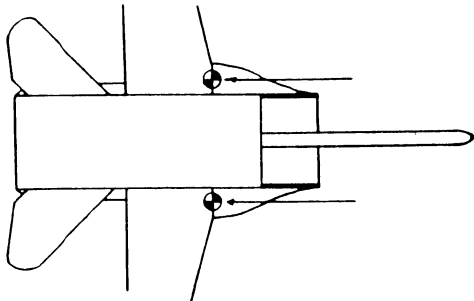
8. Sand the 1\8" ply belly fins to shape. Mark where tabs enter in to the FUSE and trim out the approx. 1" slots front and back. Trim the 1\8" x 1" ply braces to length on the inside of the fuse and epoxy in place. Epoxy the belly fins in place. Be sure to get a good bond as the fins take some abuse during landing. Do not be tempted to omit the belly fins as they are critical for spin resistance at high angles of attack.

8. Finishing Mount the battery pack and receiver so that your plane balances in the range shown on the following page. **DO NOT BALANCE BEHIND THIS RANGE.** During spin flight tests it was balanced behind the range. An intentional spin was induced and held until a flat spin resulted. It took 200' of altitude to recover. Unfortunately we only had 198' resulting in a chemical reaction of wood and earth coming together in a oxygen deprived environment.

Prep and cover the fuse, fins and elevators. We bond the fins onto the fuse, without trimming out the Monocote using RC56 glue. It dries clear and makes a strong, flexible bond that will only come loose on a hit hard enough that would otherwise do structural damage. Fabricate canopy rubber band hold down hooks from left over aileron linkage and epoxy in place where they do not interfere with radio gear. With the small strip of corrugated cardboard make two engine nozzle tubes to fit just into the engine area. Make sure they do not interfere with the elevator linkage. Trim an access arc for the actuator rod if they do. They should be painted flat black or darkend with felt pen.

When built at the minimum weight of 21 oz., the Tomkitty would probably thermal. It has been flown in 55 knot storm winds with higher gusts. Weighing 37 oz., it was still penetrating but it would have been happier with more ballast if we only had more with us. For ballast we use a clay type camper seal putty available at R.V. shops in a large roll for around \$4.00. It can be molded in around the balance point wherever you have room. It stays where you put it and is easily removable.

Balance for first flight should be at 7\8" back from the wing\front plate joint as viewed from the bottom.



Bottom View

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F-14 TOMCAT

Length: 15.5" Span: 16.25"



NO 450014
LIST \$6.50

MIG-23 FLOGGER

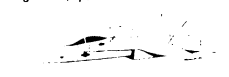
Length: 14" Span: 12"



NO 450023
LIST \$6.50

F-18 HORNET

Length: 16" Span: 10.25"




NO 450018
LIST \$5.50



SU-27 FLANKER

Length: 17" Span: 12.1"



NO 450027
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R/C "F-14 TOMKITTY" Slope Glider

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