FALCON 56 MARK II

R/C MODEL, KIT G 15II
3 TO 4 CHANNEL PROPORTIONAL
FOR .19 TO .40 ENGINES

SPAN 56"
LENGTH 47½"
AREA 558" SQ. IN.
WEIGHT 3¾ TO 4¾ LBS.

Designed and drawn by:
Carl Goldberg, J. Noonan, J. A. Mattson, Ron Pawlowski, F.C. McVickar, Warren Kronberger
R/C TECHNICAL CONSULTANT AND TEST FLYER – JOHN WISNIEWSKI
FINAL MODEL AND PHOTOS BY DICK TICHENOR

178
CARL GOLDBERG MODELS INC.
4734 W. CHICAGO AVE. • CHICAGO, IL 60651

GENERAL INFORMATION FOR CONSTRUCTING FALCON 56 MARK II

BEFORE STARTING ASSEMBLY OF MODEL, read plan carefully and construct your model in the following order:

- I FUSELAGE (Steps 1 through 11)
- II FIN AND RUDDER (Steps 1 through 3)
- III WING (Steps 1 through 11 or 8A)
- IV STABILIZER AND ELEVATOR (Steps 1 through 9)
- V COVERING AND TRIM
- VI FINAL ASSEMBLY
- VII BALANCE
- VIII RADIO INSTALLATION
- IX RADIO CHECK
- X GENERAL

(V through X: See "COVERING, FINAL ASSEMBLY, & RADIO INSTALLATION")

RADIO

A 3-channel radio will allow you to control rudder, elevator, and engine throttle. As a trainer, the Falcon does an excel-lent job with 3-channels and can perform almost all maneuvers including inverted flight and outside loops. Also, the wing construction and radio installation for 3-channels are simpler. You can buy a 3-channel radio, or use 3-channels out of a 4 or 5-channel radio.

A 4th channel allows you to use ailerons. These add precision, and enable the flyer to perform more intricate maneuvers such as rolls, wing-overs, split-S, and Immelmans; 4 channels give you all the basic controls, and satisfy the needs of a wide range of models.

A 5-channel radio costs very little more than 4, but allows you to later add another function such as flaps, etc.

HOW TO DETERMINE THE SIZE OF YOUR ENGINE

Choosing the size of your engine is governed by three factors: (1) weight of model without engine and muffler, (2) type of runway surface, and (3) altitude of airfield. If your model weighs around 3-3/4 lbs., your take-off surface is paved, and your airfield is not too far above sea level, a .19 engine is adequate. If, by contrast, your model weighs in at 4-3/4 lbs., your take-off surface is grass, and your field is 5000 to 6000 ft. above sea level, you will need a .40 engine. Check with your dealer and other modelers in your area for their recommendations.

It is often recommended to have extra power for take-off and then decreasing power once airborne for safe handling until you have gained experience.

USING THE ENGINE SELECTION CHART:

1. Determine "EXPECTED WEIGHT OF MODEL" from PLAN SUPPLEMENT booklet.
2. Check-off the box in columns A, B and C that apply to your model.
3. Circle the engine size below each box checked.
4. Add up the 3 engine sizes and divide by 3.
5. Choose the closest engine size to the resulting figure.

ENGINE SELECTION CHART EXAMPLE:

	A		B		C	
Expected weight of your model without engine and muffler	3-1/4 to 3-3/4 lbs. ✔		3-3/4 to 4-1/4 lbs.		4-1/4 to 4-3/4 lbs.	
Your Take-Off Surface	Pavement or Smooth Dirt		Short Grass or Crushed Stone ✔		Tall Grass (2" to 3")	
Altitude of Your Flying Site (Feet)	0 to 2000		2000 to 4000		4000 to 6000 ✔	
Engine Size Required	.19 to (.25)		.30 to (.35)		.40 to (.45)	
Propeller Size	9-4	9-5	9-6	10-6	10-6	11-6

Column A – Weight 3-3/4 lbs. = .25 engine
" B – Crushed Stone Surface = .35 "
" C – Altitude 6,000 ft. = .45 "
TOTAL (1.05)

ENGINE SIZE 1.05 ÷ 3 = (.35)

YOUR CHART:

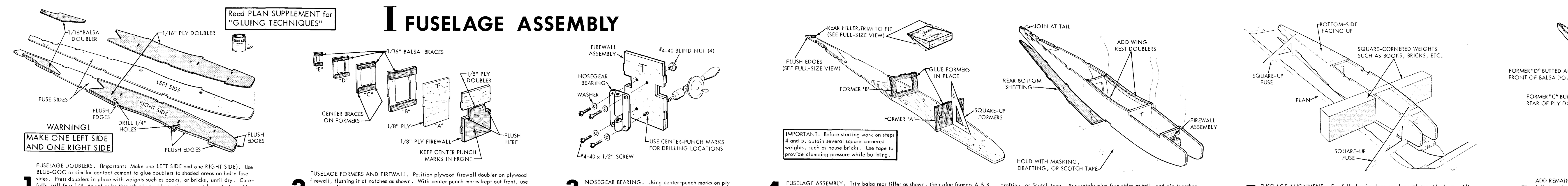
	A		B		C	
Expected weight of your model without engine and muffler	3-1/4 to 3-3/4 lbs.		3-3/4 to 4-1/4 lbs.		4-1/4 to 4-3/4 lbs.	
Your Take-Off Surface	Pavement or Smooth Dirt		Short Grass or Crushed Stone		Tall Grass (2" to 3")	
Altitude of Your Flying Site (Feet)	0 to 2000		2000 to 4000		4000 to 6000	
Engine Size Required	.19 to .25		.30 to .35		.40 to .45	
Propeller Size	9-4	9-5	9-6	10-6	10-6	11-6

When in doubt, or to get extra performance, use the next larger engine size.

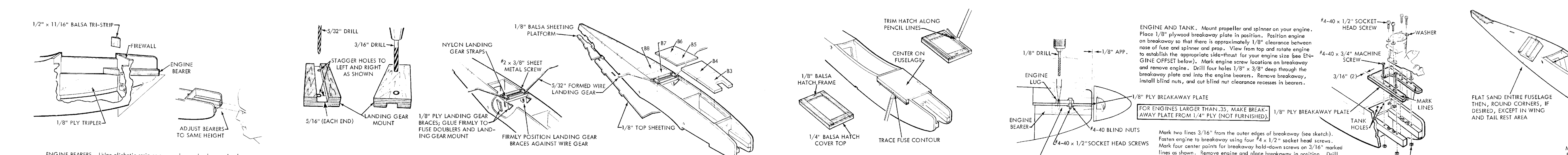
PROPELLER

Use a propeller corresponding to your engine selection as shown on the chart. If your flying site is far above sea level, you may find it necessary to go to the next larger prop diameter. If necessary, consult with R/C flyers or hobby shops in your area for their recommendations.

I FUSELAGE ASSEMBLY



1. FUSELAGE DOUBLERS. (Important: Make one LEFT SIDE and one RIGHT SIDE). Use BLUE-GOO or similar contact cement to glue doublers to shaded areas on balsa fuse sides. Press doublers in place with weights such as books, or bricks, until dry. Carefully drill four 1/4" dowel holes through ply doublers using die-cut holes in fuse sides as guides.
2. FUSELAGE FORMERS AND FIREWALL. Position plywood firewall doubler on plywood firewall, flushing it at notches as shown. With center punch marks kept out front, use epoxy or aliphatic cement to permanently glue doubler to firewall. Let dry. Cement 1/16" thick balsa braces to 1/8" fuse formers. Let dry.
3. NOSEGEAR BEARING. Using center-punch marks on ply doubler for guides, drill four 1/8" diameter holes through firewall assembly. Install nosegear bearing as shown.
4. FUSELAGE ASSEMBLY. Trim balsa rear filler as shown, then glue formers A & B, and rear filler to right fuse side. IMPORTANT: Square-up formers with fuse side and let dry. Glue left fuse side to formers A & B, and hold securely with masking, drafting, or Scotch tape. Accurately glue fuse sides at tail, and pin together. Glue firewall assembly in position and hold with tape. Glue rear bottom sheeting and wing rest doublers in position. PROCEED IMMEDIATELY TO STEP 5.
5. FUSELAGE ALIGNMENT. Carefully lay fuselage on plan with top side down. Align fuselage with top-view outline using weights, such as books or bricks, to hold fuselage assembly square and true. Let dry THOROUGHLY before proceeding.
6. ADD REMAINING FORMERS. Locate proper positions of formers C, D, and E from full-size view below. (Note which way former braces are facing when properly installed.) Butt formers against ... firmly hold fuse sides against formers until dry.



7. ENGINE BEARERS. Using aliphatic resin or epoxy, glue engine bearers in place as shown. Immediately square bearers with firewall, and adjust bearers from front view. Let dry thoroughly before proceeding. Fit and glue 1/8" plywood triplers in place. Cut 1/2" x 1-3/8" balsa triangle strip into two equal halves, 11/16" long, and glue in place against engine bearer, firewall, and fuse doubler. Let dry.
8. LANDING GEAR ASSEMBLY. Mark staggered positions for landing gear holes and drill two 5/32" diameter holes, 5/16" from each end of plywood landing gear mount as shown. Turn landing gear mount over and redrill holes with a 3/16" diameter drill. Glue landing gear mount in fuse, and let dry. Insert formed wire landing gear. Position and mount nylon landing gear straps with #2 x 3/8" sheet metal screws. Position and glue 1/8" plywood landing gear braces so they ... restrict gear movement. Let dry. Trim to fit and ... 1/8" balsa stabilizer platform and 1/8" balsa fuselage top sheeting in place.
9. HATCH COVER. Glue 1/8" balsa hatch cover frame to 1/4" balsa hatch cover top. ... Center hatch assembly in fuse cutout ... Trace fuse contour on bottom of hatch assembly. Remove hatch assembly from fuse and cut to size.
10. ENGINE AND TANK. Mount propeller and spinner on your engine. Place 1/8" plywood breakaway plate in position. Position engine on breakaway so that there is approximately 1/8" clearance between nose of fuse and spinner and prop. View from top and rotate engine to establish the appropriate side-thrust for your engine size (see ENGINE OFFSET below). Mark engine screw locations on breakaway and remove engine. Drill four holes 1/8" x 3/8" deep through the breakaway plate and into the engine bearers. Remove breakaway, install blind nuts, and cut blind nut clearance recesses in bearers.
Mark two lines 3/16" from the outer edges of breakaway (see sketch). Fasten engine to breakaway using four #4 x 1/2" socket head screws. Mark four center points for breakaway hold-down screws on 3/16" marked lines as shown. Remove engine and place breakaway in position. Drill four 1/8" diameter holes on center points through breakaway plate and engine bearers. Remove breakaway and install blind-nuts on undersides of bearers.
With fuel tank temporarily in position, mark and drill holes in firewall for fuel tank overflow and outlet lines.
11. SANDING FUSE. Cut blind-nut clearance in 1/4" balsa nose blocks and glue blocks in place. Remove wire landing gear, tack-cement hatch cover in place and sand fuselage, rounding corners and blending surfaces. Fuel-proof engine well, tank compartment, hatch cover, and breakaway plate with epoxy.

ADHESIVES

Be careful not to use too little or too much glue. Too little leaves a model weak. Excessive use of adhesives and paints can make a model heavy. Aliphatic resin glue such as Wilhold or Tite-Bond makes good strong joints, however, hot fuel-proof cement may be used for all joints except hardwood. For broad areas, such as fuselage doublers, contact cements such as Blue Goo are ideal. Cyano-acrylates, such as JET Super Glue, are good for rapid adhesion and tacking structures together. Cyano-acrylates require well-fitted joints. Where gaps exist, they can be filled with scrap, saw dust, or micro-balloons before applying the cyano-acrylate to make a strong joint. Epoxy glue or aliphatic resin glue are recommended for high stress joints such as wing joiners, firewall, and engine bearers (see PLAN SUPPLEMENT for gluing techniques). Epoxy glue also may be used as a fuel-proof coating for engine and tank compartments.

COVERING, FINAL ASSEMBLY, & RADIO INSTALLATION

V COVERING AND TRIM

Any good covering job should be preceded by filling nicks and dents with wood filler or balsa scrap, and sanding wood surfaces. Any irregularities in the wood surface will show on the covering, so a smooth sanding job is a must for appearance. Also, when using fabric, avoid excessive doping, otherwise the model will be heavy. Many novices wind up with uncontrolable tail-heavy airplanes because of this.

If you wish to avoid the tedious job of doping and sanding multiple coats, film coverings such as Monokote are attractive yet light. Fabric coverings give more strength to airframes, but they also add weight.

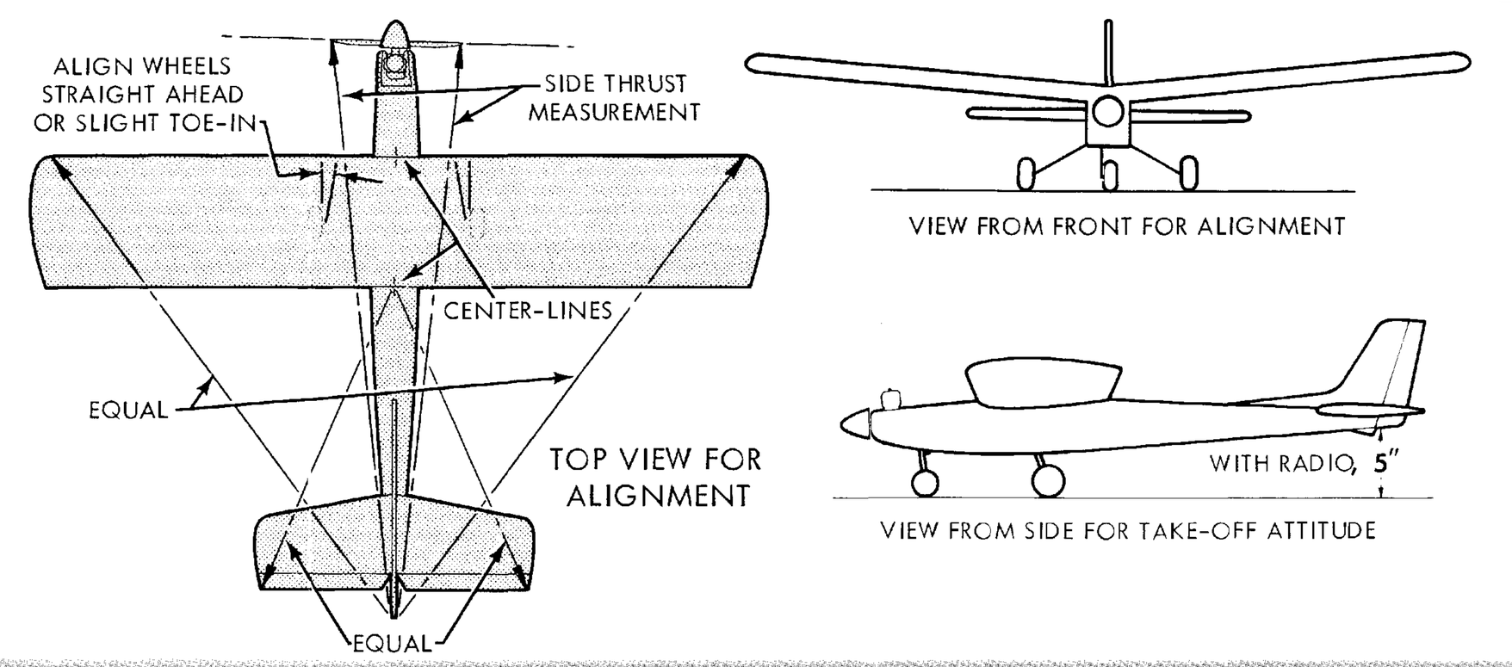
Cover wing and tail surfaces, and control surfaces, individually. After covering, carefully examine wing and tail, checking for warps. It is important to take out all warps, which can be done with the aid of a heat lamp, etc., or over a pan of boiling water. Hold the surface warped the other way while correcting.

The model can be easily trimmed with CG Color-Stripe. Glue the canopy in place, add decals, etc. Any edges of covering or trim tape that tend to come up should be sealed down with epoxy or cyano-acrylate.

The hinges should now be installed, except for the fin and rudder. To reduce chance of flutter keep all control surface gaps at 1/32" or less. The nylon hinge material supplied is quite satisfactory; however, many people prefer to use Klett hinges.

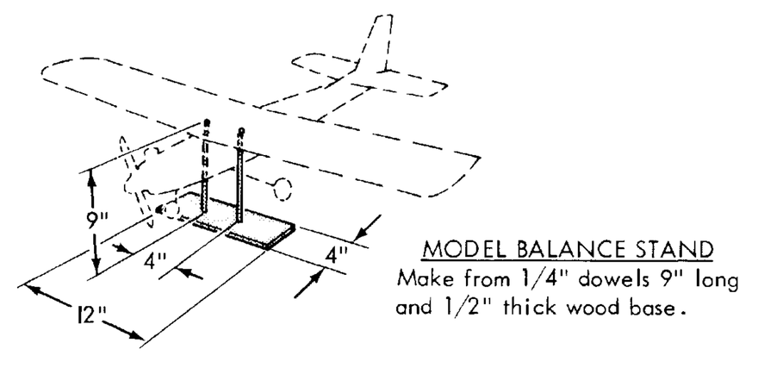
VI FINAL ASSEMBLY

Glue the 1/4" wing dowels firmly to the fuselage, and touch up with paint. Make the wing rest cushion of silicone bathtub caulk as indicated. Mount wing, and center it carefully as shown in the sketch, then mark matching center lines on wing and fuselage. Set stabilizer on fuselage, and shim up one side or the other until it is level. When the wing is level, glue stabilizer to fuselage aligning it with the fuselage end, and sighting the fin from front to rear to see that it is pointing dead straight ahead through the center of the fuselage. Hinge the rudder to the fin and fuselage. Add the control horns, and tail bumper and install the nose and main gear struts and wheels. Install the tank and fuel lines. With model fully assembled, recheck alignment of all flying surfaces.



VII BALANCE

Temporarily assemble model with all components, such as engine, tank, landing gear and wheels, etc. Set the radio components in place as far forward as practical, then check the model to see where it balances.

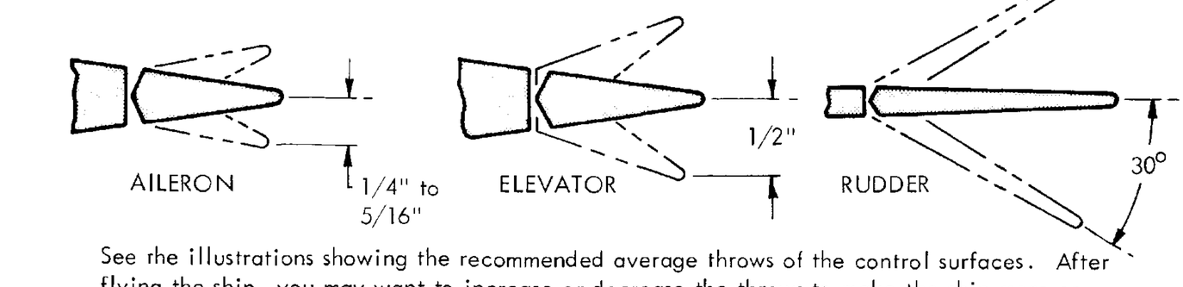


MODEL BALANCE STAND
Make from 1/4" dowels 9" long and 1/2" thick wood base.

A balance stand can be made as illustrated. Don't be too concerned if it is slightly nose-heavy, as this will just make it easier for a novice to fly. By all means, however, avoid a tail-heavy condition, as this makes a model difficult to control. The radio components can be shifted back and forth to help achieve the best balance.

VIII RADIO INSTALLATION

Glue the side rails and cross rails inside the fuselage, and mount the servos, receiver, battery, switch, and antenna. Be sure the receiver and battery pack are properly covered with foam rubber for protection against vibration, and that the servos are tightened down only moderately, for the same reason. Make your pushrods, and hook-up all controls. Turn on your transmitter and radio, and adjust linkages as necessary to get the desired control surface movements. All hinging and linkages should work very freely, otherwise the drain on your battery may be dangerously high, and cause a crash.



See the illustrations showing the recommended average throws of the control surfaces. After flying the ship, you may want to increase or decrease the throws to make the ship more or less responsive. Check for approximate 5" dimension from bottom of rudder to ground, and if necessary, bend main gears slightly to assure proper attitude for take-off. Also, check alignment of wheels for straight tracking (slight "toe-in" of wheels is recommended).

IX RADIO CHECK

Before going to the field to fly, the model should be completely assembled, and shaken in all attitudes to detect any loose components. Then, with batteries fully charged, turn on receiver and transmitter and actuate all controls many times until you are satisfied with all functions. Run the engine, and repeat the radio check for any vibration problems. At the flying field, perform a range check to see that all controls operate normally when at a distance from the transmitter.

X GENERAL

If you are a novice, seek the help of an experienced flyer. Many times a club or your hobby shop dealer can put you in touch with a qualified flying instructor. If possible, have your model checked over during various phases of the construction. If nothing else, ask one of the better flyers at the field for help. Usually they are glad to spend a little time to get somebody started right, and they probably were helped in the same manner themselves.

Fly only in areas sanctioned for R/C, and known to be free of radio interference. Great help can be found in all phases of building and flying by reading R/C Modeler Magazine's "Flight Training Course, Vol. 1."
Happy Landing!

II FIN & RUDDER ASSEMBLY

PUSHROD ASSEMBLY

GENERAL. Tape ALL control surfaces and servos in neutral before beginning pushrod installations. Operate your radio to determine servo movements, and label the servos Throttle, Elevator, Rudder, etc. Keep all pushrod routing as straight as possible. Use full-size views as guides for cutting, bending, and assembling pushrods. Final pushrod adjustments may be made with the Mini-Snaps and Pushrod Connector.

SNAP'R KEEPER — 5/32" O.D. TUBING — MINI-SNAP — 3/32" O.D. TUBING — SCREW SHANK

THROTTLE PUSHROD. Determine the most direct practical route from the throttle servo to the engine throttle arm. Mark and drill 5/32" holes in ply former "A" and firewall for 5/32" nylon tubing. Cut 5/32" tubing to a length that is 3-1/4" shorter than the distance between the servo throttle actuating arm and throttle arm. Place tubing in fuse, and slide 3/32" tubing through 5/32" tubing and cut it so it protrudes about 5/8" beyond each end of 5/32" tubing. Make throttle hook-up by threading #2-56 x 3/4" machine screw, provided, into 3/32" tubing, cut off screw head, and file burr off shank. Join to throttle with Mini-Snap. Make connection between throttle servo and pushrod by making a 90° x 1/4" bend in the unthreaded end of the short piece of 1/16" threaded wire provided; thread wire into 3/32" tubing and complete hook-up with Snap'R Keeper provided. Firmly epoxy 5/32" tubing to fuse side and let dry.

PUSHROD CONNECTOR — 1/16" WIRE — 1/8" O.D. TUBING — END "C" — SNAP'R KEEPER

NOSEGEAR PUSHROD. Determine the most direct practical route from rudder servo to steering arm. Mark and drill 1/8" hole in ply former "A" for 1/8" tubing. Cut tubing to length and make 90° x 1/4" bend in 1/16" wire end "C". Slide wire through tubing. Position pushrod in fuse, and connect to steering arm with Snap'R Keeper provided. Epoxy tubing to fuse side, as shown, and let dry. Check pushrod movement by hand to insure it operates very freely. To help avoid binding, gently bend wire inside tubing to conform to final routing. With rudder servo in neutral position, apply Pushrod Connector to servo, as shown, and connect 1/16" wire. Cut off excess wire.

THREADED ROD — MINI-SNAP — 5/16" SQ. BALSA PUSHROD — WIRE "A"

ELEVATOR & RUDDER PUSHRODS. Cut 10" threaded rod and 5/16" sq. balsa pushrod to proper lengths. Make 1/4" bend in threaded rod, and one end of 1/16" wire "A". Drill holes near each end of balsa pushrod, and bind wire ends in place with strong thread and glue. Let dry. Position pushrod in fuse, thread on Mini-Snap, and connect to control horn. With servo in neutral, carefully locate and mark bend location on wire "A". Remove pushrod from fuse, bend wire and cut off excess. Replace pushrod and check for free movement. Repeat process for other pushrod (note slightly different length required).

GRIND OR FILE ANGLED FLATS ON END OF 1/8" AND 5/32" WIRE ABOUT 10" LONG TO USE AS DRILL BITS FOR INSTALLING PUSHRODS.

-INCIDENCE-
WING 2° POSITIVE TO THRUSTLINE.
HORIZONTAL STABILIZER 4° POSITIVE TO THRUSTLINE.

ENGINE OFFSET

.19 –.25 ENGINES: Use 1° RIGHT THRUST or about 1/8" difference from propeller tips to rear of fin when tips are horizontal.

.30 –.45 ENGINES: Use 2° RIGHT THRUST or about 1/4" difference from propeller tips to rear of fin when tips are horizontal.

DOWN THRUST: For engines over .30, add one to two washers under rear engine mounting holes as required.

SEE "TOP VIEW FOR ALIGNMENT", SECTION VI

WARNING – Because of the high powered nature of radio controlled model aircraft, great caution should be exercised to prevent personal injury or property damage. Observe the potential hazard of the turning propeller and the flammable fuel. Fly only in areas considered safe for R/C. The model should be under the control of a licensed flyer or instructor at all times.

SIDE 2

FALCON 56 MARK II

ARCHIVE #000884

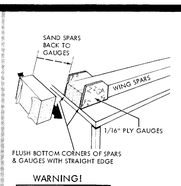
www.co-op-plans.com/

III WING ASSEMBLY

READ BEFORE GLUING

First, read "GENERAL INFORMATION, etc." and decide whether you want a 3 or 4-channel airplane. In a 3-channel set-up, the wing has no ailerons, but stabilizes itself with sufficient dihedral (the upward bend of the wings). The wing for a 4-channel ship is somewhat flatter, and uses ailerons to provide control.

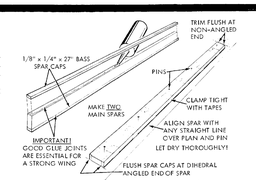
One end of each wing spar has been angled at the factory for the 4-channel dihedral. If you're building a 3-channel wing, die-cut plywood gauges will help you change to the greater angle. Also, the plywood wing joiners are designed to accomodate either dihedral. The following instructions cover the construction of both the 3-channel and the 4-channel wings.



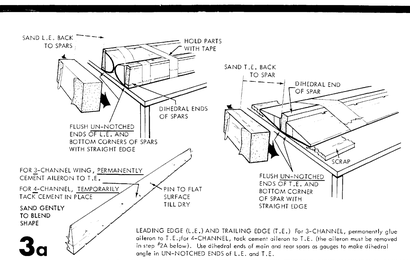
WARNING!

THIS STEP FOR 3-CHANNEL ONLY

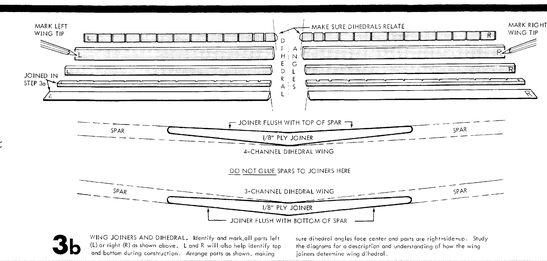
1 SPAR ALTERATIONS FOR 3-CHANNEL WING. (For 4-CHANNEL WING Proceed to STEP 2.) Sandwich wing spars between die cut 1/16" ply gauges flushed at bottom corners. Trim spars back to gauges as shown.



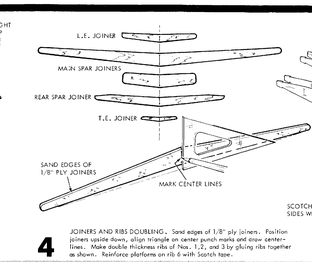
2 MAIN SPARS. Begin making two wing main spars by selecting a pair from the four wing spars provided (the two remaining will be used as rear spars). Cover plan with plastic wrap and lay 6" long strips of masking or drafting tape over plan adhesive side up. Using aliphatic resin or epoxy, glue two bass spar caps to top and bottom of spar and flush them at dihedral angled end of spar. Clamp with tapes and wipe off excess glue. Pin spar assembly along any straight line on plan. LET DRY THOROUGHLY! Repeat for other main spar. Trim spar caps flush at non-angled end of spar. Lightly sand excess glue from spars.



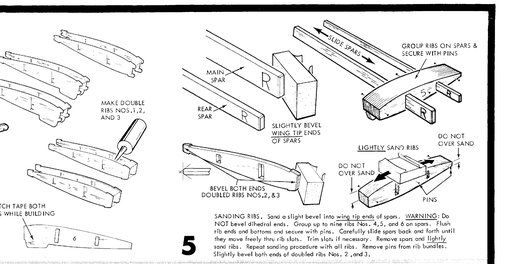
3a LEADING EDGE (L.E.) AND TRAILING EDGE (T.E.) for 3-CHANNEL, permanently glue aileron to T.E. for 4-CHANNEL, neck cement aileron to T.E. (the aileron must be removed in two PIA below). Use dihedral ends of main and rear spars as gauges to make dihedral angle in UNI-NOTCHED ENDS of L.E. and T.E.



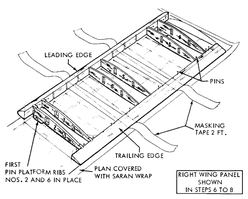
3b WING JOINERS AND DIHEDRAL. Identify and mark all parts left (L) or right (R) as shown above. L and R will also help identify top and bottom during construction. Arrange parts as shown, making sure dihedral angles face center and parts are right-side-up. Study the diagrams for a description and understanding of how the wing joiners determine wing dihedral.



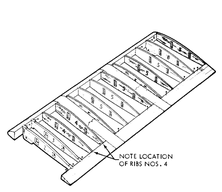
4 JOINERS AND RIBS DOUBLING. Sand edges of 1/8" ply joiners. Position joiners upside down, align triangle on center punch marks and draw center-lines. Make double thickness ribs of Nos. 1, 2, and 3 by gluing ribs together as shown. Reinforce platforms on rib 6 with Scotch tape.



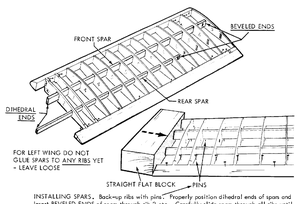
5 SANDING RIBS. Sand a slight bevel into wing tip ends of spars. WARNING: Do NOT bevel dihedral ends. Group up to nine ribs Nos. 4,5, and 6 on spars. Flush rib ends and bottoms and secure with pins. Carefully slide spars back and forth until they move freely thru rib slots. Trim slots if necessary. Remove spars and lightly sand ribs. Repeat sanding procedure with all ribs. Remove pins from rib bundles. Slightly bevel both ends of doubled ribs Nos. 2 and 3.



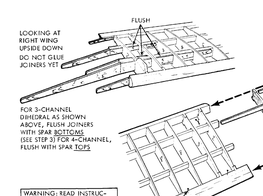
6 BEGINNING WING ASSEMBLY. Cover plan with clear plastic wrap and lay strips of masking or drafting tape over plan with adhesive side up. Pin T.E. in position over plan, and glue ribs 2 and 6 as shown. Glue and pin L.E. to ribs, then add ribs No. 3 and 5. Secure with strips of tape. Let dry.



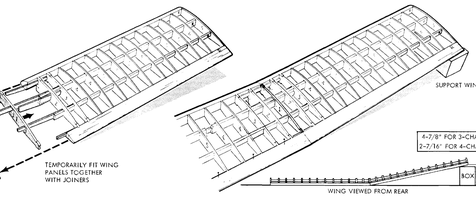
7 IMPORTANT: MAKE ONLY ONE RIGHT WING AND ONE LEFT WING. STEPS 6 AND 7 ARE TYPICAL FOR BOTH WING PANELS. LEFT WING REMAINS PINNED DOWN THRU STEP 9. Add remaining rib Nos. 4 and 5. IMPORTANT: Install ribs 4 in correct position as shown. Let dry.



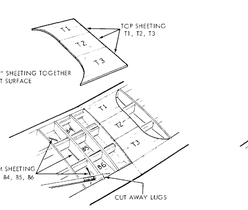
8 INSTALLING SPARS. Back-up ribs with pins. Properly position dihedral ends of spars and insert BEVELED ENDS of spars through rib 2 only. Carefully slide spars through all ribs until dihedral end is almost flush with L.E. and T.E. Now use a straight flat block to push spars until block contacts both L.E. and T.E. On RIGHT wing, glue spars only to rib ribs 5 and 6. Let dry. Remove RIGHT wing from table. Repeat STEPS 6 through 8 for LEFT wing, but it is IMPORTANT for LEFT wing to insert and position spars only. DO NOT GLUE spars at this time.



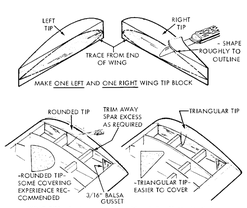
9 WARNING: READ INSTRUCTION CAREFULLY BEFORE ATTEMPTING CONSTRUCTION. JOINING WING HALVES. Temporarily slide ply joiners into RIGHT panel - do not glue yet. Add rib No. 1. Carefully bring left and right panels together. Observe accuracy of bum joints at L.E., and T.E. Make sure ply joiners are properly flushed with spars to obtain the dihedral you desire (STEP 3). Slide LEFT spars until they butt against RIGHT spars. Glue spars to all ribs Nos. 5 and 6 of LEFT panel. Let dry. Remove right panel and joiners. Now pre-glue areas to be joined on the following parts:



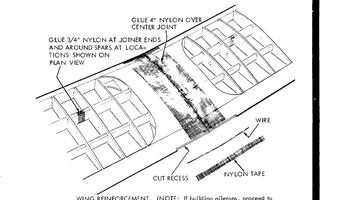
L.E. and T.E., spars, and joiners. Permanently position and glue joiners in RIGHT panel to obtain desired dihedral and hold in place with clamps or tape. IMMEDIATELY slide rib No. 3 onto joiners, and against rib No. 2. With LEFT panel still pinned down, apply glue to all joining areas and join panels together. Support RIGHT tip at proper height so that joiners are correctly located on spars. Glue rib No. 1 in place at center joints, and ribs Nos. 2, 3, and 4 to spars and joiners. Let dry overnight.



10 CENTER SHEETING. Assemble top and bottom 3-piece balsa panels on a flat surface. Let dry. Remove platforms from ribs 2 and 6. Cut away lugs from ribs 1, 2, and 3. Line-up sheeting on center of rib 1 and glue in place; trim front or rear edge to fit. Pin until dry.

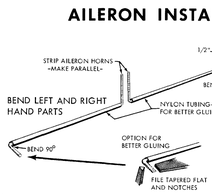


11 WING TIPS. Sand spar ends flush with end rib. Place wing tip block against end rib and trace rib shape. Make one LEFT and one RIGHT wing tip. Trim block to rib profile and glue in place. Add 3/16" thick balsa gussets. Let dry. Finish shaping wing tips to desired shape, either rounded or triangular. Let dry.

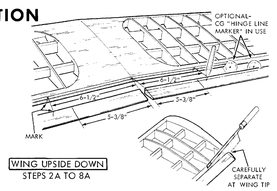


12 WING REINFORCEMENT. (NOTE: If building ailerons, proceed to AILERON INSTALLATION, STEP 1A.) Make 3/16" x 6" recess in T.E. Cut 8" length of wire from the 1/16" x 16-3/4" piece provided. Bend and install wires, cementing and wrapping nylon tape around T.E. Wrap and glue wing center joint with 4" nylon tape, top and bottom. Using 3/4" nylon tape, wrap and glue ends of ply main spar joiner and main spars at locations shown on wing plan view. Let dry.

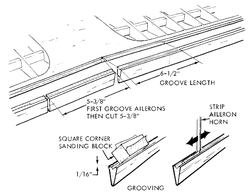
AILERON INSTALLATION



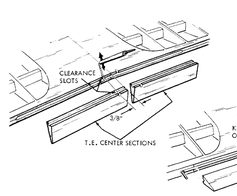
1A STRIP AILERON HORNS. Slide 5-3/4" long nylon tubing onto 3/32" aileron horn wire. Make ONE LEFT and ONE RIGHT aileron horn wire by bending UNTHREADED end of wire 90° as shown. Binding between wire and nylon tubing may be relieved by trimming tubing. File a tapered flat and notch unthreaded end of wires.



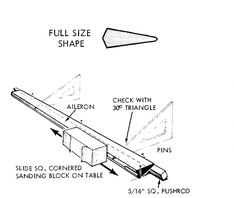
2A MARKING. Carefully remove aileron from T.E., and free from wing by cutting wing rib blocks. Mark center line along entire length of T.E. and aileron. Optional: the CG "Hinge-Line Marker" does it in one simple sweep. Mark each T.E. 5-1/2" from center joint; mark ailerons at 6-1/2" and 5-3/8" from inner ends as shown.



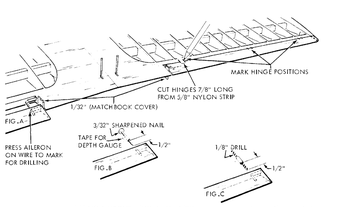
3A GROOVING TRAILING EDGE AND AILERONS. Use a square-cornered sanding block to make grooves 6-1/2" long x 1/16" deep in T.E. and ailerons on both wing halves. Using the threaded end of a strip aileron horn fills the grooves to a rounded shape so half of the nylon tubing will lie recessed. Cut aileron at 5-3/8" marks (these two short pieces will later form the center section of the T.E.)



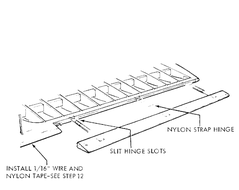
4A AILERON HORN INSTALLATION. Make two clearance slots 3/8" from center joint in wing T.E., and 3/8" from inner ends of T.E. center sections (from Step 3A). Temporarily place horn in wing grooves, position both T.E. center sections and check for horn-movement-top to move 3/4" total fore and aft. Remove T.E. center sections, and carefully glue horn wire tubing and T.E. center sections in place. (CAUTION: Keep glue off wires.) Let dry.



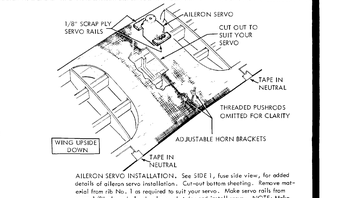
5A BEVELING AILERONS. Pin 5/16" sq. balsa pushrod to underside of aileron flush with rear edge of aileron. Sand bevel up to center-line mark with square-cornered sanding block on table. Turn aileron over and repeat.



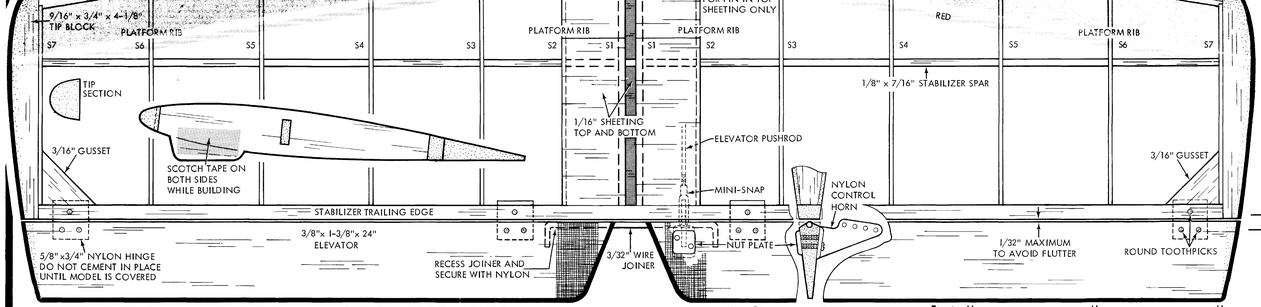
6A FITTING AILERONS. (FIG. A) Use 1/32" spacer as shown and press aileron against horn wire to make a mark. With a 2/32" diameter nail, make hole 1/2" deep (Fig. B); follow with a 1/8" drill (Fig. C). Cut six hinges 7/8" long from 5/8" wide nylon strip. Reposition aileron on wing and mark hinge positions.

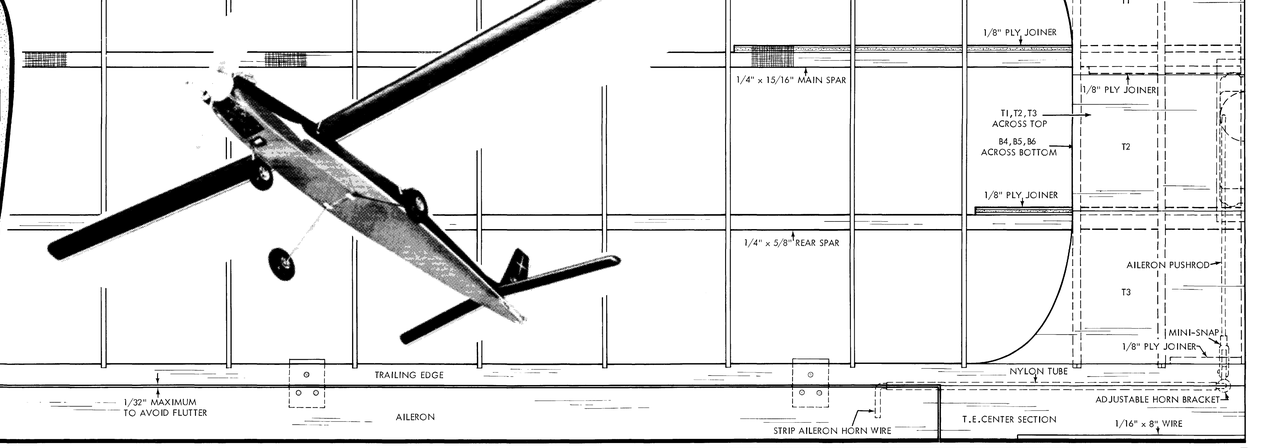


7A HINGE INSTALLATION. Cut hinge slots, temporarily install hinges, and test fit aileron (the gap between wing T.E. and aileron should not exceed 1/32"). Hinges are permanently mounted AFTER model is covered. Complete STEP 12 above and proceed with Step 8A.

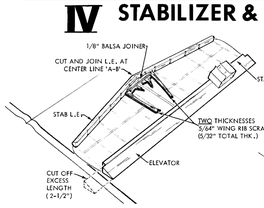


8A AILERON SERVO INSTALLATION. See SIDE 1, fuse side view, for added details of aileron servo installation. Cut-out bottom sheeting. Remove material from rib No. 1 as required to suit your servo. Make servo rails from scrap 1/8" ply and glue in place. Let dry and install servo. NOTE: Make following installations with servo and ailerons in NEUTRAL position. Thread nylon adjustable brackets on horns. Install Mini-Snaps on 7" Aileron Threaded Pushrods, and connect Mini-Snaps to horn brackets. Measure, cut, and bend rods as required to make hook-up to servo. Check-out function during radio installation.

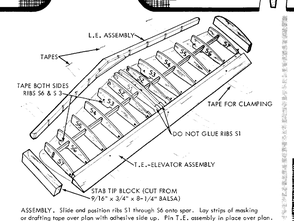




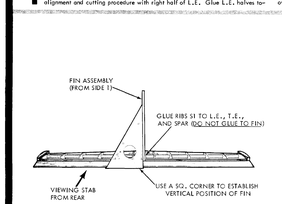
IV STABILIZER & ELEVATOR ASSEMBLY



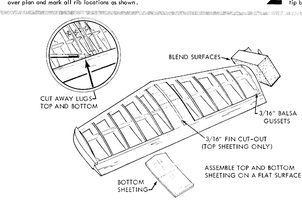
1 PRELIMINARY. Use the plan as a guide for sawing stab L.E. into two halves. First, align L.E. rib notches with corresponding notches on left side of plan and accurately saw L.E. at center-line "A-B". Lay left half aside and repeat alignment and cutting procedure with right half of L.E. Glue L.E. halves together over plan. Let dry. Glue 1/8" balsa joiner in place by using 5/64" wing rib scraps as locating shims. Let dry. Center T.E. on elevator and tack cement. Lightly sand T.E. to blend with elevator shape. Lay stabilizer spar over plan and mark all rib locations as shown.



2 ASSEMBLY. Slide and position ribs S1 through S6 onto spar. Lay strips of masking or drafting tape over plan with adhesive side up. Pin T.E. assembly in place over plan. Glue and pin rear of ribs to T.E. Then pin platform ribs S3 and S6 in place. Glue L.E. to ribs S2 through S6 (DO NOT GLUE to ribs S1). Glue rib ribs S7 in position. Glue ribs S2 through S7 to spar. Wrap stab with tapes for clamping and let dry. Trim tip blocks roughly to shape over plan and install on stab.

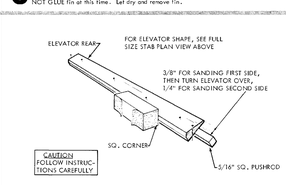


3 FIN POSITION. Position fin assembly between ribs S1. Carefully square up fin with stabilizer using a 90° corner (drafting triangle, etc.). Pin fin in position and glue ribs S1 to L.E., spar, and T.E. only. CAUTION: DO NOT GLUE fin at this time. Let dry and remove fin.

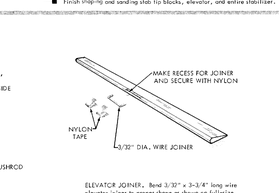


4 SHEETING. Assemble top and bottom sheeting sections on a flat surface. Let dry. Remove platforms from ribs S3 and S6. Cut away lugs from ribs S1 and S2. On top sheeting only, use marked lines as a guide to cut out a 3/16" wide center strip. Glue both halves of top sheeting in place taking care to leave a 3/16" gap for fin. Add bottom sheeting. Glue 3/16" balsa gussets in place. Let dry. Finish-trim top and sanding stab tip blocks, elevator, and entire stabilizer.

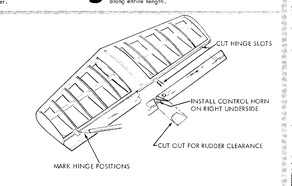
5 MARK ELEVATOR. Carefully remove elevator from stab. Flat sand front edge of elevator and mark a center-line along entire length.



6 BEVEL ELEVATOR. Raise rear of elevator by placing a 5/16" square pushrod 3/8" from rear edge and flat-against bottom of elevator. Pin pushrod in place and sand front edge of elevator to center-line. Remove pins and pushrod. Repeat procedure on opposite side of elevator, but, on this side pin pushrod 1/4" from rear edge.



7 ELEVATOR JOINER. Bend 3/32" x 3-3/4" long wire elevator joiner to proper shape as shown on full-size view. Drill and groove elevator for the joiner using techniques described in aileron installation instructions above. Glue joiner in place and wrap with nylon fabric. Let dry.



8 HINGING. Cut four hinges 3/4" long from 5/8" wide nylon strip. Arrange hinges on elevator and mark positions. Cut hinge slots in elevator and stab T.E.; test fit hinges. (Do not permanently fasten hinges until after model is covered). Remove elevator and make cut out for rudder. Install control horn as shown on full-size stab layout.