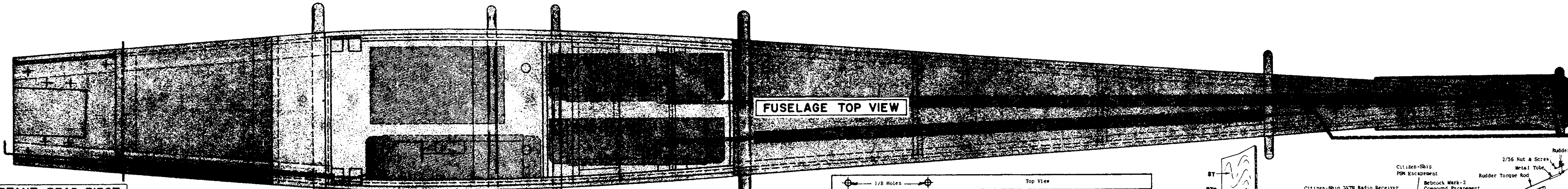
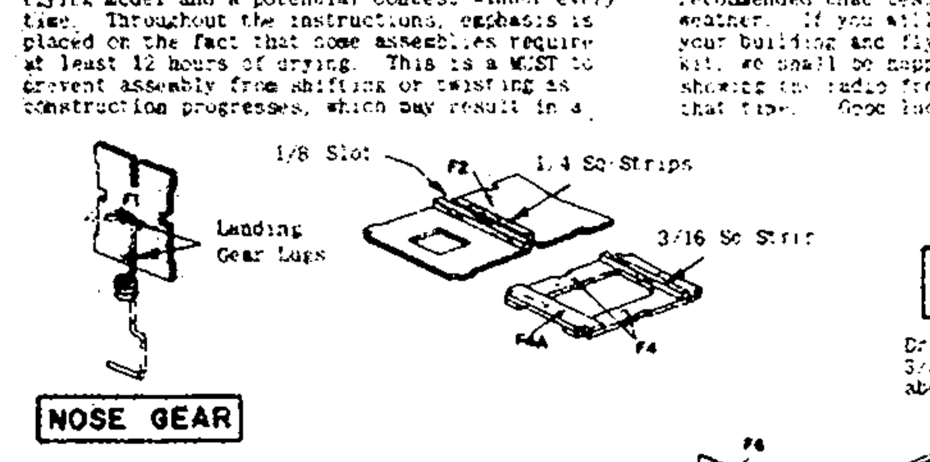


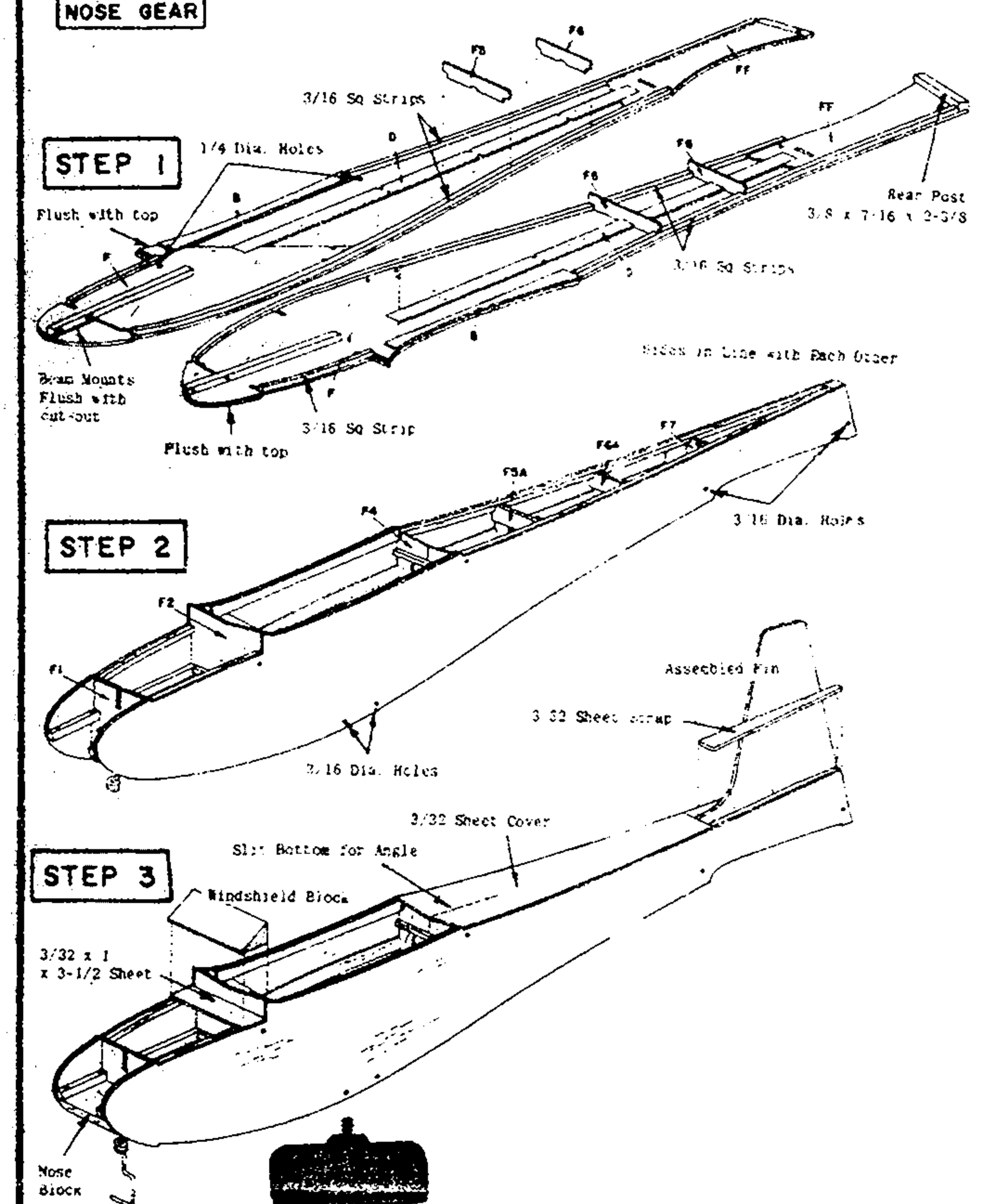
IMPORTANT READ FIRST

It is advisable when cementing large surfaces together, such as doublers, that white (poly-vinyl) glue be used. White glue can be used throughout the construction of entire model, however, any joints exposed to fuel should be thoroughly fuel-proofed with clear or colored dope. White glue is readily available at all hobby shops and hardware stores. All things being equal, PERFECT ALIGNMENT and PROPER BALANCE will insure a good flying model and a potential contest winner every time. Throughout the instructions, emphasis is placed on the fact that some assemblies require at least 12 hours of drying. This is a MUST to prevent assembly from shifting or twisting as construction progresses, which may result in a warp or a misalignment. For best results, these instructions must be followed. Before flying, BE ABSOLUTELY CERTAIN THAT MODEL BALANCES AT POINT SHOWN ON SIDE VIEW. If necessary, add weight or shift radio components in order to achieve this, but in any case, DO NOT FLY UNTIL BALANCE HAS BEEN ACHIEVED! Be careful when sanding around wing or stab cut-outs in fuselage, so that angle of incidence is not changed. It is recommended that test flights be made in calm weather. If you will drop us a note relating your building and flying experiences with this kit, we shall be happy to send you a free decal showing the radio frequency if you request it at that time. Good luck! Good flying!



REAR POST CROSS SECTION

Drawing above full size. Trim 3/8 x 7/16 x 2-3/8 to shape shown. Install in Step 1.



FUSELAGE ASSEMBLY

STEP 1

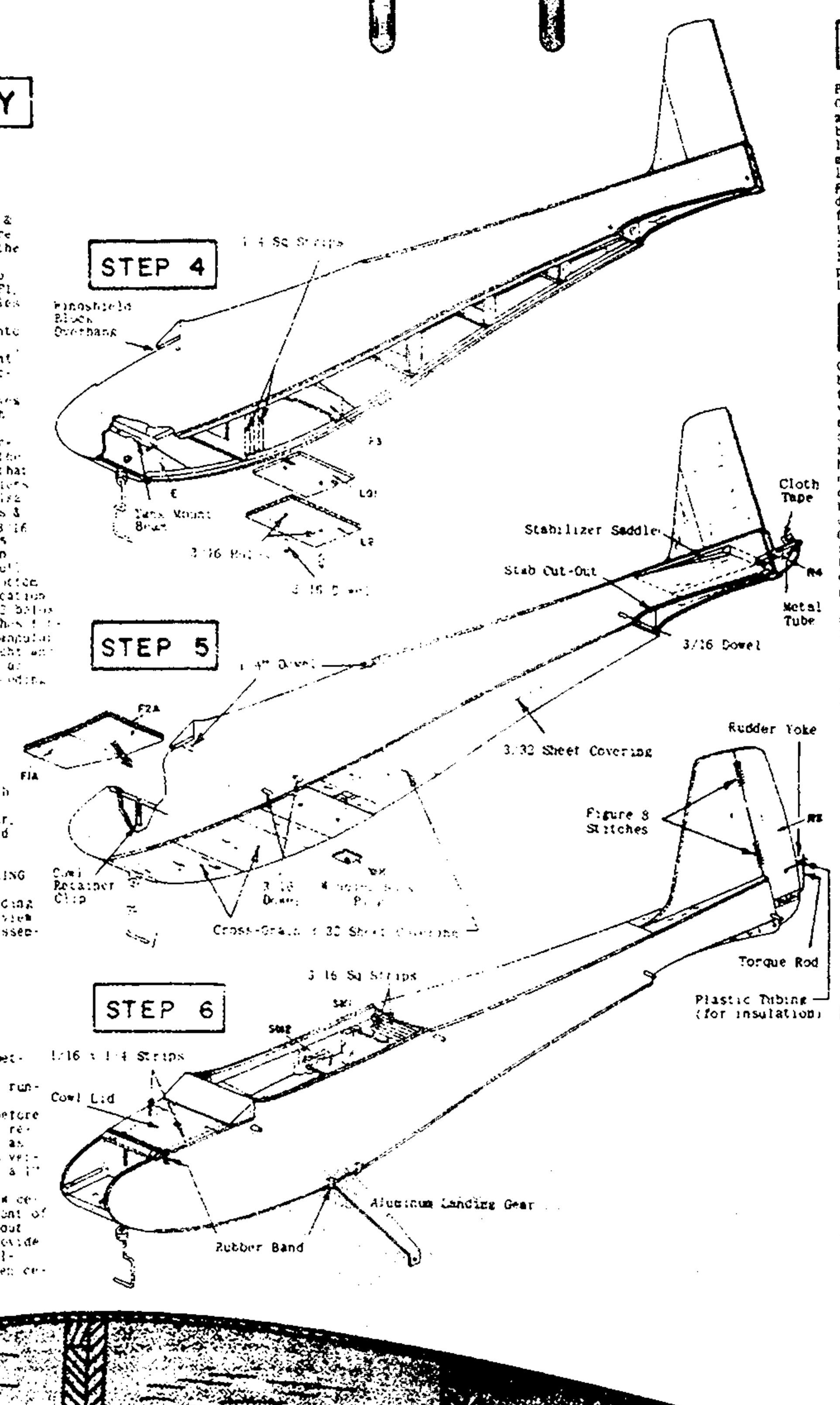
Strip die cut sides from sheet, piece together, & drill out holes at punch marks. The top ones are 1/4 dia., remainder are all 3/16 dia. Prepare the following sub-assemblies for later installation: Drill 1/8 holes through punch marks in F1. Slip landing gear lugs on nose gear then install on F1, inserting landing gear lugs and spur through holes as shown. Secure tightly with 6/32 nuts, closed side of nuts against plywood, until lugs sink into plywood; then solder nuts to prevent loosening. Cut off top lug flush with nut so tank beam mount can be installed later. Cement 1/4 sq strips across F2 as shown 1/8" apart, forming a slot at bottom of center notch as shown. Cement F4 halves together on flat surface. Cement F4A flush with bottom, and 3/16 sq strip across bulkhead flush with top of cutout. Allow all units to dry thoroughly. Most of the assembly is done right on the sides. Place them as shown in sketch above so that you make a right and left. Cement plywood doublers F to sides, flush with top as shown. Cement balsa doubler FF to rear, and waist doubler D to sides & into notches between front and rear doublers. 3/16 sq strips are now added to top and bottom, as is plywood cabin doubler B, flush with top as shown. Prepare beam mounts as shown and described in full size drawing, then cement in place flush with bottom of cutout in F as shown. You can check their location by temporarily placing F2 in place (see sketch 2 below). Cement bulkhead halves F5 and F6 in place, notches fitting into waist doubler. Trim rear post to triangular section shown then cement to one side only. Right and left sides, with the exception of the rear post, are identical. Allow to dry thoroughly before proceeding.

STEP 2

Cement sides together at rear post and hold with pins. Top of sides must be in line with each other during entire assembly. Working from rear, install F7, F6A's & F5A's (to top & bottom), and F4. Hold with pins and allow to dry overnite, making sure top of sides are in line with each other. Also check alignment with top view, MAKING CERTAIN FUSELAGE IS NOT PULLED TO EITHER SIDE. When dry, bulkhead F2 and F1 are installed, holding in place with pins or rubber bands. Check top view again TO BE SURE OF PERFECT ALIGNMENT. Allow assembly to dry overnite before proceeding.

STEP 3

Install assembled fin (see detail) vertically between rear post and notch in F7. Cover top rear between F4 and F7, with 3/32 sheet balsa, grain running length-wise. Slit bottom of front to make angle at F4, smearing glue generously in slit before cementing covering in place. Using scrap sheet remaining, continue covering on both sides of fin as shown. Allow to dry, being certain that fin is vertical. Cut a 3-1/2" length of 3/32 sheet. Cut a 1" wide strip and cement it to top of cowl against front of F2. Triangular windshield block is now cemented to top of 3/32 sheet and against F2. Front of windshield overhangs 1/8 to form a slot. Trim out rear of nose block to clear landing gear and provide space for drainage. Apply several coats of fuel-proof paint to rear of block and front of F1 then cement securely in place as shown.



STEP 4

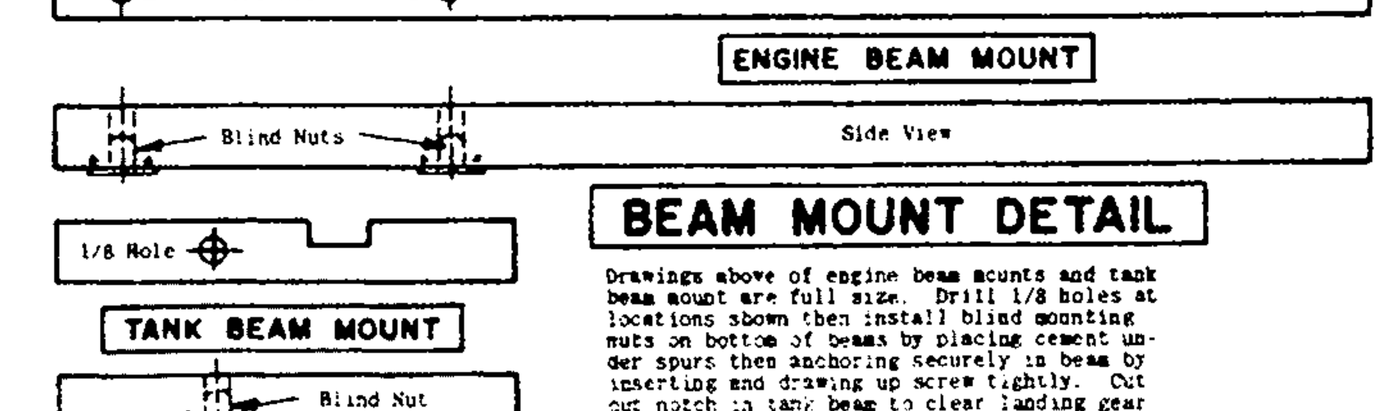
Prepare hardwood tank mount beam, (see beam detail). Cement across rear of F1 against bottom of beam mounts as shown, then cement triangular gussets E beneath beam, on both sides of fuselage. Cut four lengths of 1/4 sq strip for radio slide track. Cement two strips, 1/8" apart, to each side of fuselage against rear of F2 as shown. Cement bulkhead F3 across fuselage fitting into notches in plywood doublers. LG1 is now cemented between stringers flush with bottom of fuselage, tabs in F3 fitting into slots in LG1. Plywood landing gear platform LG is now cemented to LG1. When dry, place aluminum landing gear on LG to see if holes correspond with punch marks in LG, then drill 3/16 holes thru LG & LG1. Dowel shown is installed in next step.

STEP 5

Cement R4 to rear of fuselage (centered) flush with bottom. Drill 1/8 hole thru rear post in line with top of R4, then insert and cement metal tube provided into hole and top of R4. Cement cloth tape around tubing and R4 as shown using cement generously. Stabilizer saddle is used to keep stab from rocking. Cut 3/8 sq x 6-7 balsa for Stab Saddle in half and cement to both sides of fuselage over curve of stab cut-out. Be sure the curve of cut-out is covered when viewed from side. When dry, keeping bottom flat, trim to side view shape of stabilizer cut-out. Shape and round off to cross-section shown. Cover bottom of fuselage from R4 to rear using 3/32 sheet, grain running length-wise. Remainder of bottom is covered in sections as shown, grain running cross-wise. Cement plywood floor pieces F1A's together and do likewise with F2A's. Cement them to inside bottom of fuselage between F1 and F2, forming a strong battery compartment floor. Allow entire fuselage to dry thoroughly, then sand smooth, rounding off corners, including rear of fuselage where it fairs into rudder. For extra strength and long life, it is recommended that fuselage be covered with silk, which is not included in kit. Cut two 1-4" lengths of dowel for wing tie downs. They should extend 5/8 past sides of fuselage. Cement securely in place. Remainder of dowels are 3/16. They are installed as shown, all extending 1/2" past fuselage sides. Landing gear dowel is cut 1-2" long and is inserted thru holes in LG, allowing 1/8" to protrude from bottom. Use at least two heavy coats of cement on all dowel installations and round off ends slightly. Winding hook plug on bottom of fuselage is used only if engine control escapement is being used. If R/C installation uses escapement type equipment, it will be necessary to install a winding hook plug on right side at rear of fuselage as shown on side view. See winding hook detail for either installation. Using full size drawing, bend cowl retainer from 1/32 wire. Make holes in fuselage sides, (see side view), and snap retainer in place. Cement securely to back of F1 and fuselage sides. To avoid sharp edges, solder washer or eyelet on ends protruding from fuselage.

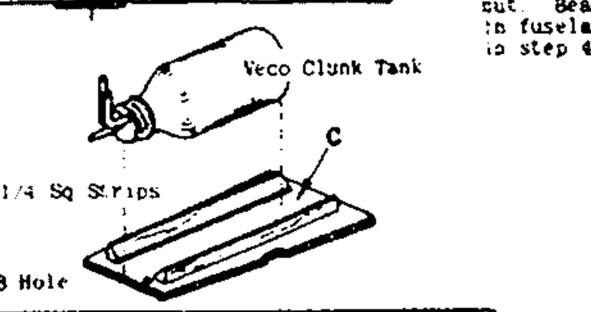
STEP 6

Removable cowl lid is made by cementing two pieces of 3/32 sheet together. When dry, cut to fit flush on sides and between front of F1 and against sheet under overhanging windshield block as shown. Sand smooth, rounding edges, then cement a length of 1/16 x 1/4 strip (from strip sheet) on each side of bottom to fit between 3/16 sq stringers as shown in dotted lines on sketch. Cowl lid is mounted by slipping rear under windshield block and snapping small rubber band across front as shown. If rudder escapement is used, make slide track similar to radio receiver track and install in approximate position shown, leaving enough room to attach rubber band. If engine escapement is used, assemble unit as described in detail note and cement in approximate position shown. Cut a length of 3/16 sq to fit between rear of plywood cabin doubler B's and cement in place against F4 flush with bottom of B's as shown. Sand rudder R3 to cross section. If fuselage has been covered with silk, cover cowl-lid and rudder also. Rudder is mounted using figure 8 stitch (see detail) AFTER MODEL HAS BEEN PAINTED to insure free & easy movement. Model is now painted as described in final assembly, then rudder is installed. Rudder yoke and torque rod shown are installed as described in radio note. Aluminum landing gear is secured by wrapping rubber bands around dowels and under landing gear as shown.



BEAM MOUNT DETAIL

Drawings above of engine beam mounts and tank beam mount are full size. Drill 1/8 holes at locations shown then install blind mounting nuts on bottom of beams by placing cement under spurs then anchoring securely in beam by inserting and drawing up screw tightly. Cut out notch in tank beam to clear landing gear nut. Beam mounts are now ready to be installed in fuselage step 1, fuel tank beam is installed in step 4. Use cement generously on installation.

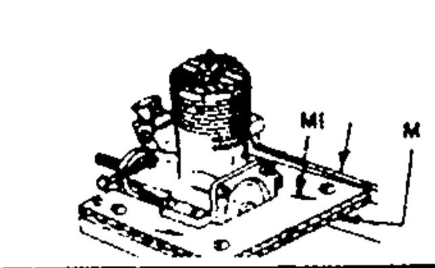


TANK PLATFORM DETAIL

Installation of Veco 2 oz. clunk tank (or similar type) as shown is made by cutting two lengths 1/4 sq strips 1/2" shorter than plywood tank mount C. Bevel side as shown then cement securely to top of C along either side of tank, so that tank nests between them. Drill 1/8 hole in front of C through punch mark for 4/40 x 1/2 screw, which secures platform to tank beam. When dry, apply two or three coats of dope. Tank is lashed to platform with rubber bands. Install after radio batteries are installed in battery compartment below.

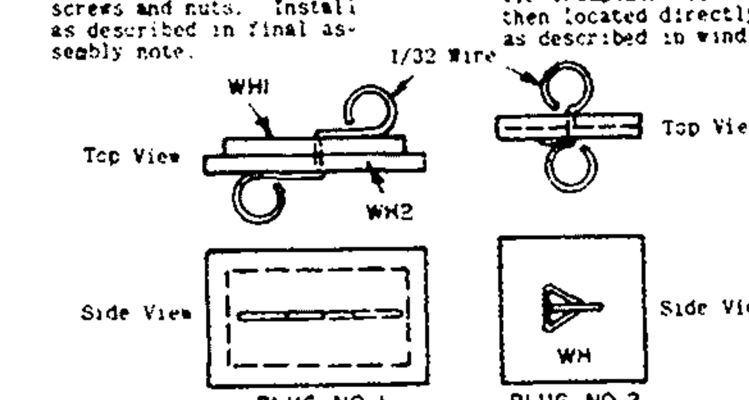
COWL RETAINER CLIP

Drawing above is full size. Bend from 1/32 wire using pattern above and install as described in step 5.



ENGINE PLATE NOTE

Cement both plywood plates M & M1 together. Drill 1/8 holes at punch marks and mount engine with 4/40 screws and nuts. Install as described in final assembly note.

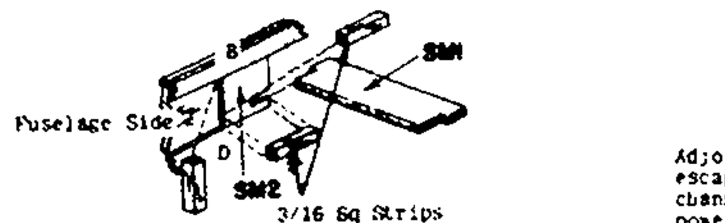


WINDING HOOK PLUGS

Hooks shown in full size drawings above are actual size and are used as bending patterns. Make rudder escapement plug No. 1 by cementing WH1 to center of WH2 and allow to dry. Using 1/32 wire, bend half of hook, push thru at location shown, then bend remainder of hook and cement in place securely. Throttle escapement plug No. 2 is assembled in same manner, using plywood door WH. Flats on hooks are for cementing. Install as described in escapement radio note.

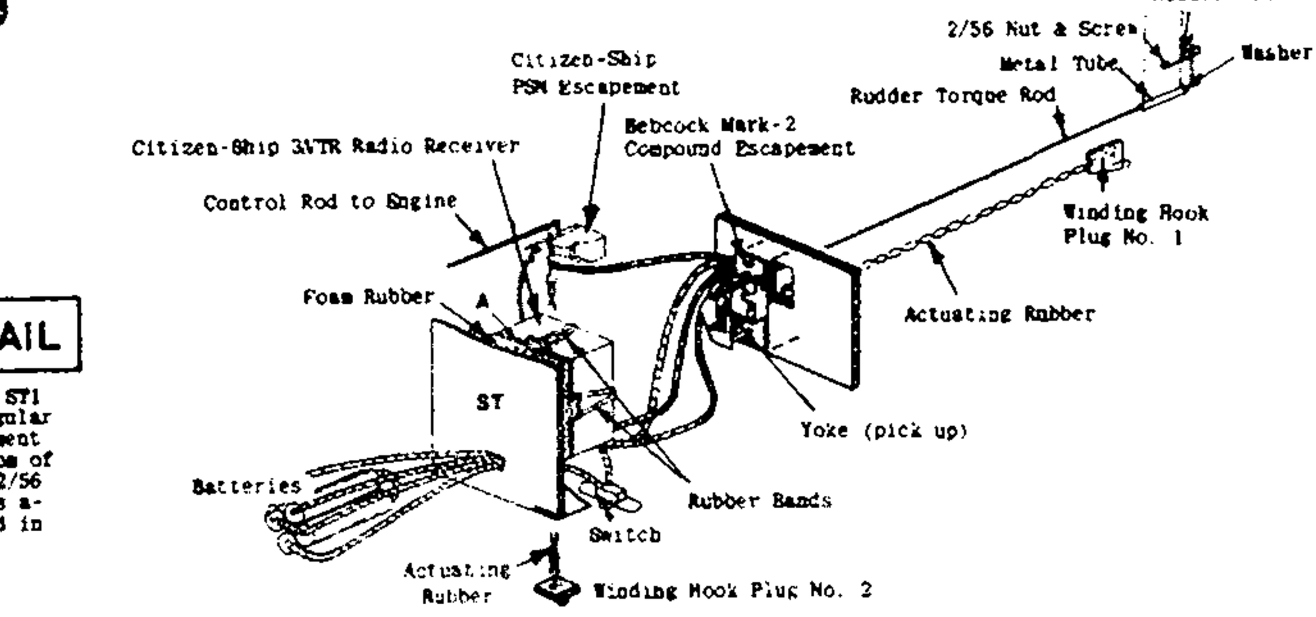
RADIO MOUNT DETAIL

Assemble radio mount by cementing ST1 into notches in ST. Cement triangular gussets ST2 to each side. Use cement generously. Mount switch to bottom of ST1 (in cut-out) and secure with 2/56 screws and nuts, flat side of nuts against wood. Install as described in radio note.



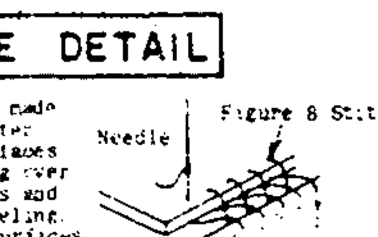
THROTTLE ESCAPEMENT MOUNT

Mount is constructed only if engine throttle control is installed, this will require an R/C engine. Install mount in fuselage at location shown on side view by securely cementing plywood sides SM2 to each side of fuselage between B and D. Slide plywood SM1 into notches and cement securely. Installation is completed by cementing 3/16 sq reinforcement strips into corners on top and bottom of SM1 and to fuselage sides against front of assembly. Mount engine throttle escapement to suit, on SM1. Winding plug No. 2 is then located directly below it on bottom of fuselage as described in winding plug detail note.



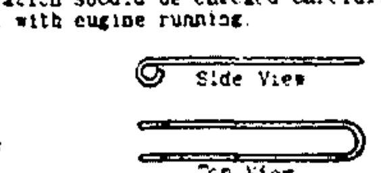
ESCAPEMENT TYPE RADIO INSTALLATION

Adjoining sketch shows typical installation of escapement radio equipment used for single channel rudder and engine control when model is powered with Fox .15 R/C engine or similar type. Engine and radio equipment is not supplied in kit. If regular engine is used, omit throttle control escapement. In this case, a Citizen-Ship SE escapement may be substituted for Babcock shown. Assemble receiver mount as shown in detail sketch. Radio receiver is protected with foam rubber 1/2" to 1" thick. Cut to size of plywood mount A then cement to center of ST with contact cement, followed by A. The radio receiver to A with rubber bands as shown. Slide radio receiver unit into slide tracks and notch out bottom of fuselage for switch. Mount escapement on 1/8 plywood sheet provided, cutting hole for torque rod and rubber-winding hook. Mount securely in fuselage and install 1/16 wire torque rod in accordance with R/C manufacturer's instructions. Torque rod goes thru tube in rudder post. Washer is soldered in position shown to prevent rod from moving forward, disengaging escapement yoke. Bend rudder yoke from 1/32 wire, using pattern provided and secure to rudder with 2/56 screw and nut (flat side of nut against yoke) at location shown. Rudder movement can be increased by raising yoke or vice-versa. If engine escapement is being used, install on SM1 as described in detail note. Assembly is now securely installed in fuselage. If used, make winding hook plug No. 2 for engine control escapement, winding hook plug No. 1 for rudder escapement as described in detail note. Cut out side of fuselage at location shown to snugly fit WH1, actual cut out size shown on side view. Radio equipment is now completely wired up and checked out according to manufacturer's instructions. Install actuating rubber between escapement hooks and winding door hooks. Batteries are stored in compartment under tank. Surround with foam rubber. Radio equipment and operation should be checked carefully before each flight with engine running.



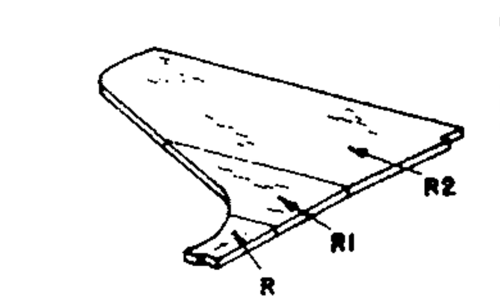
SEWN HINGE DETAIL

Sketch shows how thread hinge is made when assembling rudder to fin after model has been painted. Sew surfaces together with strong thread using over and under stitch shown. Tie ends and cement securely to prevent unraveling. Keep glue out of joint between surfaces. Check that rudder swings freely.



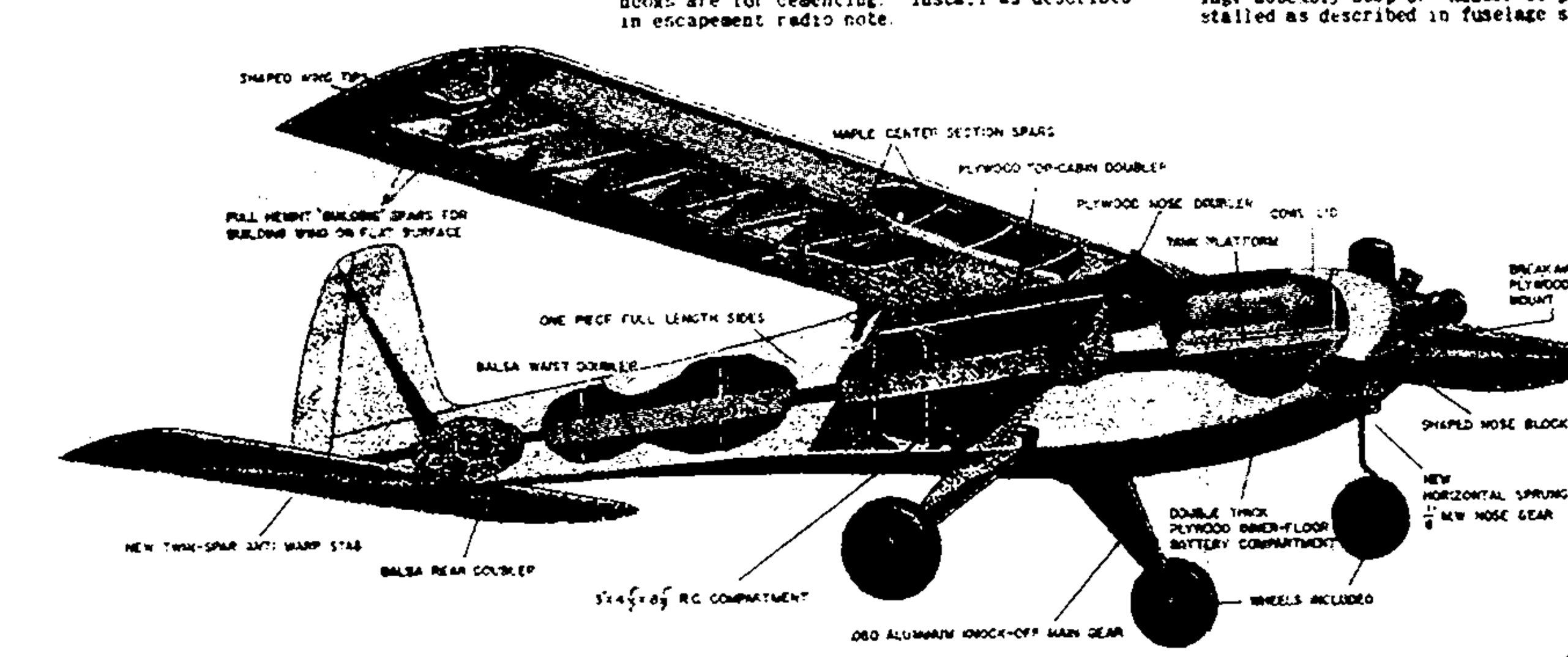
RUDDER YOKE

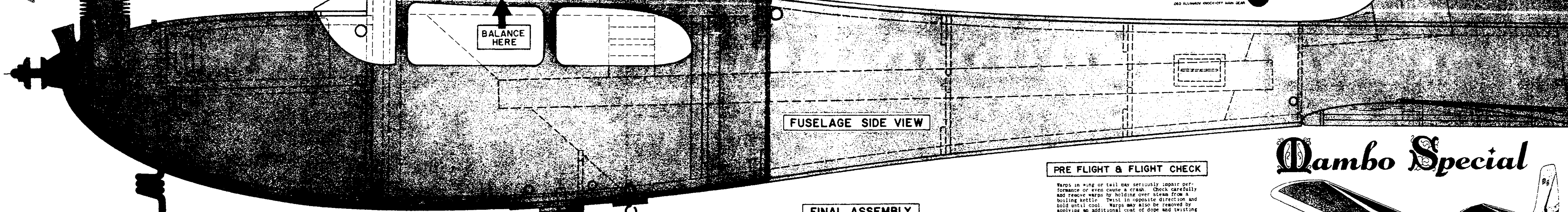
Bend rudder yoke from 1/32 wire using full size pattern above. Bolt to rudder with 2/56 screw as shown.

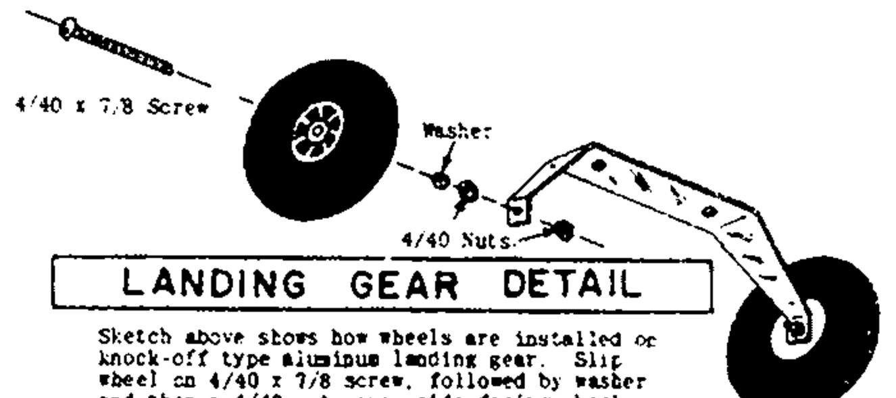


FIN AND RUDDER ASSEMBLY

Cement R, R1 and R2 together on flat surface over glass and allow to dry thoroughly. When dry, sand to cross-section shown. Leave top of R flat. Fin is now ready to be installed as described in fuselage step 3. Rudder is prepared and installed as described in fuselage step 6.







LANDING GEAR DETAIL

Sketch above shows how wheels are installed on knock-off type aluminum landing gear. Slip wheel on 4/40 x 7/8 screw, followed by washer and then a 4/40 nut, open side facing wheel; leaving just enough clearance so that wheel spins freely. Insert into hole in landing gear and secure with 4/40 nut on opposite side, flat side against gear. Tighten nuts towards each other securely. Landing gear is placed on dowels in bottom of fuselage and lashed in place with rubber bands as shown in step 6

FINAL ASSEMBLY

Your Mambo Special is now painted, using fuel-proof dope. Painting techniques vary with paint used and individual model builder, therefore the following instructions are those generally used by most modelers. Apply about five coats of clear dope to entire model, including inside of fuselage, back to bulkhead F2. Also engine plate, movable rudder and top & bottom of cowl lid. Check as each coat dries that warps do not develop. If warps should develop, they may be removed by holding over a steaming kettle or applying an additional coat of dope, then twisting in opposite direction until dry. Finish with color dope, using as many coats as desired, and don't forget the rudder, engine plate and cowl lid. Original Mambo Special was painted all white, with red and blue trim. Windows can be simulated with silver paint or metalized mylar, which can be obtained at some hobby shops and most decorating shops. Install 2-3/8 wheels on main gear as per detail and 2" wheel on nose gear. Secure nose gear wheel with wheel retainer or washer soldered on end of axle. Wheels must be parallel so that model tracks straight. Place landing gear on dowels in bottom of fuselage and lash in place with rubber as shown in step 6 sketch. Sew rudder R3 in place with figure 8 stitches as shown in stitch detail, then complete installation of all radio equipment. Bolt engine in place on engine plate and bolt engine plate to beam mounts. The "Special" used a nylon 9-4 prop and a Fox .15 engine (neither supplied in kit). Install batteries in battery compartment, then bolt tank mount with tank in place. Slip cowl under nose block and snap rubber band across front. Slide decal off backing and apply at locations shown on photograph. Tie wing in place as shown with rubber bands -- do likewise with stabilizer. Be sure to use enough rubber bands with enough tension so that wing and stabilizer are held firmly in place. These must not shift or lift during flight maneuvers. Model MUST BALANCE at point shown on side view BEFORE ANY FLYING IS ATTEMPTED! BEFORE EACH FLIGHT, check that wing and tail are in proper alignment and that radio equipment is performing properly while engine is running. Good luck!!! Good flying!!!

PRE FLIGHT & FLIGHT CHECK

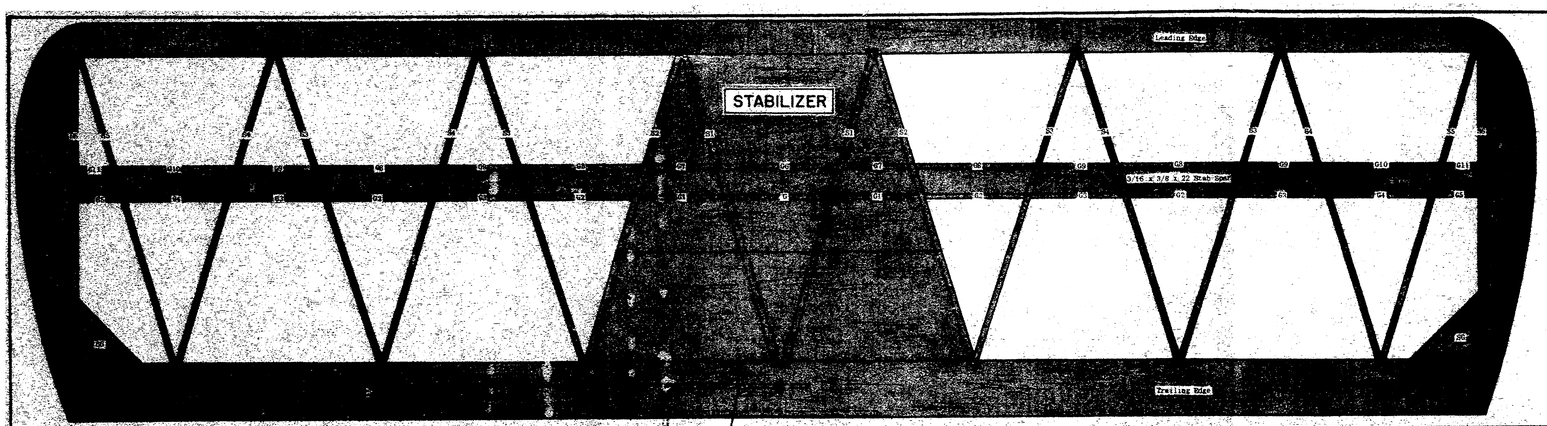
Warps in wing or tail may seriously impair performance or even cause a crash. Check carefully and remove warps by holding over steam from a boiling kettle. Twist in opposite direction and hold until cool. Warps may also be removed by applying an additional coat of dope and twisting in opposite direction, holding until absolutely dry. Do not fly model unless it balances exactly as shown on the side view. If necessary, shift components or add weight. Balancing should be done with empty fuel tank. Check angle of wing and tail (angle of incidence) when viewed from side. This should match plan which shows zero in stabilizer and 1½ degrees in wing when model is level as drawn. Push model on flat surface to be sure wheels are in line for proper tracking. If model veers, straighten wheels accordingly. Check radio with engine operating in both high and low speeds. Check before each flight. Under power, with all controls in neutral position, model should fly in straight line and climb smoothly. If model turns to one side, it can be corrected by adjusting rudder or increasing side thrust away from turn. If model does not climb to satisfaction, insert 1/16 shim between front of stabilizer and bottom of fuselage. If model climbs too fast, place shim at rear. Use additional shims if needed until proper flying trim is achieved. Before each flight check that wing, tail and landing gear are secure and in position. Your comments on the assembly and flight of your Mambo Special will be appreciated. Direct your letters to Sterling Models, Phila., Pa. 19144, Attn.: Engineering Department. Good luck and happy landings!

Mambo Special

KIT FS16
WING SPAN 52"
LENGTH 35"

.09 TO .19 ENGINES
SINGLE TO SIX CHANNELS

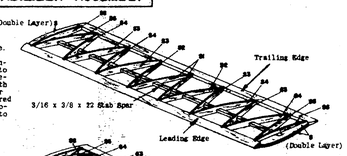
Sterling Models
Phila. 44, Pa.
USA
C21ED4



STABILIZER ASSEMBLY

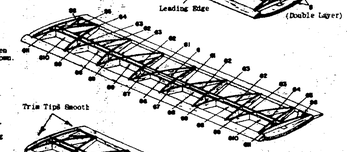
STEP 1

Build stabilizer on flat surface directly on plan. Pin leading and trailing edges in place. Assemble ribs to 3/16 x 3/8 x 22 stab spar in the exact numerical order shown, without cementing ribs to spar. Cement and insert ribs into notches in leading and trailing edges, then cement all ribs to spar. Both ribs S7's and both S2's are narrower than the others to allow for 1/16 sheet covering. Be sure these are centered in leading & trailing edge. Cement two F's together to form double layer tip. Cement tip to each side of stab, as shown.



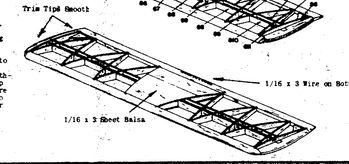
STEP 2

Install all diecut G spar gusset plates between ribs and against front and rear of spar as shown. Cement triangular corner gussets SG in place.

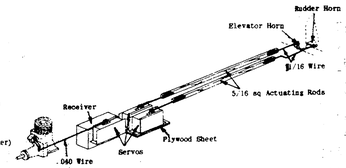


STEP 3

Cover center section to rib S2 on either side, using 1/16 x 3 sheet balsa. Completed frame must now dry at least 12 hours before removing from flat surface. When dry, turn over and cover bottom of center section with 1/16 x 3 sheet balsa in same manner as top, and allow to dry. Trim leading and trailing edge to top view shape then round off tips, blending smoothly so that leading edge flows into tip and tip flows into trailing edge as shown. Sand entire stabilizer to prepare for covering. Apply two coats of dope to frame then cover with silk or nylon (not provided) in same manner as wing. Cut a 3" length of 1/16 wire and cement it to center of bottom of stab as shown in sketch and full size stabilizer drawing. Wire will reinforce trailing edge against pressure of tie down rubber.



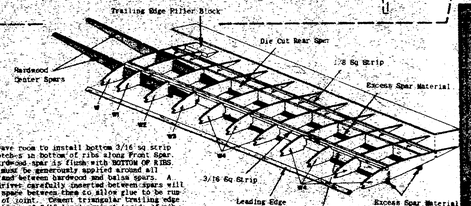
MULTI CHANNEL R.C. INSTALLATION



The Mambo Special is an unusually good performer with multi-channel gear. An engine of not less than .19 should be used. Top view shows position of Servos and radio in cabin area. Servos should be mounted on plywood sheet which is then bolted to hardwood motor bearers securely mounted in fuselage. Batteries are housed in same battery compartment. Trailing edge of stabilizer is cut off, leaving 3/8, then movable elevators are added. Elevator halves are made from 5/32 balsa (not supplied in kit) cut to shape shown on stabilizer drawing and are joined with Vecs (or similar type) elevator horn. Install on stabilizer using cloth tape hinge or figure eight stitch. Rudder horn is installed on rudder. Actuating rods are constructed of 5/16 sq hard balsa. Connecting wire are 1/16 wire. Throttle linkage is .040 wire which passes thru elbow, or brass tube. Be certain that all controls work completely freely without binding.

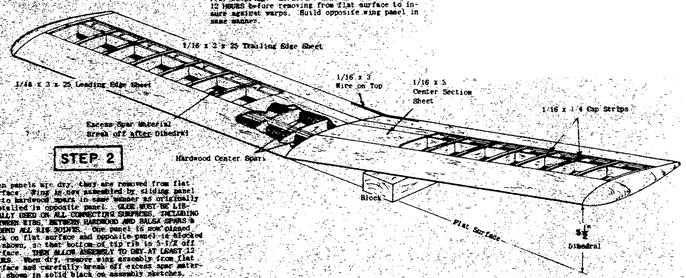
WING ASSEMBLY

STEP 1



DO NOT CONSTRUCT WING PANEL unless it can be completed to end of step 1 before construction is stopped. Secure a perfectly flat surface upon which to construct wing. Wing is built in two halves directly on plan. Die cut wing spars are notched for ribs. Bottom sections of spars, shown solid black in sketch, are used while assembling to insure a warp-free construction. These have been scored and are easily removed in step 2 after MAIN CONSTRUCTION HAS BEEN COMPLETED. Construct left wing panel (illustrated) first by slipping ribs as shown, into notches in spars. Do not glue ribs to spars yet. Place structure directly on plan and pin securely in place to flat surface. All ribs are now cemented to spars. Cement leading edge into front of ribs. Cement 3/16 sq strip into notches along top of ribs, across front spar. Cement 1/8 sq strip into rear notches along top of ribs as shown. Insert both hardwood notched center spars into ribs W to W3 from bottom. Push spars up until they seat. This will leave room to install bottom 3/16 sq strip into notches in bottom of ribs along front spar. Rear hardwood spar is flush with BOTTOM OF RIBS. Cement must be generously applied around all joints and between hardwood and balsa spars. A screw driver, carefully inserted between spars will open a space between them to allow glue to be run inside of joint. Cement triangular trailing edge filler block (2-3/16 long) against inside of rib W and rear of W3 as shown. SHEET COVERING IS NOT INSTALLED AT THIS TIME. BE CERTAIN FRAME IS STILL FIRMLY ANCHORED TO FLAT SURFACE. Use cement generously and hold sheet in place with pins until dry. Cover front section with 1/16 x 3 x 25 balsa sheet from leading edge to front spar, then cover from f/8 spar to rear with 1/16 x 2 x 25 sheet. (Step 2 sketch shows covering in place). Cover center section with 1/16 x 3 sheet in two pieces as shown on full size drawing and step 2 sketch. Break 1/4" cap strips from 1/16 strip sheet and cement cap strips to top of ribs between front & rear covering. Structure must now DRY AT LEAST 12 HOURS before removing from flat surface to insure against warps. Build opposite wing panel in same manner.

STEP 2



When panels are dry, they are removed from flat surface. Wing is now assembled by gluing panel on to hardwood spars in same manner as originally installed in opposite panel. GLUE MUST BE LIBERALLY USED ON ALL CONNECTING SURFACES, INCLUDING BETWEEN RIBS, BETWEEN HARDWOOD AND BALSA SPARS & AROUND ALL DIE NOTCHES. When panel is now placed back on flat surface and opposite panel is attached as shown, so that bottom of tip rib is 5-1/2" off surface. THIS ALLOW ASSEMBLY TO DRY AT LEAST 12 HOURS. When dry, remove wing assembly from flat surface and carefully break off excess spar material shown in solid black on assembly sketches, leaving spars flush with bottom of rib. Bottom of wing is now completed adding 3/16 sq and 1/8 sq strips, followed by sheet covering and cap strips in same manner as top of wing. Be careful not to force fit sheet covering which may cause wing warps. It is advisable, but not necessary, to hollow out wing tip blocks as shown in dotted lines on wing plan. Blocks are then cemented to tip ribs as shown. When dry, trim to shape. Entire wing structure is now sanded smooth and then two coats of dope applied to frame. Wing is now covered with silk or nylon, not included in kit. While covering, take care that warps do not develop. Warps may be removed by applying an additional coat of dope or holding over steam and tissue coat of dope or holding over steam and tissue coat of dope in opposite direction, holding until dry, twisting in opposite direction. Cement them to Cut two 3" lengths of 1/16 wire. Cement them to center of top of wing, 1/8 from rear as shown in sketch and full size wing drawing. Wire will reinforce trailing edge against pressure of tie down rubber.

PULSE R.C. DETAIL

If installing pulse equipment, it is recommended that rudder be balanced in area (dynamically) and weight (statically). To do this, cut a 5/8 x 3/8 balsa strip from rear of fin balance shown on side view. Cement section to front of rudder. To balance rudder, stick pins in top and bottom as close to hinge line as possible, then add strip solder to front of balance area until rudder balances. Rudder is now hinged to fin in regular manner. Balancing should be done with rudder yoke in place. For lightness, rudder yoke should be made of 1/32 wire cemented and sewn in place instead of using bolt for fastening. This will make balancing easier. Be sure rudder operates freely and easily.