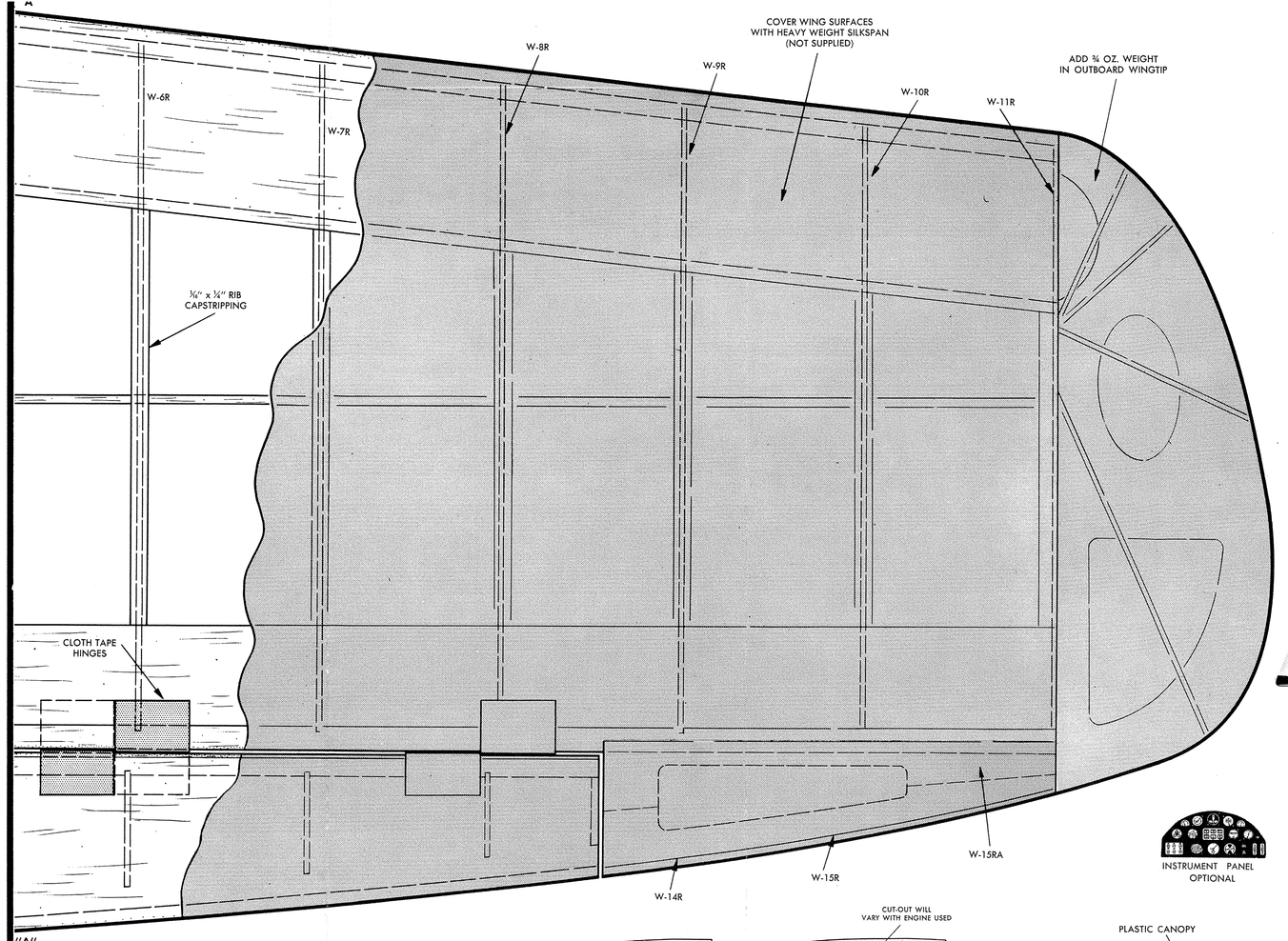

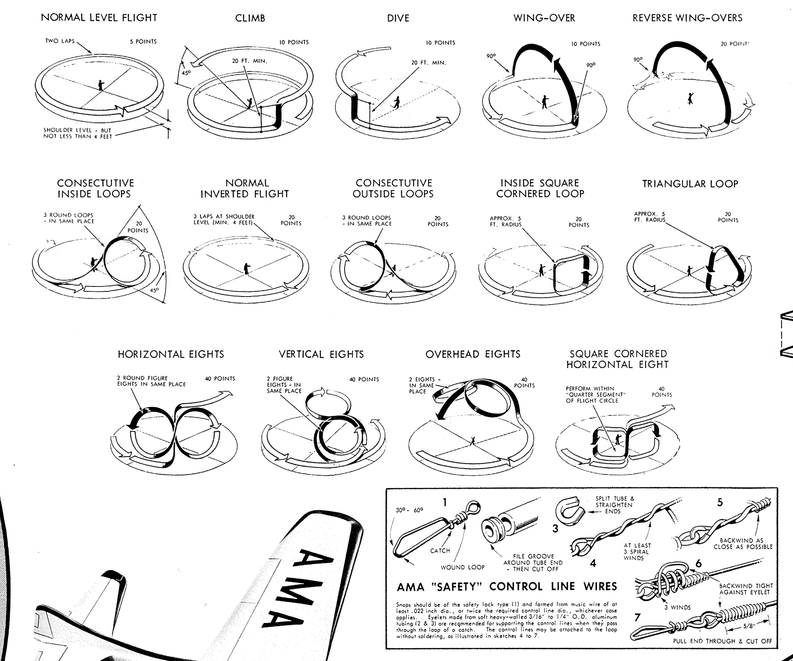

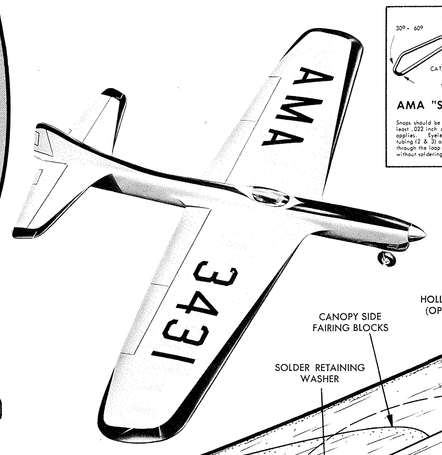

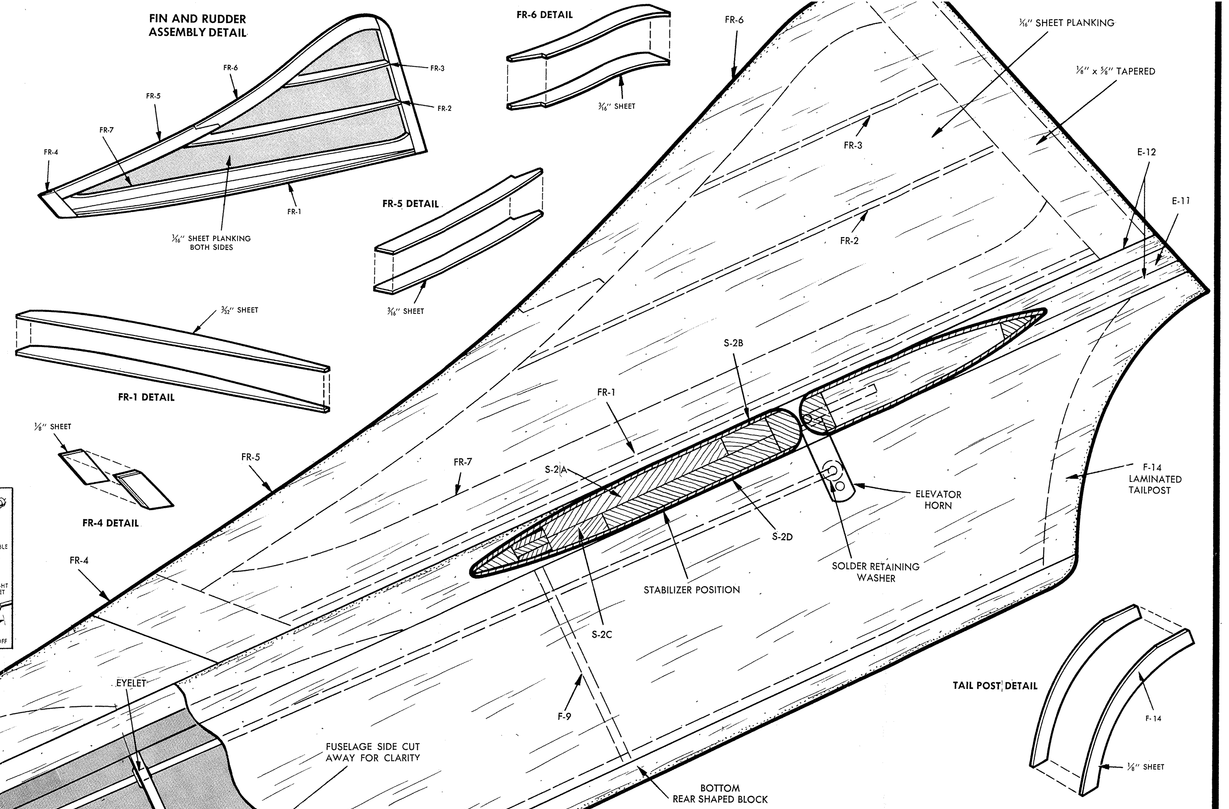

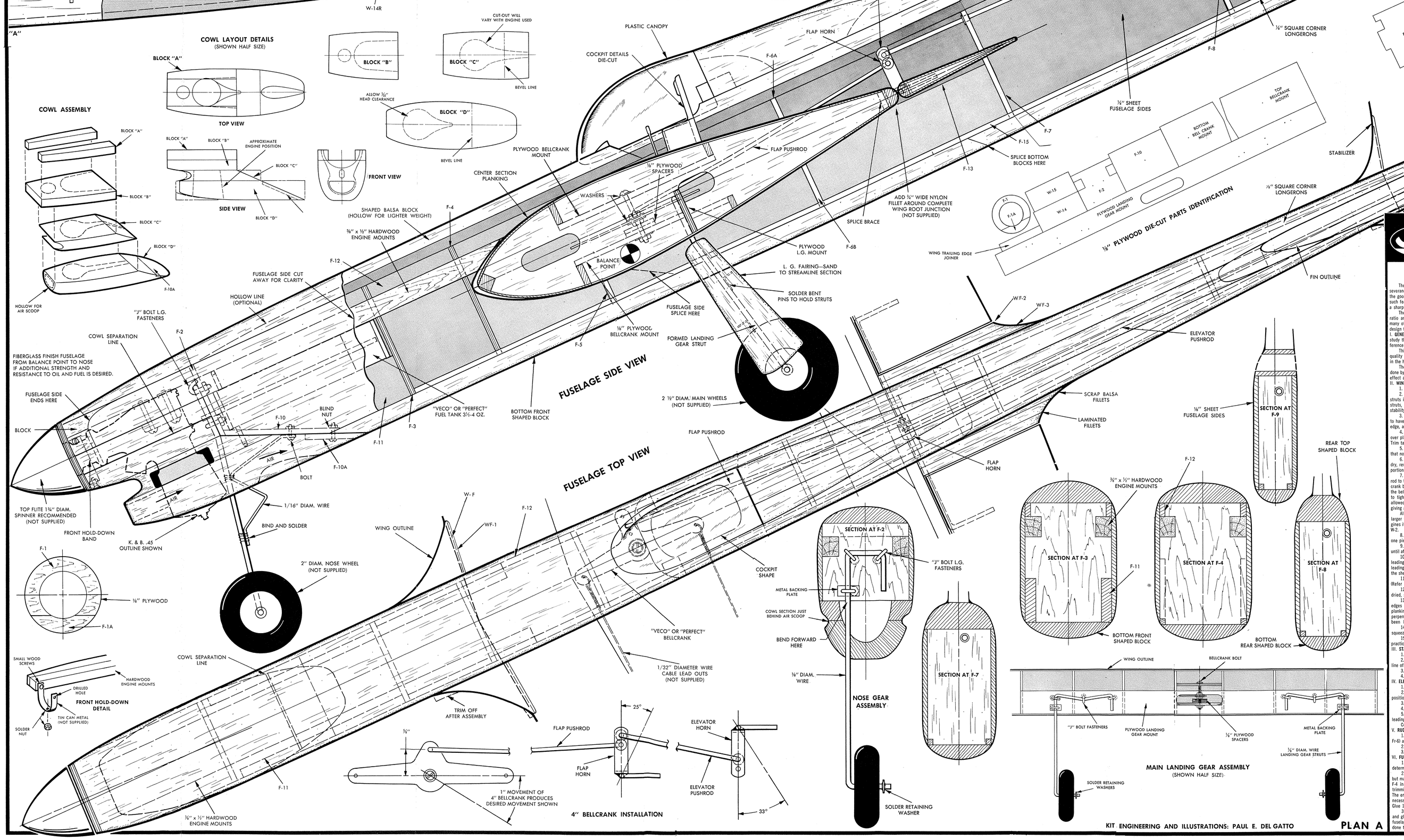

For All .35 to .60 Engines

MADE IN U. S. A.

Jetco MODELS SHARK "45"

C. A. ZAIC CO. INC.
883 LEXINGTON AVE.
BROOKLYN 21 • N. Y.

DESIGNED BY: *Lew McFarland*

INTRODUCTION

The Shark "45" is a cumulation of ten years of designing experience, practice and perseverance resulting from building and flying many stunt planes. The weaknesses as well as the good features of many models contributed to the superiority of the Shark "45", to yield such features as constant, but not excessive pull at all times. Stability . . . yet able to turn a sharp corner without sacrifice of the smooth maneuvers.

The fuselage area, area of lifting surfaces, moments, semi-balanced elevator, ¼ flaps ratio and sensitivity of controls are not accidents in this design. All of these ideas and many others must be put together and coordinated in the ideal manner to produce a model design that is capable of PRECISION ACROBATICS SUCH AS YOUR SHARK "45" WILL PERFORM.

I. **GENERAL:** If you desire to have your Shark "45" in the winner's circle I suggest that you study the plan and instructions carefully. It's the little things that add up to make the difference in today's highly competitive **Precision Acrobatics.**

This kit has been carefully engineered so that all dimensions are exact and the finest quality materials incorporated, yet the ultimate results of the finished product still remains in the hands of the builder.

The Shark "45" is intended to be Sleek and Streamlined. The final touches can only be done by the modeler so don't be afraid to use the knife and sandpaper in the proper places to effect a complete **blending** of all surfaces.

II. **WING:** (Build on a flat, level surface)

1. Remove die-cut pieces and study wing assembly sketches and plan layout.
2. Drill holes in plywood landing gear mounts for "J" Bolts and bolt the main landing struts in position. Notice metal backing plate where strut exits wing. The bend back in the struts, while not absolutely essential is recommended for optimum performance and ground stability.
3. Make diagonal splices of notched trailing edge and cement together making sure to have good glue joints. Allow to dry completely, add plywood joiner to the spliced trailing edge, as shown on plan.
4. Glue W-1, W-1R, W-4 and W-4R in position on wing trailing edge and when dry, lay over plan and add wing leading edges. Then Cement ribs W-6, W-6R, W-11 and W-11 in place. Trim tabs can be removed at this time and all remaining wing ribs added.
5. Add top and bottom wing spars and take care to check for proper alignment and see that no warps have been introduced. Then cement the top bellcrank mount in position.
6. Pin down the wing at the trailing edge and add 1/16" trailing edge planking. When dry, reverse and do the same for the other side. Then add wingtip sheet and laminated fixed portions of the wing flaps: W-14, 14R, W-15, W-15R, W-15A and W-15RA.
7. Now mount the bellcrank of your choice. After bending the 1/32" diameter wire push rod to the exact length and mounting to bellcrank. The lead-outs are also attached to the bellcrank before it is mounted. It is necessary to place two 1/8" thick plywood spacers between the bellcrank so that its final position is at the wing centerline. A nut (and washer) are used to tighten the bellcrank in position on the top plywood mount and the mounting bolt is allowed to extend down so that it will pass through the bottom plywood bellcrank mount thus giving added support. Add the bottom mount at this time.

   Although the shop does not pull excessively the pull test is hard on the "45" size and larger versions. Some weight may be saved here, if you are using a .35 engine. For .45 engines it is advisable to use a 1/8" thick sheet brace such as we have added between W-1 and W-2.
8. Double plank the section between W-2 and W-2R and in front of the main spar with one piece of 1/16" planking; both top and bottom.
9. The main landing gear strut unit is cemented into position. (Do not add strut fairings until after model has been flight tested and ship has been checked for tracking).
10. Before adding the leading edge planking, lightly sand (with a block) the wing ribs leading edge joints to insure an even curvature. In planking a curved surface such as the wing leading edge it is advisable to wet the **outside** curve of the plank with warm water and bending the sheet to the approx. curvature before attempting to glue in position.
11. The centersection may now be planked. Glue all 1/16" x 1/4" cap strips in place. (Refer to cutaway assembly).
12. Cement all 1/16" tip gussets in place on wing tips. After glue has thoroughly dried, sand with block to insure the desired contour.
13. The flaps are built by first gluing all flap ribs, (R thru R-8) fill-ins and flap leading edges in position on the bottom 1/16" planking, allowing to dry, then invert and glue the planking on the other side thus insuring equal taper on each side. Make sure ribs are glued perpendicular to the leading edge and that trailing edges of the top and bottom planking have been beveled.
14. After sanding flaps, insert flap connector into undersized hole in each flap after first squeezing in some glue. Note the connector is also recessed into the flap.
15. Hinge flap to wing after both surfaces have been sanded and tapered as much as practical.

III. **STABILIZER:**

1. Pin trailing edge in plan, glue ribs S-3, S-4 and S-5 in position.
2. Glue S-6, in position and add leading edge to ribs block up to obtain level with center line of stab.)
3. Glue S-1 and S-2 in position. Smooth sand and taper gradually towards tip.
4. Cover framework with 1/16" sheet planking.

IV. **ELEVATOR:**

1. Pin leading edge to plan, glue ribs E-4, E-5, E-6, and E-7 in position.
2. Glue E-3 in position and then add elevator trailing edge. (Block up to obtain desired position)
3. Glue E-8 in place and when dry remove from plan. Smooth sand and taper at tip.
4. Cover framework with 1/16" sheet planking.
5. When both elevators have been completed, drill correctly positioned holes and recess leading edge for elevator connector.

   Cement elevators to connector and coat liberally with cement.

V. **RUDDER:**

1. The right (outboard) side of the rudder is flat so pin F-1, the leading edge, (F-5 and F-6) and the trailing edge in position over plan (use wax paper between)
2. Cement brace F-7 in position and when dry remove from plan.
3. Sand to shape and cover with 1/16" sheet planking.

VI. **FUSELAGE:**

1. The fuselage is built around the tank and wing assembly, with the engine used determining the exact distance between the engine mounts.
2. The distance between the engine mounts selected will suit most .35 to .45 engines but may require slight adjustment for some .45's or larger engines. Glue formers F-2, F-3 and F-4 in place on the mounts and allow to dry. Mark position of engine mount bolts after trimming mounts to give a snug fit. Drill holes and draw blind mounting nuts into position. The engine is mounted with 1"-2" right thrust. Place tank in position (1/16" plywood doubler necessary if you do not use fiber glass on nose section.) Glue the 1/8" sheet sides in position. Glue 1/4" doubler in position under the tank.
3. Glue F-7-8-9 and 13 in position on the right 1/8" sheet fuselage SIDE allow to dry and glue the left 1/8" sheet fuselage side in position and allow to dry. Note that the right fuselage side is trimmed slightly shorter than the left side at both front and rear. This is done to accomplish the 1"-2" assymetry in the fuselage assembly.
4. In order to get the two halves of the fuselage mounted on the wing in the exact position over top view of fuselage this will require the removal of a small amount of wood where the right sides of the fuselage butt together.
5. Glue nose fill-in block (between F-1, F-2) in position. Glue F-12, F-5, F-6A and F-6B. Glue 1/8" sq. balsa in position at the corner of the formers.
6. Glue F-10 in position after fitting in between F-2 and tank with scrap balsa and fiber glass resin (Glue-second choice) also coat entire compartment between F-2 and F-3.
7. Solder 1/16" wire brace to nose gear and bolt to F-10. Place a blind mounting in position to be used in securing cowling.
8. Glue bottom blocks to bottom of fuselage. Be sure to make a good splice.
9. Bend 3/32" diameter wire elevator pushrod to exact length, solder in position on flap horn. Place three 1/8" I.D. eyelet on wire so they may be glued in position on F-7, F-8 and F-9 after the stabilizer has been glued in position. Solder the pushrod in position on the elevator horn. Glue stab in position, make minor adjustments so that both elevator and flap are both in neutral position at the same time.
10. Glue top blocks in position. Hollow as much as possible without sacrificing strength. Glue E-11 and both E-12's in position- note E-11 is bottowed.
11. Glue laminated flap fillet strips WF-2 and WF-3 in position. Glue the Rudder and Dorsal fairing blocks in position. Give canopy fairing blocks in position.
12. Glue fillets at leading edge of wing (WF, WF-1 and stabilizer S-7), in position. Blend all fillets and fairings to give pleasing contours as **shown on plan.**
13. Optional interior cockpit detail can be added such as, **instrument panel** and mount canopy. The canopy is imbedded approx. 1/8" into the top block and the thickness of the cellulold of the canopy where it is glued to the canopy fairing block. Cover the portion of the canopy not to be doped with masking tape.
14. With engine mounted, use the spinner blackplate to determine the exact position of W-1.

COWLING:

1. Best results are obtained by building the cowling around the engine cowling (plug exhaust and intake). Glue both block A's in position. Cut holes in blocks B, C and D just sufficient to clear the engine cylinder. (Suggest removal of large exhaust stacks from some engines). Tack glue block B to block A, also only tack glue all blocks to F-10. Shape scoop, cut holes for venturi, needle valve and exhaust. Note scoop or dishout between the fuselage proper and the scoop portion of the cowl.
2. Remove cowl by cutting at break lines, coat with fiber glass resin, hollow inside so as to force air around engine, allow 1/32" clearance on each side. Install recessed plywood mount, F-10A. Coat with fiberglass resin inside.
3. Install tin stock strip with a 4-40 nut soldered in position.
4. Mount cowl and cover entire nose section block to 2" past the leading edge of the wing with fiber glass cloth and resin. Be sure to separate cowl from fuselage before completely hardened.

ENGINES: This plane was designed for .35-45 cu. in displacement engines but will give optimum results with engines up to .60 cu. in disp. If a .35 size engine is contemplated, bear in mind that light weight will be vitally important.

CONTROL SYSTEM: The Control System is the heart of a stunt plane and requires proper attention. A four inch bellcrank is preferred, however a three inch gives satisfactory results. Several variations may be made in the control horn moments and method of hook up but the end result is what is important. For each inch of movement of the lead-out, 25° flap movement and 33° of elevator movement should result. Minor deviation is okay here but **Caution** beyond a few degrees.

A small (6") handle is best for most people. By making the lead-out position variable the model is more versatile, by making the lead-out position forward the pull (Taw) can be reduced for those extra windy days. Moving the lead-outs back results in more pull for those dead calm days. Another reason for variable lead-outs is to be able to adjust line pull to suit the individual model to correct for variation in construction features that affects line pull.

COVERING AND FINISH

1. Apply one coat of Aerogloss Balsa Filler Coat to the entire model.
2. Sand with 320 W or D (use dry)
3. Apply one to three coats of filercoat over hinges and rough places, sanding with 320 W or D between coats.
4. Cover wing surface with heavy silkspan and the remainder of the model, with a medium weight silkspan. (cover wet)
5. Allow paper to dry completely, then dope with clear until paper begins to gloss (about 3 coats)
6. Sand rough spots, edges and blemishes with 400 W or D sandpaper.
7. Brush on one coat of clear (add 10 drops of castor oil to a pint to prevent excessive drawing)
8. Add one to two Balsa fillercoats to entire model (thinned down) and smooth sand with 400 W or D between coats.
9. Apply additional coat of clear dope.
10. Add one to two coats of colored dope to entire model.
11. Mask areas to be trimmed and clear dope inside edge of trim to prevent color seepage.
12. Add one to three coats of colored trim as required.
13. Apply three to eight coats of clear dope. (The more the better).
14. Sand with 600 W or D after dope has dried at least over night or longer.
15. Rub out with a fine grit rubbing compound and then wax the entire model with "Vista" wax or similar auto wax.

FLYING: In order to check tracking I suggest a flying field with a smooth runway. First give a check by pushing the plane by hand and observe. Two pair of vice grips are very useful in making small adjustments to correct tracking. Straight tracking or just a **SLIGHT** amount to the inside of the circle is desired.

The main gear should be angled to the rear just enough to keep the nose from bouncing excessively. Takeoffs and landings are a real thrill with the Shark "45". On takeoff hold just a little down and as she picks up speed gradually, pull back and she will make a realistic, smooth takeoff.

Once in the air fly a few level laps and observe for any tendency for one wing to fly low or a tendency for it to dive or climb. Correct a low wing to level flight by bending the flap down on the same side.

For a tendency to dive (provided handle and lines are hooked up properly) bend both flaps "up", just the opposite for a climbing tendency, (this is done because the flap neutralizes in the slip stream thus acting as a trim on the elevator.)

A better center of Gravity check can be determined by how the plane glides after the engine stops. Allow the nose to drop and let the plane establish its own glide, which should be a nice descending glide. As the approaches the runway **EASE BACK** on the "up" control and she will slide in beautifully. Contact should first be made with the main gear, immediately ease off the slight "up" pressure and pass through neutral, going to full down as the plane loses speed. If the plane consistently stalls and mushes on the landing approach this indicates that the model is tail heavy. Add nose weight to determine if this is the cause for this plane literally lands itself if you have done your part on the work bench.

It is very unlikely that you will come up with a nose heavy model, but if so it will show up as a very fast nose down glide, and in being insensitive in maneuvers. Study the stunt pattern thoroughly before attempting stunts with "45", since it is not a model which is easily replaced and it would not be wise to proceed hastily.

The Shark "45" is noted for its ability to turn the square corners, well within the AMA 5 ft. radius and continue to fly smoothly, and yet be smooth in the round maneuvers.