

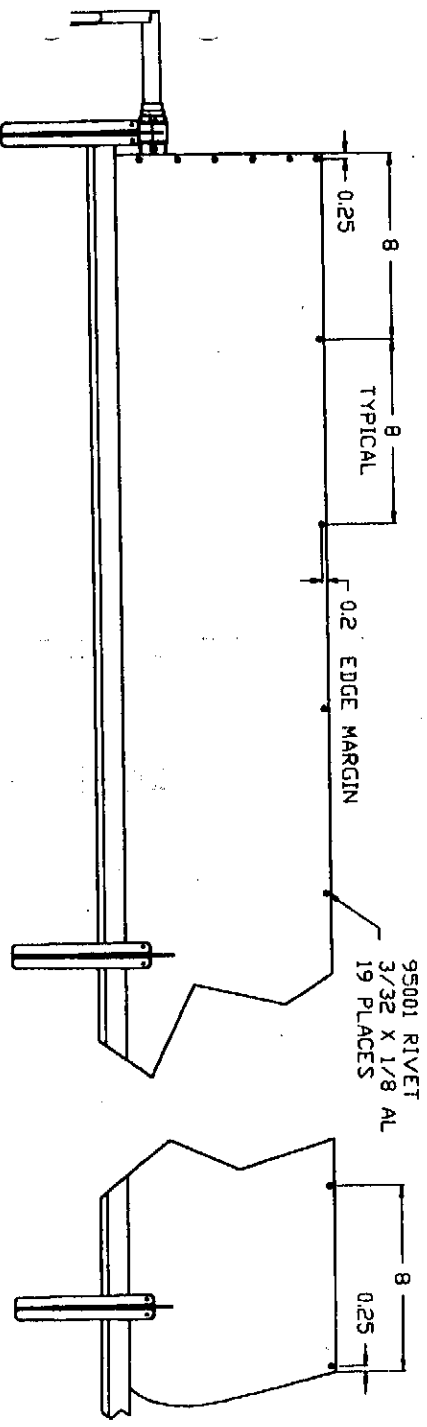
Flaperon Finish

Sub-Section "D" - Flaperon Finish

Objective: Now that the wings are covered you can install the flaperon hanger brackets on the wings. Assemble the brackets so the angle between the hinge bolt holes and the top bracket flange is exactly the same on each set of brackets and Align the brackets straight on the wing so the flaperon does not bind when it is deflected. Install the end ribs in the flapérons, shape and install the flaperon tips and install the mass balance weights on the flapérons.

STEP (1): Rivet the trailing edge of each Flaperon end and at approximately 8" intervals to prevent the skin from peeling apart (see Fig. W-D-1). (If you have access to aircraft flush riveting equipment, use 3/32" solid flush rivets here on the trailing edge -- dimpled and driven -- for a more professional appearance.) Center the rivet holes .2" from the trailing edge of the Flaperon. Drill a 1/8" hole in the bottom skin aft of each hinge, about 3/4" ahead of the trailing edge for a misture drain hole.

STEP (2): Now you can assemble the Flaperon Hanger Brackets. Build a simple jig with a small piece of 3/4" plywood to properly position the top and bottom pieces of the bracket and locate the hole for the AN426-3-3 Rivet. This jig will fit inside the Bracket and maintain a 13.8" Angle. Refer to Fig. W-D-2.



Flaperon Rivet Details

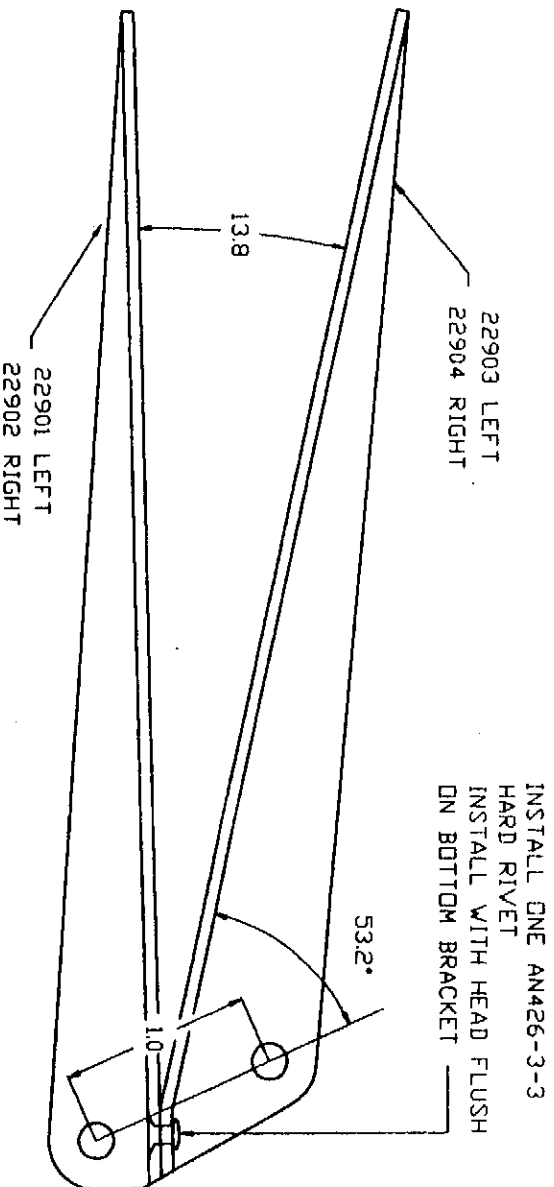
Fig. W-D-1

D62001

DENNEY AERO-PAVT COMPANY					
MODEL #	ASSEMBLY	REVISION	DATE	SECTION	PAGE
KITFOX	Sub Section "D" Flaperon Finish	1	12 Mar 92	Wing	W/D-1

STEP (3): Clamp one # 22903 Top Left and one #22902 Bottom Left piece to your plywood and use a protractor to position them as shown in Fig. W-D-2.

NOTE: We have achieved good results by first applying one brush coat of Stits Poly-Brush to the covered wing, then attaching the reinforcement tapes with Stits Poly-Brush as described in the Stits Manual. Once the tapes are on, we spray the entire wing with the second coat of Poly-Brush. Then we fit the flaperon hanger brackets according to the following directions and prepare them for paint (Poly-Spray) by lightly sandblasting, bead-blasting, or metal etching the brackets before riveting them in place. Then the entire wing (including the brackets) is ready to paint with Poly-Spray and color dope.



Full Scale Flaperon Hanger Brackets
Fig. W-D-2

STEP (4): When the pieces are properly positioned, drill through the bolt holes and through the jig, insert dowels you can use to position the other four, Left side pairs. (If you drill the holes straight, you can extend the dowels through the opposite side of your plywood plate and use them to align the right side bracket parts).

STEP (5): Tack little wooden blocks in place on your jig or use more dowels to maintain the 13.8° angle between the pieces.

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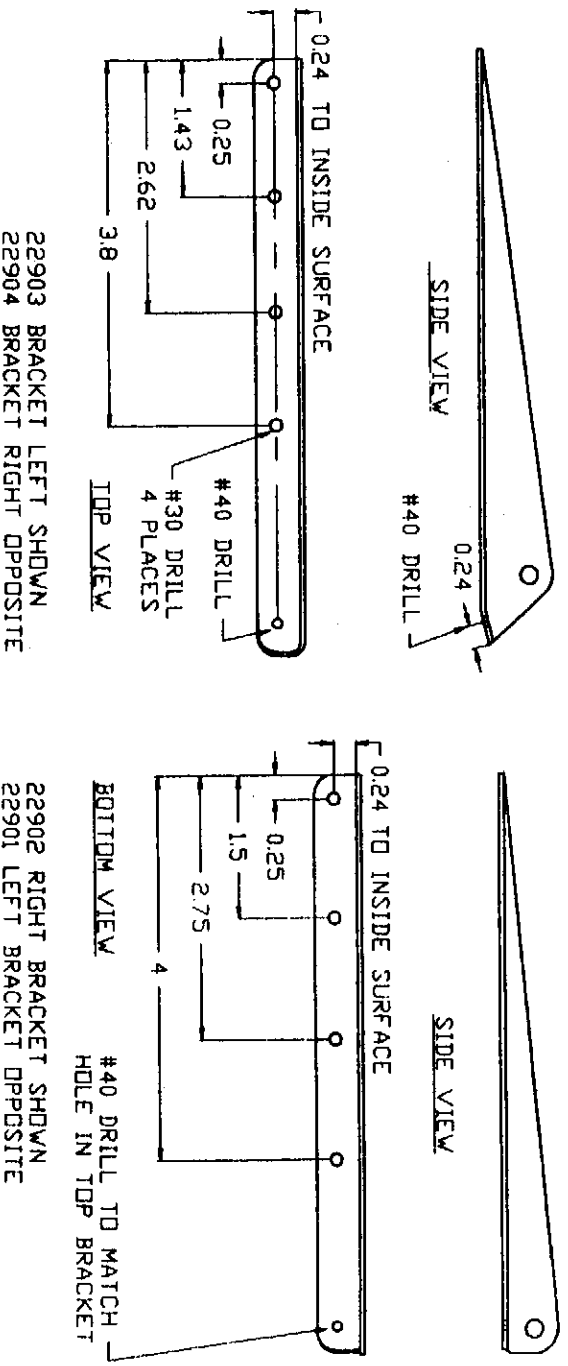
MODEL 4	ASSEMBLY	DENNEY AIRCRAFT COMPANY			
KITFOX	Sub Section "D" Flaperon Finish	REVISION	DATE	SECTION	PAGE
		1	12 Mar 92	Wing	W-D-2

STEP (6): Drill a #40 hole through both pieces at the same time for the AN426-3-3 Rivet. Do not install the rivet yet.

STEP (7): Place the other four sets of Left Side Bracket pieces into the jig one set at a time and drill the aft rivet hole in each set. Number or mark each piece so you can match them later.

STEP (8): Build another jig as described above to locate the aft rivet holes in the Right Side Bracket pieces.

STEP (9): Round the corners, smooth the edges, lay out and drill four #30 rivet holes in all the Bracket pieces as shown in Fig. W-D-3. Deburr all the rivet holes.



22903 BRACKET LEFT SHOWN
22904 BRACKET RIGHT OPPOSITE

22902 RIGHT BRACKET SHOWN
22901 LEFT BRACKET OPPOSITE

Hanger Bracket Rivet Pattern
Fig. W-D-3

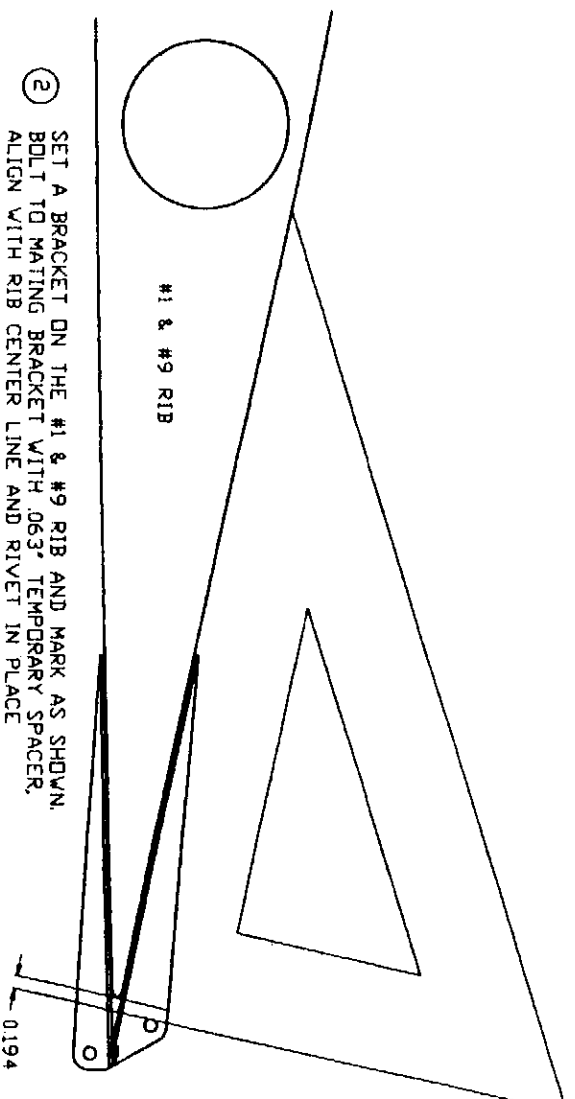
STEP (10): Rivet together all the Left Side Bracket sets and all the Right Side Bracket sets with one AN426-3-3 Rivet in each set as shown in Fig. W-D-2.

STEP (11): Mark the top and bottom centerlines of the tip ends of the odd-numbered ribs, as shown in Fig. W-A-24.

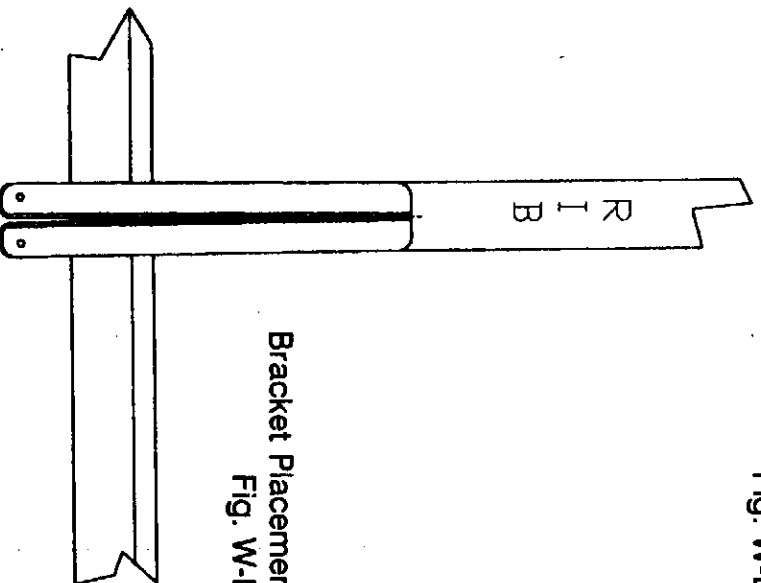
D62003

MODEL 4	ASSEMBLY	DENNEY AERO-RAFT COMPANY			
KITFOX	Sub Section "D" Flaperon Finish	REVISION	DATE	SECTION	PAGE
		1	12 Mar 92	Wing	W-D-3

STEP (12): Use a triangle or a wide ruler to position the brackets on the #1 and #9 ribs as shown in Fig. W-D-4 and Fig. W-D-5. (0.194 inch = 6.2 sixteenths of an inch). Don't forget to clamp a spacer the thickness of the flaperon hinge between the Left and Right Brackets.



Bracket Placement (Side View)
Fig. W-D-4



Bracket Placement (Top View)
Fig. W-D-5

D62003

STEP (13): Drill #30 holes through the brackets and rib capstrips of Ribs #1 and #9. Install the Brackets with 1/8" x 1/4" AL Rivets.

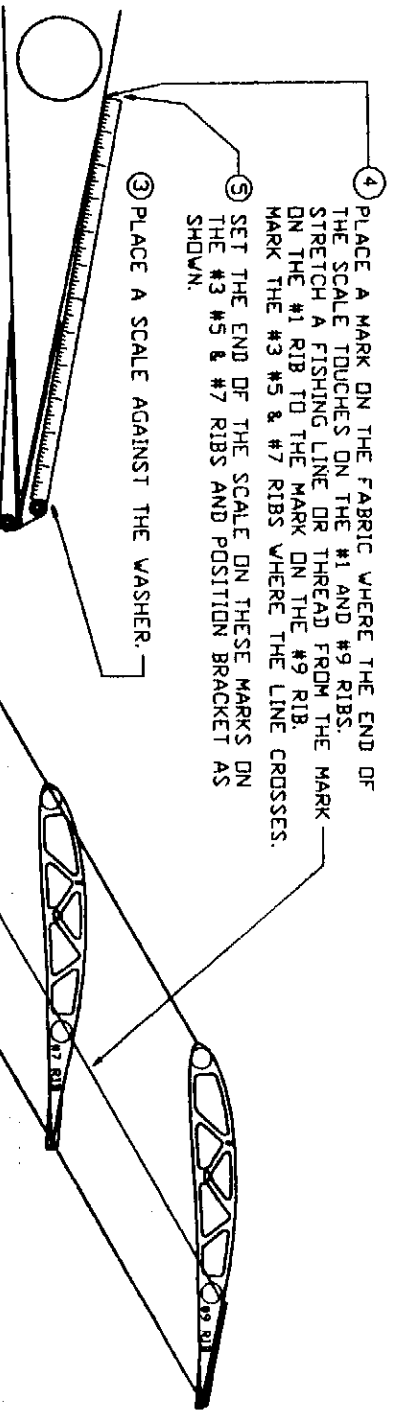
STEP (14): Insert an AN3-4A Bolt with an AN960-10 Washer in the top bolt hole of each pair of Brackets. Set a ruler against the washer in the brackets on the #1 and #9 Ribs and mark at the end of the scale as shown in Fig W-D-6.

STEP (15): String a line from the mark on Rib #1 and Rib #9, mark Ribs #3, #5, and #7 along this line, as shown in by Fig. W-D-7.

STEP (16): Position the Brackets on Ribs #3, #5, and #7 with the scale as shown in Figures W-D-7 and W-D-8.

STEP (17): Drill and cleco, then rivet the Brackets in place on Ribs #3, #5, and #7.

STEP (18): Install the #25011 Flaperon End Ribs in the end of each flaperon as depicted in Fig. W-E-2. Fit the welded Rib flush with the flaperon skin. You may have to file the tip of the Rib for a good fit. (Support the Flaperon on sandbags on your bench while you work on it so you won't dent the aluminum skin. Or you may want to skip ahead to section "E" and build the flaperon clamp to use as a support.



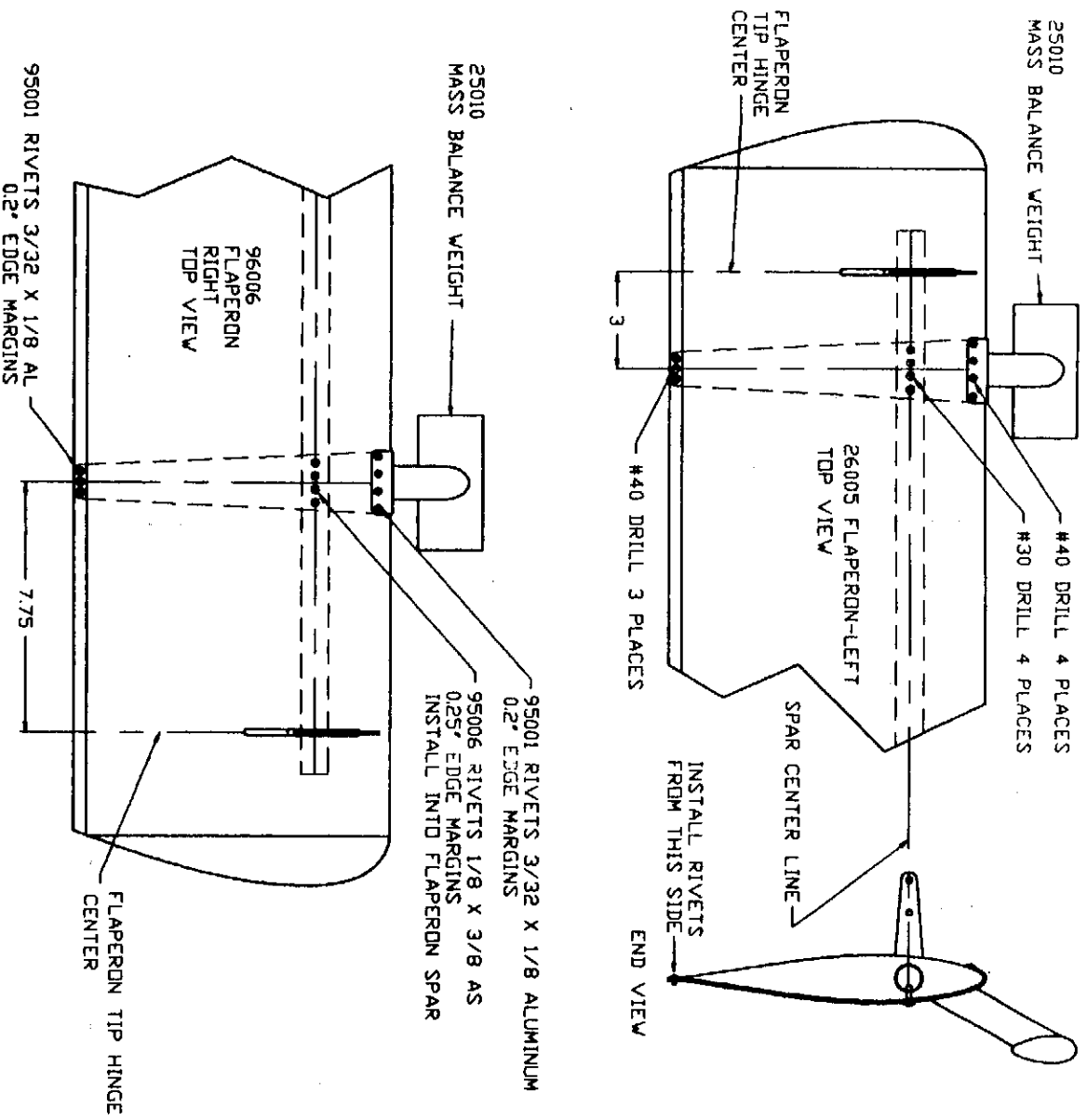
Marking the Ribs
Fig. W-D-6

Bracket Alignment
Fig. W-D-7

D62003

MODEL 4		DENNEY AIRCRAFT COMPANY	
ASSEMBLY	REVISION	DATE	SECTION
Sub Section "D" Flaperon Finish	1	12 Mar 92	Wing
KITFOX			PAGE
			W-D-5

STEP (19): Install the #25010 Mass Balance Weights as depicted in Fig. W-D-8. Stagger them as shown so they will not hit each other when the wings are folded.



Mass Balance Weight Installation
Fig. W-D-8

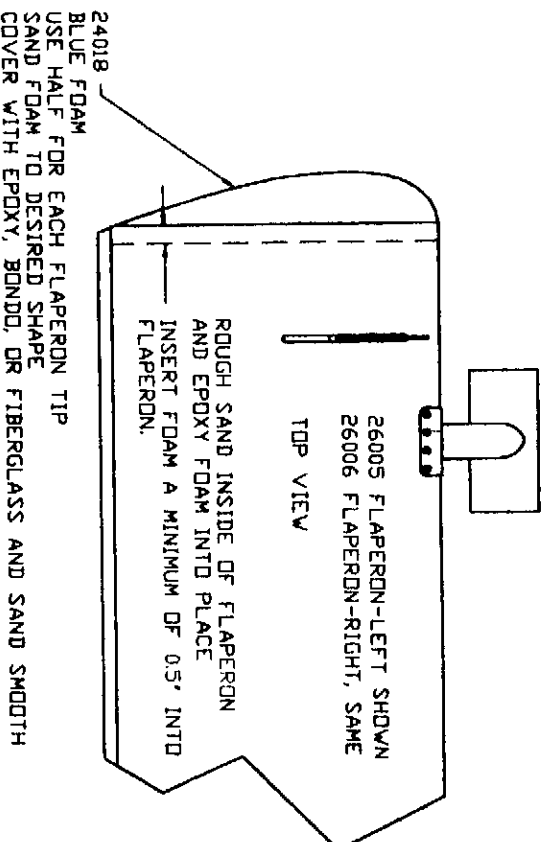
DENNEY AERO-RAFT COMPANY D62001			
MODEL 4 KITFOX	ASSEMBLY Sub Section "D" Flaperon Finish	REVISION 1	DATE 12 Mar 92
	SECTION Wing		PAGE W-D-6

STEP (20): Smooth any sharp edges and drill the rivet holes in the #25010 Mass Balance Weights as shown in Figures W-A-31 and W-A-32.

STEP (21): Cut the #24018 Foam Block in half lengthwise. Each half is large enough to shape the tip for one Flaperon.

STEP (22): Hold the Foam piece against the end of the Flaperon and trace the outline of the Flaperon on the Foam.

STEP (23): Cut straight through the Foam along the outline. Use a rasp and sandpaper to round the Foam to a shape similar to that shown in Fig. W-D-9.



Flaperon Tip Construction
Fig. W-D-9

STEP (24): Trim the corner of the trailing edge of the Flaperon as shown to form a nice smooth line with the tip.

STEP (25): Mix a small batch of structural epoxy and bond the Foam Tip at least 1/2" into the Flaperon end. Coat the Foam Tip with structural epoxy to seal the foam and provide a sanding base for paint. You can use Bondo or Safe-T-Poxy instead, on the Foam itself if you want. Do not use any form of polyester resin, it is incompatible with styrofoam and will destroy it.

D62001

MODEL 4		REVISION		DATE		SECTION		PAGE	
KITFOX		ASSEMBLY		1		12 Mar 92		W-D-7	
Sub Section "D" Flaperon Finish						Wing			

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