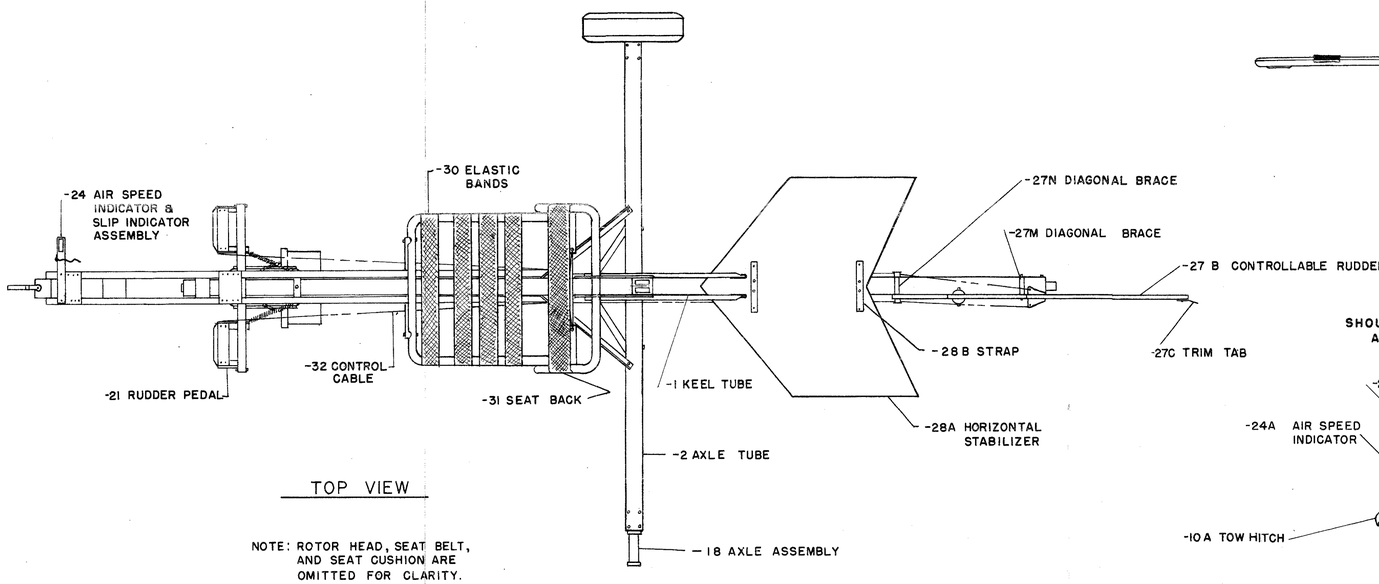
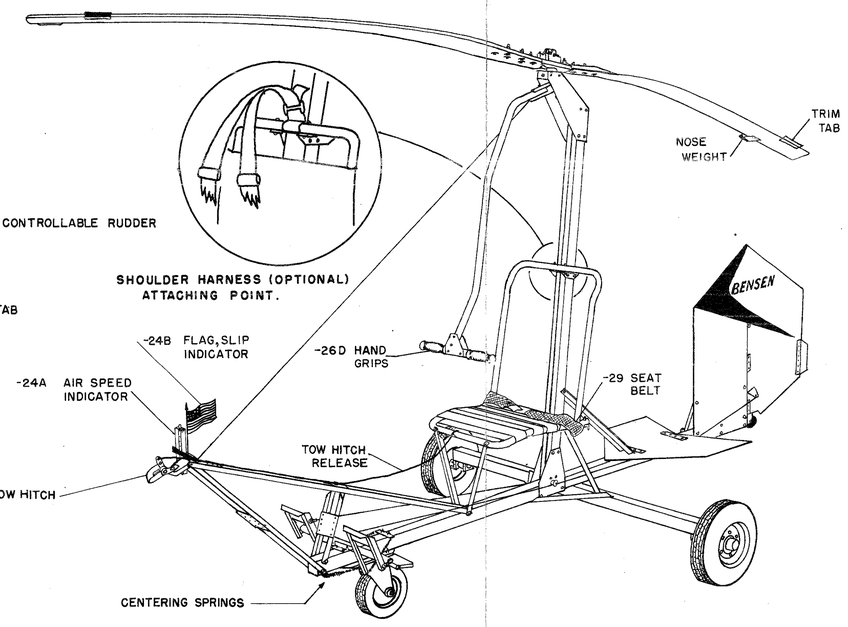


TOP VIEW

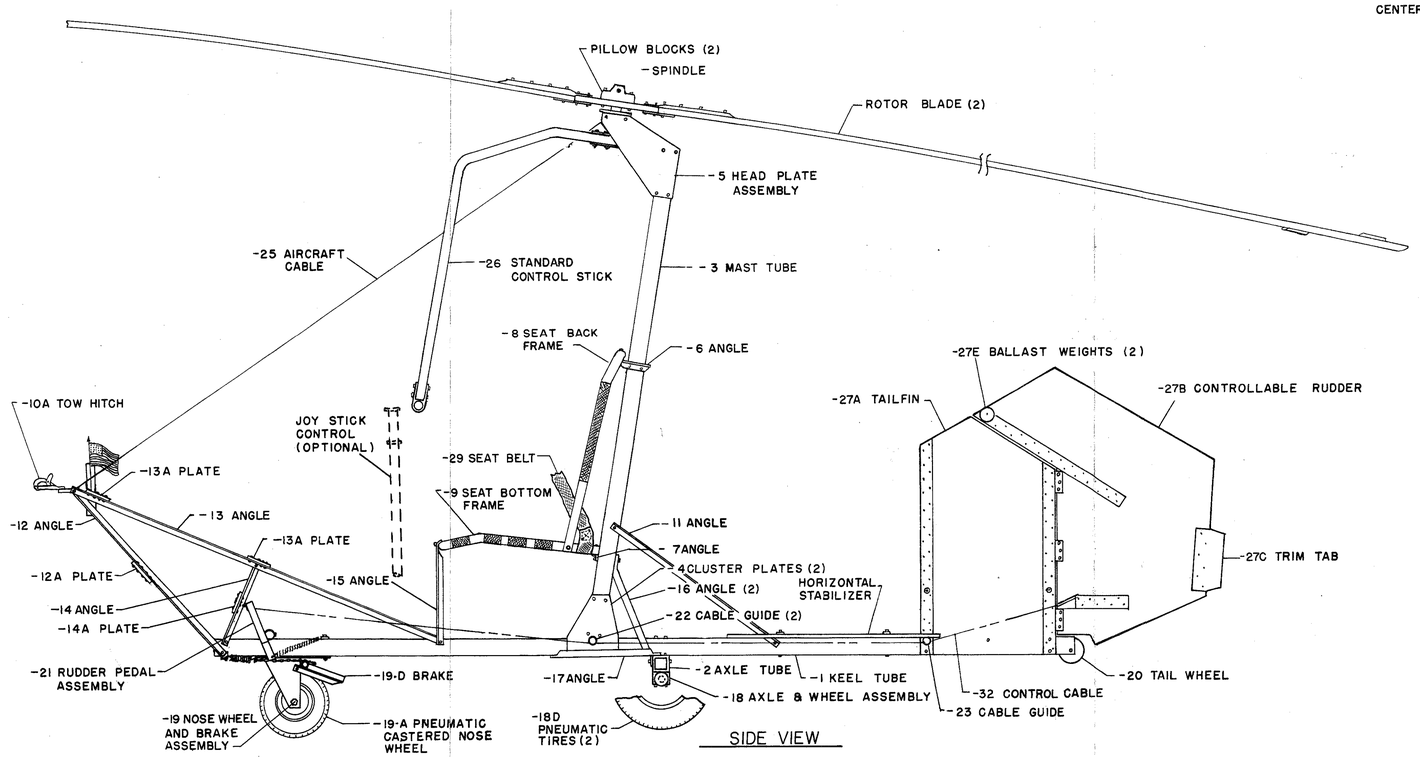
NOTE: ROTOR HEAD, SEAT BELT, AND SEAT CUSHION ARE OMITTED FOR CLARITY.



THREE-QUARTER PERSPECTIVE VIEW

(NOT TO SCALE)

NOTE: SEAT BACK AND CUSHION OMITTED FOR CLARITY.



SIDE VIEW

SPECIFICATIONS

LENGTH	135 IN	NORMAL PAYLOAD	170 LBS.
WIDTH	66 IN	MAXIMUM PAYLOAD	400 LBS.
HEIGHT	75 IN	TAKE OFF SPEED	20 MPH
ROTOR DIA.	240 IN	MAXIMUM SPEED	70 MPH
WEIGHT	128 LBS	MAX. TOWLINE PULL	300 LBS.

NOTES

1- DETAIL JOYSTICK CONTROL COLUMN PLANS AND KITS ARE AVAILABLE SEPARATELY FROM THE FACTORY. THEY ARE LISTED IN THE CURRENT PRICE LISTS.

2- CATALOG PART NUMBERS ARE IDENTIFIED BY USING THIS DRAWING NO. AND ENDING IT WITH THE DASH NUMBER OF THE PART. EXAMPLE: KEEL TUBE P/N 8-104-101.

3- THE AIRFRAME OF THIS GYRO-GLIDER MAY BE CONVERTED DIRECTLY INTO A GYRO-COPTER BY THE INSTALLATION OF A MC CULLOCH 4318E ENGINE FOR WHICH CONVERSION PLANS AND KITS ARE AVAILABLE.

4- DO NOT ATTEMPT TO BUILD THE GYRO-GLIDER FROM THIS DRAWING ALONE. THIS DRAWING WILL BE USED AS AN ASSEMBLY DRAWING IN CONJUNCTION WITH FULLY DETAILED B-8 CONSTRUCTION PLANS.

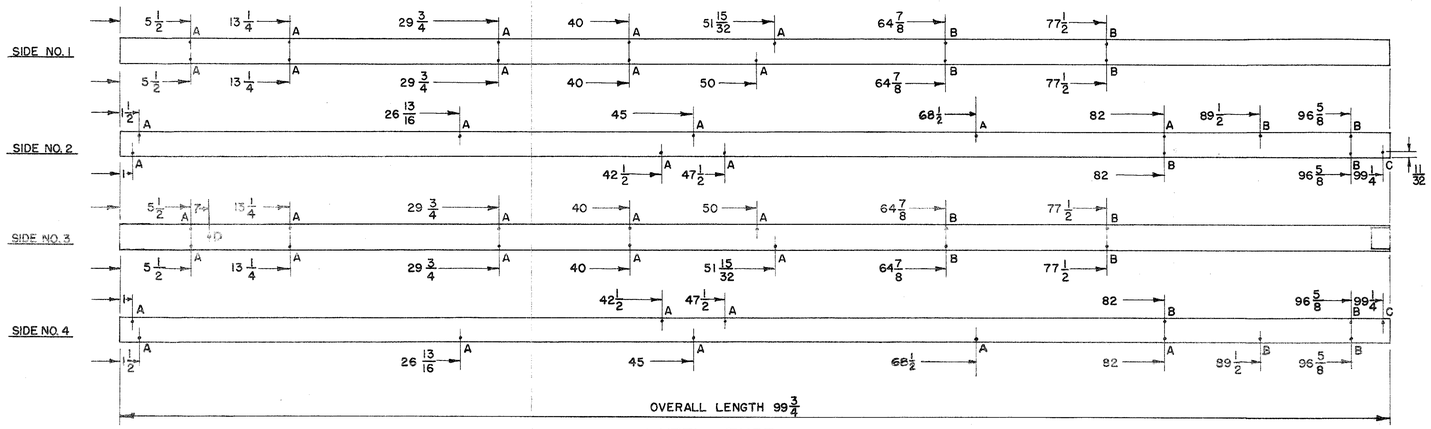
5- ONLY FACTORY-SUPPLIED PARTS AND MATERIALS SHALL BE USED IN CONSTRUCTION OF THIS CRAFT. ANY SUBSTITUTION OF MATERIALS WILL AUTOMATICALLY INVALIDATE THE DESIGN AND VOID ALL FACTORY GUARANTEES.

6- CONSTRUCTION KITS MAY BE ORDERED DIRECTLY FROM BENSEN AIRCRAFT CORP., RALEIGH, N.C., USA OR ITS AUTHORIZED DEALERS. FACTORY FINISHED UNITS ARE ALSO AVAILABLE.

REVISED 10 JAN. 1974 E.B.T.
REVISED 1 OCTOBER 1968 - H.M.C.
REV. 1 MAY 1968 H.M.C.
REV. 17 JULY 1967 GWK
REV. 24/3/70 HLW

PART NO.	PART NAME	STOCK SIZE	MATERIAL	MATERIAL SPEC
COPYRIGHT 1960 PATENTS PENDING				
TOLERANCE			TOTAL CALC WT.	TOTAL ACT WT.
GYRO-GLIDER, BENSEN MODEL B-8			130 LBS.	128 LBS.
LAYOUT	DRAWN	CHECKED	ENG APP.	CUST APP.
Eric E. Smart 1st June 60	Eric E. Smart 1st June 60		V.B.B. 6/6/60	SHEET NO. 1
BENSEN AIRCRAFT CORP.			SCALE 1" = 8"	8-104-100

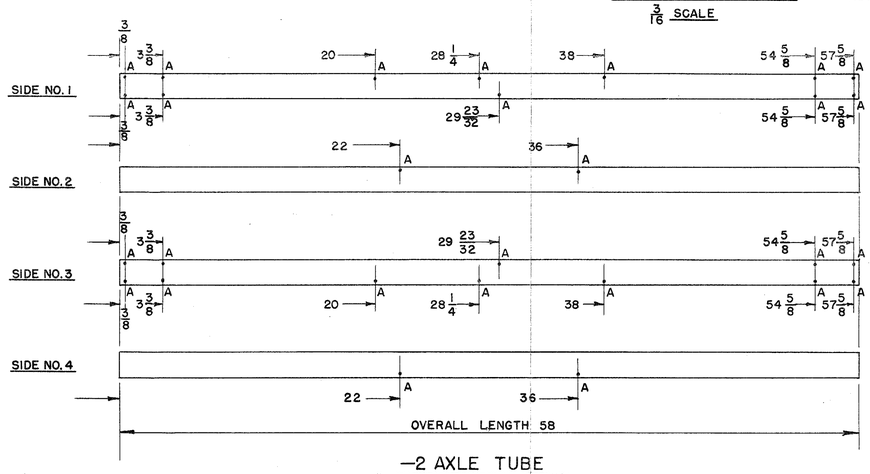
PRINTED IN USA



-1 KEEL TUBE

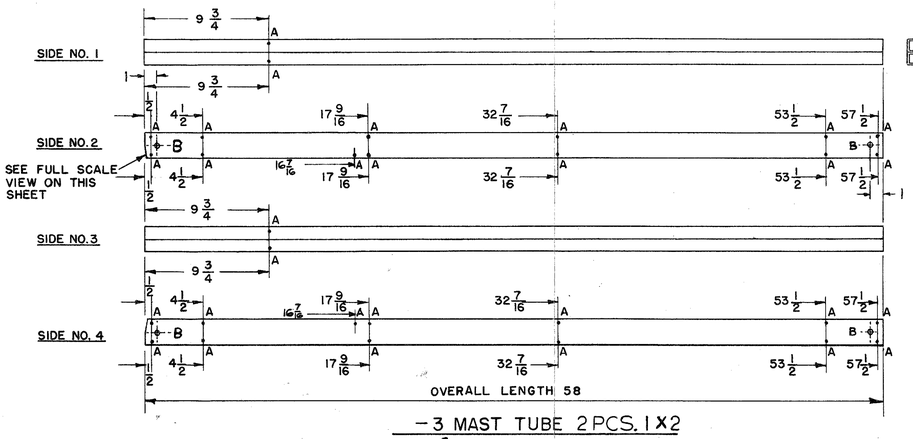
3/16 SCALE

NOTE: ALL DIMENSIONS MEASURED FROM LEFT END



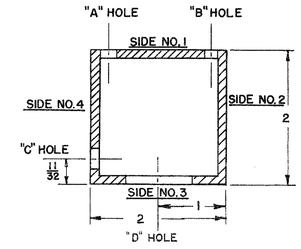
-2 AXLE TUBE

3/16 SCALE



-3 MAST TUBE 2 PCS. 1X2

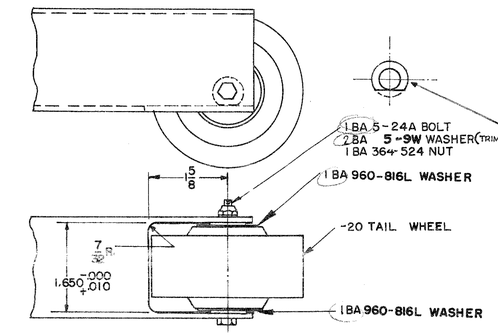
3/16 SCALE



TUBE SECTION FROM LEFT END

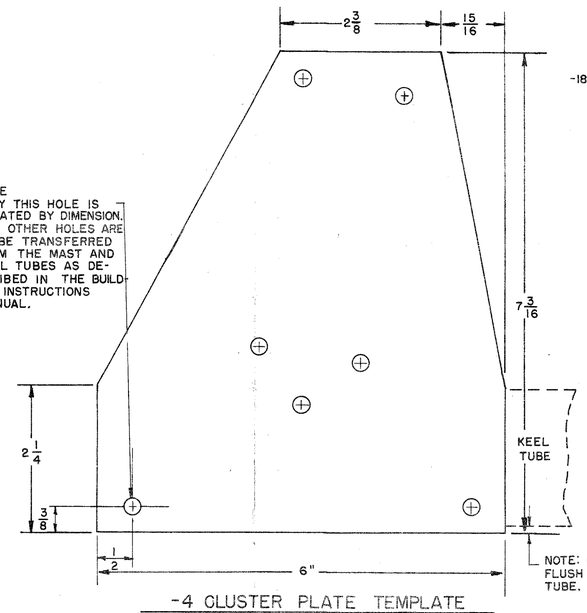
NOTE: USE PROVIDED FIXTURE TO LOCATE THE EDGE DISTANCE OF "A" AND "B" HOLES. THIS WILL ASSURE PROPER CLEARANCE BETWEEN BOLT AND INSIDE OF TUBE WHICH IS: NOT LESS THAN .002 IN. AND NOT MORE THAN .015 IN.

HOLE SIZE: "A" HOLES = 1/4 D.
"B" HOLES = 3/16 D.
"C" HOLES = 5/16 D.
"D" HOLE = 1" DIA. ON BOTTOM OF KEEL TUBE ONLY



-20 TAIL WHEEL ASSEMBLY

3/4 SCALE

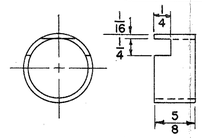


NOTE: CLUSTER PLATE IS NOT FLUSH WITH BOTTOM OF KEEL TUBE. LEAVE 1/8 OVERHANG.

-4 CLUSTER PLATE TEMPLATE

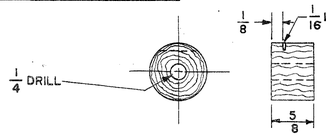
FULL SCALE

(CUT OUT AND USE AS A PATTERN)



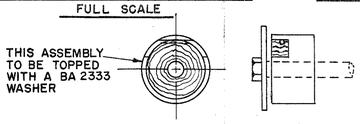
-22B & 23B TUBE SLEEVE

FULL SCALE



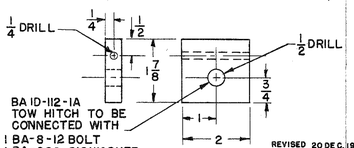
-22A OR-23A WOOD PLUG

FULL SCALE



-22 & -23 ASSEMBLY

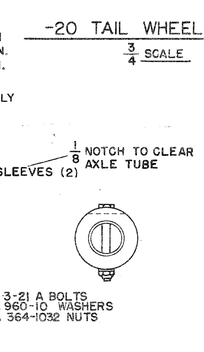
FULL SCALE



-10B TOW HITCH BLOCK

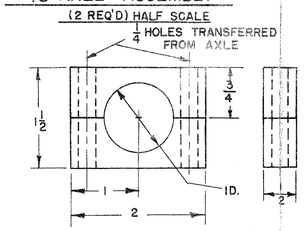
HALF SCALE

REVISED 20 DEC. 1971 EBT
Rev. 15 Feb. 1971 Wiley Price
REV. 27 MAR. 1970 H.L.W.
REV. 31 DEC. 1969 LWP
REVISED 1 OCTOBER 1968 - HMC
REV. 17 JULY 67 - GWK



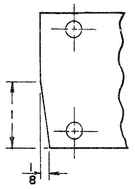
-18 AXLE ASSEMBLY

(2 REQ'D) HALF SCALE



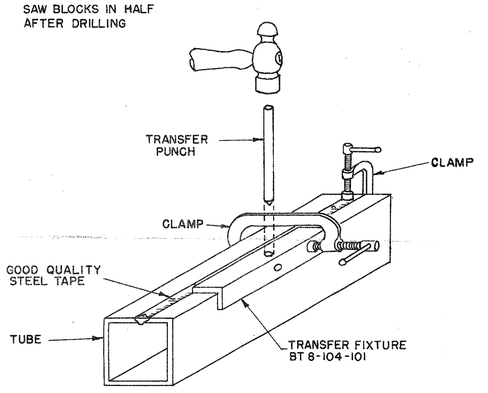
-18B CLAMP BLOCKS

(4 SETS REQ'D) FULL SCALE



VIEW OF SIDE NO. 2 OF MAST TUBE SHOWING SLOPE CUT

SAW BLOCKS IN HALF AFTER DRILLING



SKETCH SHOWING SET-UP FOR USE OF TRANFER FIXTURE

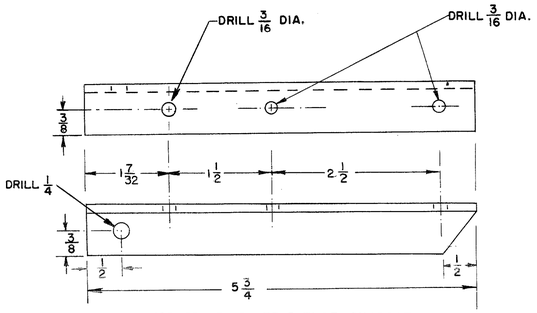
PART NO.	PART NAME	STOCK SIZE	MATERIAL	MATERIAL SPEC
COPYRIGHT 1960 PATENTS PENDING				
TOLERANCE			TOTAL CALC WT	TOTAL ACT WT
DETAILS MODEL B-8				
LAYOUT	DRAWN	CHECKED	ENG APP.	CUST APP.
Eric E. Stewart	Eric E. Stewart		J.B.B.	
June 1960	June 1960		8-1-60	

SHEET NO 2
SCALE AS SHOWN REV. 7-15-64 EBT

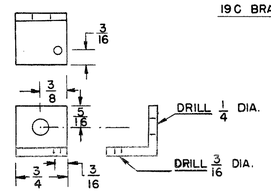
BENSEN AIRCRAFT CORP.

8-104-100

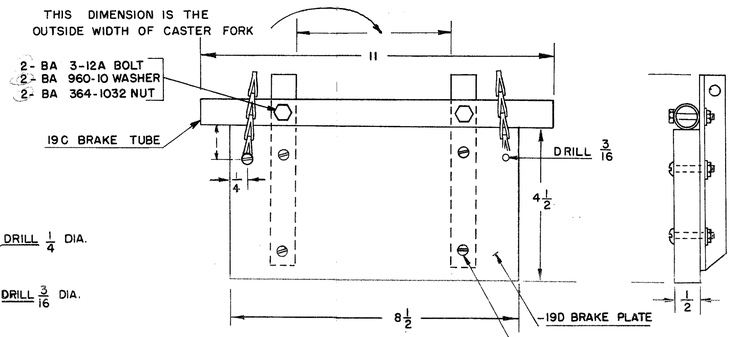
PRINTED IN USA



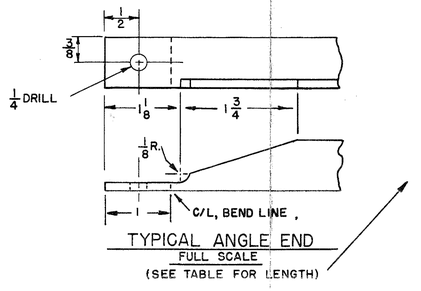
-19B BRAKE PLATE & TUBE SUPPORT
PIVOT ANGLE 2 REQ. R. & L.
L.H. SHOWN, R.H. OPPOSITE
(FULL SIZE)



* -19E SPRING CLIP
2 REQ. R. & L. (FULL SIZE)



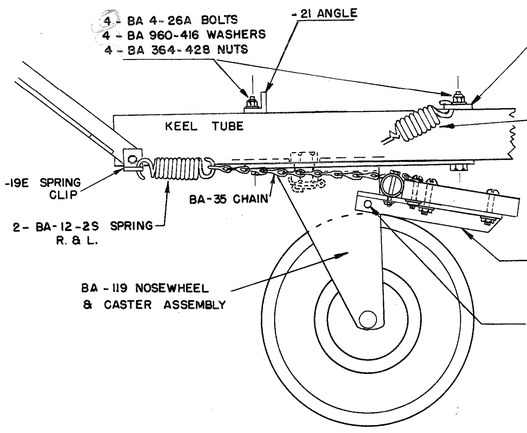
-19 BRAKE PLATE & TUBE ASS'Y.
(HALF SCALE)



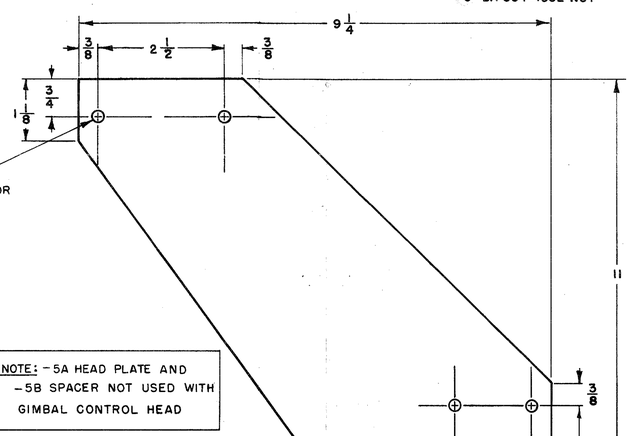
TYPICAL ANGLE END
FULL SCALE
(SEE TABLE FOR LENGTH)

TABLE OF ANGLE LENGTHS	
-11 ANGLE OVERALL LENGTH	27
-17 ANGLE " "	13 3/32
-14 ANGLE " "	10 3/4
-12 ANGLE ℄ DISTANCE BETWEEN HOLES	26
-13 ANGLE " " " "	47
(3/16 HOLE LOCATED 23 1/2 ON CENTERS)	

NOTE: -14 ANGLE HAS ONE TYPICAL END AND THE OTHER IS TYPICAL WITH THE EXCEPTION OF A 3/16 HOLE 3/8 FROM THE END, IN PLACE OF A 1/4 HOLE 1/2 FROM END OF ANGLE.
LOWER END OF -13 ANGLE HAS 1 1/8 FLAT IN PLACE OF TYPICAL 1"

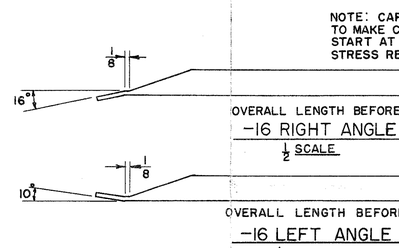


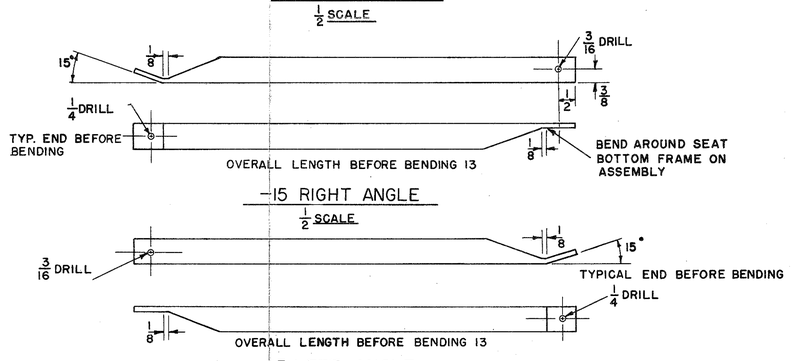
-19 NOSEWHEEL & BRAKE ASSEMBLY
(3/8 SCALE)
REVISED 7-15-64 - E.B.T.

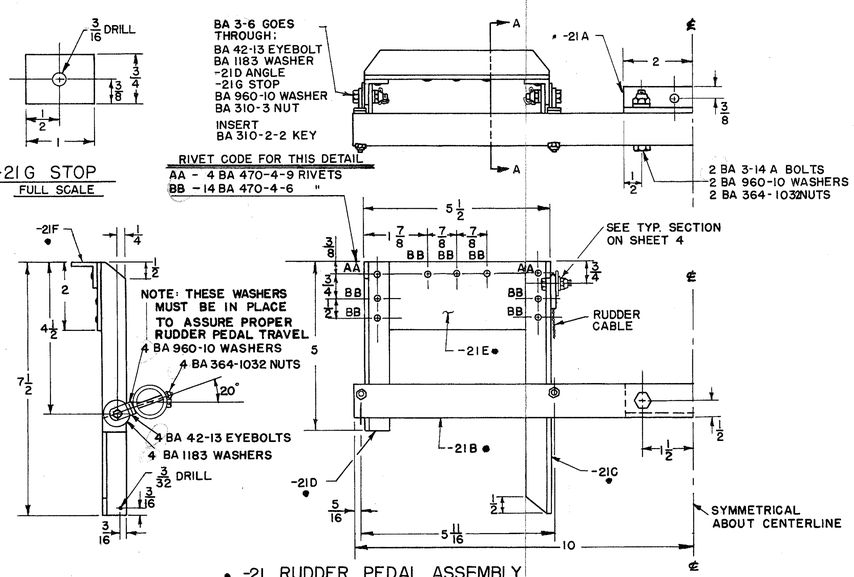


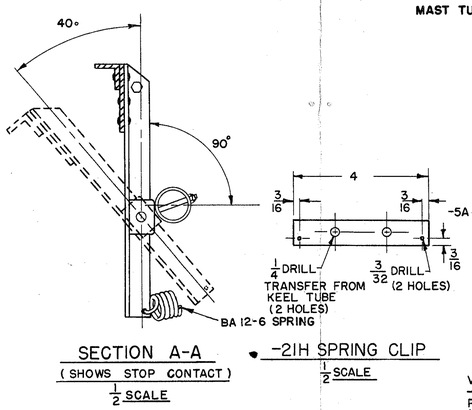
NOTE: -5A HEAD PLATE AND -5B SPACER NOT USED WITH GIMBAL CONTROL HEAD

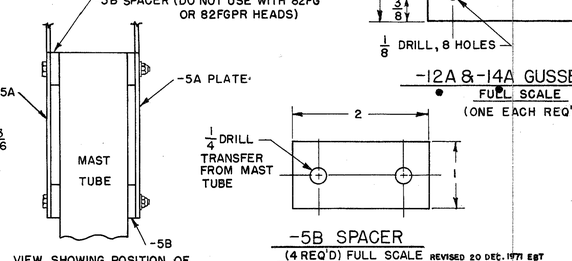
-5A HEAD PLATE
(3/4 SCALE)

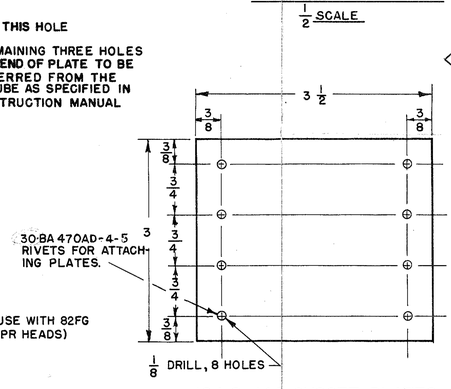


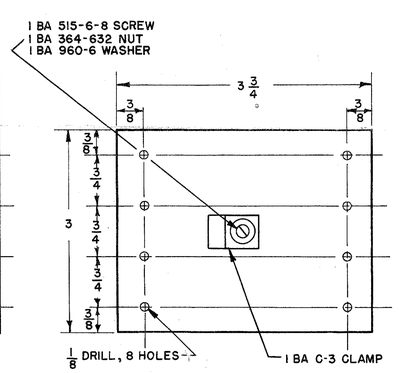












PART NO.	PART NAME	STOCK SIZE	MATERIAL	MATERIAL SPEC
COPYRIGHT 1960 PATENTS PENDING				
TOLERANCE			TOTAL CALC WT.	TOTAL ACT WT.
DETAILS MODEL B-8				
LAYOUT	DRAWN	CHECKED	ENG APP.	CUST APP.
Eric E. Smart	Eric E. Smart		8-1-60	
June 1960	June 1960			

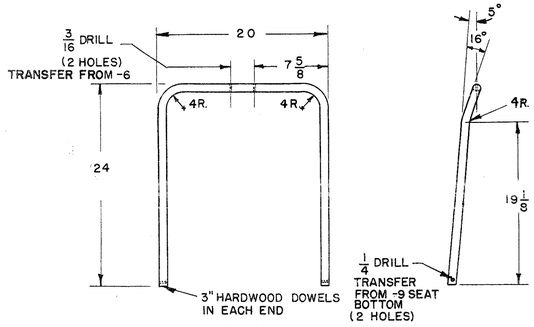
SHEET NO. 3
SCALE AS SHOWN
REVISED CASTER 7-15-64 E.B.T.

BENSEN AIRCRAFT CORP.
8-104-100

REVISED 20 DEC. 1971 EST
REV. 2 NOV. 1971 EST
REV. 31 DEC. 1969 LKD
REVISED 2 OCT. 1968 - HMC
REV. 17 JULY 1967 GWK

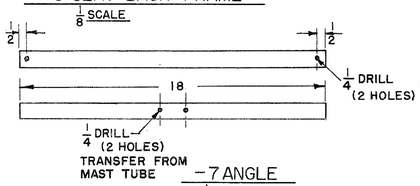
PRINTED IN U.S.A.

STANFAST CO. WHITESTONE, N.Y. U.S.A.



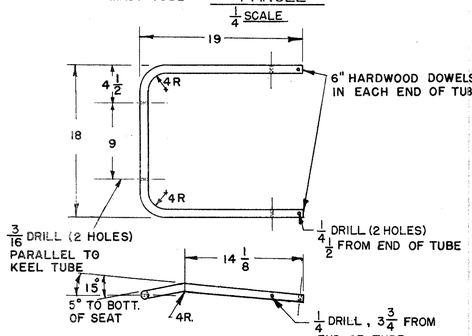
-8 SEAT BACK FRAME

1/8 SCALE



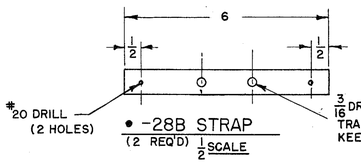
-7 ANGLE

1/4 SCALE



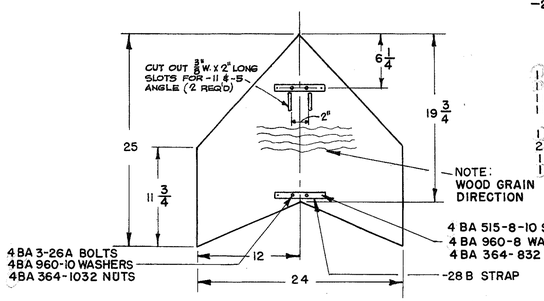
-9 SEAT BOTTOM FRAME

1/8 SCALE



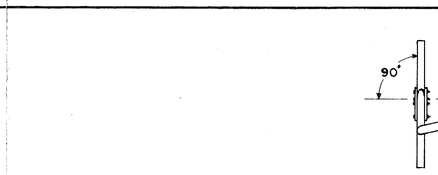
• -28B STRAP

(2 REQ'D) 1/2 SCALE



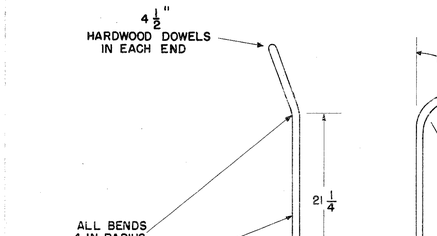
• -28A HORIZONTAL STABILIZER

1/8 SCALE



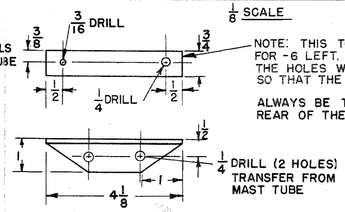
-26 CONTROL STICK ASSEMBLY

1/8 SCALE



• -26C PLATE

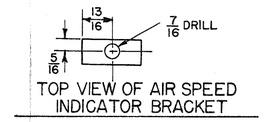
1/2 SCALE



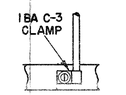
-6 ANGLE

1/2 SCALE

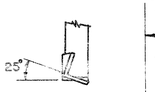
NOTE: THIS TOP VIEW IS FOR -6 LEFT. FOR -6 RIGHT THE HOLES WILL BE REVERSED SO THAT THE 1/4 HOLE WILL ALWAYS BE TOWARD THE REAR OF THE CRAFT.



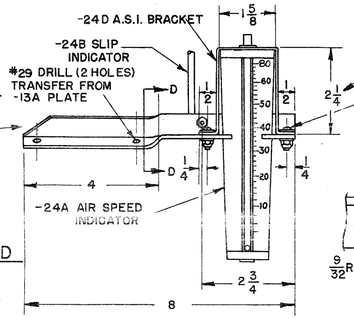
TOP VIEW OF AIR SPEED INDICATOR BRACKET



VIEW OF -24B ATTACHMENT



SECTION D-D

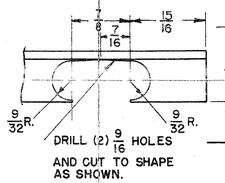


-24 INDICATOR ASSEMBLY

HALF SCALE

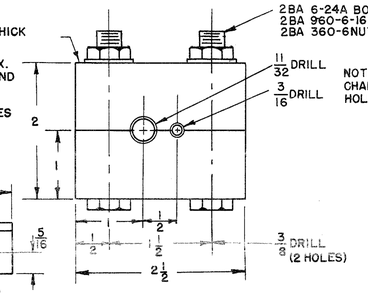
THIS DIMENSION APPROX. EXACT DIM. WILL DEPEND ON SLOT LENGTH.

THIS ASSEMBLY REQUIRES
5 BA 515-6-8 SCREWS
8 BA 960-6 WASHERS
5 BA 364-632 NUTS



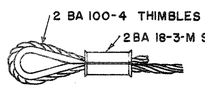
SLOT FOR -24 A

FULL SCALE



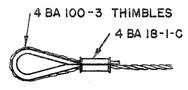
BT 8-104-132 TOOL

FULL SCALE



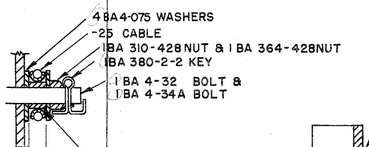
1/8" CABLE END (TYP.)

FULL SCALE



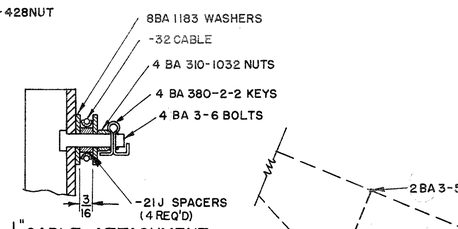
1/16" CABLE END (TYP.)

FULL SCALE



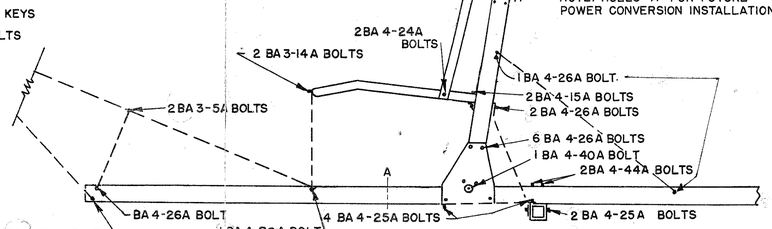
-25 TYPICAL 1/8" CABLE ATTACHMENT

FULL SCALE
FOR AIRFRAME CABLE



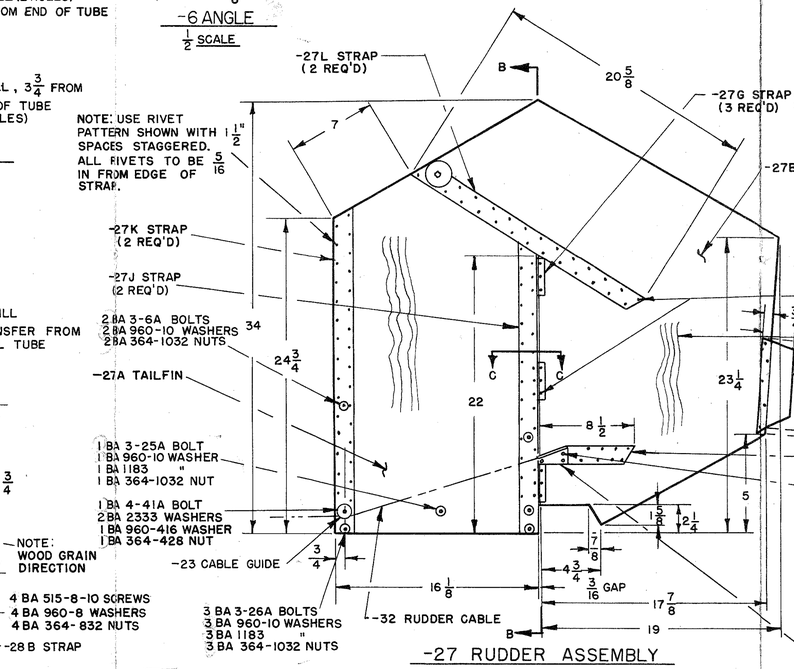
-32 TYP. 1/16" CABLE ATTACHMENT

FULL SCALE
FOR RUDDER CABLE

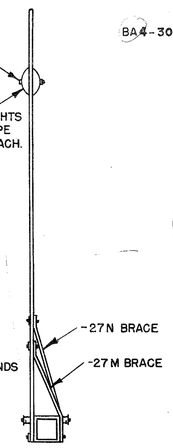


VIEW SHOWING MAJOR AIRFRAME BOLTS

1/8 SCALE

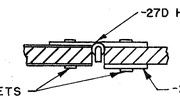


-27 RUDDER ASSEMBLY



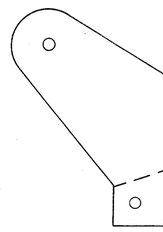
SECTION B-B

3/16 SCALE



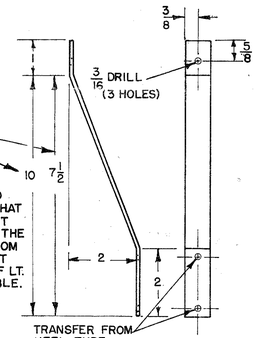
SECTION C-C (HINGE)

FULL SCALE



• -27F CONTROL ARM TEMPLATE

CUT OUT AND USE AS A PATTERN
(2 REQ'D) FULL SCALE



• -27M & -27N DIAGONAL BRACE

1/2 SCALE (1 EACH REQ'D)

PART NO.	PART NAME	STOCK SIZE	MATERIAL	MA'RIAL SPEC
COPYRIGHT 1960- PATENTS PENDING				
TOLERANCE ± 1/64			TOTAL CALC WT.	TOT ACT WT
DETAILS MODEL B-8				
LAYOUT	DRAWN	CHECKED	ENG APP.	CUST APP
Eric E. Smart June 1960	Eric E. Smart June 1960	J. B. B. 8-1-60		
SCALE AS SHOWN	REV 7-15-66	REV 31 MAY 67 GWK		
BENSEN AIRCRAFT CORP.			SHEET NO. 4	8-104-100

REVISED 10 JAN. 1974 - E.B.T
REVISED 20 DEC. 1971 - EBT
31 DEC 1960 LWP
REVISED 21 OCT. 1968 - LWP
REVISED 3 OCT. 1968 - HMC
Rev. 15 Feb 1971 WR REV. 17 JULY 1967 GWK

PRINTED IN U.S.A.

THE ROTOR BLADE (B-7)

To build the rotor, you must first build yourself the BLADE WORK-BENCH. First, buy and assemble in one room all materials mentioned in the List of Materials. Take the 2"x8" board and nail it onto a 2"x10" to form a 'T', as shown in the Sketch 1. Use 5" nails, spacing them 12" apart. Make 2"x4" legs and brace-boards and nail them onto the 2x10 two feet from each end. If your floor is not exactly level, put shims under the legs so the Bench does not rock. Put the level on top of the Work-Bench and make sure that its upper surface is: (1) level in all directions, (2) does not bow in either direction and (3) has no twist. Plane or sand the surface until it is as flat as a good carpenter's level can measure. Spread the wax paper on top of the Bench and tack it with thumb tacks on the front side.

Cut two strips of pine 2"x2"x10' to be used as pressure-pads for gluing operation. Have a roll of wax paper, small nails and brads, Weldwood glue, your shop tools, a minimum of 16 six-inch "C" clamps and a putty knife on hand. You are now ready to go to work.

All components are machined or cut to size before gluing begins. First, prepare the steel spars according to the Drawing: bend 3" of its butt end up 4 degrees; drill and countersink the holes for wood screws. Note the 3/16" locating hole for the Nose Weight. Do not drill six 1/4" holes, nor two 3/8" holes at the root; they are drilled on assembly later. Be sure to prime-coat the steel spars to prevent future corrosion. The upper retention straps may be prepared at the same time, priming and bending their ends 4 degrees up.

Cut the leading edge strip 3/4"xl"x10', plane and mark the side to be glued. Cut the wood spar to size; note the taper of 7 degrees chord-wise and 2 1/2" to 1" taper spanwise. To make sure that it is absolutely square, saw it to a "chalk line" and plane true. Make it oversize in length. Cut root and tip filler-blocks on a 7 degree taper, make oversize in width and length, to be fitted later. Do not cut 4 1/2" bevel at the root yet, leaving the end square.

Leave the lower and upper skin covers also overlength. If your lumber yard cannot supply you with 1/8" plywood in 10 ft lengths, you may join several shorter lengths together using the "scarf Joint" shown in the Sketch 2, or order a set of 10 ft skins from the Bensen factory. Cut the front edge of the upper cover to a "Chalk line" and plane straight. Its rear edge is cut on a 7 degree bevel and planed to a feather edge. The lower cover is cut rectangular for the time being, 1/4" oversize in width. The taper and reflex bevel will be cut later.

Now all parts are assembled and fitted together in the following manner:

Place the leading edge strip on top of the wax paper flush with the front edge of the bench. Align its rear edge marked for gluing to a chalk-line on the bench to assure straightness, and tack it in place with a few nails to the bench. Now place the Wood Spar in position butted against the leading edge strip. Slide the Root Filler Block into position under it and scribe a line on the Filler Block along the rear edge of the spar. Remove it and saw on line. Place the Block back in place, plane the top if necessary to flush with wood spar. Use the same procedure with the Tip Filler.

Now lay the top cover in position; check all points for close fit. If satisfactory, remove it, the wood spar and the filler blocks. The blade is now ready for gluing.

In first gluing operation, spread a thin coat of glue full length of the wood spar on rear 1/2 inch of bottom, and a thin coat of glue on the joining surface of the lower cover. Push the spar in place against the Leading Edge, and anchor with several small brads through the Spar into the Lower Cover. Root and Tip Filler Blocks are next. Put a thin coat of glue on their bottom and on the lower cover where they join; use a few small brads to anchor.

The Top Cover is next. Spread a thin coat of glue where the cover joins the Wood Spar; on full length of the 1" scarf joint; on the area of filler block contact; on top of spar; both filler blocks; and the Lower Cover where it forms a scarf joint with the Upper Cover. Lay the Top Cover in place freely; do not force it into position as it may cause the blade to twist later. When properly located, anchor with a few small brads or wire nails.

Now apply the Pressure Strips with 'C' clamps. First lay a length of wax paper on top of the blade, then lay one 2"x2"xl0' strip over the wood spar just rear of the leading edge; clamp with 8 or more 'C' clamps evenly tightened. Lay the other 2"x2"xl0' strip so its rear edge is flush with the rear edge of the Top Cover. Clamp evenly as the front strip. Wipe off all excess glue that squeezes out at seams. Now remove the Leading Edge. Again clean off thoroughly all excess glue from the strip and the front face of the wood spar.

Let the blade set for at least 10 hours or more with room temperature over 70 degrees and humidity of 50 percent or less.

The Leading Edge is then glued in place to the Wood Spar. Pressure on the leading edge strap is applied either by nailing through the strip into the wood spar, or by using 2" long wood screws spaced 12" apart. Lead holes must be drilled for either. After the glue has dried, nails or screws are removed, holes drilled oversize to accomodate 3/16" hard-wood dowels 2" long, which are inserted 12" apart and glued in place.

The blade may now be removed from the bench. All that remains now is to glue the Upper Retention Filler Pad. It may be held in place until the glue dries with two clamps with wood strips for pressure pads.

Let the blade season for several days in warm dry air to remove all glue moisture. Metal spars can then be screwed in place. Be sure to drill lead holes for the wood screws about ?" deep. Diameter of the lead holes should be about half of the screw diameter. A rubber-type adhesive may be used under the spar to assure a better bond with the wood, but not absolutely necessary.

Root and tip ends are now cut and sanded to shape. Excess piec es sawed off at the ends are used as glue test-samples. Break them at glue joints: all joints should pull wood. If they part at glue surfaces, the blade may be unsound mechanically and should be either rebuilt or discarded.

Use the leading edge as your guide to saw the blade to proper width. Then bank on the bottom of blade and saw the 7 degree reflex bevel on the trailing edge.

Now shape the leading edge by planing and sanding or by multiple-step saw cuts, or both, Make an Airfoil Template form the Drawing to constantly check the airfoil contour. Remember, round leading edges, sharp trailing edges and smooth surfaces are essential to good aero dynamic performance.

Fill large depressions, cracks and openings around the spar with plastic wood; or a mixture of plastic v/ood and primer-surfacer. Use a sanding block rather than free hand for all contour sanding. Blades should then be sealed with a thinned mixture of good quality of wood sealer.

Clamp the Upper Retention strip in place. 3e sure the distance between the spar and the strap is exactly 3/4" and they are parallel. This is quite important, bacause the Hub Plate is also 3/4" thick aluminum piece, and the steel straps must go from wood to aluminum without wedging or pinching. Drill six 1/3" holes in one setting and bolt together as shown on the print.

You are now ready to install the Nose Weight and the Trim Tab.

The Nose Weight consists of a 5" wide, 0.062" thick steel strip bent in U-shape, filled with plumber's solder and attached to the leading edge of the blade 24" from the tip. Use the Drawing as your template of the shape of the steel strip. Weld or braze the end plates on the sides of the U and the retention posts to hold the solder firmly in place. After they are filled with solder, the weights should weigh exactly 29 oz apiece. Use the 9th hole from the tip in the steel spar to locate your first outboard hole in the Nose Weight. The other two holes will straddle the No. 10 hole. Drill through with No. 11 (or 3/16") drill and use #10-32 (or 3/16") bolts to clamp the weight on the blade, Thin self-locking nuts, or shear nuts with lock-washers should be used and later may be covered with balsa streamlined caps. But you can fly also with the bolts unfaired.

The Trim Tabs are made of 0.020" to 0.030" thick aluminum sheet cut 2"x6" and located 6" from the tip of the blade. One inch of its width overhangs the trailing edge of the blade and is bent up 10 degrees. To assure a better bond, glue it on with a rubber-type adhesive and secure it with three flush rivets.

Finally, sand down the blade thoroughly, leaving no ridges, nor depressions, especially on the upper surface, round off the tip as shown, and cover the blade with the primer-surfacer. When completely dry, sand down with block and fine sandpaper and cover again with the primer-surfacer. After another thorough sanding, paint it with two coats of hard-gloss exterior synthetic enamel.

For a still more durable finish, you may cover the leading and trailing edges of your blades with aircraft fabric, or Fiberglas. That type of finish will last several years. However, if you never used aircraft dope, or polyesters, before, you will be better off to stick to the simpler procedure.

Your rotor blade is now ready for assembly. If it was correctly built, it will weigh 14 pounds fully assembled and its center of gravity will be at the station 57.

Notice that the inboard ends of the steel straps are not drilled yet. They will be drilled "on assembly" later, when attached onto the Rotor Hub.

If you made any mistakes on one blade, which might affect its weight distribution, or stiffness, you must repeat them on the second blade, or else start anew. It is very important that the two blades are exactly alike, as you will see from the instructions on "Rotor Tracking". The better work you do when building the blades, the fewer problems you will have when you start flying.

One last word of caution. Take good care of your rotor blades, because they are what keeps you in the air when you fly. Keep them out of the rain, snow and sandstorms. When storing them for a long time, leave them lying flat on the work-bench in a dry cool place. Watch for signs of rusting or severe warping, which usually come with excessive humidity.

Remember, rotor blades are your wings. Protect them as you do your arms and legs. If you do, they will give you many years of efficient and trouble-free service.

LIST OF CONSTRUCTION MATERIALS
1 Qt. Primer-Surfacer
1 Lb. Weldwood Glue
1 Roll of Wax Paper
1 Pt. of Zinc Chromate Primer,
Red Lead Primer of Alum. Paint
1 Pt, of good Wood Sealer
1/4 Lb. of Plastic Wood
1 Small Box of Thumb Tacks
3 Lbs Plumber's Solder Sticks
1 Qt. Good Exterior Enamel
1 Box of Wire Nails
1 Box of brads
List of materials for one set, complete
? ?? ???????? ??. ??????????? ????????? ?????? ?????????
7-103-001 2 Main Spars, 1018 Steel* 1/8"x2"x118"
7-103-002 2 Upper Retention Straps, 1018 1/8"x2"x13"
7-103-003 2 Wood spars, Plywood, 5-ply 1/2"x21/2"10'
7-103-004 2 Leading Edges, White Pine 3/4"x11/4"x10'
7-103-005 2 Upper Skin Covers, 3 -ply Plywood 1/8"x5 3/8"x10'
7-103-006 2 Lower Skin Covers, 3-ply Plywood 1/8 x6"/10'
7-103-007 2 Upper Filler Pads, 5-ply Plywood 1/2"x3"x13"
7-103-008 2 Root Filler Blocks, 3-ply Plywood 3/8"x3"x20"
7-103-009 2 Tip Filler Blocks, 3-ply Plywood 3/8"x3"x6"
7-103-013 2 Aluminum Trim Tabs .030"x2"x6"
7-103-01416 2 Nose Weights, 1018 Steel gage 5"x9"
7-103-015 116 Screws, Flat-Head #6x1/2"
AN 4-14 12 Bolts for Blade Root 1/4"x1 1/16" grip
AN 960-416 12 Washers" 1/4"
AN 363-428 12 Stop Nuts " 1/4"-28
AN 23-19 6 Clevis Bolts for Nose Weights 3/16"x7/8" grip
AN 364-1032 6 Stop Nuts, Thin #10-32
AN 6-15 4 Bolts, Blade-to-Hub 3/8"x1 1/16" grip
AN 310-6 4 Nuts, castellated " 3/8"-24
AN 960-616 8 Washers " 3/8"
  4 Cotter Pins " 1/16"x1"
AN 456-A4-4 6 Rivets, Aluminum, soft 1/8"x 1/4"