

ROCKWELL J10, Model L-230
 2 cycle, Single cylinder
 Weight: 29 lbs.
 15.5 H.P. @ 6000 R.P.M.
 11.5 H.P. @ 4500 R.P.M.
 with 36" dia., 16" pitch
 propeller

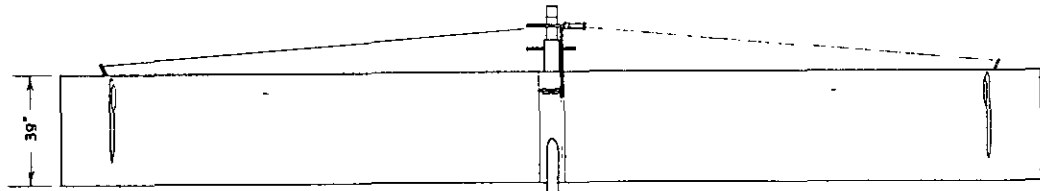
Flybike

A DIFFERENT FLIGHT SENSATION...

CONTROLS ARE ULTRA SIMPLE AND PROVIDE A TRUE FEELING OF FLIGHT. ARM MOVEMENTS ARE SIMILAR TO WING MOVEMENTS OF A SOARING BIRD. FORWARD WING MOTION CAUSES ASCENT, REARWARD MOTION CAUSES DESCENT TO TURN RIGHT, EXTEND LEFT WING, PULL IN RIGHT WING... AND YOU GET TWO HOURS OF JONATHAN LIVINGSTON MANEUVERING ON ONE GALLON OF REGULAR GAS. TWIST GRIP GAS THROTTLE ON RIGHT HANDLEBAR PROVIDES INSTANT CONTROL.

UNIQUE CONSTRUCTION...

WING PANEL IS MADE UP OF FRONT SPAR, REAR SPAR, AND SOLID STYROFOAM. ENTIRE PANEL IS MIRROR FINISHED WITH EPXYED FABRIC. SIMPLE, LIGHT, AND EXTREMELY STRONG. BOTH PANELS WEIGH 50 LBS. 4" x .035 ALUMINUM BOOM IS INTERNALLY BRACED WITH A DOWEL AND SPAR ARRANGEMENT. TAIL GROUP IS OF SOLID STYROFOAM WITH WOOD SPARS. FRAME IS 5/8" x .035 STEEL TUBING. GO-KART WHEEL USED. SEAT AND ENGINE MOUNT ARE OF SPRUCE.



DIMENSIONS -	
WINGSPAN	28 - 7 3/4"
WING CHORD (CONSTANT)	3 - 3"
ASPECT RATIO	8.8
WING AREA	92.0 SQ FT
WING LOADING	3.8 LB/SQ FT
STABILIZER SPAN	6 - 0"
STAB - ELEV CHORD (MEAN)	2 - 6"
STAB - ELEV AREA	15 SQ FT
TOTAL FIN AREA	4 SQ FT
CL TO HINGE	5 - 9"
AIRFOIL	CLARK Y

WEIGHTS -	
GROSS	350 LBS
EMPTY	145 LBS
MAX PILOT WT	230 LBS

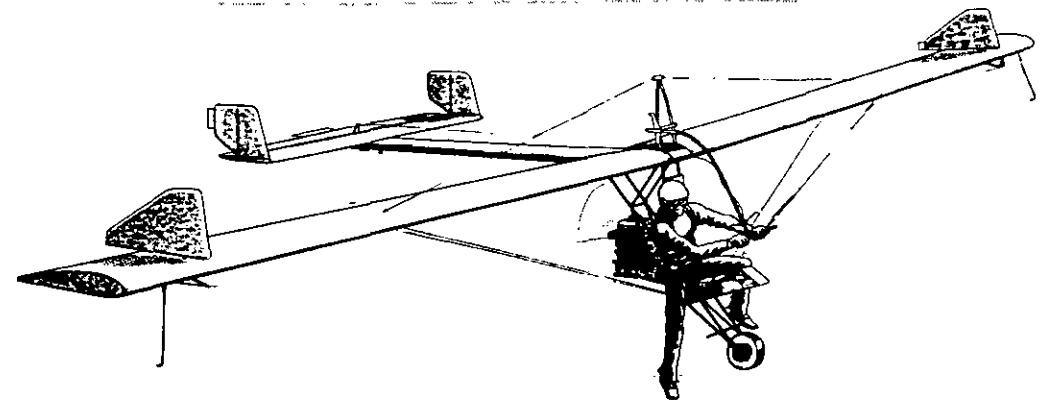
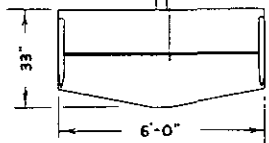
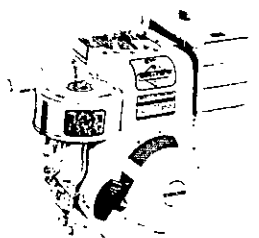
PERFORMANCE -	
CRUISE SPEED	45 MPH
MAX SPEED	54 MPH
STALL (POWER OFF)	23 MPH
STALL (POWER ON)	20 MPH
BEST GLIDE SPEED	33 MPH
GLIDE RATIO	12:1
TAKE OFF OVER 50 OBSTACLE	650 FT.
RATE OF CLIMB	250 FT/MIN

ENGINE - BRIGGS & STRATTON 190400	
HORSEPOWER	8 HP @ 3600 RPM
MAX. BHP	7.25 @ 3000 RPM
MAX TORQUE	12.7 FT/LB @ 2600 RPM
DISPLACEMENT	19.44 CU IN (320 CC)
BORE & STROKE	3 x 2 3/4 IN.
POWER LOADING	4.3 LB/HP
FUEL CAP.	1 GAL. REG
FLIGHT DURATION	2 HRS
WEIGHT	45 LBS.

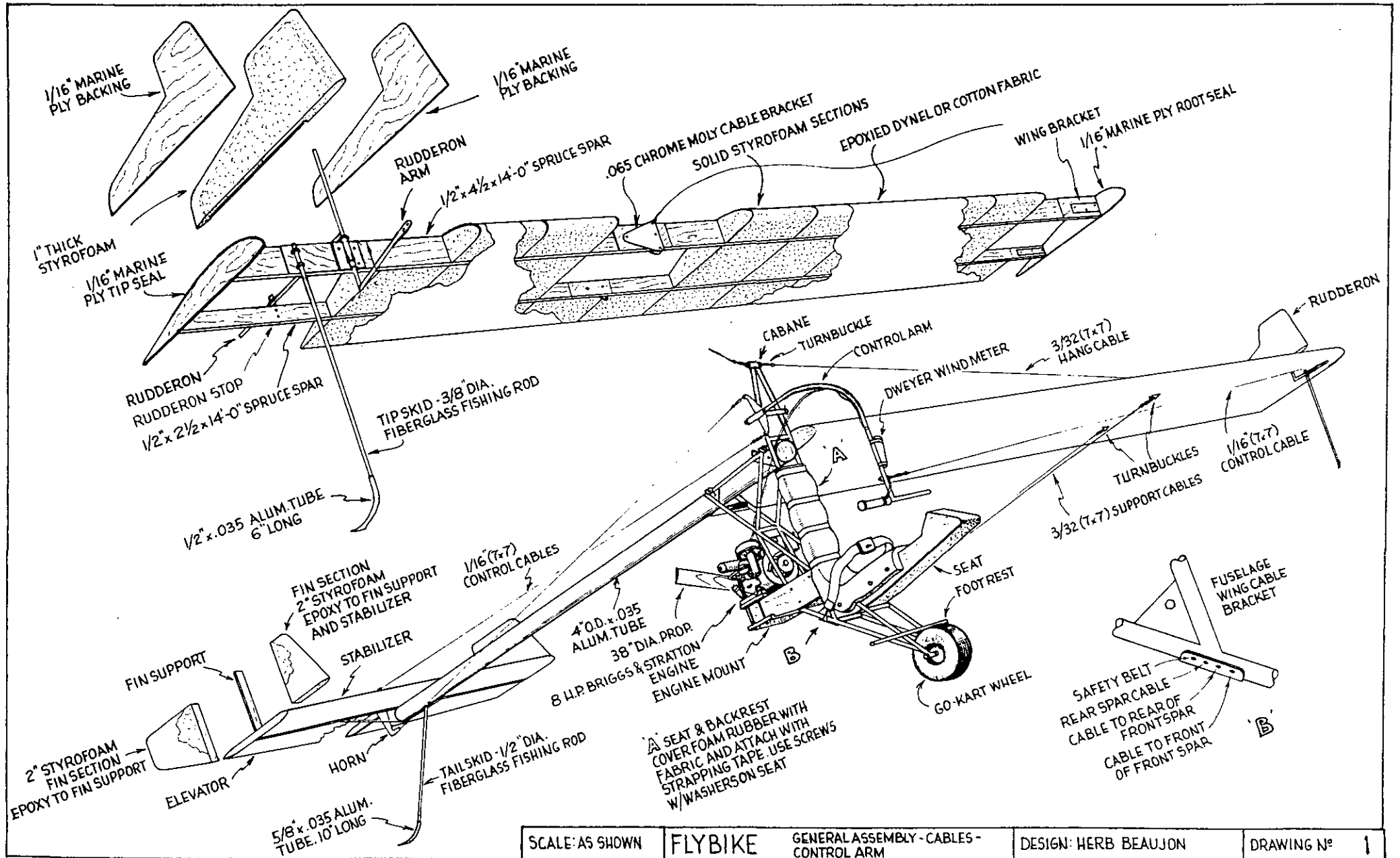
SERVICE CEILING	6000 FT.
MAX. G. LOADING	3.5 +
RANGE	100 MI.

PROPELLER DIA.	38 IN
PROPELLER PITCH	26 IN
PROPELLER P/D	7

YOUR 8 H.P. BRIGGS & STRATTON ENGINE COMES COMPLETE WITH GAS TANK, MUFFLER, AIR FILTER, ETC.



Series	Bore	Stroke	Disp.	H.P.	Net Wt.
190400	3	2 3/4	19.44	8.0	43



SCALE: AS SHOWN

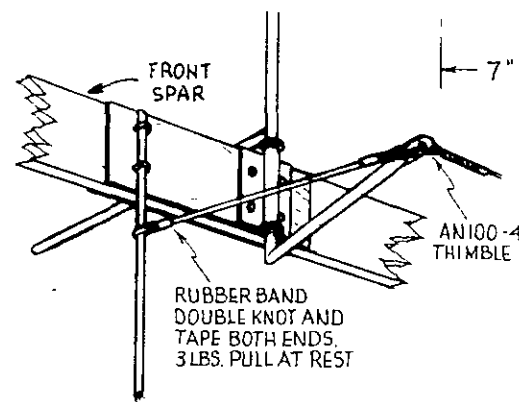
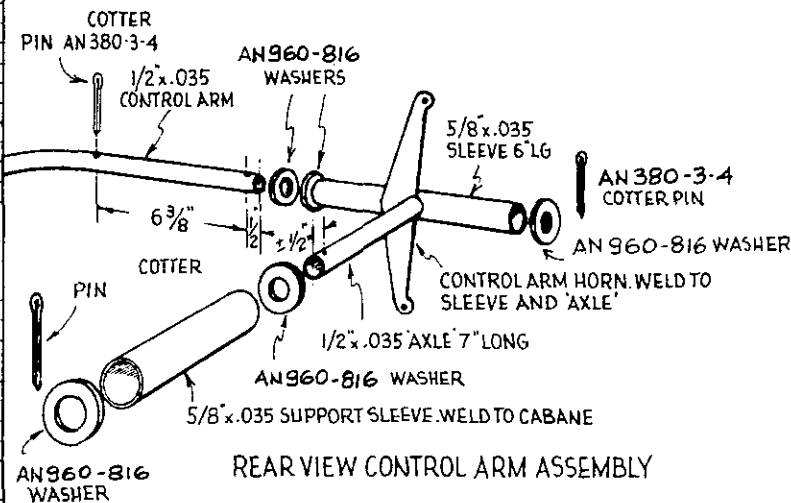
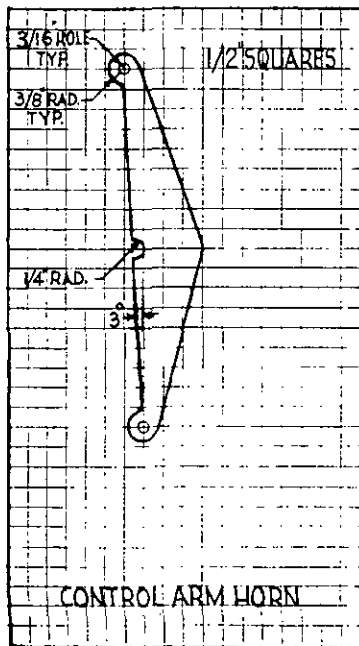
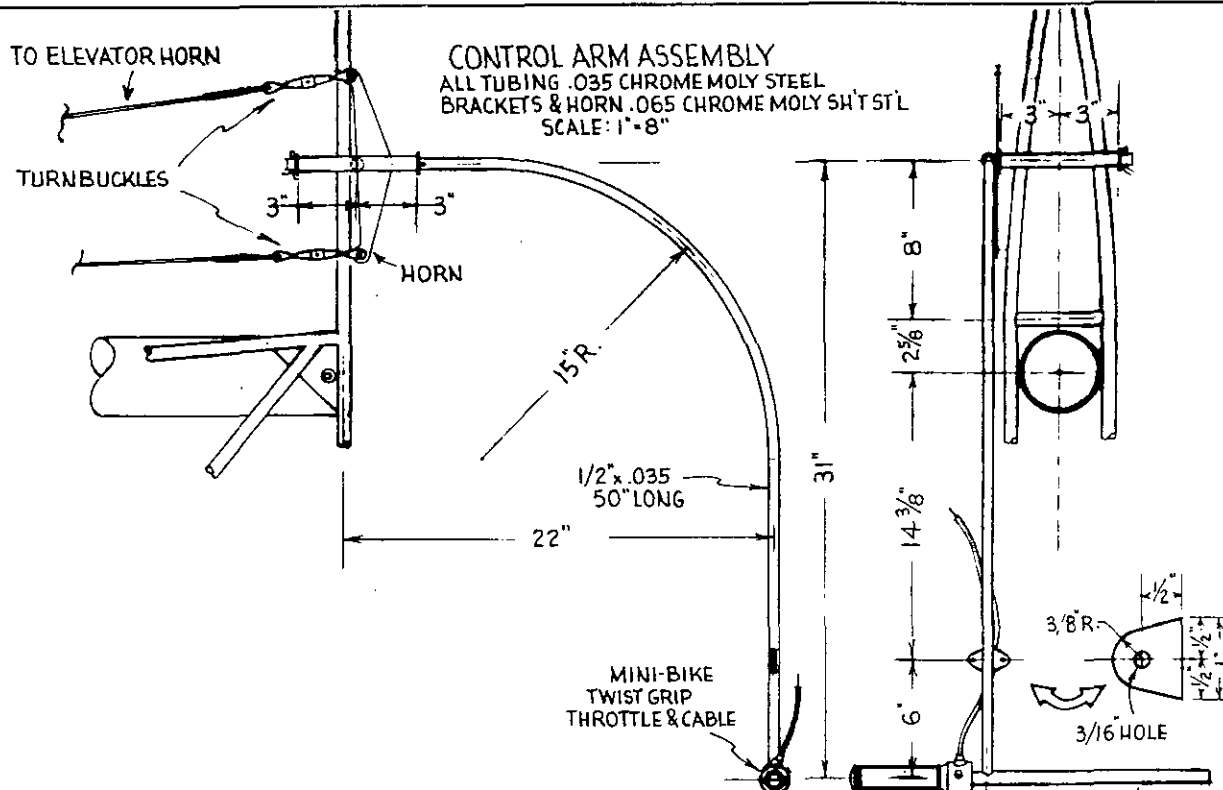
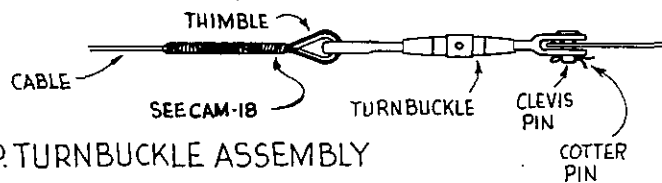
FLYBIKE

GENERAL ASSEMBLY - CABLES - CONTROL ARM

DESIGN: HERB BEAUJON

DRAWING N° 1

CABLE AND TURNBUCKLE ASSEMBLY					
AREA USED	MIL-C1511 CABLE	THIMBLE	TURNBUCKLE EYE-BARREL-FORK	CLEVIS PIN	COTTER PIN
ELEVATOR RUDDERON CONTROLS	1/16(7x7) 52 FT REQ'D	AN100-4 8 REQ'D	AN130-5 S 4 REQ'D	AN393-9 4 REQ'D	AN24665 -132 4 REQ'D
WING SUPPORTS	3/32(7x7) 100 FT. REQ'D	AN100-4 16 REQ'D	AN130-8 S 8 REQ'D	AN393-9 8 REQ'D	AN24665 -132 8 REQ'D



SCALE: AS SHOWN

FLYBIKE

GENERAL ASSEMBLY - CABLES - CONTROL ARM

DESIGN: HERB BEAUJON

DRAWING N° 2

NOTE: ALL STEEL FITTINGS & TUBING OF 4130 CHROMOLY

1/16" PLY END

SEE DETAIL 'A'
(PG. 6)

ENTIRE PANEL SOLID POLYSTYRENE FOAM. SECTIONS 12" WIDE, EPOXIED TOGETHER, TO SPARS, FITTINGS, AND 1/16" PLY ENDS (SEE 'INSTRUCTIONS')

SPRUCE SPARS

TOP VIEW
SCALE: 1" = 16"

RUDDERON

1/16" PLY END

SEE 'TYPICAL WING SECTION'
(PG. 6)

TRAILING EDGE

LEADING EDGE

SPAR LENGTH 14'-0"

96"

10"

2 1/2"

8 1/2"

1/16" PLY BOTH SIDES

FRONT SPAR

3"

9"

54"

REAR SPAR

7"

11"

2 1/2"

6"

1/16" PLY BOTH SIDES

TIP SKID - 3/8" x 30" FIBER-GLASS FISHING ROD

1/2" x .035 ALUM. EPOXY TO ROD BEND & FLATTEN TIP

SPAR CLEARANCE 1/4"

SPAR CLEARANCE 1/4"

SPAR CLEARANCE 1/4"

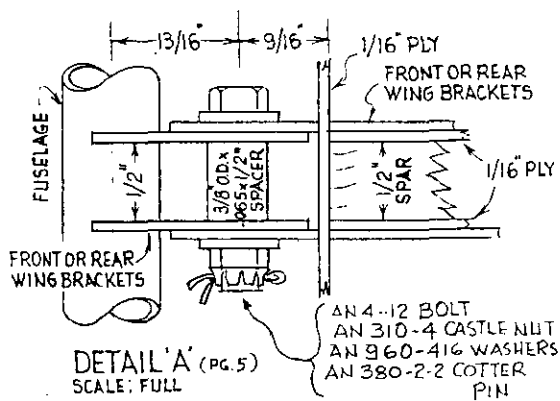
SPAR CLEARANCE 1/4"

FRONT SPAR CABLE B'K'T (FRONT SIDE) SCALE: 1" = 6"

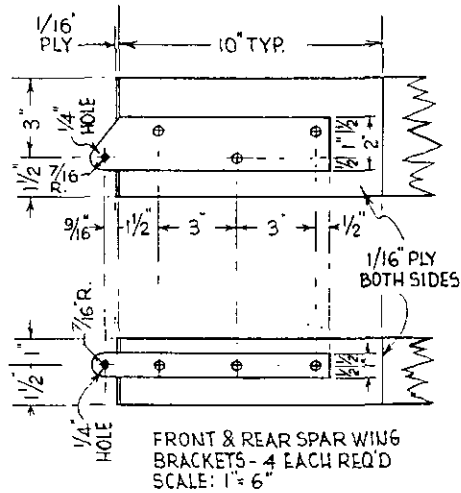
FRONT SPAR CABLE B'K'T (REAR SIDE) SCALE: 1" = 6"

REAR SPAR CABLE B'K'T (REAR SIDE) SCALE: 1" = 6"

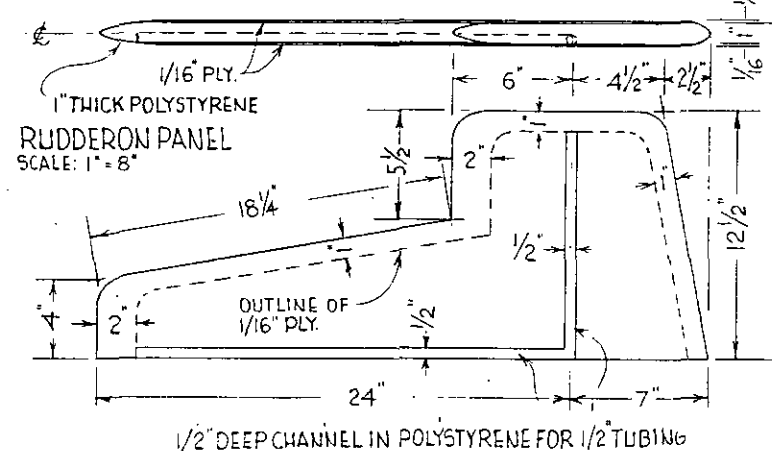
NOTE: HEAT & BEND EXPOSED PART IN LINE W/FRAME B'K'T.



NOTE: ON ALL FITTINGS SHOWN ABOVE DRILL 1/4" HOLES AS INDICATED & ATTACH TO SPARS WITH AN 4-11A BOLTS AN 365-428 NUTS FITTINGS: .065 CHROMOLY SHEET



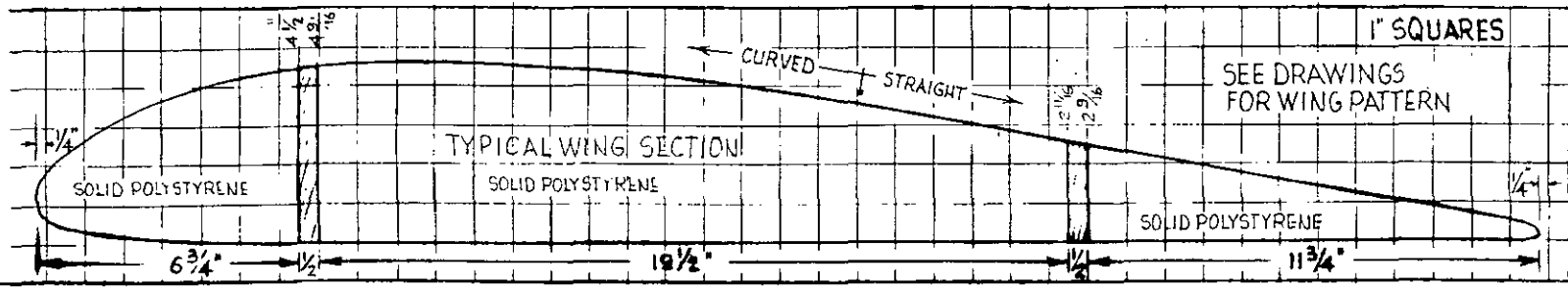
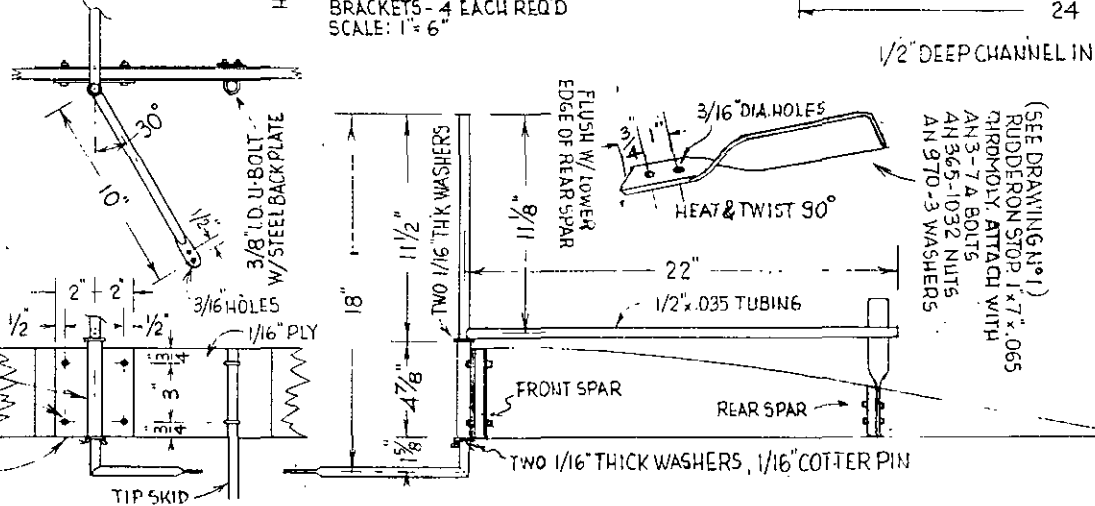
SEE DWG N°13 FOR OPTIONAL DRAG AILERON



5/8" x .035 TUBING, 4 7/8" LONG

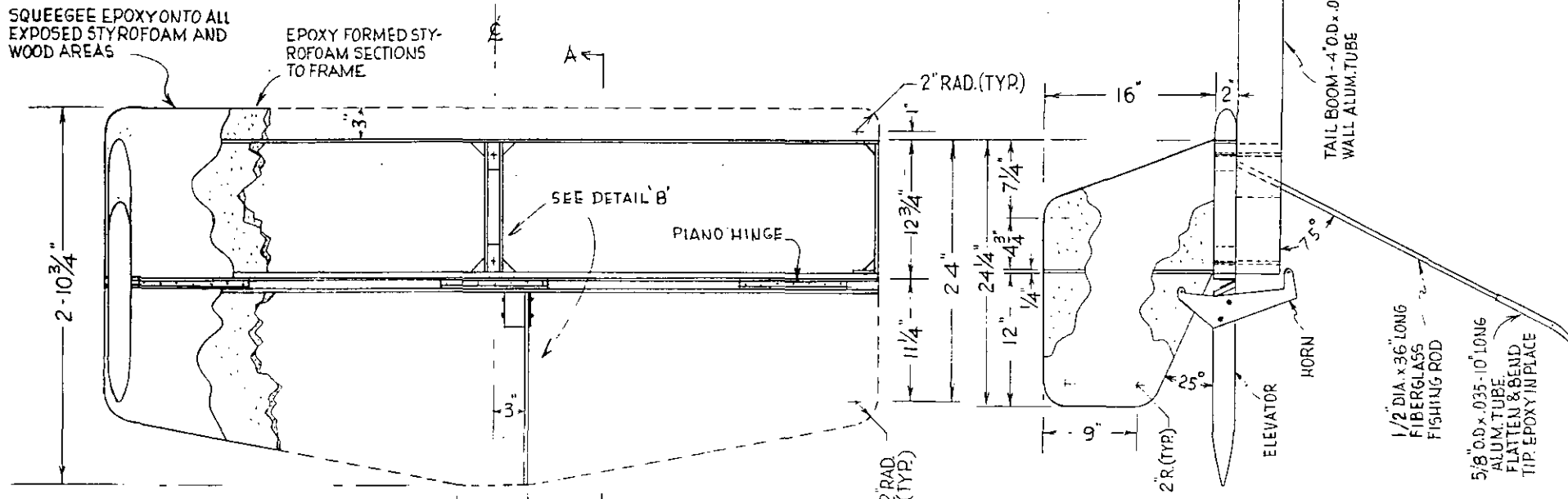
AN 3-10A BOLTS
AN 365-1032 NUTS
AN 970-3 WASHERS

4" x 4 1/2" x .065 CHROME-MOLY BASE PLATE DRILL 3/16" HOLES. WELD TO 4 7/8" x 5/8" x .035 GUIDE TUBE

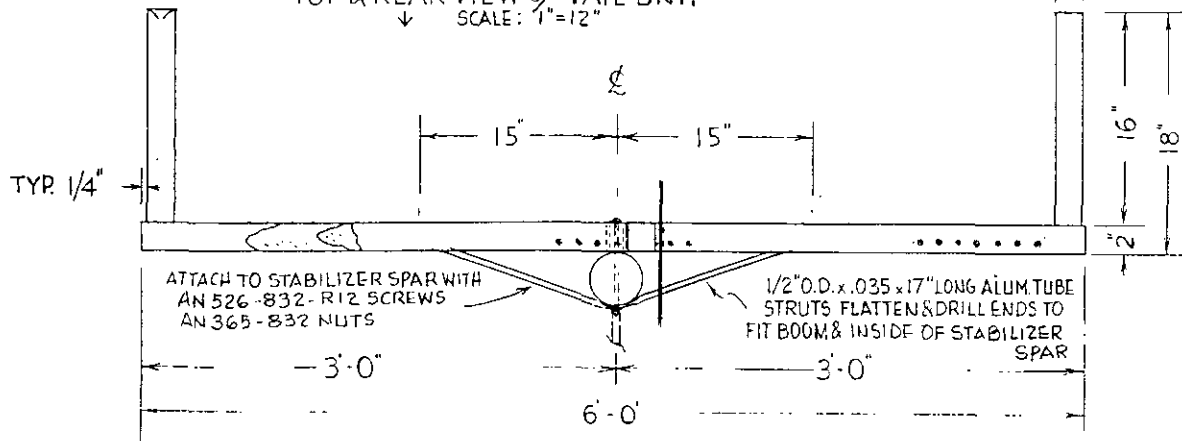


SQUEEGEE EPOXY ONTO ALL EXPOSED STYROFOAM AND WOOD AREAS

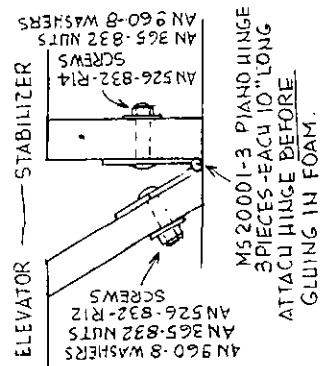
EPOXY FORMED STYROFOAM SECTIONS TO FRAME



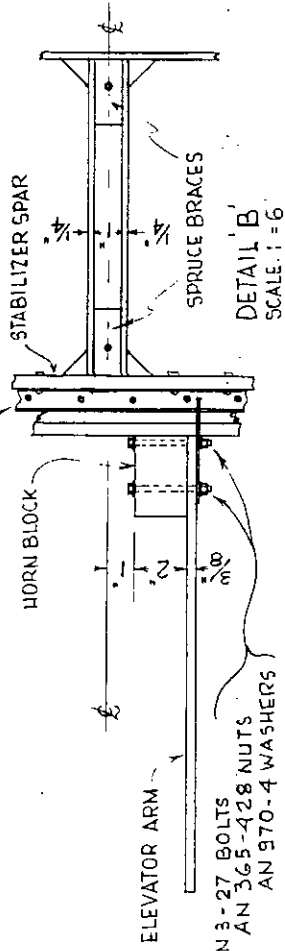
↑ TOP & REAR VIEW OF TAIL UNIT
↓ SCALE: 1"=12"



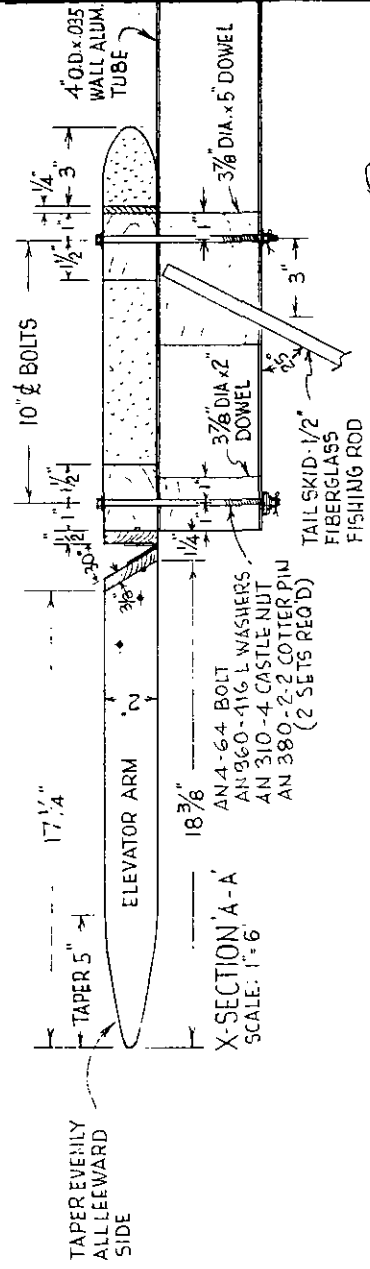
NOTE: USE WHITE STYROFOAM (1 LB./CU. FT.)



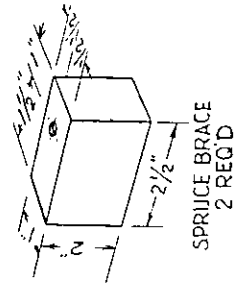
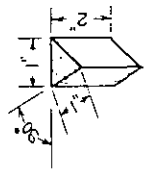
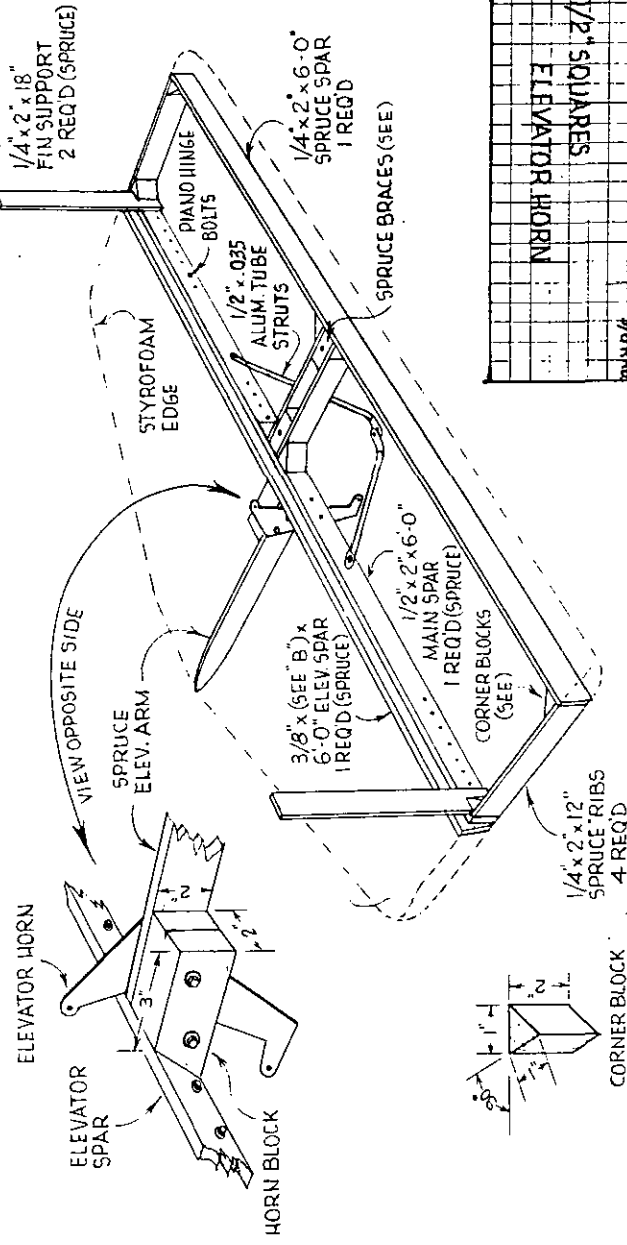
1/4" WIDE x 10" LONG DURAL PIANO HINGE,
3 REQ'D



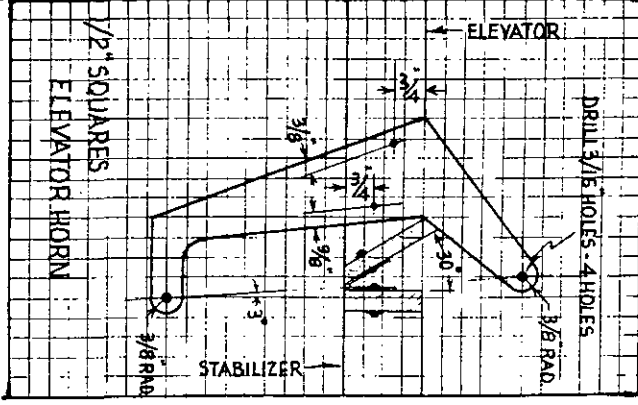
AN 3-27 BOLTS
AN 3/65-428 NUTS
AN 970-4 WASHERS

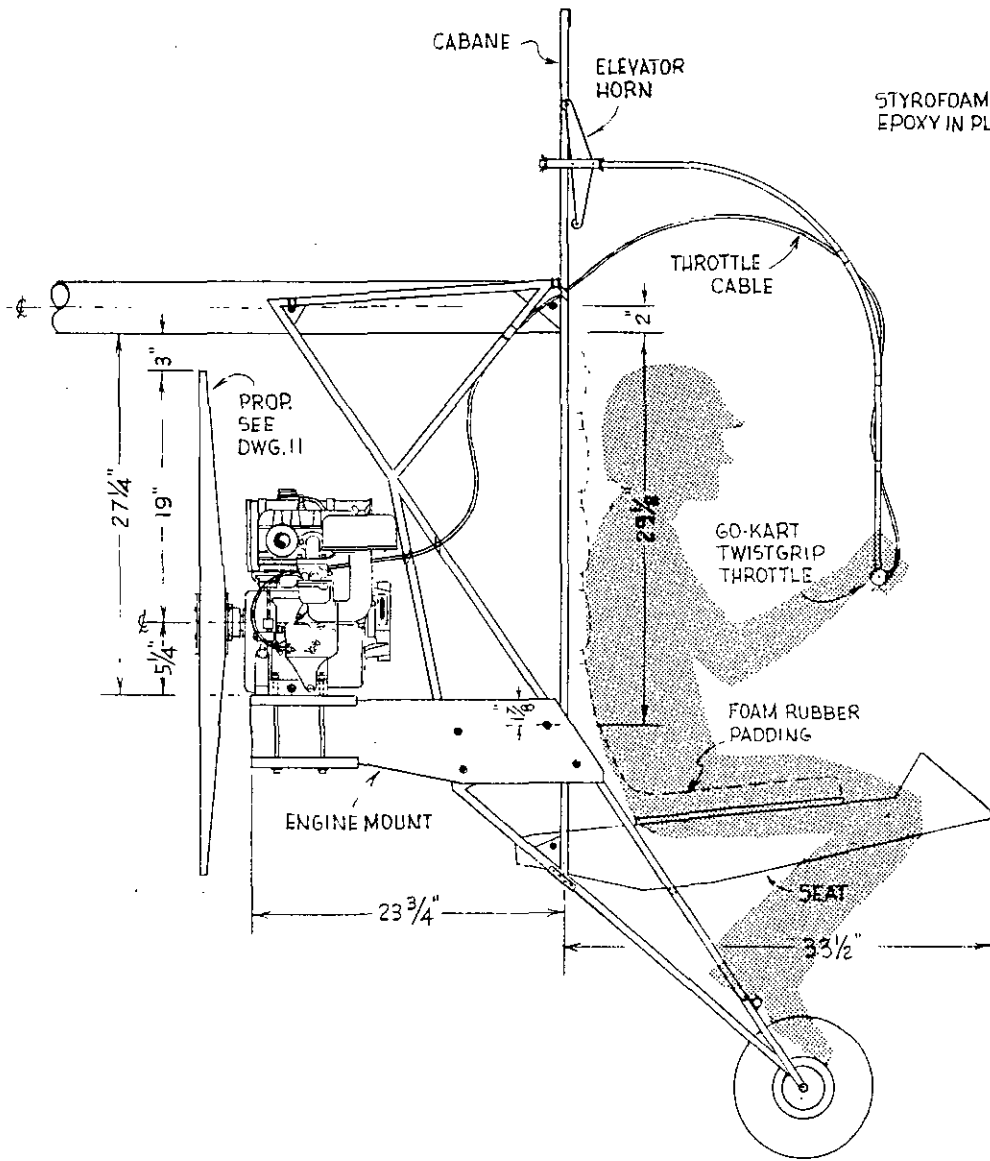


TAPER EVENLY
ALL LEeward
SIDE

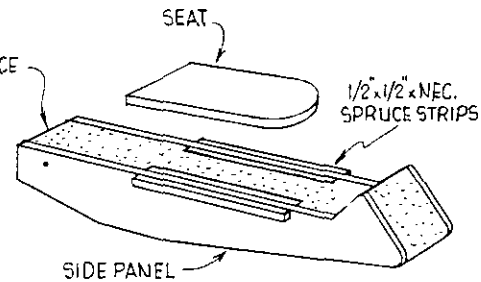


TAIL FRAME
CUT, SAND AND DRILL ALL SPRUCE PARTS TO PROPER DIMENSIONS. EPOXY ALL CONTACTS TO FORM RIGID FRAME. BOLT HORN. INSTALL 1/4" WIDE DURAL PIANO HINGE. CUT STYROFOAM FROM 2" x 24" x 8-0" SHEETS AND EPOXY TO FRAME. (SEE INSTRUCTIONS)

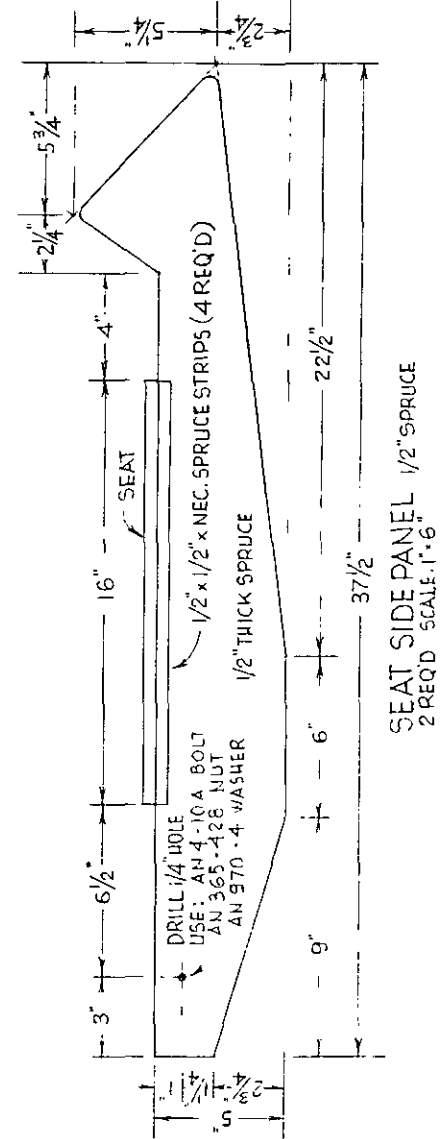
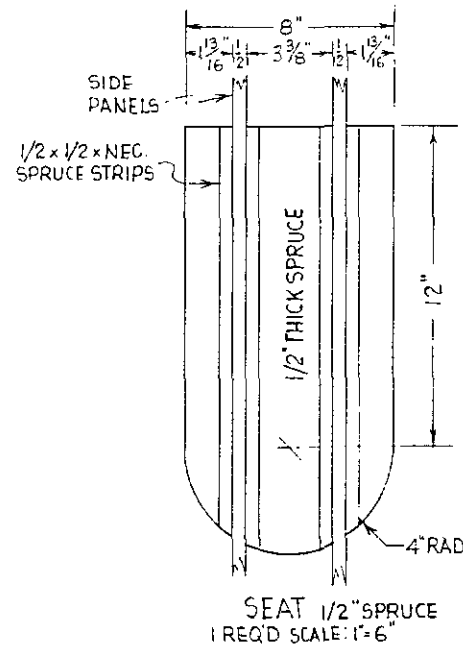




STYROFOAM
EPOXY IN PLACE



SEAT ASSEMBLY
EPOXY GLUE ALL WOOD AND STYROFOAM PARTS TOGETHER INTO SOLID UNIT



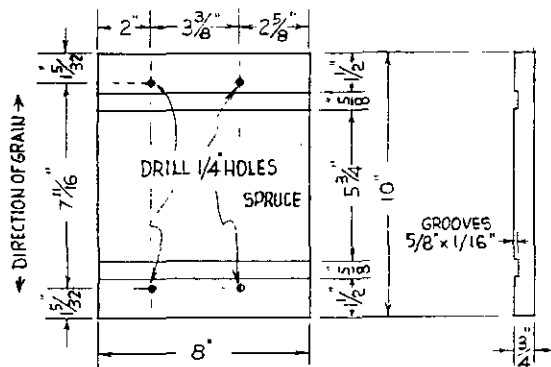
SCALE: AS SHOWN

FLYBIKE

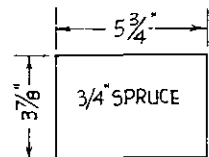
ENGINE MOUNT & SEAT
ASSEMBLY

DESIGN: HERB BEAULON

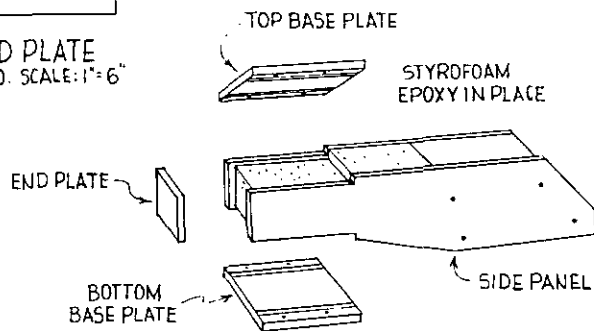
DRAWING N° 9



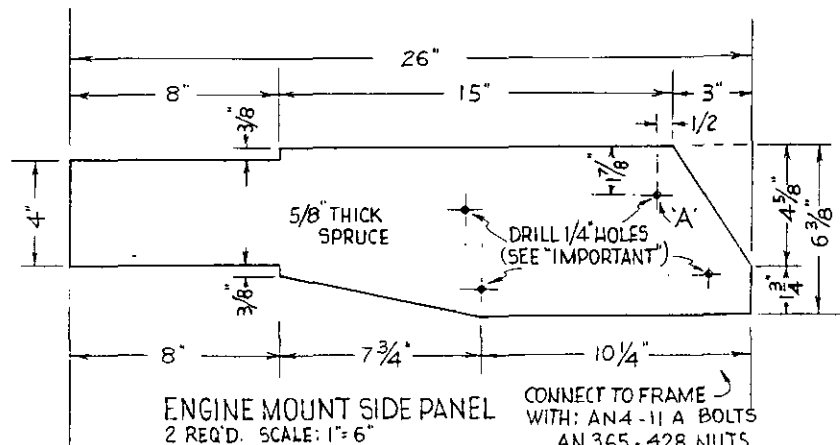
ENGINE BASE PLATE
2 REQ'D. SCALE: 1" = 6"



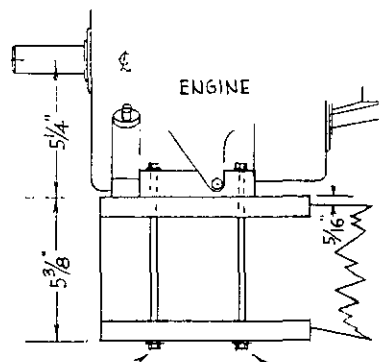
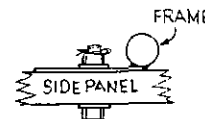
END PLATE
1 REQ'D. SCALE: 1" = 6"



ENGINE MOUNT ASSEMBLY
EPOXY GLUE ALL WOOD AND STYROFOAM
PARTS TOGETHER INTO RIGID UNIT.

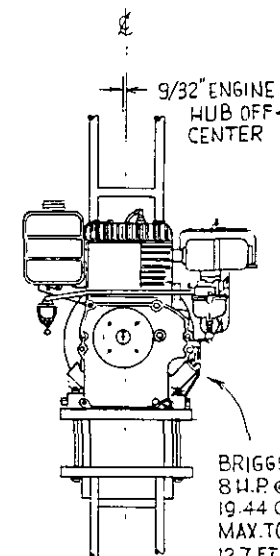


ENGINE MOUNT SIDE PANEL
2 REQ'D. SCALE: 1" = 6"



AN 5-67 A BOLTS
AN 365-524 NUTS
AN 960-516 WASHERS
AN 970-5 WOOD WASHERS
(4 SETS REQ'D)
SCALE: 1" = 6"

IMPORTANT: SINCE BOLT HOLES IN FUSELAGE FRAME MAY BE A FRACTION OFF, USE FOLLOWING LINE UP METHOD - DRILL HOLE 'A' AS INDICATED AND BOLT TO FRAME. LEVEL TOP OF PANEL PARALLEL TO BOOM AND DRILL OTHER THREE HOLES THRU BRACKET HOLES.



BRIGGS & STRATTON
8 H.P. @ 3600 R.P.M.
19.44 CU. IN. DISPL.
MAX. TORQUE:
12.7 FT./LB @ 2600
R.P.M.
FUEL CAP: ONE GAL.

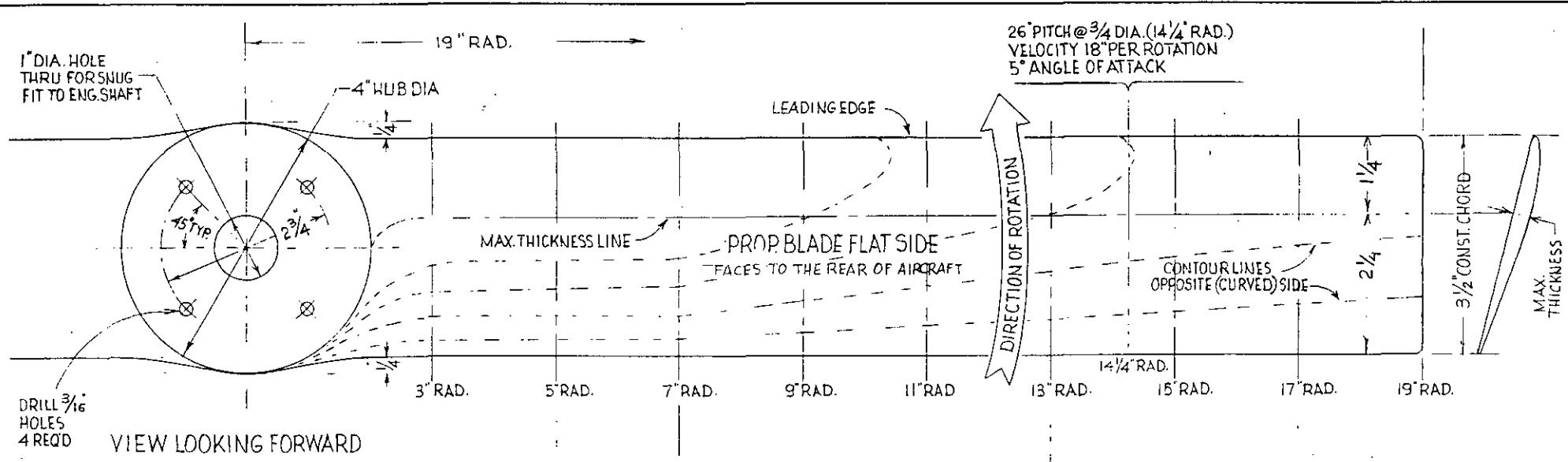
SCALE: AS SHOWN

FLYBIKE

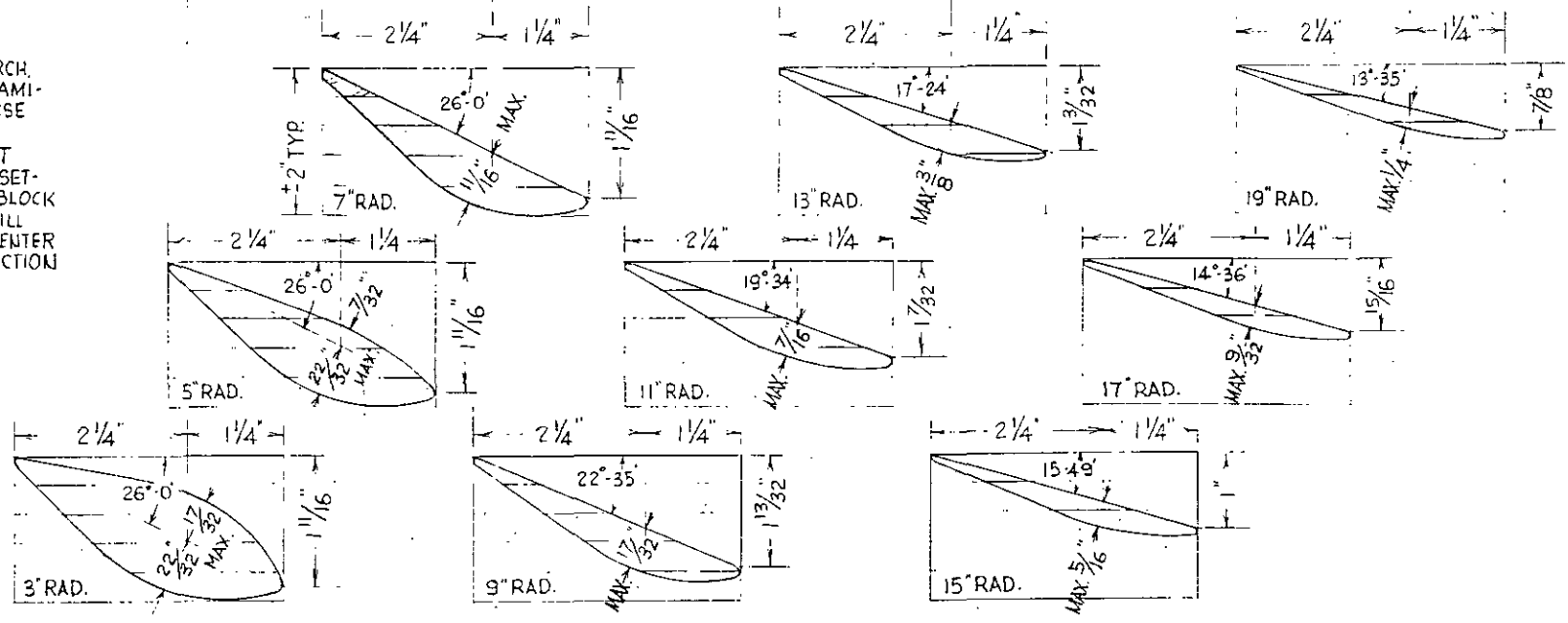
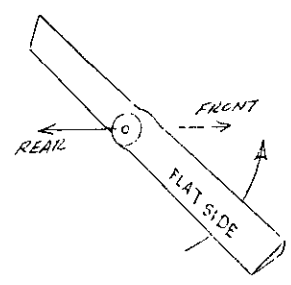
ENGINE MOUNT & SEAT
ASSEMBLY

DESIGN: HERB BEAUJON

DRAWING N° 10

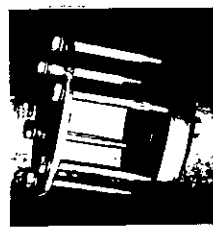
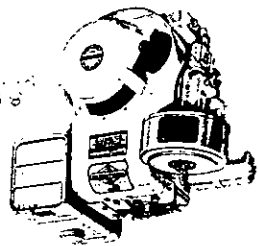


PROP CONSTRUCTION: USE BIRCH, MAPLE OR SIMILAR WOOD. 5 LAMINATIONS, EACH 3/8" THICK. USE RECORCINOL GLUE OR EPOXY. USE 30° C CLAMPS AND A FLAT BOARD. ALLOW 24 HOURS FOR SETTING. MAKE PLAN LAYOUT ON BLOCK AND CUT WITH BANDSAW DRILL DRILL SMALL HOLE THRU HUB CENTER FOR REFERENCE. SEE INSTRUCTION SHEET FOR DETAILS.





PROP. 36" DIA. 24" PITCH

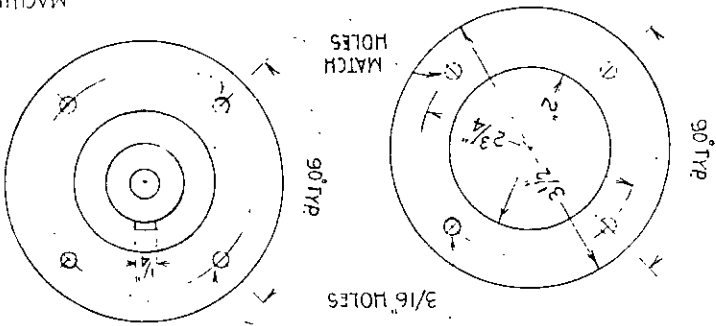


HUB

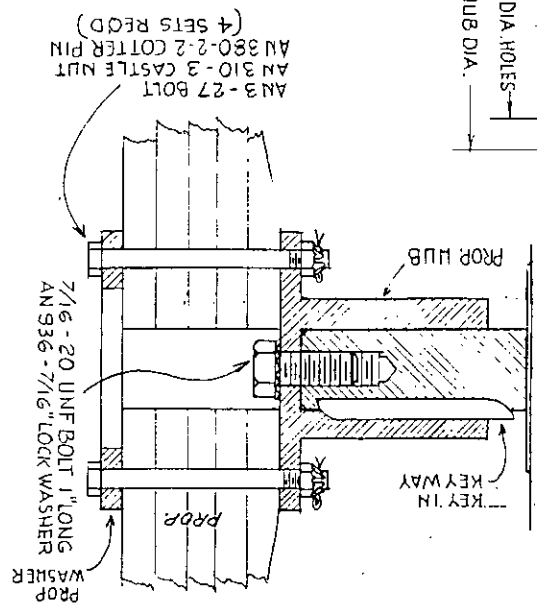
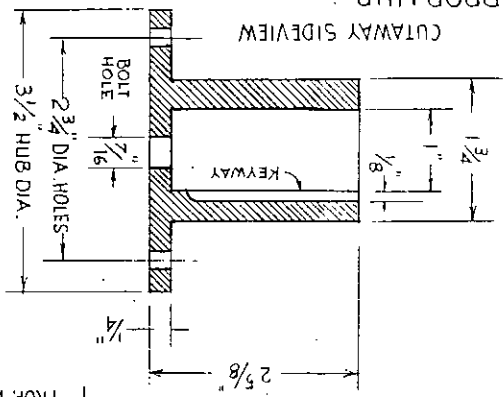
NOTE: THIS DRAWING IS INCLUDED TO SHOW HOW A WORKABLE PROP IS CONSTRUCTED. YOU CAN, HOWEVER, SAVE TIME, SWEAT AND MONEY BY ORDERING ENGINE, PROP AND HUB FROM THE FIRM BELOW. — PROP. 36" DIA., 24" PITCH COMPLETE WITH HUB. — BANKS-MAXWELL COMPANY P.O. BOX 3301, FORT WORTH, TEXAS 76105

PROP WASHER CUT FROM 1/8" HARD SHT STL. 1 RECD

SCALE: 1" = 2"



PROP HUB MACHINE FROM STEEL STOCK 1 RECD



PROPELLER SPECIFICATIONS:
 38" DIA. 3/2" CONSTANT CHORD.
 26" PITCH @ 3/4 DIA.
 VELOCITY: 18" PER ROTATION W/5° ANGLE OF ATTACK. CLARK-Y-X-SECTION
 MOST EFFICIENT SPEEDS @ RPM'S
 3600 R.P.M. - 61 M.P.H. (DIVE)
 3000 R.P.M. - 51 M.P.H. (CRUISE)
 2600 R.P.M. - 44 M.P.H. (MAX TORQUE) (CLIMB)
 PROP WASHER
 7/16" - 20 UNF BOLT 1" LONG
 AN936 - 7/16" LOCK WASHER
 AN3 - 27 BOLT
 AN310 - 3 CASTLE NUT
 AN380 - 2-2 COTTER PIN
 (4 SETS RECD)

Flybike

MATERIALS:
 All sheet steel items made of .065" thick 4130 chrome molybdenum steel.
 All vane frame tubing of 1/2" O.D. x .035 - 4130 chrome molybdenum steel.
 Sleeve made of 5/8" O.D. x .035 - chrome molybdenum steel.
 Vane covering cut from 1"x24"x96" styrofoam sheets.

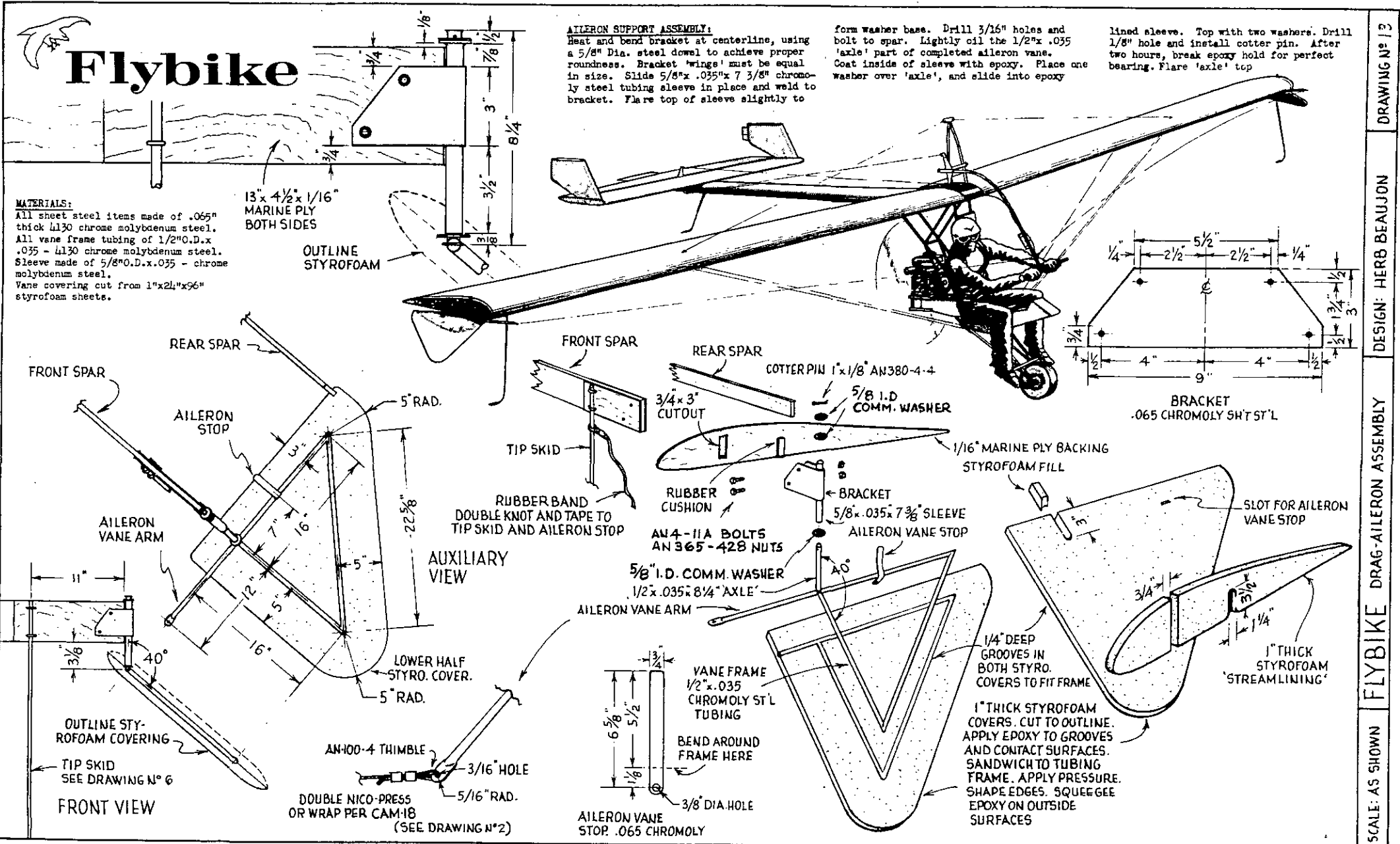
13" x 4 1/2" x 1/16" MARINE PLY BOTH SIDES

OUTLINE STYROFOAM

AILERON SUPPORT ASSEMBLY:
 Heat and bend bracket at centerline, using a 5/8" Dia. steel dowel to achieve proper roundness. Bracket 'wings' must be equal in size. Slide 5/8"x .035"x 7 3/8" chromoly steel tubing sleeve in place and weld to bracket. Flare top of sleeve slightly to

form washer base. Drill 3/16" holes and bolt to spar. Lightly oil the 1/2"x .035 'axle' part of completed aileron vane. Coat inside of sleeve with epoxy. Place one washer over 'axle', and slide into epoxy

lined sleeve. Top with two washers. Drill 1/8" hole and install cotter pin. After two hours, break epoxy hold for perfect bearing. Flare 'axle' top

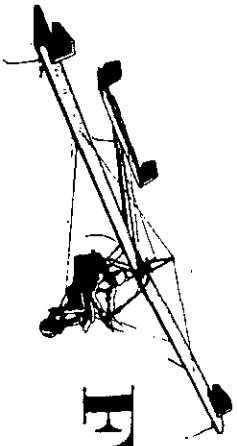


DRAWING N° 13

DESIGN: HERB BEAUJON

FLYBIKE DRAG-AILERON ASSEMBLY

SCALE: AS SHOWN



Flybike



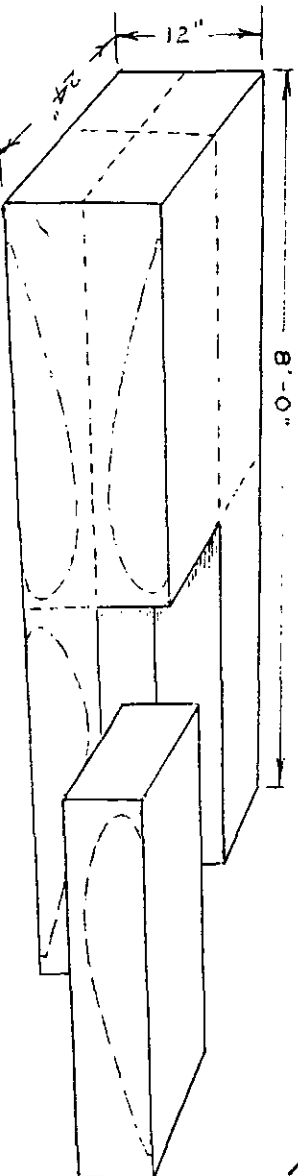
LEGAL NOTE

Herbert Beaujon and his Estate, author and designer of Flybike, submit the enclosed plans and related information for use as reference only, and do not guarantee, offer assurances, or accept liability for actions which may result from the use thereof. Copyrights pending.

CONSTRUCTION

In order for all parts of Flybike to fit perfectly, construct sections in the numerical order shown below.

1. RUDDERONS. Plans 1 & 3. These pivoting vanes act as spoilers and rudder by both causing reduced lift and drag. Fit and weld all parts as indicated before constructing vane. Vane is made of 1" thick styrofoam cut from a standard 1" x 24" x 8'-0" sheet. Cut, groove, and sand to proper size, then epoxy to 1/2" tubing. Allow to set for two hours. Apply epoxy soaked cotton tape at styrofoam - tubing area to further ensure hold. Apply epoxy to styrofoam faces and to contact faces of 1/16" ply backing. Sandwich together. Lay unit on a flat surface and supply pressure with three cement blocks. Fill any cracks with epoxy. Allow to set for 24 hours before removing cement blocks. Sand down to aerodynamic shape and squeeze thin layer of epoxy over vane surfaces. See Plan No. 7, 'Aileron Support Assembly' for idea on how to obtain tight bearing inside the 5/8" tubing sleeve.
2. URAG-AILERONS. Plan 7. Optional. Instead of rudderon, you may want to use the more efficient drag-aileron. These are somewhat more difficult to construct, but will provide better ground handling. Complete instructions with Plan 7.
3. WING PANELS. Plans 1, 3, 8, 9, 10. Wing panels are super strong. Without safety factors considered they will stand 13 'Gs'. With the safety factors included they will stand 5 'Gs'. This is well beyond the range of a utility aircraft. Panels are detachable. Cut and shape the aircraft quality sitka spruce spars according to dimensions shown on Plans 3, 8, & 10. If splice is needed, refer to Cam-18 (at your library), and place as far out to wing-tip as possible. Cut and drill all brackets. Epoxy 1/16" ply sections to spars. Attach all brackets, rudderon (or drag-aileron), rudderon stop, and tipskid as shown. Form a simple jig on a perfectly flat surface and space spars in their exact position. Bandsaw a standard 12" x 24" x 8'-0" styrofoam block as shown below in order to achieve longitudinal 'grain' and a smooth lower surface. Make wing cross section template according to Plans 8, 9, 10. Mark off as shown below and hot wire cut one foot wide sections.



Remove area occupied by spars. Epoxy to spars and to each other. Sand down to a smooth finish. Use template to check for uniformity. Epoxy 1/16" ply backing to ends of panel. If you are using drag-aileron, epoxy styrofoam streamlining to outer end. Wait 24 hours for wing to set. Now squeeze epoxy to both upper and lower panel surfaces and apply Grade A cotton or dymel cloth to upper surface. Smooth out any wrinkles. Apply a second coat of epoxy to upper surface. Squeeze down very thin and smooth. Trim and fill rough spots.

NOTE: USE WHITE STYROFOAM (EXPANDED POLYSTYRENE - 1 LB./CU. FT.) THROUGHOUT.

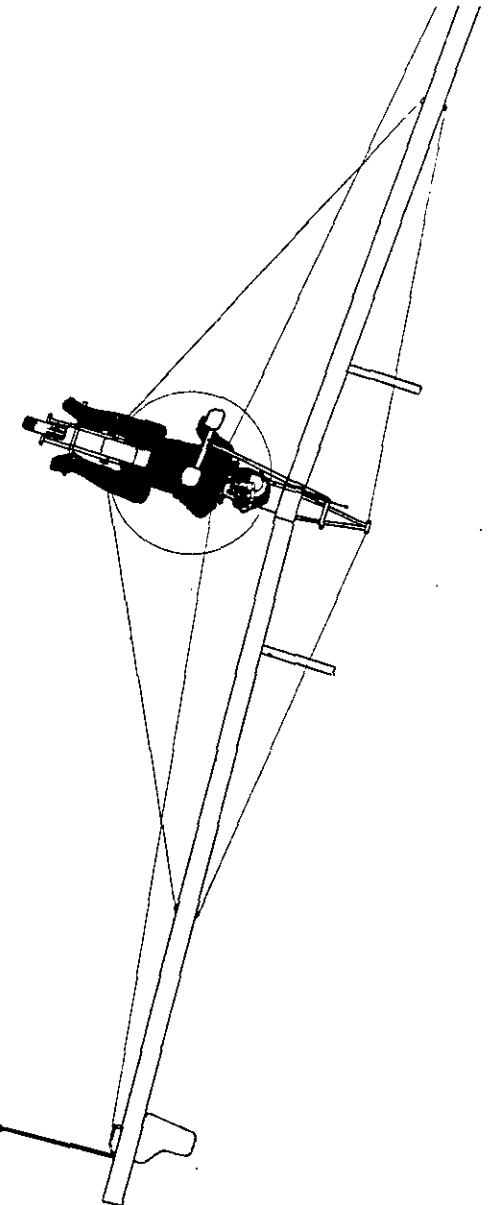
4. TAIL GROUP. Plans 1 & 4. Cut and sand all spruce parts to proper dimensions and epoxy together to form frame. Bolt in horn, piano hinge, and 1/2" aluminum tube struts. Cut styrofoam sections from a standard 2" x 2 1/4" x 8'-0" sheet, and epoxy in place. Epoxy fins last. Sand down to aerodynamic shape and seal:geeg epoxy to surfaces for a smooth finish. Drill holes for boom attachment.
5. FUSELAGE. Plan 2. Twin sides of fuselage frame are constructed separately, then welded into one unit with cross tubing. Build a simple jig from a sheet of plywood and strips of 1/2" x 1/2" wood moulding. If you have a perfectly flat cement floor, you can attach wood moulding directly to floor with small cement nails. Cut tubing to proper size and lay in jig. Tack weld, remove, and complete welding. Cut 2" x 1/4" lumber into exact 4 3/8" lengths. You'll need ten pieces. Match left and right side of fuselage frame, using these 2" x 1/4" x 4 3/8" spacers and strapping tape for a perfect alignment. Cut cross tubing to size and weld at proper locations. Weld wheel sleeves in place using the 5/8" wheel bolt to maintain alignment. Heat and bend cabane 'horns' inward until they touch. Remove spacers. Cut out all braces and brackets. Drill all necessary holes. Weld all brackets and braces, maintaining perfect alignment. Install wheel, using your 5/8" I.D. washers to prevent any play along bolt. Although a magnesium racing go-kart wheel is preferred, you may use any similar wheel capable of supporting the weight.
6. TAIL BOOM. Plans 2 & 4. Designed to hold an end load of 500 lbs. Without the boom spar arrangement, the end load capacity would only be 200 lbs. The reinforced boom also prevents control wires from 'jogging'. Cut and shape boom spar, half dowels, and complete dowels. Epoxy half dowels to boom spar. Use a small section of your 1/4" x .035 aluminum tubing as a template to insure a tight fitting assembly. Epoxy spar-dowel assembly into boom tube flush with front end. Epoxy complete dowels in place at tail end. Allow to set for 24 hours, then use frame and tail assembly to locate and mark holes. Drill.
7. ENGINE MOUNT. Plans 1 & 5. Cut spruce side panels, base plates, and end plate. Epoxy together. Slide unit into fuselage frame, marking off top front holes as indicated on plan. Drill holes marked and bolt to frame. Now level engine mount parallel with tail boom. Mark off remaining holes, drill, and fasten with bolts. Cut styrofoam to tightly fit between side panels. Epoxy into place. Mark off engine bolt holes on top base plate. Drill. Install engine after rest of aircraft has been completed and assembled.
8. SEAT. Plans 1 & 5. Foam seat plate and side panels. Epoxy together. Insert into frame. Mark off bolt holes from frame. Drill and insert bolts. Cut styrofoam to tightly fit between panels. Epoxy in place. Seat is supported by two bolts and a frame cross tube.
9. PROPELLER. Plan 6. This simple propeller was specifically designed to eke out as much thrust as possible from the maximum 7.25 brake H.P. available. It operates most efficiently around 48 M.P.H. Have a lumberyard prepare five pieces of 3/8" x 5" x 40" beechwood of birch laminations. Apply epoxy to all opposing faces and clamp together. Use two 1" thick planks and several tightly screwed down 'C' clamps to distribute pressure evenly. Allow to set for 24 hours. Remove clamps and planks. Trace propeller outline on stock face and bandsaw barely outside lines. Sand down to outline. Drill a 1/16" hole through center of hub for use as a reference point. Mark of stations for leading and trailing edge on sides of stock. With help of a french curve connect points. For each station, make a template by cutting out the cross section in a piece of plastic. Carve flat side of prop first. As you carve the curved side, slide templates in position to check for proper cross section shape. Sand to a smooth finish. Insert a 1/16" pin through hub hole and check balance. Sand heavier side until balance is achieved. Drill a 1" hole through hub. Slide ~~propeller~~ hub and prop onto engine shaft and mark off the 3/16" holes. Drill. Squeezege thin layer of epoxy over entire prop surface. Add epoxy to lighter side until balanced. Author suggests that prop be built by expert.

CONTROLS

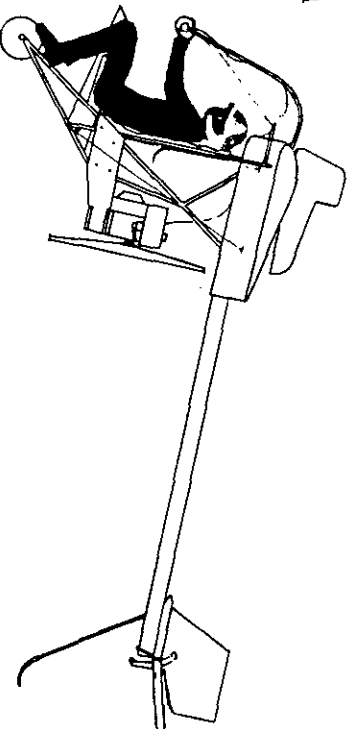
The author suggests that the first flight be made by a licenced pilot who has had some rogallo experience. Controls on Flybike require arm movements similar to those on a rogallo. The only difference being that with a rogallo the body is shifted. With Flybike only the arms shift. These control movements are just the opposite found on a conventional aircraft.

Pitch is controlled by the elevator. The rudderon (drag-ailerons) create a combination of yaw and roll. Pulling on the rudderon (drag-aileron) cables forces the vane against the airstream. Rudderon vanes create drag and spoiling of airflow over wing. Drag-ailerons are more efficient in that they produce more roll and the drag is mostly induced.

To turn left, shift handlebar to right
To turn right, shift handlebar to left



To go up, push handlebar forward
To go down, pull handlebar in



WEIGHT AND BALANCE

When completed and ready for flight testing, check for proper balance by hanging Flybike from some cross beam or from a strong children's swing frame. A short distance behind the front wing brackets, atop the tubular frame, are two hang brackets. These are located at the center of lift, or at 25.75% of the wing chord. With pilot and fuel, Flybike should hang with tail boom perfectly horizontal. If tail heavy, add some styrofoam behind the foam rubber backrest until pilot's new position levels aircraft. If nose heavy, screw lead strips to top of stabilizer between tail bolts until aircraft returns to a horizontal position. Flybike was designed to balance without adjustments holding a 190 lb. person. Your finished version may vary some. A single pound increase at the tail end necessitates a nine pound offset in the pilot's seat.

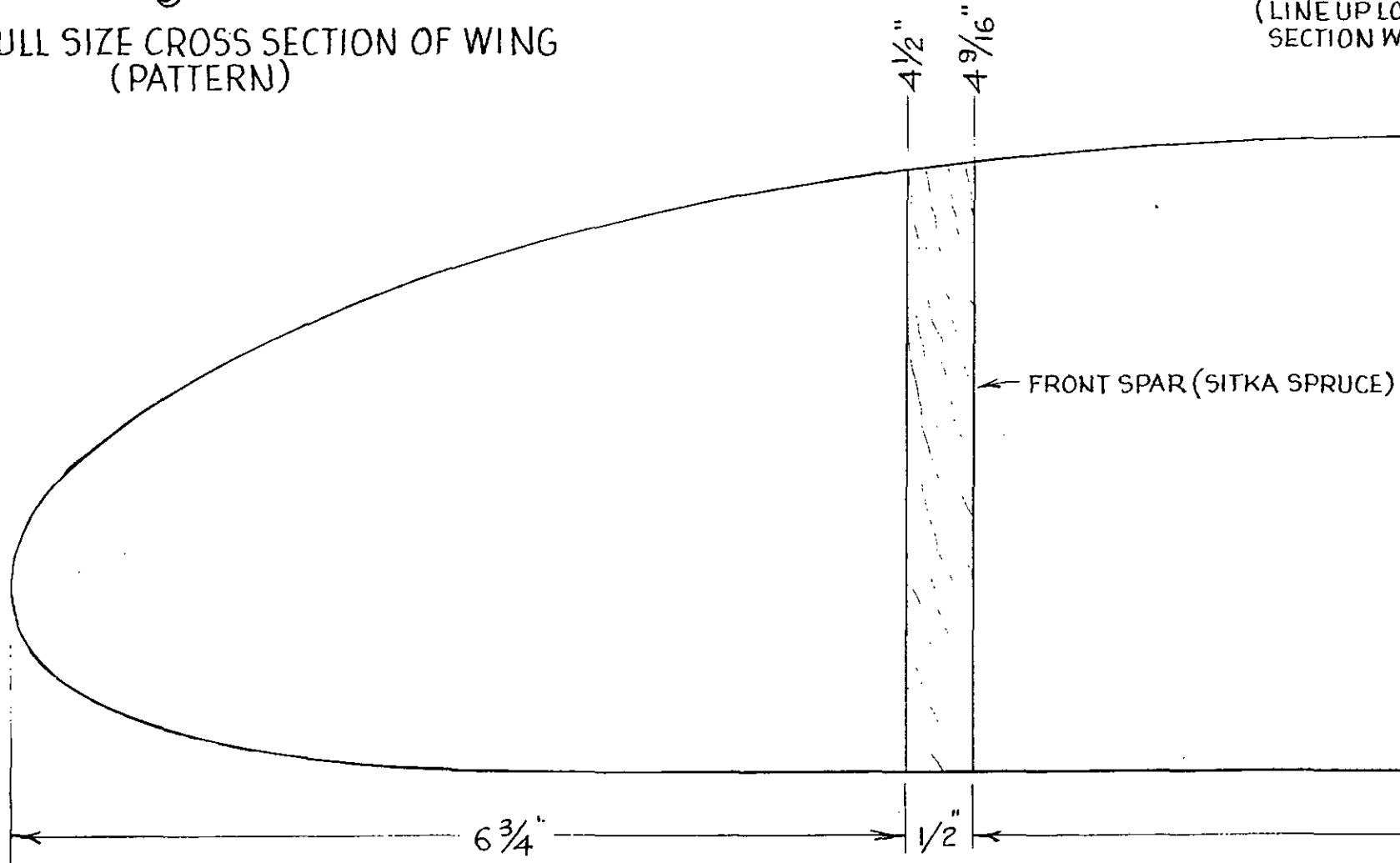


Flybike

FULL SIZE CROSS SECTION OF WING
(PATTERN)

17

TRIM OFF AT THIS LINE AND
MATCH WITH LEFT BORDER
OF DRAWING N° 18
(LINE UP LOWER EDGE OF CROSS
SECTION WITH STEEL RULE)



← LINE UP THIS BORDER
WITH TRIMMED EDGE
OF DRAWING N° 17

FLYBIKE

18

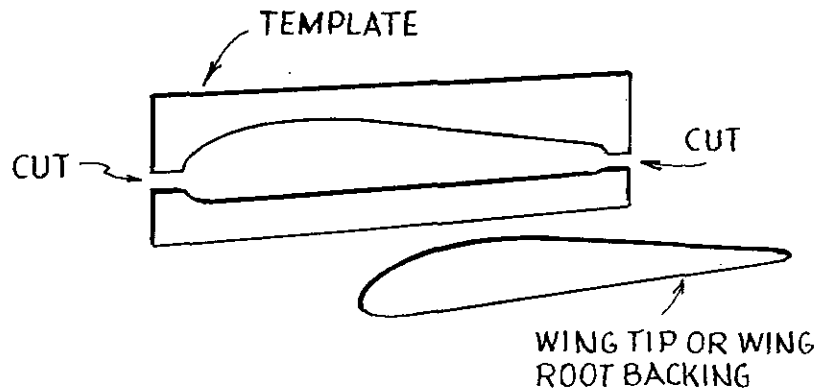
TRIM OFF AT THIS LINE AND
MATCH WITH LEFT BORDER
OF DRAWING N° 19 →

19 1/2"

FLYBIKE

19

LINE UP THIS BORDER
WITH TRIMMED EDGE
OF DRAWING N° 18



INSTRUCTIONS:

Trim right hand borders of drawings 8 and 9, and line up as indicated. Use a perfectly straight yardstick or steel rule to keep lower edge of pattern in a straight line. Tape together drawings 8, 9, and 10. Now glue completed pattern to a piece of 1/16" marine plywood. Using a sharp X-Acto or similar knife, cut lightly and several times precisely on pattern outline until completely cut through plywood. You now have one wing tip or wing root backing, and a wing cross section template. Use template to mark off styrofoam blocks (see instructions). After styrofoam sections have been epoxy glued to spars, cut template as shown and use to check cross section of finished wing panel.

2 1/16"
2 9/16"

REAR SPAR (SITKA SPRUCE)

1/2"

11 3/4"