

"GULFHAWK" SPECIFICATIONS

TYPE OF SHIP.....GRUMMAN G-22 BIPLANE
 SPAN.....28-1/2"
 LENGTH.....23-4-1/2"
 PROPELLER.....9-0" 3 BLADED HAMILTON CONTROLLABLE
 ENGINE.....WRIGHT G-1 CYCLONE 1000 H.P. AT 2200 R.P.M.
 TOP SPEED AT 12000 FT. - 290 M.P.H.
 CLIMB.....3500 FT. PER MINUTE

NOTE BOMBS ARE USED BY MAJOR AL. WILLIAMS TO DEMONSTRATE BOMBING MARKSMANSHIP.

FORCE A CLIPPED PIN INTO THE AERIAL MAST
 APPLY GLUE AND PUSH PIN INTO CENTER RIB OF UPPER WING

POSITION OF AERIAL POST ON WING

GLUE STRIP OF PAPER 1/4" WIDE AROUND CENTER SECTION OF UPPER WING BEFORE PAINTING WING

DOUBLE BLUE TISSUE AND PLACE UNDER PLAN BENEATH LICENSE NUMBERS CUT OUT NUMBERS WITH RAZOR TOOL.

BREAK RAZOR BLADE, WITH AID OF PLIERS, AS SHOWN AT LEFT. THIS MAKES A GOOD TOOL TO CUT OUT PIECES FROM PRINTED Balsa SHEETS. ADHESIVE TAPE PLACED OVER TOP OF BLADE PERMITS EASIER HANDLING.

GLUE WING LIGHT IN PLACE BEFORE WING IS PAINTED.

CUT WING LIGHTS FROM 1/8" PRINTED Balsa SHEET AND SHAPE AS SHOWN IN FRONT AND SIDE VIEWS. PORTION OF LIGHT IS RED OTHER PART ORANGE. APPLY FILLET PUTTY AROUND WING LIGHT TO FAIR IT INTO THE WING.

LOWER WING PANEL
 WING FILLET
 GLUE 1/4" STRIP OF PAPER AROUND SEAM WHERE LOWER WING IS JOINED TO THE FILLET BLOCK SEE FRONT VIEW BELOW.

CUT DUMMY ALERON HORN FROM 1/8" PRINTED SHEET AND SHAPE AS SHOWN IN TOP VIEW AND CROSS SECTION

PAINTING THE MODEL

IT IS WELL TO REMEMBER IN A PAINT JOB THAT THE MORE THE SURFACE IS PREPARED BEFORE PAINTING, THE BETTER WILL BE THE FINISHED PRODUCT. BEFORE PAINTING WOOD SURFACES, SANDPAPER THEM SMOOTH, APPLYING ONE OR TWO COATS OF BANANA LIQUID SANDING BETWEEN EACH COAT. WOOD FILLER, WHICH WOULD FURTHER ENHANCE THE BEAUTY OF YOUR FINISHED MODEL, CAN BE SECURED FROM YOUR NEAREST COMET DEALER. THE TISSUE COVERED SURFACES SHOULD ALSO BE COATED WITH BANANA LIQUID.

WHEN APPLYING THE DOPE REMEMBER TO BRUSH IN ONE DIRECTION; NOT ACROSS.

A COAT OR TWO OF GLOSS DOPE OVER THE FINISHED MODEL WILL MAKE YOUR MODEL GLOSSY AND IMMUNE TO DUST PENETRATION.

ENTIRE MODEL IS ORANGE EXCEPT FOR STRIPED WING AND ELEVATOR, AND PARTS OTHERWISE NOTED.

COCKPIT INTERIOR INCLUDING SEAT, CONTROLS AND FLOOR IS GREY.

CUT SHEET OF THIN PAPER INTO NARROW STRIPS ABOUT 1/16" WIDE USING A STRAIGHT EDGE AND RAZOR BLADE. LAY STRIPS OF PAPER OVER A WOOD SURFACE AND PRESS RIVET MARKINGS INTO THE PAPER WITH A PENCIL HELD VERTICAL. SEE SIDE VIEW OF SHEET 1 FOR SPACING OF RIVETS. GLUE STRIPS OF RIVET MARKINGS TO FUSELAGE BEFORE PAINTING. THESE STRIPS COVER SEAMS OF FUSELAGE PLATES.

AFTER BENT CONTROL WIRE IS JOINED TO THE BELL CRANK PUT IN SECOND BEND WITH PLIERS AS SHOWN AT RIGHT

FASTEN ONE CONTROL WIRE TO ANOTHER BY OPENING THE LOOP OF ONE WIRE ENOUGH TO HOOK THEM TOGETHER. THEN PRESS THE LOOP CLOSED WITH PLIERS.

SEAL OPEN END OF LOOP WITH A DROP OF CEMENT.

CUT HEADREST FROM PRINTED 1/8" SHEET AND SHAPE AS SHOWN IN SIDE VIEW

CUT FROM 1/16" PRINTED SHEET

GLUE SEAT SUPPORTS OVER DASH LINES ON BOTTOM OF SEAT

TAILWHEEL LOCK Balsa WOOD KNOB

CUT THROTTLE CASE FROM 1/32" PRINTED SHEET

THROTTLE HANDLE (GLASS HEAD PIN)

CUT STABILIZER ADJUSTMENT FROM 1/32" SHEET

GUIDE WIRE FOR SLIDING COVER

1/8" X 1/4" X 1/2" Balsa BLOCK

PARACHUTE CORD AND SAFETY BELT REPRESENTED WITH RIBBON

DUMMY ALERON HORN (SEE TOP VIEW)

BELL CRANKS

RIGHT SIDE PANEL

LEFT SIDE PANEL

LANDING GEAR CRANK 1/16" SQ. ROUNDED

LANDING GEAR CRANK DIAL CUT FROM 1/32" SHEET

HEAVY CORD TO REPRESENT WIRE

RADIO EQUIPMENT BOXES 1/8" X 1/4" X 1/2" Balsa BLOCK

BATTERY BOX 1/2" X 5/8" X 7/8" Balsa BLOCK

RADIO LEADS STRING

PARACHUTE CORD - USE FLAT RIBBON

SHAPE PADDED HEADREST FROM 1/8" Balsa SHEET

RADIO KNOBS MADE FROM 3/32" SQ. Balsa ROUNDED

SLIDING COCKPIT COVER

OPENING IN FORMER FOR ACCESS TO RADIO EQUIPMENT

1/4" X 1/2" X 2" Balsa BLOCK GLUED UNDER RIGHT SIDE PANEL

NOTE CUT 3/64" WIDE BRACE WIRES FROM GELULOID SHEET WITH RAZOR BLADE AND STRAIGHT EDGE AND PAINT ALUMINUM.

PILOTS SEAT

SAFETY BELT

1/4" X 3/8" X 1" Balsa CARTRIDGE BOX NOTE: CARTRIDGES ARE USED TO START MOTOR ON REAL PLANE.

PARACHUTE CORD

FLOOR BLOCK

CARVE SEAT PACK TYPE PARACHUTE FROM 1/4" PRINTED Balsa

USE PIN HEADS TO REPRESENT LIGHT SWITCHES

ASSEMBLE "N" STRUTS OVER ACTUAL PATTERN

MAKE HOLE WITH PENCIL POINT TO REPRESENT RECESSED BOLT

USE FILLET PUTTY TO FILL IN GAP WHERE STRUTS ARE GLUED TOGETHER

NOTE: FILLET PUTTY CAN BE SANDPAPERED WHEN THOROUGHLY DRY.

PUNCH RIVETS IN WITH PENCIL POINT

SMOOTH FILLET PUTTY AROUND RUDDER, ELEVATOR, STRUTS AND WING LIGHTS USING LITTLE FINGER.

CORRECT LOCATION OF "N" STRUTS IN SIDE VIEW

RED WING LIGHT

AILERON
 AILERON HORN
 PLIERS
 REAR CABANE STRUTS
 CONTROL WIRE
 RUDDER PEDALS
 AILERON CONTROL ARM

FRONT VIEW
 TOP VIEW
 INSERT THIS PORTION OF CONTROL ARM INTO TUBING THEN PRESS THE END OF THE TUBING FLAT. (SEE SIDE VIEW)

1/16" Balsa WALL

OTHER HALF OF 1/16" X 3/16" STRIP IS CUT AWAY FOR COCKPIT

NOTE: CONNECT CONTROL WIRE TO CONTROL STICK BEFORE GLUING SEAT IN PLACE.

RUDDER HORN
 ELEVATOR HORN
 CONTROL ASSEMBLY ROD

TAILWHEEL LOCK WIRE
 ELEVATOR CONTROL WIRES

TAILWHEEL SHOWN IN RETRACTED POSITION

CUT OPENING FOR TAILWHEEL WITH AID OF PAPER PATTERN FURNISHED

GLUE 1/8" DIA TUBING FIRMLY TO FORMER

TUBING SERVES AS BUSHING FOR CONTROL ASSEMBLY ROD

HEADREST
 INSTRUMENT PANEL
 GLUE SMALL PIECE OF 1/16" SHEET Balsa TO COCKPIT COWL TO FILL IN CURVE

CUT Balsa COVERING TO THIS SHAPE USING PATTERN

LANDING LIGHT CONTROL HANDLE

GLUE STRING AROUND CONTROL STICK FOR HAND GRIP

LOWER INSTRUMENT PANEL
 RUDDER PEDAL
 BRAKE PEDAL
 RUDDER PIVOT ROD

FLOORBOARD
 CONTROL ASSEMBLY ROD

FLOORBLOCK

REAR CABANE STRUT

BELL CRANK PIVOTS ON A PIN PUSHED INTO FORMER

GLUE RUDDER PEDAL PIVOT ROD TO BOTTOMS OF SIDE INSTRUMENT PANELS

GLUE LOWER INSTRUMENT PANEL TO ROD. SEE SIDE VIEW

BRAKE PEDAL (STIFF PAPER)

PRESS TUBING TOGETHER TO HOLD CONTROL ARM IN PLACE AFTER 3/32" DIA. CONTROL ASSEMBLY ROD IS INSERTED THROUGH 1/8" DIA. TUBING BUSHING

LANDING LIGHT CONTROL

1/16" Balsa WALL

STRIP OF PAPER 1/4" WIDE GLUED AROUND CENTER SECTION

1/16" X 3/16" CROSS GRAIN Balsa STRIP

FILLET PUTTY

THICK SOFT IRON WIRE

LANDING WIRE

WING BRACE WIRES ARE 1/4" APART

SLIP BRACE WIRES THROUGH HOLES MADE IN THE ROD WITH A PIN

SHAPE TIE ROD FROM 3/32" SQ. X 1/2" Balsa STRIP

GLUE A STRIP OF Balsa IN SLOT OF REAR CABANE STRUT AFTER CONTROL WIRE IS IN PLACE. ALLOW CONTROL WIRE TO MOVE FREELY.

3/32" SQ. LONGERON

FLOORBOARDS

CONTROL STICK

FLOORBLOCK

PAPER FINNS
 MAKE 8 BOMBS

BOMB RACK

CUT BOMBS FROM 1/8" PRINTED SHEET AND SHAPE. GLUE ON FINS AND PAINT ALUMINUM.

STRIP OF PAPER 1/4" WIDE WRAPPED AROUND SEAM

MAKE HOLE THROUGH FILLET BLOCK FOR CONTROL WIRE

1/16" X 1/2" CROSSGRAIN Balsa REAR WHEEL WELL PLATE

1/16" X 1/2" CROSSGRAIN Balsa GLUED BETWEEN WHEEL WELL PLATE AND OUTSIDE WALL

FRONT WHEEL WELL PLATE

FORMER 4

FRONT WHEEL WELL PLATE

REAR WHEEL WELL PLATE

SPREADER PLATE

FLYING WIRE
 NOTE "N" STRUTS ARE NOT FAIRED INTO WINGS

INSTRUMENT ADJUSTMENT KNOB

AIR SPEED
 CYRO HORIZON
 CLIMB
 CLOCK
 MANIFOLD PRESSURE
 R.P.M.
 BANK TURN
 LARGE KNOB

FUEL
 OIL PRESSURE
 TEMPERATURE

LANDING LIGHT CONTROL HANDLE

ALTIMETER
 COMPASS
 CARBURETOR AIR TEMPERATURE

ACCELERATION
 SUCTION
 DIHEDRAL ANGLE - 2° OR

SANDPAPER BACK OF LANDING LIGHT TO THIS SHAPE

HANDLE

9/16" DIHEDRAL

GRUMMAN G-22 GULFHAWK	
DESIGNED SPECIAL FOR AL. WILLIAMS	
WINGSPAN 28-1/2 IN	LENGTH 23-3/8 IN
DESIGNED AND DRAWN BY <i>Paul Rubin</i>	
EXACT SCALE 1" = 1'-0"	PRODUCED 8-10-37
3 SHEETS - SHEET 3 KIT NO. X-12 © 1937 BY COMET MODEL AIRPLANE & SUPPLY CO. CHICAGO	

HAPPY LANDINGS, FELLOWS!
 YES, AND MANY HAPPY HOURS WHILE YOU'RE BUILDING THIS SWELL MODEL OF THE GRUMMAN GULFHAWK. I KNOW YOU WILL HAVE A LOT OF FUN BUILDING IT AND FLYING IT, BECAUSE THE METHOD OF CONSTRUCTION OUTLINED IN THE PLAN IS SO SIMPLE. IT'S A MIGHTY FAITHFUL REPRODUCTION OF THE GRUMMAN SHIP WHICH WAS DESIGNED AND BUILT ESPECIALLY FOR MY USE.

Al Williams

FORCE PIN THROUGH TUBING TO MAKE HOLE

MAKE HOLE THROUGH CONTROL ASSEMBLY ROD WITH A PIN USING A TWISTING MOTION

CUT SLIT IN TUBING WITH A KNIFE. SPREAD AND SHAPE TO FIT AROUND CONTROL ASSEMBLY ROD. PUSH A PIN THROUGH CONTROL STICK INTO HOLE IN CONTROL ASSEMBLY ROD. THEN CLIP PIN AND APPLY A DROP OF CEMENT TO CLIPPED END

ASSEMBLING THE FUSELAGE

GLUE FORMER SHAPES TOGETHER, THEN CEMENT FORMERS TO LEFT FUSELAGE HALF. NEXT ASSEMBLE COCKPIT INTERIOR AND CONTROLS. GLUE SHAPED FILLET BLOCK AND STREAMLINED CABANE STRUTS IN NOTCHED FORMERS. NOW SLIP RIGHT HALF OF FUSELAGE OVER CABANE STRUTS AND GLUE FIRMLY TO ALL FORMERS. THEN GLUE RIGHT FILLET BLOCK IN PLACE. PAINT ALL PARTS INSIDE OF COCKPIT BEFORE GLUING FUSELAGE HALVES TOGETHER (SEE NOTE ABOVE ON PAINTING)

STRIP OF PAPER 1/4" WIDE WRAPPED AROUND SEAM

MAKE HOLE THROUGH FILLET BLOCK FOR CONTROL WIRE

1/16" X 1/2" CROSSGRAIN Balsa REAR WHEEL WELL PLATE

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FRONT WHEEL WELL PLATE

FORMER 4

FRONT WHEEL WELL PLATE

REAR WHEEL WELL PLATE

SPREADER PLATE

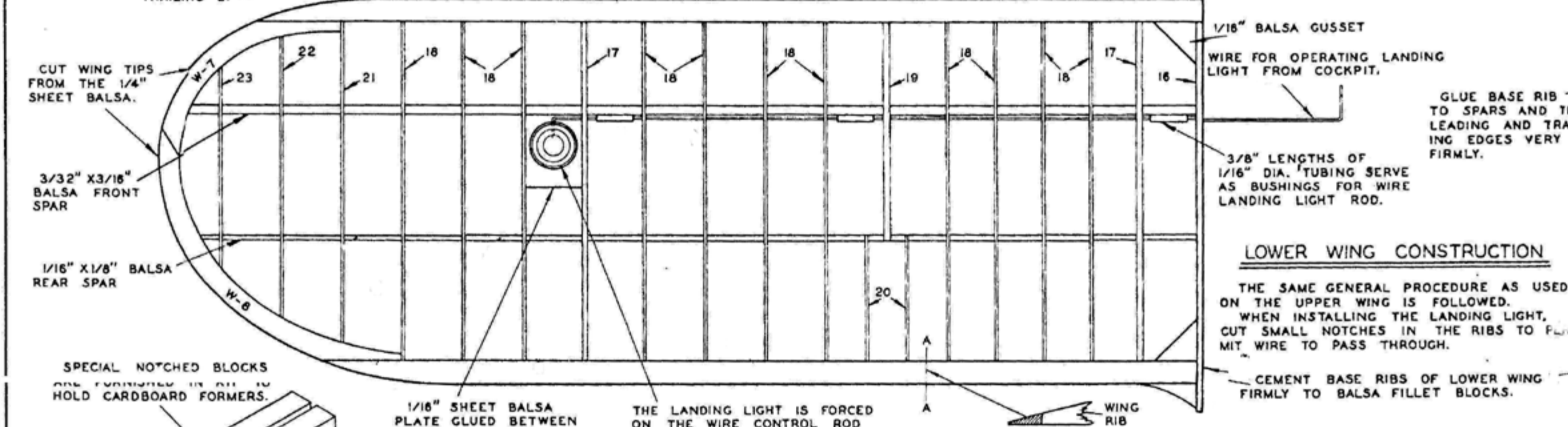
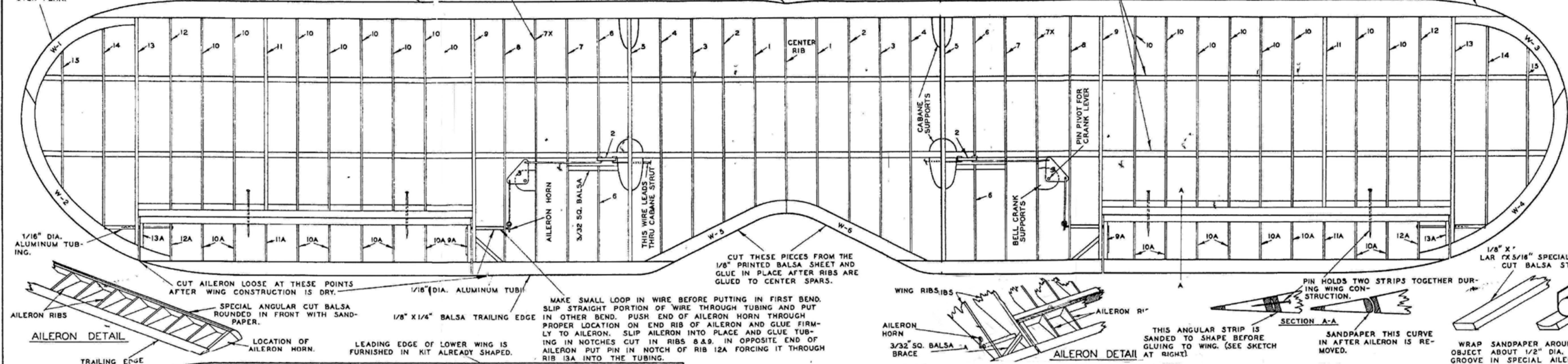
CUT NOTCHES IN THE FUSELAGE WALL TO PERMIT PIVOT STUB TO EXTEND THROUGH.

CUT WING TIPS FROM THE 1/4" PRINTED SHEET Balsa AND GLUE TO CENTER SPARS IN PLACE. LEADING EDGE OF WING IS FUR 13 IN KIT ALREADY SHAPED. RIB 7X HAS LOCATION OF Balsa BELL CRANK SUPPORT PRINTED ON IT. SHAPE THIS INTO WING LEADING EDGE AFTER WING IS ASSEMBLED. BOTH WING SPARS ARE: 3/32" X 3/16". SHAPE THIS PORTION OF LEADING EDGE TO FLOW IN SMOOTHLY WITH TIP AFTER WING IS ASSEMBLED.

UPPER WING CONSTRUCTION

TACK THE PLAN SMOOTHLY OVER A FLAT SURFACE SUCH AS A DRAWING BOARD AND COVER IT WITH WAXED PAPER. PUT THE SPARS OVER PLAN AND HOLD IN PLACE WITH A FEW PINS. AFTER CUTTING ALL RIBS FROM THE PRINTED SHEET, PLACE THEM TOGETHER ON A SPAR AND USE SANDPAPER TO TRUE THEM UP. THEN GLUE RIBS IN PLACE ON SPARS. NEXT CEMENT WING TIPS TO THE SPARS AND END RIBS. REMOVE THIS STRUCTURE FROM PLAN AND GLUE THE LEADING AND TRAILING EDGES TO RIBS. WHEN THOROUGHLY DRY, SHAPE WING TIPS TO FLOW IN SMOOTHLY WITH LEADING AND TRAILING EDGES, TAPER TRAILING EDGE, AND SAND ALL JOINTS TO MAKE CERTAIN THERE ARE NO PROJECTIONS. FINALLY CUT THROUGH CORRECT PLACES TO DETACH AILERONS. THEN TRIM BOTTOM OF SPARS AT CENTER SECTION. (SEE FRONT VIEW)

NOTE: ALL RIBS WITH "A" AFTER THE NUMBER BELONG IN THE AILERONS.
NOTE: TOP OF "N" STRUT IS FASTENED TO RIB 11.

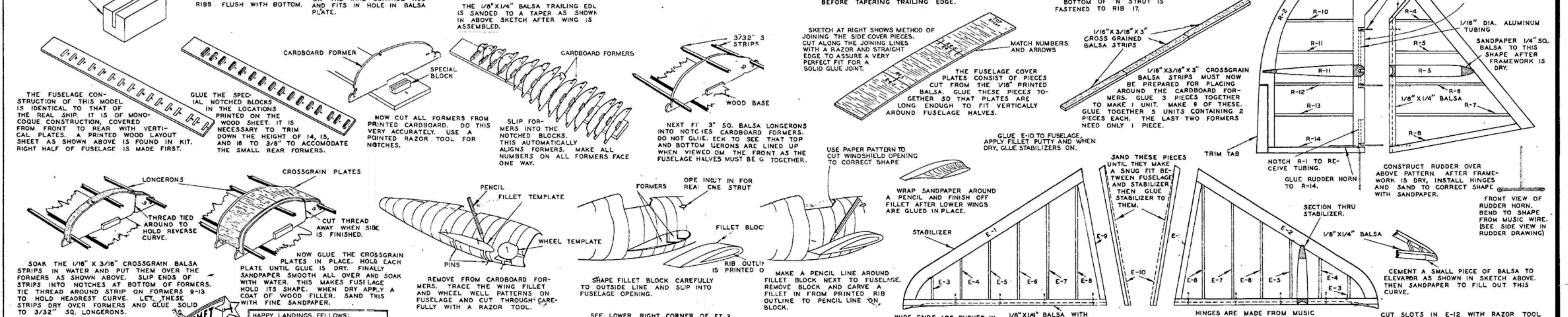


LOWER WING CONSTRUCTION

THE SAME GENERAL PROCEDURE AS USED ON THE UPPER WING IS FOLLOWED. WHEN INSTALLING THE LANDING LIGHT, CUT SMALL NOTCHES IN THE RIBS TO PERMIT WIRE TO PASS THROUGH.

ACKNOWLEDGMENT TO:
MAJOR ALFORD J. WILLIAMS OF GULF OIL CO.
GRUMMAN AIRCRAFT CO.
WRIGHT ENGINE CO.
HAMILTON PROPELLER CO.
FOR DESIGN DATA ON EXACT RIB SPACING, MOTOR CONSTRUCTION, FUSELAGE CONSTRUCTION, PROPELLER, ETC.

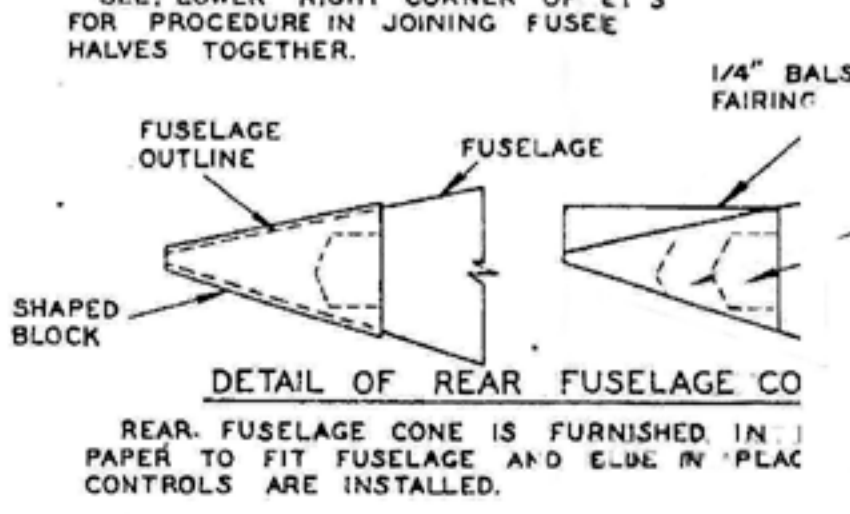
NOTE: DO NOT COVER TOP OF UPPER WING UNTIL WING IS IN PLACE WITH AILERON CONTROLS ALL HOOKED UP.



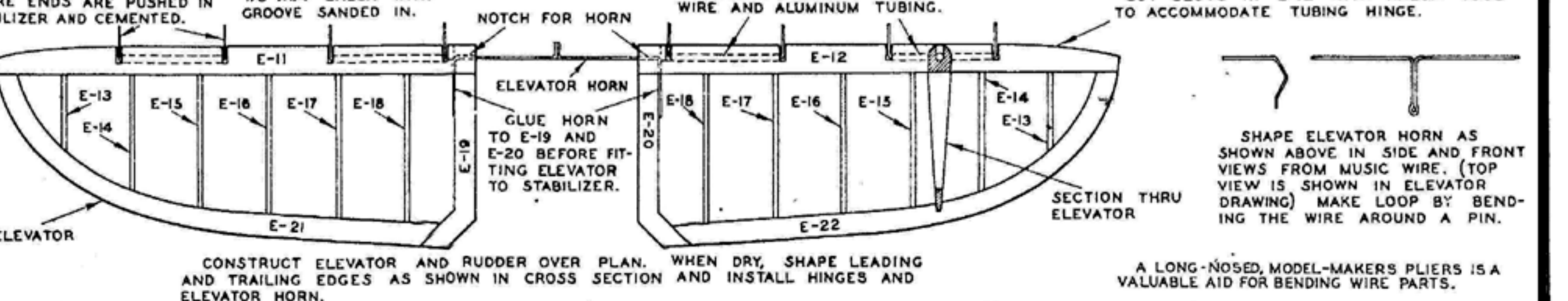
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Al Williams

NOTE: REMOVE CARDBOARD FORMERS FROM PRINTED WOOD LAYOUT SHEET AND REVERSE THEM SO ALL NUMBERS FACE THE REAR. THEN CONSTRUCT LEFT HALF OF FUSELAGE IN SAME MANNER AS DESCRIBED ABOVE FOR RIGHT HALF.



CONNECT ALL CONTROLS THRU OPENING IN REAR OF FUSELAGE BEFORE GLUING REAR FUSELAGE CONE IN PLACE.



SHAPE ELEVATOR HORN AS SHOWN ABOVE IN SIDE AND FRONT VIEWS FROM MUSIC WIRE. (TOP VIEW IS SHOWN IN ELEVATOR DRAWING) MAKE LOOP BY BENDING THE WIRE AROUND A PIN.
A LONG-NOSED MODEL-MAKERS PLIERS IS A VALUABLE AID FOR BENDING WIRE PARTS.