READ AND UNDERSTAND ASSEMBLY PROCEDURE BEFORE BEGINNING WORK.

WHITE GLUE 3/8" x 1/2" ENGINE BEARERS CLAMP OR HOLD WITH RUBBER BANDS

IMPORTANT: TRIM TO THIS SHAPE.

SPACERS

ADD FILLER BLOCKS IN STEP 4

1/8" PLYWOOD SKID PROTECTS NEEDLE VALVE

CHECK ALIGNMENT

1

CAUTION: FOR NEEDLE VALVE ON TOP SEE ASSEMBLY PROCEDURE - STEP 1.

"A" MEASURE YOUR ENGINE

ADD SPACERS PROVIDED IF NECESSARY (SEE TABLE "A")

TABLE "A"

ENGINE SIZE (DIMENSION "A")	SPACERS TO USE
15/16"	NONE
1-1/16"	2-S2
1-1/8"	2-S1

ASSEMBLED ENGINE MOUNT

FOR SMALL ENGINES TRIM EXCESS PLYWOOD

DRILL 1/8" HOLES

TRIM SPACERS

FOR LARGE ENGINES ENLARGE OPENING IN PLYWOOD

OPTIONAL: DU BRO BLIND NUTS

2

WING IS BUILT UPSIDE DOWN

PLAN

WING REMAINS UPSIDE DOWN UNTIL END OF STEP 5

MOUNT IN PLACE BUT NOT GLUED

PINS

1/2 PLATFORM RIB

SHAPED LEADING EDGE

PINS

1/4" x 3/4" TRAILING EDGE

PARTS ARE ALIGNED EXACTLY ON PLAN BORDERS

NOTE: SCOTCH TAPE ON BOTH SIDES WHILE BUILDING

3

ONE OF OUR NEW "SYMMET-TRU" WING CONSTRUCTION METHODS (NOW WIDELY IMITATED). DETACHABLE PLATFORMS KEEP WING TRUE ON TABLE.

WASHER FOR SIDE THRUST

4-40 x 3/4" MACH SCREWS

TIN FOIL HEAT SHIELD OPTIONAL

ENGINES TO USE	
McCOY	.19
COX	SPECIAL .15, TD .15
	MEDALLION .15
FOX	.15X
VECO	.19
K. & B.	.19
CAMERON	.15
SUPER TIGRE	.15, .19
O.S	.15, .19
ENYA	.15, .19

ALL .15 TO .19 ENGINES MAY BE USED COX SPECIAL .15 ENGINE SHOWN

ADD REMAINING RIBS

FILLER BLOCKS

NOTCHES MUST FACE BOTTOM OF WING

PINS

1/4" SHEET TIP FILLERS

5/64" RIBS

USE WHITE GLUE

1/8" RIBS

1/8" TIP BRACES

1/8" x 1/2" SPAR

1/8" GUSSETS

4

1/16" BOTTOM SHEETING

CEMENT PLUG IN BOTTOM SHEETING ONLY

5

CAUTION:
Do not fly control line models in the vicinity of electric power lines!

1 5/8"

USE .012 DIA. LINES 52-1/2 FT. LONG

1/8" TIP

NOTE PLATFORM RIB

1/8" GUSSET

1/8" BRACE

SMALL VECO BELLCRANK

FOR 15 ENGINES USE PERFECT 19 OR VECO 123C TANK

FOR 19 ENGS. USE VECO 123D TANK

1/4" BALSA TANK BRACE

1/8" RIBS

5/64" RIBS

7/16"

1/16" SHEETING

1/8" GUSSET

Jr. SATAN

29" COMBAT-STUNT FOR .15 TO .19 ENGINES KIT G 20

SPAN 29"

LENGTH 16-1/2"

WEIGHT 11 TO 13 OZ.

ORIGINAL MODEL BUILT BY — RICH FROST

Designed and drawn by:
Carl Goldberg Ross Pawlowski
Paul Frauenhoffer F.C. McVickar

CARL GOLDBERG MODELS INC.
CHICAGO, ILLINOIS

NOTE: INBOARD WING IS 3/4" LONGER THAN OUTBOARD

SCALE: 2/3 FULL SIZE
ADD 50% TO ANY DIMENSION TO GET FULL SIZE

USE CABLE LEAD-OUTS

COPPER WIRE

WRAP AND SOLDER

ALLOW 16" LEAD-OUTS

SCREW

2" BELLCRANK

1/8" PLYWOOD PLATFORM

1/4" x 5/16" BELLCRANK MOUNT SPARS

5/16"

(BELLCRANK AND LEADOUTS NOT FURNISHED)

6

1/4" TANK SUPPORT

MAKE TANK BRACE FROM SCRAP 1/4" BALSA

BIND 1/2 OZ. WEIGHT TO LEADING EDGE

7

WING RIGHT SIDE UP

CLEAR DOPE

A B C

"AIRLITE" HI-STRENGTH TISSUE

D E

8

STANDARD COVERING METHOD FOR "AIRLITE" HI-STRENGTH TISSUE. FOLLOW CAREFULLY - DO NOT USE OTHER METHODS

SOLDER RETAINING WASHER

WIRE HINGE PIN

1/8" PLY BOOMS

STREAMER HOLE

1/8" STABILATOR

1/4" x 3/4" TRAILING EDGE

CARVE OUT TO FIT ENGINE BEFORE PAINTING

BALSA NACELLE

PLYWOOD SKID (NEW TO COMBAT MODELS) SERVES 3 PURPOSES: BINDS ENGINE MOUNT AND LEADING EDGE TOGETHER, PROTECTS NEEDLE VALVE, AND PROVIDES LANDING SKID. WING MAY BE BUILT WITH SKID ON TOP (SEE ASSEMBLY PROCEDURE).

1/8" BRACE

SHAPED LEADING EDGE

5/64" WIRE PUSHROD

1/16" FAIRINGS

1/16" WIRE HINGE PIN

1/8" PLY CONTROL HORN

1/8" PLY HINGE DOUBLERS

1/8" STABILATOR

3/8" x 3/4" NYLON

SOLDER RETAINING WASHER

1/16" DOUBLER

YOUR SUGGESTIONS WANTED!

Modelers often have ideas for improvements. We will be happy to hear from you by post card or letter on:

1. Your suggestions.
2. What you like best about our models.
3. What three new models you'd most like to see us bring out.

Be sure to include your name, age, and address so we can reply and thank you.

ASSEMBLY PROCEDURE

READ BEFORE GLUING

GENERAL - The lighter a model is, the tighter it can maneuver. Keep the weight down, and aim at a total not to exceed 13 oz. complete with engine, tank, etc.

Ruggedness is important, too. Don't spare the glue - but don't expect it to make up for sloppy joints.

White glue (such as Elmer's, Wilhold, etc.) makes excellent joints. Otherwise, use hot-fuelproof cement. Pre-glue with a first thin coat (and let dry) before actually joining parts. Excess white glue may be removed with a damp rag.

Prevent errors by going through the plan thoroughly before beginning work.

1. Use white glue (such as Elmer's, Wilhold, etc.) to assemble engine mount. Before assembly, add spacers S1 or S2 if necessary to fit your engine. See table "A".

White glue skid in place. Be sure edges of opening and rear notch are flush with inner edge of spacers. If no spacers, use inner edge of bearers.

On most engines, needle valve will appear on bottom of this airplane. If on top, needle valves can be reversed, but this should be attempted only by (or with the help of) an experienced modeler. If needle valve is left on top, skid may be put in upside down for protection on inverted landings. Wing is then built right side up, and should be lined up on lower right hand border of plan.

Plywood skid (new to combat models) serves 3 purposes: Binds engine mount and leading edge together, protects needle valve, and provides landing skid.

IMPORTANT: After gluing skid to engine mount, trim all corners of bearers as indicated.

2. Trim away spacers if necessary to clear engine. Drill 1/8" mounting holes for engine and install blind nuts. Center the rear holes exactly 1" from front of bearers.

3. Note the different spacing on each side of the leading and trailing edges. Be sure notches match indications on left bottom border of plan before gluing.

Pin trailing edge along bottom border as shown. Be sure notch for rib No. 2 is centered on left border. Cement No. 2 platform ribs. Slip engine mount on leading edge, and cement leading edge to platform ribs only. Make sure wing is perfectly square.

4. Add 1/8" center ribs, using plenty of white glue between them and the mount; also between the mount and the leading edge.

Add all remaining ribs. Use pins to back up ribs, and slide spar in place. Add wing tips, and other small parts shown. Also glue the balsa fillers between the mount and the leading edge.

5. Sheet center section on bottom. Cement plug in bottom sheeting only.

6.-7. Turn wing right side up. Bend pushrod per full size drawing. Make up bellcrank assembly with pushrod in hole about 7/16" from crank pivot center to give less "stabilator" movement. You won't need much, as stabilators are highly effective.

Glue two 1/4" x 5/16" spars to plywood bellcrank mount, then to bottom sheeting and ribs. This installation must be strong, since in flight the entire weight of the plane and engine must be held by this assembly.

Install tank as shown. Make tank braces from scrap. DO NOT drill through leading edge for fuel line. Route fuel line through either the top or bottom sheeting, depending on which side the fuel pickup is on your engine.

Sheet the top center section, and add 1/8" brace against rib to reinforce bellcrank mount.

Add a weight (about 1/2 oz.) to the outboard wing tip. Wrap it securely to the spar with fine soft wire or strong thread, and cement. Secure the leadout tubes on the left wing tip with fine soft wire, bent over and glued.

Use a sanding block with fine (4/0) sandpaper, and smooth up the entire model.

8. IMPORTANT: Follow these instructions carefully to obtain best results with the "Airlite" Hi-Strength tissue furnished. You may have trouble with other methods. This tissue has excellent dry and wet-strength, both. Silk may be used for greater strength.

(A) Sand entire wing smooth. Dope framework one or two coats clear, then sand lightly to remove fuzz.

(B) Try covering over wing, then cut to size with slight excess for handling. Spray each piece with water before using.

(C) Apply dope to center of bottom of wing, and lay damp covering in place. Lift as shown and proceed with doping framework and laying covering.

(D) As you go, gently pull out major wrinkles. AVOID CAUSING WING TO TWIST! If wrinkles are only minor, they will disappear when covering dries.

(E) When entire wing is covered, sand off any excess. Dope edges, and rub dope in with fingers for smooth job.

9. Sand plywood booms and stabilator. Add 1/8" plywood hinge doublers. Drill 1/16" holes in each boom, and attach stabilator with 1/16" wire hinge pins and nylon. Hook up the pushrod. The horn provided will give about 15 or 20 degrees of movement in each direction. That is all you will need on this model.

Punch holes in the wing covering with a pin where the booms go, and rub cement into the wood. Glue booms firmly in place.

10. Model should balance slightly ahead of the point shown on the plans. Doping the model will bring the balance back slightly. Modelers who haven't flown a combat ship before should balance the model about 1/4" ahead.

Shape the balsa nacelle and glue it in place on the engine mount and wing (for a better joint, first remove any covering). Carve out front fillet block to clear engine shaft housing. Cover the mount and nose with nylon or silk.

Finish the model as you desire, but go easy with the colored dope. Keep the model as light as possible, but finish it neat and smooth, as it will pay off in the circle. Give the entire model from 4 to 6 coats of dope.

NACELLE FAIRING OMITTED FOR CLARITY

ADJUSTMENT KINK

1/8" PLYWOOD BOOMS

STREAMER HOLE

FULL SIZE SIDE VIEW

BALANCE POINT 1-1/2" TO 1-5/8" BEHIND LEADING EDGE

RIB NO. 2

FULL SIZE PUSHROD PATTERN

3/8" BEND DOWN

ORIGINAL COLOR SCHEME: ALL CLEAR WITH BLACK BOOMS AND RED TRIM

SPEED CHART

52-1/2 FT. LINES		8 LAPS (1/2 MILE)					
SEC.	M.P.H.	SEC.	M.P.H.	SEC.	M.P.H.	SEC.	M.P.H.
18.0	100.0	20.5	87.8	23.0	78.3	25.5	70.6
18.5	97.3	21.0	85.7	23.5	76.6	26.0	69.2
19.0	94.8	21.5	83.7	24.0	75.0	26.5	67.9
19.5	92.3	22.0	81.8	24.5	73.4	27.0	66.7
20.0	90.0	22.5	80.0	25.0	72.0	27.5	65.4

LINE RIBS UP HERE WHEN BUILDING WING UPSIDE DOWN

LINE RIBS UP HERE WHEN BUILDING WING RIGHT SIDE UP