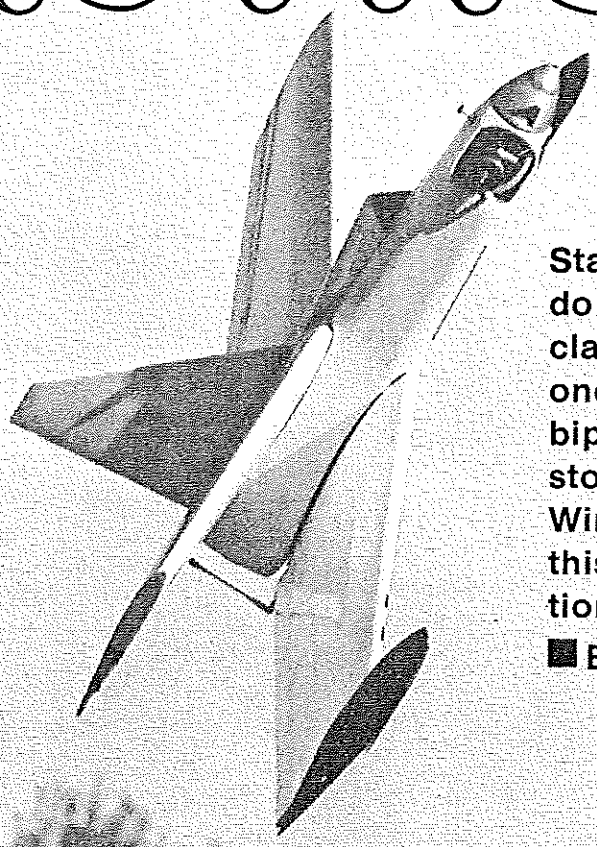
ASTRON



Star Wars had nothing to do with it! The designer claims he was only going one step beyond a Simitar bipe he had been brainstorming. So, if an "X-Wing" takes your fancy, this 19-powered apparition will really zap 'em.

■ **Bill Evans**

SEVERAL months ago during a discussion with your editor about the many variations of the Simitar, he asked about the bottom line. Well, after designing and flying Simitars ranging in power from 020 to 40, and even the twin 049's, 09's and 19's, my reaction was that the last word in Simitars would be a biplane. I had envisioned that the Simitar Bipe would have the wings one above the other, separated by at least 6 or 7 inches and that they would be negatively staggered. A ship so built would have been the stepping stone between the Simitar 540 (RCM, Oct. 78) and the Astron.

Avoiding convention, the move was to leap over the Simitar Bipe, and beyond, to the Astron. At first, the thought of anhedral in the lower wing gave rise to doubt. It quickly dissipated when I rationalized that the Simitar inverted flight characteristics are excellent, even with the one inch of dihedral under each tip, which produces the same amount of anhedral when inverted. Besides, some birds fly with their wings in the anhedral mode. Once over the initial worry that it shouldn't, or wouldn't fly, the real work began.

Since I had a visual picture of lines for the Astron, a few sketches, calculations and laying out internal components lead to transferring the data to balsa and foam.

As the Astron construction project came close to completion, several calls came from fellow fliers who wanted to know when the first flight was to be made. They wanted to be on the spot to see if it really would perform (or even fly).

On August 22, 1978 some 25 spectators assembled at the field for the Astron's maiden flight (even my wife, sons and daughter who had long since become indifferent to my idea's of "way-out" designs, just had to see this one make its first flight).

Amid the conjecture about what was about to happen (mostly that it wouldn't fly) and a bet with me giving five to one odds, flight preparations were completed. In an instant, the K&B Veco 19 engine was running and leaned out to full power. Then the Astron was in the air, moving straight out in a gentle climb. Its first command was for a wide left turn and the response was excellent. Next, a hard right turn followed by an inside loop, roll, and finally an inverted pass. Such moments of truth makes all of us realize why we are in the hobby. For me it is the challenge and satisfaction of having solved it.

Landing was easy. Even on the rough dirt field, the wire skids epoxied to the wing tips and sub fin, worked well. A second flight was made during which the transmitter was passed to several eager hands.

The 504 sq. in. of wing area, or 3.5 sq. ft., at a little over 32 oz. gross works out to a wing loading of less than 10 oz. per sq. ft. In the air, the Astron seems even more unique with its distinctive look. When I think of what we went through to make a successful flight (that's get it down in one piece) with the first rudder-only, single-channel, escapement ships; seeing the Astron actually

in the air gave me the feeling that the god of flight has been cheated, and he would surely smash this alien craft into the ground. But it is an exciting, perfectly "normal" aerobatic machine.

It doesn't require too much balsa. All you need is: 4 — 3/16 × 4 × 36; 1 — ⅛ × 4 × 36; 4 — 1/32 × 6 × 36; 1 — ¼ × 3 × 36; 1 — ½ × 36 triangle; 3/16 ply firewall. Wing foam cores are available for $16.00, plus $2.00 shipping, and 1/64 plywood wing sheeting at $14.00, plus $2.00 shipping — Soaring Research, 19216 Calvert St., Reseda, CA 91335. (Editor's Note: You may prefer to order from other sources who also offer custom-cut foam; this reference was given for convenience in the event the reader has no prior experience with sending away for cores.)

Construction: Glue and pin ⅛ balsa leading and trailing edges to foam cores, making sure to keep wing panels free from bends or warps. Cut out fuselage sides, top bottom, formers, and firewall. Pin fuselage bottom down on a flat surface, then glue and pin fuselage sides to fuselage bottom.

Glue and pin ½" triangle stock into the inside corners where the fuselage sides meet the bottom. Glue firewall in place. Glue ½" triangle stock to the top inside edge of the fuselage edges, then glue and pin fuselage top front 3/16 sheet in place. Glue and pin in rear former, corner triangles and top and bottom, then pin in nose filler blocks.

Trim and sand leading and trailing edges of wing panels so that the 1/32 sheeting fits nicely over them. Sheet wing panels, using contact cement such as Sig Corebond, or the new double-sided sheeting transfer tape, such as "Corefilm."

Join wing panels with five-minute epoxy. The top wing has 3 inches of dihedral under each tip; bottom wing has 2 inches anhedral. The bottom wing joint is best made by sitting the panels upside down on a flat surface, and blocking up each tip 2 inches.

When fuselage is dry, remove it from the bench. Sand front of fuse square and glue on 1/16 ply nose ring. Trim and sand wing leading edges and glue on ¼ balsa leading edge. Cut and sand to shape the elevons, vertical stabs and wing tip plates. Trim and final sand wings. Trim and sand fuselage to shape.

Cover all parts with your favorite covering material (we used white Solar Film). Hinge elevons to the wings (to provide for free movement and, to eliminate hinge line gap, Solar Film or MonoKote hinges be used). Build and install sliding tray as shown on plans.

Use five-minute epoxy to attach the top wing to the fuselage (a bit of baking soda mixed with the five-minute epoxy thickens and helps prevent running).

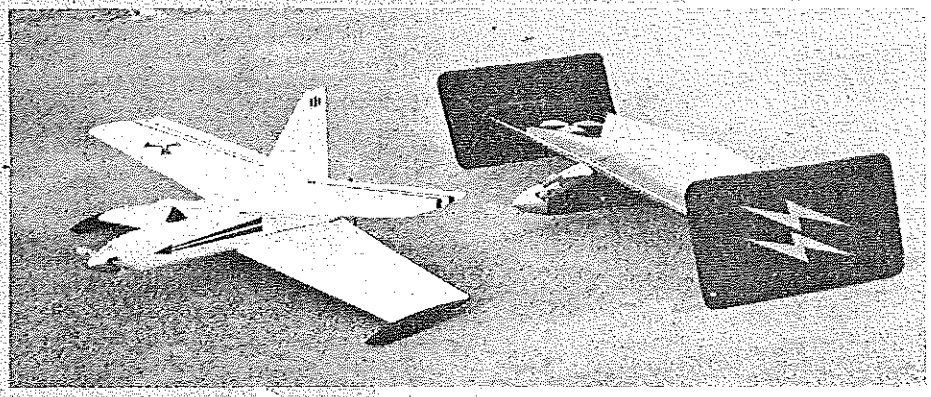
Install wing wood pegs and 10–32 nylon bolts for fastening lower wing to fuselage. Use five-minute epoxy to attach the vertical fins and lower wing tip plates. Note that 3/32 music wire is epoxied to the bottom of the wing tip plates and sub vertical stab.

Install engine tank and radio, then balance per plans ¼ inch behind leading edge. Install elevon couplers per plans using 5/32" O.D. brass tubing, threaded rod, and snap links as shown.

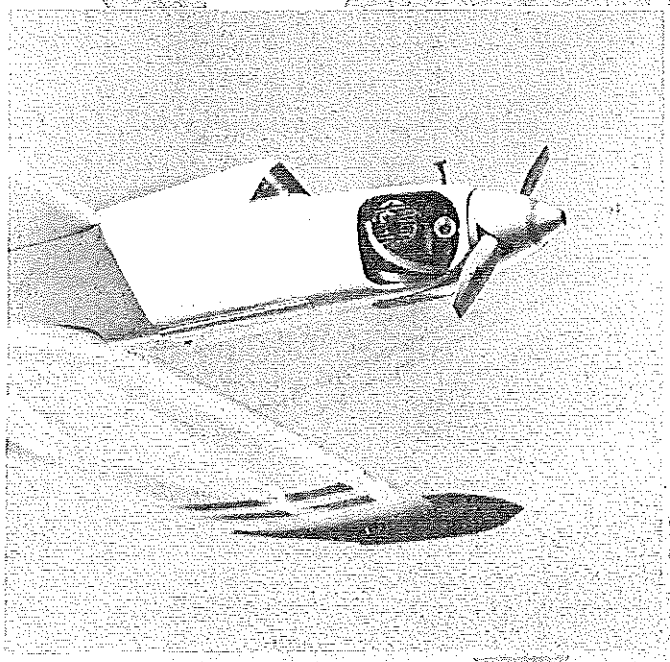
Be sure to align all four elevons. Neutral position should be set 3/32 inch above what would normally be considered as neutral. This is to provide necessary reflex which is required on flying wings.

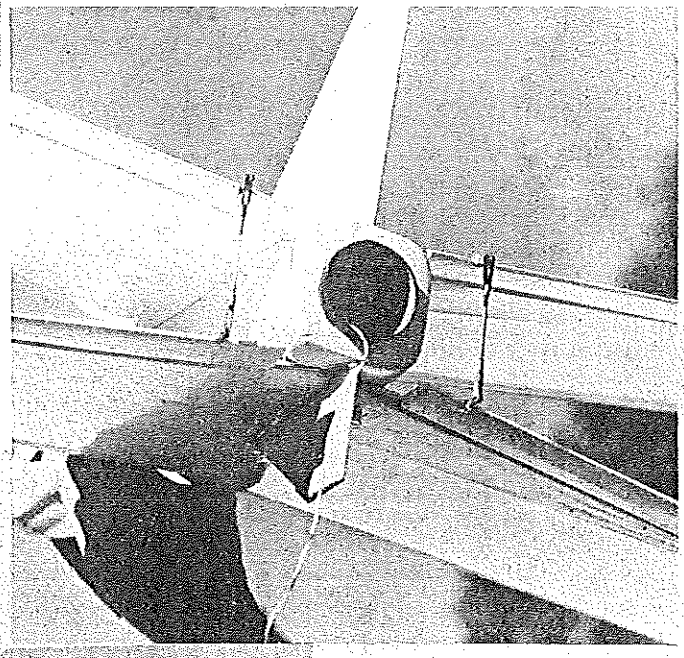
Flying: Since the original Astron was not equipped with engine control, landings are dead-stick but this presents no problem. Due to absence of landing gear, takeoffs are made by hand launch. Do not throw the ship into the air! The proper hand launch technique is to merely run with the craft and release it. As it becomes airborne it will leave your hand on its own.

more on ASTRON

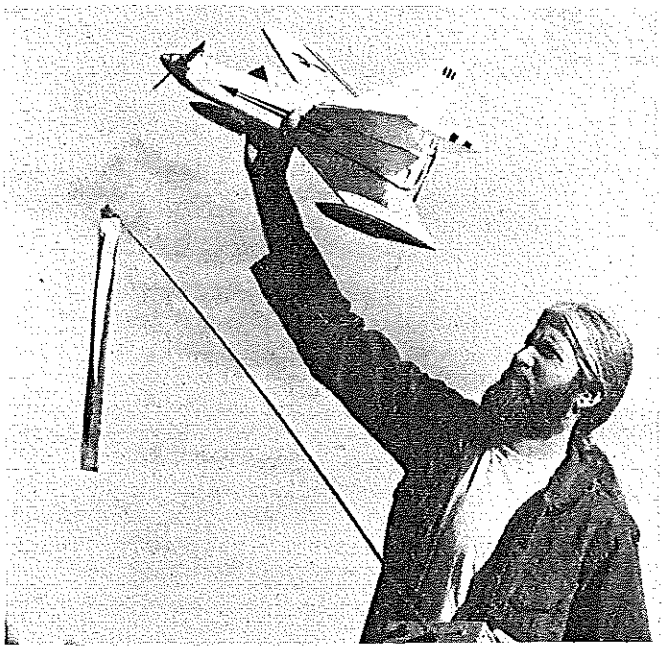


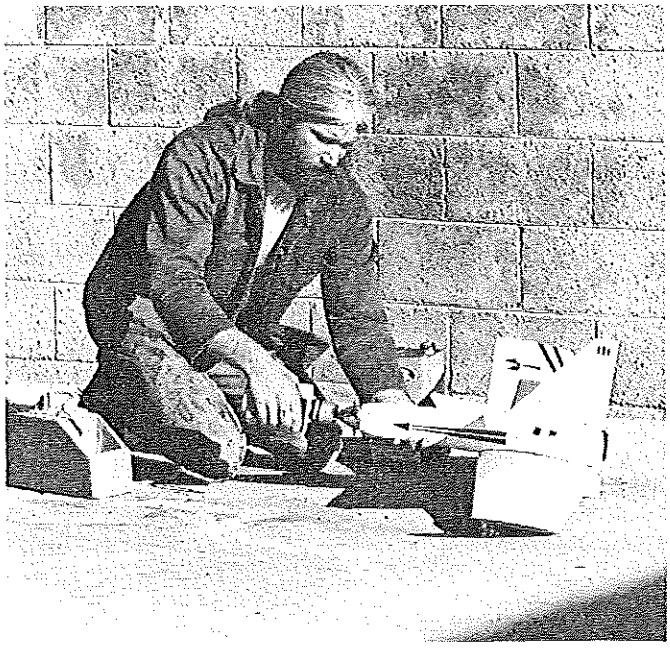
Attention! We are supposed to be looking at the ship on the left, the Astron sitting on its wing skids upon which it lands. "Thing" on the right is Black Bart. Oh, those Californians!





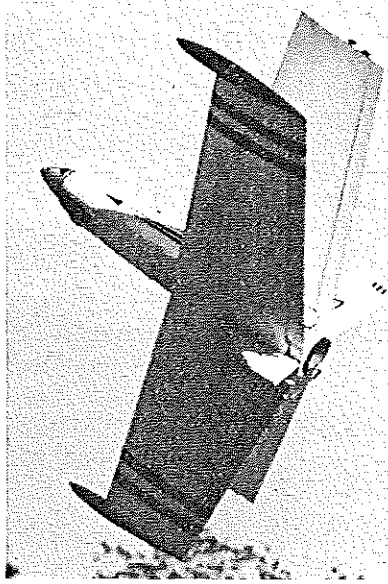
Personnally, we can't concentrate enough to look at the bottom hatch on the fuselage which, in addition to engine installation details, the photo is supposed to show. We've seen good flying Great Lakes balanced at the bottom wing L.E. (top wing swept) and E.A.A. bipes balanced well forward of the lower wing L.E., but this guy puts both wings in the back and he comes out OK—note CG on plans. Coupled elevon, right, showing threaded links on top and solder links on bottom elevon. It should respond! Incidentally, if the fireworks distract you, ship is biplane flying wing.

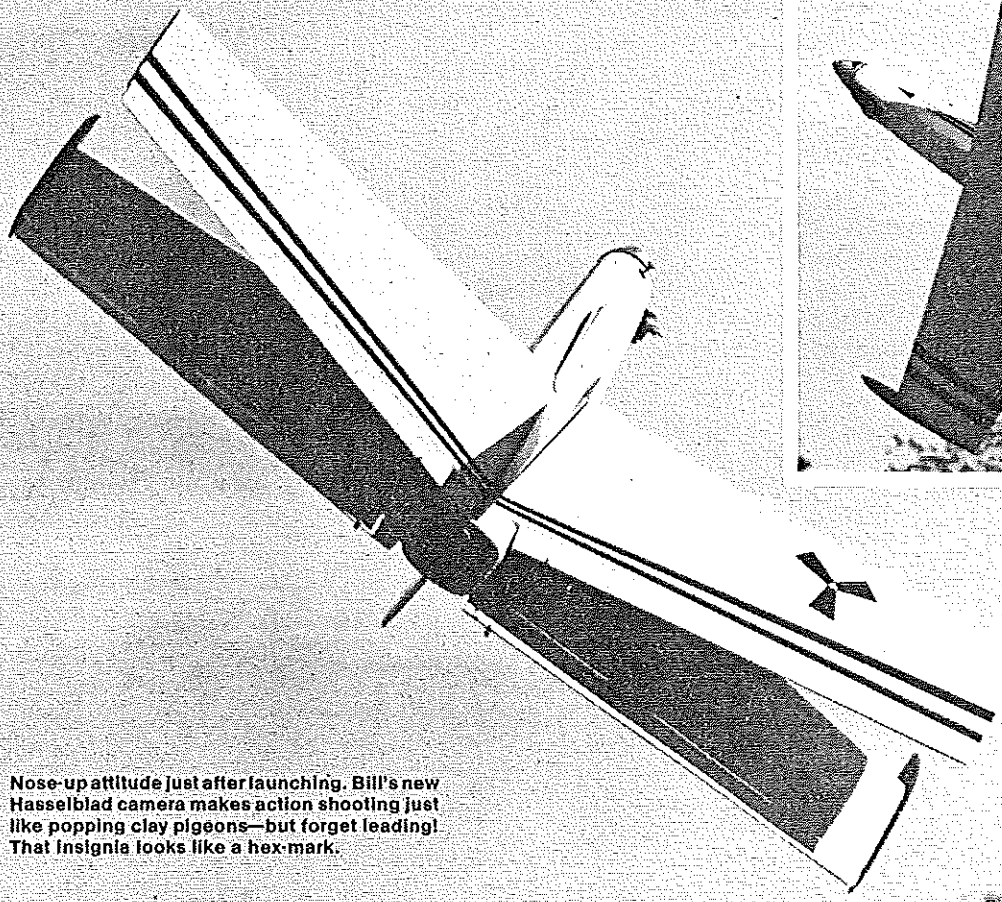




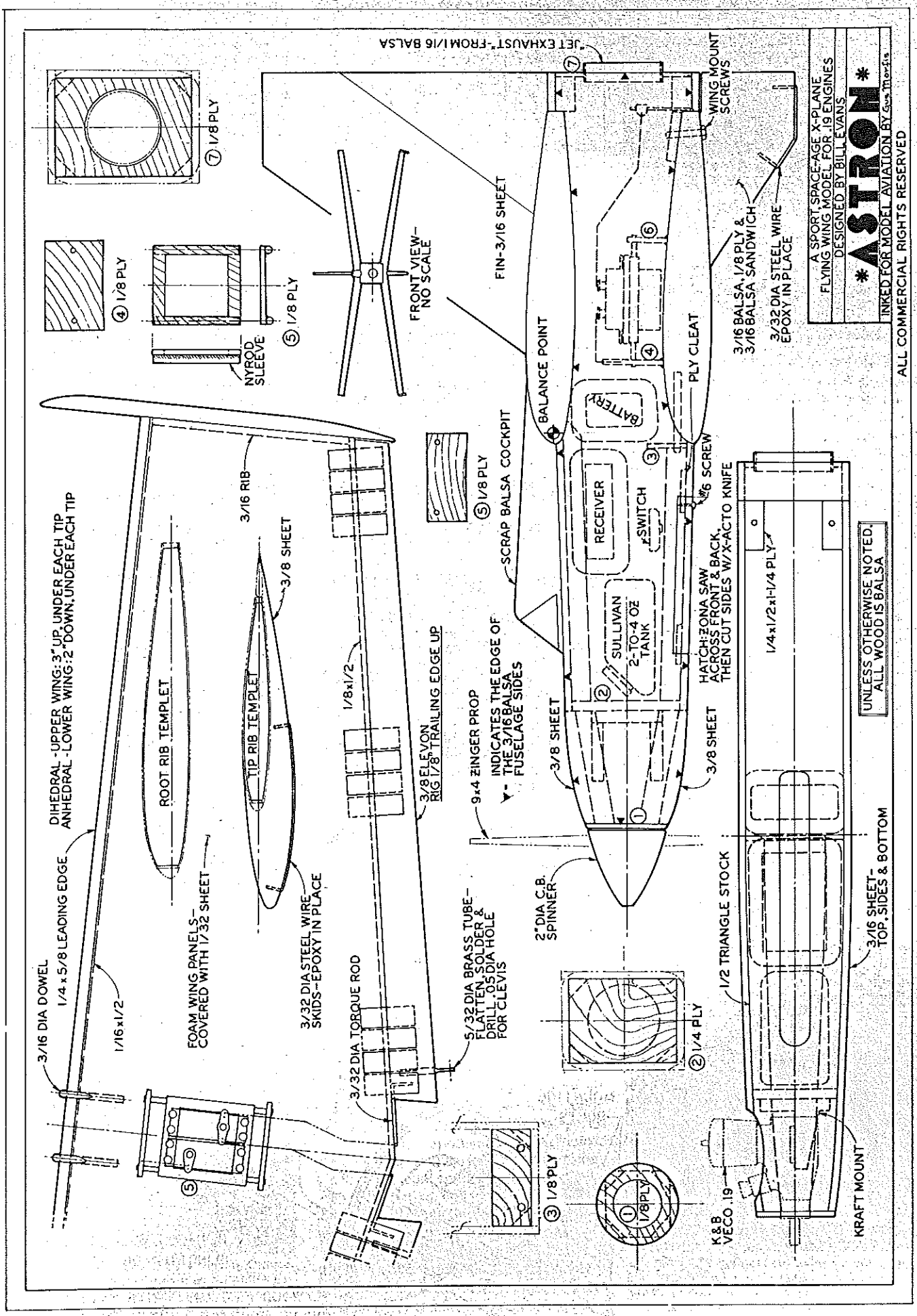
Ready for launching, Steve Lepler shows how to hold the beast. Would be a good idea for you to start your engine when you try it. And, right, Steve, does just that, demonstrating the starting procedure. Hand-flippers better get a starter or your holding arm could drop off at the shoulder.

Fly-by showing stripe markings on bottom wing —to aid orientation. Which side is up? Things can get mighty confusing, very, very fast! Shutter bugs note—heading shot with 200mm lens.





Nose-up attitude just after launching. Bill's new Hasselblad camera makes action shooting just like popping clay pigeons—but forget leading! That insignia looks like a hex-mark.


ASTRO
A SPORT SPACE-AGE X-PLANE
FLYING WING MODEL FOR .19 ENGINES
DESIGNED BY BILL EVANS
INKED FOR MODEL AVIATION BY Gus Morris
ALL COMMERCIAL RIGHTS RESERVED
UNLESS OTHERWISE NOTED, ALL WOOD IS BALSA
DIHEDRAL - UPPER WING: 3" UP UNDER EACH TIP
ANHEDRAL - LOWER WING: 2" DOWN, UNDER EACH TIP
3/16 DIA DOWEL
1/4 x 5/8 LEADING EDGE
1/16 x 1/2
FOAM WING PANELS - COVERED WITH 1/32 SHEET
ROOT RIB TEMPLET
TIP RIB TEMPLET
3/16 RIB
3/8 SHEET
3/32 DIA STEEL WIRE SKIDS - EPOXY IN PLACE
3/32 DIA BRASS TUBE - FLATTEN, SOLDER & DRILL .05 DIA HOLE FOR CLEVIS
3/32 DIA TORQUE ROD
3/8 ELEVON RIG 1/8" TRAILING EDGE UP
1/8 x 1/2
9x4 ZINGER PROP
INDICATES THE EDGE OF THE 3/16 BALSA FUSELAGE SIDES
2" DIA C.B. SPINNER
SCRAP BALSA COCKPIT
BALANCE POINT
FIN - 3/16 SHEET
FRONT VIEW - NO SCALE
JET EXHAUST - FROM 1/16 BALSA
WING MOUNT SCREWS
3/16 BALSA, 1/8 PLY & 3/16 BALSA SANDWICH
3/32 DIA STEEL WIRE EPOXY IN PLACE
PLY CLEAT
BATTERY
RECEIVER
SWITCH
6 SCREW
SULLIVAN 2-TO-4 OZ TANK
HATCH: ZONA SAW ACROSS FRONT & BACK, THEN CUT SIDES W/ X-ACTO KNIFE
1/4 x 1/2 x 1-1/4 PLY
1/2 TRIANGLE STOCK
3/16 SHEET - TOP, SIDES & BOTTOM
KRAFT MOUNT
K&B VECO .19
NYROD SLEEVE
1/8 PLY
1/4 PLY