

SPEEDY



■ Dave Horvath

This aerobatic design builds easily and uses relatively inexpensive engines

THIS MODEL WAS DESIGNED for advanced fliers who are comfortable with basic aerobatic maneuvers; those who like to fly fast, aerobatic, Club .20-type sport Pylon aircraft with less-expensive engines.

This project took more than four years to complete. I have built seven of these models, and I've logged more than 400 flights. Landing gear is optional; it can be installed in the tail-dragger configuration, or omitted so the model can be hand-launched.

Every model design is a compromise, and this one is no exception. The basic laws of physics show that every time speed doubles, drag squares. For this reason I left off the landing gear. This definitely makes a difference in the model's speed and maneuverability. The advantages include reduced drag, weight, building time, runway independence, reduced chance of crosswind disasters, and fuel savings.

Since most four-channel radios now come with three servos, the hand-launched version requires only three channels for the ailerons,

elevator, and throttle. No mixing is required. The V-tail functions as an elevator only; it's connected by a "Y" pushrod. A simple skid makes it possible to land on a paved runway or grass.

The tail-dragger version requires four-channel control with a V-tail mixer, since rudder control is necessary. The receiver, battery, and servos are standard.

CONSTRUCTION

A step-by-step construction sequence is not required, as this design is elementary. Make sure all of the parts fit well, and that the glue joints are good. I use Elmer's Professional Carpenters' Wood Glue for general assembly, and slow-setting epoxy for the high-stress areas.

Wing: The double-tapered low wing has a NACA-0012 symmetrical wing section at 0° incidence. Dihedral is 5°, 2.5° per wing panel. The wingspan is 55½ inches; there is no washout.

Be careful when using the sandwich method to cut the ribs; cut the balsa strips at least $\frac{1}{2}$ inch longer at both ends of template, and trim the ribs during assembly. Make a right and left set of ribs; this way the edge of the ribs will taper outward. Make sure the spars are straight-grain wood.

Lay the ribs over the bottom spar on the plan. Start with rib 3. Add the $\frac{1}{8}$ shear webs, then the top spar. Make sure the shear webs fit well, and that their grain is vertical. Join the wing panels with dihedral braces, using slow-setting epoxy.

Using a Dremel tool, cut $\frac{3}{8}$ inch off of the threaded end of the aileron torque rods to clear the servos. Cut the ailerons from medium trailing-edge stock. Make sure the gap between the wing and the aileron is minimal.

Fuselage: Tape two $\frac{1}{8}$ Lite Ply pieces together with double-face tape, and cut out the fuselage sides. Sand and separate the two sides. Glue on the $\frac{1}{8}$ -square balsa longerons. The fuselage is assembled upside-down over the plan. Start with formers F2 and F4 using C clamps.

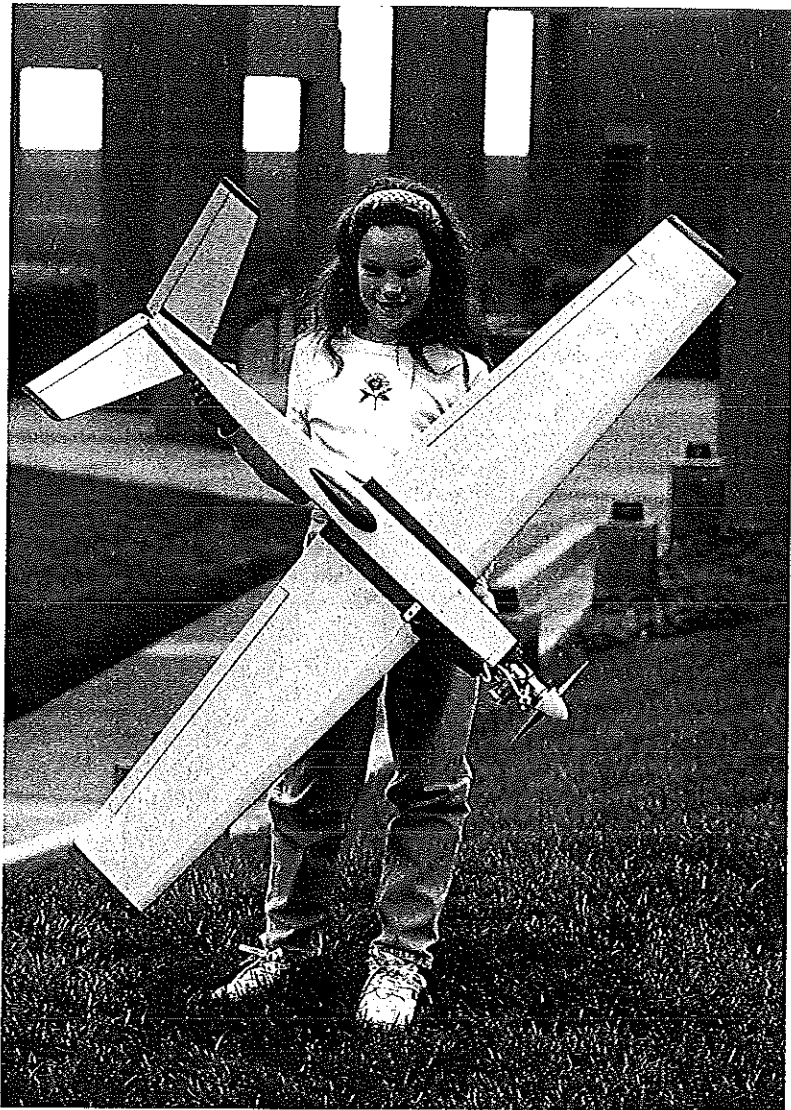
The Sig canopy base is sandwiched between two $\frac{1}{16}$ balsa sheets. The bottom sheet is crossgrained; the top sheet with the opening for the canopy is parallel grain. Sand and spray paint the canopy from the inside, and epoxy this assembly.

Fit a suitable plastic tube for the receiver antenna; it exits at the bottom-left corner of the fuselage. Use slow-setting epoxy to install the firewall, wing-bolt blocks, servo rails, and the V-tail.

Empennage: Cut $\frac{1}{2}$ and $\frac{1}{8}$ strips from $\frac{1}{8}$ balsa sheet. Frame up the stabilizer over the plan, then sheet the top and bottom with $\frac{1}{16}$ balsa. Fit and hinge the elevator. After sanding everything, cut this assembly on the centerline. Bevel the joint, and epoxy the two halves together at 110° . Make sure the halves are true.

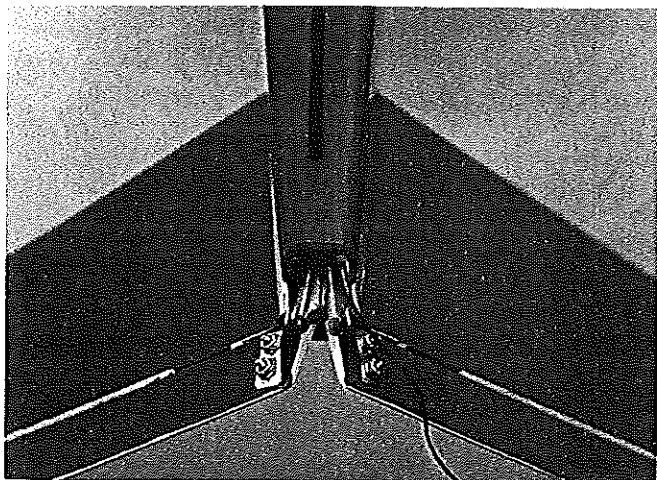
Alignment: The engine's thrustline is 0° , both vertically and laterally. Align the V-tail and wings with a Robart incidence meter for 0° incidence.

Since the fuselage is tapered, the leading edge of the V-tail will "sink" lower than the trailing edge. Sand the

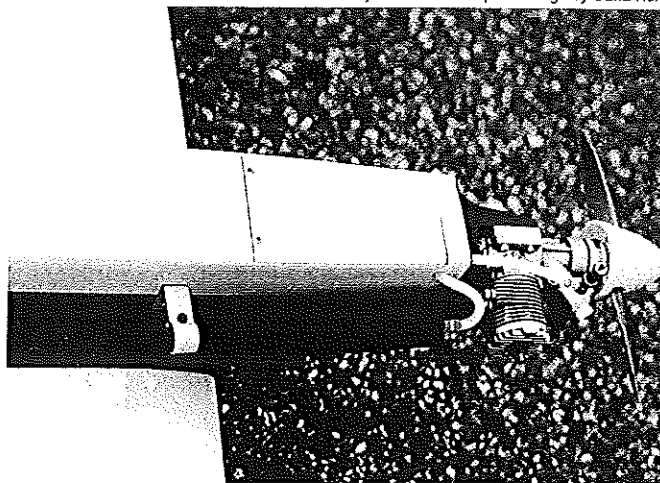


Despite its V-tail, the hand-launched version of Speedy requires only three channels for ailerons, elevator, and throttle.

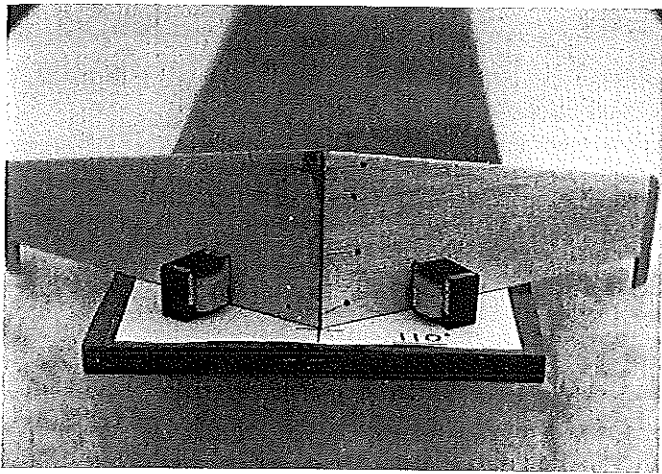
Photos by the author Graphic Design by Carla Kunz



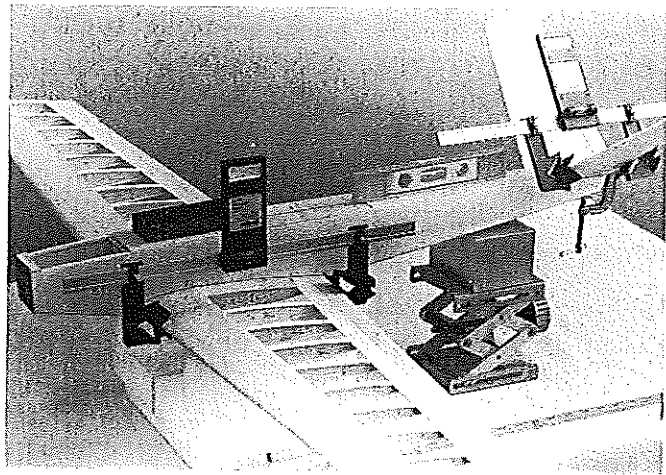
Closeup of the V-tail. No mixing is required. The V-tail functions as an elevator only; it's connected by a "Y" pushrod.



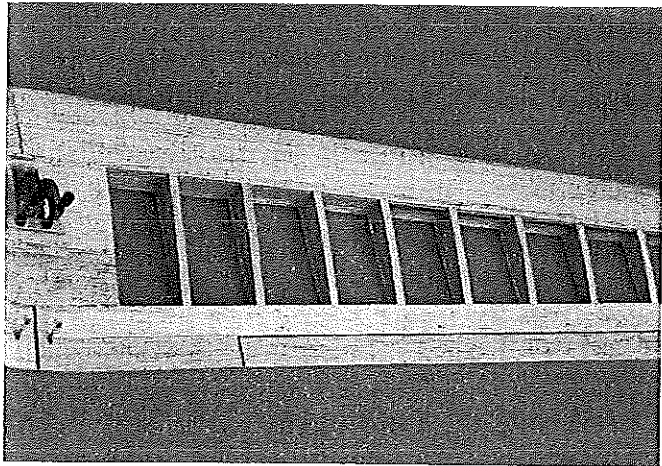
One of many possible engine/muffler combinations: A rear-exhaust MVVS .21 GFR with a #3244 tuned pipe.



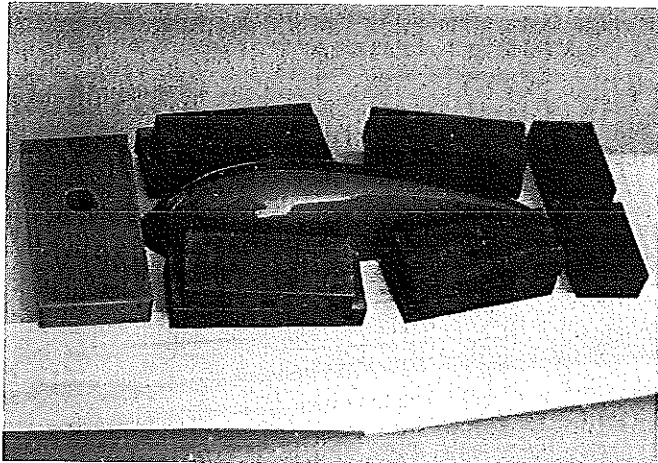
Carefully bevel and align the halves of the V-tail at 110°. Use slow-setting epoxy for this assembly.



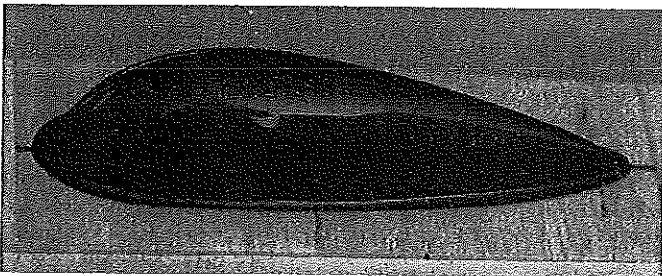
Wing is conventional D-tube of balsa, plywood, and spruce. Make sure the gap between the wing and aileron is minimal.



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Canopy installation. Metal weights hold everything in position on the fuselage until the slow-setting epoxy cures.



The canopy is a Sig unit. It's attached to the model with a piece of 1/16 balsa sheet with an appropriate hole cut in it.

fuselage sides under the tail to achieve 0° incidence. Make sure the V-tail is aligned in all three dimensions. Carefully sand the wing saddle to obtain a 0° reading. Check the wing tips with the incidence meter for 0° incidence.

The model is covered with MonoKote. The ailerons should have 1/4-inch throw each way; the elevator should have 3/8-inch throw each way. The model weighs approximately three pounds ready-to-fly.

Engine and Fuel Tank: There is a good selection of two-stroke engines on the market for this design. I fly my fleet with the following engine-and-prop combinations: One model has an MVVS 21 GFR (with a #3244 tuned pipe) turning a 7 x 6 APC prop, another model has an O.S. .25 SF with an 8 x 6 Master Airscrew scimitar, a third model has an O.S. .32 F with a 9 x 6 wooden Rev-

SPEEDY

Type: RC Sport

Wingspan: 55½ inches

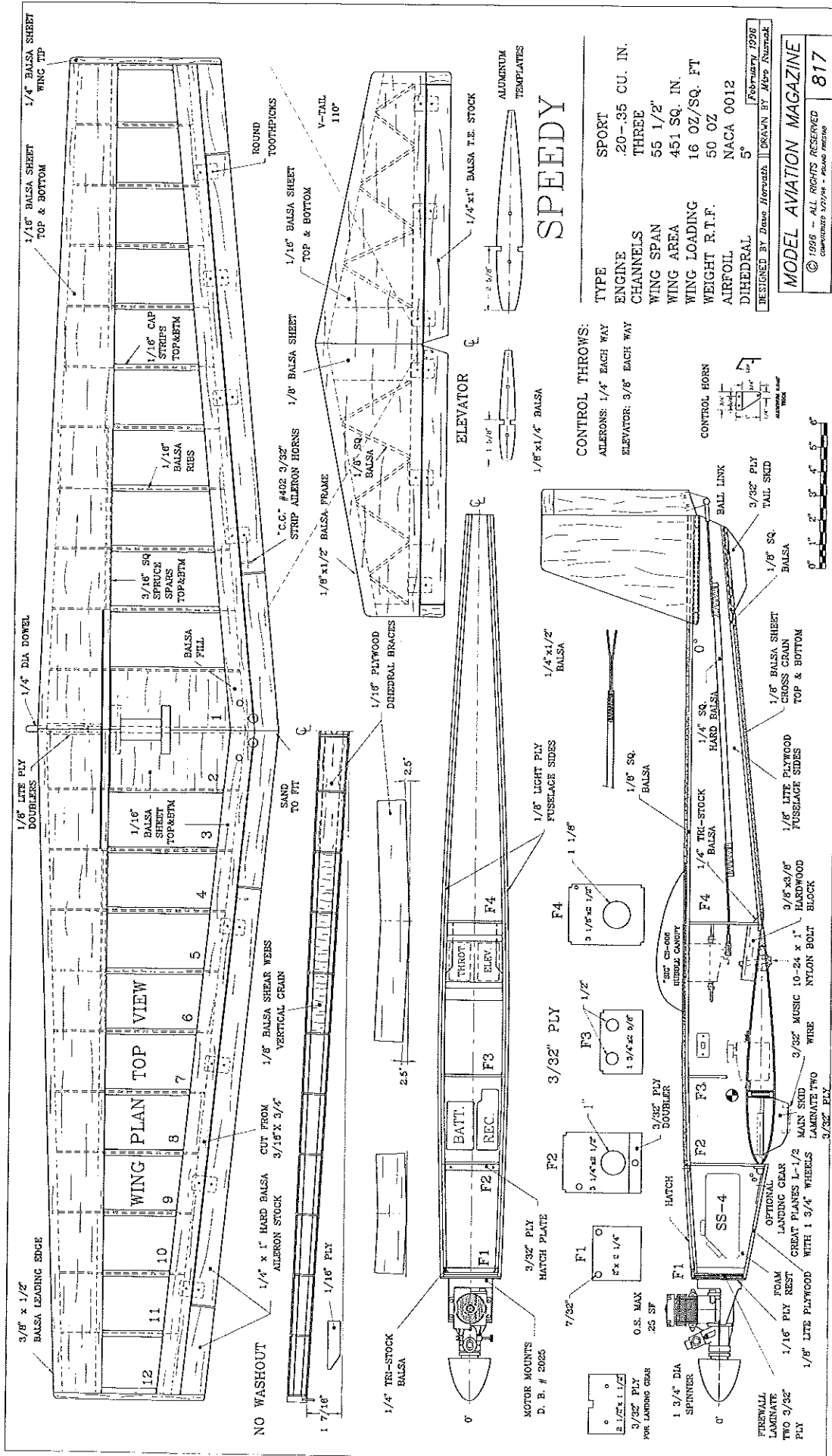
Engine: .20-.35 two-stroke

Functions: Throttle, aileron, elevator (hand-launched version); throttle, rudder, aileron, elevator (landing-gear version)

Flying Weight: 50 ounces (approx.)

Construction: Sheet/built-up

Covering: MonoKote

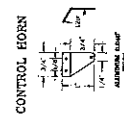


SPEEDY

TYPE	SPORT
ENGINE	.20-35 CU. IN.
CHANNELS	THREE
WING SPAN	55 1/2"
WING AREA	451 SQ. IN.
WING LOADING	16 OZ./SQ. FT.
WEIGHT R.T.F.	50 OZ.
AIRFOIL	NACA 0012
DIHEDRAL	5°

DESIGNED BY Dave Horvath DRAWN BY Mike Busmark
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CONTROL THROWS:
 ALERONS: 1/4" EACH WAY
 ELEVATOR: 3/8" EACH WAY



MOTOR MOUNTS
 D. B. # 2025

1 3/4" DIA SPINNER
 3/32" PLY FOR LANDING GEAR

FIREWALL LAMINATE TWO 3/32" PLY
 1/16" PLY REST
 1/8" LITE PLYWOOD WITH 1 3/4" WHEELS LAMINATE TWO 3/32" PLY

OPTIONAL LANDING GEAR
 GREAT PLANES L-1/2 MAIN SKID
 3/32" MUSIC WIRE
 10-24 x 1" NYLON BOLT BLOCK

F1 5x x 1/4"
 F2 3/4" x 1/2"
 F3 1 3/4" x 3/8"
 F4 3/16" x 1/2"

3/32" PLY DOUBLER
 3/32" PLY

1/8" LIGHT PLY FUSLAGE SIDES
 1/4" x 1/2" Balsa

1/8" SQ. Balsa
 1/4" TRI-STOCK HARD Balsa

1/8" SQ. Balsa
 1/8" Balsa SHEET CROSS GRAIN TOP & BOTTOM

1/8" SQ. Balsa
 1/8" SQ. Balsa

3/32" PLY BALL LINK
 3/32" PLY TAIL SKID

1/8" x 1/4" Balsa
 1/8" x 1/4" Balsa

1/8" SQ. Balsa
 1/8" SQ. Balsa

1/8" SQ. Balsa
 1/8" SQ. Balsa

1/8" SQ. Balsa
 1/8" SQ. Balsa

1/4" x 1" Balsa T.E. STOCK
 ALUMINUM TEMPLATES

NO WASHOUT
 1/4" x 1/2" Balsa LEADING EDGE
 1/8" LITE PLY DOUBLERS
 1/4" DIA DOWEL

1/16" Balsa SHEET TOP & BOTTOM
 1/16" Balsa SHEET TOP & BOTTOM
 1/16" Balsa SHEET TOP & BOTTOM

1/8" SQ. SPRUCE SPARS TOP & BOTTOM
 1/16" Balsa RIBS
 1/16" CAP STRIPS TOP & BOTTOM

1/8" SQ. Balsa
 1/8" SQ. Balsa

1/8" SQ. Balsa
 1/8" SQ. Balsa

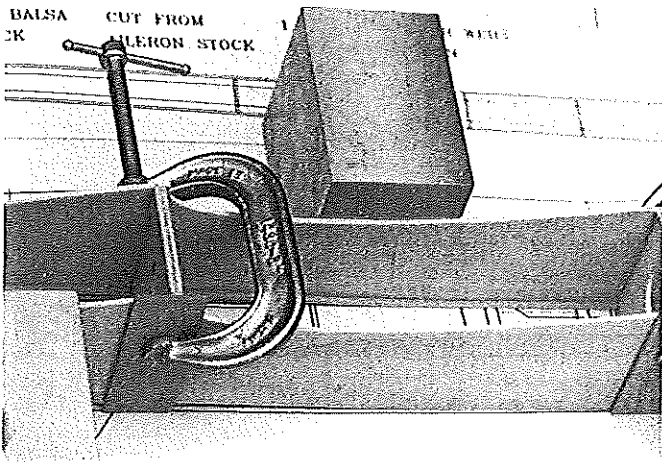
1/8" SQ. Balsa
 1/8" SQ. Balsa

1/8" SQ. Balsa
 1/8" SQ. Balsa

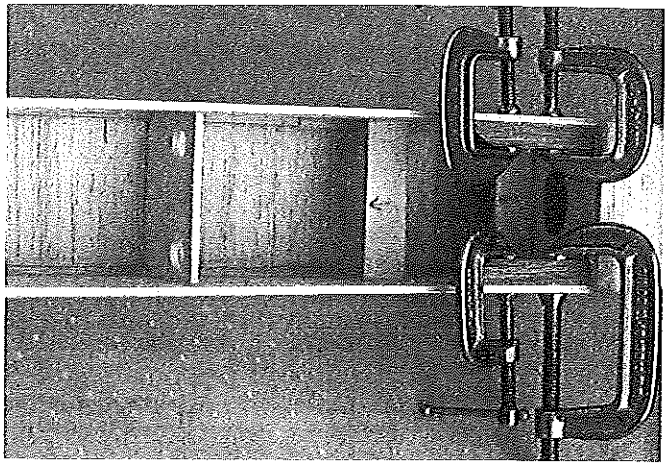
1/8" SQ. Balsa
 1/8" SQ. Balsa

1/4" Balsa SHEET WING TOP
 1/4" Balsa SHEET WING TOP

1/4" Balsa SHEET WING TOP
 1/4" Balsa SHEET WING TOP



Use C-clamps during construction of the fuselage; they'll help maintain proper alignment of the sides and formers.



Fuselage assembly upside-down on plan. Start with formers F2 and F4; make sure fuselage is straight and formers are square.

Jp, and another has a SuperTigre G-34 with a wooden 9 x 6 Rev-Jp.
 The fuel tank is a four-ounce Sullivan unit, pressurized from the muffler. The plan shows a four-ounce tank; however, the fuselage is designed to accept a six-ounce Sullivan tank. Make sure the fuel tank is wrapped in foam, so it won't be in direct contact with the fuselage.

straight. Be extra cautious the first time you fly the model in case it's out of trim. I fly until the model runs out of fuel, then land "pylon" style. The glide is excellent due to the model's low wing loading.

Flying: Make sure the model is properly aligned, warp-free, and balanced properly. The prop should be horizontal when the piston starts to "bite." Adjust the throttle so you can shut the engine off at any time.
 Hand-launching this model is easy; just throttle-up and toss it

Acknowledgments: Thanks to my friend Miro Rusnak for spending countless hours at his computer making the drawings and prints. For help and advice, thanks to Frank Brown and Toni Stark. Last, but not least, special thanks to my family for their patience and support. →

*Dave Horvath
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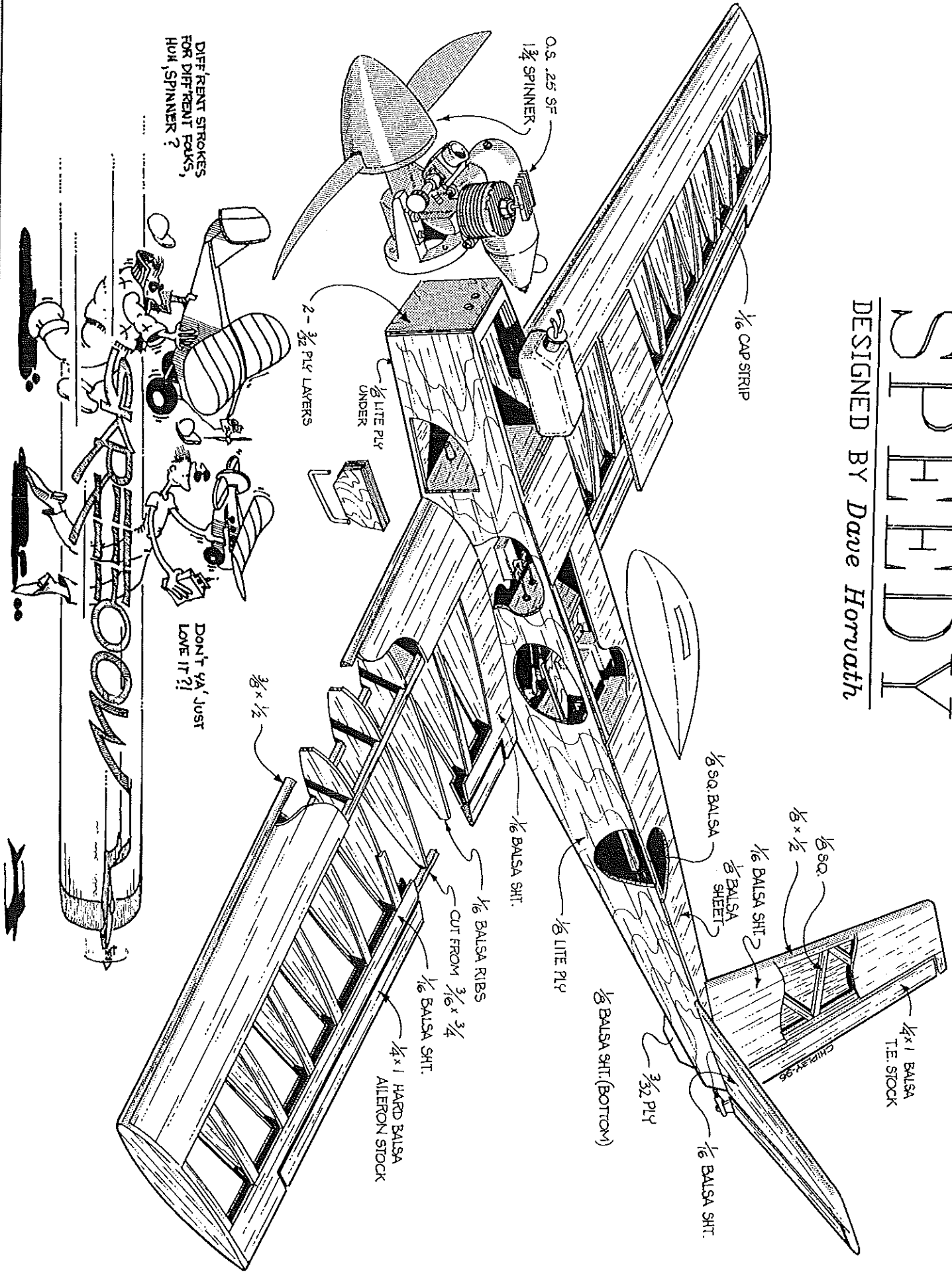
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SPEEDY

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