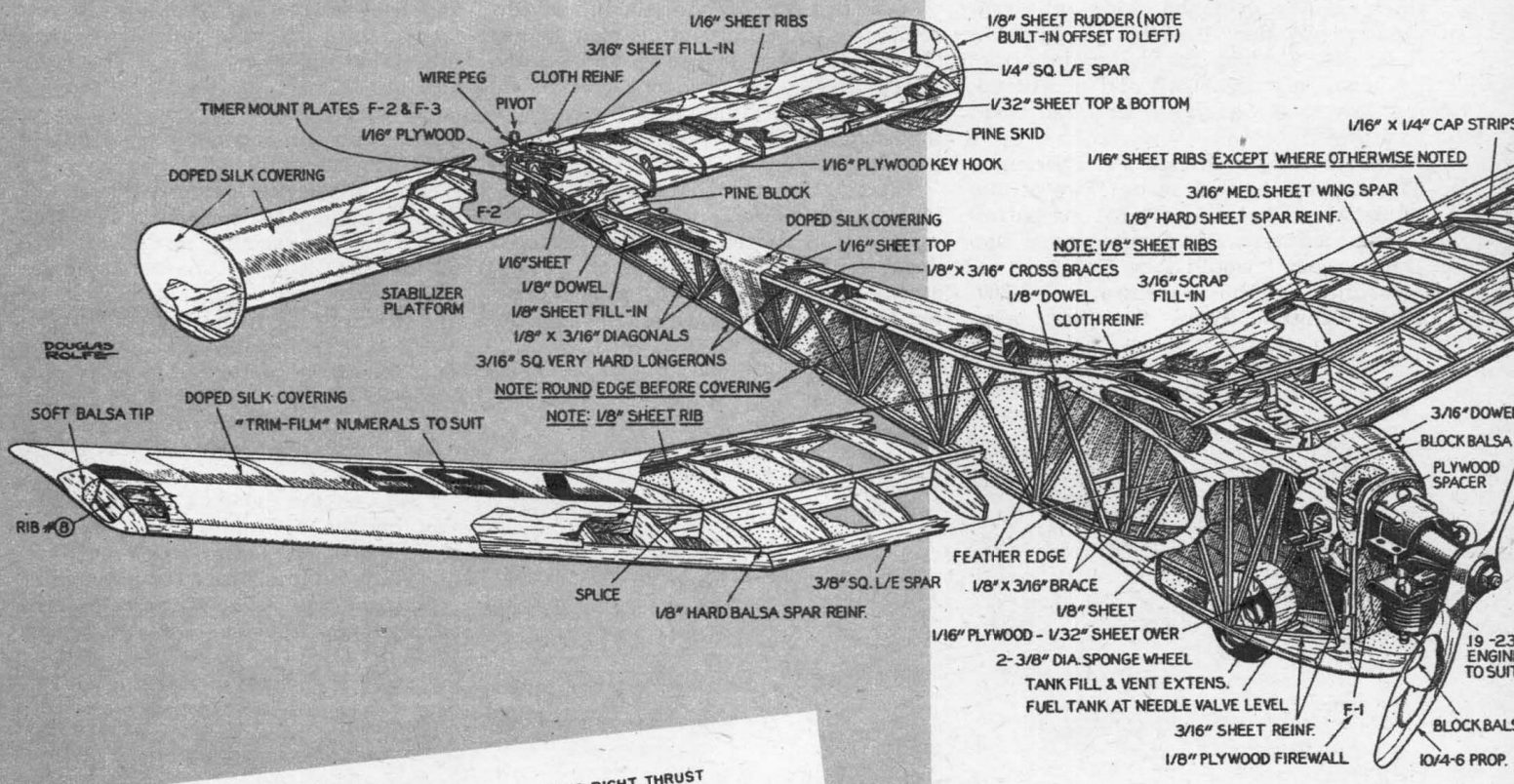
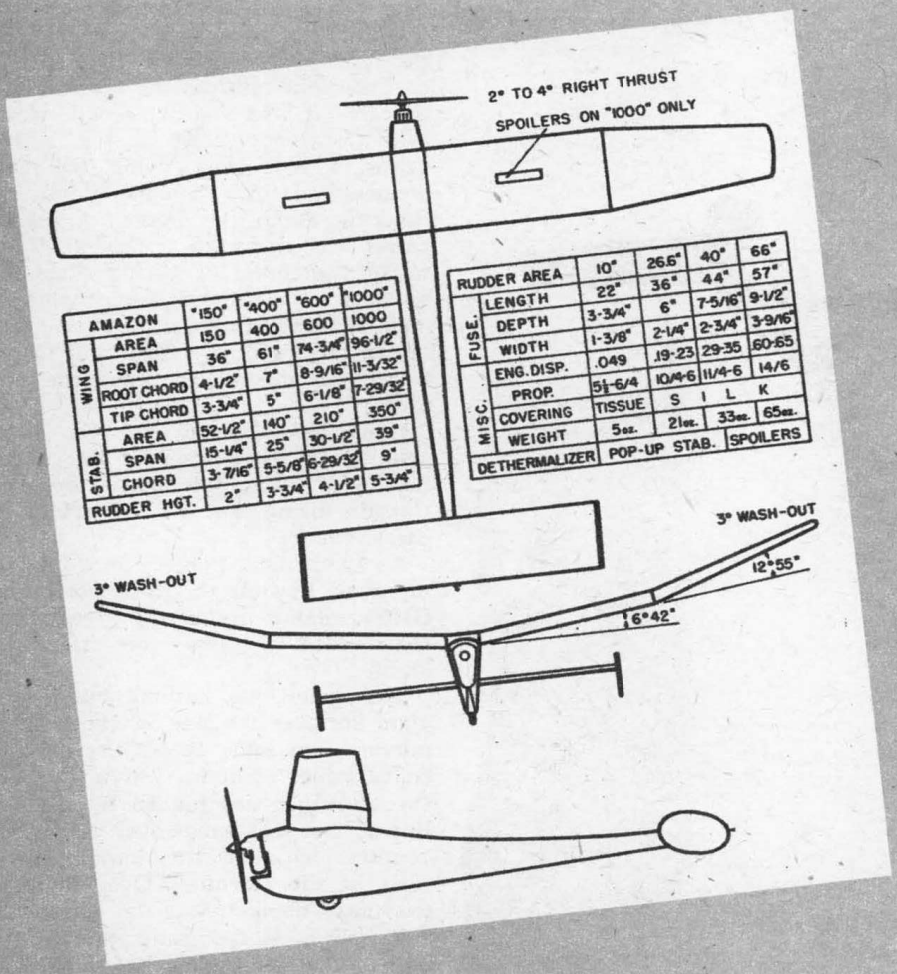




		"150"	"400"	"600"	"1000"
AMAZON		150	400	600	1000
WING	AREA	36"	61"	74-3/4"	96-1/2"
	SPAN	4-1/2"	7"	8-9/16"	11-3/32"
	ROOT CHORD	3-3/4"	5"	6-1/8"	7-29/32"
	TIP CHORD	52-1/2"	140"	210"	350"
STAB.	AREA	15-1/4"	25"	30-1/2"	39"
	SPAN	3-7/16"	5-5/8"	6-29/32"	9"
	CHORD	2°	3-3/4"	4-1/2"	5-3/4"
RUDDER HGT.					

RUDDER AREA		10"	26.6"	40"	66"
FUSE.	LENGTH	22"	36"	44"	57"
	DEPTH	3-3/4"	6"	7-5/16"	9-1/2"
	WIDTH	1-3/8"	2-1/4"	2-3/4"	3-9/16"
MISC.	ENG. DISP.	.049	.19-.23	29-35	.60-.65
	PROP.	5-6/4	10/4-6	11/4-6	14/6
	COVERING	TISSUE	S I L K		
	WEIGHT	5oz.	21oz.	33oz.	65oz.
DETHERMALIZER		POP-UP STAB.		SPOILERS	

■ *Sandra Hill, air-model designer extraordinary, is speaking:* Most girls learn to bake an apple pie passably well and have little trouble in snagging the man of their dreams, but with model builders it's different. After the first few dates with my husband-to-be I had to bone up on aerodynamics to show him what a good companion I could be.

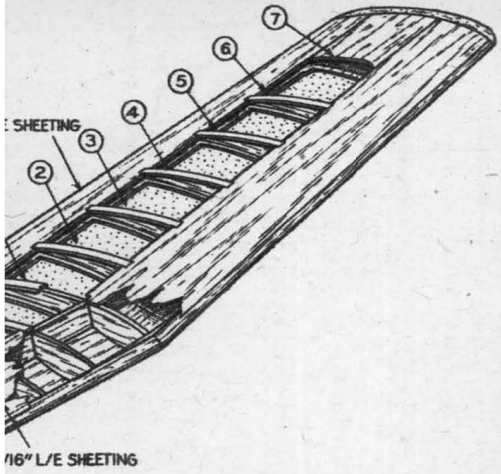
After we were married and I had tagged along to a few dozen contests, I marveled at the dogged patience of the number of modelers who could pick up the shattered remains of a brand-new ship, patch it to fly again, only to have the same faulty and disastrous flight characteristics. With the few aerodynamic principles I understood, I felt that I could design a model with more dependable performance.

This turned out to be more research than I had expected, but I finally worked out on paper a ship which theoretically had stability superior to pylon-type designs and high performance. Every detail in the *Amazon* was carefully planned, and any feature which could not be listed as "functional" was discarded.

The efficient high aspect ratio (9.24) wing has a sheeted leading edge, full-

SANDRA and STAN HILL'S

Amazon "400"



Jack Smith, left, winner of the Class B open division free flight competition at the '52 Nationals, Dr. Stan Hill and Mrs. Hill shown with the four different "Amazons." From the left these models are the "600", "150", "1000" and the "400". Mrs. Hill is responsible for the design of the airplane which had both its test flight and contest debut at '52 Nats. There Bill Cook took 7th in C Sr. with a "600."

depth box spar, and cap strips for warp-resistance and strength. The full-sheeted tail is easily constructed, warp proof, and twin rudders out of the prop wash make for less "touchiness" under power and high efficiency resulting from an effective increase in stabilizer aspect ratio.

The triangular fuselage construction allows maximum rigidity for weight of materials. A single belly wheel cuts out conventional landing gear weight and drag, R.O.G.'s easily, and will never cause the ship to nose over. The engine was inverted to allow a high thrust line near the center of drag to lessen nosing-up moment and the inefficient compensatory effects which go with it. The deep slab sides enable control of C.L.A. placement for stability, and far better visibility. (The longer the ship is seen, the longer that stop watch runs!)

First flights confirmed my choice of high C.G.-low C.L.A. approach to spiral stability. No *Amazon* made to date has shown less than a 1 to 10 power to glide ratio in dead air, and the "1000" has been hitting a surprising 1 to 18 fairly consistently.

Stan Hill on construction: Lay out and assemble the two fuselage sides one on top of the other. When dry remove the two sides from the plan as one and block-sand to identical outline before separating. Bevel the lower longerons, glue and clamp with clothespins. While this is drying, install cross members at the top and the forward part of the bottom of the fuselage. Recheck the bottom for proper alignment before dry, as it cannot be warped into shape later. Install engine on firewall and give the nuts several heavy coats of fuel-proof glue. This same glue should be used for the entire forward quarter of the fuselage.

Install firewall, fuel tank, wheel well, and dethermalizer timer mounting plates. Glue on wing mounts and side planking and when these are dry, plank the top, checking alignment carefully as this sheet "locks" the fuselage into a rigid structure when dry. Install stabilizer platform. After sanding smooth (#½ closed coat garnet paper followed by #4/0), dope on the cloth (linen) firewall reinforcement.

The wing is the only part of the *Amazon* that departs from usual structural practice and *must* be done in the following sequence:

1. Pre-glue joining surfaces of the spar and when dry assemble the *complete* spar on the spar plan. When dry remove from the plan, glue and clamp reinforcement plates, and dry for twenty-four hours. Bevel as shown on plan.

2. Block up T.E., spar and L.E. from plan as indicated and glue in rib halves on either side of spar. (Ribs should previously be stacked and sanded to identical outline.) Before removing from the plan glue on the upper part of the T.E. It is best to assemble the inboard panels first and tips last.

3. Complete the center section and bevel the entire L.E. preparatory to sheeting. Sheet the section from spar to leading edge doing the *bottom* first, one panel at a time, being sure to glue it to all ribs as this forms a rigid cellular structure. Note: Upper surface sheeting should be medium on inboard panels and medium soft on outboard and lower inboard panels. Lower outboard panels should be soft.

4. Weight wing down on a flat board and glue on upper surface planking, allowing to remain under weights until dry. When sheeting the upper surface of the tips block up the end of the trailing edge ¼ inch for washout.

5. Complete remaining planking and cap stripping and sand in usual manner preparatory to covering. Dope on linen T.E. reinforcement at the center section.

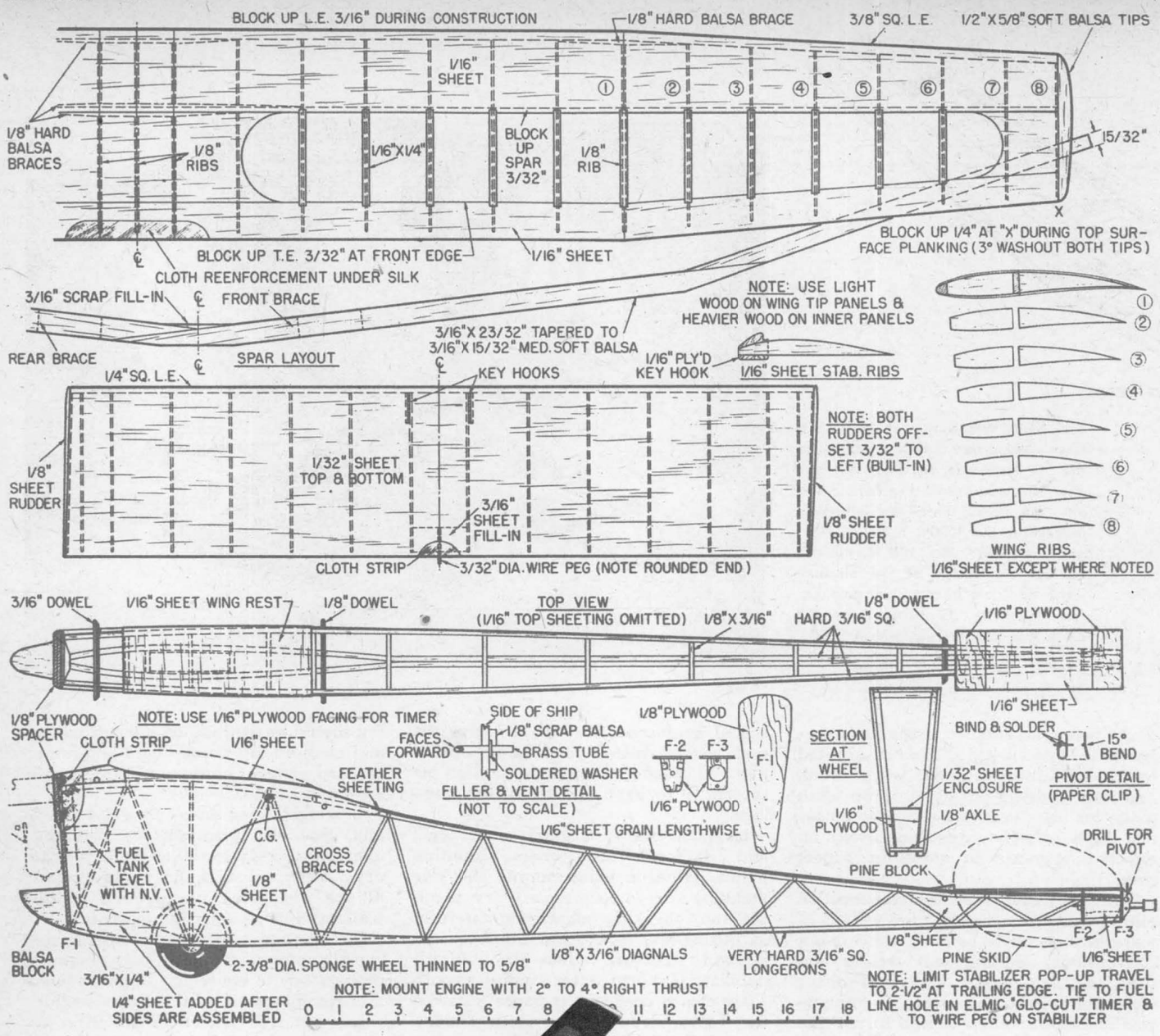
Lay out 1/32" sheet for stabilizer on plan and glue L.E., ribs, and center reinforcement block to it. Allow to dry and then cover upper surface with 1/32" sheet before removal from plan, gluing to all ribs as in the wing. Cut sheeting and insert plywood key-hooks.

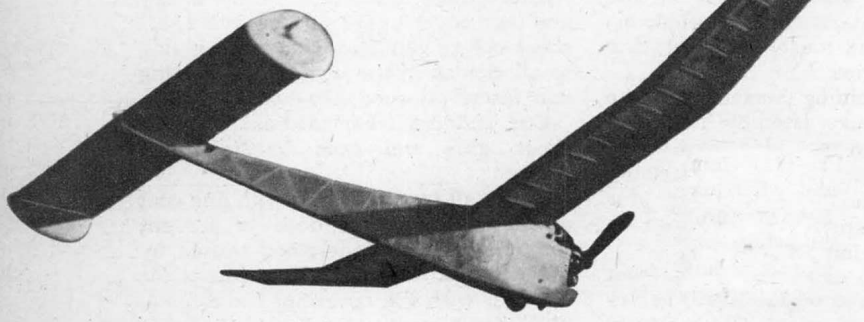
Cut rudders from medium soft ⅛" sheet, glue and sand to streamline shape.

Finish all planked areas with one coat of sanding sealer or dope to prevent lumpy swelling of the wood caused by the wet silk covering. The ship is *far* stronger with silk covering. The original "400" built in '49 has never needed a patch! For inexpensive dyed covering try any 5 and 10¢ store for yard-square silk scarves. After covering apply two coats of clear nitrate dope and follow with a very light sanding, using #400 paper. Glue on the wing keys before further doping. This is *essential* for consistent flying in any contest ship. Put off keying the rear part of the stabilizer until test flights have indicated the exact setting. Apply two coats of thinned acetate butyrate dope; clear butyrate for

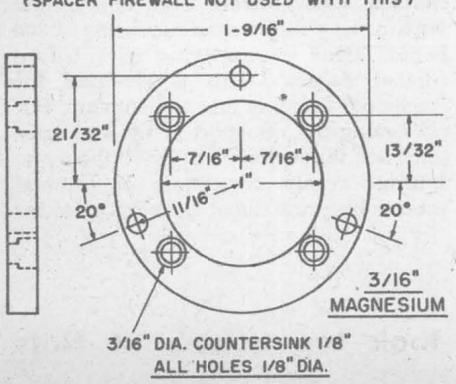
Outstanding new free flight design by California gal took top honors at Nats

AMAZON "400"





RADIAL ENGINE MOUNT ADAPTOR FOR K&B .19
(SPACER FIREWALL NOT USED WITH THIS)



the wings to allow the color of the silk to "glow" as sunlight passes through, and pigmented orange or vermilion butyrate for the fuselage and rudders. This combination gives maximum contrast with all possible backgrounds for very high visibility and needs no fuel proofer of any kind. A little wax will heighten flash visibility and makes the finish even more fuel proof.

Jack Smith on flying: Adjust for a fast glide with a *very* slight left turn by shifting stabilizer. Test fly with low power runs of about seven to ten seconds until a very wide *left* climb circle and fairly tight *left* glide turn are obtained. Make all turn adjustments with rudder and thrust changes rather than drag tabs, stabilizer or wing cocking. The climb will tighten under high power to a loose vertical barrel roll. When peak adjustment is attained key the rear end of the stabilizer. A 9/6 prop is minimum for good performance, with a 10/5 or 10/6 wide-blade prop being the best.

Every *Amazon* built by local modelers, whether expert or not, has given excellent, dependable performance. It isn't the slightest bit tricky to handle.

We would appreciate hearing from any builders concerning problems or contest performance of your *Amazon*. Write to S. D. Hill, c/o Air Trails.

DESIGN DATA

Wing. Area: 400 sq. in. Span: 61". Root chord: 7". Tip chord: 5". Av. chord: 6.6." Aspect ratio: 9.24:1. Airfoil: N.A.C.A. 4612. Incidence angle: +7 deg. Dihedral angles: 6 deg. 42 min. inboard, 12 deg. 55 min. outboard. Washout: 3 deg.

Stabilizer. Area (35% of wing): 140 sq. in. Span: 25". Chord: 5.625". Airfoil: 10% Flat Bottom. Incidence angle: +3 deg.

Amazon "400"

Rudders. Area: 12 sq. in. each. Chord: 5.625". Height: 3.75 in.

Fuselage. Length (firewall to tail): 36 in. Depth: 6 in. Width: 2.25 in. Thrust angles: 4 deg. down, 2 deg. right.

Bill of Materials—Amazon "400"

Wing

Quan.	Size	Grade	Part
2	⅛"x⅝"x5"	Soft	Tips
2	1/16"x3"x36"	Med. hard	Inboard plankng & T.E.
3	1/16"x3"x36"	Med.	Lower inboard planking, ribs & outboard T.E.
2	1/16"x3"x36"	Soft	Tip & misc. planking
2	⅜"x⅜"x36"	Med.	L.E.
2	3/16"x¾"	1 hard, 1 med.	Spar
5	1/16"x¼"x36"	Soft	Capstrips

Fuselage

4	3/16"x3/16"x36"	Very hard	Longerons
5	⅛"x5/16"x36"	Med.	Compression members
1	⅛"x3"x36"	Med.	Planking
1	1/16"x3"x36"	Med. soft	Planking & wing mount
1	1½"x1½"x1⅛"	Med.	Nose skid
1	⅝"x2"x2¼"	Med.	Cowl
1	3/16" Diam.	Birch Dowel	Pegs
1	2⅝" Sponge	Rubber Wheel	
1	1/16"x3"x6"	Plywood	Wheel well, tail platform, timer-mount
1	⅛"x2¼"x8"	Plywood	Firewall
1	3/16"x⅜"x12"	Hard	Firewall backing comp. member

Tail

4	1/32"x3"x36"	Hard	Planking
1	¼"x¼"x36"	Med.	L.E.
1	1/16"x1"x36"	Med.	Ribs
1	⅛"x3"x12"	Soft	Rudders

Misc.

2	yards orange or yellow silk