

#822

■ Dick Sarpolus

Stephens

Modeling



THE POPULARITY of modeling full-scale acrobatic aircraft can be easily seen today; kits are available of the Extras, Sukhois, Lasers, Caps, Pitts, etc., in a variety of sizes and construction

types. When a new version of an acrobatic aircraft appears, it's only a short time before an RC version is out in kit form or published as a construction article. Usually the latest

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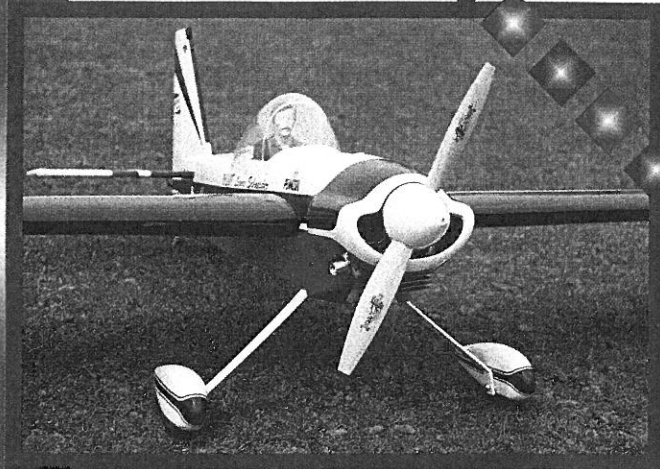
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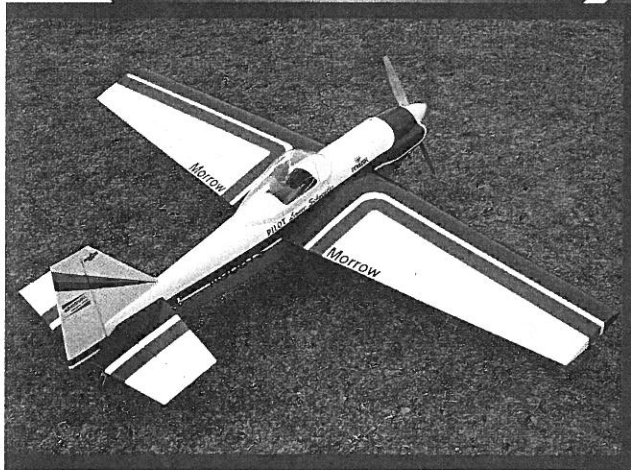
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ance Schneider built the prototype Akro, and now it is his all-time favorite model—he wishes he could fit in it!

Fiberglass cowl and wheel pants, wing spar/joiner, canopy, landing gear are commercially available—text has sources.



The Akro's tapered plug-in wing, large ailerons, elevators, and rudder provide plenty of aerobatic capability.

Sachs 3.2 on vibration isolation mounts. Two exhaust stacks exit from bottom. A special exhaust baffle is available.

signs are the most popular and get the most attention at the flying fields.

I like the newer aircraft too, but one older design that I've always admired has never had much impact in the modeling world: the Stephens Akro.

In the late 1960s, Clayton Stephens' Akro was one of very few aerobatic monoplanes around that dared to challenge the biplanes; the reason was about the hottest aerobatic machine going. Stephens designed the Akro to take on the Pitts, and new competition pilot Leo Loudenslager opened a lot of eyes when he began winning major contests with his Stephens Akro.

After a few years flying his Akro, which he had built himself, Loudenslager stripped the machine down and rebuilt it with a number of modifications. The major modification, one that changing the appearance in a big way, was the removal of the bubble canopy and the addition of a turtledeck along with a much-smaller canopy. Rebuilt with different appearance and a new color scheme, Loudenslager's modified Akro began winning even more competition events. The plane got a new name: Laser. Time went by, the Laser became famous, and you don't hear about the Stephens Akro anymore.

It may not be as competitive as the Laser or other, newer designs, but I like the appearance of the large bubble canopy and sleek, racerlike lines of the Akro. I'm aware of only one RC design published of the original bubble-canopy Akro, and that was a .60-size model. A number of modified Akros were built, some with a raised turtledeck that eliminated the full bubble canopy; some of them have been modeled.

I wanted a large, gas/ignition-engine Akro, and figured that if Loudenslager modified his Akro to get the Laser, I could start with a Laser layout and modify it back to the Akro configuration. My version certainly isn't 100% authentic, exact scale, but it's obviously a Stephens Akro—and it's quick and easy to build, and flies well.

I saw several pictures of a Stephens Akro flown by acrobatic pilot JoAnn Nottke; its white, red, and black color scheme really looked good. To get enough information to model this particular aircraft, I checked with Bob Banka's Scale Model Research. Sure enough, Bob had several three-view drawings available, and a number of his Foto Paaks cover different Akros; one set of color photos was of JoAnn Nottke's aircraft. The photos were a big help to me. Contact Bob at

Stephens Akro



Photos by the Author Graphic Design by Carla Kunz

Full-scale Akro as flown by JoAnn Nottke. Three-views and photos are available from Scale Model Research.

Type: RC Sport

Wingspan: 90 inches

Engine: Sachs 3.2

Functions: Throttle, elevator, rudder, ailerons

Weight: 19¾ pounds

Construction: Built-up

Covering/finish: Coverite 21st Century fabric/paint

3114 Yukon Ave., Costa Mesa CA 92626; Tel.: (714) 979-8058.

To lay out this Akro design, I took a look at several three-view drawings (which varied a bit) and several Laser plans, which also varied a little.

For me, the tough part of designing and scratch-building is figuring how to handle the cowl and canopy that are needed. In this case, Fiberglass Specialties had available a Laser cowl in the size required; Steve Durecki was willing to modify it as necessary to suit my Akro fuselage design, make a mold, and add it to his line of cowls. Steve also had a large bubble canopy that was very close to the Akro's size and shape. Again, they're not *exactly* scale, but they look real good and they're available.

Molded fiberglass wheel pants for the Laser were already being made by Steve, so they're available too from Fiberglass Specialties, 38624 Mt. Kisco Dr., Sterling Heights MI 48310.

The next item needed was a formed aluminum landing gear. Abell Hobby and

Manufacturing Co. (Box 22573, Billings MT 59101) now manufactures the gear for this model. They do a really nice job on the gear; the aluminum alloy works fine, and the gear looks good.

One more piece of hard-to-find hardware is the aluminum tube spar and composite socket tubes for the plug-in wing design. Gator R/C Products Inc. (3713 Pompano Dr., Pensacola FL 32514) has just what we need. So all the tough stuff is available; order the special parts, get or cut your own foam cores, cut out the wood parts, and you have a Stephens Akro kit.

I laid out the wing to a 90-inch span; the highly tapered wing has just over 1,300 square inches of area.

The builder of the prototype Akro was Lance Schneider, longtime friend and fellow RCer. Lance had always admired the original Akro and was tempted by this project to get back into active RC flying, having left the hobby for some years to get into ultralight and home-built aviation activity. He pushed me to complete the Akro plans and he quickly built up the prototype.

We thought about the power plant to be used, and finally settled on an Air Hobbies Sachs 3.2, primarily because of the combination muffler/engine mount, which looked very convenient. The engine also has an electronic ignition system, with the variable timing coupled to the throttle linkage. We knew that retarding the timing at the bottom would make the engine easy to start, and advanced timing at the top end would produce the most power. This engine runs neat, is reasonably quiet (a special baffle is available to go inside the muffler and lower the noise level even more) and has plenty of power for good vertical performance.

(If you like the popular Quadra 42, which is used in a number of different designs, I'm sure it would be fine in this aircraft, for model flying.)

CONSTRUCTION

The construction is totally conventional and well proven. The fuselage is a basic box, with balsa sides and plywood doublers. Foam-cored top blocks are sheathed with balsa, as are the foam-cored tail surfaces. The wing panels are foam-cored, with several balsa ribs retaining the composite tubes to the aluminum tube spar; again, standard procedure.

The airplane is easy to build with the foam-core construction, and will be reasonably light; the prototype, with the Air Hobbies Sachs 3.2, weighs 19¾ pounds. Lance had his aircraft ready to cover in about two weeks. He covered his Akro with Coverite's 21st Century pre-painted fabric in white, dark blue, and black, following the color scheme on JoAnn Nottke's aircraft and using a variety of computer-cut vinyl trimmings for scale appearance.

Most acrobatic full-scale aircraft utilize wire bracing on the tail surfaces; although they weren't used on the prototype, I'd recommend them for the appearance as well as the added strength. Du-Bro has a good line of clevises/rods/straps available for this use. Modelers at the flying field recognize the full-scale acrobatic machine heritage, but most do not know about the older Stephens design; it does attract attention and favorable comments.

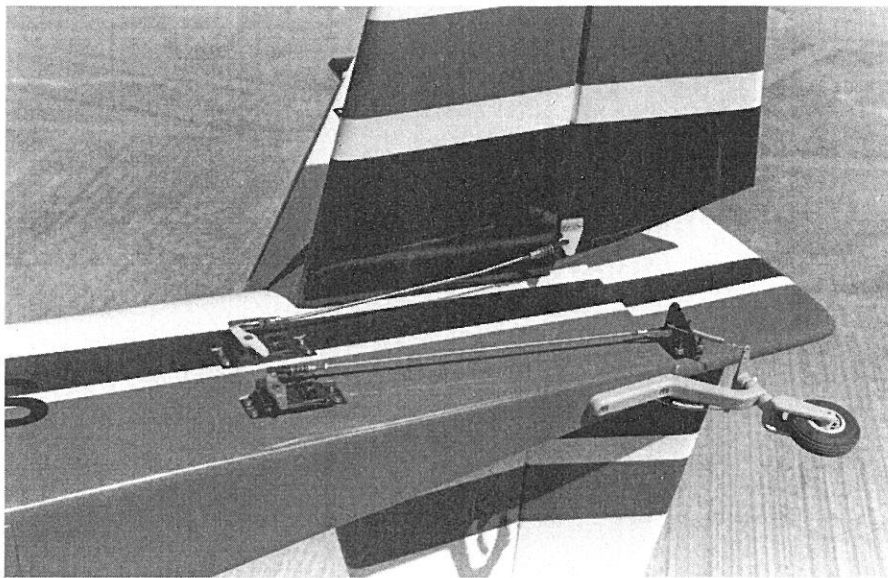
Scratch-builders usually develop their own building procedures and techniques; I'll review the methods I use.

Fuselage: Select firm to hard balsa for the top sides, edge-gluing and splicing as needed to get the size required. Glue the 1/16" plywood doublers, 1/4" plywood landing gear block doublers, plywood stab-saddle doublers, and balsa lower edge strips to the two fuselage halves. I like a firewall at least 3/8" thick for these large engines, so I laminate a piece of balsa to a piece of 1/4" plywood.

With one fuselage side flat on the workbench, add the firewall and the next three bulkheads to that side, installing them perpendicular to the side. Glue the second fuselage side to these bulkheads; the sides are parallel from the firewall to the wing trailing edge position.



Pilot figure adds a touch of realism. The close-to-scale color scheme was accomplished with Coverite's 21st Century fabric and paint.

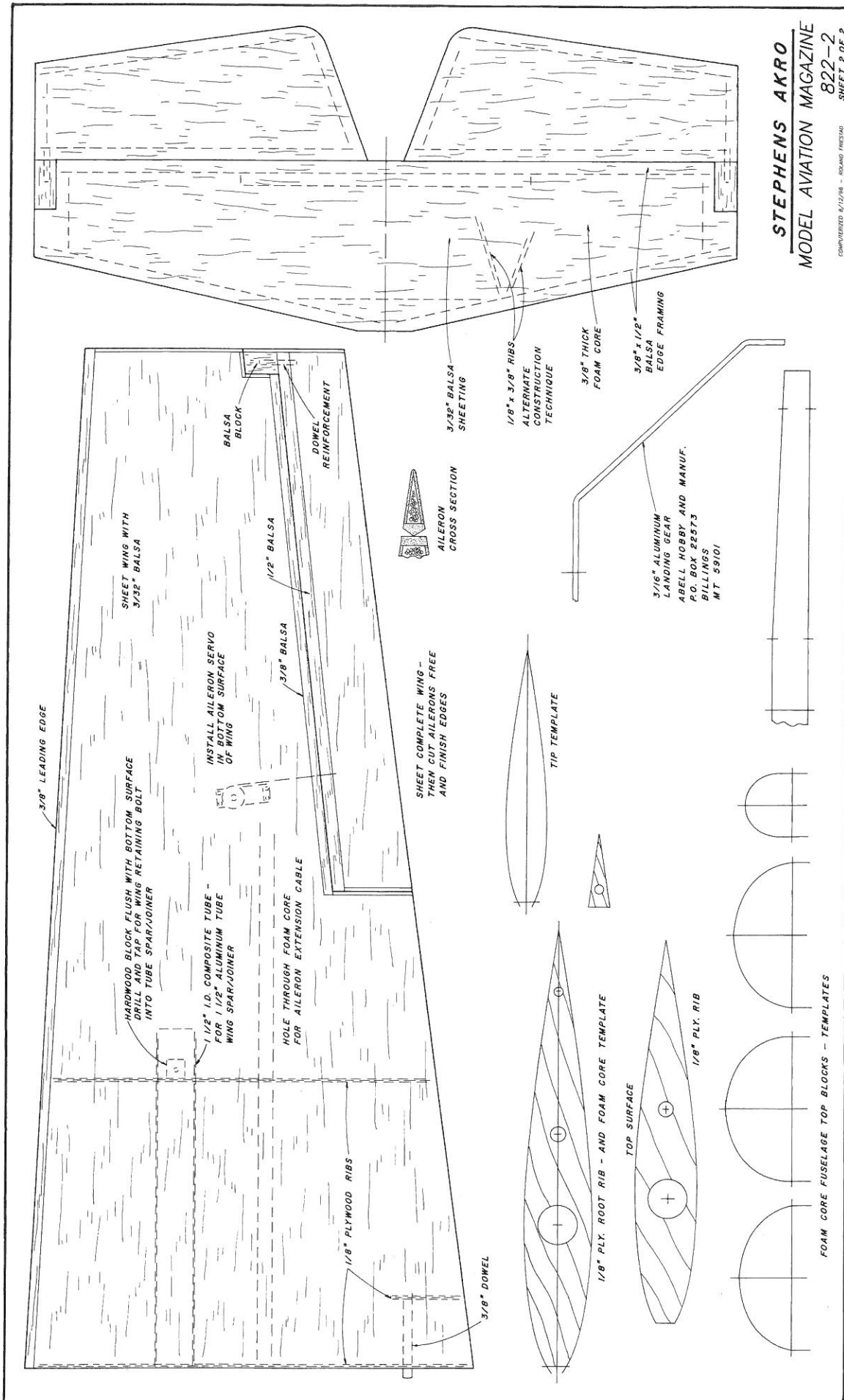


Author prefers forward servo location with fiberglass tube pushrods; Lance Schneider prefers rear-mounted servos with short elevator and rudder linkages.



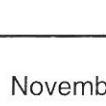
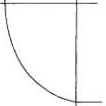
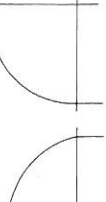
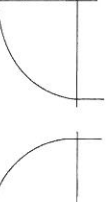
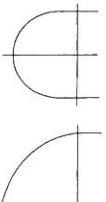
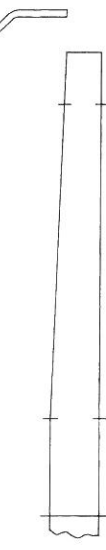
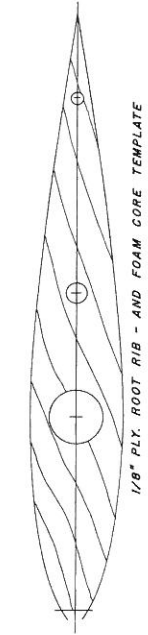
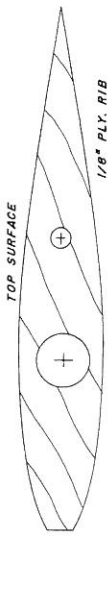
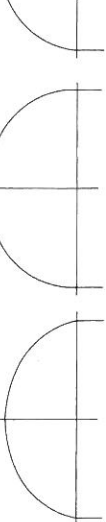
Lance begins field assembly by sliding aluminum-tube joiner through the fuselage. Lack of a cutout for the wing results in a stronger fuselage.

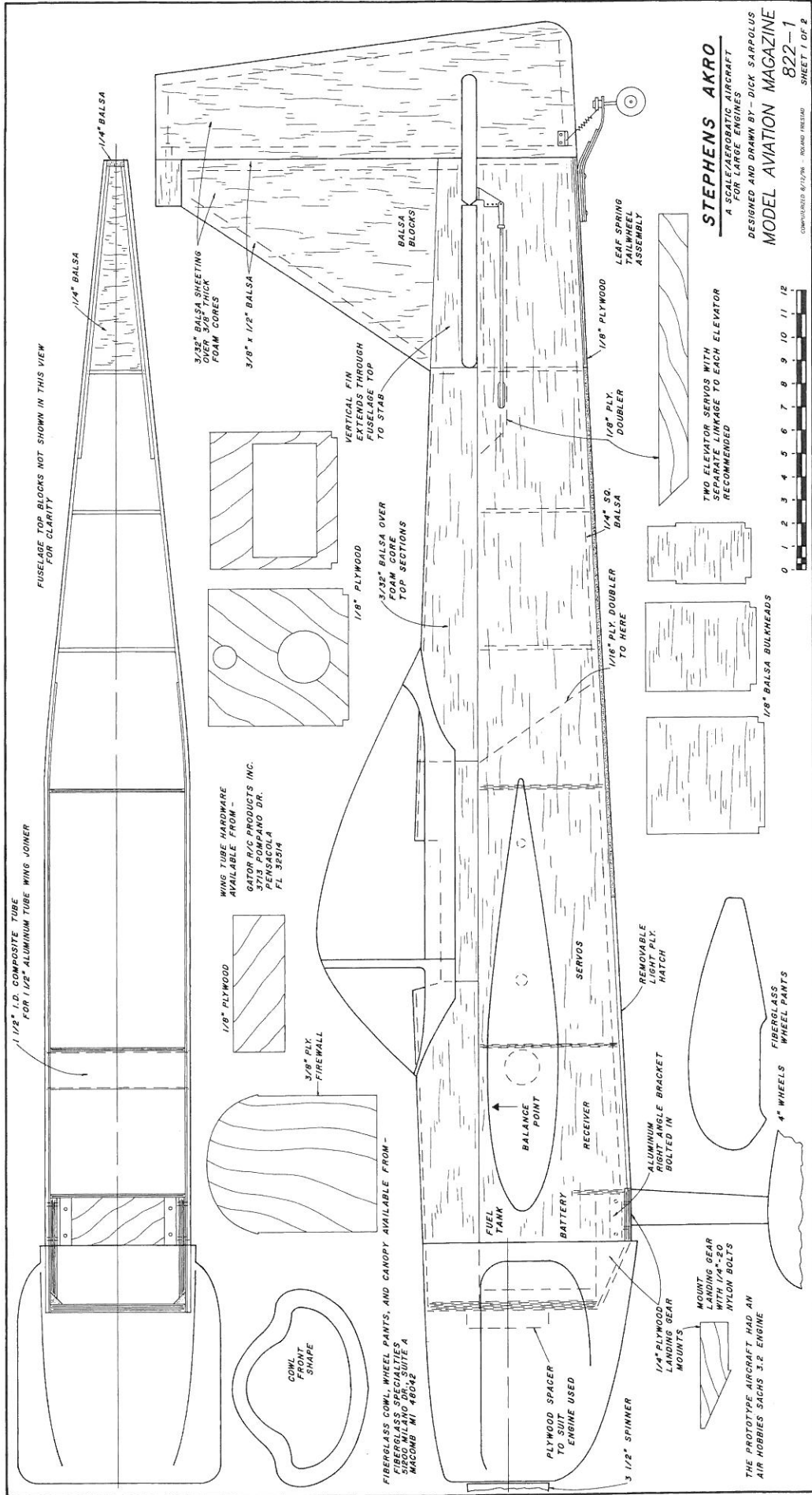
COMPLETED 8/12/96 - RONALD FRETWOLD



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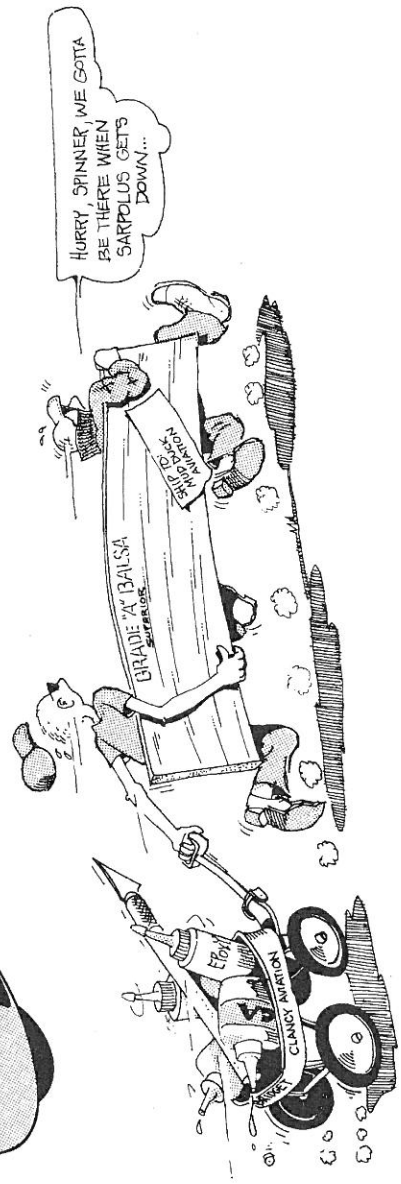
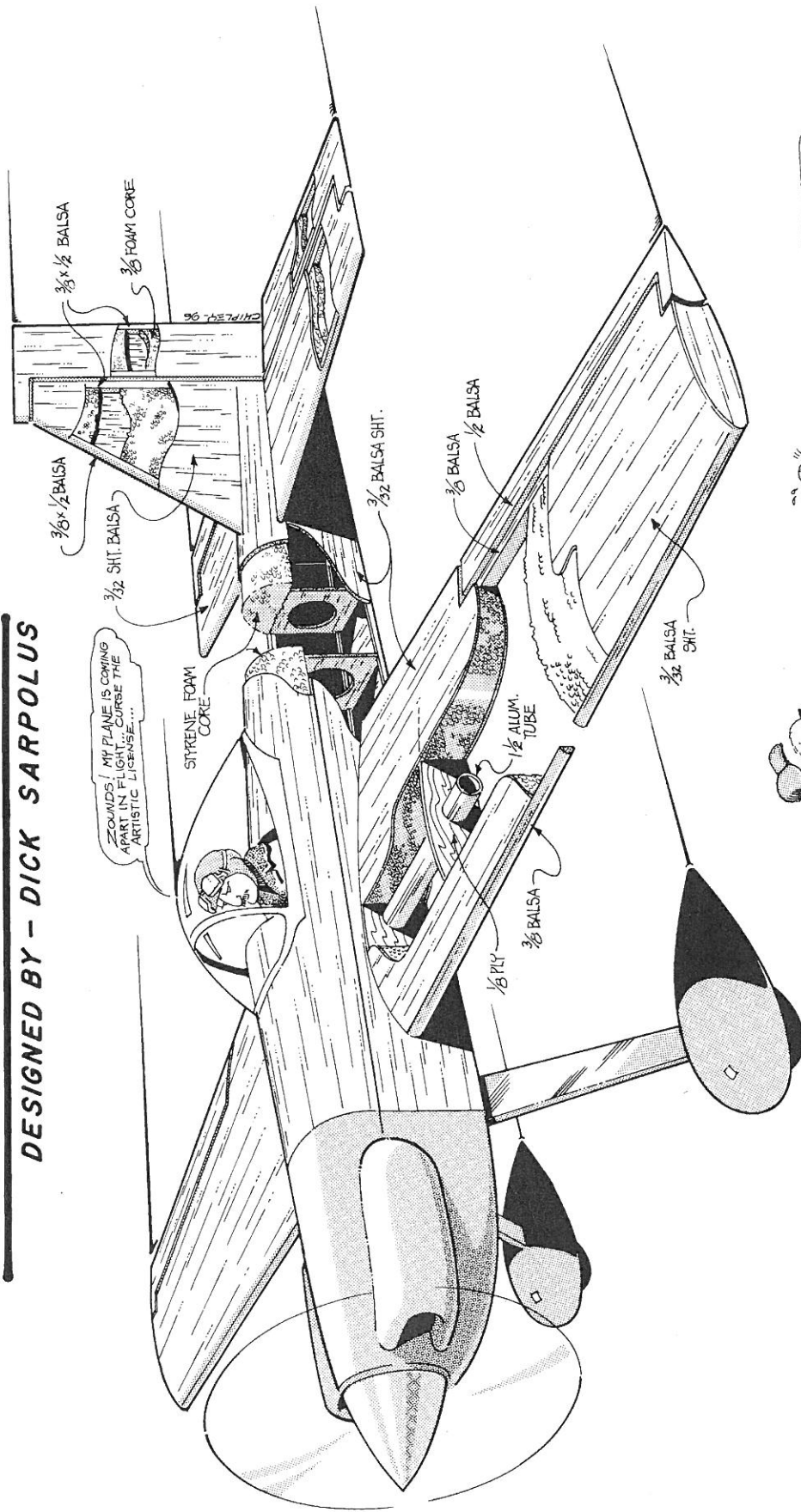
FOAM CORE FUSELAGE TOP BLOCKS - TEMPLATES





STEPHENS AKRO

DESIGNED BY - DICK SARPOLUS



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