



A modern landing gear mounted in the wing provides better takeoffs and landings than the original Smoothie's in-fuselage version. A small piece of paper in the cockpit says, "The pilot is out." AMA numbers are Coverite's stick-on vinyl covered with Sig Lite Coat clear dope.

#468

smsmosma

AT THE 1983 NATIONALS I had many people ask me if the Stunter I was flying was a modified Smoothie. In fact, it was a modified Thunderbird. I began to feel obliged to build a modified Smoothie to show the difference. The result is the model you see here.

I am drawn to the older, more classic designs—such as the Smoothie and Thunderbird—but in general I haven't been satisfied with the original design characteristics. This model, like the modified

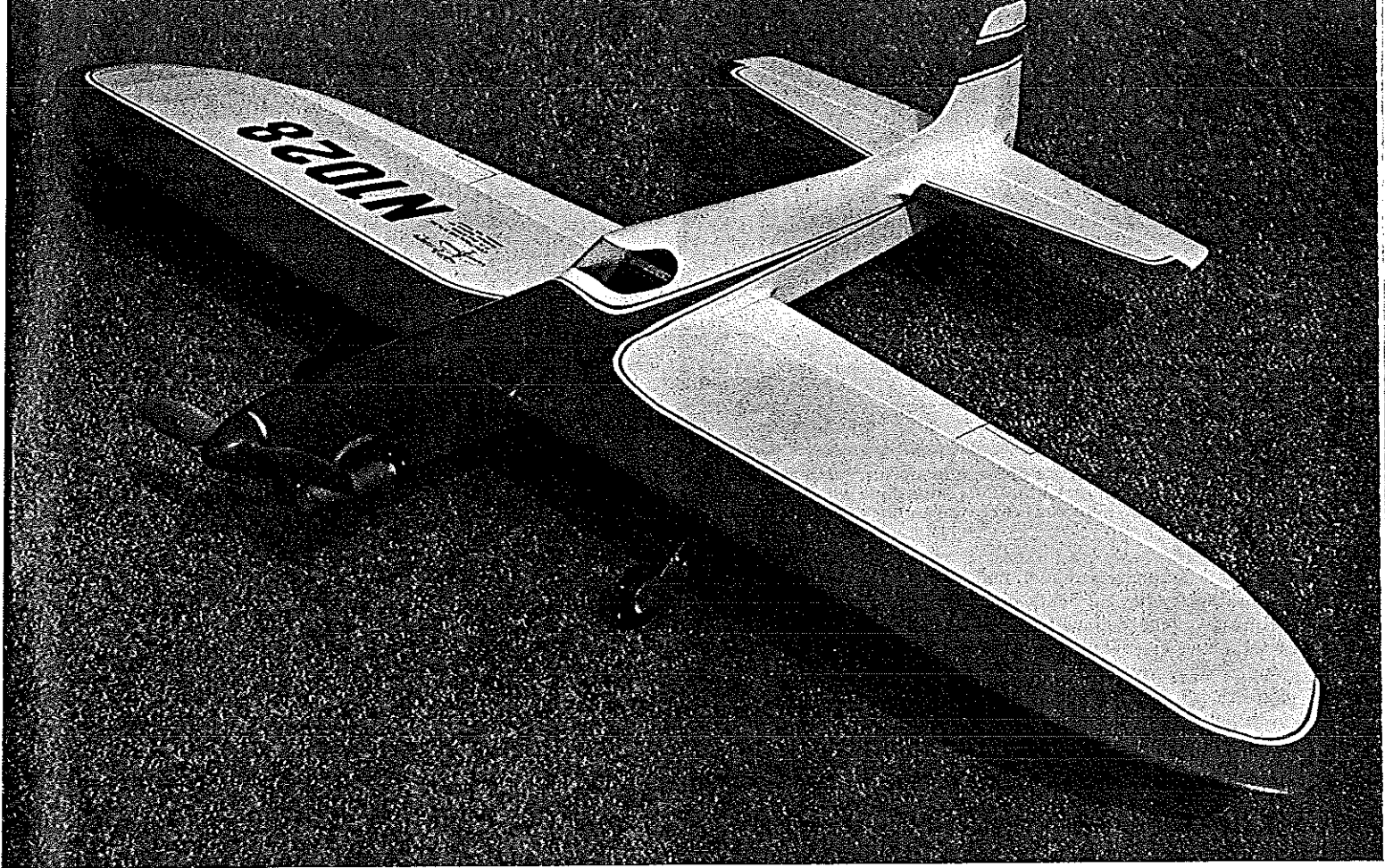
Thunderbird presented as the Phoenix construction article in a recent issue of *Model Aviation*, has many changes made to accommodate the current standards for performing the AMA Precision Aerobatics pattern.

The original Smoothie was designed by Bob Palmer and presented in the August 1952 issue of *Air Trails* as Palmer's answer to windy weather conditions. As originally published, it had quite short moment arms, small flaps, very little flap

movement, and a unique airfoil with very aft high point. This worked quite well for the 1952 pattern which had only one square loop. Palmer even took second place in the 1952 Nationals with his original model.

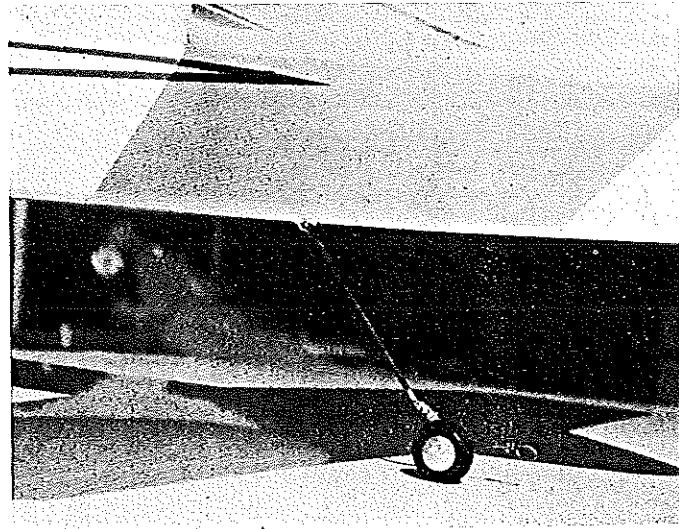
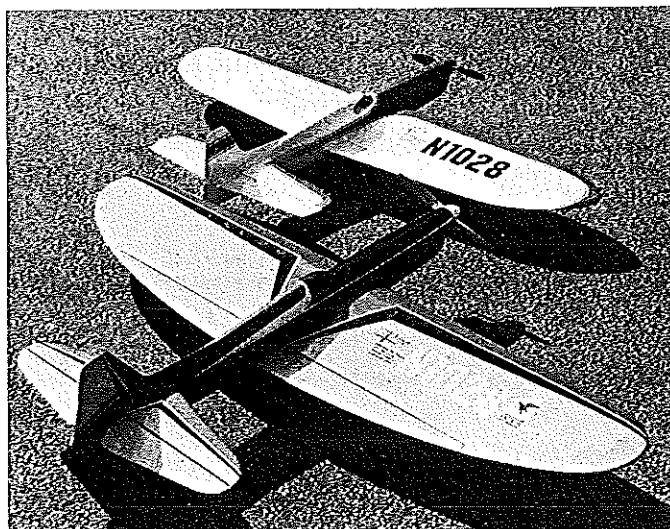
The Veco (later, Dumas) kit version had minimal structural changes, was better looking, and also included details for an inverted, cowled engine. This was the model shown on the kit box. Palmer's first Smoothie had an upright, uncowed

Bob Palmer's designs and his flying of them in Control Line Precision Aerobatics are legendary. One of the most beautiful of his airplanes was the Smoothie from the early Fifties. The airplane presented here is a variation of this classic for the present-day pattern. For a .29-.35 engine. ■ Tom Dixon

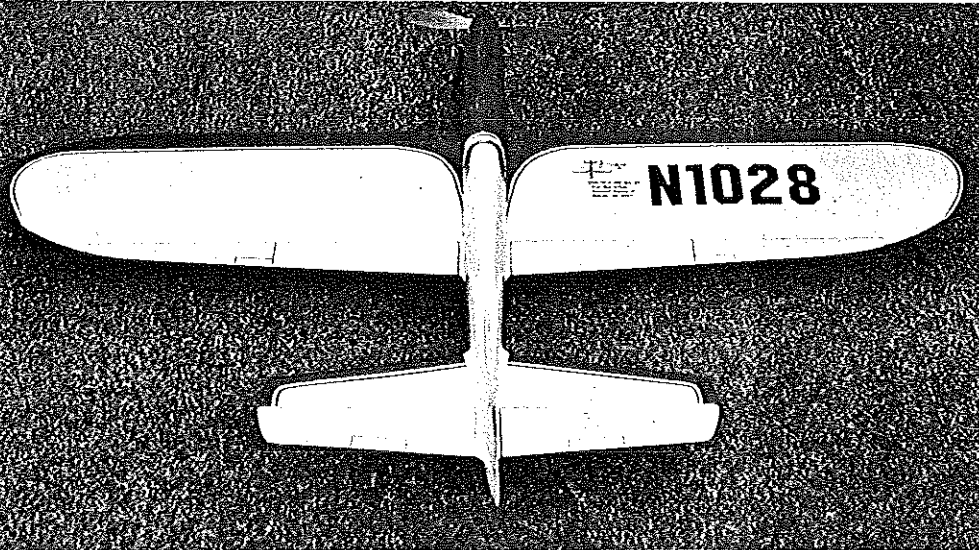


The Smoother's windshield is plastic sheet bent to shape, adhered with cyanoacrylate glue, and faired-in with Epoxolite. Tom Dixon notes that a painted-on windshield would be much simpler to make and, he thinks, a good substitute. Our choice would be to go the whole way.

osmooother



Left: A comparison shot of the Smoother (rear model) and the author's earlier Phoenix modification of the Thunderbird. The Phoenix now flies with the author's Stunt-modified Fox .40 Mk V. Right: Tall tall wheel also helps with landings. Wheel is made up of a 1-in. Banner hub and a 3/4-in. Perfect tire. It may not be visible in the magazine reproduction, but there's a 1/32-in. wire stooge hook behind the wheel.



Pin striping is done with use of 3M auto masking tape available at auto paint stores. The only ink lines are control surface markings done with a Rapidograph technical pen. Logo inboard of the wing numbers is from the author's plan and supply service. Ads on models?

engine.

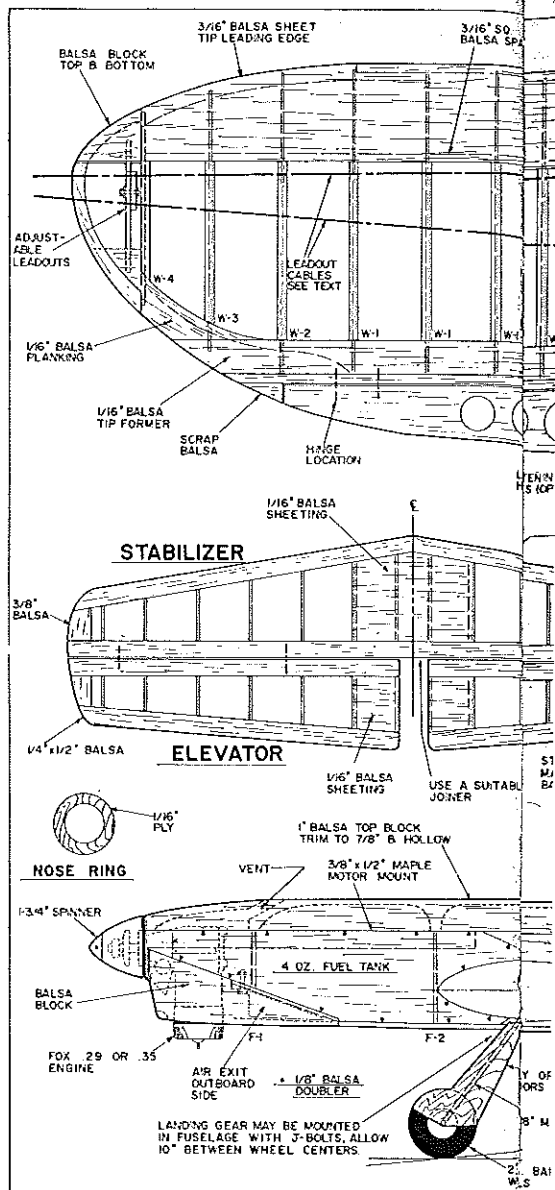
Several factors served as stimuli for my reworking this design. First, there was the confusion some had with the Smoothie and the modified Thunderbird. Second, I wanted a slightly smaller airplane for my Old Fox .29, which is excellent, that I had been flying in a Barnstormer Old-Timer. Third, like Palmer, I wanted a model that was easier to handle in very windy conditions. Flying the small 470 sq. inch Barnstormer in all kinds of weather showed me that a small, lightweight model with plenty of power might be the way to go. Fourth, I also feel some obligation to keep the .35-size airplanes around in the face of the current movement to go to bigger and more expensive designs in Control Line Stunt. My correspondence indicates that there is still a great deal of interest in .35-size planes even if it isn't shared by those in the top ranks of PAMPA competition.

In revamping the Smoothie, I wanted a competition-capable airplane for the present-day pattern, keeping the appearance of the original. The wing was changed to equal-length panels by extending the outboard wing two inches. This also added about 25 sq. in. of wing area. Flaps were made larger by moving the hinge line forward and extending the flap span one

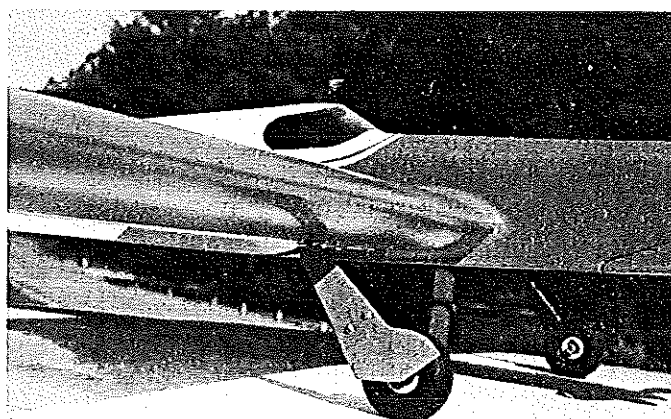
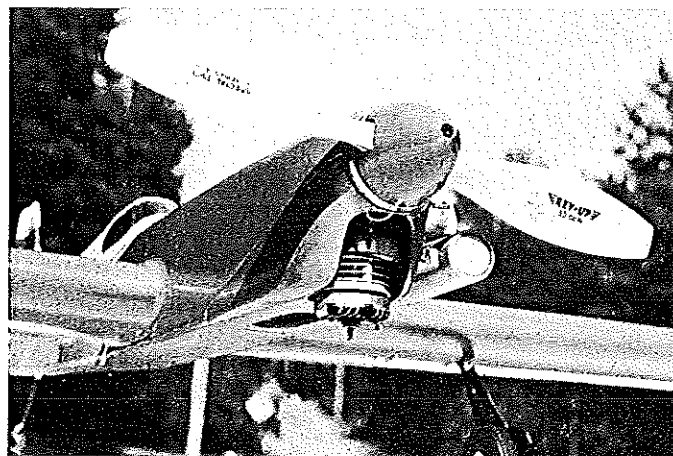
rib bay on each side. The nose moment was lengthened slightly, and the tail moment was also lengthened approximately 1 1/4 in. The guideline for the moment arms was Dee Rice's Oriental design originally published in *Model Airplane News*. The airfoil was changed to that used by the Nobler, as this was a known, dependable factor. Also, control ratios were changed to 1:1, stabilizer span was increased to correspond with the increased wing area, and the landing gear was placed in the wing for better ground handling. You may wish to put the gear back in the fuselage if you fly off grass or want to retain more of the original Smoothie's appearance.

The result of this shuffling of design factors is a small model which is both modern and nostalgic, and it performs quite well. I feel better about using it in turbulence than I do the Phoenix, but still the Phoenix is the No. 1 competition model. The Smoothie is the one that gets flown for practice, sport, demonstrations, and in rough conditions. It may work the same for you.

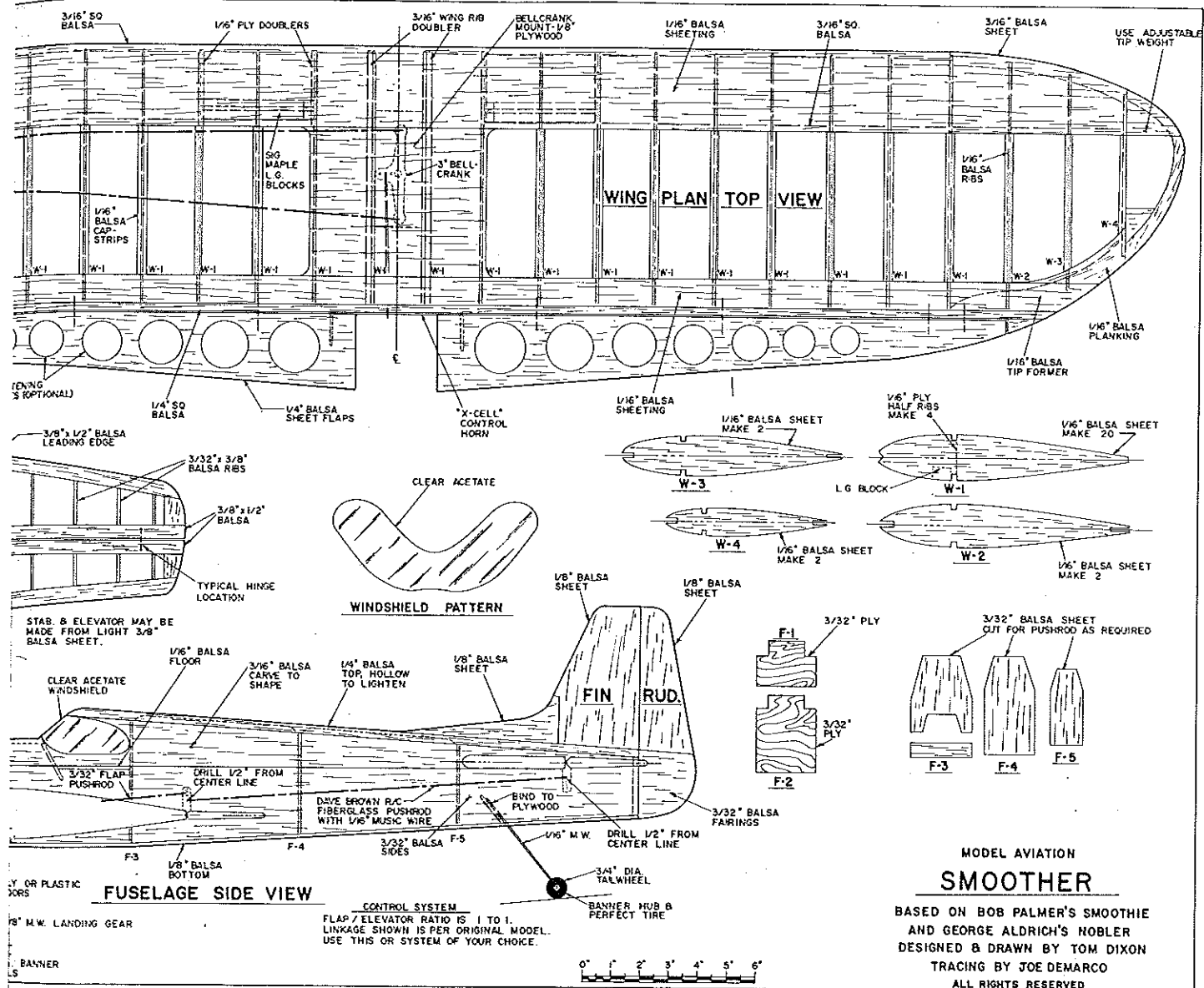
Wing construction. The semi-elliptical wing is easier to build than it first appears. It is actually a straight wing with rounded tips. Begin by stacking 20 1/16 sheet balsa



rib blanks between two W-1 rib patterns of 1/16 plywood. This stack is carved and sanded into shape as a unit, giving 20 neatly-formed ribs when the patterns are removed. The tip section ribs must be cut individually due to their size differences. Also, cut notches for the leading and trail-



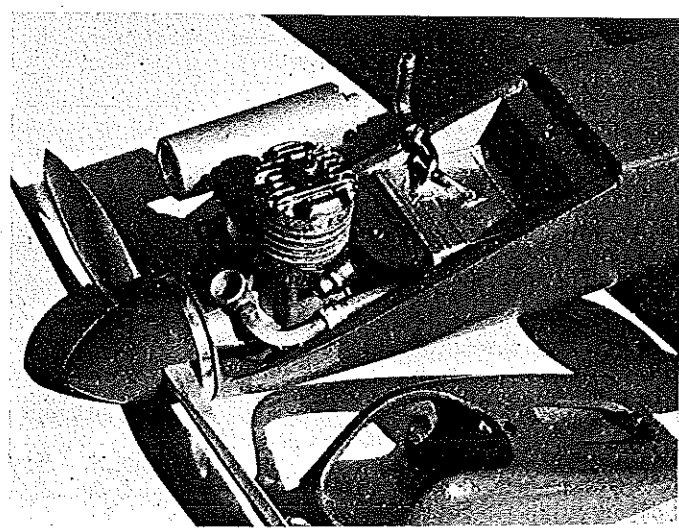
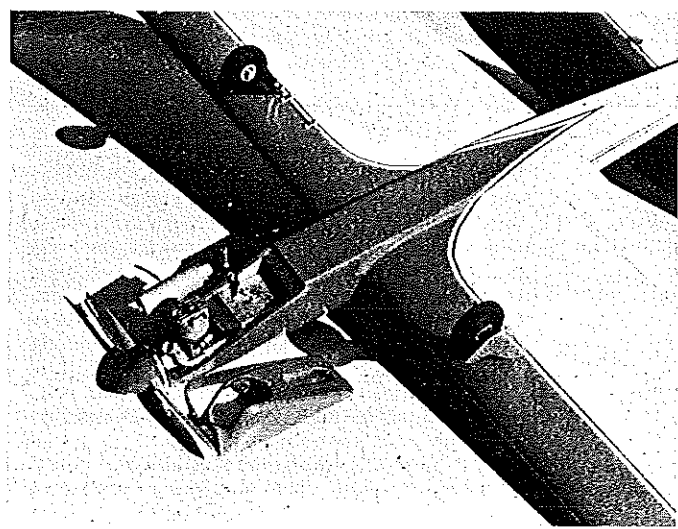
Left: Cowling is completely open in front to allow maximum cooling. Note air exit slot behind the cylinder head. Right: Gear doors are 1/16 covered with tissue and finished like the rest of the model. Metal clips are soldered to the strut, then doors fastened with screws and nuts.



ing edge tip pieces as needed, and cut notches in the appropriate ribs for the landing gear blocks. The location of the landing gear blocks should be reinforced with $\frac{1}{16}$

ply so the blocks won't twist under stress. I suggest the use of an Adjust-o-Jig for wing construction, but it can be built "in hand" with the use of cyanoacrylate

(CyA) glues. Assembly begins by drawing a centerline on the $\frac{1}{4}$ sheet trailing edge cap. The trailing edge of each rib is
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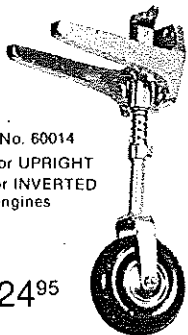


Left: The main landing gear is removable for painting and adjustment of angle if need be. No engine shaft extension is used. The tank is held in place by small pieces of $\frac{1}{4}$ sq. balsa (not visible in pic) glued with CyA. Right: Engine is a Dixon Stage II Fox .35. Tank is a reworked 4-oz. Taffinder wide. Spinner is by C.B. Associates, and the author likes a 10-6EW Rev-Up for this model. Has a mod. Fox muffler.

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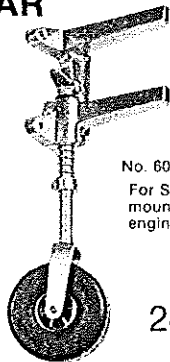


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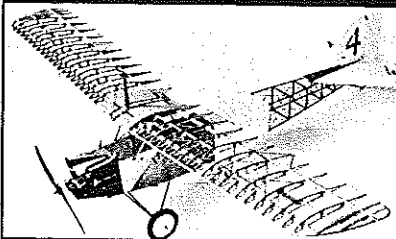
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P-47) certainly lacks any semblance of tasteful shape. The rear-mounted turboprops look like they were quickly stuck on when the prototype was being rolled out for its press preview and someone realized it didn't have any engines.

The French have certainly made great strides since the 1930s when they seemed incapable of building military airplanes that looked right. The Mirage fighter, in all its versions, possesses fine lines. But they started out building some really weird jets...like the Nord Griffon. It had a turbojet engine mounted *inside* a ramjet engine! It looked like it had been designed during the third hour of the engineering department's annual office party. It once flew faster than the existing world speed record, but it nevertheless suggests a mid-air collision.

While the British must get credit for some of the most beautiful airplanes in history, they also know how to work the other side of the street. The Fairey Gannett, an anti-submarine patrol plane, looks bad enough in flight with its huge spinner above a grimacing air intake, and double-humped canopy. But on the ground, it truly stands out. The mildly-cranked wings fold twice for convenient storage on aircraft carriers, just making it look broken and pathetic.

Short Brothers, an old ship building firm, produced the majestic Sunderland at the end of a long and distinguished line of

flying boats. Then, something must have snapped. From the same company there suddenly emerged the Skyvan, a short-haul airliner and cargo plane that looks for all the world like a winged box. Ungraceful to the extent of being almost a cartoon of itself, the Skyvan was an example of that odd theory that it is more important for an airplane to be functional than beautiful. As if to admit its error and to apologize, Shorts eventually replaced it with the longer 3-30 (still with cardboard cut-out tail) and finally with the almost-streamlined 3-60 commuter airliner.

Grumman, a great American firm that built far too many airplanes that were practical at the expense of being homely, produced an agricultural airplane epitomizing the hopelessness of the category. The Ag-Cat is big and bulky with the high canopy and deep fuselage common to Ag planes. While these are needed for the special demands of crop dusting, there is no good reason why they couldn't be rounded off and the lines smoothed. Would fewer nasty little bugs die if sprayed by a streamlined airplane?

In the first section of this article we mentioned the many marvelous biplanes built by Waco. Near the end of its existence, the company veered from its proud course and built a monoplane, to its eternal shame. The sole remaining Waco monoplane (not counting the scraps of World War II troop gliders which were

more like flying packing crates) was seen some years ago at the Ottumwa, IA antique fly-in, where it attracted the deserved lack of attention, despite its rarity.

Since we previously mentioned one reasonably attractive helicopter some paragraphs back, we have no alternative but to counterbalance it with a truly gruesome one. The Kamov Ka-26 has all the classic qualities of rotorcraft: a profusion of struts, blades, booms, and fins sticking out in all directions, with no concern for the niceties of aerodynamics. One gets the feeling it was built not from plans but from what was left over when Sikorsky stopped building flying boats. Not even comrade Kamov could have meant a machine to look like that.

So there it is; at least for now. We could have rambled on and on, adding so many deserving airplanes to both lists that Herbie, the Volkswagen-shaped art director, would have blown yet another fuse. But our goal was to make a point, rather than to be all-inclusive. You may have nominations of your own...if so, why not let us know what they are and why.

Smoother/Dixon

Continued from page 91

centered on this line (at appropriate spacing) and tacked in place with CyA glue. At this point, the leading edge strip is added, and the ribs are aligned perpendicular to

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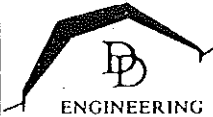
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the trailing and leading edges and parallel with one another. Add the top and bottom spars, and glue them in place.

Tip ribs and tip leading and trailing edge pieces are added next. Hold the spars down into the tip rib spar notches, and glue them. Trailing edge 1/8" sheeting is then added. Now, add the controls, landing gear blocks, and leading edge sheeting.

The leading edge sheeting at the compound curve of the tips can be formed more easily by soaking the sheeting with hot water before pinning and cementing it in place. I use Titebond to adhere the leading edge sheeting to ribs and spars, but I use Sigment at the leading edge so the radius can be more easily sanded. Once all the glue is dry, check the wing for warps. Steam the wing straight if needed, and then add the center section planking

and cap strips. Putting on the tips, tip blocks, lead-out guide, and wing tip weight box, finishes the wing.

Tall surfaces are solid sheet balsa, but they should be built-up as per the plans if very light wood cannot be found.

The fuselage construction is a basic box with thicker planking on the turtle-deck area so it can be sanded to a curved shape. This is easier and very nearly as light as the usual curved-sheet planking. It is important in building the fuselage to use slow-drying epoxy to adhere the doublers and engine mounts.

I find it easiest to build the entire fuselage separate from the wing and tail with all blocks, cowl, and planking rough-shaped while being temporarily tack-glued in place. The blocks and planking are then removed, the wing and tail installed, then the blocks and planking are reinstalled and sanded into final shape. This procedure avoids having to carve around the wing and tail surfaces.

Proper alignment is critical for good performance. Be sure the wing and stab are set at zero-zero incidence and parallel with the thrust line. Likewise, the wing and stab trailing edges must be parallel to one another and perpendicular to the centerline of the fuselage when viewed from the top.

Frontal view alignment should also have the wing and stab parallel with one another and perpendicular to the fuselage.

I measure, mark, and "eyeball" all this for what seems like hours before finally gluing everything in place. Astigmatism definitely makes this job much more difficult.

The control system is also critical in a Stunter. I use components distributed by X-Cell and sold by me. The bellcrank is a 3-in. Top Flight nylon. Sullivan C-D cable lead-outs are used without being bushed at the bellcrank. Instead, the cable and bellcrank are lubricated with lithium wheelbearing grease. This prevents both corrosion and wear.

I believe soldering the cables into bushings as is usually done can lead to weakening of the cable, and possible breakage due to the corrosive effects of soldering

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