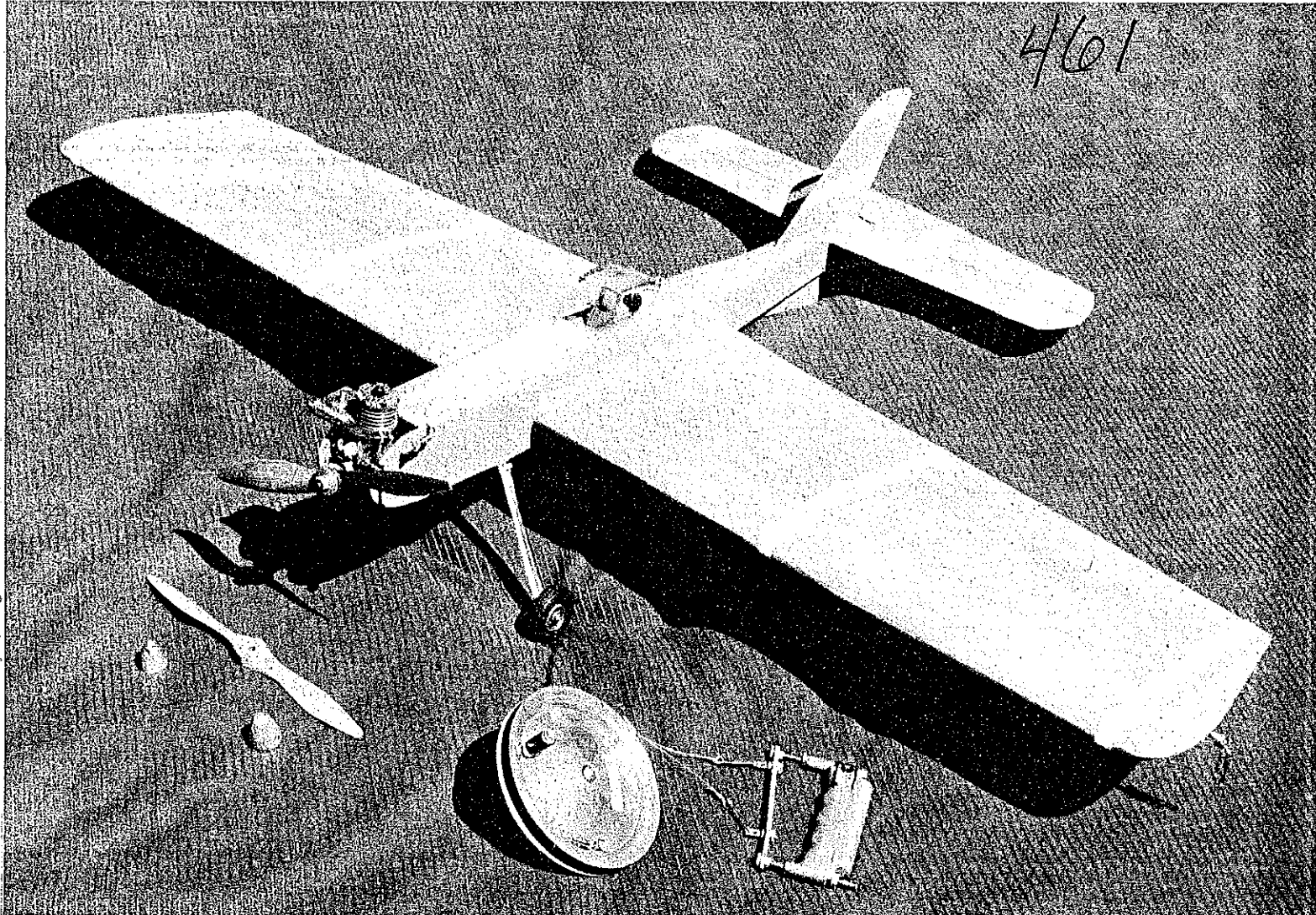
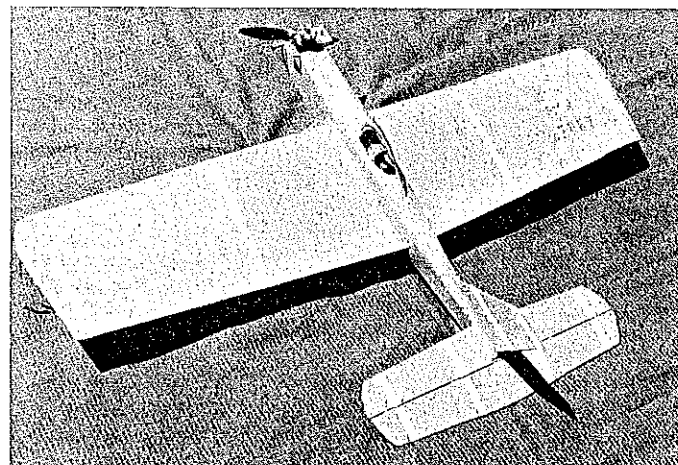
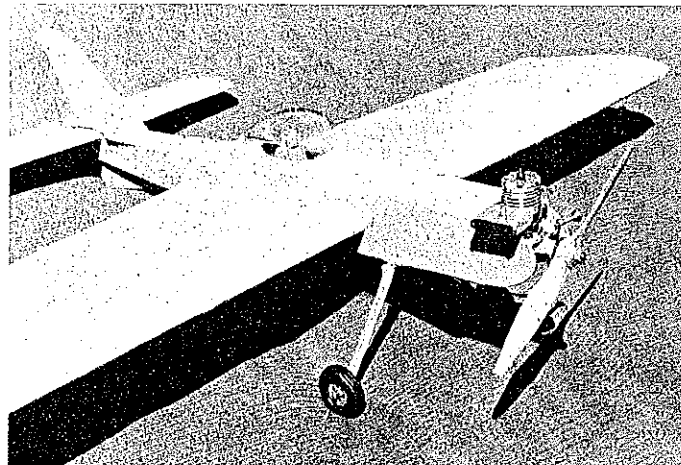


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Author's re-creation of this famous Stunter from the Fifties is virtually the same as the original kit model. As noted in the text, a few changes are suggested for improved strength. In front of the model are some more old-timer things: a rare O&R F 23 H prop (not recommended for flying), spinner prop nuts of different weight, an old Berkeley Models aluminum line reel, and an old aluminum handle (with modifications).

Andrews/Guillow Trixter Barnstormer



Left: Up front is an early Tornado 10-5 Plasticote prop on an early Fox .29 Stunt engine. It runs great, produces plenty of power for the model. Also fitted is a modified Du-Bro Muffle-Aire I muffler, which weighs just 22 grams. Right: Note the rather long rear moment arm, solid, fixed flaps, and generous size of the tail feathers in comparison with the wing. It is still a pretty airplane more than 30 years later.

This famous CL Stunter, designed by Lou Andrews and kitted by Paul K. Guillow in 1950 is an American classic with many contest wins to its credit. It is still an excellent flier for .25 to .35 engines.

Douglas A. Dahlke

ALTHOUGH OTHERS have used the same name, Barnstormer still means Andrews/Guillow and 1950 to thousands of modelers. When I was a kid of age 14 watching my first Barnstormer fly at the old Oshkosh Aeronauts field on one corner of Wittman field, it was hard for me to believe that a model which looked so realistic could do the maneuvers so well and, at the same time, fly so slowly. Surely it would fall from the sky at that speed, I thought. (Needless to say, it didn't.)

At a time when some model magazines coyly suggested that super speeds might help cover flying errors (and Hal deBolt's 'Wagons rocketed about the Stunt circle at around 100 mph), the Barnstormer puttered its way into first place at the 1950 National Contest. To prove that this was no fluke, it won again in 1951. It also chugged into hundreds of first places at local meets all over the country, convincingly demonstrating that a longer aft moment arm was capable of turning very sharply, and a realistic appearance was no hindrance.

Fox engines poured off the assembly line and filled the noses of countless Barnstorm-

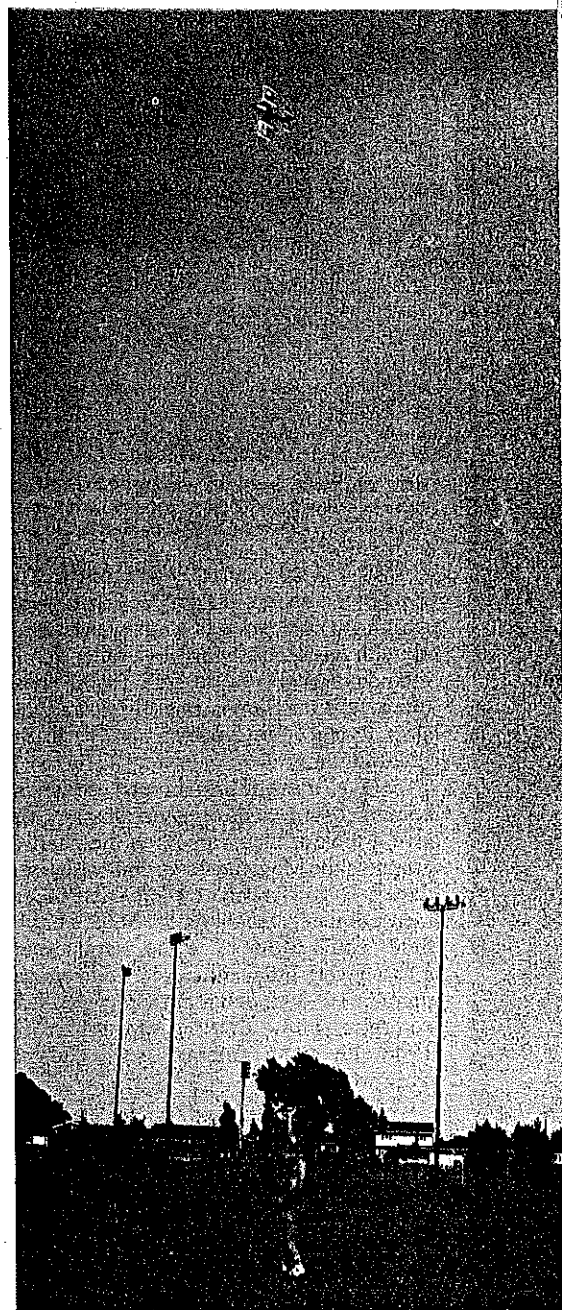
ers throughout the land. The Fox .35 was the most common, but Fox .29 fans grabbed their share of wins, including places at the Nats. These two engines continue to be the engines of choice for the majority of current builders of Old-Timer Stunt models—for three good reasons: 1) they run great, 2) they are easy to obtain, and 3) they are inexpensive.

The Barnstormer was an attractive kit at the initial moderate price of \$4.95. The average builder could assemble the kit and stand a reasonable chance of winning with the model, much as one can with the Gieseke Nobler of today. It was the right plane at the right time—and for the right price.

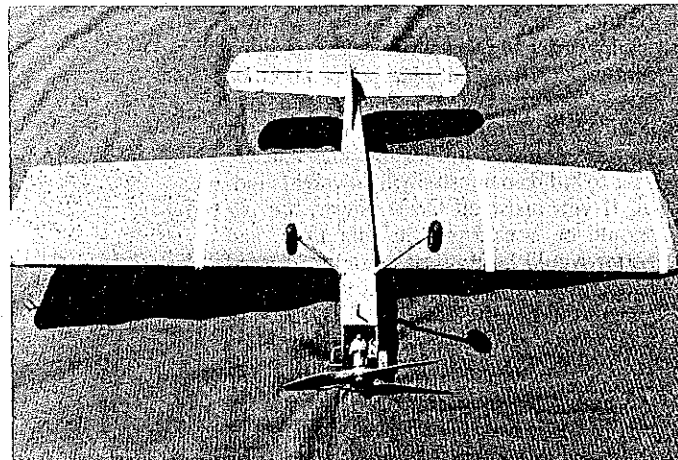
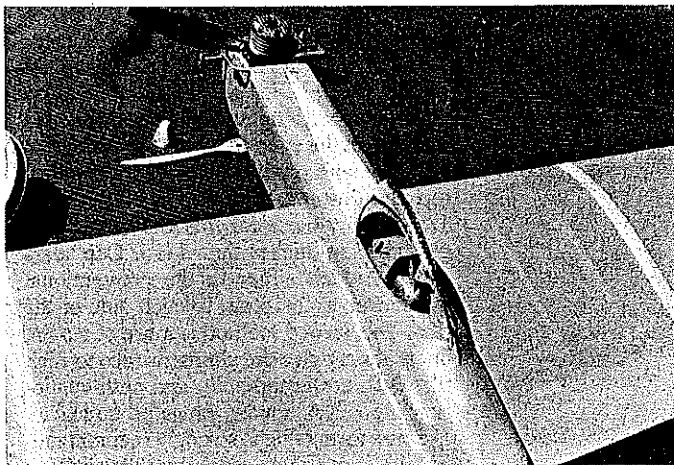
The Barnstormer was the last non-flapped Stunter that was a major winner. You see, there was this youngster from Texas, George Aldrich, flying what looked like a flapped Team Racer with an antenna. An era was ending. Introduced in 1950, the Barnstormer kit was still available from America's Hobby Center in New York during 1959. Unfortunately, no production records exist.

Today, Old-Timer Stunt is growing almost as fast as the average age of modelers! As an unofficial Nats event, it outdrew all Stunt events except Open at the 1982 Nats. The 1983 Nats saw AMA President John Grigg flying a Secret Weapon with a Drone diesel. O-T is strong and growing in the Midwest and elsewhere. At Milwaukee in 1981, during a 40-mph wind, my Barnstormer not only took first place in the PAMPA (the initials stand for Precision Aerobatic Model Pilots Assn.) Intermediate event, but it also took the high score of the entire meet—beating a Nobler in Advanced by 20 points and the Expert-class flier who sadly crashed in the wind. (Each mention of that is good for a number of grumbles, but oh how sweet it is!)

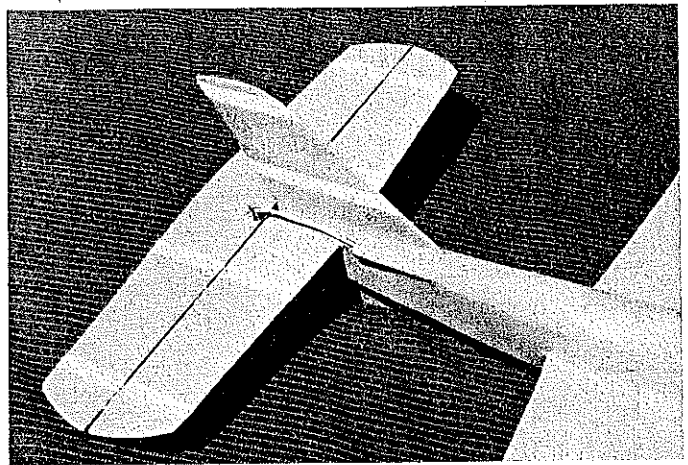
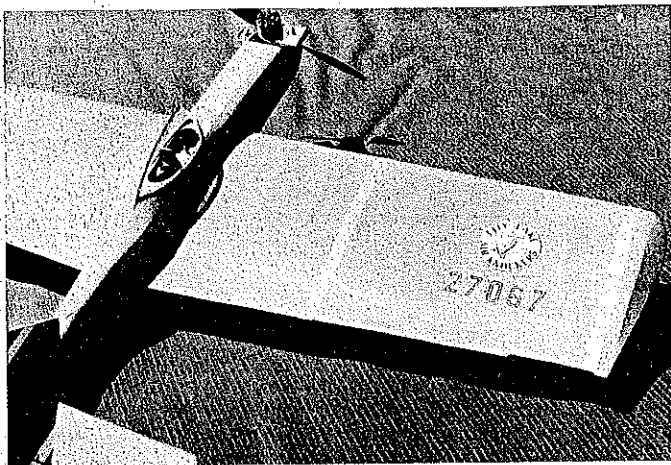
At 32 oz., my Barnstormer mocks the supposed fact that lightweight models fly poorly in the wind. In 1983 it scored two firsts, two seconds, and two thirds, as well as first in "Best-Flying Glow (Stunt-a-thon '83) and first in "Spirit of '52 judging (Pecoria '83) for the most authentic O-T model.



The author's friend, Tom, gives the Barnstormer a workout. It does the whole AMA Precision Aerobatics pattern very nicely.



Left: The Barnstormer just wouldn't be right without its original moccasin-stitched canopy. They hadn't learned to work plastics so well back in those days. Besides, you'd be amazed at how much the stitching helps if you happen to have an upside-down landing. Right: Speaking of upside-down, this belly shot shows the clean, simple, straightforward approach of this design. Plane is painted/trimmed to match.



Left: This picture shows a long-ago tradition that the author would like to revive: a club decal on the wing in addition to the AMA numbers. Plane is covered with bamboo paper over which is applied a base of nitrate dope and a thin coat of orange Hobby epoxy. The trim stripes are white. Right: Fairlead at the pushrod exit point prevents fuel residue from backing up into the fuselage. Stab/elevator ratio nicely balanced.

"What's the secret?" you might ask. There's no secret, no magic, just a great-working combination of a lightweight model with generous wing area and an aft moment arm of considerable length. These things help the Barnstormer fly slower, and slow flying helps us folks survive in the Stunt circle.

To put these things in perspective as compared with some other popular models, give a look at the numbers in the chart (I assumed the Magician to be built with fixed flaps). If you consider what each of the measurements means to a Stunt ship, I think you'll agree that the Barnstormer gives up very little, and it is indeed younger than its 1950 kit debut date suggests. Lou Andrews, whose first big win was at the 1948 Plymouth Internationals, did his work well.

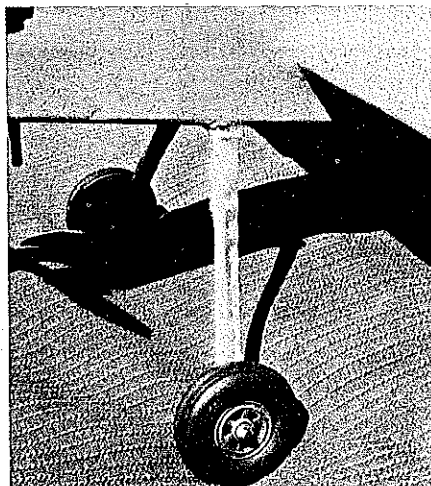
Construction. First, I would like to point out that the original plans provided for clockwise flight. If you fly as most folks do, be sure to change things "to the other side." Next, the original instructions have been greatly condensed. Many practices originally spelled out in detail are now pretty well standard. If in doubt, one is seldom wrong in using conventional stick-and-tissue methods.

Pick your wood as carefully as serious builders once did (before high-horsepower engines tricked them into thinking it didn't matter). The original plans show an O&R .23 engine as an option. That's not a good choice, I feel, unless you know exactly what you are doing with O&R engines and are able to build an unusually lightweight model. If you insist on O&R power, the .29 should be considered the minimum, and better would be the less-common .33 red head. More practical among non-Fox engines would be the early Veco .29-.31s; to their credit they have various early Nats Stunt wins. Also fine are the K&B .29 to .35 engines from the Glow Torp through to the fine Green Head series. I've also seen some pretty good McCoy Super Stunt engines of that period, as well.

Wing. Splice the center spar with Lite Ply

	Comparison of Early Stunt Models		
	Gullow (1950) Barnstormer	Midwest (1961) Magician 35	Sterling (1951) Ringmaster
Wingspan:	47 in.	48½ in.	42 in.
Wing area:	470 sq. in.	488 sq. in.	392 sq. in.
Wing root T.E. to hinge line:	9½ in.	7½ in.	7½ in.
Prop face to wing L.E.:	6 in.	7.9 in.	5.7 in.
Stab span:	18.6 in.	19.9 in.	16.9 in.
Listed weight:	26 oz.	32 oz.	N/A on plans
Airfoil thickness:	1.5 in.	1.625 in.	N/A full-scale

ties. Lay the spar, leading edge (LE), and trailing edge (TE) over the wing plan, marking the rib positions. Cut the rib notches in the TE. The four root ribs have extra-large center spar slots. Glue the right root ribs (with two holes for the lead-outs) together; do the same for the two left root ribs. Slip all the ribs on the center spar at the marked positions. Fit the TE to the ribs. Carefully align the ribs before gluing them. Add the LE and TE ties; taper to fit flush against the main TE. Glue the flap TE in place, and then glue the rib extensions and diagonal braces in place.



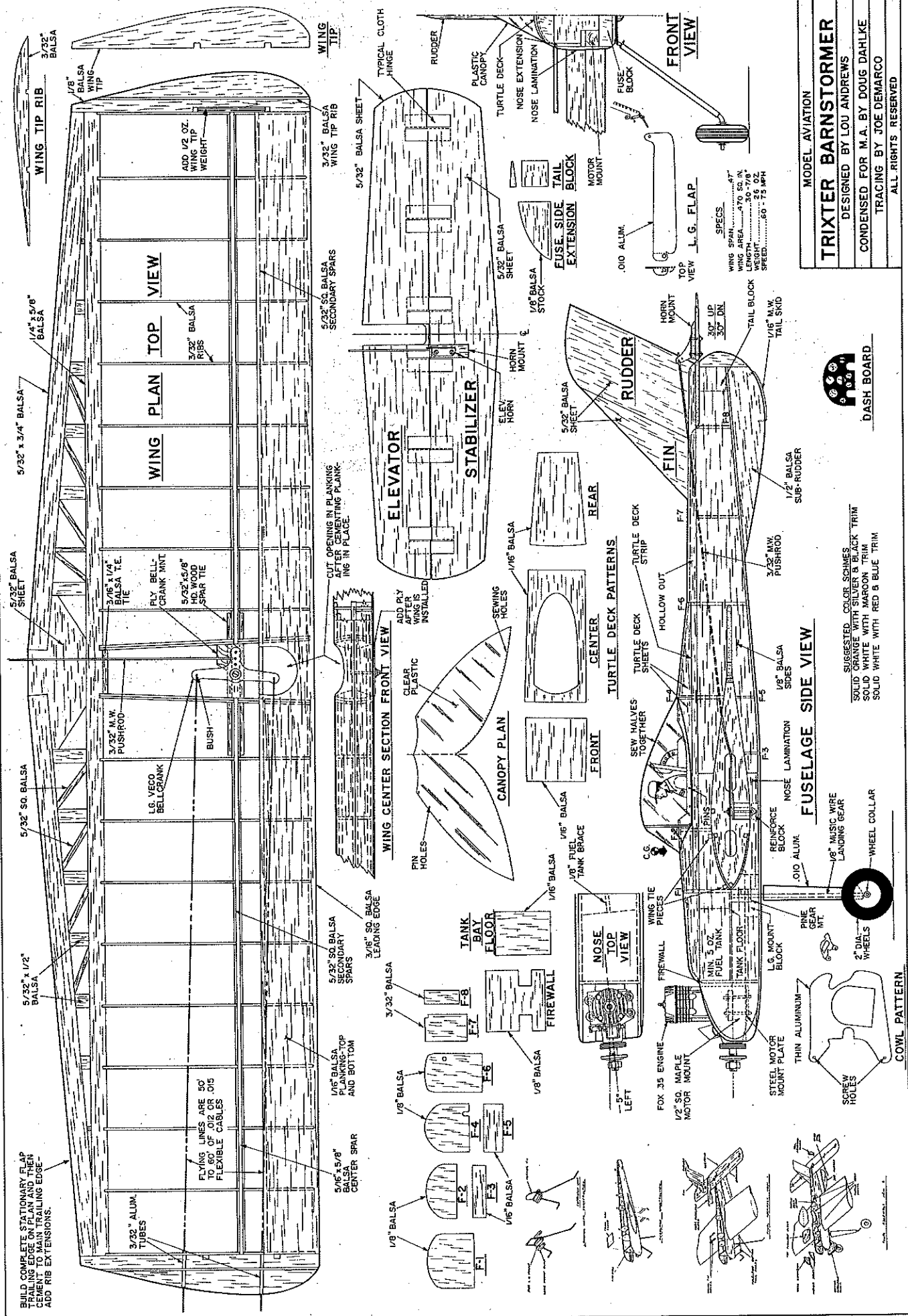
The landing gear fairing is .010 aluminum wrapped around the wire and held together with silicone glue; hasn't let go in four years of flying. Wheels are Veco/Fox military type.

Add the top and bottom secondary spars. Cement the tips in place, and add half-ribs to the top and bottom of the tips. Glue the Lite Ply bellcrank base to the top of the center spar between the center ribs. (The bottom ply piece is added after the wing is installed in the fuselage.) Install the LE sheeting, top and bottom, and the lead-out guides. Add tip weight (better, a tip weight box), and sand smooth. Install the bellcrank and lead-outs temporarily. Cover the wing with modeling tissue of your choice. Insert the wing, and glue it in place.

Notes: In O-T Stunt it is okay to add wood in order to strengthen the model. Although the external proportions of the Barnstormer are excellent, the internal construction can benefit by making it more resistant to warps. Some guys have replaced the 5/32-in. spars with 3/16. This works well with lightweight wood. Be sure to close off the open C-tube, converting it to a D-tube with vertical-grain shear webbing, top and bottom, between the ribs. I used 1/32 mushy balsa for this and would suggest nothing thicker than 1/16. Cap spars can be added either in the conventional manner or as 1/16 sq. to each side of the ribs. The second method is more of a pain, but it offers twice the gluing surface to each rib. Both are acceptable, and with cyanoacrylate (CyA) glues, things go quickly.

Some form of jig is strongly recommended. In fact, there are five "tricks" to building a true balsa wing time-after-time:

Continued on page 80

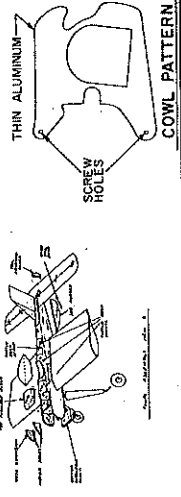


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 CONDENSED FOR M.A. BY DOUG DAHLKE
 TRACING BY JOE DEMARCO
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 LENGTH.....30-7/8"
 WEIGHT.....30-7/8"
 SPEED.....60-75 MPH

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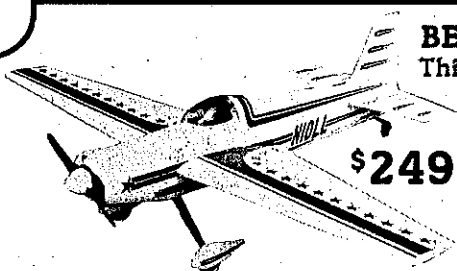
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1) Use a jig, commercial or homemade; 2) Use CyA glues; 3) Build only wings with twin spars (at least), vertical-grain shear webbing, cap spars, and V trailing edge are closed with vertical-grain shear webbing; 4) Match wood densities, using mostly mushy stock; 5) *Never* force any piece into position.

I am always concerned about wear in the control system; therefore, I bush all moving points that are subject to wear. Be sure to make both ends of the pushrod bend long enough so that, if the solder fails, it is mechanically too long to fall out (you'll be glad you did!). In that area, a better way to solder the usual washers: take a Dremel tool with a cutoff disk, and lightly notch the rod all the way around; slip on the washer, then wrap with bare fine copper wire which falls *into* the notches; then solder.

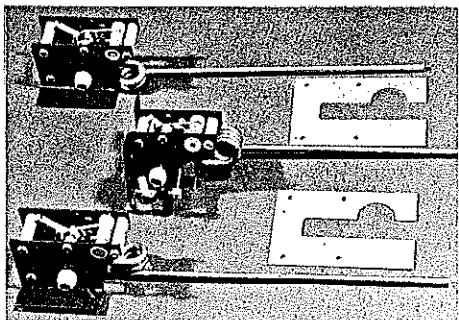
Lead-outs are wrapped in the approved manner as shown in the AMA rule book, then dabbed with silicone glue to hold the copper wire binding and prevent unraveling. The unbraced 1/16-in pushrod will flex. I used 3/32-in. wire, but better ways would be either some sort of light tube or 1/16-in. wire with braces added every 2 in. or so. Remember, lightweight models strain control systems far less than heavy ones do.

Although the plans don't show it, I sheeted the wing center section with 1/16 balsa—just to be on the safe side.

The stock fixed flaps are thinnish and may warp. I substituted a solid piece of very light, mushy balsa and haven't yet had a problem. If you want built-up flaps as per the plans, I would suggest going to a Warren-truss structure with the thickest wood possible. (One more word on the adjustable tip weight box, now papered over: sure they had adjustable tip weight boxes in the good ol' days, but they had a different name—they were called X-Acto knives; same may be said of adjustable lead-outs.)

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Fuselage. Mark the former positions on the main fuselage sides. Cement laminations to the sides, then add the engine mounts. Bend the landing gear as per the plans. Make a slotted pine gear mount as called for on the plans, and cement the gear in place. Add balsa gear mounting blocks (A), and cement Former #1 to the top of the gear mount (B). Cement one fuselage side to the gear unit, then add the second side. When dry, add the tail block. Glue the firewall in place, followed by the rest of the formers and the tank compartment floor. The soft aluminum (.010 in.) wrapped around the gear wire is optional, but it sure looks nice, and the weight is only two grams each. Once the fairing is wrapped around the wire, fasten it shut with silicone glue (works great—flexible and fuel-proof).

O-T Stunt aficionados will quiver and twitch with pleasure on seeing the standard moccasin-type stitched canopy. Others will groan and use a bubble canopy. I used the standard canopy. Before you start jumping up and down about how ugly it is, consider

Continued on page 82

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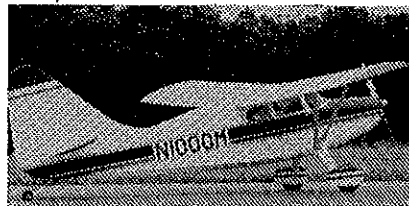
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the practical aspect of this lovely enclosure: my Barnstormer has had about four inverted landings to date with zero damage. Try that with your sleek bubble canopy, my friend.

Although a small item, I added an extended fairlead where the pushrod exits the body to prevent fuel from creeping back inside. Plans show tin stock for the fuel tank, which is about .009 in., but .005-in. brass works fine.

The plans show 5° of engine offset, but I find 1° or 2° is adequate. Resist all temptation to use hard balsa in the fuselage "for strength." Heavier is not necessarily stronger. For a weight penalty of perhaps 1 1/2 oz., I used all old-timer parts—mostly Veco stuff like the bellcrank, tank, wheels, and horn. A Froom spun-aluminum spinner is the lightest all-metal one I know of (if you can find one). These vintage goodies make things "righteous."

At an overweight 32 oz., my bird still performs well. An alternative to a spinner is an aluminum spinner nut. You'll want to consider a muffler, as well. If you use a good Fox .29 and 10-5 prop, you'll need a tank of around 2 1/2-oz. capacity. Mount the engine far forward on the bearers (but not so far forward that you won't have anything to absorb the vibration). I used the brass eyelet from an old Perfect Parts accessory pack in the sub-rudder for a stooge release hole.

Stabilizer and Elevator. Cut out the pieces from the lightest wood you can find. Sand the wood, and mark the hinge spots. If you choose the traditional Z-hinges, use nylon reinforcing tape to make them—looks like the original, won't rot, and it's strong. (The stab/elevator is thinnish for pinned, regular nylon hinges. They will work, and I did use them.) If you go with the nylon Z-hinges, you can imbed them slightly so they are flush with the surface. *Don't use common cotton cloth hinges.*

When hinged, notch the stab LE at the center. Install the control horn temporarily (don't glue in place yet). Glue the stab to the fuselage.

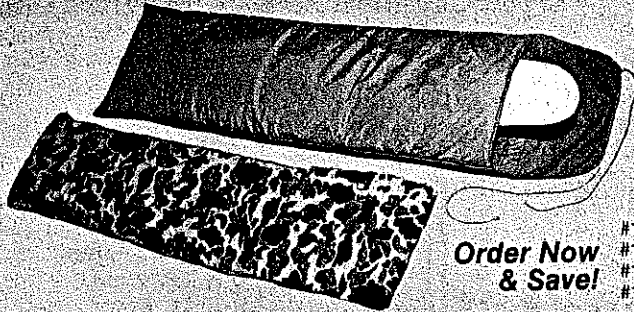
Final assembly. Bend the pushrod as shown (but don't bend the horn end yet). Insert the pushrod through the bottom of the wing, and hook the end to the bellcrank. Glue the bottom ply piece to the bottom of the center spar between the center ribs. Bolt the bellcrank in place. Center the bellcrank and neutralize the elevator; bend the horn end of the pushrod accordingly. When aligned, glue the horn in place. Glue the reinforcement block to the bottom of the ply piece and between the fuselage sides after first cutting a hole in the block to clear the bellcrank bolt. Notch the rear fuselage block for pushrod clearance. Spot-glue the block in place atop the fuselage sides; carve and sand the block to shape, matching Former #6; remove and hollow as per the plans, then glue in place.

Sand the rudder/fin, and cement in place.

Continued on page 175

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As another Indoor Nationals ended, there was talk of having several permanent Nationals sites and rotating from one part of the country to another—Reno being considered for one such site. The Indoor fliers sincerely hope that a higher-ceiling Indoor site can be located!

There were some good things about this Nats. One was the staff that conducted the events and ran the table. Murry and Sandy Frank, father and son, did a great job as always. Thanks to them and to the volunteer timers who made it possible for the modelers to fly.

Barnstormer/Dahlike

Continued from page 82

Glue in the three tie pieces between the fuselage sides and around the wing LE. Cement in a slightly oversize fuselage bottom after notching it first for gear clearance, then trim and sand. Add the sub-rudder and tail fairing block; shape to blend in. Add the wire tail skid.

Glue turtledeck strips to the top of the fuselage sides and formers. Spot-glue the top fuselage block in place, and carve to shape; remove and hollow-out. Repeat for the bottom fuselage block. Now is the time for cockpit details and that lovely canopy. Install the engine with the offset you desire. Install the fuel tank, and glue its covering

block in place. Glue the canopy in place, and after the model has been finished, add the wheels.

Finish. Although I have seen some O-T Stunters with plastic film covering, that somehow doesn't seem to be in the right spirit. For covering I use either Ply Span or bamboo paper with the shiny side out. These are lightweight because they require less dope for sealing. (Oldtimer Models, P.O. Box 913, Westminster, CA 92683, carries both; Sig Mfg. Co. carries Ply Span.) Although I hear the formula has been changed, Aero Gloss dope is a true O-T material.

I used clear nitrate dope as a base, then sprayed grossly-thinned Hobbypoxy orange over everything. My trim design is the second-lightest possible (the lightest being none at all). It consists of a few chordwise stripes and a little paneling on the fuselage. The pattern was taken directly from the plans, except that the rear panel of paint was left off for weight considerations. Dry transfers are nearly weightless and not too expensive. (Alert readers will note that my Barnstormer carries a club decal. Sadly, this is a worthy tradition not often seen

these days. What say we revive the club decal idea?)

Flying. The original center of gravity (CG) was about 1½ in. aft of the LE. The older model Fox engines of .19, .25, .29, and .35 displacement all have the same mounts; if you have all four of these jewels as I do, you can have extra fun playing musical chairs with your engines. However, unless you have an unusually light model, the .25 with either a 10-4 or 9-5 prop is the minimum power I recommend.

If you use either the Fox .29 or .35, I suggest the 10-5 Top Flite prop (I prefer the old style gumwood for lightness as compared to the current Super M). With my .29, I find that 51 to 52 ft. of .012-in. solid lines works fine. Solid lines need lots of wiping-down and are heavier, but they have less drag than stranded lines. The fuel I use has 5% nitro and 30% castor oil.

Acceleration is brisk for a big model powered by a plain-bearing .29 with the needle set at a four-cycle, and you are airborne quickly—perhaps before you want to be (watch this at contests). I lean toward mildly nose-heavy trim, achieved by building a *very light* tail. If you need to change

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the CG, try swapping spinners. The trim setup I use gives a better groove, improves wind penetration, and tends to dampen the effects of the somewhat shortish nose.

Here, then, is an airplane that stands literally cockpit stitching and rudder above most others. With a high angle of attack and low gross weight, it gets off rough fields in good order. At a recent local holiday demonstration, I took the Barnstormer out for two full days of actual *barnstorming*, just like the name says. I wasn't especially trying to do a full pattern every flight—sometimes just doing big, sweeping, old-style maneuvers to show the folks what a good CL ship can do.

A few closing thoughts on the Barnstormer: How many of you are game to build one using only Ambroid or Testors glue? I considered this but backed off in a moment of weakness. This was how they were all built, you know. Modelers didn't always build with oak, steel cable, and ferro concrete (or the present-day modeling counterparts).

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$\frac{1}{8}$ capstrip to butt against it.

Cut two strips of balsa at least $\frac{1}{4}$ -in. wider than the leading edge of the foam (about $\frac{1}{2}$ in.) from a sheet of $\frac{1}{2}$ -in. balsa. Glue and pin these to the trailing edge, again centering to allow for the cap strips.

After the leading and trailing edges have dried, mark the cores at 2-in. intervals to locate the cap strips. Mark both the top and bottom of the cores so that the top cap strips are directly over the bottom cap strips. Also, mark the location of the 3-in.-wide inboard sheeting.

Place the wing core top cradle on a flat surface, and place the core on top of the cradle with the bottom side up. Cut the inboard sheeting to fit, and glue and pin it in place on the bottom of the wing. Next, cut the $\frac{1}{4} \times \frac{1}{8}$ cap strips to fit between the leading and trailing edges, and glue and pin them in place.

Repeat these steps for the other wing panel.

After the bottom cap strips have dried

in place, repeat for the top of the wings. Again, use the wing cradles to help keep the wing free of warps.

After the assemblies are dry, trim and sand the leading and trailing edges flush with the cap strips.

Mark the locations for lightening holes, and cut them with a hole saw.

Cover the wing with a *transparent* film to enable the full effect of your work to show.

The construction, as described, resulted in a weight reduction of 50%—from 16 oz. to 8 oz. The strength has been more than adequate.

Airplane Design/Powers

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ways, vertically, and off at an angle while maintaining forward speed, thus increasing their ability to outmaneuver their adversaries. When the model industry comes out with such equipment, then stability and CG location will no longer be problems for modelers.

Questions and comments may be addressed to Brad Powers, 5470 Castle Hills Dr., San Diego, CA 92109.

Pomilio PE/Noonan

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leading and trailing edges at the wing roots. Bamboo or $\frac{1}{2}$ -in. O.D. aluminum pins about $\frac{1}{4}$ in. long act as a method of indexing the wings to the fuselage and center (cabane) section. These fit in aluminum tubing in the fuselage and wings. It is important to have all the tubing in exact alignment before cementing it in place. To assure accuracy, it is necessary to assemble the wings with the proper dihedral angle in a temporary jig, then apply epoxy to the wing root tubing which has index pin in place. Allow the cement to dry before disassembling.

The eight interplane struts may be made from flattened plastic straws or cut from balsa. If you use the straw method, which has the advantage of being virtually indestructible, it will be necessary to insert bamboo slivers about 1 in. long at each end of the strut, allowing $\frac{1}{4}$ in. to pro-

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