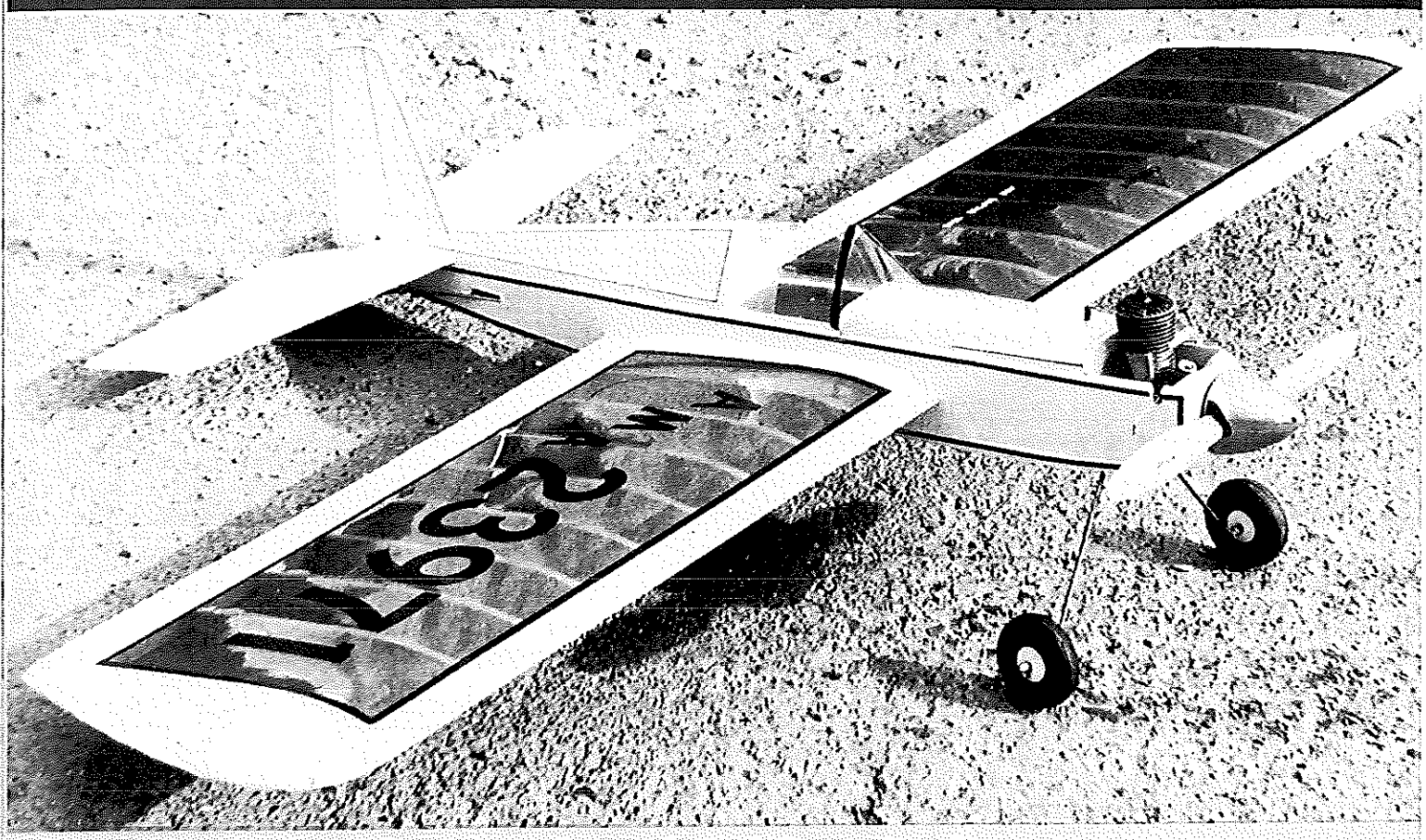
The Super Duper



You can go home again, Doc seems to prove with this glorious Super D, covered in transparent orange iron-on and trimmed in white paint—do see text. He made a dozen or so in the days of yore and cut quite a figure.

ZILCH! What an odd name for a famous model for a series of highly successful kits. Not really, when we recall that a company named S.N.A.F.U. and another P.D.Q. were contemporaries of the Berkeley Zilch series in the immediate post WW II era.

Other names were becoming famous in control-line stunt in that era. J.C. "Madman" Yates, Bob Tucker, Davey Slagle, Lou Andrews—and Jim Saftig. These men, and others, were adding dimensions to stunt with their designs and flying skills that seemed incredible. U-Control (a name and mechanism patented and licensed by Jim Walker) stunt had advanced from Ralph Roof's 1946 Nats winning T-Craft, to nearly all the maneuvers flown in the event nearly 30 years later.

I had watched Ralph Roof fly his winning T-Craft in the Wichita Nats, 1946, and was impressed. Having missed the '47 Nats, I was amazed by the quantum jump in flying at the '48 Olathe Nats. In a 24-month period, stunt fliers had made more progress than has occurred in the ensuing 30 years. Although lacking the smooth, highly polished patterns of today, the event had progressed from "doing weird stunts—such as banner pick-ups and wheel rolls to the beginning of "precision flying."

Vividly etched in my mind is control-line scale at that 1948 Olathe Nats. The models were flown late in the afternoon before a crowd of several thousand spectators. As was so often the case, back then, many of the elaborate scale models were too heavy for their spark ignition engines, barely staggered around the circle, or were unable to clear the ground. Each successful flight of the required ten laps was greeted with enthusiastic applause.

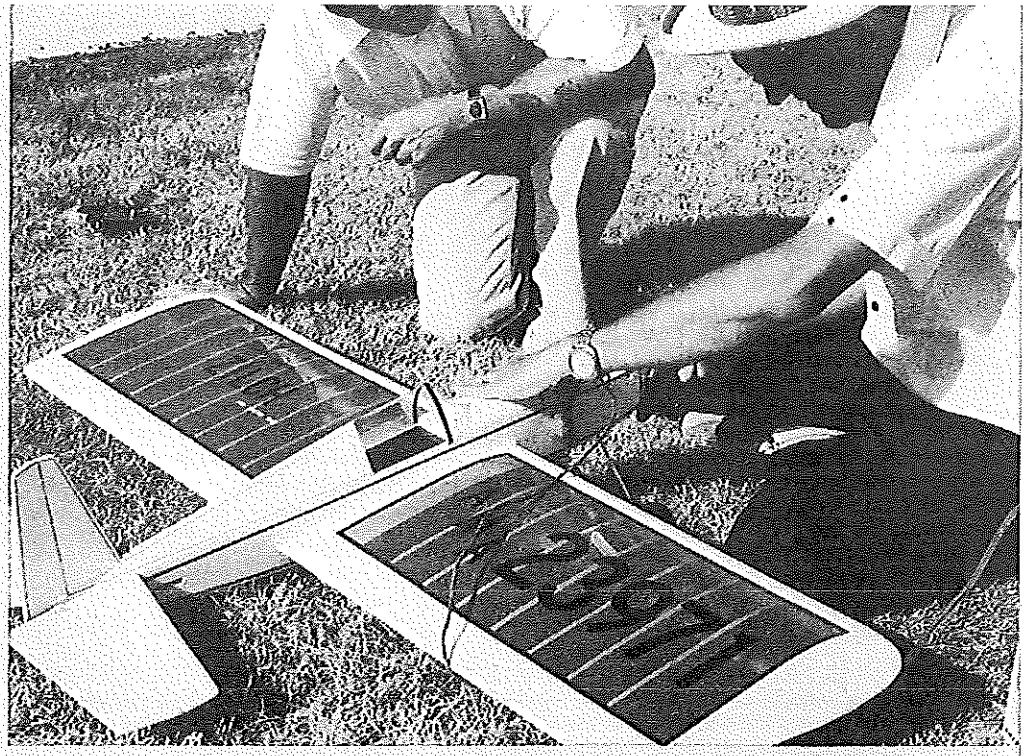
And then it was J.C. "Madman" Yates' turn to fly his lovely Stearman bipe powered with an ignition Orwick 64, finished in white and orange with Sammy Mason (on whose full-sized Stearman the model was based), lettered upside down on one side of the fuselage. Yates fired up the Orwick, tuned it to a roar, took off easily and proceeded to do three inside loops, three outsides, and suddenly was *inverted* so that Sammy Mason's name was now right side up. The murmur became a roar, we all nearly fell to the concrete in amazement. Truly an astonishing event at the time.

At this same Nats the odds-on favorite to win the Stunt event and the Jim Walker perpetual trophy was the winner of the previous Nats and Internationals, Jim Saftig, although he eventually lost the Walker to a 12-year-old Davey Slagle. Considered by many to be the finest example of the state-of-the-art, his Super

Around 1950 were the glory days of stunt, like Bob Palmer, J. C. "Madman" Yates, and Jim Saftig turning the world upside down with their incredible ships and maneuvers. The author was there, to see Nats and Internats (Plymouth) champ, the great Jim Saftig, put his latest Zilch, the Super Duper, through its paces. It's still quite a machine—as Doc's excursion into the past here vividly reveals.

■ Dee B. Mathews

Zilch

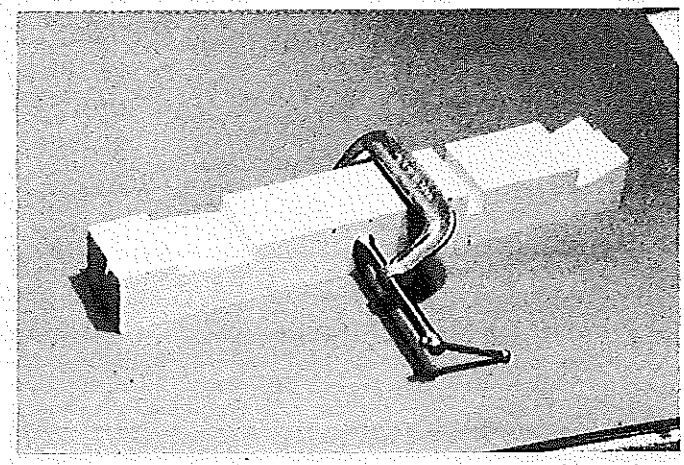


Firing up a potent Triumph, Doc prepares to show the youngsters how it was done. While he used unequal span wings, a la the 1950 Warrior, plans show equal span wings for the purist. Flight was clockwise in the early days, so torque worked for line tension—now guys want reverse running engines for the same reason! If you fly equal-span wing counter-clockwise, expect to add three ounces of lead to outboard tip. For a 30-year-old design, Saftig's bird is still a thriller.

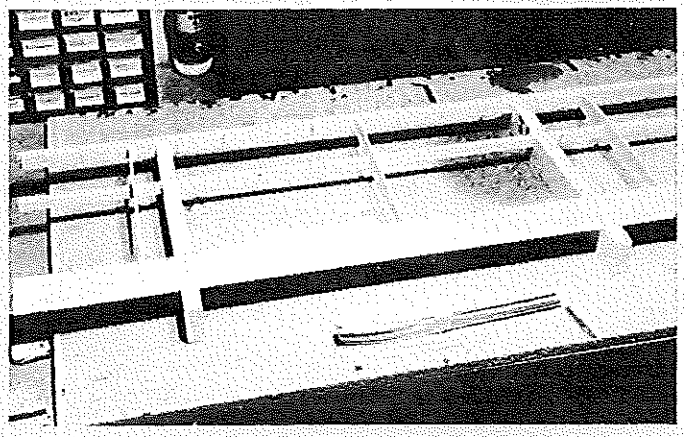
Duper Zilch was the talk of the contest. His original Super Zilch was being kitted by Berkeley. Saftig's Super Duper was introduced as a kit by Berkeley in the early spring of 1949. The Zilch series was eventually to include seven distinct sizes and degrees of innovation, ranging from a Pee Wee Zilch for .02 power to the Zilch 40 with flaps.

I flew more than a dozen Super Duper Zilchs as a young man, with O&R 60's, Atwood JH's, and with my all-time favorite, the Atwood Triumph 49. Invariably finished in chartreuse and red dope over Silkspan, my Zilchs always flew better than I, were relatively simple to construct and, in those days of paper routes, clunker cars, and girls, could be scratch-built from a few dollars in materials.

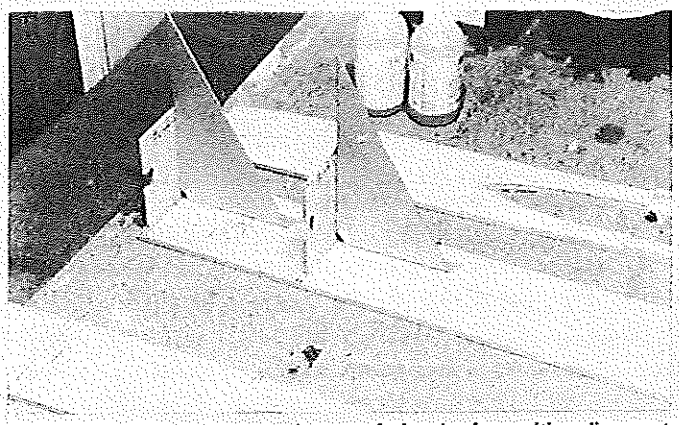
As I dragged out the ancient plans "one more time," several negative memories challenged me to re-engineer Jim Saftig's classic design. Perhaps I tried to gild the lily. The most annoying problem was warped wings. The use of full-length large wood sizes with their built-in stress relief problems had made building an unwarped wing virtually impossible. Such sizes as ⅛ × 2" preformed trailing edges just cannot be purchased in an unwarped state. Equally perplexing was the fuselage construction. A pre-cut bottom sheet was pressed into the assembled sides, while the top was supposedly aligned with a triangular turtle deck. The resultant structure invariably resembled a distressed pretzel



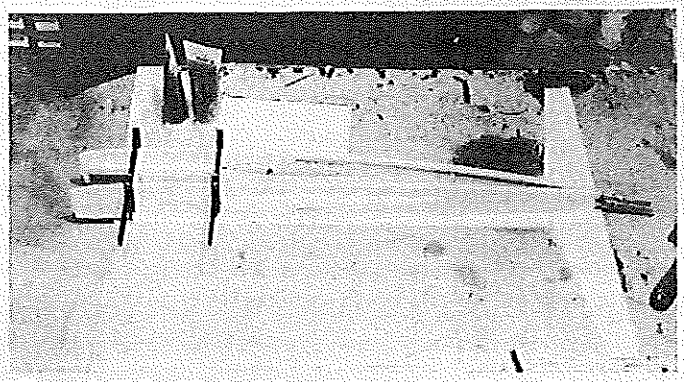
Three wing jig blocks—held here by C-clamp—are located over plans, with edges, spars, held in place with masking tape, weights, pins.



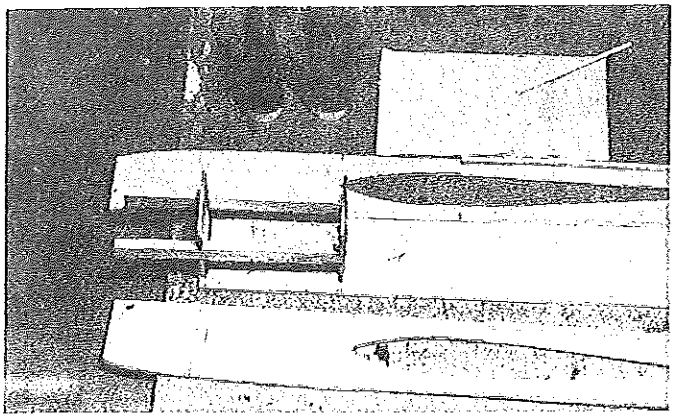
Warps being the big problem of the ultra-light prototype, Doc substituted laminated spars for the 48-in pieces in the original, and used the jig for easy, accurate assembly of the symmetrical-section wing.



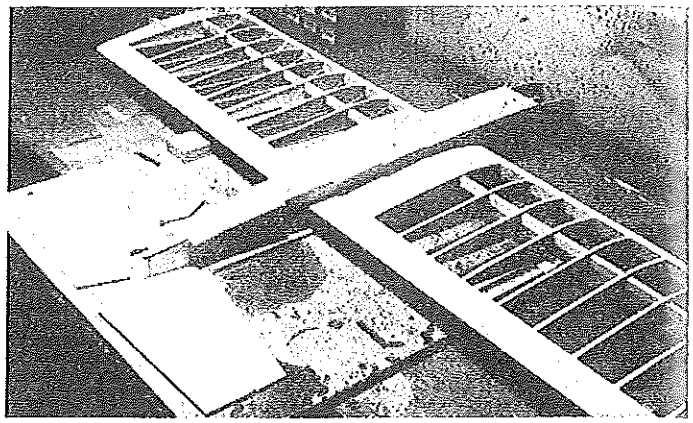
Any good builder makes extensive use of triangles for positive alignment of things like bulkheads. Saftig's Zilch had featherlight fuse, but our version utilizes crutch of 3/16" sheet, 1/16" ply doublers.



Clamps hold the sides to ply formers in this pic, while the sides are pulled together at rear to match centerline mark on top sheet crutch. Fortunately, long stab fits flat on bench, and can be precisely aligned at this stage. Spruce spar for stab eliminates tendency to snap when the early S.D.'s were manhandled through maneuvers.



Rather like the simplified techniques employed in many modern RC jobs, the more or less standard stunt model fuselages went together like mad. Note placement of hardwood motor mounts in two ply formers.



You know, the darned crate hasn't budged yet on its building board and it is practically rough-finished! The framed wing has been inserted through the cut-outs, and bottom sheeting is being pinned and glued.

and was woefully weak.

The stabilizer was prone to break in half occasionally when flying in windy weather. I felt that these problem areas could be alleviated while still retaining the appearance of the original design, improving durability. One visible change is the asymmetrical wing concept introduced on the Veco Warrior in 1950. I had used this modification on several of my later Zilchs so it looks perfectly normal to me. For the purist, the drawings show an alternative equal-span center section.

For authenticity the model should be set up to fly *clockwise*, as this was the direction of rotation at that time. The advantage of clockwise rotation was the line tensioning effect of the motor torque. Needless to say I have found considerable amusement, of late, with the introduction of special crankshafts for reverse rotation of the prop to generate what can be had much more simply by flying clockwise. The equal-span wing when flown counter-clockwise will require at lease 3 ounces of lead in the outboard tip.

A simple wing jig has been developed to use in laminated wing members. By using two-piece spars, etc., one can pin the sections flat and true while 5-minute epoxy cures. A little block sanding yielded the first truly unwarped Super Duper I've ever constructed. Other structural improvements are self explanatory. The construction of the fuselage onto a 3/16" sheet crutch is a technique commonly used in RC, and is nearly goof proof. The 1/16" ply doublers add considerable strength, and the spruce spar in the stab corrects that little problem.

General: The epoxy used is one-part to two-part type, such as Hobbypoxy II. Five-minute epoxy is used to attach the bulkheads to the 3/16 in. crutch, and Formula III thixotropic (by Hobbypoxy) is used to attach the wing to the fuselage. C.A. refers to cyanoacrylate quick-setting cements, such as Hot-Stuff and Jet. The 48-in. spruce and balsa as used in the wing could be substituted with laminated sections *if* the joints are scarfed and distributed about the length of the part, well away from each other.

Wing: Laminate the spruce spar using two pieces of 3/16 × ½" joined with 5-minute epoxy. Use a metal straightedge to correct any bow while the lamination is pinned flat onto a surface. Sand top and bottom after epoxy has cured. Repeat the process for leading and trailing edges. Contour leading edge using a jack plane, sanding blocks, and a metal template to develop a consistent shape. Note that notches are cut into leading edge prior to its being shaped.

Mark rib locations onto spar and trailing edge, using previously notched leading edge as a guide. If building non-symmetrical wing, mark upper left, etc. on each piece to aid identification when setting up in the jig. Cut rib slots into trailing edge. Facing the teeth of the saw blade to the rear makes for easier notch cutting.

Place carbon paper between plan and a piece of 1 × 2 pine to develop a master block for the wing jig. Cut notches and file for a tight fit of the three longitudinal wing members, then cut two additional pine blocks to match the master block exactly. C-clamps and a bastard file are most helpful in developing the blocks. Pin the three jig blocks over the plans carefully, locating them exactly paralleled with three long members of the wing. Hold leading and trailing edges and spar into the blocks with masking tape, pins, and weights.

Develop a plywood master rib, using the carbon paper or tracing paper Spray-ment technique. Cut wing ribs from stacks of 3/32" C-grain sheet. Sand to smooth contour and check for spar clearance. Glue each rib into the slots, position carefully to allow for the 3/32 × ¼" cap strips that will be added top and bottom. Add tip outline sheets and fillers. After glue has set, epoxy ply bellcrank floor into position with the 3-in. bellcrank and leads installed. Punch holes into appropriate ribs for leadout clearance. I use a common paper punch, but an X-acto punch can also

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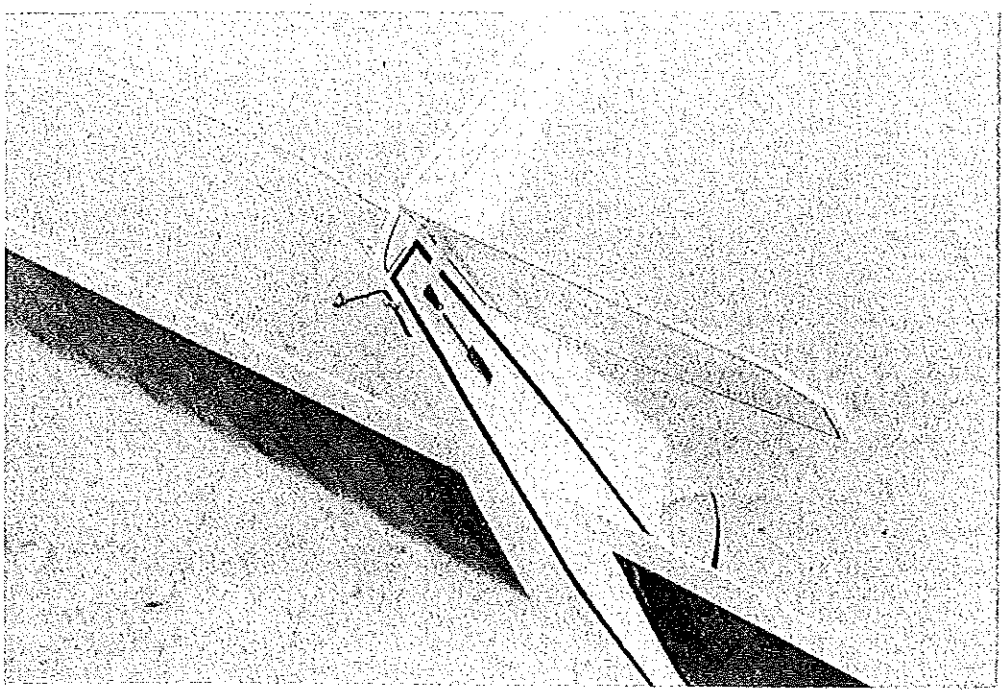

All's well that ends well, and this tail end picture tells its story. Our plane-making machine from Kansas must have loved this one, if he took time for pin stripes! Maneuvers are more open than those performed by today's sleeksters, and more abrupt. Nylon horn, clevise, no less!

CL Aerobatics/Paul

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FAI tryouts, and knows what is needed for a good contest—but needs some help!

Any other site representatives who wish to be considered for the FAI stunt tryouts should contact PAMPA president Keith Trostle, at 10900 Phillips Drive, Upper Marlboro, MD 20870. Maybe the FAI speed people should drop by the stunt tryouts to learn how to make an official flight.

Aero-Challenge Post Mortem: Bill Allen of DeKalb, Illinois, knocks himself out each year to set up his two-day extravaganza with lots of control-line events and great awards. This past contest had 137 contestants and generated $1297.75 for the Jerry Lewis Labor Day Telethon. Stunt, for instance, had 33 entrants in four classes, and included some top National qualifiers.

Unfortunately, not everyone shares our enthusiasm for toy airplanes and associated activities. Bill sadly received a discouraging letter from the Wurlitzer Company, the site of the 1978 contest. According to the facilities manager they are concerned over protecting their investment in landscaping and underground sprinkler system; they also felt that the children present were not under proper control. (Some fool was actually playing in their fountain!) "Therefore, I regret Wurlitzer cannot offer you their facilities for future model meets." signed R. G. Myrland, Facilities Manager. How narrow-minded; such a wholesome activity for the people involved, plus spectators and, added to this, the donation raised for the Telethon. Is Wurlitzer's margin of profit so slim that they can't support civic activities such as this? Let's hope that Bill Allen can find another site for his Aero-Challenge.

Swept-forward trailing edge. This idea has been used by Bill Werwage on several of his planes recently, and also has been tried by Al Rabe, Bob Gialdini and Don Shultz. Bob Hunt said recently that he, too, is going to cut a foam wing to try this idea for next year. The claim for this method is that with the swept-forward trailing edge the plane will not yaw. According to the experts, air spilling off the conventional T. E. when the flap is deflected helps to create yaw. Hunt cites the example of grasping a 12-inch ruler in the middle and drawing it through a pan of water; the ruler will yaw back and forth. However, a piece of wood cut and glued at the center to represent a swept forward trailing edge does not exhibit the same tendencies.

It is obvious that, with the swept-forward trailing edge, the deflected flap does not meet the air flow flat across the entire surface but, rather, the air is channelled or spilled off the ends. Werwage had a trailing edge sweep of some 2.25 inches. Bob is trying two configurations: 1.5 and 2 inches.

Forties coming on strong. The switch to the 40-size engine is becoming a roar rather than a trickle. The HP-40 and the Max 40 FSR are getting the majority of stunters. Talking with Bill Werwage recently, he said that he has been experimenting with the HP, both the Max 40 and 45, as well as the ST 46 all during 1978. His new plane will be built to accommodate all four engines. How is this accomplished? Well Bill's resident machinist has carved out some odd-sized front covers for the crankshaft so that the extensions all end up at the same place for the spinner.

Recently, Bill really tried a novelty. He put the front half case and crankshaft of an HP 40 onto a Max 40 FSR. The result was a very nice 8 oz. engine, however, it didn't run too well. Bill attributes the loss in performance to the smaller porting in the HP crankshaft. He feels that the almost double port in the Max crank gets more fuel/air mixture to the chamber, which in turn gives more power. Bill stated that he really likes the "guts" that the Max 45 has but it is just too rough to suit him for stunt. He likes the combustion chamber design of the 45, but still the engine has rough spots that don't please him.

Those who have been running the HP 40 with success all seem to have to adjust the timing of the sleeve. It seems that about .015 in. drop of the liner will make the HP run better for stunt. Popular venturis for the HP are in the .290 to .296 range.

The writer has had some limited experience with the Max 40 FSR and it does appear to be a very good engine. Tank height is a problem. Werwage suggests that the tank be ⅛ in. or more off the beams for a better run. I experienced wind-up in the consecutive maneuvers but have not yet been able to try adjusting the tank height. One thing for certain, the Max can be flown right out of the box. It looks like a good engine, certainly it can be about the same as an average or better than average ST46 without any reworking. And, you can use the .015-size lines which is an advantage.

For information on stunt or PAMPA write Wynn Paul, 1640 Maywick Drive, Lexington, KY 40504.

Zilch/Mathews

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be used effectively if the rib is backed up with a scrap of the 1 × 2 pine to prevent breaking the rib.

Check for absolute free movement of the leadouts and the pushrod, cut and trim until satisfied. Epoxy ⅛" brass tubes to inside tip, and lead weights to outside tip. After epoxy cures, remove wing from jig. Plank center section and install cap strips, using C.A. wherever possible. Complete wing by adding any needed wing-tip contour fillers, and sanding to the point of ready-for-covering, but do not cover until wing is installed into fuselage.

Tail Feathers: Cut 3/16" balsa to correct length and epoxy the spruce spars to stab and elevator. Trace outlines onto blanks using carbon paper under the plans, and cut. Sand to airfoil section and add offset to rudder. Leave center leading edge of stab flat for joint with fuselage keel.

Fuselage: Trace bulkhead patterns onto plywood using carbon paper under the plans. Note difference in motor bearer notches for varying powerplants. Use carbon paper technique to develop two identical fuselage sides of ⅛" sheet, choose closely matched pieces of wood. Develop the 1/16 ply doublers, using balsa sides as a pattern. Join to balsa sides with contact cement or 5-minute epoxy.

Mark a mid-line and the position of the bulkheads onto a straight grained, flat piece of 3/16 balsa. Attach bulkheads 2 & 3 to top, using 5-minute epoxy. Check for parallelism with a 90-degree triangle. Epoxy stab to rear of top, checking that mid lines are parallel.

Epoxy maple motor bearers and fuselage to bulkheads. Hold in alignment with

C-clamps, masking tape, and pins. Allow epoxy to cure, then pull tailpost together directly over mid-line mark and C.A. fuselage sides to top crutch.

Slide wing into cut-out without removing fuselage from work surface. Sand and trim sides for clearance as needed. The pushrod stub will slide through with some bending of the ⅛th sides. Measure for equal height of wing above work surface and equal distance from leading edge of the stab. Use Hobbypoxy Thixotropic epoxy to attach wing in the accessible areas of cut and to bulkhead 3.

Temporarily tape elevator to stabilizer with control horn, C.A. in place. Cut slot in fuselage side to clear heavy duty pushrod, bending as necessary for clearance. Project wing pushrod stub in full up position and join to rear pushrod with 3/32 I.D. brass tube soldered at joint.

Mount previously bent landing gear wire to bulkhead 1 with nylon landing gear brackets. Epoxy this assembly onto bulkhead 2 and to the maple bearers. Plank bottom up to bulkhead 1 using C.A. Sheeting is cross grained.

Remove the assembly from the work surface. Cut and sand top and bottom to contour. Position engine on bearers, mark and drill 9/64-in. holes for 4 × 40 T-nuts. Cut and trim nose blocks to clear engine and attach with 5-minute epoxy.

Cut hatch inside the bulkheads and sides. Pencil-mark rear limit of hatch onto sides for reference, then glue ½" balsa block in position with hatch in place. Do not glue sides or front of perimeter around the 3/16 hatch, just the removable portion. When glue is dry, cut through the ½" sheet using the marks as a guide for the razor saw. Remove hatch and install hold-down hardware.

Cut bulkhead 4 and turtle deck sides from firm ⅛ sheet. C.A. 4 to crutch, bevel joint of sides for neat fit to crutch and C.A. in place. Cut turtle deck to clear fin. Hinge elevator to stab using your method. I used the classic cloth hinges (Sig ½" tape) and glue. Permanently attach horn and clevis, adjusting for neutral and trimming the cut-out in the side for free movement.

Trim turtle deck for a neat fit of the fin, epoxy fin to stab and the slot. Check for a right angle with a 90° triangle. Fill any voids in the wing-fuselage joint with Thixotropic epoxy, forming a fillet with a moistened finger. Sand wing and fuselage members.

Finishing: Those wishing authenticity should cover in Silkspan and Testors Hep. If durability and beauty are more important, contemporary finishes are recommended. I covered the wings with transparent MonoKote, masking off the outlines with electrician's tape and newspaper, applying two coats of K&B filler with sanding between coats, the filler was fine sanded with #380 paper and the whole works sprayed with two coats of Perfect White Poly-urethane paint. Coat tank and engine areas with resin or epoxy for fuelproofing.

The pinstripes on the prototype are D&J Multi-stripe, the numbers and letters are vinyl stick on items from an office supply. For those who were not building model airplanes 30 years ago, the spinner is a genuine Froom (the definitive name in spinners and tanks back then, but long since out of business). The powerplant is a Atwood Triumph 49, the last "large bore" engine to bear the design genius of Bill Atwood.

I have flown the Super Duper Zilch with a Fox 35. Although lacking the brute strength of the Triumph, the Fox is more than adequate to pull the aircraft through the stunt pattern. Maneuvers with models of this era are somewhat different, being more open and abrupt in execution. Inverted flight requires definite up (down really) elevator, and the horizontal 8's use up a lot of air space. Flight characteristics are delightful with no vicious habits. Grooving is excellent. I did wheel-rolls for my elder son while he was taking photos; he had never seen such a thing. Wheel-rolls were part of the event in the early days.

I hope those of you who choose to construct a new and improved Super Duper receive as much genuine pleasure from yours as I have from mine.

Engines/Lee

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valve, Schnuerle ported, ringed designs.

Several times I have mentioned "bar stock" engines. This is a term used when we literally "hog" a new crankcase out of a solid chunk, or bar, of aluminum for a new or prototype engine. It is an awful lot of work to make patterns and core box to get a crankcase casting, so it is much simpler and cheaper to use bar stock to make one-of-a-kind crankcases. It is unusual to find large production RC engines made this way, but there is one line that utilizes solid aluminum instead of castings for their crankcases.

The Profi engines, imported by Nelson Products, are manufactured in West Germany and come in five sizes from a .10 (1.76 cc) to a .76 (12.65 cc). Almost every part in the engine except for bearings, carburetor, and the carburetor housing is machined from solid metal stock. The wrought, heat treated aluminum is much stronger and more stable than cast material. The crankcase is machined out of solid aluminum, and an aluminum cylinder jacket with integral Schnuerle bypass ports screws into the top. A hardened steel liner is held in place by a conventional bar-stock squish-band head and single-ringed machined piston is utilized. The carburetor is different from most since it uses a sliding