

# AMERICAN aircraft modeler

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*Pictorial*

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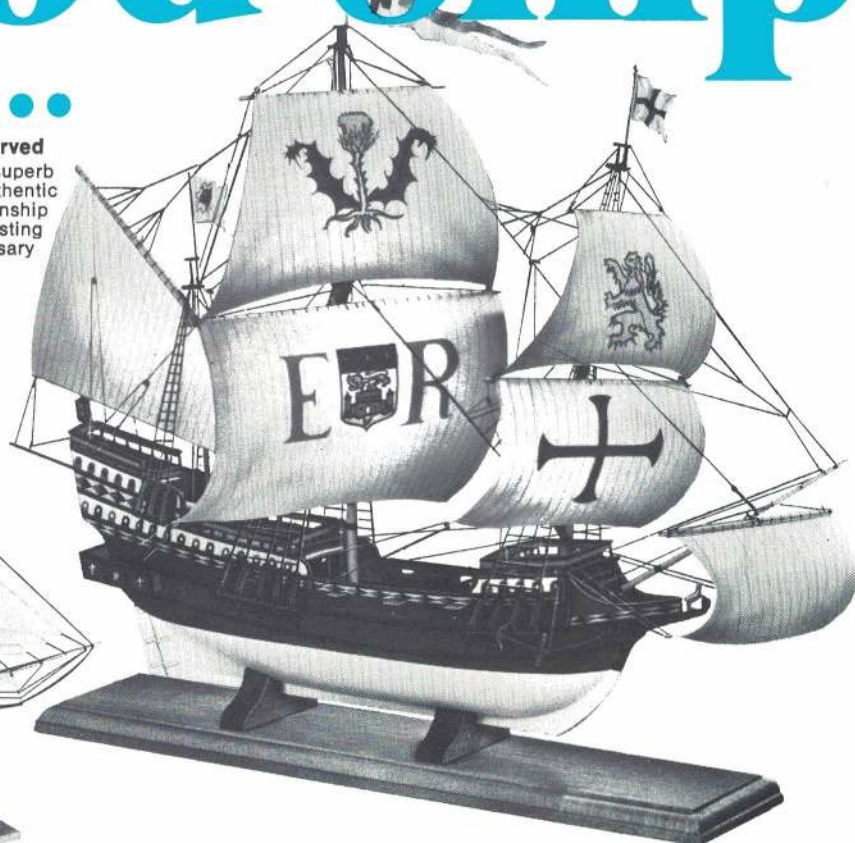
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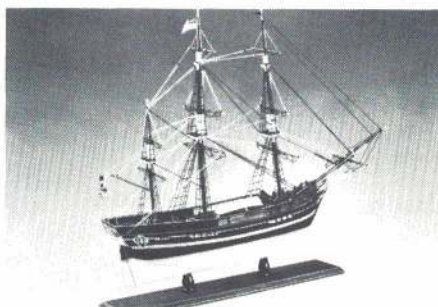


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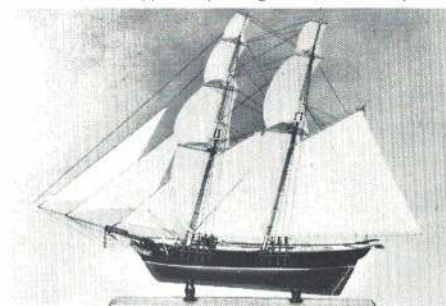
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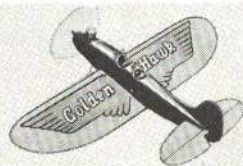
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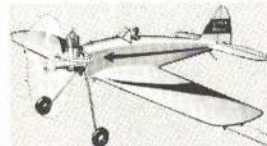
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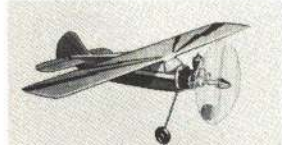
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# AMERICAN aircraft modeler

COVER PHOTO: Ektrachrome by Ed Okie, taken at Orchid Springs, Fla., finds Miss Judy Sapp with Roland Dilley's Goldberg Shoestring and Playboy magazine. Only the model plane is MonoKoted.

**WILLIAM J. WINTER — PUBLISHER** **EDWARD C. SWEENEY, JR. — EDITOR**  
**Kathryn Conover, Editorial Assistant** **Eleanor Swavely, Editorial Assistant**

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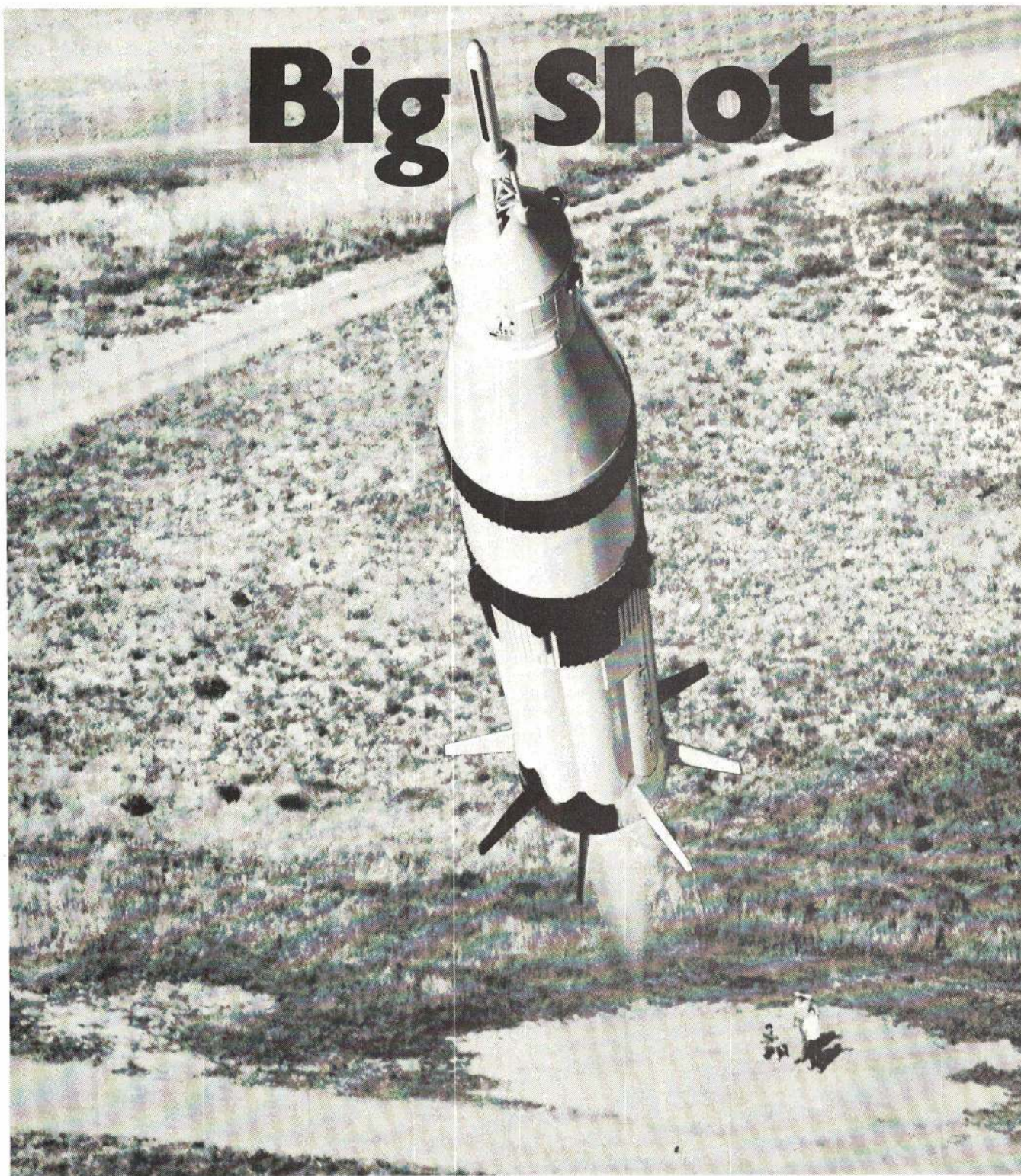
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# Straight...and Level



## New models fly right off the workbench. Is it Utopia?

RECENTLY WE READ advance proofs for an article entitled "Greater Than Golf," which will appear in *National Aeronautics*, an aviation special to hit the newsstands early in February. Prepared by the Academy, the article deals with the special kind of people who fly radio-control models, and thereby enhance our hobby image. For the guy who gets his kicks from a Sunday afternoon session of piloting his swift stunt job about the skies, the model airplane is more of a means to an end and not the end in itself. Concentration, excitement, elation take him out of the ordinary world, ten or so minutes at a time. RC, for him, is a wonderful sport.

Most model aircraft these days are stylized, an aerodynamic shape, a computerized readout from the input which is our intelligence of size, areas, configurations required to yield an acceptable "norm" of performance. If they can design jetliners and awesome fighters and bombers which fly right off 5000 drawing boards, why should not a model do the same—be taken for granted?

It is hard to get acquainted with a modern crate. What ever happened to the ornery, independent "dream" ships which talked back like Francis the Mule, or Ed, the TV horse? One feels self conscious about patting a faithful crate on its cold fiberglass back and saying, "Well done, you good and faithful servant." One is no longer tempted to squish some hopeless flying machine beneath a heavy foot while chanting, "Take that, and that, and that. . ."

We feel good because of what we do with the RC craft, a satisfaction that comes with an acquired skill which coordinates physical and mental attributes in the fulfillment of purpose—like breaking 70 in golf. Who cares about the ball or the club?

How strange it is that, in most RC, the effects of various amounts of dihedral hardly matter, or the relationship of fin and rudder area to dihedral. Or the effects of varying decalage, or the effects of profile area distribution. And a thousand more things. There always were results to be observed as we felt our way through designs, sometimes wild and wooly. Skull-crackers, really, which keep you going like an addict year after year.

In radio, the most challenging, the most rewarding form of the art, the single greatest problem is the attainment of pilot skill—learning to fly. But in free flight, be it indoor, contest outdoor, sport, or just hand-launched glider, the same old problems which plagued every model designer from the turn of the century are still there. These "simple" models are, in reality, the toughest. Everything matters, crucially, and a little bit of this, instead of a bit of that, is to be read out in the way the ship flies—or goes berserk.

Fifteen years ago in radio, everybody feared the low wing like the devil. When Fred Dunn put the wing on the bottom, instead of the top, of his Smog Hog and called it an Astro Hog, radio was revolutionized. Kasimirski pepped things up with the Orion, then made them easier with the Taurus. After that everyone got into the act. The Orion was a 1960 design. Only ten years back!

How long ago was it that we wondered about the Live Wire's odd ability to be "walked" for a fantastically stretched-out "final" on the final by wiggling the rudder slowly. They taught you that on real Cubs, too, swinging a low wing by booting rudder to bring it up. More airspeed on that side, you know. Why did a

Rebel resist turning when gliding straight downwind—oh, a bigger rudder fixed that, but then the crate began to wind in turns.

And when a weak wing broke, why did it usually happen after the crate pulled out, presumably unloaded, and not during the bottom of the pull-out? And, if tail-trimmed for a wind, how about the crazy crates which outside-looped into the ground once the nose was put down. And how one model would turn perfectly and have excellent directional stability, but when loaded down would lose that stability and tend to wind off in either direction, often without control application. The arguments: add fin area, cut down the fin area.

Do we realize, even today, that more fin area in some cases produces a nose-down spiral instability, while in others it corrects the same fault? The pundits still say too much fin makes you wind down. So can too little fin area. It also gives "Dutch roll." The time you added nose weight to get balance, and the crate stalled worse! It flew faster, had more lift, and needed still more weight. Four times. Finally it got nose heavy.



Some free flighters thought downthrust made you loop. It can. Fly faster, more lift, more downthrust. But not when you have enough of it. Or put a weight on one wing for balance—and the crate turned more strongly the opposite way! And when washin acted like washout. You got that with an undersize fin.

Alas, we miss those eye-popping surprises. Kept a guy humble.

*William Winter*

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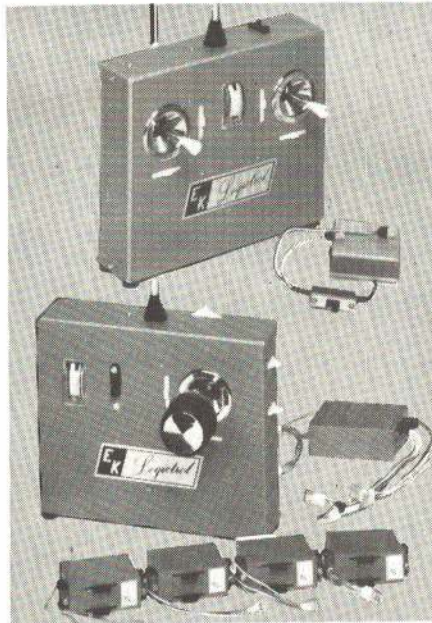


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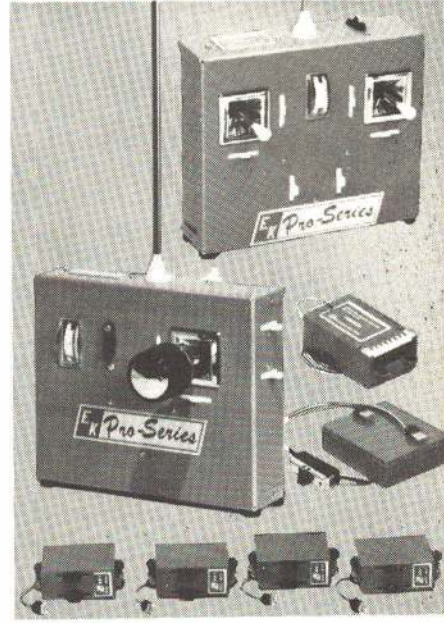
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### In defense of the Q

It would be a relief to see an end to all of this "it couldn't run" business. It all depends on whether or not you're old enough to remember back to the time when the engine cost more than five bucks (not that big jump when WW II started, either), and came packaged as an engine should be, not like an assortment of leftovers.

She didn't have much in the way of breathing freedom to help her—the intake and bypass were as old-fashioned as the year she went on the drawing board. It is said that she definitely had rings at first but that issue wasn't seen by me. In all events, this gal wasn't any bomb as she peeked up out of the box at you—but *I've never seen one that wouldn't run*. There are some guys for whom nothing will run, let's face it.

She got down to \$5 postpaid about the time the packaging went kablooeey. She came to you as a knocked-down kit in a cheap carton—the parts grating on one another in a newspaper. It was very plain that the girls who made up the kits were told to be sure to pick pistons that would "go into" whatever cylinders had to be matched. Some fits were pretty loose, naturally, but even these things ran—and they'd fly, too!

They dropped the cast iron piston for a deep-draw stamping about 1940 or so—this didn't seem to hurt anything (or help it, either). They ran—every issue until it all stopped.

C'mon fellas, face it: she'd run. If you really want a big deal in justified beefing, go back to the Thor 29 of 1945 or so. I haven't found anyone who ever got 60 seconds running time out of any one start—if he ever got a start. On the other hand, this engine could let go with some of the finest single pops a guy ever heard. The neighbors loved these engines from coast to coast, for one of those distinctive pops meant that ten minutes minimum of dead silence would follow before the next pop.

Why not leave old Lady Q alone—for the job they did on her on the drawing board—plus production kinks accompanying the price war she started later—she was a respectable old gal.

R. S. Demitz, St. Louis, Mo.

Now I have thrown away my eyedropper tanks and colored dope, and replaced them with timers and colored tissue and clear dope. I now know what a good flight is. My interest and enjoyment of this great hobby has increased a hundred-fold. This all happened with just a few words of encouragement and advice!

It doesn't take much to put a kid on the right track. If you "experts" who want to help a junior (but think it's a real hassle) would just keep an eye out for the inexperienced members of balsa hackers and give them a little of your time and wisdom, the ranks of fliers would double!

Marc Sexton (address not given)

### Ever since Eden . . .

After reading Fearsome Contribution in "You Said It" (July AAM), I thought the enclosed photo worthy of publication. I don't go along with the view that requires gals on every cover, but I find nothing wrong with teenage boys interested in teenage girls. As *American Aircraft Modeler* is well received and written with both adults and youngsters in mind, I believe your subscribers would find this young lady acceptable.

The plane is Bill Brenchley's scale ME 163 Rocket Fighter built as a Slope soaring sailplane. This ship won Most Unusual category at the Travis AFB California scale contest.

The young lady is Doynetta Striker, a student at the San Lorenzo Valley high school, who was swimming with Mr. Brenchley's daughters at their pool when the photo was taken.

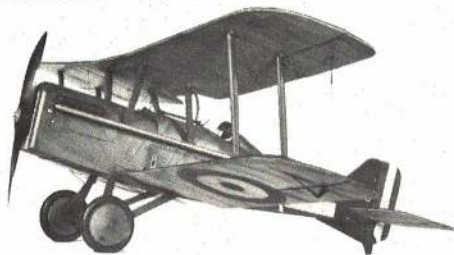
Whitey Pritchard, Boulder Creek, Ca.



## R/C MULTI CHANNEL



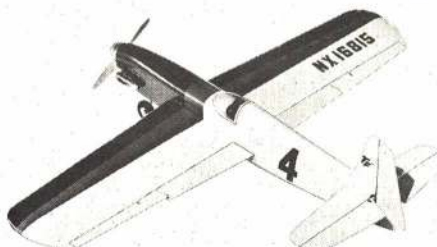
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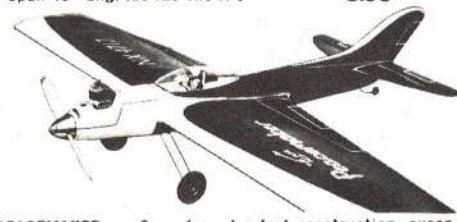


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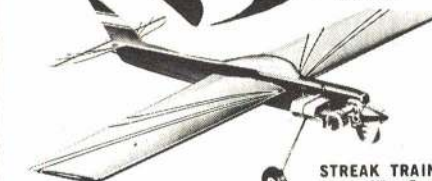
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### CONTROL LINE COMBAT MODELS

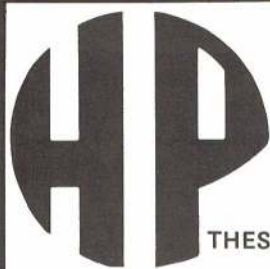


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# 1970 RC Car Championships

This new radio control sport had its big annual meet in Indianapolis. One hundred models were there.

GEORGE SIPOSS



Imagine a race with all those cars! Only five could compete simultaneously. The lineup shows all the entries at the meet. Each was fabulously painted.



This beauty features a high air dam for increasing downforce at rear wheels.



Flag waved by NASCAR official started each race. First-turn casualties were high.



All kinds of starters appeared. Here the popular bike was used; others had electric.



Hinged body allows quick servicing on Sweeney's Dynamic. Weather was cool.

THE THIRD NATIONAL Championships of this young but fast-growing hobby saw 67 competitors race their  $\frac{1}{8}$  scale cars in oval races, drag races, slalom, concourse d'elegance and Grand Prix on a road course. The location was in Indianapolis (where else?) and the principal sponsor was the Curtis Dyna-Products (Citizen-Ship) Corporation.

The track, painted on a parking lot, had barricades all the way around it to protect spectators. In the turns,  $\frac{3}{4}$ " wooden planks were placed like spokes of a wheel to prevent corner cutting. Drivers stood on a raised platform with lap scoring judges in front of them. An official NASCAR starter looked after starting and judging duties, while a photoelectric system was used to time the cars. In most heats five or six cars were run at one time, and their completion times were tabulated and later completed to arrive at the final score.

The drag race, first of its kind any-



Many Heath cars appeared. This one's wild color scheme certainly deserves a prize.

where, was over a scale quarter-mile smooth surface. There was a sequential "Christmas Tree" and, again, safety barriers to protect spectators from the speeding cars. A completely unassisted standing start was used in each case. Lowest E.T. was turned in by Ed Hughey's car, which ran the distance in

(Continued on page 79)



Engine running, competitor carries his car to the track. Solid suspension used.



# CARL GOLDBERG

THIS MONTH  
IN THE SPOTLIGHT

## CG MINI-LINK

I think a lot of modelers are going to like our new MINI-LINK. It's strong enough to hang 3 big 7 lb. ships from it. But it's small enough to look right on the new small models. Made of tough nylon, so you can use it anywhere because it makes no electrical noise. MINI-LINK comes with a long, strong rod (needs no connector) and has a mini-price—29¢. See your dealer for it.

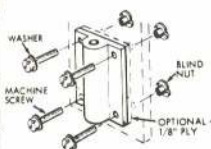


Send 10¢ for 4-pg. Illustrated Catalog, with recommendations on "Getting Started in R/C."

P.S. For best service, see your dealer for kits you want. If not available, write direct; add 35¢ per kit in U.S., 75¢ outside U.S. Minimum order \$1.

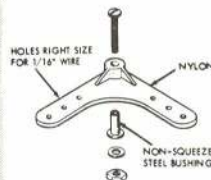
## FITTINGS and ACCESSORIES

### NOSE GEAR BEARING



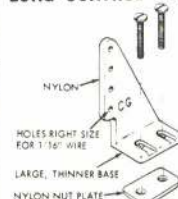
One-piece Nosegear Bearing mounts easily to firewall without alignment problems. If extra steering angle is desired, use 1/8" ply stand-off. Includes blind nuts, screws, etc. ....60¢

### AILERON BELLCRANK



Bellcrank has steel bushing of proper size, so crank can be screwed firmly in place without binding. No electrical noise—all metal parts are screwed tightly together. 50¢ for 2

### LONG CONTROL HORN



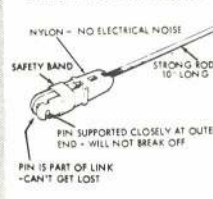
Control Horn has right size holes for 1/16" wire, and nut plate for simplest mounting to control surface. Horn is long for maximum range of throw; can be cut down. 50¢ for 2

### NYLON REINFORCING TAPE



Extremely tough. When applied with heavy coats of cement, it approaches fiberglass. Excellent hinge material. 3/4" wide x 5 ft. ....25¢

### NYLON AJUSTO-LINK



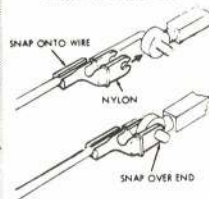
Ajusto-Link is used for adjusting linkage to control surfaces, throttle, steerable nose gear, etc. Nylon-tough and no electrical noise. Takes heavy load. ....29¢

### SHEET METAL SCREWS



Sheet metal screws—like wood screws, but better. Sharp, clean, full-depth threads, hard and strong. Excellent for mounting servos, etc. Includes washers. #2x5/16 20¢ for 10, #4x3/8 20¢ for 8

### SNAP'R KEEPER



Quickest, handiest way to secure pushrod wire end to servos, horns, etc. Nylon can be squeezed together with pliers to work on wire under 1/16" diameter. ....50¢ for 4

### STEERABLE NOSE GEAR



Steerable nose gear with shock absorbing steering arm, molded one-piece nylon bearing. Includes blind nuts, screws, etc. ....\$1.95

Falcon 56 Canopy .....	75¢	Skylark 56 Canopy ....	75¢	Falcon 56 Nose Gear ..	50¢	Falcon-Skylark Wing	\$7.95
Sr. Falcon Canopy .....	75¢	Jr. Skylark Canopy ....	25¢	Jr. Falcon Nose Gear ..	25¢	Sr. Falcon Wing ....	\$14.95
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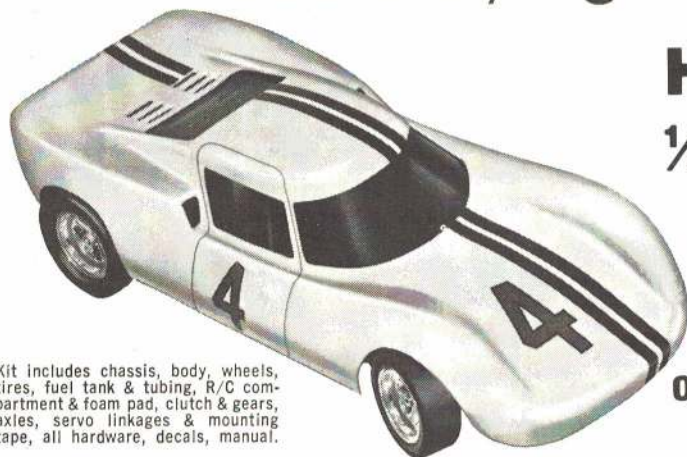
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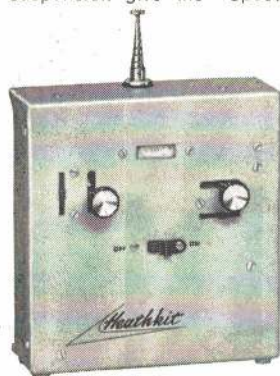
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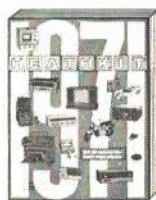


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# Bonanza and Mustang

A basic hand-launched glider can be patterned after almost any real aircraft. These fly great.

**DAVID THORNBURG**

LIKE TO BUILD a flying model that's simple, quick, and fairly realistic? Here it is! Choose either of two well-known aircraft—the Mustang or the Beech Bonanza—and build the plane directly from the full-size plans. Or, better yet, build both at once for a real ball! A single sheet of  $\frac{1}{4} \times 3 \times 36$ " will build three fuselages, and two pieces of  $1/16 \times 3 \times 36$ " will easily build all of the flying surfaces for two to three models. By building two or more planes at once, airplanes can be turned out in less time than by building them singly, especially if they are the same or nearly the same in design. This is a trick the experts use in building their stables of high-performance contest jobs.

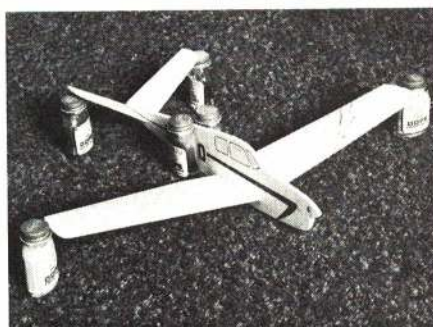
In performance as well as appearance, both planes are a cut above most of the chuck gliders that can be bought in the stores. The Mustang flew out of sight in a big, lazy thermal the third time I had it out—good thing I got pictures first!

There are a number of ways to build from full-size plans. The easiest is to cut out the magazine pages, tape them together, and use carbon paper to trace the parts onto balsa. However, once this is done the plan is as good as lost, and the book is pretty well ruined. Most modelers like to keep their books intact, both for reference and for nostalgia. My own collection dates back into the early 1950's, and I often turn to it for design ideas and performance tips. Aerodynamic theory doesn't change much, so books don't really get out of date.

It's best, then, to avoid mutilating the book. Instead, either trace the part outlines directly onto thin paper, using carbon paper, or run the page through a Xerox machine available at most li-



Heave ho! Trim model for left turn in glide if you launch right-handed. Then model makes a curling climb and arrives at maximum altitude with wings level and at glide speed.



Setting dihedral joints is merely a matter of having enough small dope bottles.

braries or schools. This last method is not against the law as long as the plans are for personal use only. Be sure to ask for legal size, and the whole plan should come out in a single printing.

To trace the parts from the copy of the plan, use carbon paper or the pinprick method—aligning the plan over the wood and punching shallow pinholes every  $\frac{1}{4}$ " or so all around the outlines of the parts. Notice the grain direction of all of the parts, because it's very important. Learning to use wood grains to their best advantage for strength and wrap-resistance is one of a modeler's most valuable skills.

Use the softest wood available for the fuselage. If no really soft  $\frac{1}{4}$ " is in the balsa rack, drop down to  $3/16$ " and pick a piece of medium softness. The harder the wood, the heavier it will be, and neither model can stand a great deal of extra weight if it is to fly well.

The only difficult cuts on the fuselage are the wing and stabilizer slots. They must be marked accurately. A modeler's knife with a triangular blade helps in the cutting. The cut can be made with a single-edge razor, but the slots must go through the fuselage exactly on the perpendicular. Otherwise either the wing or the stabilizer will have a high side and a low side. These perpendicular cuts are much easier to make with a long-handled knife than with a razor blade. When using a razor, prop it against a scrap piece of  $\frac{1}{4}$ " balsa (one



Models use same wings but Bonanza's tail is slightly longer. Color with Magic-Marker.

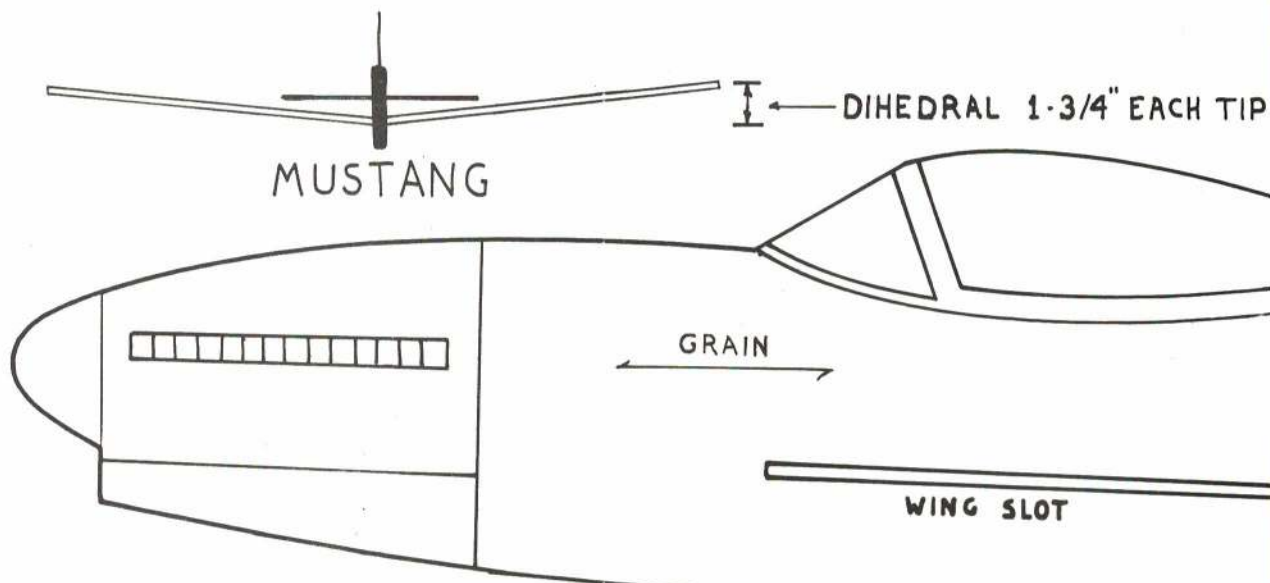
with a square edge) to guide it into the wood straight.

Cut the wing and tail out of medium-weight, straight-grained balsa. Don't be backward about asking the hobby dealer to help in selecting this piece of wood. Tell him what it's for, and ask if he has C-grain balsa. C-grain indicates the way the balsa was sawed out of the log; it is particularly good for strong, light sheet surfaces.

What about airfoils? Most models this size have some sort of curve to their wing cross-section, whether it's a scientifically plotted shape or simply a warp made by spraying the top side of the wing with water and pinning it to a flat surface until dry.

The plans show no airfoils, just a flat plate, and that's what the planes pictured have. I tried airfoiling the wings, but it didn't increase the performance much. However, later models were built with  $3/16$ " wood for the wings and a conventional airfoil sanded into them. (Both the wood and the instructions in Jetco Thermic B hand-

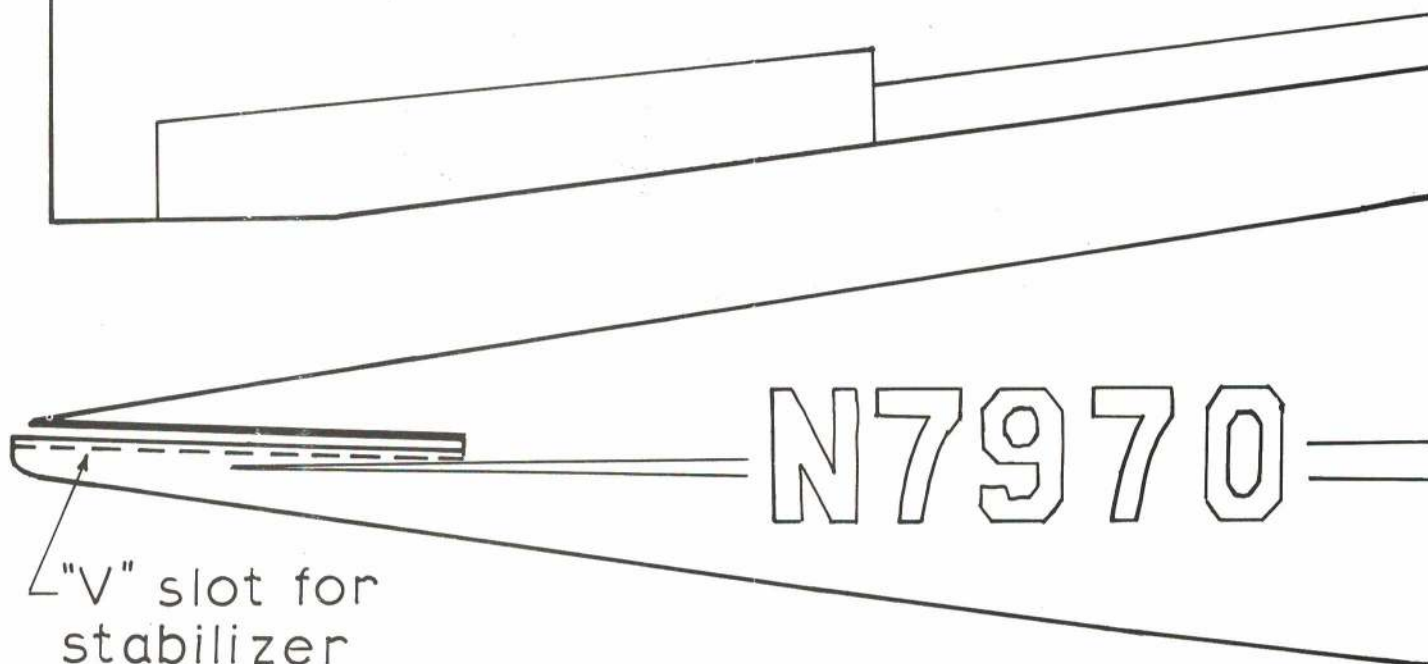
*(Continued on page 80)*

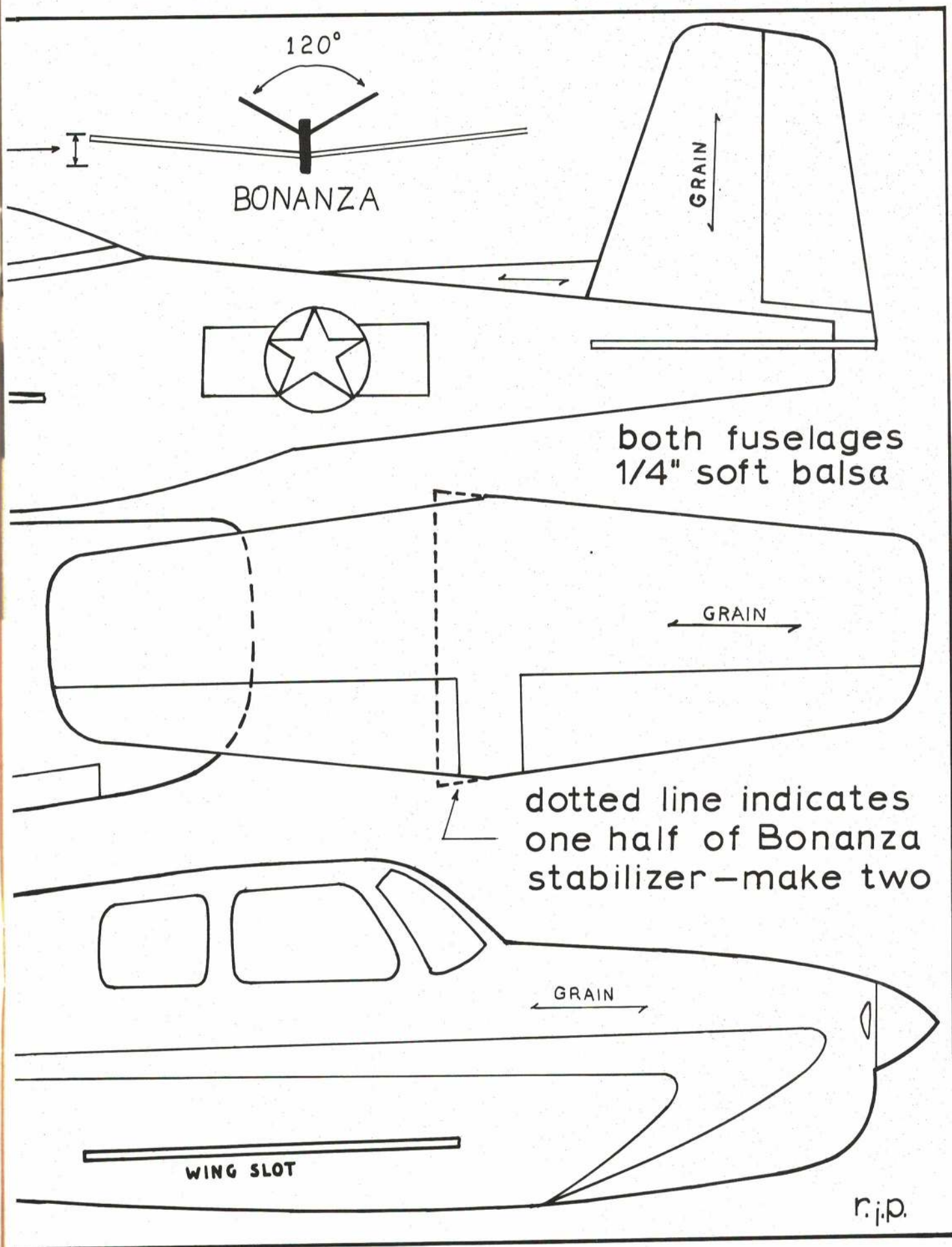


all flying surfaces 1/16" med. balsa

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CONTROL SURFACES, ETC.  
DRAWN WITH INDIA INK  
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# DRAGON FLi

All-out competition stunt ship by Phil Kraft—  
based on years of experience and testing. Retracts  
recommended for best performance.

PATTERN FLYING TODAY is perhaps 97 per cent pilot and three per cent aircraft design. However, the world's top fliers are so close in ability that the airplane's three per cent can be decisive. There is no question that in the last two years a trend has developed toward heavier, faster competition stunt models. After all, a stunt performance is primarily intended to take maximum advantage of the human factor in judging. At contests, fliers often comment that "so and so" put in a lousy flight, but his spectacular performance biased the judges.

In my opinion, it is not possible to differentiate between the spectacular performance and a properly performed sequence of maneuvers. Fliers are trying to paint a picture and to create an effect. Thus, I have come to believe that the high-speed spectacular pattern with large graceful maneuvers will be most effective in gaining maximum points.

This new line of thinking has been a complete turnabout. The Kwik-Fli series of designs was in exact opposition to the current trend. They were slower flying, lightweight, rather unspectacular designs. The maneuvers were compact and had to be tightly controlled to be effective. The Kwik-Fli emphasized reliability

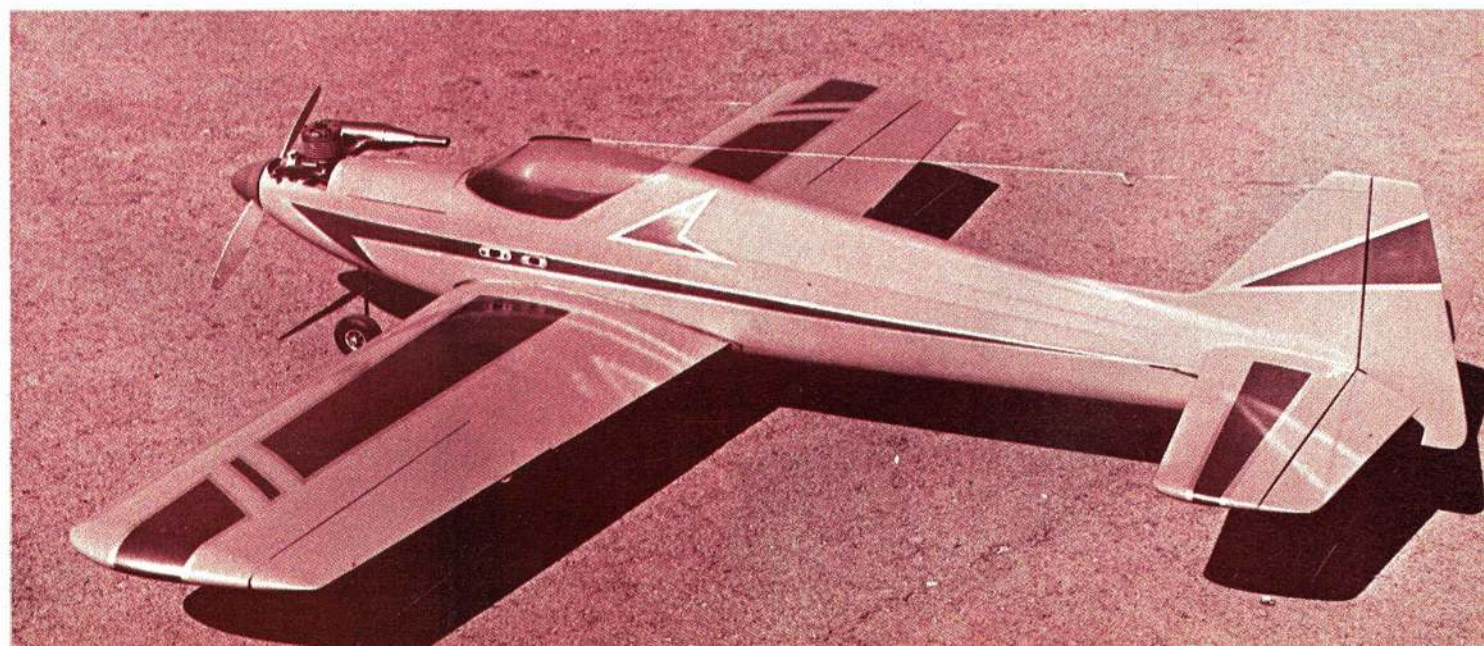
and consistency above other factors. However, it was designed in an era when powerful contest engines which also were reliable just weren't available. Today, there are several extremely powerful

engines with great reliability as well. Therefore, the design trend has been made possible almost entirely by the availability of superior engines.

*(Continued on page 82)*

Author holds latest in his Fli series. It is sensitive, precise, fast and graceful.

Editor's note: Dragon Fli's speed and airfoils need only small control surface movements, proper balance. It can land quite slowly, too.





Roscoe and NR61Y at Chicago Air Races in 1933. Greatest aerial showman of his day, he wore famous two-toned blue uniform when aloft.

# Roscoe Turner's Wedell-Williams

In the Golden Age of Air Racing, Roscoe Turner was every boy's hero.

KENNETH DON WILSON

THE GOLDEN YEARS of air racing, from 1929-1939, saw many new ideas and improved machines evolve and many air race pilots achieve fame.

Among the most daring was Col. Roscoe Turner, who forever strove to get that one more mph out of his aircraft. He made world-wide headlines in 1930-

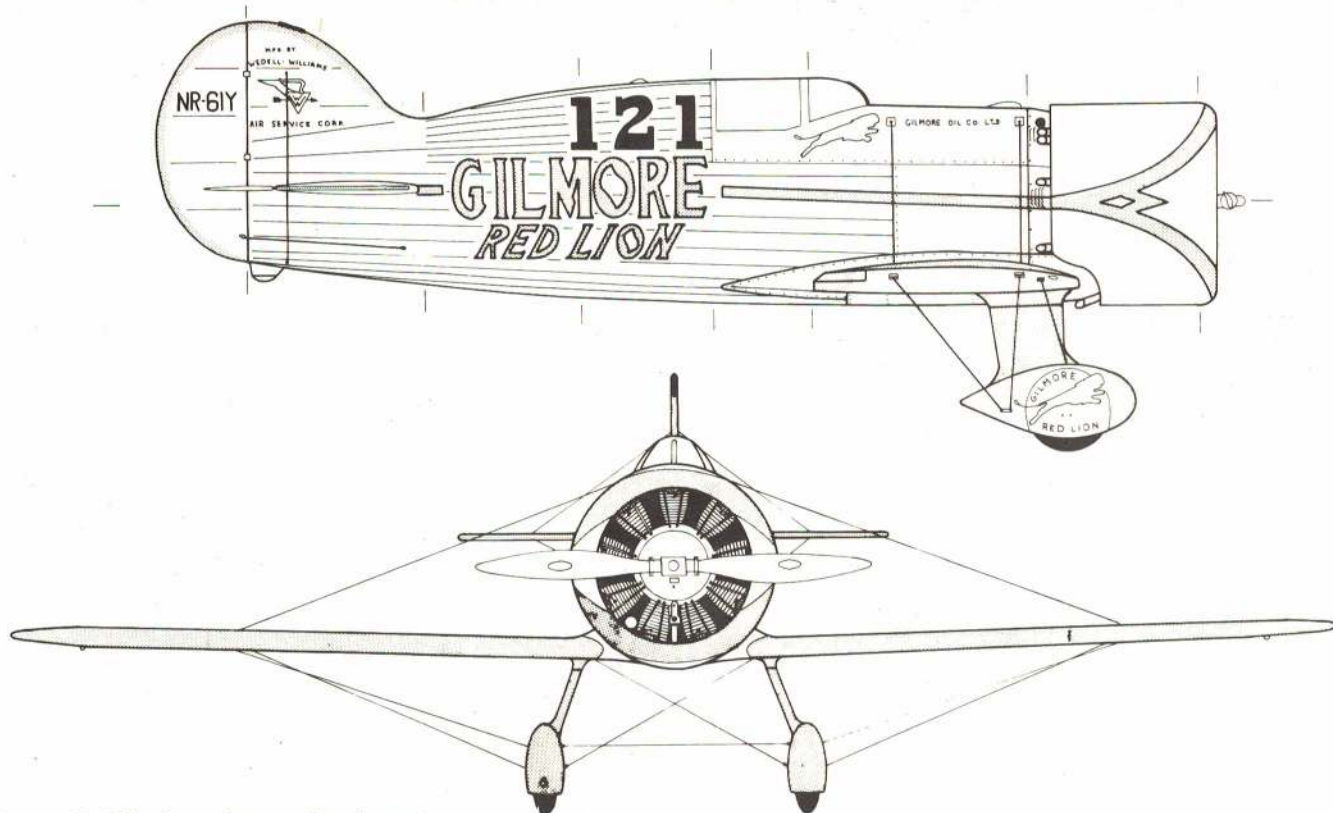
1931, when he set national and international speed records with his famous Lockheed Air Express. Roscoe had a flair for staying in the public eye, for

Before takeoff at the National Air Races in Cleveland in 1932, Roscoe discusses a situation with one of the air race officials.



At Burbank, before the 1932 Bendix Race got underway, is the Gilmore Red Lion Special. In cream and red trim, it was a fine looking entry.





he excelled in dreaming up flamboyant new schemes. Who else would splash the Gilmore Oil Company's name and colors all over his Air Express and take with him on every trip, as a symbol of the company's trademark, a live lion named Gilmore.

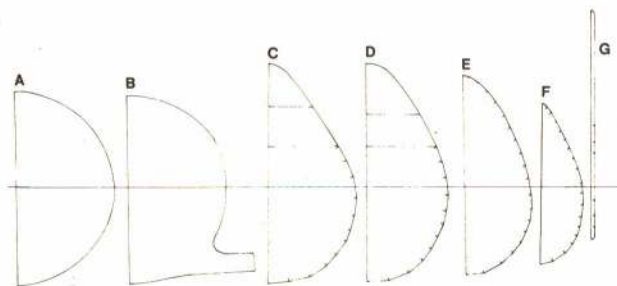
Turner and his Air Express, in the summer of 1930, established the Three Flags record: a flight from Vancouver, Canada, across the United States, to Agua Caliente, Baja California, Mexico, in 9 hrs., 14 min., 30 sec. Hoping to better this record, Jimmy Wedell, another famous air-race pilot, arrived on the West Coast with his early-model Wedell-Williams NR278V.

After closely inspecting that aircraft, Turner asked Wedell if he could build a 300 mph racer. Without hesitation, Jim said, "Yes." Roscoe agreed to put up the money. Harry Williams—"Mr. Harry," Jim's promoter in building racing planes—gave his OK, and March 1931, found Roscoe and his mechanic, Don Young, heading toward the Wedell-

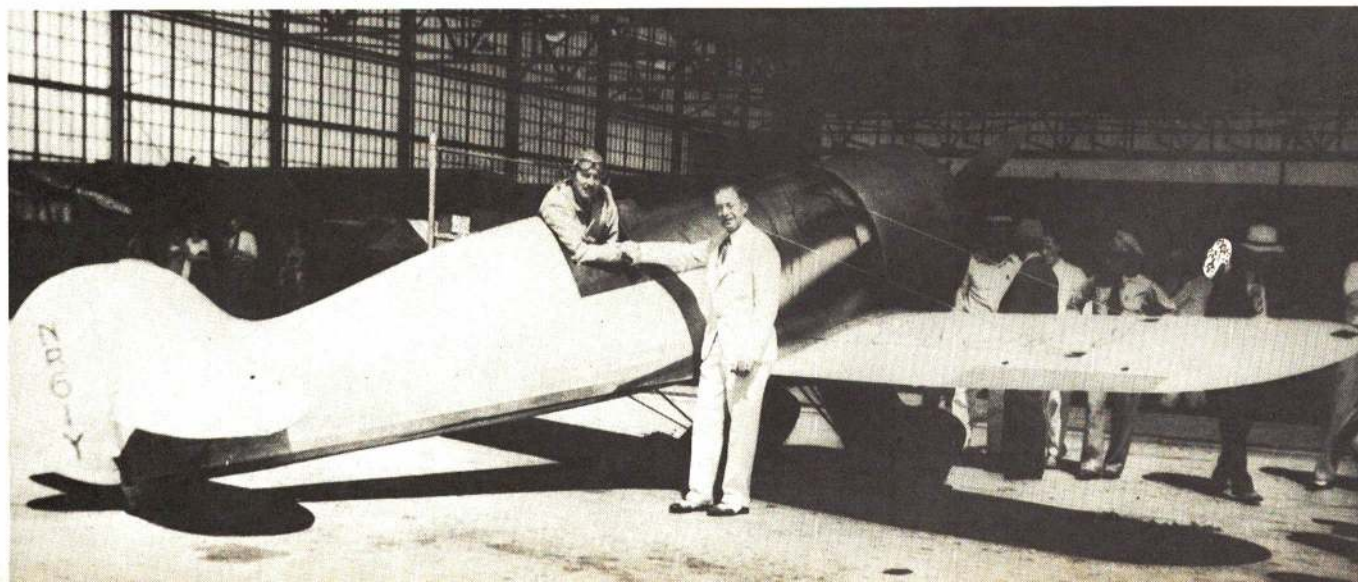
Williams Air Service Corp., in Patterson, Louisiana.

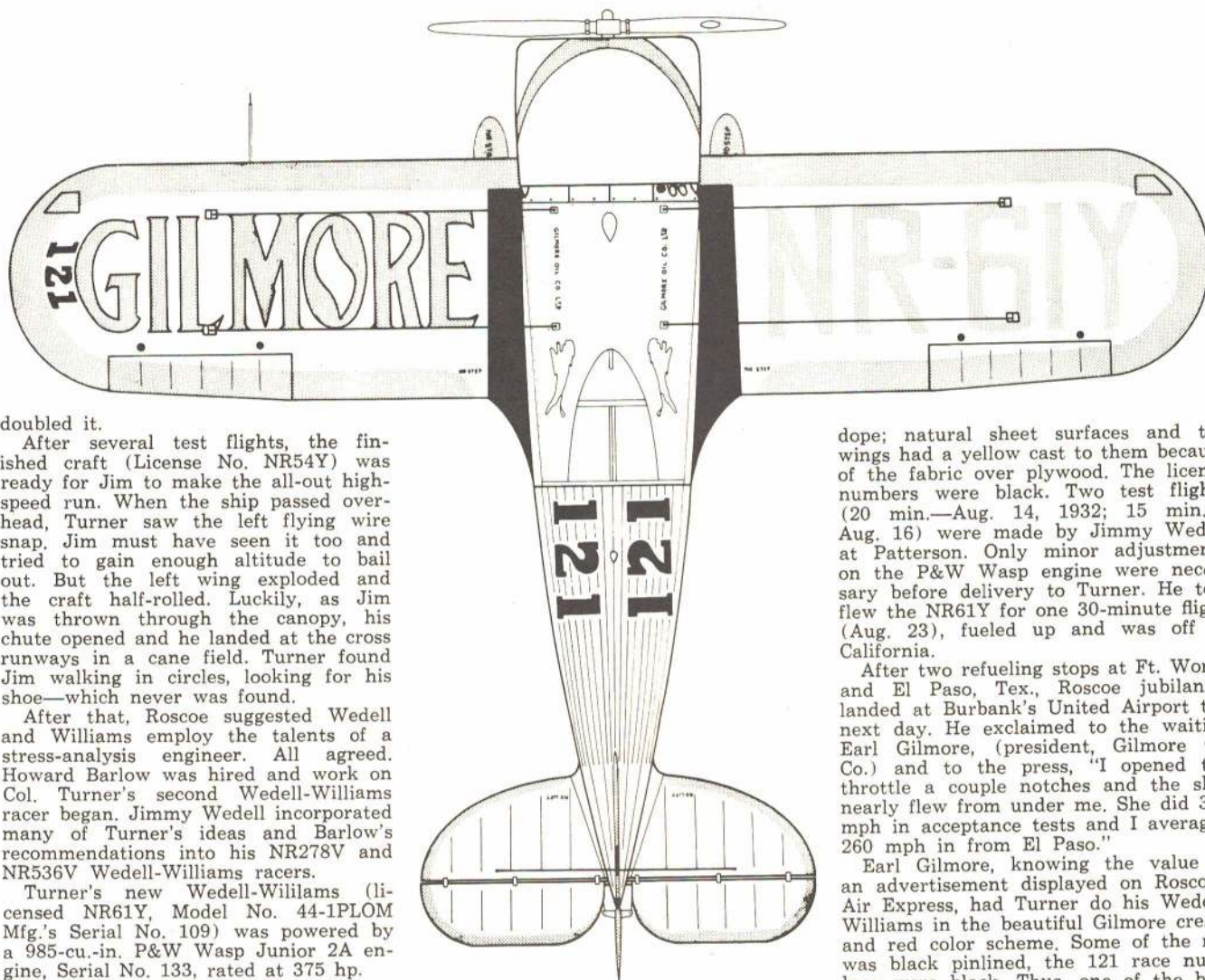
On arrival, both were somewhat disillusioned. They expected a small aircraft factory—and found one tin hangar. But Turner and Wedell made do as they laid out Roscoe's new racer. Among the

Wedell-Williams employees was Charles "Frenchy" Fortum, a draftsman who made the drawings as Turner and Wedell explained details. Although the venture was cooperative, Roscoe did override Jim on one item, the stress analysis. Whatever Jim said, Turner



Col. Turner and Earl Gilmore with the brand-new NR61Y at Burbank's United Airport, August 24, 1932. Power was only a 375-hp Wasp.





doubled it.

After several test flights, the finished craft (License No. NR54Y) was ready for Jim to make the all-out high-speed run. When the ship passed overhead, Turner saw the left flying wire snap. Jim must have seen it too and tried to gain enough altitude to bail out. But the left wing exploded and the craft half-rolled. Luckily, as Jim was thrown through the canopy, his chute opened and he landed at the cross runways in a cane field. Turner found Jim walking in circles, looking for his shoe—which never was found.

After that, Roscoe suggested Wedell and Williams employ the talents of a stress-analysis engineer. All agreed. Howard Barlow was hired and work on Col. Turner's second Wedell-Williams racer began. Jimmy Wedell incorporated many of Turner's ideas and Barlow's recommendations into his NR278V and NR536V Wedell-Williams racers.

Turner's new Wedell-Williams (licensed NR61Y, Model No. 44-1PLOM Mfg.'s Serial No. 109) was powered by a 985-cu.-in. P&W Wasp Junior 2A engine, Serial No. 133, rated at 375 hp.

The fuselage was of welded chrome-molybdenum steel tubing, with sheet metal used forward of the rear landing wire and around the cockpit, and for wing fairings. Doped fabric covered the remainder of the fuselage and the tail surfaces. The wing, with two spruce spars and spruce ribs, was covered with

thin plywood and Irish linen doped over the plywood. Two gas tanks in the fuselage held 147 gal. and 51 gal. respectively. The oil tank held 14 gal. The color scheme was a sight to behold. Fabric surfaces were aluminum color

dope; natural sheet surfaces and the wings had a yellow cast to them because of the fabric over plywood. The license numbers were black. Two test flights (20 min.—Aug. 14, 1932; 15 min.—Aug. 16) were made by Jimmy Wedell at Patterson. Only minor adjustments on the P&W Wasp engine were necessary before delivery to Turner. He test flew the NR61Y for one 30-minute flight (Aug. 23), fueled up and was off to California.

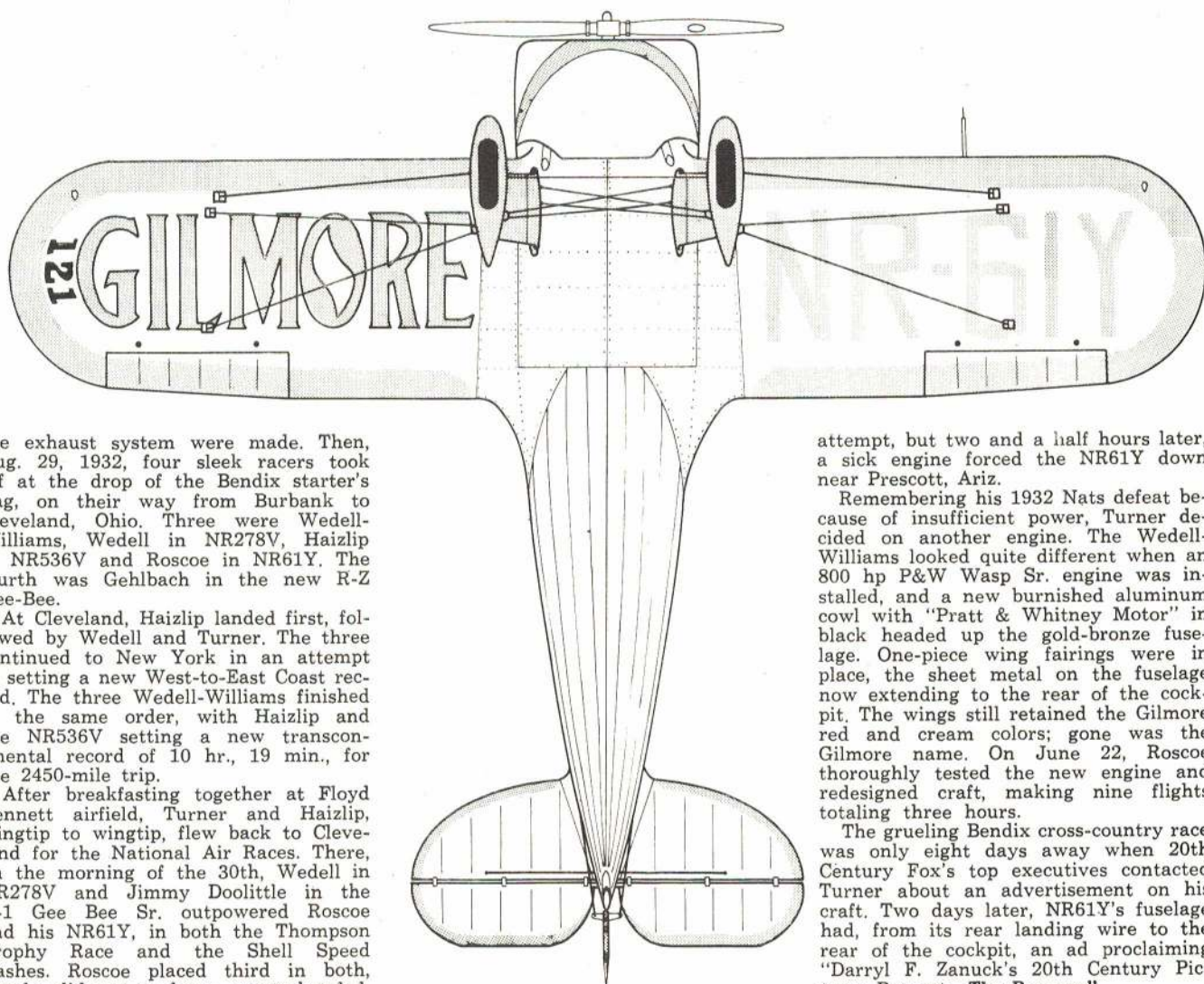
After two refueling stops at Ft. Worth and El Paso, Tex., Roscoe jubilantly landed at Burbank's United Airport the next day. He exclaimed to the waiting Earl Gilmore, (president, Gilmore Oil Co.) and to the press, "I opened the throttle a couple notches and the ship nearly flew from under me. She did 325 mph in acceptance tests and I averaged 260 mph in from El Paso."

Earl Gilmore, knowing the value of an advertisement displayed on Roscoe's Air Express, had Turner do his Wedell-Williams in the beautiful Gilmore cream and red color scheme. Some of the red was black pinlined, the 121 race numbers were black. Thus, one of the best and most colorful racers of 1932 came to complement its pilot in his resplendent two-tone powder blue uniform.

With the Bendix race just five days away, Roscoe found that the short exhaust stacks under the cowl seeped fumes into the cockpit. Modifications to

At Matty Laird's Chicago factory in 1937, Wedell-Williams had won '33 Bendix, '34 Thompson. Turner Special, background, won '38 and '39 Thompson. Turner only man to win Thompson three times. The Special on exhibition now at Roscoe Turner Museum in Indianapolis.





the exhaust system were made. Then, Aug. 29, 1932, four sleek racers took off at the drop of the Bendix starter's flag, on their way from Burbank to Cleveland, Ohio. Three were Wedell-Williams, Wedell in NR278V, Haizlip in NR536V and Roscoe in NR61Y. The fourth was Gehlbach in the new R-Z Gee-Bee.

At Cleveland, Haizlip landed first, followed by Wedell and Turner. The three continued to New York in an attempt at setting a new West-to-East Coast record. The three Wedell-Williams finished in the same order, with Haizlip and the NR536V setting a new transcontinental record of 10 hr., 19 min., for the 2450-mile trip.

After breakfasting together at Floyd Bennett airfield, Turner and Haizlip, wingtip to wingtip, flew back to Cleveland for the National Air Races. There, on the morning of the 30th, Wedell in NR278V and Jimmy Doolittle in the R-1 Gee Bee Sr. outpowered Roscoe and his NR61Y, in both the Thompson Trophy Race and the Shell Speed Dashes. Roscoe placed third in both, but he did not go home empty-handed. His winnings included \$525 for the Shell Speed Dashes (266.674 mph average), \$1500 for the Thompson Trophy Race (233.042 mph average), and \$2250 for the Bendix Race (226 mph average).

On the way back to Burbank, Roscoe planned how, with a little modification, he could break his own coast-to-coast record, set with the Air Express in May, 1930. He might even try for a round trip coast-to-coast! With this in mind, Turner and Young worked on the NR61Y, upping the Wasp Jr. to 525 hp. The colorful Gilmore color scheme was modified too, as the company's ad on the wheel pants and the 121 race numbers disappeared.

On Sept. 25, 1932, the first record to fall to Turner and his modified Wedell-Williams was Los Angeles to San Francisco and return, in 2 hr., 41 min. Then, on Nov. 12, the Wedell-Williams lifted off from Burbank in an effort to establish a round-trip coast-to-coast record. But on landing at Columbus, Ohio, the NR61Y blew a tire and caused much delay in reaching New York.

Undaunted, Roscoe took off from Floyd Bennett Field, Nov. 14, in a try at regaining his East to West record. With refueling stops at Columbus, Kansas City, and Albuquerque, he reached Burbank in 12 hr., 33 min., his first national record in the Wedell-Williams. Now Turner was fired up to set the West-to-East-Coast mark.

But first, still more work had to be done on the plane's fuselage and landing

attempt, but two and a half hours later, a sick engine forced the NR61Y down near Prescott, Ariz.

Remembering his 1932 Nats defeat because of insufficient power, Turner decided on another engine. The Wedell-Williams looked quite different when an 800 hp P&W Wasp Sr. engine was installed, and a new burnished aluminum cowl with "Pratt & Whitney Motor" in black headed up the gold-bronze fuselage. One-piece wing fairings were in place, the sheet metal on the fuselage now extending to the rear of the cockpit. The wings still retained the Gilmore red and cream colors; gone was the Gilmore name. On June 22, Roscoe thoroughly tested the new engine and redesigned craft, making nine flights totaling three hours.

The grueling Bendix cross-country race was only eight days away when 20th Century Fox's top executives contacted Turner about an advertisement on his craft. Two days later, NR61Y's fuselage had, from its rear landing wire to the rear of the cockpit, an ad proclaiming "Darryl F. Zanuck's 20th Century Pictures Present—The Bowery."

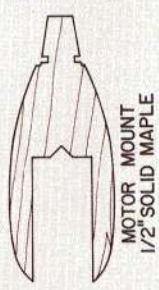
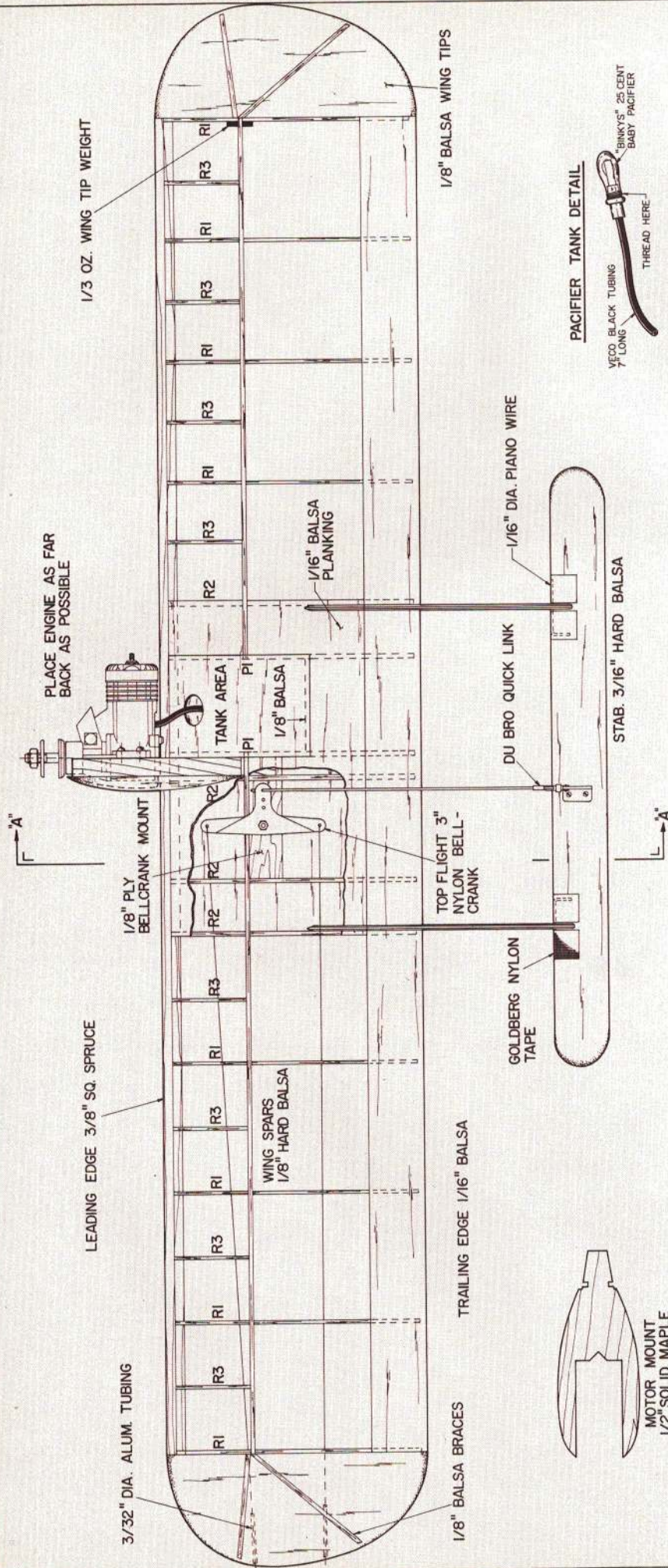
The 1933 Bendix was to be flown from New York's Floyd Bennett Field to Los Angeles' Mines Field, site of the '33 National Air Races. Roscoe, delayed by foul weather, arrived late for the line-

(Continued on page 86)

gear. After these modifications were completed, fuselage, landing gear and tail surfaces were painted a gold-bronze. The wings and cowl retained the Gilmore colors. Roscoe took off from Burbank, April 29, 1933, for the record

By hauling around real lion named Gilmore in his Lockheed Air Express while setting National and International records in 1930-32, Roscoe gained fame. Gilmore in cage at left.





MOTOR MOUNT  
1/2" SOLID MAPLE



R1- 3/32" Balsa- 8 REQ'D



R2- 1/8" Balsa- 4 REQ'D



R3- 3/32" Balsa- 8 REQ'D

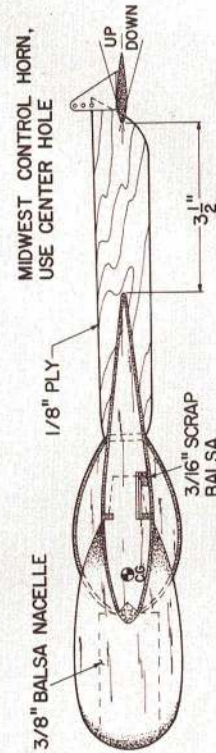


PI- 1/8" Balsa- 2 REQ'D

#### PACIFIER TANK DETAIL



CUT THE END OFF OF THE PIECE THAT COMES INSIDE THE PACIFIER. SLIDE FUEL TUBING THROUGH. PUT NIPPLE ON AS SHOWN AND WRAP WITH SEWING THREAD. PUT SPOT OF GLUE ON THREAD TO HOLD.



SECTION 'A-A'

## TOOTHPICK!

Designed & Drawn By: DICK TYNDALL  
Inked For A. A. M. By: BILL TOMASCO

Wing Span: 42" Cord: 7" Aspect Ratio: 6 to 1  
Power: Fox 36XB.B. Speed: 125 mph +  
Weight: Approx. 15 1/2 oz. to 16 1/2 oz.



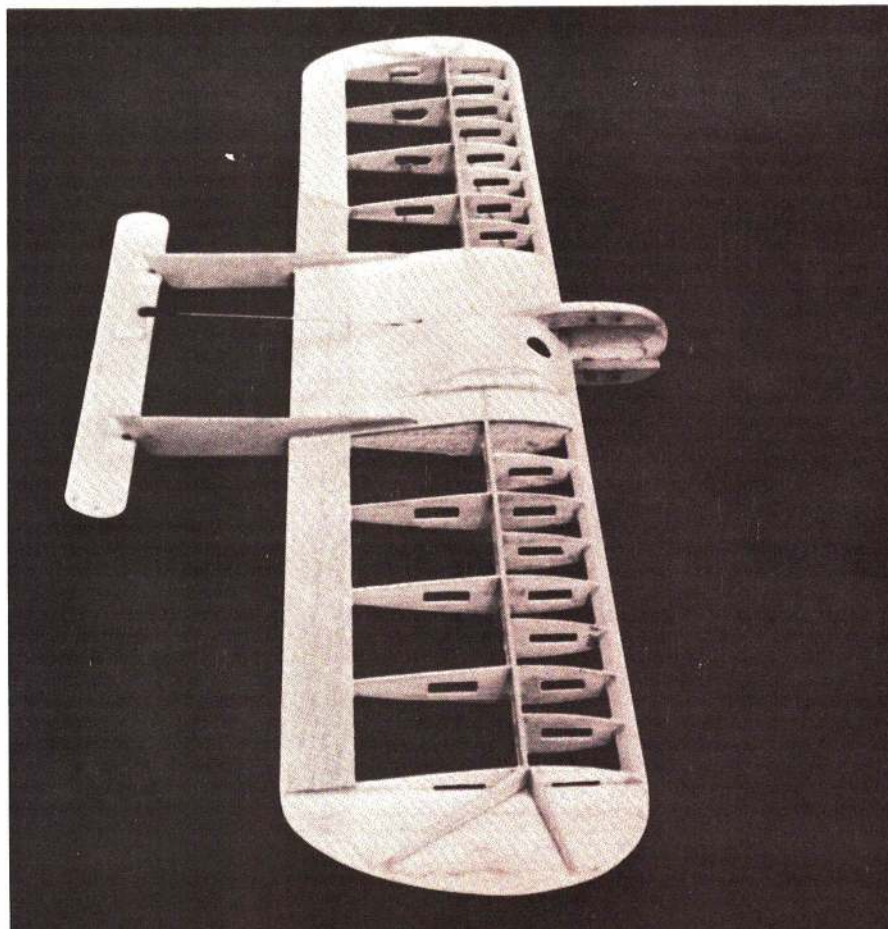
# Toothpick

DICK TYNDALL

Both speed and agility  
can be had in one hot  
combat ship.

Combat is an art requiring much practice and many planes. Author recommends pacifier pressure tank and wood prop.

Long, thin, high-aspect-ratio wings with extremely light construction give speed and instant right turning.



IT ALL BEGAN at a contest. As my father and I were unpacking our airplane, we noticed a yellow blur buzzing around in the combat circle. That blur turned out to be Larry Scarinzi flying his new Super Satan. Fascinated by its high speed and tight turning, I decided right there I had to have one.

Thus, I began designing what was to be the first Toothpick. When my father saw the completed plane, he looked at it carefully, flexed the wing, and said, "Man, that thing is gonna fold up like a toothpick." So that's how the plane was named. And it did fold up like a toothpick, but only after proving it was fast and its turns were extra tight.

The next Toothpick had some center structure changes, and the LE was changed to a piece of  $\frac{3}{8}$ " x  $\frac{3}{8}$ " x 36" spruce—which really made the big difference. That ship went right where I wanted it to and wasted no time getting there. And the outboard wing stayed where it belonged.

At the season's first contest. I heard a comment, "Hey, look at the splinter this guy's got." Word soon got around about a funny-looking, long-wing combat job that was going to be flown, so my father and I decided to get in a practice flight. The next few minutes were breathtaking and everyone watched! By the end of the contest, Toothpick had managed a third place, including a five-second kill on an open flier.

Since then, the Toothpick has been modified to the design shown on the plans. The pacifier tank, in my opinion, is a must for the serious combat flier who wants the utmost performance. Some people wonder why my runs are steady, flight after flight, while their pressure tanks vary the needle valve setting so much. The only way that they will find out is to try one themselves.

One area for experiment is the propellers and fuel, which make a big difference in whether the airplane performs well. Some fliers use nylon 9-7 propellers, because they don't break when they hit the ground, but that doesn't necessarily make them the best prop to use in the air. While flying the Toothpick, I found that a propeller with less pitch (such as a Top Flite 9-6)

(Continued on page 52)



Numerous models of real aerobatic craft were entered in the World Championships Scale Meet. These colorful planes are popular both for appearance and for the flying points their maneuvers can earn. Hale Wallace, with his model of Bill Lumley's full-size Chipmunk, put on quite a show, including very low altitude inverted passes. He received the highest flight points to place fourth.

# SCALE WORLD CHAMPIONSHIPS

Fabulous detail on all models made this event truly outstanding.

RISING FROM THE NEATLY tended fields of rural Bedfordshire, England, is the Institute of Technology, a place of many aeronautical traditions, not the least of these being World Champion-

ship aeromodel competitions, dating back to 1949. Here, over the Bank Holiday long weekend, some of the best scale creations from nine countries were gathered.

American team members Maxey Hester, Hale Wallace and Walt Moucha, Jr., in RC, and CL scalers Doc Keith, Bill Harney and Andy Sheber, accompanied by Team Manager Roy Weber, AMA

Dr. Keith brought his big Lancaster bomber and placed fourth, despite a crash caused by high winds during its last flight. Here, Maxey Hester helps with engine starting and tuning.



Highest CL scale points were earned by Bill Harney (US) with this weathered-looking FW 190. The small plastic model in front was used as part of Bill's scale presentation.





Retract gear in Andy Sheber's Cessna Skyknight makes it quite a sight when flying. Plane took four years to complete, has working flaps, beacon, navigation lights. Interior is complete with seats and instrumentation. Only obvious exception to scale is the exposed cylinder heads of model engines. Too bad scale multi-cylinder engines are not available.



Mike Reeves (UK) won control-line scale with retract-gear-equipped Zlin. The judges were stunned by his sharp aerobatics, which seemed impossible for this big, heavy model.

## FOR CL AND RC

U. S. teams were first in CL and second in RC.

**CLAUDE McCULLOUGH**

THE AUTHOR AND PETE CHINN.

Executive Director John Worth, Logictrol's Bob Elliott, and the writer as an RC Judge, arrived at the comfortable dormitory facilities of Mitchell Hall after spending a few days in London.

At the Cranfield Aerodrome, a 200-ft.-long tent formed the nucleus of a well-laid out flying area. Tables were provided for the models, and viewing aisles enabled the paying spectators to inspect the

planes at close range.

Friday was scheduled for static judging, with only 20 minutes planned for each entry. However, it took longer than this and the judging teams had to work overtime. Mick Charles scored highest in RC with his relatively simple but almost flawless Jurca Sirocco. He received 2389.2 static points. Bill Harney's highly detailed FW-190, covered with .007 off-

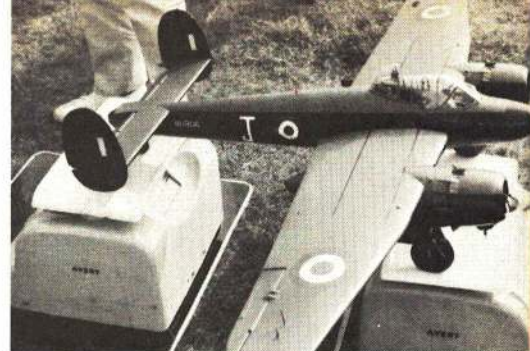
Derek Goddard's Merco-61-powered Pfalz DXII placed high in CL scale. Trailing edge braces on bottom wings prevent warps. CL bipes less popular due to wind handling problems.

Jerzy Ostrowski of Poland cleans his well-built DH Hornet. Earning highest control-line flight points with his impressive flying despite high winds, he placed second in CL.





Walt Moucha disembarks from rented van with his huge Fly Baby. It is quarter scale, using a 60 for power. Like a real airplane, it ignores the wind when flying. Details include carefully duplicated structure (real plane also is wood), cockpit, engine.



Two scales are used for weighing heavy models. Here, Al Brigg's Bristol Brigand is checked out. Regulations are set for engine size, total weight, pull-test, etc. Twins are popular in control line for power and points.



Maxey Hester, second in RC with a Ryan ST, used too much detail (see text), but the ship flew great. Model may be kitted later this year. The muffler is hidden in the cowl. Rivet and metal work is superb.

set-printing aluminum sheet, totalled 2306.5 for the best in CL.

Hester's Ryan ST Special, second in RC, sparked a discussion among the judges which carried over into the evening meetings of the FAI Scale Sub-committee. His large amount of detailing, supported by complete photo documentation, gave more areas in which to find faults, yet there was no compensation for the extra effort involved. Committee sentiment seemed to be in favor of adding a Complexity K factor to the rules to award extra credit for intricate construction and to keep the events from gravitating exclusively to simple types.

The first day of flying saw rough performances and many aborts due to contest nerves and airplane and equipment problems. Doc Keith's Lancaster had engine difficulties, as did Roy Yates' Proctor (U.K., RC). Hester nosed over on

a takeoff attempt. Bruno Klupp (W. Germany, RC) put his flaps down on approach to the landing circle, stalled and snapped onto the concrete, damaging his attractive Cherokee heavily.

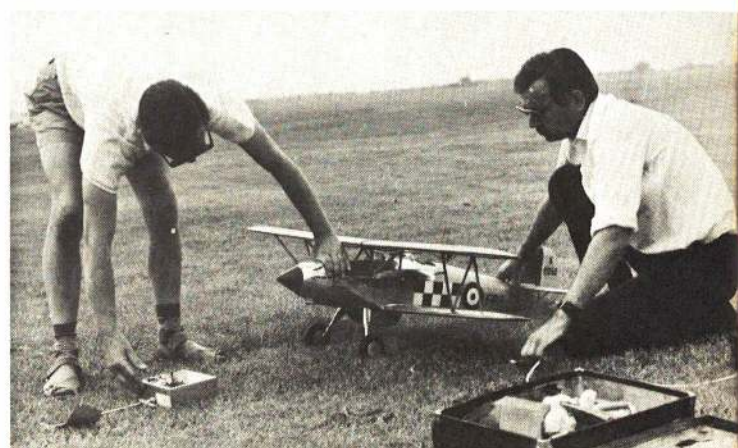
The Swordfish of Dr. Amman (Switzerland, RC) seemed over-elevated and wallowed in flight. Bill Harney had a handful when his FW-190 stalled and began to oscillate on the lines, then hit the runway hard, bending the gear. Meanwhile, a lot of teamwork helped Doc Keith get his Supertigre 23's Anglicized and he went into the lead in CL. Despite a few hairy moments. Mick Charles steadied and charged well ahead in RC with a 3200 pointer.

The weather had been so ideal during the preceding week that it was a rude surprise to wake up on Sunday to a more typical English morning—chilly and foggy, with an increase in the wind

later. CL flew first to give the ceiling a chance to lift. Andy Sheber got in a smooth flight with his slick Cessna Sky-knight and kept the landing even despite loss of a wheel. Harney, his gear damage repaired, concentrated on getting in a qualifying flight without frills and moved into third place.

Terry Melleney's Miles Hawk Speed Six uses a Merco 61 with a muffler which ducts exhaust through the six scale outlets! Highly detailed cockpit includes operating control stick, leather seat. Airplane won recent British scale championship.

Several interesting models were demonstrated, but not entered. Here, Frank Van de Bergh starts fast-flying Hawker Fury. Fiberglass fuselage with metal-finished cowl looks sharp. Another noted pattern flyer, Chris Olsen, assists.





Excellent camera work by Peter Chinn captures several in-flight shots. Here, the Miles Hawk flies on, flaps down.



And here, third place model, Roy Yates' Percival Proctor, flies past. Fully detailed, including structure, but no pilot!

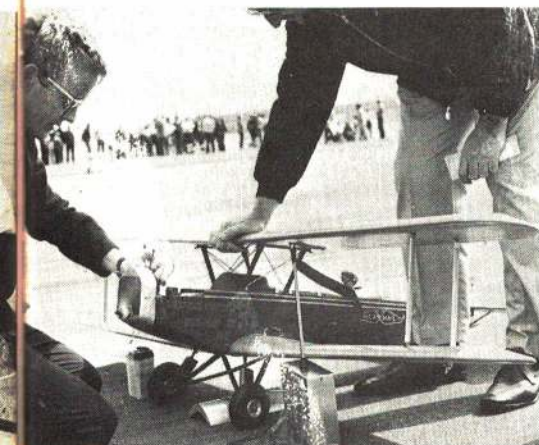


Jacques Matter, who entered this DH 89 in control line, took eighth place for France. His ship uses two Cox 15's and flies quite realistically. A pretty plane with lots of color, it has nice interior work.



Robert Lestournaud (France) kept everyone laughing with his infectious humor. Flying a Jodel D 140, he placed eighth in RC. External details of his plane are perfect, but interior treatment is incomplete.

Demonstration flyer, Bob Upton, adjusts an ST 60. His craft is a model of the Douglas Mailplane, which was actively flown for many years. It is a fun-scale-type ship, not overly detailed, but bright in color.



Kuszilek (Poland, CL) was coming in for a landing when his Lancaster bounced back into the air, the lines slackened and crunch! Mike Reeves (U.K., CL), who went onto the board in the lead with a good flight, used his retract gear which almost folded on landing and caused gulps with stunts that appeared risky for the big 2"-scale ship.

In RC, both Walt Moucha's Bowers' Fly Baby and Hale Wallace's Chipmunk returned good scores, moving them into fourth and fifth places. Hale woke up the judges with an on-the-deck inverted fly-by right in front of the table. Walt (who had been nick-named "Walt Baby" because of age and model name) surprised spectators with the easy way his large 3"-scale craft ignored the breeze. Maxey improved his first day score, particularly with a picture-perfect landing approach and a scale touchdown smack in the center of the circle, and stayed in second place. Walter Reger (W. Germany, RC) stalled his fine-looking Boeing P-26A just after lift-off and dove into the runway, breaking off the ship's cowl and nose.

Monday dawned ominously with showers and bending trees. Though the contest was spared any downpour during the flying sessions, the cold wind continued all day. Many contestants de-

cided not to attempt flying. Doc Keith gamely tried to buck a 28-mph siege but his Lanc came in on the lines and was badly damaged. Hale Wallace did the best RC job of coping with the impossible conditions and went into fourth place. Anyone stuck with Monday flying was at a heavy disadvantage and the close of the competition was an anticlimax.

However, spirits soon were revived at the prize award banquet. The good-humored ceremonies conducted by Henry J. Nicholls concluded a well-run and successful Championships. Victory by the U.S. control-line team (Harney third, Keith fourth, Sheber ninth) was sweet and the near miss in the RC team award section, losing to the friendly bunch representing the host country, was eased by Hester's individual second place (Wallace fourth, Moucha fifth).

The best result of the Cranfield meeting is the reversal of a trend toward separation of modeling types. Scale may be the common interest that will keep us all together.

The Grand Champion in RC was this magnificent replica of the Jurca Sirocco by Mick Charles (UK). Detailing is indescribably perfect. Smooth finish is typical of the real plane. Landing gear retracts in exactly the same manner as the full-scale craft's—with cables. Here, the ship is being examined by scale officials. Impressed, they awarded it highest scale points.



HOWARD McENTEE

# Getting Started in RC

## Pushrod Installations

A FAILED LINKAGE to a vital control can totally wreck a model just as completely as a shot servo or dead battery! The failing part can be a control horn, clevis, or another part worth only a few cents! Some notes on proper use and installation of the vital linkages follow.

Linkages must transfer power from a servo (or other control operating unit) to a control surface, throttle, steerable nose wheel, etc. Linkages must not bind. Linkages must not bend.

There are two main styles of control surface linkage—torque rod and push-pull. Torque rods are not widely used today except in smaller planes, where escapements and propo actuators are the surface movers; torque rods rock from side to side under the surface mover urge. Pushrods are much more common

and are used in larger planes. In some types, they can be quite free of excess drag. In others, a moderate drag is expected, and tolerated, because the servos are powerful enough to overcome it. Pushrods are almost always utilized with motor-driven servos.

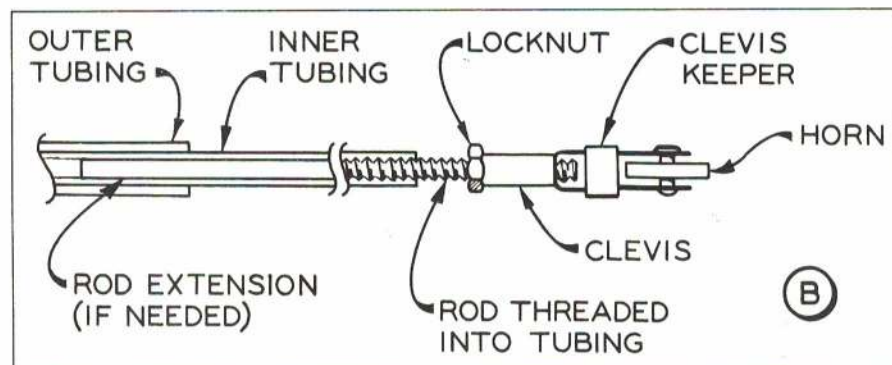
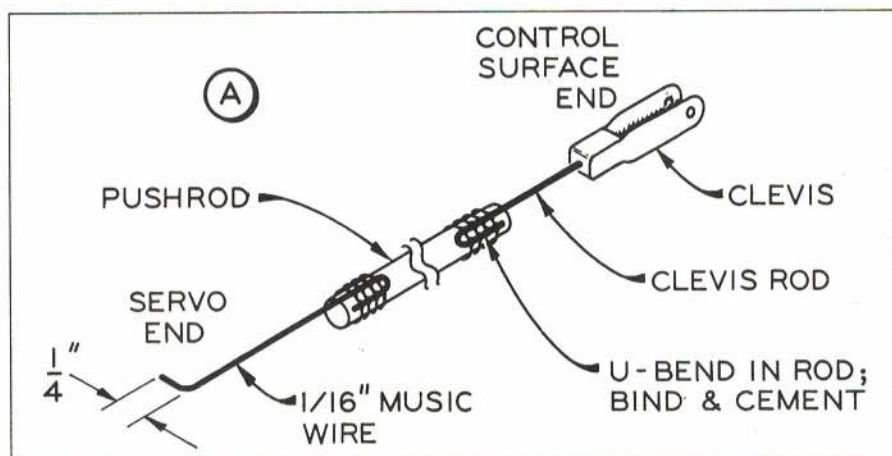
Torque rods must be fairly stiff, or else some of the actuating power will be lost in simply "winding up" the rod when there is a control surface load. Pushrods must be stiff or they will tend to bend under load in flight. Lightweight balsa of rather large cross section is often used for either type of rod. Therefore, such rods can be of low weight, but the large cross section makes them acceptably stiff. Hardwood dowels or square hardwood of smaller cross section also is used. These often are pre-

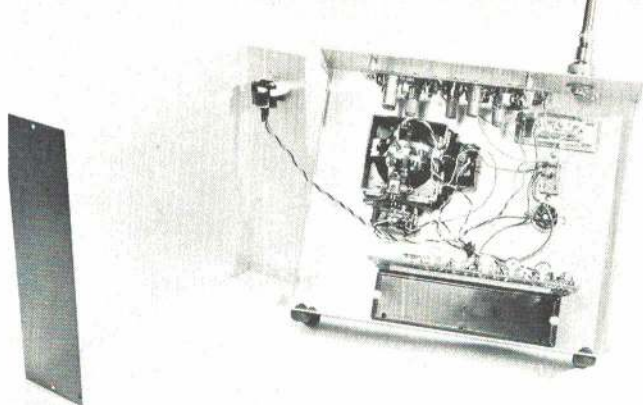
ferable where two rods must go through the fuselage (for rudder and elevator) and the fuselage cross section or internal bracing cuts space. Fiberglass tubes have become quite popular too. Arrow shafting is often used, since it is very strong, reasonably lightweight, but very stiff. Thin aluminum tubing is also a possibility. Contrary to what might be expected, a length or two of such tubing through the fuselage will not interfere with antenna pickup—provided the tubing is insulated at both ends by means of nylon clevises, servo output attachments, etc. Such insulation is vital, in any case, to prevent metal-to-metal joints in the linkage which can cause serious receiver interference.

All the linkages discussed so far are of the stiff variety. Quite popular nowadays are flexible linkages which are relatively easy and fast to install, and which will route servo power around moderate bends, if this is necessary. Such linkages consist of an outer nylon tube around 3/16" OD and an inner tube of the same material that is a smooth sliding fit. Properly installed, such pushrods work fine, and the nylon-nylon type is still in wide use. One drawback is a slight change in length with wide temperature shifts. For sport flying this will make little difference. However, competition planes are finely tuned and adjusted, and such control shifts can be annoying. Flexible-pushrod makers have overcome this temperature problem in several ways. One is to use plastics that have little or no change in length with temperature. Another is to make the inner sliding component of flexible (twisted or braided) metal wire. For the latter, metal end joints must be avoided, which is easily done with one of the vast variety of plastic linkage fittings available. More use of slippery plastics in such pushrods will be made either with the plastics alone or with metal inner components. Teflon is such a plastic and has been marketed as the outer casing, with a metal wire inside. Teflon is rather expensive but, in the small amounts needed for RC models, its higher cost probably would be acceptable.

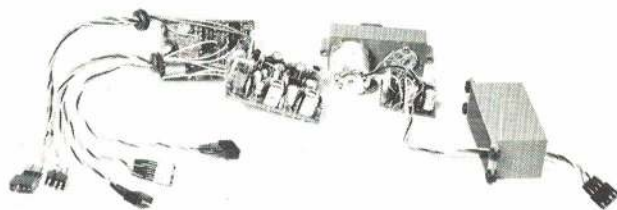
The all-plastic pushrods (note that, while the term pushrods is used, they act as pullrods too—the servo action is translated in push-pull rod action) can be run with reasonable bends—the fewer and less severe the better—as required in almost every linkage installa-

(Continued on page 80)





Simplicity and well-proven circuits with Min-X single-stick knob on Kraft assembly are reason for Min-X claim to low price.



EK servo has fast movement with Min-X amplifier. Decoder uses two IC's. Receiver is quite selective, double-tuned RF.

RC TECHNICAL FEATURE



# MIN-X ASTROMITE 72

FRED MARKS

AS I REMEMBER, the first good, reliable, all-transistor single channel receiver was introduced by Min-X in 1959. I know because I bought one. Not only was it all-transistor, but it also utilized

the then newfangled idea of tone instead of carrier wave (CW). A new era of reliability was ushered in. To the best of my knowledge that original 3V relay receiver still is functional.

Welcome feature of Min-X systems is transformer-isolated charger. Gold-plated Deans pins used throughout. Lightweight transmitter appreciated after many flying hours.



DuBro Seabird is fully stuntable with strong engines. Quite docile at low power.

Coupled with a monstrous three-watt, ground-based transmitter having a nine-foot antenna and combined with considerably modified Babcock Mark III escapements for rudder, throttle and "kick-up" elevator, that receiver brings back my fondest memory of the last day I flew escapements. A magnificent total of seven flights of about ten minutes duration each were completed with but one missed command. That missed command caused a landing in the corn field! And you are complaining because one of your servos quit after only one hundred flights?

Min-X is still with us and, of five major RC equipment manufacturers, is the only one of two which were around in 1959. It has presented an excellent line of single-channel, reed, analog proportional, pulse proportional and, more recently, digital systems.

The Astromite 72 is a single-stick, four-channel system. Its major features are the low price for a single-stick system, the use of an integrated circuit decoder, and the utmost in simplicity, resulting in reliability dividends.

System Description: Modelers will remember the gold anodized aluminum Min-X equipment of the past. Not any more! A bright red vinyl clad material is now used. The transmitter is a single-stick unit measuring approximately 7 x 7 x 2½". Other models are available with two sticks operable in either Mode I or Mode II. A Kraft-Hayes stick, modified by Min-X to add the rudder pot, was used in the unit tested. The transmitter is absolutely the lightest weight unit I have observed. This is achieved by use of rather light-gauge aluminum for the case, the simplicity of the PC boards, absence of a second stick assembly and use of a separate charger.

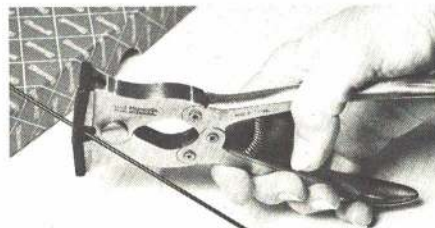
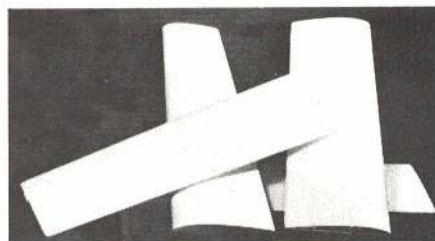
(Continued on page 76)

# NEW PRODUCTS CHECK LIST



FRANK PIERCE

Write the manufacturers for more data; tell them, "I saw it in American Aircraft Modeler."



**ACE/Foam wings.** Two new foam wings, constant with  $5\frac{1}{2}$ " section, and tapered chord with  $5\frac{1}{2}$  to 4" section. Can be used in natural finish or with polyurethane foam spray. Weight, 2 to 3 oz. Packed two  $17\frac{1}{2}$ " panels per bag, \$2.95. **Accessories Components Equipment Inc.**, 203 W. 19th St., Higginsville, Mo. 64037

**Hobby Products/Hot and cold plugs.** Choice of hot plug for normal flying, or cold plug for high-performance nitro-powered engines or high-temperature operations. Uses rhodium-platinum alloy element, available in either RC hot or cold, standard long or short. RC, \$1.29 ea.; std., 75¢. **Hobby Products**, 103 E. 33rd St., Los Angeles, Calif. 90011

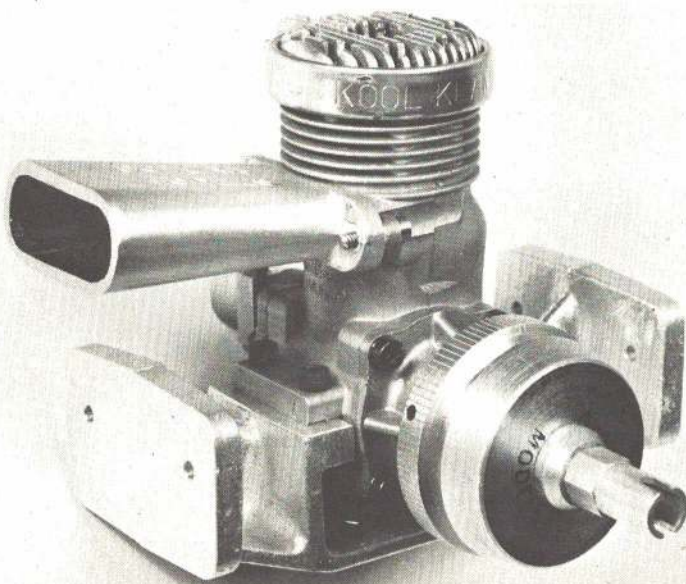
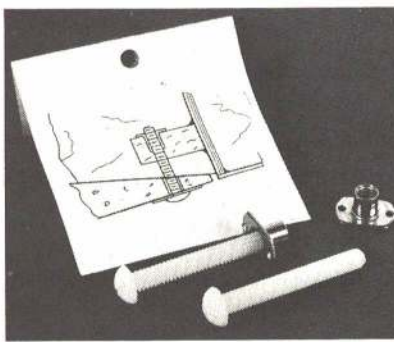
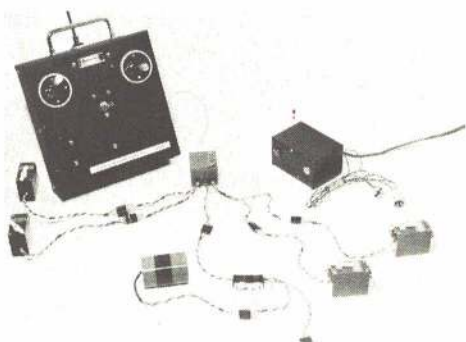
**Starrett/Music wire cutters.** Precision tungsten-carbide-tipped Cut Nipper allows accurate angle cutting of high-strength music wire. Available in  $5\frac{1}{2}$  and 7" sizes. Professional quality, \$27 and \$30 ea. Cat. No. I-X. **The L. S. Starrett Co.**, Athol Mass. 01331

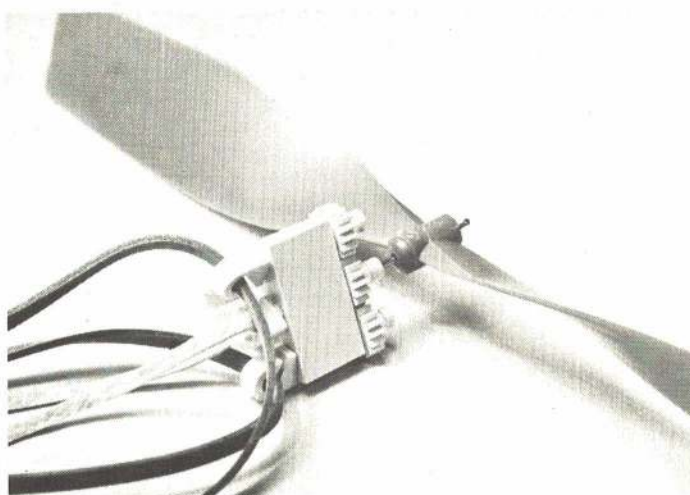
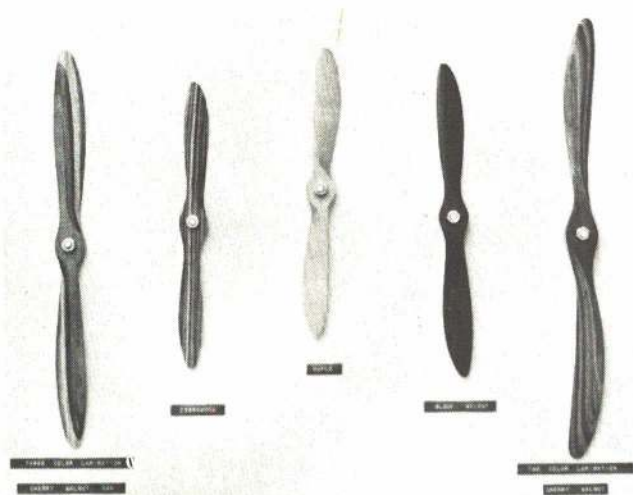
**Vintage Model Aircraft/Mr. Mulligan.** Semi-scale replica of Ben Howard's famous racer of 1930's. 40" span for 010 to 19 power, can be flown RC or up to full-house. Metal cowling, full decals, machine-cut balsa parts, all necessary hardware. \$21.95. **Vintage Model Aircraft**, Box 454, Coos Bay, Ore.

**World Engines/Digital RC system.** Blue Max series digital proportional gear. Four servos. NiCad batteries. Transformer charger for both transmitter and receiver battery included. \$275. **World Engines Inc.**, 8960 Rossash Ave., Cincinnati, Ohio 45236

**Taran Products/Wing anchor.** Quick, secure mounting for both high- and low-wing applications. Two  $2 \times \frac{1}{4}$ " nylon screws. Freefit 1" washer, threaded metal nut with flange for blind-hole mounting. \$1.25. **Taran Products**, 466 Ginannini Dr., Santa Clara, Calif. 95051

**Octura Models/Kool Klamp.** Allows water-cooling of almost any 15 through 80 engine for RC model boat applications. Requires no alteration of engine, can be removed or installed easily. Write for ordering data. Various sizes according to cylinder head dia. \$4.35. **Octura Models**, Box 536, Park Ridge, Ill.





**Woodcraft Model Products/Hand-carved props.** For flying, not just scale. Offers a complete line of pylon special props, vintage, pusher, etc. Pre-run to check balance. Hand-rubbed to beautiful high polish. Laminated props up to 8", \$2.50., solid wood, \$1.50. Sizes up to 20". Made to customer spec. Woodcraft Model Products, Box 119, Big Rapids, Mich. 49307

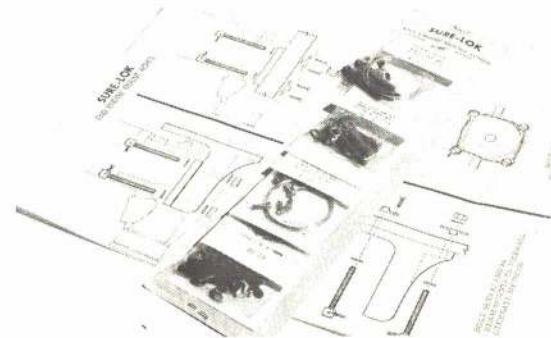
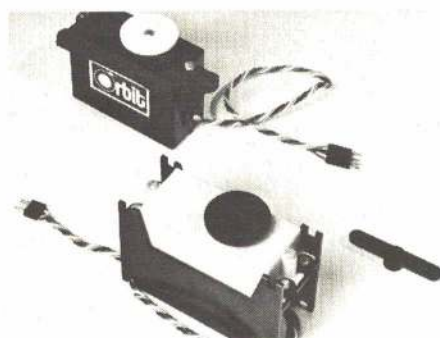
**M & L Models/Tri-I geared engine.** Allows three rubber strands to feed single prop for greater torque without overwinding. First breakthrough in rubber power equipment in a long time! 7" plastic prop included. \$1.25. M & L Models, 145 Forest Rd., Rochester, N.Y. 14625

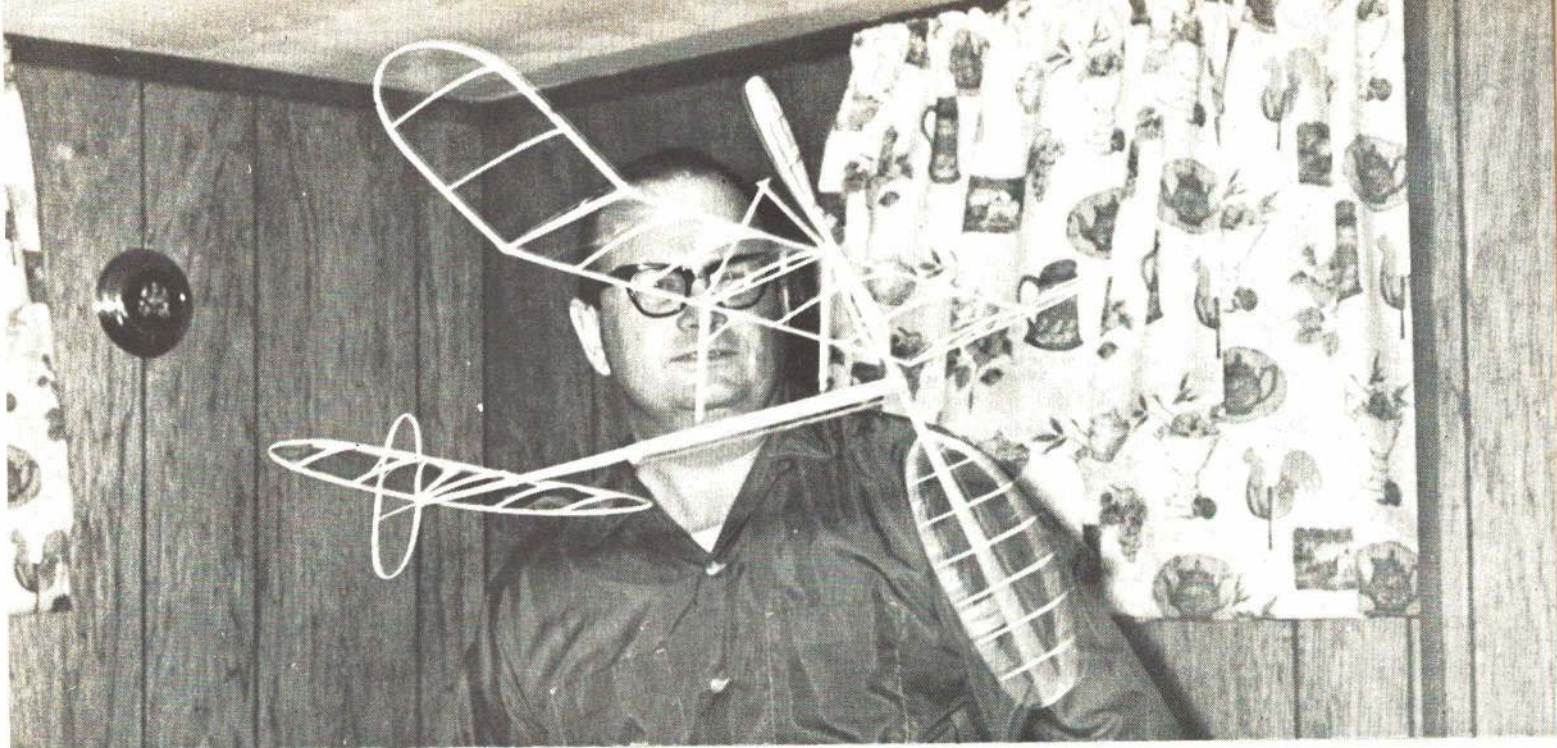
**McKenna Industries/Fiberglass Opel GT.** Two-piece fiberglass body, all necessary materials except epoxy and lacquer finish, can be used with any standard chassis. Provides excellent protection for undergear. 20 1/2" length, 12" wheelbase, 9" width. \$23.95. McKenna Industries, Inc., Hobby Division, 4838 Leafdale, Royal Oak, Mich. 48073

**Orbit Electronics/Servo mount.** New for mounting PS-5D servo, primarily for cars or boats, but works great in planes too. Mounts on any side in any position. Also directly applicable to Kraft KP-11 as shown. \$1.95. Orbit Electronics, 11601 Anabel Ave., Garden Grove, Calif. 92640

**Sure Lok/Mounting accessories.** Quality throughout, sets contain drilled fillister-head stainless steel bolts, lock washers, aircraft-type lock nuts, safety wire. Eliminates loose mounts from vibration. Corrosion resistant. 6-32 and 4-40 sizes. Write for complete data. Cost, app. \$1.25. Sure-Lok 4032 Larwin Ave., Cypress, Calif. 90630

**Kyosho Corp./P-40 Warhawk.** Highest quality, one of the most complete kits available. All wood parts machine cut and hand-finished. All hardware, including wheels, tank, genuine silk covering, etc. 52" span, RC multi-channel with 29 to 50 power. Detailed plans, vinyl insignia (not decals), other custom features make this an outstanding value at \$55.00. Kyosho Corp., 1636 E. Edinger, Unit N, Santa Ana, Calif. 92705



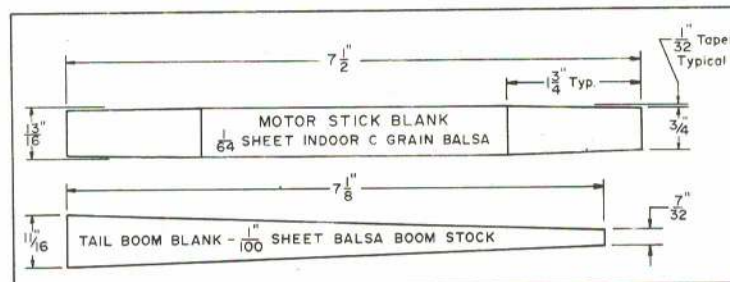
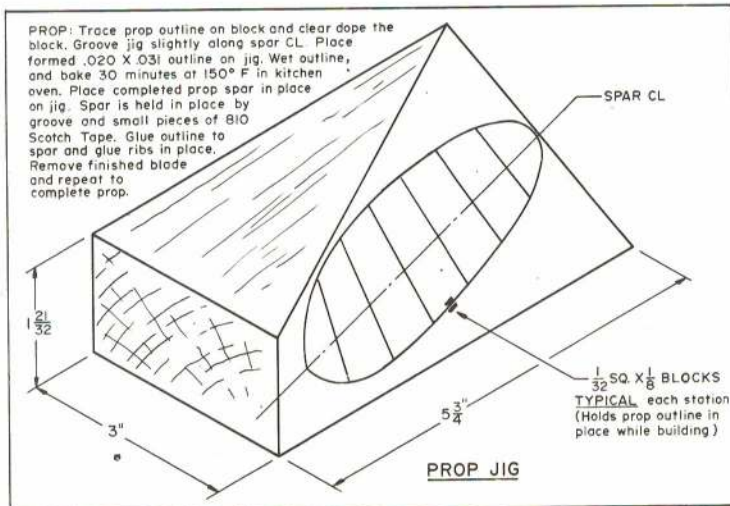
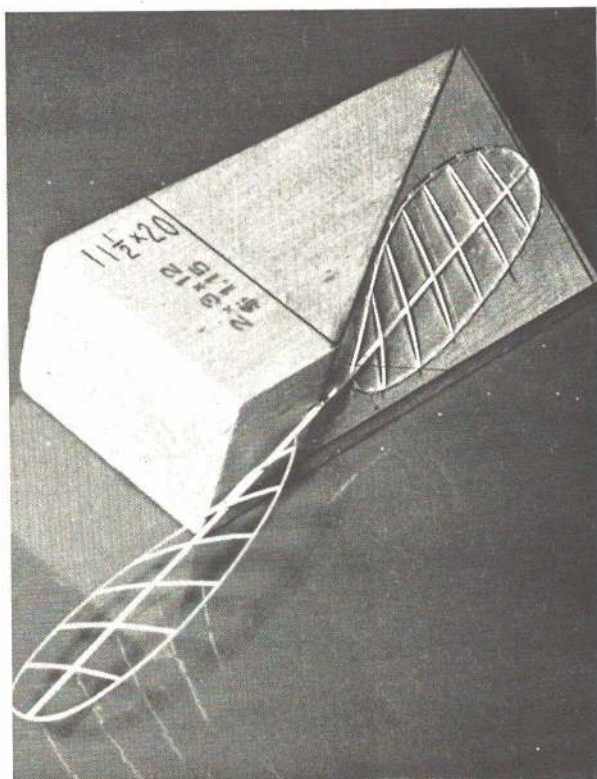


Microfilm models fly mysteriously. Barely moving, the prop turns so slowly it is always visible. Airfoils, balance and trim are really important for flying at this speed. World Record for microfilm models is 45 minutes, 40 seconds.

# Bandersnap

First of three part series on indoor microfilm modeling.

Prop pitch is progressive, continuous, and determined by dimensions of block. Face of block is flat with uniform twist.



**High-time microfilm model  
for beginners and experts. Next  
month, pouring and covering.**

## TOM VALLEE

THE BANDERSNAP IS a small microfilm-covered contest-type indoor model designed for use under low ceilings in school gyms, halls and armories. It is at this type of site that most indoor beginners do their first serious flying. In addition, a great many local indoor contests are conducted in similar low-ceiling situations.

Because of the model's small size and smaller flight circle, it is possible to adjust the Bandersnap to operate efficiently where full-house contest models can't be flown to full advantage. Thus, the Bandersnap can be real fun for indoor experts who find their larger competition ships unsuitable for local sites, and it is ideal for a first contest-type microfilm model.

For the serious indoor beginner who would like to advance beyond the simple Easy B, Bandersnap is a tested contest design, evolved over a period of years from a series of models, and has won two of three low-ceiling AMA contests in which it was flown. As a historical footnote, several years ago it took first place (in its class) in a postal competition between the D.C. Maxcutters indoor fliers and the John Malkins club in New Zealand, in what is believed to be the first international postal competition for indoor models.

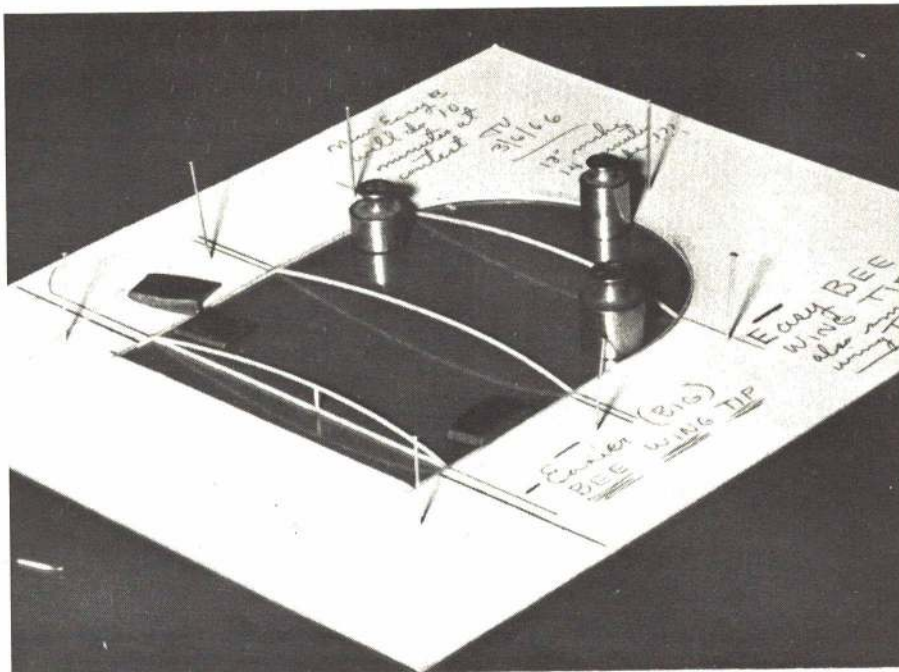
Any modeler who competes and flies the Bandersnap has mastered all the basic techniques necessary for even the most advanced indoor models. For the average beginner, the small frames of microfilm needed to cover Bandersnap, are easier to pour than the big sheets needed for larger models.

Bandersnaps are a natural for small sites and can be adjusted to fly in large rec rooms or small meeting places, as well as in the more usual sites. A Bandersnap has done over three min. in the DC Maxcutters club meeting room, which has a seven-ft. ceiling and modest floor area. The same model also did over 12 min. in a gym with a 20-ft. ceiling. This capability to fly in even the smallest spots gives the ambitious beginner maximum opportunity for valuable practice in handling and adjusting contest-type indoor models.

### Construction

**The Box:** Somehow, the first step in building an indoor model is often a surprise. Since these models are light and fragile, they obviously need a box for storage and for transportation. Beginners can be frightened off at this point, thinking some elaborate, hard-to-build, carrying case is necessary. Not so! Model boxes are made simply and inexpensively from sheets of corrugated cardboard.

Modelers who are pressed for time may use a Montgomery Ward blanket storage box (Cat. No. 16A8982), which will hold the two Bandersnaps or a Bandersnap and an Easy B. The box comes broken down but can be assembled in about five minutes. A coat of clear lacquer will make it moisture resistant, and a tape measure glued to



All curved tips are made inside a cardboard cutout. Tip bow held inside by weights. Then ribs are shaped and glued inside.

the lid is an aid in measuring rubber motors at contests.

**Microfilm:** Techniques for pouring the microfilm and for covering the model will be detailed in the next issue of AAM. Then the film must cure for several weeks before being used. However, construction of the Bandersnap's framework will occupy this period of time.

**Materials:** The motor stick blank is cut from 1/64" sheet C grain indoor motor stick stock and the tail boom blank from 1/100" sheet C grain tail boom stock. No substitutes are advised here. Wing and stab spars are cut from a piece of 1/32" sheet indoor spar stock. Good judges of wood may choose a lightweight sheet of 1/32" Sig outdoor contest balsa instead. Ribs are cut from .020-.025 indoor C grain or light 1/32" B grain balsa, a little longer than half the length of the finished spar.

With some exceptions, special indoor rubber, indoor balsa, indoor bracing

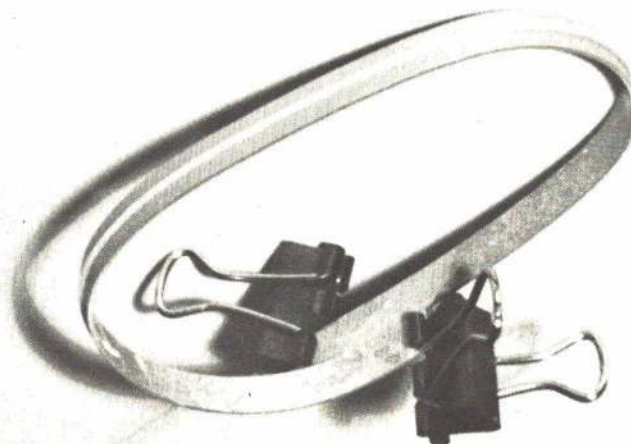
wire, prop bearings, Teflon washers and other special indoor supplies are not available at local hobby shops. Two principal sources for them are: Micro-Dyne Precision Products, Box 2338, Leucadia, Calif. 92024; and Micro-X Products Indoor Model Supplies, 5200 Seven Pines Dr., Lorain, Ohio 44053.

**Tools:** Other than several small pliers and a wire cutter to bend the prop shaft and rear hook, no special tools are needed. For cutting indoor ribs and spars, use one half of a double-edge Gillette Blue blade with the end broken off. Do not use a soft stainless steel blade. An indoor glue gun is a handy device but not absolutely necessary. However, serious modelers should build or buy one as a valuable time saver.

**Motor Stick:** The 1/64" sheet motor stick blank is soaked a few minutes in warm water. Excess water is removed and the damp motor stick blank is rolled

(continued on page 85)

Another method for shaping the bows is to use a curved piece of veneer with balsa stick clipped to it as on rudder, as shown.



IMPORTANT!  
THIS IS LEADING  
EDGE

PROP RIB  
TEMPLATE

WING &  
STAB RIB  
TEMPLATE

TYPICAL RIB  
.025 X  $\frac{1}{32}$

X

DIHEDRAL BREAK

X = COMPRESSION RIB  
(See side view)

PROP SPAR TAPERS FROM  
 $\frac{3}{32}$  DIA. AT SHAFT TO  $\frac{1}{32}$  DIA.  
AT TIP

TRUE PROP OUTLINE  
IS SHOWN

.025 X  $\frac{1}{32}$  OUTLINE

.025 X  $\frac{1}{32}$   
RIB

BRACE WIRES  
PASS THRU  
CROTCH

GLUE WITH  
SMALL DROP  
OF EPOXY

$\frac{1}{32}$  X  $\frac{1}{64}$

X = TYPICAL COMPRESSION RIB



$\frac{1}{16}$  I.D. PAPER TUBES

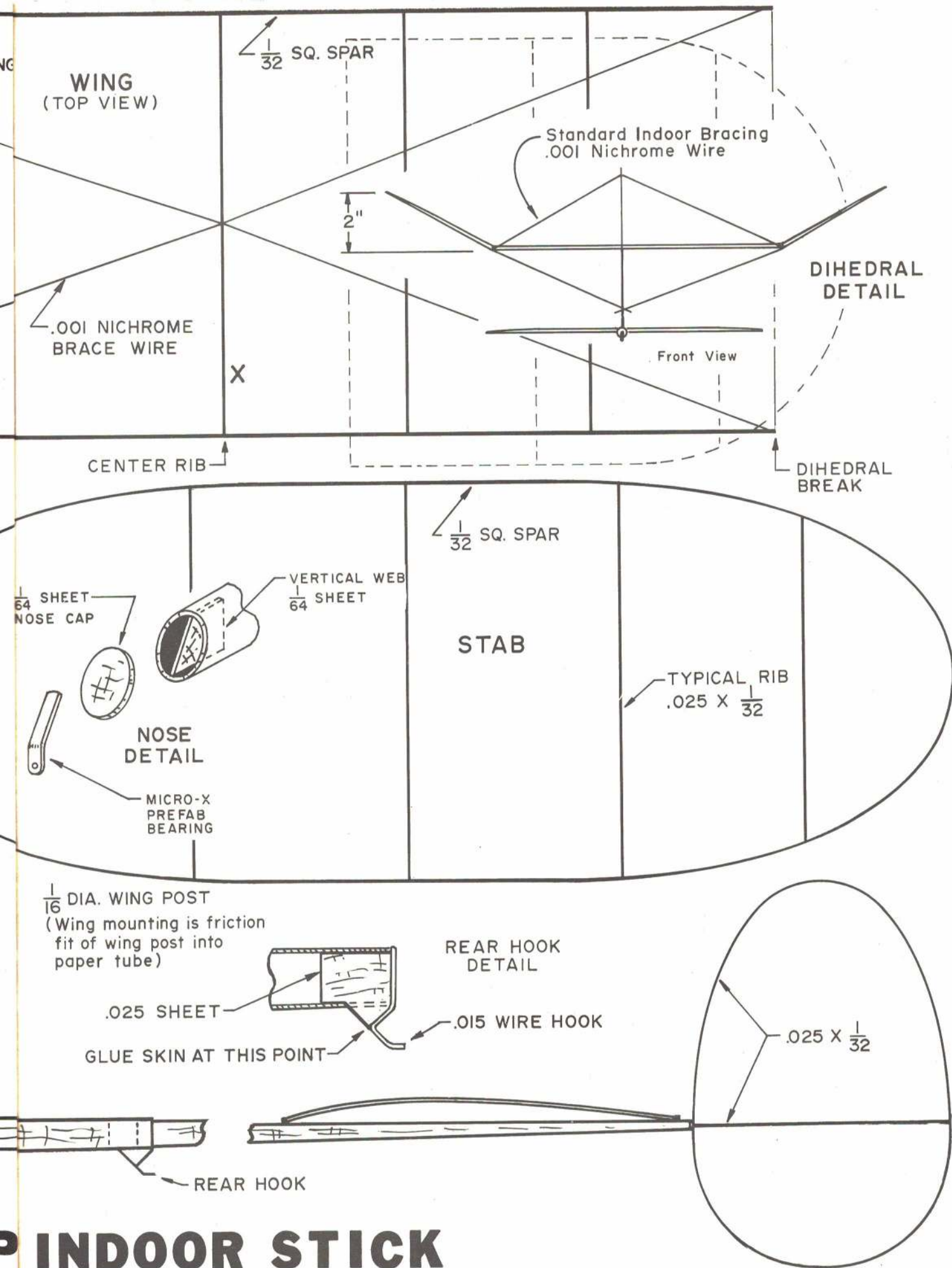
SIDE VIEW

.015 WIRE SHAFT

TEFLON WASHERS

TISSUE WRAP ("Crush" protection for spar)

**BANDERSNAP**



# F/F BOB MEUSER

## General Correspondent

### SPORT

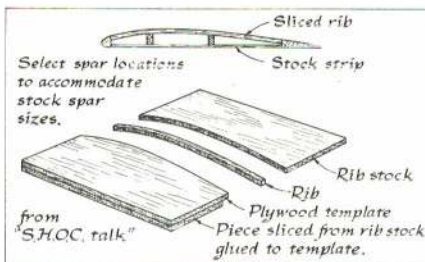
**Help Wanted:** Help! Most long-time free-flighters have developed either a few construction tricks, or nifty design details or clever gismos, or a pet design for a sport or competition model. So why not share them? Send your ideas to AAM, and fame and riches may be yours—\$5 upon publication. Rough sketches will do, photos help. If you like what you have seen in these columns, send in more of the same. If you don't like it, send in the sort of thing you do like. Keep those cards and letters coming—club newsletters too. . . .

**Big Bong Bash:** A Gathering of Eagles, the fly-for-money contest for FAI Power, Wakefield, and A/2 Nordic Gliders, was held at abandoned Bong Field near Kenosha, Wis., on the Sunday preceding the Nats. Attendance at this Detroit-Balsa-Bugs-Sponsored meet was high, but entries were low—perhaps the \$25 entrance fee was a deterrent. Winner in each event received 50% of the purse, second place 35%, and third 15%.

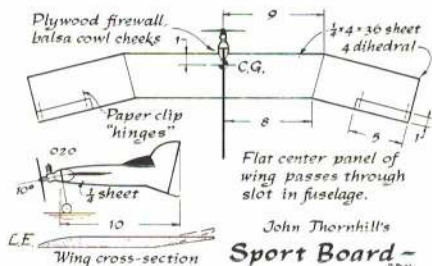
Former U.S.-Wakefield-Teamster John Gard topped the field in Wake, and Peter Allnutt of Canada polished off the Nordic event as a warm-up to doing the same at the Nats. The power event was tied up after seven rounds. In the flyoff, Earl Thompson put up his Pussycat with a short engine run, failed to find lift. Don Wenzel put up his not-so-hot-climbing model, found lift at low altitude, and with its superb glide was able to max. He took home a handsome ransom—\$125. Whatever happened to flying for fun? . . .



Anyone happy? Well, George Howard found three serious Coupe fliers at Blythe one day. Bill Bigge shows off his great dirigible.

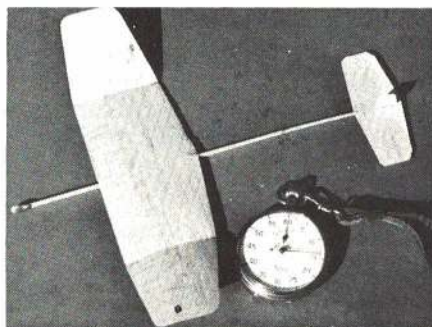


**ULCER:** That is what the initials of the Ultra Low Ceiling Endurance Rally spell, and that is what Pete Vacca probably got when the Oakland Cloud Dusters descended on his living room to participate in this mad Hand-launch glider meet. David Parsons' single-flight time of 13.9 sec. set a new intra-galaxy record for the 12-ft. ceiling category—  
(Continued on page 71)



**Flying Wing:** John Thornhill's little 020-powered all-sheet sport model can be built in an evening or two. The CG position is critical, so add weight to the nose or tail to get it right. Glide is fast and flat. Adjust ailerons together to correct diving or stalling tendency, one up and the other down to get proper turn. If the model climbs in a series of stall-steps, add more downthrust. Any 020 engine will do.

Try to beat this—Parson's 7 1/2-in. 1/35-oz. glider did 13.9 sec. in 12-ft. living room.



# F/F BUD TENNY

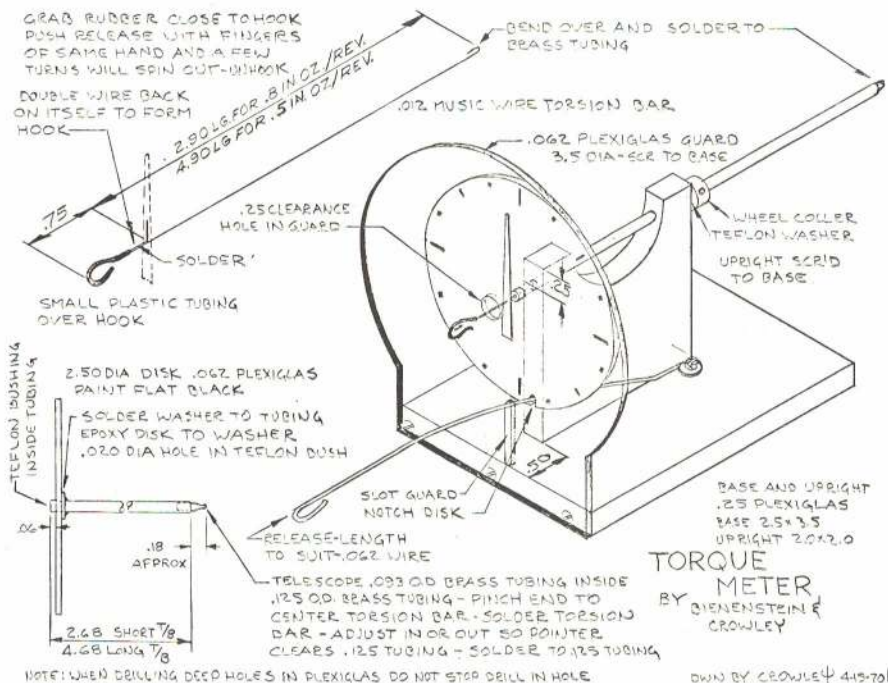
## Specialist Correspondent

### INDOOR

**Indoor Team Selection:** About this time, the selection of the U.S. Indoor Team for the 1972

Indoor World Championships will begin. The four-step qualification process likely to be used begins at the local level and continues through Quarter-Final and Semi-Final Trials. Program entrants face increasingly stiff competition, culminating in the Team Selection Finals. Here, twelve of the original program entrants plus the three members of the 1970 team will compete for three team positions. . . .

**Rules and Program Details:** As mentioned before, FAI Indoor Model specifications may



be changed. Decisions will be made early in December, and AMA has arranged to spread the word. Those interested in receiving early notification of changes in the model specifications for FAI models may send a stamped, self-addressed envelope to AMA headquarters with a request for this information. For notification of the Team Selection Program, send a stamped, self-addressed envelope to Box 545, Richardson, Tex. 75080.

**Plan Ahead:** If your group plans to hold regular indoor sessions during the winter, an announcement can be made in this column.

However, at least three months' advance notice is needed in order to meet publication time. Give name, address, and telephone number of a contact man, along with a brief description of the activity.

**Torque Meters:** The torque meter submitted by Paul Crowley is a useful flying tool. Most casual indoor fliers tend to shun torque meters, feeling their use is being "too technical," but how many times have models just barely gone too high and tangled with the girders? Would you believe that a model can be quickly calibrated and the climb

altitude predicted within six inches? The fundamental principle is simple. For a particular prop, motor, and model combination, the launch torque (torque output of the rubber motor at launch) determines the maximum altitude the model will attain.

Besides predicting how high the model will climb, a torque meter permits winding the motor while it is off the model. This way, all that breaks is the motor. With a little more practice, it's possible to tell whether a piece of rubber is good or if it is worn out. What more is needed for consistent performance?

## F/F BOB STALICK

### Specialist Correspondent

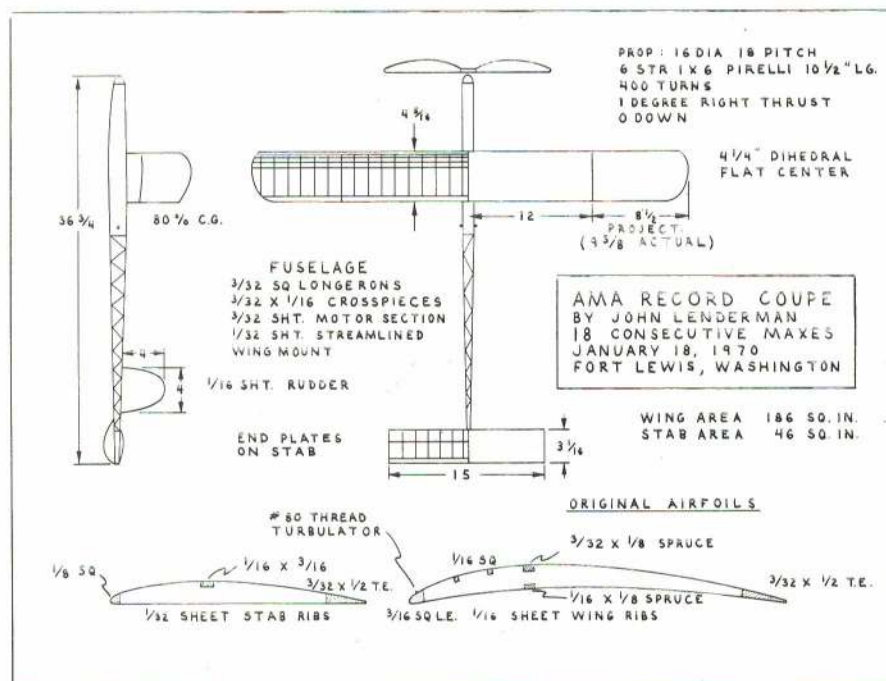
### GLIDER and RUBBER

**Jetstream Arrives:** Midwest Models has just warmed the cockles of the free flier's heart by bringing out Warren Kurth's Jetstream, an A-1 towline glider which has been a many-times winner at the Nats. For the modeler wondering what to build in A-1, here is a brief kit review based on my own experience.

The wood selection is good and the die-cutting is second to none (no die-crunching on this one). A young beginner might have difficulty with banding the wire parts and covering the undercambered wing, but a little experienced adult guidance would guarantee a reasonable model on completion.

The plans have been redrawn from the original Ambroid kit of eight or nine years ago; and the addition of a power pod could make this model a contender in 1/2A Gas, if equipped with a Cox 020. Some RC types may equip it with one of the new sub-mini receivers

(continued on page 74)



## F/F WALT MOONEY

### Specialist Correspondent

### SCALE

**Scale Contest Popularity:** The San Diego Oribiteers monthly scale contests are catching on, even though they are primarily fun events and the prizes are seldom more than a few ribbons. They have attracted several contestants from as far away as the Los Angeles area. Bill Pardoe went so far as to join the Oribiteers as an out-of-town member so he could keep in better touch with what was going on. As luck would have it, his company transferred him out of Los Angeles. But it wasn't too bad—he now works in San Diego.

At the last monthly scale contest, he eliminated his Curtiss Seagull rubber scale job by having the fuselage break right in the middle when it hit the ground. Usually, a competitor will try to repair a model on the field, but that Seagull fuselage had multiple stringers and every one of them had multiple breaks.

**Versatility Pays:** A model powered by a Brown Junior CO2 motor took a first for Douglas Mooney, and then the same motor installed in another model took first in Open for Walt Mooney. Both models were Pilius Porters. CO2-powered, convertible to rubber. Doug converted his on the field to a rub-

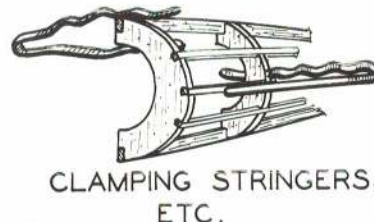
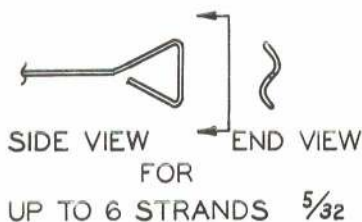
ber-powered version of the Turbo Porter and proceeded to take first in Junior rubber scale with it.

Peanut Scale Junior was won by Glen Jones with a Miles M-18. And Peanut Open was taken by Bob Peck with a Pietenpol Air Camper. The best flight was a half-second less than two minutes. The model was just a speck when it decided to spiral in—with the prop and nose block dangling down as a most opportune dethermalizer. This flight provided the challenge, and several people made gallant efforts to beat it. Bill Hannan did 1:14.2 with his Avro ultra-light.

**Flying Aces News:** The Flying Aces Club (Bridgeport, Conn.) puts out a monthly newsletter chock full of news and other modeling goodies, including a lot of Phineas Pinkham type jargon and old Flying Aces-type illustrations.

The propeller hooks illustrated in one of their latest issues are worth trying if the fully wound motor of your latest super scale model has walked off the hook and become a wild gorilla in the tail end of the fuselage. That's

(Continued on page 71)



# C/L BILL BOSS

General Correspondent  
SPORT and SCALE

What An Audience! Would you believe a model airplane club could have an audience of over 30,000 at a demonstration of control line flying? The Prop Busters M.A.C. (Willowick, Ohio) was the guest of the Cleveland Indians Baseball Club for a doubleheader. Not only did the club see the Indians play, but it also had the pleasure of putting on a flying show between games.

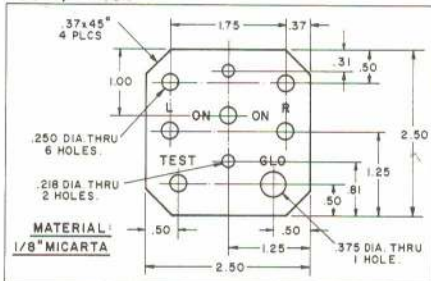
The demonstration consisted of two men flying Stunt, a four-man Slow Combat match, then a six-man round robin—six planes in the air at the same time. A fast Combat match that followed produced a kill to the satisfaction of the entire audience. What a sound that must have been to hear 30,000 or more people applauding model fliers doing their thing. . . .



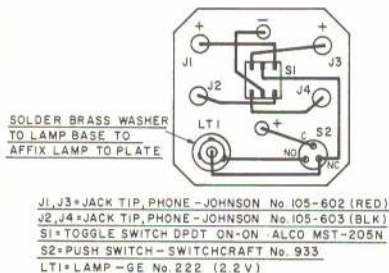
Insurance! Simple glow tester and starter.

**Black Box Replacement:** Most of us have built a box to house the battery, ammeter, plug-in jacks and some fancy switching arrangement for starting model engines and testing the glow plug. These so-called Black Boxes often are cumbersome and heavy, but George Metz has made substantial improvements. He incorporated all the features required for starting the engine and testing the glow plug into a unit about 2 1/4" square, which is easily mounted atop a 1 1/2V battery. With just the flip of a switch, it can be used to start two-engine planes as well as the single-engine type.

Materials required are listed on the wiring detail sketch, except for the nylon standoffs, two 6-32 round-head machine screws and hookup wire.



WIRING DETAILS (BOTTOM VIEW)



To begin construction, lay out on a Micarta panel the holes shown in the drawing. Drill the holes to appropriate sizes, which may vary if jacks and switches other than those listed are used. After all holes have been drilled, mount the switches and jacks. The lamp goes into the hole provided and is secured in place by soldering a large brass washer or solder lug over the lamp base.

The wiring diagram is drawn just as it will appear when viewed from the bottom and may be used for completing the wiring. Use any light-gauge multi-strand hook-up wire and rosin core solder. The positive and negative leads for connection to the battery are approximately 2 1/2" long. Use care when soldering because too much heat could cause lamp damage.

The two nylon standoffs are made from 1/2" hexagonal or round stock cut to 3/4" lengths. Drill one end of the standoff to a depth of 1/2" and tap for 8-32 screw size. The other end is drilled to a depth of 1/4" and tapped for 6-32 screws. When completed, install the unit on a 1 1/2V square hobby bat-

# C/L JOHN BLUM

Specialist Correspondent  
CARRIER and STUNT

**U.S. Stunt Champ's New Slant:** An old subject in a new form breaks the barrier this month. Tom Niebuhr is piloting a project to offer a United States Model Aerobatic Championship late in 1971.

Influenced by Old-Timer Stunt meets at his former club, the Garden State Circle Burners (New Jersey), Tom developed his idea to include several categories: (1) Old-Time Stunt using models kitted or published before 1952 (with bonus for no flaps and ignition engines) and using simplified pattern; (2) AMA Stunt as it is known today, with the possible elimination of appearance points; (3) Grand Champion Event similar to full-size aerobatic meets, whereby the contestant draws his flight pattern from a hat and is permitted no practice.

The last category should stir curiosity and be a challenge! Tom, with the help of John D'Ottavio and Frank McMillan, suggests that the unlimited event consist of a predetermined sequence of maneuvers, known beforehand only to the judges. The fliers would be allowed half an hour to study the pattern; someone in the circle would call them out. An example of these maneuvers might be: one quarter wingovers, diagonal eights, etc.

Tom is interested in response to the idea and in having old plans sent to him. He wants to recreate plans of the old stunt designs. The following are now available: All



Ever-popular—the B-36 Peacemaker. At Cam Ranh Bay, Vietnam, Captain Darold gives his six-engine model a final sanding.

tery by placing the positive and negative leads on the battery terminals and securing finger tight with the nylon standoffs. Position the unit over the standoffs, lining up holes in standoff and panel, and secure with 6-32 x 1/4" machine screws. The clip leads must be modified by installing phone plug tips such  
(Continued on page 69)

American; All American, Sr.; Barnstormer; Wee Dooper Zilch; and Frisky Pete. Write Tom Niebuhr, 1170 S. Florissant Rd., Florissant, Mo. 63031. . . .

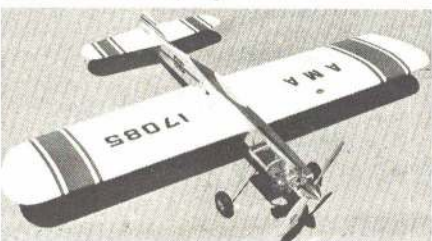
**New Profile Stunter:** A new big-wing stunter is being kitted by Sig Manufacturing Company. With a 540-sq.-in. wing area and long fuselage moments, the model flies the full pattern. The Banshee, flown by Mike Getz, 18, in Senior Stunt at the Nats used a Fox 35, a 10-6 Top Flite prop, and 3 1/2 oz. tank. The 39-oz. model handled the pattern and wind quite well.

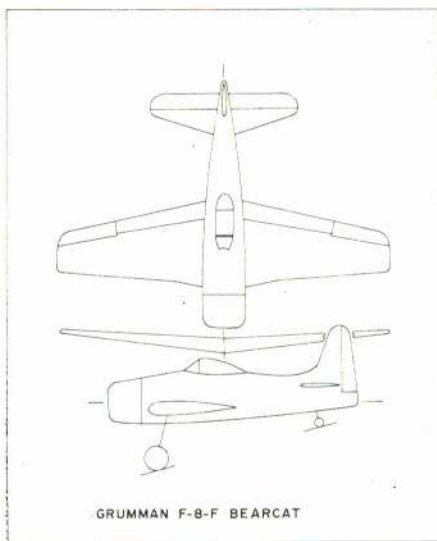
The kit comes with built-up wing, die-cut balsa, half-in. profile balsa fuselage, and pre-bent pushrods and landing gear. . . .

**Navy Carrier Score Calculation:** Harry Higley presents a set of numerical tables for Carrier score calculation. Conventional flight scoring requires two table references, a subtraction, a multiplication, and an addition; but the Carrier Time Score Conversion Tables require only two table references and a subtraction.

Example: high speed time 26.2 gives 274.70 from the table; low speed time 77.3 gives 69.83; the difference is 204.87. This hypothetical flight, by more lengthy calculation,

Banshee profile stunter, for 39 to 40 engines, has long nose moment. Airfoil has max thickness further aft. By Sig.





GRUMMAN F-8-F BEARCAT

tions, is scored at 204.84. Harry states that the answer correct to four decimal places is 204.8693, which is a slight improvement in accuracy and a vast improvement in ease of



Guardian gets its hook right on the deck. Apparently it is on the rebound, note broken prop blades. Rossi-powered model ranges from 28 mph to well over 130 mph.

calculation.

For a quarter and a self-addressed, stamped envelope, Harry (433 Arquilla Dr., Glenwood, Ill. 60425) will send you a set of the tables. . . .

Grumman Bearcat: The 3-view shows the basic layout of one of the fastest prop-driven Navy planes. Adapted to the Navy Carrier event, the model has been popular, mostly in Class I. It has one basic problem: tailheavy-

ness due to the short nose moment. Structures must be planned in advance to avoid such problems. The old Berkeley kit and/or plans have been the most used source for Carrier-flown Bearcats. . . .

And Away to the Library: "You Can Fly Carrier," June 1970 AAM; "The Two-Cycle Engine," Feb. 1968 AAM; "Dual-Carb Power," May 1968 AAM; "Aerodynamics Simplified," May 1969 AAM.

## C/L JOHN SMITH Specialist Correspondent SPEED and RACING

**Modified Motives:** Something in the make-up of the average speed flier urges him to tinker with any piece of engine unfortunate enough to fall into his hands. The desire to change things, to make them better, to add personal innovations probably has been around since the days of the caveman.

Speed fliers are always looking for ways to improve the breed. This provides a market for new products and gives infinite satisfaction to the modeler. The fact that he is not always doing his engine any good has nothing to do with the case!

This fellow may never be in the winners circle, but he talks a good flight in the pits and even if he doesn't get in an official flight, he goes home knowing that with a little bit of luck he could have beaten anyone in the place.

Other kinds of equipment might be compared with the speed model. Radio also is a tinkering machine, but probably several times as many modelers work on their engines as radio fans modify circuits for better results. You don't see many ads or articles for hopping up the family washing machine or TV set or any articles about "How to Make Your Electric Clock Run Faster."



Clifton Norman of Philadelphia holds his TWA-powered and piped A Speed job. Original design plane is very fast.

Of course, there are people who think model airplanes are unnecessary pieces of junk, but we are not concerned with them. But all of you who have read this thought-provoking bit of material so far, read on. This magazine is for you. . . .

**Japanese FAI Model:** Satoshi Kojima's (Osaka, Japan) FAI speed model has done over 125 mph with a home-built 15, ABC piston-cylinder setup, and rear drum rotary induction. The shaft, rod, and pin are OS parts. He uses pressure on a tin tank with fuel switch. Excellent workmanship on the model. . . .

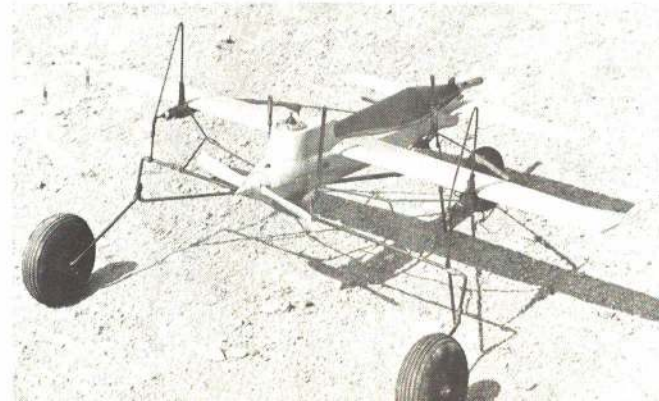
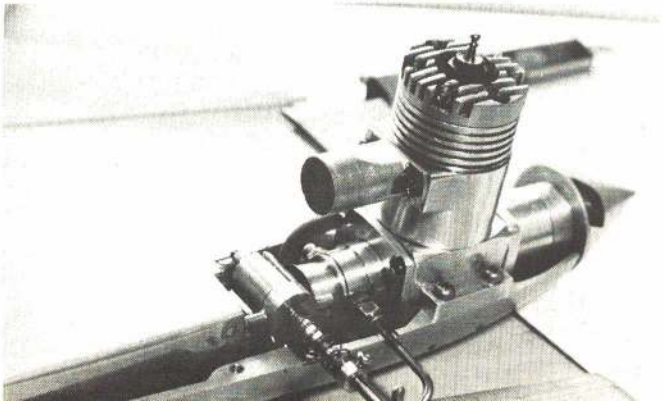


Second in Junior A Speed at 133.97 mph is Dennis McGraw with his Kansas Twister. Lauderdale case, K&B parts.

**Nats Shots:** Junior Contestant Dennis McGraw took second in A-Speed at 133.97 mph. His Kansas Twister has a Lauderdale case with K&B innards and rear exhaust. Cliff Norman flew all speed events and did very well with his A job. TWA up front. A real fine competitor. . . .

**Pipe Knowledge Improving:** Piped engines are showing up at all the meets and are being made to run. The mysteries are being (Continued on page 69)

Speed models are much alike—Satoshi Kajima's FAI plane uses OS parts, home-made ingenuity. Has classic takeoff dolly, curved prop.



## R/C DON LOWE General Correspondent SPORT and PATTERN

**Engine Innovation:** Innovation is the spice of life and improvement in a good product is particularly satisfying. Bob Gray of the WORKS Club, a tinkerer from way back, has a worthwhile idea for engine improvement, which involves a technique to improve the idling and top end. Personal observation shows that nobody's engines run better than Bob's.

He says, "The method I use to improve idling characteristics of the glow-plug engine (40's to 60's) is called Variable Compression. Very small bleed holes are drilled through the cylinder liner a certain distance above the exhaust ports, and by-pass passages are routed in the case so that the by-passes are in line with the bleed holes when the cylinder liner is in place.

"With the engine running in the idle position and as the piston starts the compression stroke and covers the exhaust ports, a small portion of the fuel-air mixture in the cylinder is bled off through these small holes to the exhaust stack. This reduces the mixture in the cylinder or, in effect, reduces the compression ratio. The chart gives hole sizes, number of holes, and the dimension X for various sizes of engines.

"When the engine is running at full throttle, the piston is traveling so fast that the air-fuel gases can't get out of the small holes fast enough to cause any appreciable loss. Thus, a full air-fuel charge is available for the power stroke.

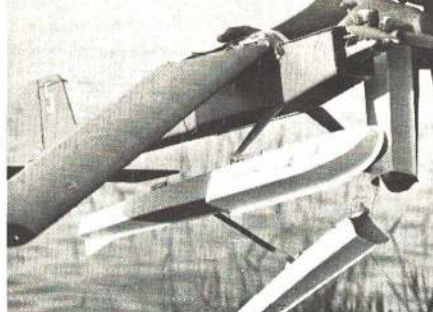
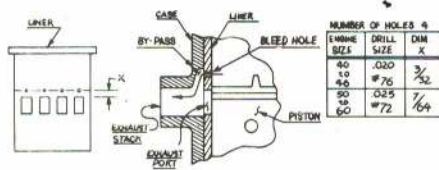
"I put the cylinder in a lathe and take about .010 to .015 off the top surface of the flange to increase compression a little and to allow for the small loss due to the bleed holes. To get a good seal, the head should be lapped to the top of the liner.

"Although I use this technique on RC engines, I also have used this modification on a few rat race engines. The bleed hole increased compression combo gives two good results: a few more rpm on top and an engine that isn't a wicked beast to start because of the higher compression.

"One caution: drilling these small holes will throw burrs up on the inside surface of the liner. These burrs, however small, must be removed, otherwise they would chew up the piston and ring in no time. These burrs can be removed in several ways, but the best is to use 000 steel wool. Rub the steel wool in a direction 90 degrees to piston travel. Do not rub it in the same direction as the piston travel."

**The Lighter Side of Engine Care:** Now that the serious side of the care and feeding of engines has been presented, let's look at the lighter side. Excerpted from the Toronto Radio Control Flying Club's July newsletter is the following, authored by a mysterious ding-a-ling, Ima D. Gremlin.

**Method by Bob Gray for improving idle and top end really works. See text for details.**



Dick Carson now recommends secure float mounts. Prop sliced left float—oops!

Ima invites you to create your own customized power plant around a Super Klunk '60 by using roughly (ha!) the following method. (1) Remove from package and throw engine into a dirty tool box. Repeat several times for maximum effect. (2) Take a pair of pliers and remove and replace glow plug several times. This rounds off plug base and breaks off portions of head fins that interfere with rapid plug changing. (3) Pry off prop drive washer with a big screwdriver. Place a pinch of dirt in the front bearing and, while you're at it, put same in the carb!

(4) Make up a batch of "finfiller"—a mixture of fuel varnish, castor oil, clay and grass. Random pack in cooling fins. This will insure a hot running engine. (5) Slightly loosen head and backplate screws. This reduces cranking loads.

(6) Before reading manufacturer's instruction, fiddle with all carburetor idle, stop and air-bleed screws. Soften needle valve restraint to allow needle to float and produce a nice pulsating engine run similar to WWI rotary engines (scale boys note). A bit of dirt to the carb barrel will slow down speed changes. Plugging the air bleed with leftover "finfiller" will give a nice rich cut-off when you retard the throttle.

(7) Pack the fuel jet with balsa sanding dust or employ an old rubber bulb for fueling the tank to achieve the same result." Ima certainly has some words of wisdom here. All you have to do is exactly the opposite of that suggested and engine bugs should go away!

**TCRC Flying Circus:** From the Twin City Radio Controller newsletter, "Flare Out," comes a report of their successful Flying Circus. These fellows put on a real show which included open and biplane races, pattern flying demonstrations, Snoopy's Doghouse, helicopter rides, etc. They collected over \$900 in parking or admittance fees alone, so, the crowd must have been large. As these shows become more and more popular, they are a good way to add money to the treasury and also to create terrific public relations. Club members get to ham it up, display all of their creations and fly for the public without the pressures associated with a regular contest...

**Canadian RC Nats:** Word from Canada lists the following winners in the annual Canadian NATS held at Sault Ste. Marie, Ontario: Scale, Frank Knowles; Class A, Jim Goyde; Class B, Keith Brown; Class C, Ivan Kristensen; and Class D, Warren Hitchcox.

Unfortunately, the U.S. and Canadian Nats dates overlapped and prevented a possible larger entry of U.S. fliers. However, Al Signorino did drive all the way up to put on a demonstration with Snoopy and the Doghouse...

**Drill Jig:** Larry Hoffman makes up motor mount drill jigs out of old engine crankcases. He cuts off the top (cylinder) section and fits 3/16" dia x 1 1/2" drill rod material in the mounting holes. These drill rod sections have been previously drilled to the desired mounting bolt size and hardened. Hardening is accomplished by heating the drill rod material to a bright red color and quenching in water. An old crankshaft can be fitted in the case to align prop for a perfect fit. The jig never wears out...

**A Snappy Idea:** What modeler hasn't found himself looking for a third hand when wiring a plug or something similar? Paul McIlraith has a simple solution. He expoxied a snapper clothespin (the spring variety) onto the workbench in a convenient location and uses it as a simple vise. It works great (I've tried it!) since it is non-heat conducting...

**Pinstriping Made Easy:** Dennis Weatherly reports that pinstriping with a Flair felt-tipped marker is super-easy. Can be doped over without smearing for permanency.



Lucky guy, Warren Hitchcox, won Class D at Canadian Nats. Poses with Miss Canadian RC Modeler, Brenda Toristo.

This is the "Dark Continent"? Johannesburg, South Africa, fliers enjoy this large field, lots of activity. Note variety of planes; much American, as well as European, equipment is used.



## R/C HOWARD McENTEE

### Specialist Correspondent

#### GLIDERS and FAI

**Low-Cost Wind Meter:** The Dwyer Wind Meter, a quite accurate pocket unit having two ranges (2-10 mph, 8-66 mph) is a worthwhile addition to the kit of any modeler who depends at all upon wind strength (RC glider types, free flighters, model sailboatmen, etc.). Phil Milam brought it to our attention. We've used one for years, but newer modelers may not know about the meter. It is available for around \$6 in a few hobby shops or from Edmund Scientific Co. (150 Edscorp Bldg., Barrington, N.J. 08007). They also offer a large, free catalog. . . .

**Schleicher Ka6E Still Available:** When Gerry Nelson moved his business to Chicago, many felt production of his big, sleek, all-fiberglass, ready-to-fly Ka6E would end. Not so—all production tools and rights were purchased by J & R Model Products (42816 Philadelphia Pl., Fremont, Calif. 94538), and owners Brinton Jones and Gary Rebiskie offer this glider at \$199.50 for a limited time (packing and shipping is additional). They promise high quality workmanship, comparable to Gerry's. . . .

**Second RAMS Soar-in:** A group of glider pilots got together for slope soaring at a site in the hills near Wenatchee, Wash. No competition events were scheduled—just two days of flying for fun. Conditions were quite good and most of the standard kit gliders were on hand, plus a few unusual ones. One looked like the Neutrino (from AAM plans, but sans engine), said to be fast and tricky to fly. (Continued on page 68)



Speaking of great flying sites—this magnificent slope-soaring area overlooks the Columbia River, in Washington. A Kurwi 68 heads for the hills. Paul Thomas photo.



Bob Welch's aerobatic glider is sleek low-winger. Power plane fuselage can be altered.

Gene Bartell likes realism. This fighter glider is his original design. The ailerons are inboard on the wing.



## R/C GEORGE SIPOSS

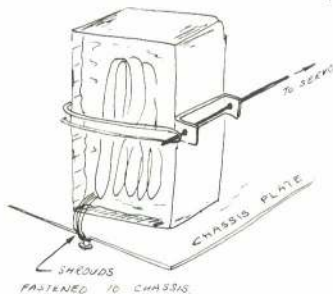
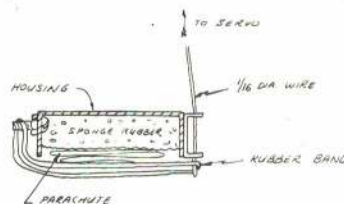
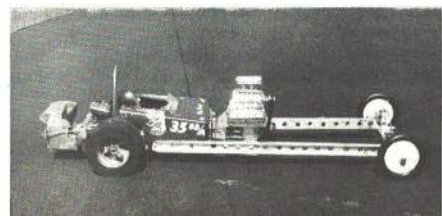
### Specialist Correspondent

#### R/C CAR RACING

**Beginners Take Note:** A beginner is wise to attend club races or to at least see an experienced modeler's equipment. Quite a few of the local "kingpins" will gladly help beginners in this great new hobby. Among them are: Joe Sullivan, Northlake Speedway, 210 Lake Highlands Village, Dallas, Tex. 75218, and Don Braaten, 3355 36th Ave., Minneapolis, Minn. 55406.

**Publicity Ways and Means:** Club racing is getting more and more publicity. Many club secretaries report on their groups' activities in simple bulletins which also are displayed on supermarket and local hobby store bulletin boards. During club races, the director usually announces the rules and events on a PA system. In this manner drivers

RC drag racer by Siposs is a scaled-down version of big one. Uses drag chute to stop.



A simple system to spring out the chute in a dragster uses full low throttle.

are always well informed of starting times, cars stalled on the track and race results. A low cost PA system can be financed from club funds and starting fees. . . .

**Car Performance:** Among the many models available commercially, the Delta cars seem quite reliable and have won many races. The Wen-Car has won an important Chicago event; Ra/Car's (Continued on page 64)

## R/C BOB MORSE

### Specialist Correspondent

#### PYLON RACING

**Racing Fuel Systems:** One of the most perplexing problems in racing is selecting the proper fuel system for installation. Many systems, ranging from the tried and true suction feed used in stunters to a virtual rat's nest of pressurized plumbing, are available. Obviously, to place well up in the race standings, pressure feed is essential. Suction feed just won't do. The next question is: will it be the timed pressure port or the untimed port?

The relatively high pressure (up to 4 psi) provided by the timed port can be difficult to contain in the full system with the usual hardware—tanks can fracture, flexible tubing can blow off. But probably the most difficult problem to master with timed pressure is the extremely critical needle valve setting required.

With the untimed pressure port (on K & B engines we recommend the upper left-hand back-plate retaining screw hole) the pressure is down to approximately one-half to one psi and gives some latitude in needle valve setting.

(Continued on page 64)

# corsair II



With wing flaps and leading-edge slats in high-lift configuration, an A-7E comes in for a landing after a test flight at Vought plant.

A sub-sonic workhorse with marked success in Vietnam, Vought's A-7 series will replace the famous Skyhawk. It looks like a Crusader but . . .

**DON BERLINER**

IN THE DAYS of the glamorous, cranked-wing Chance Vought Corsair, flown by groups of rugged Marines like Pappy Boyington's "Black Sheep," it was a matter of a man and his machine. The man did the thinking and the machine did the work. Today, in the era of such exotic craft as the Ling-Temco-Vought Corsair II, it is a man, his machine and a raft of complex electronic devices which do much of the thinking. It has taken a lot of the fun and the glamor out of flying for the Navy, but then war never really was much fun nor very glamorous.

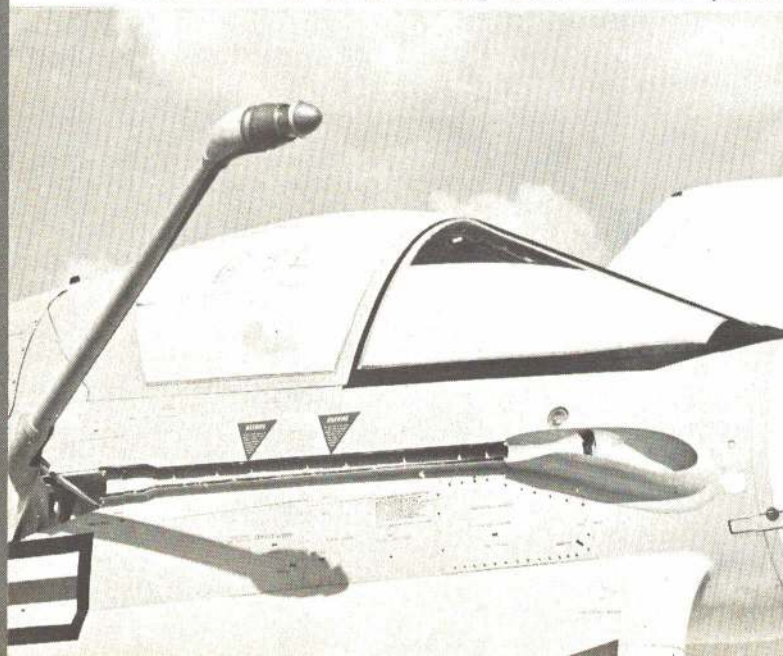
The story of the L-T-V A-7 Corsair II began with the highly successful F-8 Crusader, an L-T-V product that was one of the Navy's best fighter planes. When, early in 1964, the U.S. Navy announced that it wanted a single-seat, carrier-based, light fighter-bomber to replace the veteran Douglas A-4 Skyhawk, a much-modified Crusader was one of more than 20 designs proposed.

The idea was accepted, the contract signed and construction begun. The first flight of the prototype A-7A was made in September 1965, barely 18 months after the awarding of the contract. Had

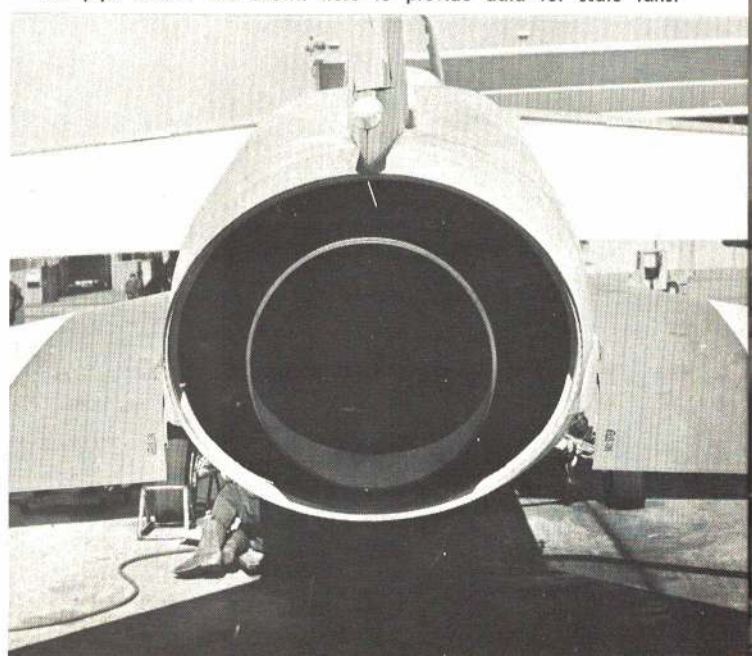
the Corsair II been the modification of the Crusader that it appears to be at first glance, this would not have been much of an accomplishment. But the similarities that at first seem so obvious, fade as the comparison becomes more detailed, until all that remains to connect the two airplanes is their general outline.

The most marked similarity is the nose, with both airplanes having a bulbous radome atop a gaping air inlet—but then, so did North American's F-86D Sabre. Actually, the Corsair II is more  
*(Continued on page 81)*

Unique probe for in-flight refueling shown in extended position.



Tail pipe details are shown here to provide data for scale fans.



#### VERSION AND VARIANTS

A-7A—prototype flew Sept. 27, 1965 with P&W TF-30-P-6 engine. Last of 199 delivered to USN in Spring, 1968.

A-7B—196 built for USN by April, 1969. P&W TF-30-P-8 engine @ 12,200 lbs. First flew Feb. 6, 1968.

A-7C—projected two-seat version.

A-7D—645 ordered by USAF with Allison/Rolls Royce TF-41-A-1. First flew Apr. 6, 1968.

A-7E—similar to A-7D, for USN. First 67 had P&W TF-30-P-8 @ 12,200 lbs., remainder of 618 ordered have Allison/Rolls Royce TF-41-A-2 @ 15,000 lbs. First flew Nov. 25, 1968.

#### SPECIFICATIONS

##### Dimensions

Length—46' 1 1/2"

Wingspan—38' 9" (23' 9" folded)

Height—16' 2"

Wing Area—375 sq. ft.

Wing Airfoils—root, NACA 6500A7 (A-7D), NACA 65A006 (A-7E); tip, NACA 65A007 (A-7D), NACA 65A004 (A-7E)

Vertical Tail Airfoil—root, NACA 65A005.2; modified tip, NACA 65A004 modified

Horizontal Tail Airfoil—root, NACA 65A006; tip, NACA 65A004

Empty Weight (A-7A)—15,904 lbs.

Maximum Catapult Takeoff Weight (A-7A)—38,000 lbs.

#### PERFORMANCE

Maximum Speed at Sea Level—578 mph

Approach Speed—140 mph

Takeoff Run to Clear 50 ft.—5865 ft.

Landing Run Over 50-ft. Obstacle—4695 ft.

Normal Radius of Action—715 mi.

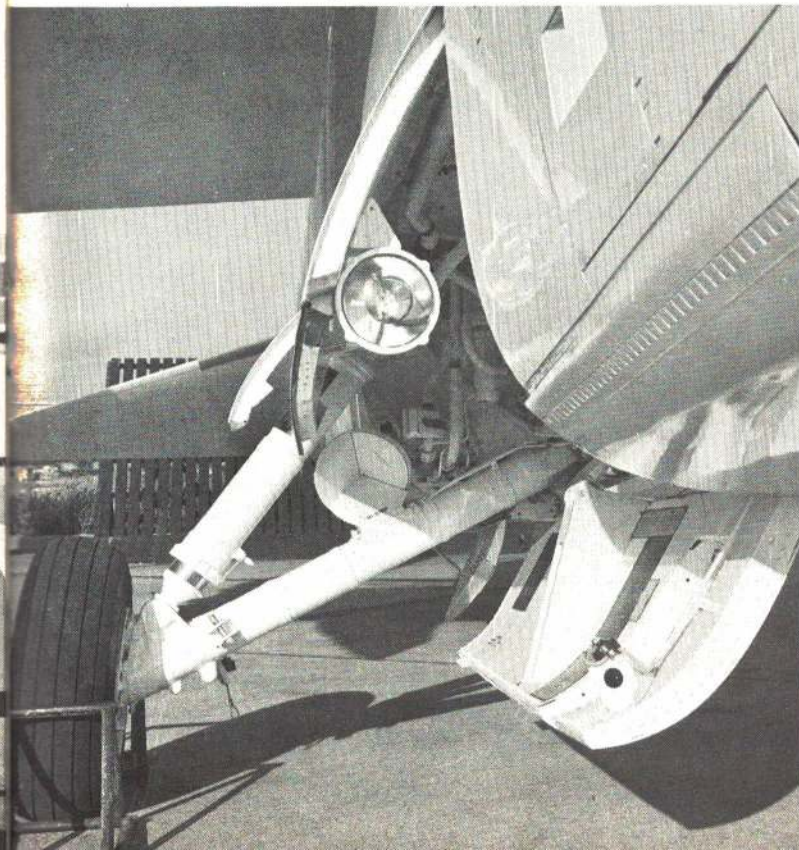
Maximum Range—3360 mi. (internal fuel)  
4100 mi. (four drop tanks)

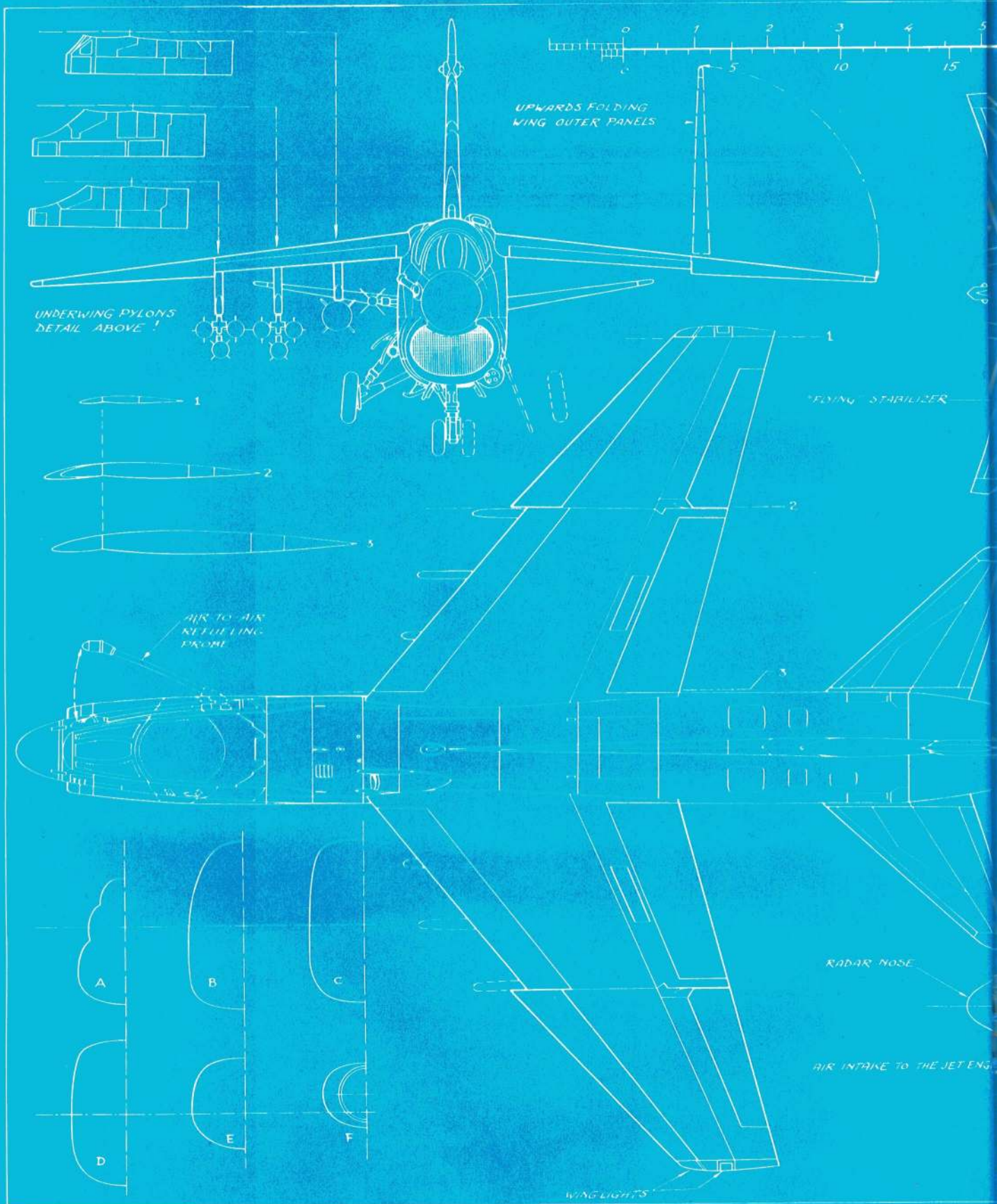


Closeup view of nose, showing canopy in open position, windscreen, and rugged nose gear.

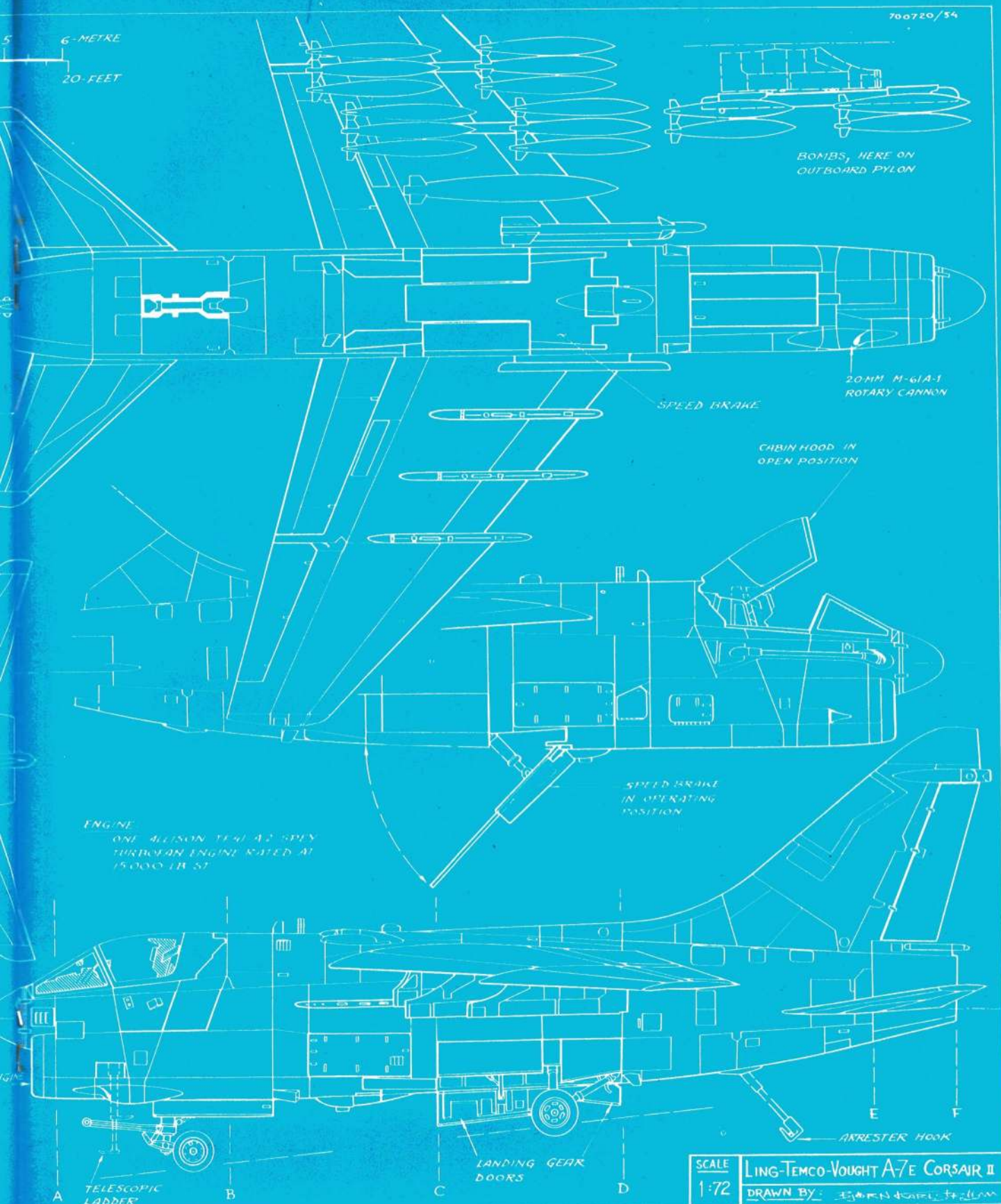
On catapult takeoff the gross is 19 tons; empty, 7 1/2 tons. Gear is robust.

Gun location and nose gear details here differ from top photo.





# Ling-Temco-Vought Corsair II



Since the prototype appeared in 1965, 1658 of the tough Corsair II's have been built through the A-7E version. As a carrier-based fighter bomber to replace the

aging Skyhawks, Corsair has a top speed of 578 mph. It carries a murderous mix of stores and can fly 4100 miles with drop tanks. A 24-hour all-weather capability.

# Luton Minor

Buoyant-flying  
scale job for  
rudder-only or  
a few small servos.

HURST BOWERS



With a large rudder and plenty of dihedral, only small rudder-control movements are needed. The model has an intriguing history which began with an errant free flight near Delhi, India.



In flight, a real Luton Minor plods along. Anything from 30 to 50 hp could be used. Plans for real plane are produced by Falconar Aircraft, Edmonton, Alberta, Canada.

MY AFFECTION FOR the Luton Minor goes back to a beautiful winter in Northern India about seventeen years ago. When I received my December 1953 copy of *Aeromodeller* and spread out the full-size plan which was included, there before me lay, without a doubt, one of the most pleasing little airplanes I've ever seen. I built the model and powered it with a trusty old Mills .75 c.c. diesel engine and flew it free flight for well over a year with not a scratch (my bearer turned out to be an excellent model retriever).

Now comes the remarkable part of the story. I gave the model to an English friend, D. A. Blackford, who was the local representative for an American tractor firm. We installed his ED Bee 1 c.c. engine and took the model out to the polo field for a test flight. Needless to say, with the added power we got much more altitude than expected and the Luton hooked a gigantic thermal. The last we saw of it, it was a mere speck heading east across the Jumna River. Blackie and I wrote it off and headed for the Gymkana Club for a "chota peg."

About a month later Dottie Blackford called me at my office and asked if I would recognize my model from a picture. I assured her that I would, so she said to look on the cover of the current issue of *Eve's Weekly*, a Bombay news magazine. I got the magazine and there it was: my Luton Minor being held by a Member of Parliament, with a young member of the National Cadet Corps pointing out some of the finer construc-

tion details of "his aircraft"!

A little intelligence work by Blackie uncovered the story. The thermal had dropped our model near a village about ten miles east of Delhi (site from which flight originated), where a local cowherd picked it up and rushed it by bullock cart to Palam Airdrome. Here the Indian Air Force had a Spitfire Squadron, along with a Cadet Corps Model Club. One of the cadets paid the cowherd 2 rupees (about 40¢) for it, and he returned to his grazing herd, having done his bit for God and Country. When Blackie saw how it had been "buggered up," he decided to let the cadet keep it, but his wife, Dottie, had a more practical suggestion. She said "the little blighter needs a good hiding."

And so it goes—the first liar never has a chance.

I never lost my "hots" for the Luton, however, and vowed some day to build a radio control model of it. Here you have the results. As a two inch to the foot scale radio control model, it is every bit the flyer its predecessor was those many years ago. This time I used the O.S. Max engine and reliable Controlaire radio gear, so this ship won't be lost. Thanks to the Falconar Aircraft, Ltd., people up in Edmonton, Canada, who sell the full-size drawings for home construction of this bird, I obtained a brochure with a set of three-views, a beautiful cutaway drawing, and two excellent pictures. This was all I needed to develop the model to the scale that I wanted, so if you are looking for a sweet-flying, docile scale trainer, this

will fit the bill perfectly.

The construction is simple and straightforward, so no lengthy explanation of how to glue piece x to former y is necessary. A few hints should prove helpful. With seven degree dihedral, ailerons are absolutely not needed, but they can be added, if desired. The outlines are provided on the plan and there is ample room for an S-4 Servo in the wing root bay. If ailerons are used, be sure to reduce the dihedral to one degree. I did not cover the center section, leading edge, or tip with sheet balsa, but you may do so if you wish, as pointed out on the plans.

The real key to success with the Luton is a sturdy, true wing mount. Make accurate bends with 3/32" piano wire and insert the tips into 1/4" sq. brass tubing at the top. Securely bind and epoxy the bases of the struts to the plywood plates on the fuselage. Now bind the 1/8" brass tube which makes up the front leg of the forward strut to former 3 as shown and epoxy well. When dry, bind with fuse wire to the 1/4" sq. brass tubing and solder well. This fits snugly into the 1/4" groove formed on the bottom of the butt ribs of the wing, which is attached by nylon shear bolts. I made the wing struts from 1" streamline strip aileron stock picked up at the local hobby bazaar.

Although I have used two degree downthrust, three, or even four, degrees might be an improvement. Cover the turtle deck with silk, along with the rest of the model, and furnish in your favorite color scheme. My first model was white trimmed with blue, and the current RC job is light gray with blue trim and dark blue registration numbers cut from MonoKote. Insure true alignment. A scale seat over the servos to keep out the oil and "goop" is suggested. Keep the control movement to only about five degrees each way, since the surfaces are quite large and effective. Balance the model at about 30% MAC and it is ready to go.

Be prepared for one of the most delightful models that you have ever flown. It's stable, forgiving, and beautiful in flight. The takeoffs and landings are smooth, and the plane has a remarkable adaptability to rough fields, school yards, parking lots, and the like, from which we members of NVRC are having to fly these days.

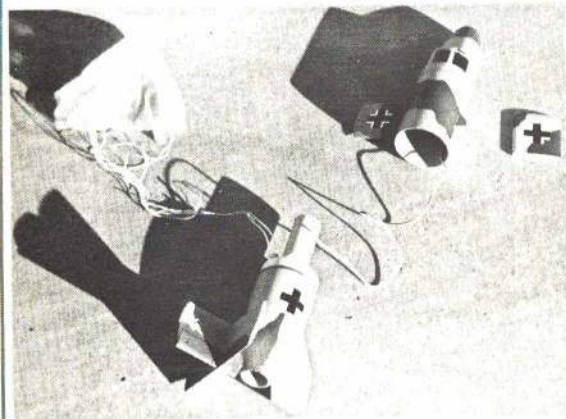




Differential rudder and elevator used on real plane. It was launched vertically.

# Natter

Nose cone ejects to deploy chute. Model might make a hot boost glider.



**NATTER ("VIPER")**  
W.W. II EXPERIMENTAL  
ROCKET INTERCEPTOR  
SCALE: 1/28  
BOB WOODS '70

Model of experimental rocket-driven German interceptor sheds its stubby wings at launch.

## BOB WOODS

THE NATTER (German for viper) is an example of the desperation weapons put together by the Germans in the closing days of WW II. As a workable weapons system it was a complete failure. When the program closed, it had killed one German and probably had not cost the Allies as much as one sleepless night.

The objective was to produce a cheap interceptor which could be flown by inexperienced pilots against bomber formations. Construction cost was minimized by using an all-plywood airframe which could be built in approximately 600 man-hours. The only component of any real value was the liquid-fueled sustainer rocket engine. This, along with the pilot, was to be parachuted to earth after the mission was accomplished. The rest of the aircraft was to be expendable.

The Natter was launched by a method quite similar to that used by model rockets today. A pair of 50-ft. vertical guide rails steered the aircraft by means of lugs on each wingtip. A pair of JATO bottles were used, in addition to the sustainer engine, during the launch. These were mounted well aft, on the horizontal centerline of the fuselage. In order to clear them, a high-mounted stabilizer was used. This gave the tail

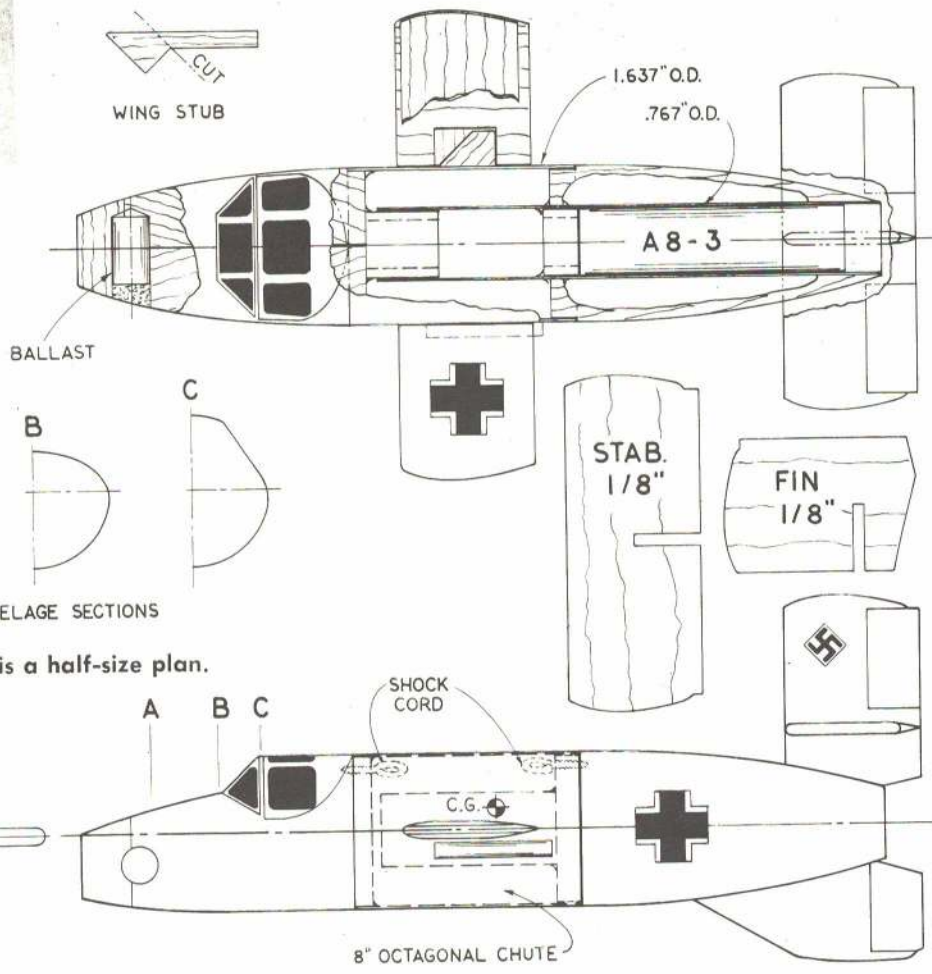
group its characteristic cross shape.

Since the airframe was to be allowed to crash, no landing gear was fitted. This made it practical to use a ventral fin. It appears that differential movement of the upper and lower rudders was used instead of ailerons to accomplish roll control. This provided an ingenious solution to a number of problems. The wing structure could be stronger since it was not necessary to break it to provide space for the control surfaces. It was also easier to build since internal access was not required. In addition, the adverse yaw effect due to ailerons would not be present. This meant that the aircraft could be flown by a poorly-coordinated pilot.

The relatively untrained pilot was to be given another advantage. In order to simplify gunnery he was, in effect, provided with a shotgun. Armament took the form of a battery of 28 small rockets which were to be fired in salvo from short range. These rockets were mounted flush with the flat-plate nose bulkhead, another feature which gave the aircraft its very peculiar appearance.

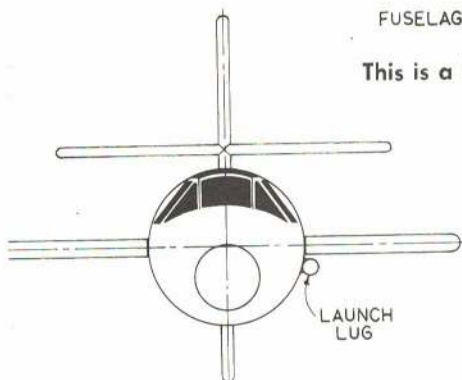
A number of tests were performed in which four JATO units were used in

(Continued on page 82)



FUSELAGE SECTIONS

This is a half-size plan.



# Starting Made Easier

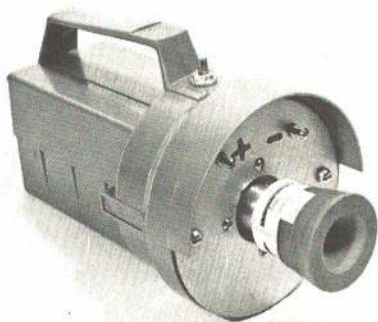
Make your own self-contained starting gear  
from off-the-shelf components.

ED SWEENEY

Photos by Frank Pierce

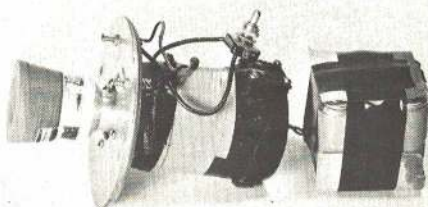
STARTING A GLOW-PLUG model engine is always a chore, but it can't be avoided! Many fine commercial products are available to make this step easier. Among them are glow-plug clips, batteries, electric starters, recoil-type starters, etc. Home-made equivalents also are suitable. The Editor has developed those shown here for his own use. At the field many modelers have commented on them favorably and so they are presented, along with instructions for making them or for obtaining the parts used.

(1) Self-contained lifetime built-in rechargeable booster battery. Retail price of this Sonotone 2.5V flashlight battery is about \$20. It is intended to replace two D cells in a flashlight and has two 1.2 ah NiCad cells with internal charger and prongs for plugging into the house



Stylish Sears lantern case houses 14.4V NiCad pack, surplus 12V aircraft motor.

More time between charges possible with higher capacity battery and small motor.



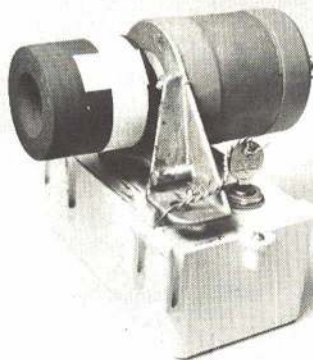
AC line. A plastic cap covers the prongs and offers the positive terminal when in use. With the cap removed, the battery can't be shorted out.

In model use the voltage is dropped by means of a one-inch length of nichrome wire in series, with the negative terminal located inside a fiberglass tube taped beside the battery. The length of the wire should be adjusted to give exactly 1.5V output under load (attached to a typical glow plug). The positive lead is attached to the cap so that it swivels on a 4-40 bolt to permit screwing the cap onto the battery. The cap is removed when the battery is not in use, thus preventing any chance of shorting the cells while in a tool box.

I normally get two weekends of flying between chargings. A period of 48 hours for charging is adequate, but a longer period is not harmful, due to the low charge rate. Source is any major Sonotone dealer. Mine are still going strong even after two years of steady use.

(2) The stylish-looking electric starter is a Sears lantern-flashlight plastic case which houses a 12V surplus motor with a pack of 1.2 ah NiCads, giving 14.4V output with no load. The motor is mounted on a plywood disk. Charging is via the front terminals marked plus and minus. The only disadvantage of this unit is that it must be charged every week. Current drain is quite high when turning over a cold 60 engine. Also, 12 NiCads are rather expensive. An ACE RC heavy-duty charger is needed to recharge at recommended rates. It is most effective for starting Goodyear racer motors of the high-

Long-lived, readily available — Toro lawn mower starter, battery, and charger.



2.5V Sonotone pack has built-in charger. Simple conversion to glow-plug lighter.

revving 40 variety. No doubt, the idea can be improved on with smaller but powerful motors and the larger-size NiCad batteries. The batteries used in the next electric starter described are better because they are designed for high-discharge rates and are sold as a pack for operating a 12V motor.

(3) Toro is a well-known manufacturer of lawn mowers. Recently they offered an electric-start option for their four-cycle-engined rotary mowers. After looking at one with envy, I found that the battery, motor, and charger were available at a local distributor. Retail price is listed as \$56 for all the parts. They make an ideal combination, and little work is required to set it up (photo shows how). The motor's mount is screwed to the battery case top. The key switch is modified by removing the spring inside so that the switch now stays on when the key is turned. It must be turned off manually. With the key removed, there is no chance of inadvertent operation.

The motor has an unusual shaft since it is intended to drive a Bendix assembly to get the lawn mower started. Unfortunately the rotation is backwards for model plane application, or else the Bendix feature could be used. So, a Sears drum sander assembly, which normally is chucked in a lathe or electric drill, was obtained and fitted to the starter motor. It just happened to fit perfectly and is retained by a nut on the threaded end of the long motor shaft. The black rubber extends beyond the nut and is coned to fit a propeller spinner.

This starter is also useful for starting RC glow-engine-powered racing cars. Leads from the battery and switch are routed directly to the motor. The plug which normally attaches to a chord on the mower is used for attaching the charging lead. The NiCads inside are very-heavy-duty high-discharge rate units. They last for several weekends of use with big 60's and racing 40's. Recharging takes overnight but indefinite charging is still not harmful.

Although the Toro has ample power and battery capacity for a weekend of flying or car starting, there is space in the case for more or larger size cells. Alternatively, one could mount the charging unit inside and have an AC cheater cord plug in the side for even more convenience.

# Need more Power?

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**\$59.95**  
BORE — 1.000  
STROKE — 1.000

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Do you have one of these models? Install a Fox 78RC and come up to **Stage II** in flying pleasure.

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SHERLOCK — Lear Jet  
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the motor for power hungry RCers.



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Convert your model airplane engine for marine use . . . easily . . . instantly . . . neatly . . . with the

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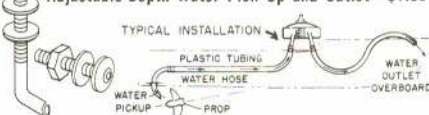
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ENGINE	SIZE	ENGINE	SIZE
Enya 15 & 19	3	Super Tigre 15 & 19	3
Enya 60	12	Super Tigre 29	6
K & B 19	4	Super Tigre 60 & 65	12
K & B 29 & 40	7	Veco 19	4
OS Max 15	1	Veco 29 & 35	6
Rossi 60	11	Veco 45	10

To determine the size of Kool Klamp for engine not listed: measure diameter of cylinder head and the no. of 1/16's over 1" is the size to order.



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## Toothpick

(continued from page 25)

wood) makes the airplane turn better, but it loses some of its flat-out speed. With a Top Flite 9-7 wood, more flat-out speed is gained but the airplane does not turn as well. What is really needed is a propeller somewhere between the two. So I finally settled on a Rev-Up 9-8, which works very well with the Fox 36xBB using Missile Mist fuel.

It is important to get the feel of one of these 125 mph bombs before entering a contest. I learned that the hard way. My technique was to come under my opponent inverted to get the kill but, not being familiar with the Toothpick, I repeatedly kept going through the middle of other fliers' airplanes! Do get to know the airplane before it chews up all the opposition! Combat will always be "kill or be killed."

The Toothpick was designed for the lazy combat flier who doesn't have much time to build, or doesn't much like to build, but loves to fly combat. Start by cutting out the ribs and half-ribs. Split a piece of 1/16 x 3 x 36" balsa in half for the TE. Pin the bottom half of the TE down to a flat board with a sheet of wax paper between them. Glue down all of the ribs to the TE except the two pacifier ribs, then attach the LE and let dry.

Pull the structure off the board and add the two pacifier ribs. Add the top of the TE, making sure everything is straight. Cut out the wing tips and the motor mount and glue in place. When dry, add all of the spars except the top one on the inboard panel. After covering the bottom center section, cut out and assemble the booms and stabilator.

Set up the controls according to individual preference. I highly recommend using the nylon bellcrank and control horn, which make the controls work much more smoothly and do not wear as metal ones do. The Kwik-Link push-rod is better than wire because it is adjustable for changing the amount of throw on the stabilator. It also eliminates all shoulder joints in the control system.

After the bellcrank is mounted on the 1/8" plywood mount and all necessary control adjustments are made, attach the bellcrank to the structure with white glue. Be sure to put the piece of balsa behind the pacifier tank area and, when dry, add several coats of dope making sure it is smooth. Plank the top, then drill the holes for the engine and install 4-40 blind nuts.

Sand the LE and make a smooth airfoil. After sanding the entire structure smooth, give it a coat of dope. When it is dry, sand it smooth again. I cover my planes with red silk, but super MonoKote would do just as well. The transparent kind gives a fantastic finish.

The Toothpick should weigh around 15 1/2 oz. Mine are built with Franklin's Titebond glue, which is a little heavier than regular cement. Titebond also helps keep the plane together should it hit the ground straight in. One Toothpick has done this, but the only damage was a dirty engine and broken planking on the pacifier rod. Another Toothpick survived a mid-air collision directly in the center section.

Once the Toothpick is finished, sharpen up your reflexes and give it a go. I'm sure you will find it fun to fly and an excellent contest machine.

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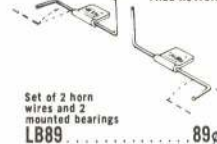
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Set of 2 horn wires and 2 mounted bearings **LB89** ..... **89¢**

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The up-to-date way to fasten wings to fuselage. "No Noise" Nylon bolts and Nylon threaded blocks.

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**DU-BRO KWIK-LINK CLEVIS**

The tried and true spring steel clevis used on the Du-Bro Kwik-Link. Ideal for any control linkage. Cat. No. KL-75



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### GEAR STRAPS—GS25

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**Strip Aileron Horn Wire CONNECTORS—AH79**

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Each set contains 2 Dura-Collars, 2 slot head set screws, 2 horn connectors **AH79** ..... **79¢**



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Rugged cadmium-plated brass. Threads will not strip. Complete with set screws and Allen wrench

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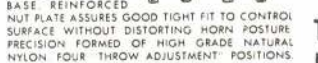
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2 632 BLIND MOUNTING, STEEL NUTS. REQUIRES LESS SPACE—SETS UP FAST POSITIVE MOUNTING. RG-75 12 PIECES **75¢**

**LONG WRENCHES** Allen-type for those hard-to-reach places. Fits all Du-Bro socket head cap screws. Fine for bench and field box

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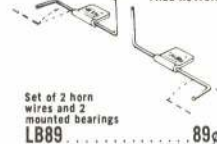
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Complete set of 22 pieces **ONLY \$1.25**



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12 pieces **ONLY 25¢**



**Strip Aileron Horn Wire CONNECTORS—AH79**

These natural nylon fittings simplify servo link hook-ups. **NO NOISE**



Each set contains 2 Dura-Collars, 2 slot head set screws, 2 horn connectors **AH79** ..... **79¢**



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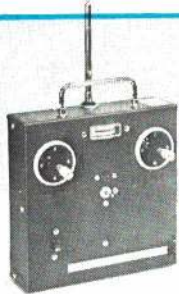
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## SERVO NOTES

The S-4C replaces the S-4, S-4A, S-3 servo and works with Controaire, M.A.N., O.S. Digital Systems. The S-4B works with World Engines Blue Max Systems, Mule Digital, Digit Migit 3 Ch. and most other 4.8v center tap system decoders. The S-4D is very similar to the S-4C but is recommended for systems using SCS Decoders.

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## SERVICE EXPERTS

The service experts listed in this advertisement are, for the most part, people who have been working with Digitrio and other kit systems in the various areas mentioned. They have all put together an M.A.N. System from a raw kit and have agreed to stock parts that are compatible with World Engines Systems. They have been given schematics of World Engines Systems and current OS Digital Proportional Systems. Many of these service experts service other makes of equipment other than our own. Consider these people for repair work or for help in matching up our flight packs.

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INTERESTED IN JOINING A.M.A.? Over 32,000 did in 1970. Membership details may be had by requesting FREE BROCHURE from above address.

## 1970 Masters RC Team Selection Tournament

By Frank Schwartz  
AMA Dist. V Associate V.P.

**The Drama.** A U.S. team had lost the last World Championships, for the first time, after winning all five previous meets. The 1970 U.S. Team Finals was to pick the next team, hopefully to prove next year that our guys are still the world's best. The Finals competition was expected to be tough, but the big unknown was whether the previous team members would end up on top or if some new blood would replace them.

Among the contenders was **Ralph Brooke**, already twice World Champion. There was also **Larry Leonard**, RC Champion of the two most recent National Model Airplane Championships. And there was **Don Coleman**, winner over previous team members only two weekends before on the same field, at the Memphis Labor Day Meet. Altogether there were 23 others, besides the 1969 team, competing for a chance to represent the U.S. at the 1971 RC World Championships. All were good—they had already proved their abilities at other meets—but this was the showdown, and the pressure for perfection was greater than for any meet except the World Championship itself.

Besides the question of whether the old team would hold off the competition, some new factors were involved: airplanes were generally heavier, and most were complicated by retractable landing gears which promised better performance but also grief if malfunctions occurred to cost take off or landing points. Also, the weather—usually taken for granted—suddenly threatened to dominate the outcome with unseasonable cold, wind

and rain.

Two days of speculation came to an end at Memphis, Tenn., September 26-27, with the '69 team still on top. However, an interesting switch occurred as **Ron Chidgey**, the '69 Team Manager, displaced **Jim Kirkland** for third place. Jim, in turn, beat out **Doc Edwards** for the first alternate position—Doc had that spot with the previous team.

**Jim Whitley** won big—he was second in the first round and first during each of the final three rounds. **Phil Kraft** was right behind him, finishing very strong with the highest scoring flight of the meet in the last round. Chidgey did what is becoming his usual thing—flying late and coming from behind to win out at the last minute. As in the 1969 Masters RC Tournament, when he flew last and won the meet, Chidgey flew last at Memphis and jumped from ninth place at the end of the third round to make the team on the final flight of the meet.

**The Contest.** Activities for the flyers and officials began on Friday night with a meeting to brief the judges and flyers which was opened by **Torrey Williams**, president of the hosting **Memphis RC Club**. The main portion of the meeting was conducted by **Maynard Hill** who previously had organized and lectured at the first International RC Judges School. Maynard spoke on the criteria for judging, which was welcomed by both the flyers and judges, as he cleared up many points that previously had been vague.

One problem which brought forth some sharp discussion was the runway

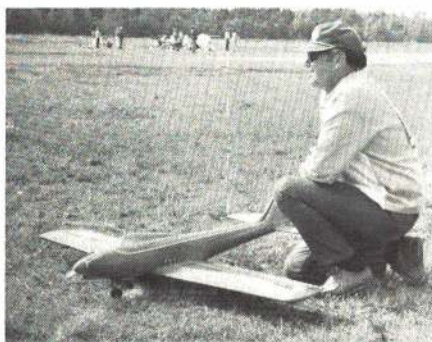


1971 RC Team members all come from warm climes: (L-R) Phil Kraft from California, Jim Whitley, Alabama, Ron Chidgey, Florida.

length which was shorter than that to which most flyers had been accustomed. Earlier in the day some of the contestants had been practice flying and, since brakes are not particularly necessary in FAI scoring, it was learned that some were having difficulty with overruns into some rather bad terrain.

The problem was solved easily enough. The landing circle, originally placed in the center of the runway, was moved to the upwind end of the runway. It should be noted that none of the flyers in the competition over-ran the runway, although there were a couple of hairy landings in the gravel rather than on the hard-top.

Prior to the flying on Saturday morning there was a short briefing of the judges. Then, a proclamation by **Mayor Henry Loeb** of Memphis was read by one of the city officials proclaiming Saturday and Sunday as Model Aviation Days. After the playing of the National Anthem, the Masters RC Team Selection Tournament was officially opened.



Left: Top man Jim Whitley flew a Webra-powered Daddy Rabbit VI, the third design modification since the Nats. Don Coleman pits. Center: Sleekness trend is exemplified in Phil Kraft's Super Fli. Right: Like most, Ron Chidgey's model, held by Jim Kirkland, used retracts.

At this time the sky was overcast, and by 10 a.m. the flying was halted due to heavy rains. The flyers huddled in the tents waiting out the rain, only one-third of the first round having been flown. Official flying was recessed until 12:30, and as fate would have it, the rain stopped before that time, allowing some demonstration flights by Memphis RC Club members. Rain threatened again as the round was resumed, and when it was well underway, flying had to be interrupted again. It was mid-afternoon before Round One was completed, and due to continued rain, further flying was cancelled for the day.

One can imagine the consternation of the flyers, many of whom had come long distances to compete, but this is one of the hazards that every contest involves. A cold front had come through Memphis from the northwest; ahead of it was considerable rain and some heavy showers.

The rain did not dampen spirits, as a rousing dinner was held at **Marshal Robilio's** fine restaurant. (Marshal is a member of the Memphis RC Club.) The contestants, their families and friends, officials and interested visitors all partook. A large variety of food was placed before us, and many—who shall be nameless—went back for large second helpings. I know, for I was in the second line, myself! Contest Director **Buddy Hord**, of the Memphis RC Club, MC'ed the festivities which followed. Short talks were given by **John Patton**, AMA president, **Walt Schroder**, MAN publish-

er, and others. **Maynard Hill** amused all with anecdotes from earlier international events.

The flying was to resume at 7 a.m. on Sunday. On arrival at the field it was found that the temperature which had dropped during the night remained low in the morning. The judges were wrapped in blankets, and those fortunate enough to have thought to bring jackets found them well worth the trouble.

Before going on, the judges should be praised for their good work. There were ten of them from all over the country, five for each flight line, and only the best can be said for them and their scoring under very difficult circumstances. They were tough but fair—theirs was the hardest job of all.

At seven on Sunday morning, with unseasonably cold weather, a steady breeze and cloudy-to-clear skies, the flyers began. The chill air had a substantial effect on the entrants who did not use electric starters, and there were quite a few. Engines that had started with the first flip during the hot summer days began to get balky—an irritant which might have rattled some of the flyers who were under extreme pressure trying to get in good flights.

Round Two was the first flight of the day for each entrant, and almost without exception first round scores were bettered. Round one was flown under such difficult weather conditions that scores were bound to be low. By the end of Round Three the scores were leveling off, the leaders being **Whitley**, first;

**Kirkland**, second; **Kraft**, third; and **Jim Martin**, fourth.

During Round Three, Jim Martin's muffler came apart, causing the rear of both prop blades to go as well. Jim did a fly-by to see if he could detect any damage or vibration, but the airplane was flying so well that he continued. Not only did he have the fastest turning engine of the meet and what appeared to be the fastest flying plane, but he turned in the highest single flight score of the first three rounds!

Originally it was planned to have three rounds of flying on each day, six rounds total, with the best three scores being totalled for final place position—but the first day's rain put a damper on this. After the conclusion of Round Three, officials announced that Round Four would be the last. The scores at this point were so close that it was still very much an open contest. Every flyer was going to have to put his best efforts into his last flight.

Perhaps it was the tremendous pressure the flyers were under—whatever the reason, it seemed that more maneuvers were "blown" than at the earlier Glenview Nats. Particularly troublesome were the Three Turn Spin and the Figure M. Even some of the most accomplished flyers bounced some landings, and more than one Top Hat wandered off in a rather odd angle as compared to the entry.

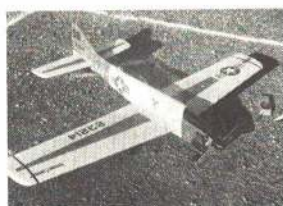
By 3:30 in the afternoon Round Four had been completed, and the scores were being tabulated. Since the scores had been so close it was hard to guess who the winners would be. To relieve the tension and provide some action for the spectators, demonstration flights were put in by **Ralph Brooke** and **Ted White**, who both did some fantastic flying. (By the way, on Brooke's Round Four flight, when his front retract wheel failed to extend, he was heard to call out a three-point landing: "two main wheels and muffler!")

The seven runners-up were announced first, beginning with number 10. **Ted White**; then **Dan Carey**, 9th; **Jim Martin**, 8th; **Larry Leonard**, 7th; **Norman Page**, 6th; **Jim Edwards**, 5th; and **Jim Kirkland**, 4th.

Next, the first place winner, **Jim Whitley** was announced. Jim had flown a fourth round of 7,885 points, bringing his best three total to 22,835. Second was **Phil Kraft**, whose last flight of 8,100 points was the highest scoring single flight of the meet, with a three-flight score of 22,340. Then **Ron Chidgey**, the third place winner, was called and roundly cheered. Ron had turned in a last flight score of 7,935, bringing his best three score to 22,050. The other contestants were aware of how hard Ron had tried and how often he had come so close to winning at previous Team Trials and the Nats; they were happy for him at this moment. **Jim Kirkland**, in fourth place, had best three score of 21,975, and to illustrate the closeness of the contest, tenth place man **Ted White** had a best three score of 21,070!

The three winners, who will comprise the 1971 U.S. RC Aerobatic World Championship Team, were presented with bronze medals, suitably engraved and hung on colorful ribbons.

**Observations.** There was not a single contestant in this Masters RC Team Selection Tournament who was not capable of winning. The flying by all was superb,



Three strong contenders for U.S. team spots—(L-R) models of Don Coleman, Ralph Brooke and Tony Bonetti. Webra engines predominated, while radios were mostly Pro Line and Kraft.



Jim Martin, left, placed 8th with Webra-powered Eye Ball, Pro Line radio. Only two entries were lighter than Ed Keck's 113 oz. Star Fire, right, a real accomplishment with retracts.



Left, John Dougherty with original entry. Right, Phil Kraft was the lucky raffle winner for Bob Lopshire's original souvenir program art. Lopshire is AMA's Public Relations Director.

giving every indication that our team should do extremely well in the World Championship.

The great majority of the contestants used retractable landing gears—few used brakes. Most of the models were original designs—very few kit planes were evident. One, however, was a Lanier ARF which did a good job in the hands of **Hank Walker**. Pro-Line equipment was predominant, with Kraft a close second. There were a few EK Systems and one Royal and one Galaxy.

It was gratifying to see the spectators on Sunday and find that the news media of Memphis covered the tournament. As a matter of fact, the radio stations in the home town of the author, Nashville—200 miles from Memphis, carried stories of the event. This kind of publicity for our sport is good for our public image.

**Behind the Scenes.** The 1970 Masters RC Team Selection Tournament was a joint effort which was an excellent example of how national and local organizations can work together. The event proved that a local AMA chartered club and AMA national officers is an effective combination.

The **Memphis RC Club** provided the flying site, facilities and basic personnel, including a great Contest Director, **L. T. "Buddy" Hord**, and a dynamic club president, **C. Torrey Williams**. From the national scene came AMA's upper echelon of officers to coordinate and aid the local effort: **John Patton**, AMA president and FAI RC Subcommittee chairman; **Maynard Hill**, AMA-FAI coordinator and secretary to FAI's Committee for International Aero Modeling; **Tom Rankin**, AMA's RC Team Selection Program administrator. Lending further support were AMA's Public Relations director, **Bob Lopshire**, and **John Worth**, executive director.

Attendance of the national AMA officers, and the 10 judges who were selected to represent various sections of the country, was made possible by the **Radio Control Industry Association**. Donations by RCIA member-firms provided a travel and housing fund for the officials. The fund-raising effort was led by RCIA President **Len Purdy**, Vice-President **Walt Schroder**, and Executive Director **Gail Jacobson**—all were present at Memphis, adding to the national representation.

Judging at Memphis were **Rudy Black** (Del.), **Sam Crawford** (N. Calif.), **Jack Josaitis** (Mich.), **Dave Lane** (S. Calif.), **Arnold Lipschutz** (Del.), **Travis McGinnis** (Mo.), **Dick Patton** (Ala.), **Bob Reuther** (Tenn.), **Larry Sartor** (Okla.), and **Bob Upton**, (S. Calif.).

RCIA sponsors: **American Aircraft Modeler**, Washington, D.C.; **Andrews Model Aircraft**, Danvers, Mass.; **Carl Goldberg Models**, Chicago, Ill.; **DeBolt Model Engineering**, Buffalo, N.Y.; **Dee Bee Models**, Pitman, N.J.; **Du Bro Products**, Wauconda, Ill.; **E. K. Products Co.**, Hurst, Tex.; **Flying Models**, Ramsey, N.J.; **K & B Manufacturing Co.**, Downey, Calif.; **Kraft Systems**, Vista, Calif.; **Lanier Industries, Inc.**, Oakwood, Ga.; **Midwest Products**, Hobart, Ind.; **Mini-Flite Company**, Red Bank, N.J.; **Model Airplane News**, White Plains, N.Y.; **RCIA—G. Jacobson**, Atlanta, Ga.; **R/C Modeler**, Sierra Madre, Calif.; **Sullivan Products**, Willow Grove, Pa.; **Su-Pr-Line Products**, Plainfield, Ill.; **Top Flite Models**, Chicago, Ill.; **World Engines**, Cincinnati, Ohio.



Key 1970 RC Masters officials: (L-R) Torrey Williams, Memphis RC Club president; Tom Rankin, team program administrator; Buddy Hord, Contest Director, MRCC V.P.; Maynard Hill, AMA-FAI Coordinator; John Patton, AMA President. Patton, Hill and Rankin formed the Jury.



Left, Ed Izzo's finish was beautiful, reflecting both U.S. flag color and motif. Right, Don Lowe with his Phoenix V. All engines in the team finals were muffled as per FAI rules.



Attendance of 10 RC Judges from all over the country was made possible by Radio Control Industry Assn. member contributions. Poor visibility restrained operations on the first day.

## Official Results 1970 Masters RC Team Selection Tournament

Pl.	Entrant	Round One	Round Two	Round Three	Round Four	Best Three
1	Jim Whitley, Decatur, Ala.	6865	7445	7505	7885	22835
2	Phil Kraft, Oceanside, Calif.	6610	7200	7040	8100	22340
3	Ron Chidgey, Pensacola, Fla.	6425	7265	6850	7935	22050
4	Jim Kirkland, Valparaiso, Fla.	6840	7190	7080	7705	21975
5	James Edwards, New Albany, Miss.	6400	6945	7210	7760	21915
6	Norman Page, Mt. Prospect, Ill.	5685	7105	7330	7480	21915
7	Larry Leonard, Northridge, Calif.	6330	7400	6910	7595	21905
8	James Martin, Bloomfield, N. J.	6185	6820	7735	7330	21885
9	Dan Carey, Ft. Worth, Tex.	6005	6975	6895	7320	21190
10	Ted White, Albuquerque, N. Mex.	6915	7150	6480	7005	21070
11	Ralph Brooke, Seattle, Wash.	6585	7115	6965	6875	20955
12	Doug Spreng, Vista, Calif.	6205	6190	6920	7510	20635
13	Lewis Penrod, Handsboro, Miss.	5810	6625	6325	7270	20220
14	Don Coleman, Citronelle, Ala.	6215	6060	6880	7030	20125
15	Tony Bonetti, Hackensack, N. J.	6165	5535	6495	7125	19785
16	Henry Walker, Annandale, Va.	5240	6285	6650	6810	19745
17	George Hill, Annandale, Va.	4900	6150	6325	6845	19320
18	Whit Stockwell, Encino, Calif.	5445	6085	6140	6795	19020
19	Ed Keck, Webster, N. Y.	4350	6220	6730	6065	19000
20	Lloyd Nicholson, Denver, Colo.	4530	5930	6500	6500	18930
21	Don Lowe, Dayton, Ohio	5020	5570	6650	6685	18905
22	Alan Dupler, Millersport, Ohio	5250	5540	6550	6615	18705
23	Ed Izzo, Skhaneateles, N. Y.	6820	6290	6105	6220	18615
24	John Dougherty, Jr., College Hts., Ark.	435	5660	6205	6250	18115
25	Edward Dreese, Broadview, Mont.	4490	4955	5505	6610	17070
26	Gail Jacobson, College Park, Ga.	3915	1335			5250

# AMA News Bits

## RC Judging Improves Flying

In urging new enrollment in the Judging Classes organized by the AMA chartered McDonnell RC Club, President John Rawlings cited the example of Gene Jones. When Jones first joined the club he was a bit erratic with his flying, and this cost him several airplanes. Then he volunteered to act as a judge, joined the class, was one of the instructor's severest critics, and "graduated" to judge at the club's 11th annual contest. Since then he has made tremendous strides in advancement of his flying quality, and he is now bringing home trophies and hardware from contests. The important observation is made by Rawlings: "Nearly everyone in the hobby would like to be a winner of trophies, but this requires practice and a knowledge of the maneuvers. The quickest way to learn this is by judging others, seeing what they do wrong and thereby knowing how to achieve winning perfection." Rawlings' message was contained in *Carrier Wave*, the club's newsletter, edited by Al Signorino.

## FF Winternationals

The Free Flight Association of Model Airplane Clubs of Southern California (FFMAASC) is well along with plans to stage a big FF Winternationals at Taft, according to reports from several sources. Impetus for this is the expected location in Glenview, Ill., of the AMA

Nats for the next few years. Tentative dates for the First FF Winternationals are February 13-14, 1971. The plan is for each of the FFMAASC member clubs to each run one or two of the events in a big cooperative effort.

## RC Gain is CL's Also

Members of the AMA chartered Greater Pittsburgh Aero Radio Control Society are now flying at the new Hillman's Model Airport provided by the State of Pennsylvania, which was dedicated on October 4. What's happening with the ARCS' previous field, you ask? It is getting good use, for the ARCS voted to turn it over to a local area Control Line club. The CL group has fenced the field which, in addition to the safety it provides, prevents further RC flying which might cause interference at the new field. This information was in Phil Catanzaro's column of the club's *Fly Paper* newsletter, Karen Dempler, editor.

## Indoor Program Administrator

Bud Tenny (Box 545, Richardson, Tex. 75081) has been appointed by AMA President John Patton to be Program Administrator of 1972 Indoor World Championship Teams. The job, for which Tenny is imminently qualified, involves determining the nature of the team selection program and supervising its being carried out. Clarence Mather was the previous Indoor Program Administrator.

## Canadian RC Nats

When the dates for the 1970 AMA Nats were changed, this resulted in an unavoidable overlap with the Canadian RC Nats at Sault Sainte Marie, Ont., on August 1-2. Nonetheless, the contest was well attended and enjoyed by all. The winners were as follows:

**Class A:** 1. Jim Boyd, Gowanstown, Ont.; 2. Garry Titze, Dryden, Ont.; 3. Ted Highnell, Clarkston, Ont.

**Class B:** 1. Keith Brown, Stoney Creek, Ont.; 2. Robert Harris, Brantford, Ont.; 3. Charles Mills, Chatham, Ont.

**Class C:** 1. Ivan Kristensen, Guelph, Ont.; 2. John Frazer, Pontiac, Mich.; 3. Gerard Shaw, Orillia, Ont.

**Class D:** 1. Warren Hitchcox, Oakville, Ont.; 2. Len Roe, Genison, Mich.; 3. Jean Rivard, Montreal, Que.

**Scale:** 1. Frank Knowles, Guelph, Ont., Nieuport 17-c-1; 2. Fred Brydges, Guelph, Ont., SE-5a; 3. John Klassen, Thunder Bay, Ont., DeHavilland Chipmunk.

Host to the Canadian RC Nationals was the Soo Modellers Radio Control Club, a charter club of the Model Aeronautics Association of Canada.

## FGMC Disaster

The contest trailer of the AMA chartered Fresno Gas Model Club, California, was virtually reduced to kindling wood when it was being towed home following the club's June contest. Bill West, FGMC president, was hauling the trailer behind his pickup when a terrible wind gust blew over the trailer on the highway, and it tumbled end over end down the road shoulder. Fortunately no damage was done to Bill or his truck, but the trailer and its contents—stop



Larry Hacker's semi-scale Jodel D-150 has a slow, flat glide. Wing and tail surfaces covered with Fascal 710 Chrome Mylar, weighs 5 lbs., 6 ozs.—Veco .45 RC engine, Micro-Avionics radio. Dungan/Allen photo.



Price Dempler, 8½, helps AMA President John Patton during the ribbon cutting opening Pittsburgh's new Hillman's Model Airport in October. Also participating Ralph Penetti, left, and John Worth, right.



Curtis Motes, Bernie Coleman and Ron DeWees (L-R) were the 3rd, 1st and 2nd placers in the Cobb County RC Club Fun Fly in Sept. for power-assisted gliders, gaining in popularity. Phil Milam photo.



It's hard to imagine piloting a model steadily for more than 11 hours, but that's what it took for Robert Boucher's RC Malibu glider 187.6 miles to set a new Closed Course Distance FAI World Record.

watches, PA system, etc.—were completely destroyed, and contest papers were scattered to the four winds. The financial loss to the club is substantial. We are glad to already be hearing of contributions being received by the club from present and past entrants in the Fresno FF meets to help in replacing the watches and equipment. It's a good investment.

### 100 Club

We've heard of the 900 Club in FF (so named because a perfect string of five 3-minute flights equalled 900 seconds) but this number business in RC was new to us until we read a recent issue of *Crawfish Tales*, newsletter of the AMA chartered Acadian RC Club of Lafayette, La., edited by Ron Lawson. The Acadian group has instituted a "100 Club" within its membership which is a distinction that can be obtained only by taking one airplane and flying it (safely) for 100 flights. Flights must be made as a part of normal activity and last at least two minutes each. The club secretary records flights claimed at regular club meetings.

### CL Carrier Techniques

A recent issue of the newsletter produced by the Southern California Control Line Association, edited by Lynn Bowman, reports some interesting information about Navy Carrier ideas used by members of the AMA chartered Orange County Thunderbugs. For one thing they use walkie-talkies for the pit crew to communicate with the pilot. They count out laps, position the plane for landing, etc. Also, they use remote needle valves on their K & B engines to prevent breakage, and they carry nicad batteries

## Too Late to Renew AMA Membership without Losing Service, Magazines?

December 15 is the critical deadline. Owing to the publication lead time, the very least to be expected for members renewing after this time is that their March *American Aircraft Modeler* will reach them late. This is because the March issue is mailed in January, and the address tapes of AMA members are prepared for the publisher during the latter half of December.

Those who wait until after December 15 will have 1971 subscriptions initiated from scratch—just like new members,

with a six week lag in magazine renewing service.

The February AAM, which is printed and mailed in December, is the last magazine to be mailed to 1970 members—all 1970 AMA memberships expire December 31, 1970.

Renewal notices were mailed to 1970 members in early October. Any AMA member who has not received his bill for 1971 dues by the time this issue reaches newsstands should notify AMA HQ immediately.

**Thinking of joining AMA for the first time?** Right now (before December 15) is the best time to join because, by joining now, you will receive maximum value—12 issues of *American Aircraft Modeler* plus AMA benefits during each month of 1971. Use the handy form on page 61

aboard the planes to provide glow plug heat at low speed, thereby increasing dependability.

### RC Airport Improvement

From the newsletter of the AMA chartered Dallas RC Club we learn that the City and County of Dallas, Tex., were planning to pave the runway strips and vehicle parking areas at Samuel-East Park, used extensively by the club. The work may have been completed long ago, but there was the possibility that it might be delayed if the work could not be completed before Labor Day. The area should accommodate Pylon Racing or two separated flight lines of Pattern, assuming good traffic control. Great! We

join with the Dallas area modelers in saying thanks to the Park Department and all concerned.

### Troubles from Sweep Back?

Ralph Prey reported that most of the entries in the AMA sanctioned San Va-leers Annual FF Meet in June at Taft, Calif., were in good trim—far more so than at the beginning of the season. But an interesting observation he made in the *Satellite*, the club's monthly, is the models with swept-back leading edges were a bit on the "squirrely" side, having a tendency to dive and then recover after gaining flying speed. We don't take this as necessarily an indictment of this design feature in gen-

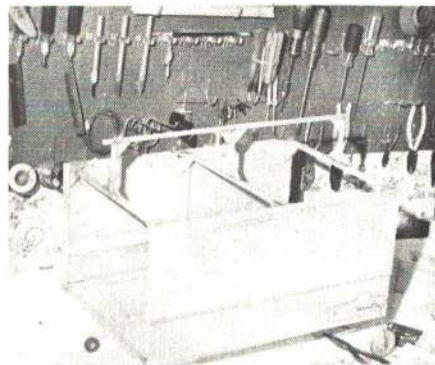


Josh Schwartz tests indoor helicopter in M.I.T. Armory, Cambridge, Mass. Herb Franck photo.

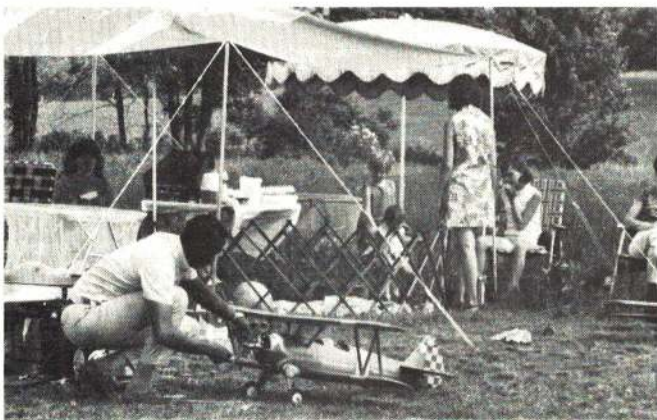


Orange crate race for real. Shirley Boretto, L, and Ethel Stalacher are putting together winning model on spot at Napa, Calif., meet. Top place for fun event went to first model completing five laps. Calvin Hull photo.

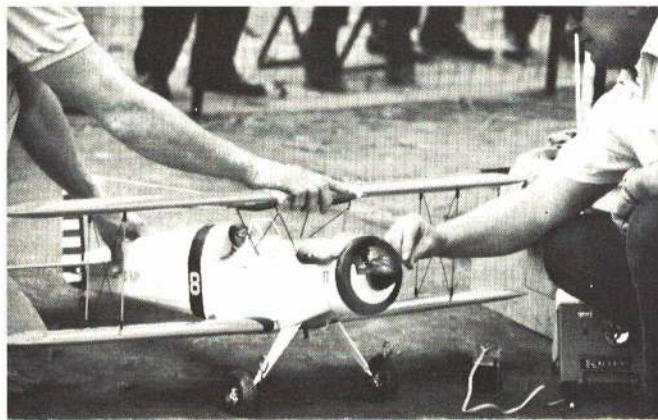
Below: "Now when she's about 50 feet out, ease in a little up," seems to be the last-minute instructions Bob Cleary is giving pilot Tom Duncan. Photo by E. E. Walker. Right: What's in the bag? Goodies Horrace Cain won in CL Stunt at Rockford meet. Handing out bag is Joe Hapanier. R. Ed Jordan photo.



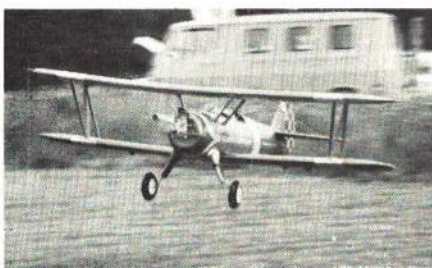
Left: Dan Wakerly, L, helps Phil Boretto hook up the rubber motor on his Easy B indoor model. Boretto is president of the Napa (Calif.) Air Phantoms Association. English photo. Above: Neatly stored tools form the backdrop for Snoopy's Dog House by Jim Talbutt, Chico, Calif., nearing completion. This one is a CL version. Photo by the builder.



Dick Carrol cranks Fox-powered Sterling PT-17 in photo above while, below, the model is pictured about to land. Flying was part of the Top O' N.J. RC Club Contest and barbecue. Charles O'Donnell photos.



Beautiful Aero Master RC model being prepared for flight, above, by Florian Kroll, Westchester, Ill.—in-flight photo below. Kroll is former president of the Aero Telemechanics. Jack Burns photos.



Pit area of the RC field used by the Simi Valley Fliers, Calif. Submitted by Don Scott.



eral, although Prey indicated that both experienced modelers and novices had trouble.

### RC Flyoff

Two exceptional flyers, **Tim Symes** and **Ralph Yount**, tied for first place in Class D Expert Pattern at the **AMA sanctioned Wavemaster Annual Contest** at San Jose, Calif., last June, resulting in a flyoff to sort out the top positions. "I feel this topped off two days of good RC flying," said Contest Director **Ken Wilson**. The spectators really enjoyed seeing the top flyers in such close succession.

### July 4 Celebration

"The New Quiet Sound of Model Aviation" was the theme of the **AMA chartered Indian City RC Club** used for its part of the July 4th parade at Wyandotte, Mich. **Walt George** and several other club members organized the effort, the highlight of which was the taxiing of muffled RC airplanes along the street (by **Walt George**, **Mike Patke**, **Alan Hickman** and **George Bargerstock**) while on a float were **Dick Falkenberg's** children in a real bed, supposedly sound asleep. This is a great way for a model club to participate in community affairs. Thanks to **ICRCC's Tom-Tom** for this info.

### Hands-Off Idle

One of the things that **AMA** rule makers have been kicking around as a possibility to return **RC Sport Pylon Racing** to its original concept—a race of basically aerobatic models—was tried in a contest last September by the **MARCS Club** at Mentor, Ohio. The idea simply is to start the races from a hands-off idle engine setting. **AMA** Contest Director **Frank Vidmar** says this is encouraging more beginners by curbing planes with super speed engines that won't idle. **Vidmar** also reports that the

¼ Midget Pylon Race, which his group has been promoting, is gradually gaining in popularity.

### CL Profile Stunt

Lots of modelers have been thinking about ways to bring new blood into the **CL Stunt** competitions. It seems that most are satisfied with the present **AMA** class, with its important appearance scoring, for accomplished modelers, but some feel that the appearance factor simply drives away newcomers. We won't try to settle the question, but we do want to report that **Profile Stunt** was an event of the **AMA sanctioned Queens Stuntmasters Second Annual Meet** at New York last September, for the first time, and Contest Director **Victor Macaluso** says that it appears to him that the **Profile** event is a fantastic way to draw more modelers into **Stunt**.

### Leased RC Field

At least for some time to come, the **AMA chartered Propbusters RC Club** of Rapid City, S.D., has licked the problem of "creeping civilization" by leasing a flying field a bit farther out. For \$10 a month the club's lease will be for use of a maximum of one acre for runway, pit area, etc., but it includes flying rights over hundreds of surrounding acres with virtually no flight hazards. This information came from the **Propbusters Newsletter**, edited by **Clark Besancon**.

### RC for FF Testing

Some of the most novel models at the **San Valeers Annual FF Meet** were those entered by **Wes Morris** of Phoenix. He had **RC engine cut-off** and **RC dethermalizer** which—since there was no other **RC** flying at the contest—he was able to use to good advantage in test flying. According to the **Satellite**, "There is no doubt that his models were trimmed to perfection and climbed the highest of

any other models in the meet." He won first in **A** and **C FF Gas** and placed fourth in **B**. No, he didn't use radio control for any official flights.

### Interesting RC Trainer Combo

**Aeronaut's Chatter**, newsletter of the **AMA chartered Eugene RC Aeronauts**, reports an interesting combination by **Brick McKelvey** for a training plane which has had good results. Most importantly, the plane and equipment are lasting from one session to the next. He is using a **Comet** with a **Lanier glider wing**—very slow and forgiving. The paper, edited by **Roger Breedlove**, reasons that the success of **Brick's** trainer has much to do with its size and speed. For one thing, it is much easier to see what a large model is doing. For another, control response with larger models generally is much slower. "The smaller ones invariably will do three snap rolls before you can even make an appropriate comment."

### Space Age Material

"Did you know that you build most of your models out of an exotic space age material?" asked **Chuck Anderson** in the **Air-Foiler**, newsletter of the **AMA chartered Coffee Airfoilers MAC**, Tullahoma, Tenn. "No, I'm not talking about fiberglass, plastics, **MonoKote**, etc. I'm talking about **balsa**. The early **Ranger** moon probes used **balsa** as a shock absorbing material for hard landing payloads on the moon. **Balsa** wood is also frequently used when a light, strong, insulating material is required. Recently, **balsa** was used to solve a heat transfer problem in a nuclear "bubble" chamber used to study atoms and subatomic particles (**Product Engineering**, July 6, 1970). Some of the reasons given for using **balsa** were linear conductivity decrease with decreasing temperature, high compressive and horizontal shear strength, ability to take up to 100% overload for short duration im-

pect loads, and light weight. Think about that the next time you cut out a wing rib!"

### Modeler for Heart Devices

Probably the position has been filled by now, but a few months ago Detroit's Sanai Hospital contacted the AMA chartered Indian City RC Club seeking to employ a prototype maker of mechanical heart devices to work closely with a group of surgeons and engineers doing animal experiments and to aid research toward the development of systems to aid the failing heart. "The skills required are those used in the making of radio controlled model airplanes," said Dr. Dov Jaron in a letter published in *Tom-Tom*, the club's newsletter edited by Bob Mayhew.

### Training School Demonstration

A letter from the director of recreation of the Boy's Training School at Whitmore Lake, Mich., a maximum security detention home for boys, attests to the enjoyment the youngsters received from a demonstration the AMA chartered Pontiac Model Airplane Club provided earlier. Included was John Frazer's twin engine RC model and Roy Pinner's RC Pattern model, but the real hit of the day was when 15 of the boys were given their first chance at flying the club's Control Line trainer. "This resulted in a great feeling of accomplishment for those boys," Director Verne Buehler said.

### Draw for RC Flight

Contest Director Alan Mey says that the Snohomish Air Races for Formula I was more for spectators than it was for an actual race. Associated demonstration flights showed all the phases of RC aeromodeling. A feature of the event sponsored by the AMA chartered Seattle Radio Aero Club was the drawing among spectators for a chance to fly an "Ugly Stick" on a buddy box. This really excited the crowd, Mey said. Several spectators flew, including one 3½-year-old who really had a ball.

### CL at Taft

With thousands of acres to fly at the Taft FF mecca, it's hard to imagine a CL ship doing loops, wing overs and overhead eights in that great expanse. But there he was, Walt Prey (son of Satellite Editor Ralph Prey) buzzing around his seven-year-old Nobler on Saturday evening, between the two-day AMA sanctioned San Valeers Annual FF Meet. Actually, he had a lot of interested followers who wished they had thought of bringing one along, too.

### More Photos Needed

Photos for reprinting in the "AMA News" section are beginning to be in short supply, and we would like to appeal both to "old faithful" contributors as well as to AMA members who haven't sent in photos before to do so now. All types are wanted—RC, CL, FF, Scale, Indoor, sport or contest. All sizes of prints are useful, black-and-white or color, including Polaroid prints.

Submit only prints which need not be returned, and on the back of each (or in an accompanying note) print descriptive information about the models and modelers shown, also the name of the photographer. No payment possible for photographs used, but full credit will be given. Send to Publications Director, AMA Headquarters, 806 15th St., N.W., Washington, D.C. 20005.

# OVER 32,000 JOINED IN 1970— 5,000 more than the year before! YOU can too!

## AMA\* Membership Offers:

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- competition privileges
- special discounts
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- official rules manual
- national recognition
- exclusive decals

**Subscription to American Aircraft Modeler** is included with AMA adult membership—includes AMA news. Subscription alone is worth \$7.50 (or \$9.00 if bought separately on the newsstands). Members under 19 can purchase the magazine at a special, low, AMA rate.

**Liability Insurance** is included with all AMA memberships. Bought separately, this insurance would cost more than the adult AMA membership fee. Coverage is for \$300,000!

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**Official Rule Book** included with all AMA memberships. This manual details the specifications by which different types of models are built and flown and clarifies most of the specialized model aviation terms—a real aid to understanding model magazine reporting.

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# CONTEST CALENDAR

## Official Sanctioned Contest of the Academy of Model Aeronautics

**Dec. 13—Van Nuys, Calif.** 2nd Annual Jumbo Rubber Scale FF Meet. Site: Sepulveda Basin, J. Bailey CD, 11161 Mansel Ave., Inglewood, Calif. 90304. Sponsor: Flightmasters.

**Dec. 13—Los Angeles, Calif.** (AA) SCIFS Year Ender for Old Timer Events. Site: Sepulveda Basin, J. Keller CD, 1800 Moore St., Simi, Calif. 93065. Sponsor: Southern California Ignition Flyers.

**Dec. 27—Fresno, Calif.** (A) Fresno's Monthly FF Contest. Site: Near Kernan, F. Gallo CD, 1725 Kenmore Dr., W., Fresno, Calif. 93703. Sponsor: Fresno Gas Model Club.

**Dec. 27-28-29—Winter Park, Fla.** (AA) Tangerine International RC Championships. Site: RCACF Field, W. Schoonard CD, 2080 Sharon Dr., Winter Park, Fla. 32789.

**Jan. 24—Aurora, Colo.** (A) MMM Indoor Meet. Site: Hinkley High School, G. Bariuk, Sr., CD, 2945 So. Teller St., Aurora, Colo. 80027. Sponsor: Magnificent Mountain Men.

**Feb. 7—Green Bay, Wisc.** Winter Polar Bear FF Meet. Site: Frozen Green Bay, R. Cowles, Jr., CD, 2424 Ducharme Ln., Green Bay, Wisc. 54301. Sponsor: Green Bay R.U.F. Club.

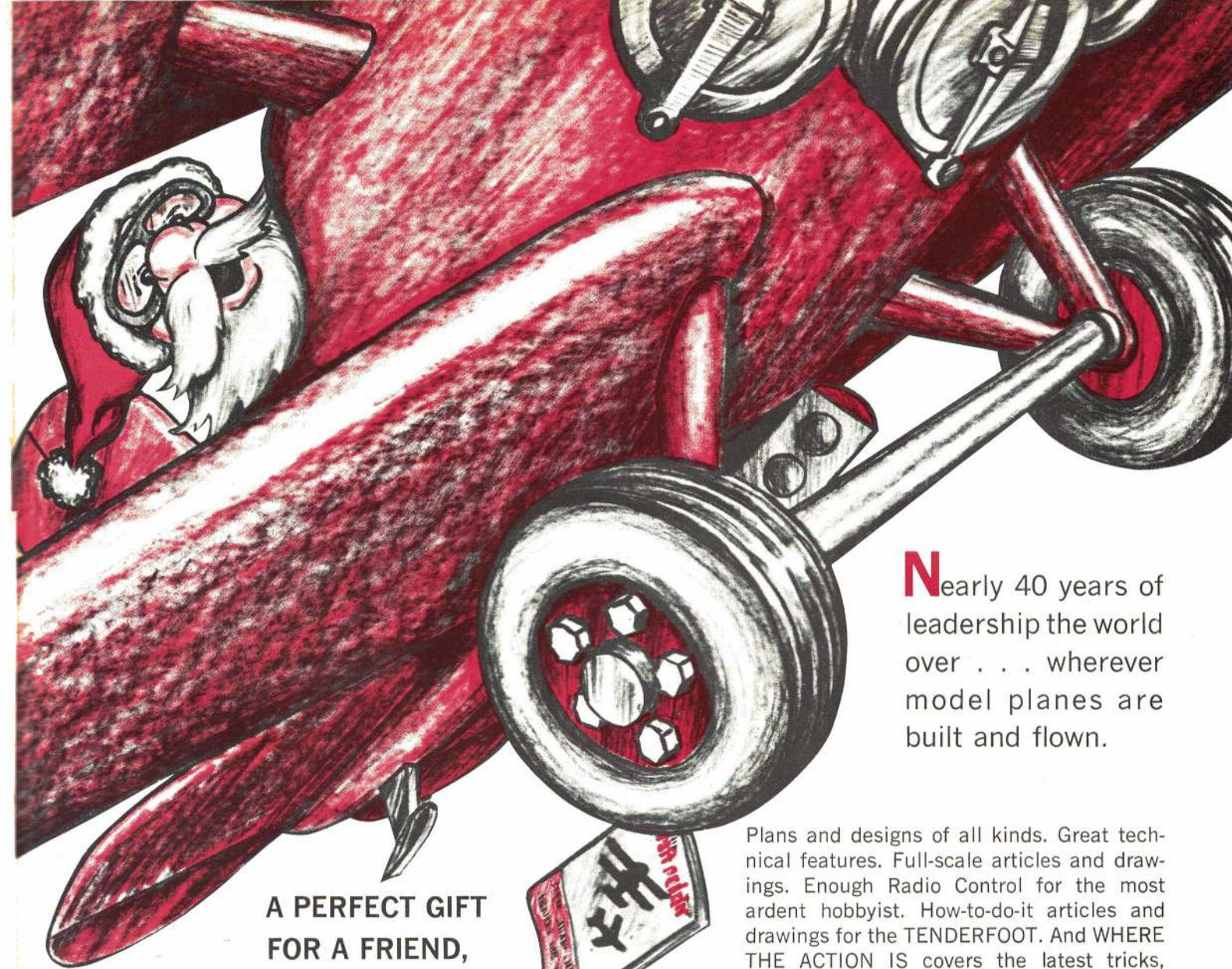
**Feb. 21—Aurora, Colo.** (A) MMM Monthly Indoor Meet. Site: Hinkley High School, D. McGhee CD, 1260 Elm, Denver, Colo. 80220. Sponsor: Magnificent Mountain Men.

**March 21—Aurora, Colo.** (A) MMM Monthly Indoor Meet. Site: Hinkley High School, G. Bariuk, Jr., CD, 3066 So. Upham St., Denver, Colo. 80227. Sponsor: Magnificent Mountain Men.

**June 5-6-7—Nashville, Tenn.** (AAA) Mid-South 8th Annual RC Championships. Site: Percy Warner Park, B. Reuther CD, 216 Vaughans Gap Rd., Nashville, Tenn. 37205. Sponsor: Middle Tennessee Radio Control Society.

**June 26-27—Portville, N.Y.** Southern Tier RC Fun Fly. Site: Route 305 So. B. Brown CD 1253 High St., Bradford, Penn. 16701. Sponsor: Clean Model Airplane Club.

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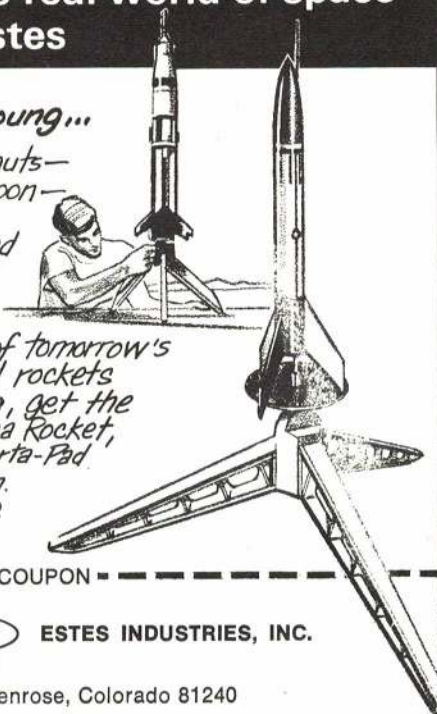


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## Siposs—Car Racing

(continued from page 43)

brand new model is also making a name for itself. Dynamic car owners are beginning to get excellent results after learning the intricacies of their cars. Heathkit is helping the sport with its newspaper advertising. It won't be long before RC cars will be so popular that racing rules will have to be made more stringent to keep the hobby on a dignified level, just like model railroading.

Dragster Advice: RC dragsters are making a rip-roaring entry with slingshots, funny cars, etc., running against standard road-racing machinery. It won't be long before drag racing is a specialized field. Since I have been running dragsters for a while, here is some advice. Keep the front end light and use narrow front wheels so that the car will tend to go in a straight line. The use of a positive clutch is not absolutely mandatory as long as the centrifugal clutch engaging speed is set fairly high.

For the final touch, don't use just a band brake on the clutch bell; install an operating parachute, it is much more realistic. On the extreme rear end of the chassis, mount a small aluminum enclosure about 1 1/2 x 2" and 1/2" deep, with its rear end open. Cement a soft foam rubber pad inside the box, place the parachute on top of the rubber and hold it down with a rubber band. The rubber band is hooked to a wire rod which is servo-operated. When the servo pulls the rod, the rubber band pops off, and the foam pad pushes the parachute out into the slipstream. Use a cheap plastic chute of the type employed in model rockets.

## Morse—Pylon Racing

(continued from page 43)

Probably the greatest benefit from this unpulsed low pressure is the simplified fuel system which can be used. We are flying with one flexible tube from the pressure port to tank and a second flexible tube from tank to needle valve, and that's that. We've had no flooding with this system, and in some respects it's as simple to operate as the suction system. This simplified fuel pressure system was first seen being flown by Joe Foster some time ago in his Shushonik. We've flown it many times and do not hesitate to recommend it. . . .

New Products: Every so often a new concept or method surprises us all with the ingenuity of the guy who figured it out. Al Rayden has developed a method for fabricating a fiberglass- and cloth-surfaced wing assembly, which he calls the "Glaskin" wing.

"The Glaskin wing consists of a low density foam core covered with an epoxy-glass skin, which in turn is bonded to 3/32" thick subskin of high density foam. The resultant covered core features a glass-smooth finish ready for color, high strength to weight ratio, and imperviousness to moisture and fuel. Gear and torque block cut-outs are provided where applicable, as is center section glass tape. All that is required to complete a pattern-type wing is adding a trailing edge hinge strip, ailerons and tips. Pylon wings, because of sharp leading edges, require the addition of leading edge strips. Pattern wings are covered in one piece around the LE."



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# ACE R/C

INC.  
HIGGINSVILLE, MO. 64037



Dear Friend:

Dick McNeil's drawing sets the stage this month.

This is a tale about a wagging tail! Puppies and dogs have them. Pulse Rudder airplanes have them, too.

That wagging tail is the secret of the simplicity of Pulse Rudder-Only Proportional. As the tail wags, so goes the plane. If it wags more to one side than the other, the plane flies to that side. And vice versa. And you cause the wagging by moving the stick from one side to the other.

Tail wagging has been around for a long time. But it has never been refined or updated as in the series of Ace Commander Pulse packages. While this is tail wagging—it is considerably different and more sophisticated than that used in the "Good Old Days." This tail wagging R/C was designed as carefully and have as the finest digital units costing much more.

For several years we had the best tail wagging radio gear in the business—and now we bring you a true and matched companion piece: An airplane that flies best ONLY when its tail is wagged.

That plane—the Dick's Dream Kit—is introduced in the next column. It goes with our Commander like a wedding ring—and they do live happily together!

Prototypes of the design were tried in many sections of the country. George Rosenberger of New York tells how he let his 13 year old son fly his tail wagging Dick's Dream; how his son decided he had to build one for himself; and how his son's outflies the one George built!

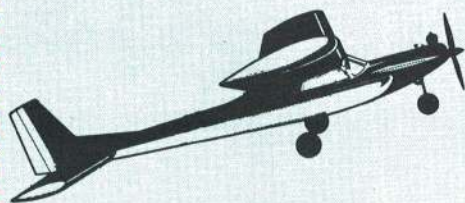
Our foam wings also offer new dimension for tail waggors. We have plans available for both the constant chord and the taper sections. The Dick's Dream and Citabria plans use the constant; while the Skampy (hot Goodyear type midwing design by Owen Kampen) uses the taper section. Plans are \$1.00 each. Others see the foam wings as possibilities for their own home brew tail waggors.

So join the tail waggors and have a ball.

Keep 'em pulsing,

*Paul F. Runge*  
Paul F. Runge

## DICK'S DREAM PLANE KIT For the Beginner or Expert!



NOW! A Mini Foam Wing Airplane Kit. This is a first! DESIGNED FOR PULSE!

There are foam wing kits on the market, but with the Ace Mini Foam Wings, small planes in the 30-35" range fill a gap for something that did not exist in the kit field.

This kit is of the Dick's Dream, designed by Owen Kampen. Has been extensively test flown over a period of years by a number of modellers in various parts of the country. The Dick's Dream is partially a scaled down Whiz Kid—a proven performer. It has several innovations which are for the small breed of airplane specifically, and with the foam wing the beginner is assured of overcoming a big drawback to success. Features crutch type fuselage construction to assure line-up and accuracy.

Balsa and hardwood parts specially selected and clean precision cut by Lou Andrews of Aamco especially for this kit. This assures you of quality and integrity. Wire parts for landing gear and torque rod, hinge material, and other extras are supplied. Wheels and engine mounting hardware are not.

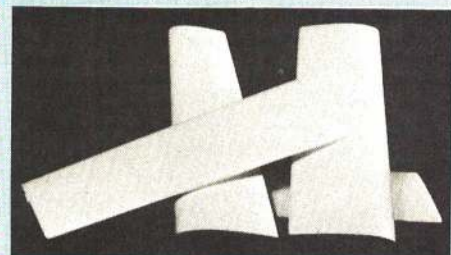
Full step by step instructions to assist in building this gem of a kit. AND ultra simple installation shown for the Commander R/O Baby or Baby Twin!

Span is 32" (cut from the Ace constant chord foam section), 5 1/2" chord, length is 25 inches. Weight with R/C gear is 12 to 14 ounces.

With a Pee Wee .020 and a Commander R/O Baby you have a docile performer and excellent trainer. If you want something hot, TeeDee .020 with the Commander R/O Baby Twin will do the job—it'll do everything in the Rudder Only book!

Excellent for the beginner—fun for the experienced flyer. Join in with assurance of satisfaction with the new Ace Foam Wing Dick's Dream.

No. 13L100—Dick's Dream Foam Wing Airplane Kit \$5.95



## ACE MINI FOAM WINGS

Special 17% semi-symmetrical airfoil expanded foam developed by Owen Kampen for the small planes.

The constant chord measures 35" span, width is 5 1/2". Area is 192.5. Weight about 3 oz.

The taper section is 35" span, center is 5 1/2" which tapers to 4". Area is 166.24. Weight is just over 2 oz.

Come in two 17 1/2" pieces which may be easily epoxied for desired dihedral. May be used unfinished. Or may be finished with polyurethane varnish. Stripe with Monokote for trim.

Build small with foam. Makes planes which are ideal for the Cox Pee Wee or TD .020 engines, and the Commander R/O Baby or Baby Twin units.

No. 13L166—Ace Foam TAPER Wing \$2.95  
No. 13L192—Ace Foam CONSTANT Wing 2.95

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## PULSE COMMANDER FOR 1971

- \*\* New, smaller Transmitter case
- \*\* 50% more powerful actuator
- \*\* COMBOS with all batteries AND charger!
- \*\* BASIC Paks less batteries - charger

## RUDDER ONLY PULSE IS:

- \* FULLY PROPORTIONAL!
- \* LIGHTEST--2.5 oz. for Baby
- \* SIMPLEST--only one moving part, noise free
- \* VERSATILE--arrange to suit your particular installation. You can go up in size or down in size. You can even go micro and mini, and not obsolete your transmitter or basic receiver. Simple changes of battery and actuator allow a variety of installations. Motor control can be easily added to larger units.
- \* EASY to install
- \* GREAT for Beginners--CHALLENGING to the pros.

## COMMANDER BASIC R/O PULSE PACKS

Available in Four Sizes

We are offering our Commander Rudder Only series in both "Choose-Yourself" style, and in the same combos as last year. This offers you greater choice and therefore more versatility.

The Basic Packs contain the new improved Dickerson Designed Rudder Only Pulse Transmitter, the Commander DE 2.4 v superhet receiver, and four choices of size on the more powerful Adams actuator.

Our Basic Pack (A) comes less batteries and charger. You select the size of the battery pack and charger kit (BC) you want, and this ABC makes it YOUR combo. (If for instance, you have a glider in which you want to use just the Baby or Baby Twin Pack, BUT need 500 ma nicads instead of the usual 225 ma, you can get this combo by just ordering the right choice of A and BC units.)

The Baby and Baby Twin are ideally suited for the new Ace Mini Foam Wings, and the Mini Foam Wing plane kits, while the Standard and Stomper will handle larger jobs--even up to .19-23 size and Motor Control may be added.

The Baby is for .010 to .020 jobs. Airborne weight 2.5 oz. (If you use 225 ma nicads). The Baby Twin is for hot, .020 to .049 ships. Airborne weight 2.9 oz. (If you use 225 ma nicads).

Use the Standard for more power for hot .049 to .09 power. Airborne weight 4.5 oz. (If you use 500 ma nicads).

The Stomper is the workhorse and will be useable in ships from .049 to .19-23. Weight 4.9 oz. (If you use 500 ma nicads).

ALL UNITS ARE COMPLETELY WIRED, TESTED, GUARANTEED

To help the beginners, we also offer the usual combos which contain the Basic Pack (A) plus the Battery & Charger Kit (B-C) which have proven to be the best all-around combinations.

10G25--BASIC R/O Baby Pk (A)	\$59.95
10G25T--BASIC R/O Baby Twin Pk (A)	62.95
10G26--BASIC R/O Standard Pk (A)	59.95
10G27--BASIC R/O Stomper Pk (A)	62.95

26.995, 27.045, 27.095, 27.145, 27.195 mHz  
Please Specify



## COMMANDER R/O PULSE COMBOS with ALL batteries and charger!

If you are going the routine way, and want to get started with what we recommend for all ordinary applications, this is the way for you. Here you have the Basic R/O Pack (A) and the suggested B-C matched.

10G15--COMPLETE R/O Baby Combo	\$69.95
10G15T--COMPLETE R/O Baby Twin Combo	72.95
10G16--COMPLETE R/O Standard Combo	71.95
10G17--COMPLETE R/O Stomper Combo	74.95

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## COMMANDER BTRY. & CHGR. KITS

The two kits you need to make up any of the four R/O Packs to come up with the Combo of your choice. Consist of 2.4 Nicad Battery Pack in either of two sizes (you CAN use pen cells, but we don't recommend it). Mallory M1603 Transmitter Battery, and Deluxe Charger complete with submini jack and plug. Charger is transformer isolated for your protection.

No. 10K35--B-C 225 Kit for Baby or Baby Twin	\$10.75
No. 10K36--B-C 500 Kit for Standard or Stomper	12.75

## MICRO GEM RECEIVER AVAILABLE

The new Micro Gem Receiver is available for the foregoing units. Just specify "WITH GEM" when ordering and add \$5.00 to the Basic or Combo cost.

The Gem measures 1 1/16 x 1 1/2 x 1/2" and weighs under 1 oz.

Also available separately. The DE model is used with Adams actuators.

No. 12K2--Commander DE Gem Rx	\$31.50
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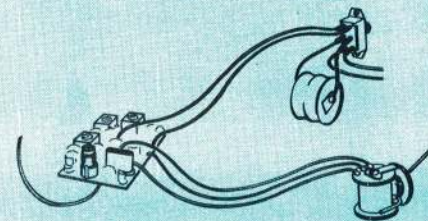
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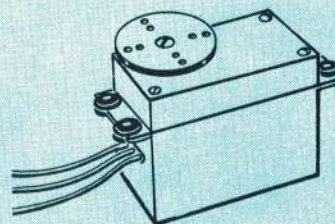
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The new and improved models of the Adams Actuators available separately. Has 50% more power! Four sizes. See catalog.



## KEN'S PULSE THROTTLE CONTROL

Recommended for use with the Standard or Stomper Commanders

Manufactured by Ken's R/C this new unit uses a motor driven servo. Designed for high, medium and low throttle on Rudder Only Pulse systems, the control requires only slight modification to the Transmitter. Easy to hook up to airborne R/O Packs--just three wires. Uses same battery supply. Designed specifically for the Commander R/O series of Standard or Stomper size.

Housed in a WE S4 case. Completely wired and tested. Weight only 1 1/4 oz.

Transmitter modification is simple, since Throttle Control requires a fast pulse momentarily. Kit is available or complete custom factory conversion of your transmitter.

No. 14K69--Ken's R/O Throttle Control \$24.95

## TRANSMITTER CONVERSION

Kit to allow you to convert your Commander R/O Transmitter for above motor control. Easy to follow instructions.

No. 14K70--Tx FP Throttle Control Kit	\$3.00
No. 14E71--Factory Custom Installation of above unit in your Tx (Includes above kit) (Postage return paid)	\$6.00

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**Scatter Pylon Signal Lights:** The Northern Connecticut R/C News and "Skip" Williams report that the club's scatter pylon signal lights were tried out during a recent race. Skip comments, "The light system seemed to work very well. It cut down some on the fast times because the callers could not anticipate the lights, as they did the flagmen. There were very few cuts on the number one pylon because of the lights. I didn't hear any gripes, so assume that it is an improvement over waving a flag."

Our version of a portable signal light system was tried out in California. Several requests to go back to the flag system were received, and it took quite some time to unravel the reason. Simply put—you can't get the jump on a light!

Next month, this homebuilt, fully portable signal light system, built for \$60 and contained in two 9 x 9 x 48" boxes, will be presented.

### McEntee—Gliders

(continued from page 43)

George Wilson reports that "accidents" caused the Goof Award to change hands rather frequently. Power pods were allowed but apparently not used to any extent. A full-page picture story of the affair appeared in a Seattle newspaper. . . .

1971 RC World Champs in U.S.: The RC World Championship Stunt events possibly may be held here. Since chartered jets offer lower cost travel, the meet could be held on

the East Coast. A site in the area of Norfolk, Va., is currently under study and a final presentation will be made at the Dec. FAL meeting. England has relinquished the 1971 affair in favor of the U.S. The meet is most likely to be held in Sept. when travel and other rates are lower and the flying weather still is good. . . .

**Date Mixup:** Unfortunate scheduling resulted in two glider meets within easy travel distance of many fliers being held on the same day. Attendance may have been affected, but about 25 fliers were on hand at each location—a good indication of the rapid expansion of glider flying in the Northeast. At the Northern Conn. RCC meet, entrants had three rounds in each of two events. Winners were: FAL event—(1) Mitch Epstein, (2) Herb Gray, (3) Bob Fish; Modified FAL—(1) Dick Jansson, (2) Stu Richmond, (3) Herb Guay. Because many glider novices entered and much interest was generated, the club may run another glider meet in Nov.

On the same Sunday, the Monmouth MAC sponsored, at the Lakehurst N.A.S., the third of four meets on the East Coast Soaring Society schedule. Weather was hot, thermals moderate. The contest's top winners were: Modified FAL—(1) H. Terry; (2) Tom Rankin; (3) B. Hagerman; FAL—(1) H. McEntee; (2) Joe Roslyn; (3) Walt Good. Three rounds in each event were flown here too. . . .

**Model Glider Plans:** The RC glider mag, Zephyr, features in each issue full-sized plans for a glider, plus building information. Some are scale, some semi-scale, some originals. Designs have included a 1/6th scale Bowlus Baby Albatross pod and boom fuselage craft of about 7 1/4" span (Jan.-Feb.); Ira Achey's 94"-span Soar Tee, good for slope and thermal flying (Mar.-Apr.) a semi-scale copy of the beautiful Polish Zefir 2, 88" span (May-June); Sputnik, a slope soarer developed by German modeler Adolf Stick, a fast job with

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thinned Eppler E-374 wing—not for novices (July-Aug.). Some odd parts, such as canopies, etc., may be had from the Zephyr publisher (Box 824, Tustin, Calif. 92680). The plan comes with each issue; without it, the magazine is available at a lower cost.

## Smith on CL

(continued from page 41)

figured out, fuel switches are being developed, and the end result is very fast airplanes. Even those who wanted to outlaw them are joining in the crowd. Then some diehard pops up with an unspiced one and blows a couple of them off. So—you pay your money and you take your choice. . . .

Suppliers for Racing Equipment: I am trying to locate all suppliers of CL Speed, Rat racing, and Team racing equipment. Readers have requested this information. Many people make and supply these parts locally, so if you know of anyone who has specialty items for these events, let me know, and we'll pass the word. . . .

Laughing on the Outside, Crying on the Inside Department: Bill McGraw's son was all set to fly A Speed at the Nats. The Navy line checker told me he had undersize lines—.0015" under. Made up a new set—six inches too short. No line material left and the sun setting in the west. We got him off with a set of six-in. line connectors and he placed. Bill probably still is wondering how many sets of lines he sold off that seven-lb. spool of wire. . . .

Greetings: This closes out our first year of writing this column. Thanks to all of you who have sent pictures and ideas; I can use lots more. To all of you, A Very Merry Christmas and a Happy New Year.

## Boss on CL

(continued from page 40)

as H.H. Smith #215 to match the receptacles on the panel. Plug the leads into the right or left hand circuit and the unit is ready to go.

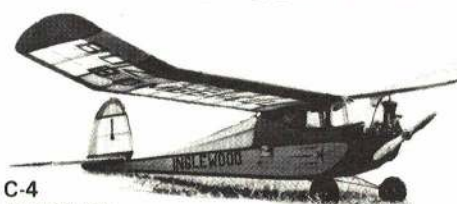
The toggle switch allows an on-off action when one circuit is used and changes to a two-circuit operation for twin-engine planes. To test the glow plug, hook the leads to the engine and depress the push switch. If the plug is good, the lamp will light. To test the lamp, connect the clip leads together and depress the push switch, which should light the lamp. This unit provides all the necessary field requirements for engine starting and glow plug testing, is compact and lightweight, and should prove to be a real asset on the flying field. . . .

Eyelet Source: Need an extra eyelet for making up flying lines? Joe Combs suggests the use of eyelets found on the Perfect Brand Accessory packages. I tried a couple of them on some scrap stranded wire, following normal line make-up procedures, and found that they work out well. The only difference in these eyelets from the ones normally used is that they are a slight bit larger. . . .

Fuel Primer: George Strunk uses an empty white-glue plastic squeeze bottle as a fuel primer for small (.049) engines. The bottles work well since the tips are adjustable and the amount of fuel squeezed out can be regulated. When glue is used up, wash out the bottle with detergent and water, dry well, and it's ready for use.

B-36 Flies Again at Cam Ranh Bay AB, Republic of Viet Nam: Many aircraft have been revived and put back to work for the U.S. Air Force in Viet Nam—the A-1 Skyraider, the AC-119 Shadow and the AC-47 Spooky

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No. 1281, **Strato-Streak '68** — Frank Heeb's 1/2A F/F updated version of hottest gas model of 1941 era. Simple pylon, 275 sq. in. \$1.50

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No. 0201, **Cardboard Cutie** — Inexpensive all cardboard C/L for Tenderfoot. 049. Two sheets. \$1.25

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#### THIS MONTH'S PLANS

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No. 0113, Luten Minor—Delightful 10-powered semi-scale RC for three light servos is high-winged parasol monoplane. \$2.25

gunships. But recently a B-36 Peacemaker circled the base and rolled to a perfect stop in front of the 12th Avionics Maintenance Squadron area.

The six-engined craft, flown by Captain Thomas A. Darold, was not part of the air war in Viet Nam, but a nine-and-one-half-foot control line model. The captain, an avionics officer with the 12th AMS, spent over 350 hours on its construction. He has been building model planes since his junior year in high school and relied on 12 years of model-building experience to get his biggest project off the drawing board and into the air. The B-36 will be put on permanent display in a recently opened recreation workshop at the Cam Ranh Bay Air Base.

### Mooney on FF

(continued from page 39)

bad enough if you are holding the model, but, when it happens halfway through the power run on an official flight, the pieces of longeron that fly out in all directions constitute parts dropped in flight and will eliminate that attempt.

Another idea from the newsletter will help in assembling a wing or fuselage, especially when another hand or two is needed. Old bobby pins work wonders as minatures of any specialized clamp which may be needed. They can be bent with a pliers but the steel is hard enough to maintain plenty of pressure for holding small model parts in place. However, don't swipe new ones out of your wife's or mother's collection!

### Meuser on FF

(continued from page 38)

previous record, established at the same site, was held by Carl Goldberg (no kidding!). Dave also received the OCD Leonardo perpetual trophy and a bottle of champagne for winning the 21-and-over championship with a two-flight total of 26.7, while his kid brother Gary won the under-21 champs with 22.3 sec. Small models proved best, as they could be built with low wing-loading, recovered from the launch with little loss of altitude, and circled tightly. Dave's tiny 7½-in.-span glider weighed 1/35 oz. . . .

New Events: These seem to pop up at a rate of one or two a year. Some flourish to become official AMA events (Coupe d'Hiver, Indoor Flying Scale), some remain active at a local level for decades (OCD Catapult Glider), and some fall by the wayside, never to be seen again, or to be re-invented as a "new" event decades later. Peanut Scale, Navy Scale, 12-ft.-ceiling HLG, Pennyplane, 020 Old Timers, WWI scale, ½ A FAI mentioned in Chuck's column last month—how many more can you think of?

One "new" event introduced by the Oakland Cloud Dusters will be an indoor towline glider event to be tried in San Francisco's Cow Palace. Some of us flew a similar event in the old Junior Birdman days. Another "new" event, suggested by Bob Oslan of the Southern California Antique Model Plane Society (SCAMPS), is the New Ruler category—new designs built and flown according to the 1941 rules and intended to inject some creativity into the Old-Timer movement.

It seems that there are both the "jazz" men among us who prefer to improvise around a basic theme, others who prefer the "classics" as they were originally set down. If this continuous stream of new events and rules changes seems too upsetting, just remember that without them we would all be flying Old-Timers!

(Continued on page 74)

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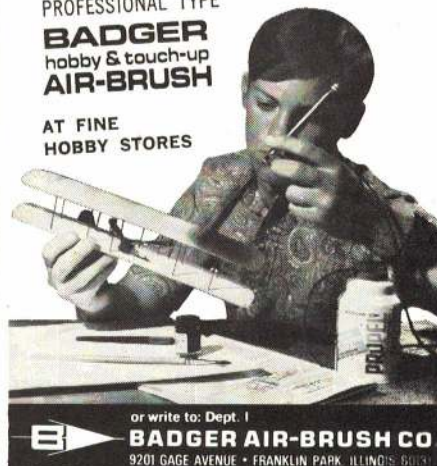
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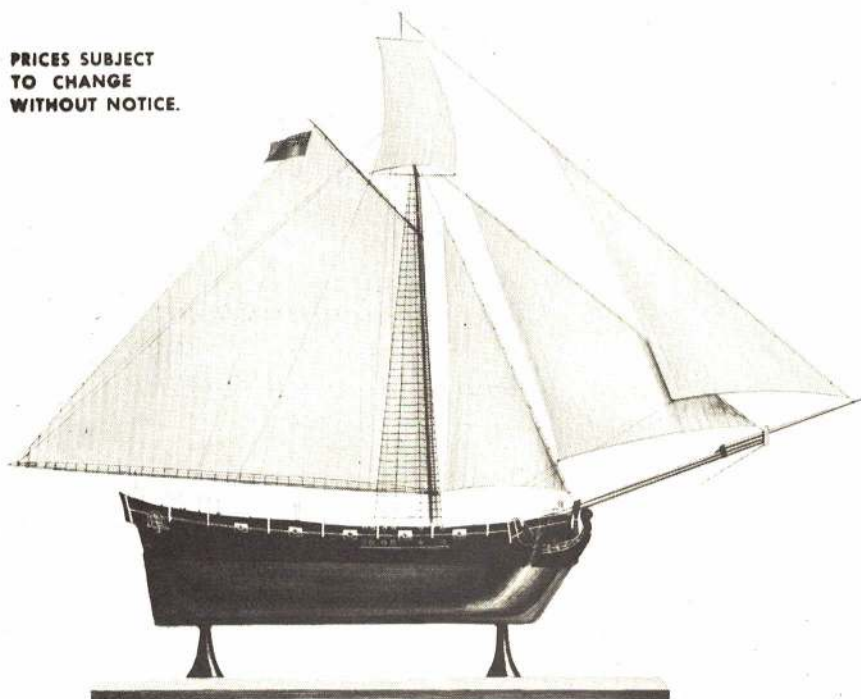
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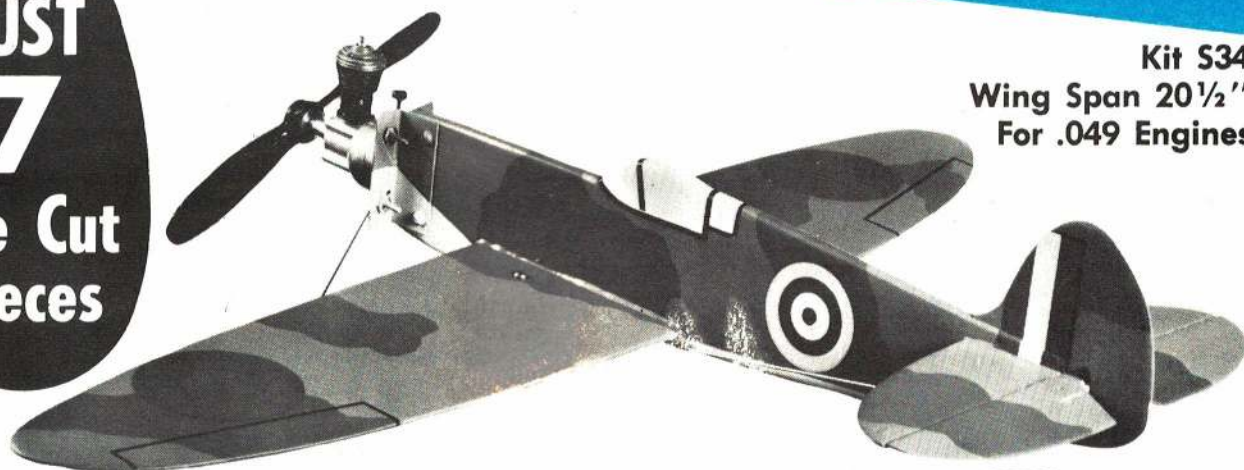
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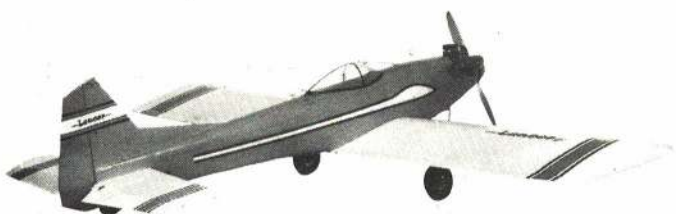
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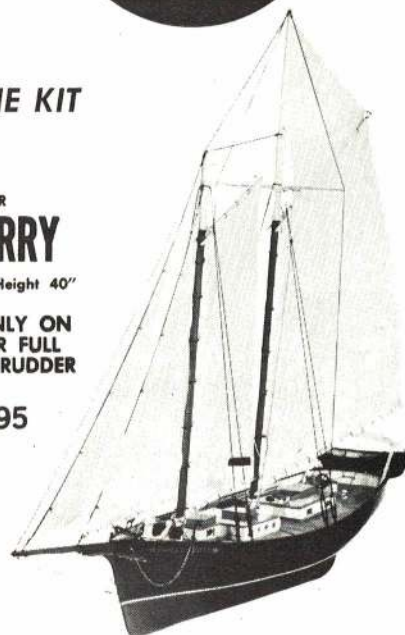
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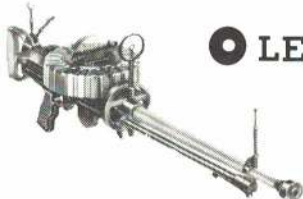
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Flying Scale Dirigible: Merely flying micro-film model planes doesn't seem to be enough of a challenge for physicist Bill Bigge. He had to go and build a flying scale model of the R-100 which he threatened (tongue in cheek) to enter in Peanut Scale event at the Nats! Superlight framework is covered with Micro-lite. Unlike the full-scale R-100, the entire hull is filled with gas. Model is buoyant with stove gas, has about an ounce excess lift with helium. Bill flew it rubber-powered at the Nats, but kept it on a leash just in case. Each of the structural rings is made from 16 individual pieces, and 1-mil wire spokes connect opposite joints. Her name? "Metrical". . . .

New Material: Ever wish that there were something halfway between spruce and music wire in both weight and strength? Try bamboo! Neat little bundles of bamboo sticks about 1/16 in. diam. with one end pointed can be bought at grocery stores as barbecue skewers or hors d'oeuvre picks. They make beautiful glue sticks. Bamboo can be softened over an open flame, or better yet, bent to shape around a heated metal form—a piece of pipe, for example. Most models before 1938 used bamboo for wingtip and rudder outlines and cockpit canopy frames. Getting it to stick to the rest of the framework was

something else, but modern epoxy adhesives make light work of it. . . .

Cutting Tubing: Some use a razor saw, others a Dremel tool, but here's a third way you might find even better. Lay the tubing on a hard flat surface, set the blade of a pocketknife blade over it, and roll it back and forth under the blade. Stop just before the blade cuts through, then snap the tube in two with your fingers. With tubing sizes larger than 1/8-in., getting the blade square with the tube is difficult to do by eye, and if you don't start out square you cut a spiral. If this presents a problem, get a piece of graph paper, or any paper with rulings at right angles. Set the tube on top of the paper and aligned with one set of rulings; the knife blade lined up with one of the lines at right angles to the tube. It works on both brass and aluminum.

Uniform Sliced Ribs: Sliced rib caps are the key to minimum-weight wing structures, but cutting them uniformly isn't easy by the usual method. "Shoc Talk," the Orange County, Calif., free flight newsletter, edited by Jim Scarborough, suggests the method shown in the sketch. Stock strip sizes can be used for the spars if care is taken in selecting the spar positions and rib cap depth. A template is made from metal or thin plywood. A piece of rib sheet stock is cut according to the template, then glued to the bottom of the template with an overlap equal to the rib cap depth. After the first cut, simply advance the template using the lower sheet as a stop.

## Stalick on FF

(continued from page 39)

and have an RC glider. In any of the above roles, the ship should handle admirably. Designed as an A-1 glider, it builds easily and flies well—a good combination. This excellent Midwest kit is \$5.95. For a modeler who has built several other planes and wants to move into A-1 competition, the Jetstream's record stands high. . . .

Champion Coupe: John Lenderman's current AMA record-holding Coupe d'Hiver may appear ordinary but that's deceptive, in that it has a very strong power pattern for its ten grams of motor and a soft glide which allows for calm air duration well beyond the two minute specified maximum for Coupe. To copy this plan, magnify the rib templates for an accurate airfoil. The model should be built light, not in excess of the 70 grams specified for this class. . . .

Nose Weights: Don Gelo has a tip for hand launch glider nose weights. "The clay used to balance a hand launch glider sometimes gets lost, hardens, or smashes out of shape (or melts in hot sunlight). A better way to achieve balance is to bend soldering wire

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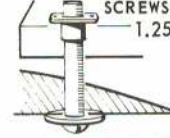


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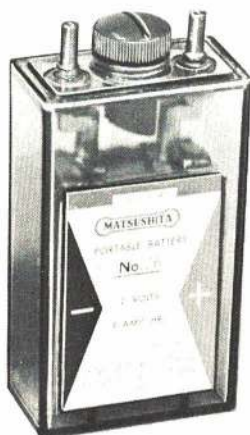
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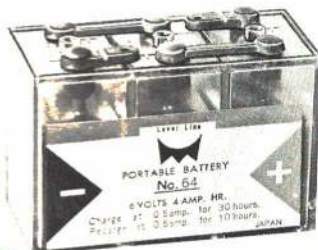
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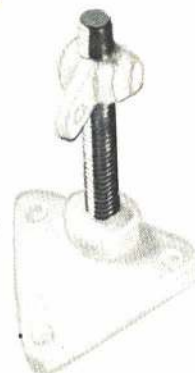
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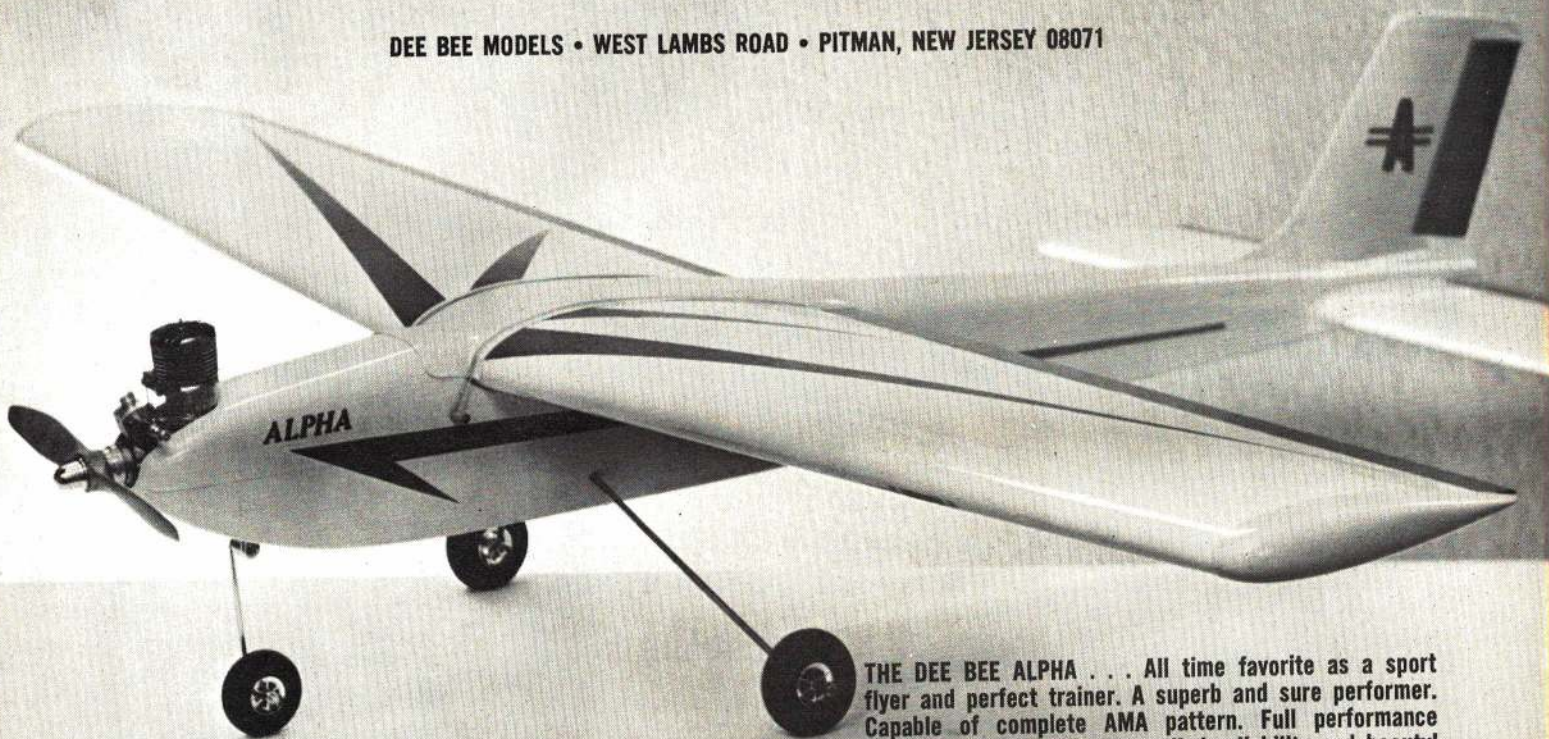
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around the nose of the plane until the desired weight is reached, then wrap it with friction tape."

Other ways to avoid clay are to mould lead sheet to the nose shape and then epoxy it into place, or to hollow out a portion of the nose to accept sufficient lead weight. I pound two 6d or 8d finishing nails into the nose on my Hedgehoppers and it works great, as long as holes have been drilled into the nose first.

Many modelers use a lead nose weight fastened to a line attached to the tail. The nose weight acts as a dethermalizer, after a fuse burns through the rubber band retainer. For the curious, this idea will be detailed in a future column. . . .

1970 FAI FF Team: During the 1970 FAI FF Team Selection finals at Albuquerque this past Labor Day weekend, this nation's finest

Wakefield, Nordic and Power fliers gathered to battle severe winds, as well as each other, for the privilege of representing the U.S. during the 1970 FAI Internationals in Sweden.

The winners, after three days and 14 rounds of competition, were: Wakefield—(1) John Allen, 2295 seconds; (2) Frank Parmenter, 2286; (3) Bob White, 2265; A-2 Nordic—(1) Dennis Bronco, 2322; (2) Lee Polansky, 2256; (3) Hugh Langevin, 2199.

Looks like a high-powered team, congratulations to the winners. For us also-rans, the 1973 team trials begin next spring, so the time to prepare is now.

## Fly Safely! Follow AMA Rules

## Min-X Astromite

(continued from page 31)

Elevator and aileron and their respective trims are conventional. However, rudder is controlled via a knob located at the top of the stick. A description is in order for those who wonder how in the world a single stick works. Instead of the normal solid stick, start with a tubular stick mounted in a ball and socket to permit hemispherical movement. The bottom of the stick engages the bails of the stick assembly, as seen in the transmitter photo, via a nylon fitting which slides smoothly in the bails and restrains the stick from rotating about its own axis, i.e., it can't be twisted.

Attached to the top of the stick is an aluminum cone into which is fitted a miniature potentiometer. The potentiometer body is restrained within the cavity of the cone by a lock screw. The shaft of the potentiometer is free to rotate. The potentiometer leads are routed through the hollow stick and are free to flex at the bail of the stick as shown. A scissors spring, familiar to all the old pulse proportional fans, is slipped over the pot shaft and engages a fixed pin on the cone mentioned earlier. A knob is slipped over the pot shaft until a pin on the knob engages the same scissors spring. The knob is then locked to the pot shaft and is restrained at neutral by the scissors spring. The knob is twisted for rudder control.

The preceding description leads to one of only two criticisms of the Min-X system. The nylon fitting at the bottom of the stick had a certain amount of

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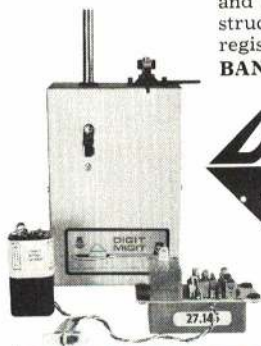
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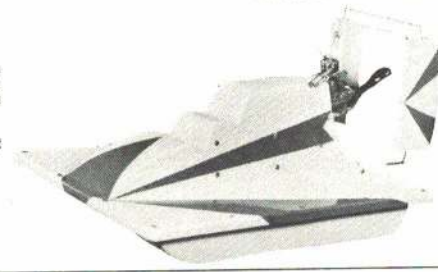
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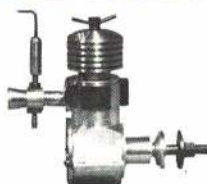
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plus and minus 0.5 milliseconds for control.

A 500 mah battery pack and switch harness complete the airborne unit. Gould nickel cadmium cells are used in both the transmitter and receiver packs.

Tests: Bench tests of the Astromite 72 were performed to determine such things as temperature tolerance, servo resolution and thrust, etc. The system proved to be the equal of contemporary systems in most respects. Servo thrust was an average of three lb.; however, thrust is about one-half pound greater in one direction of travel. This has been encountered on other systems and is no problem. Servo resolution is excellent with a good range of trim (about 15% of total travel) available via the stick

trims. Since the test set was produced, a change to silicon output transistors in the servo amplifier has been made and an average thrust in excess of three lb. is available for both directions of travel.

The system performed satisfactorily over a temperature range of 20 to 150 degrees F. It was tested at zero degrees F after a two-hour cold soak and would not operate; however, not many people fly at that temperature. Those contemplating operation at extreme cold with any RC set should check the system after a cold soak in a deep-freeze to verify proper operation.

The manufacturer indicates that the batteries provided will permit about two hours' operation. This estimate is extremely conservative in that at least

four hours of safe operation is more accurate, provided the batteries are fully charged. The receiver drain, including average servo movement, is around 100 ma, transmitter drain is 50 mls. The 500 mah cells used are quite capable of sustaining more than a normal day's flying activity.

The system was flight-tested extensively and performed quite well. The only problem encountered was the eventual roughness of the rudder control stick, discussed earlier. This was eliminated by readjusting the stick control knob as described.

In all respects the system performs quite well. Quality of components, assembly, and design is excellent throughout. As with all sets, a few criticisms can be made. The transmitter antenna, when collapsed, is longer than necessary. Min-X has gone to a four-section antenna which corrects this problem and is developing a center-loaded antenna which will be only 24 in. when extended. The eventual tendency of the rudder control stick assembly to bind has been eliminated by the latest changes. In addition, rudder trim is not provided. This is not a necessity since rudder trim is usually set mechanically at the plane. This is the only concession made in achieving the system's relatively low price.

The plane shown with the set is the Dubro Seabird, a highly prefabricated model, but not an ARF, constructed of foam, plastic, and balsa. Wings are foam cores covered with plastic; fuselage, power pod and fairings, and floats are formed plastic. Tail surfaces are balsa. Assembly of the plastic components utilizes a plastic solvent, presumably methylethylketone. Other construction is with model cement, epoxy and white glue.

The Seabird is not considered an ARF model since it must be finished with dope. The tail surfaces should be silked and filled prior to painting. Butyrate dopes can then be used on the entire model. The model shown was completed in approximately one week by a local flier, Bob Munn, who is also an excellent builder. Bob suggests one precaution during construction. The seams along the fuselage might be split by a hard ground landing, so he added a width of plastic

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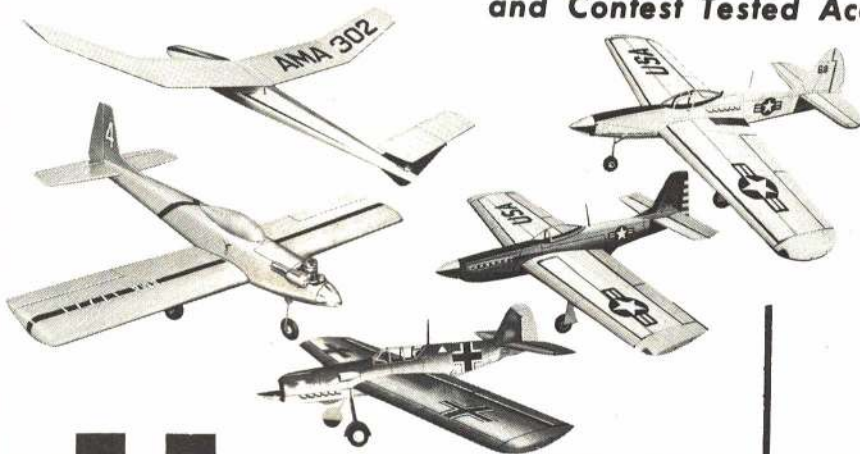
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tape over the joint before finishing the model. Nevertheless, this is a much more rugged model than the usual plastic ARF. Provisions are made for wheels for ground operation. The airplane is designed for operations with either rudder and/or ailerons. The rudder and elevator pushrods are provided and are lengths of brass rod threaded for clevises and inserted through nylon tubing. This arrangement eliminates open holes in the fuselage and avoids corrosion of the pushrods.

Dubro recommends the use of a 60 engine; and test flights indicated this to be more than adequate. It was felt that as little as a 45 could be used successfully. Operation from the water or ground was quite satisfactory. Once airborne, the Seabird is capable of loops, rolls, snaps, and inverted flight. One peculiarity of the model is caused by the location of the engine, a rather short tail coupling, and the large area of the forward fuselage. With the power and speed provided by the 60, introduction of small yaw angles by either rudder or aileron results in an initial turn in the opposite direction from the expected. Don't fight this, it settles out in a moment. If you do fight it, continual trim changes will result.

A letter from Dubro indicates that, for less experienced modelers desiring an exact location, the CG should be between 3 1/4 and 4 in. from the leading edge of the wing.

The Seabird is an excellent model for operation from water or ground. It is rugged and is capable of pleasant aerobatics flights. It can be constructed much more rapidly than a full kit, but its building requirements are sufficient to permit exercising craftsmanship.

## On the Scene

(continued from page 12)

5.4 sec. It was powered by a 19 Veco engine.

Since the track surface was quite slick, the best tires to use were the hard solid rubber type such as those supplied by Heathkit, Ra/Car, Dynamic and Wen/Car. Most cars were of the sidewinder variety, sporting a 5:1 spur gear arrangement or cog-belt drive.

In the slalom race each car had to negotiate a prescribed course according to ROAR specifications. Dick Schnell turned in a fantastically low time of 20 sec. The concourse event saw many beautifully finished cars displayed, some with operable air brakes, moving driver's arms and other features.

In the Grand Prix, the cars had to negotiate a complex road course with a fast back straight and several "esses" placed between two fast sweeping turns. Because of the length of the race, smoothness and regularity were more important than top speed. The top ten qualifiers were required to run off a final 50-lap race during which a pit stop for fuel was made compulsory. In the final tabulation, the winners were scant seconds apart. Based on total points gained in four events, Dick Schnell, model boat racing champion, turned out to be the winner with a total 87.5 points out of a possible 99 points.

Final results of the third National Championships for Radio Controlled Cars follow. Grand Championship: (1) Dick Schnell, (2) R. Ballenger, (3) G. Siposs; Oval race: (1) R. Ballenger, (2) R. Moody, (3) N. Fisher; Slalom race: (1) R. Schnell, (2) G. Siposs (3) Ken



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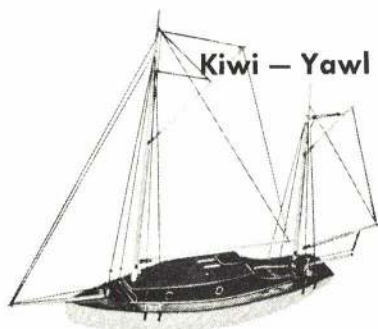
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Chief Steward for the race was Don Powers who also manned the microphone throughout the race and did an excellent job of keeping the events moving. Dan's crew of judges inspected every car for adherence to rules of the Radio Operated Auto Racing Association, the official body for 1/8 scale RC car racing. Merchandise prizes were donated by several companies and magazines as well. The winners received trophies and merchandise awards.

## Getting Started in RC

(continued from page 30)

tion. A moderate bend or two doesn't add much friction. However, friction rises with rising control loads, so the rods should be installed as straight as convenience allows. The units with a flexible metal wire inside a plastic tube will generally work better if there must be more severe bends.

Plastic tube pushrods are made with the inner tubing of such diameter that threaded metal rods can be screwed into them. The rods cut their own threads in the plastic, as they are turned in, and hold well as long as they are threaded into the tube for a quarter inch or more. Since this is a force fit, the rods are held very tightly but can be turned for length adjustment if need be. Either nylon or metal clevises go on the outer ends of the threaded rods, or other styles of termination may be utilized.

The outer casing of any flexible pushrod, whether the inner component is of plastic or metal, must be fastened to the model structure at both ends. If it is not, operation under load can cause buckling, which cuts down on usable pushrod movement at the control surface and also increases binding. Many methods have been used to fasten the tubing. It can be roughened with coarse sandpaper and held by some such element as Goo (a most useful material sold in hobby shops catering to model railroaders). Most cements won't stick well to the smooth nylon surface, hence roughening is recommended. Some makers provide outer tubing of such diameter that machine nuts can be threaded onto the outside for clamping purposes, and they pack the proper size nuts with the pushrods.

End lengths of inner pushrod longer than two inch should have some internal stiffening or they will bend under heavy loads. In some installations, two or three inches (or more) of the inner tubing may be unsupported by the outer casing; in such cases the smart modeler utilizes longer clevis rods. The threaded end is forced into the plastic tubing as usual, but the unthreaded end of the clevis rod is not clipped short and is allowed to extend inside the inner tubing to stiffen the unsupported area.

While rudder and elevator pushrods generally can be reasonably straight or have only the gentlest curves from end to end, linkages from servos to engine throttle or steerable nose wheel often must contend with several sharp turns, while snaking around and under fuel tanks, battery packs, fuselage structural members and so on. It is here that the pushrods with inner flexible wire really come into their own!

This subject is so important and has so many ramifications that all of them can't possibly be covered this month. Therefore, the subject will be continued in Part 37.

## Bonanza and Mustang

(continued from page 15)

launch kits are ideal for this purpose.) This increases the performance of both gliders amazingly, and makes them almost contest quality. Try it on your second or third model and see!

Flying is simple. Add nose weight until the plane balances about one in. back from the front of the wing. A coin glued onto the side of the fuselage as far forward as possible makes a fine weight. Throw the plane gently, aiming it at the ground about 30 ft. in front of you, and observe the turn. If you are righthanded, the plane should turn left; opposite for lefties.

Now tightly grip the fuselage, under the wing, between thumb and third finger, putting the tips of the first and second fingers behind the wing trailing edge and snug against both sides of the fuselage. Throw the plane sideways, so that it starts out in a right bank and circles. If you have the proper amount of left turn in the glide, it should "s-out" into a left turn at the very top of the throw.

Experiment with the direction of throw in relation to the wind to find the best altitude. Generally it will be just slightly to the left of the wind, but the choice of direction depends on the individual. Good flying!

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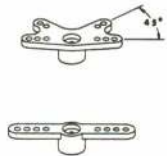


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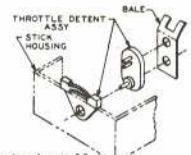


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## Corsair II

(continued from page 44)

than 46 feet long, compared with the Crusader's 54 feet, while the wingspan of the newer machine is a full three feet greater than that of its predecessor. The bulkier fuselage of the new attack craft is designed to haul a great load of fuel for long flights, as demonstrated by its seven-hour, 3800-mile trip without refueling, to the 1967 Paris Air Show.

Speed was one of the big items in the Crusader design program, and it was good for well over 1000 mph in its early models and close to Mach 2 in the later ones. The Corsair II is a subsonic work-horse, with some versions capable of lifting 15,000 lb. of bombs, rockets and cannon shells at one time.

But the greatest differences are deep inside, where all the little black boxes are parked. The most interesting electronic gadget is the Head Up Display unit, which holds great promise for commercial and even general aviation use in the coming years. In the A-7 installation, it is a method for displaying information from a computer on a 5½ x 6½" piece of clear glass directly in front of the pilot's eyes. Without taking his attention away from the vital view out the windshield, the pilot can get the answers to problems of day and night visual attack, radar bombing, navigation in all kinds of weather, and approach and landing.

Weapons avionics jammed into the Corsair II include a CP-741 weapons delivery computer, an ASN-50 all-altitude reference system, and an ARW-77 Bull-

pup command transmitter, optical sight unit and weapons release programmer. Among the many radar units are those for mapping; terrain avoidance, following and clearance; air-to-ground ranging; a TV display for the Walleye missile; a radar beacon, and a TPQ-10 tracking radar.

Navigation electronics is similarly extensive, with a Doppler sensor, navigation computer, roller map, air data computer, radar altimeter and Tacan. The automatic flight controls include a Lear Siegler three-axis, stick-steering autopilot; attitude director indicator, and horizon situation indicator. There is also a wide variety of highly-classified electronics counter measures equipment installed.

Among the amazing variety of weapons that Corsair II can carry are 24 250-lb. general purpose bombs; or four Zuni rocket pods and eight other rocket pods with a total of 104 2.75" rockets; or one Shrike air-to-air missile and one Walleye glide bomb; or 12 Snakeye bombs; or four Bullpup A missiles and two Shrike missiles; or two 2000 lb. bombs. And on, and on...

While early Corsair II's were equipped with a pair of 20-mm. cannon in the nose, later A-7Ds and A-72's have been fitted with a single six-barrel Vulcan Gatling gun, capable of firing up to 6000 rounds of 20-mm. shells per minute, although just 1000 rounds are carried.

The first models of the Corsair II were powered by versions of the Pratt & Whitney TF-30 turbofan engine rated at about 12,000 lb. thrust with afterburning. In a successful effort to reduce fuel consumption while increasing power,

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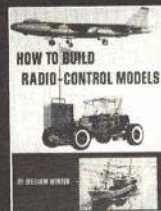
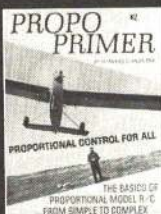
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the U.S. Air Force ordered its A-7D's with the Allison-built Rolls Royce Spey, known as the AF-41. This is rated at 14,250 lb. of thrust without a fuel-gulping afterburner. Following the success of this engine change, the U.S. Navy decided to have most of its A-7E's built with a slightly later version of this engine, which also powers the McDonnell-Douglas F-4K for the Royal Navy and F-4M for the RAF, making it the powerplant on more than 70% of the Corsair II's ordered.

Right from the start, the A-7 looked like a winner. Following its initial test flight, L-T-V Chief Test Pilot John Konrad reported, "All systems appeared great. Take off was calculated at 130 knots, but the airplane wanted to get off—and it did—at 125. As for handling characteristics . . . the plane is immediately responsive, giving you the good feeling of having positive control around all axes." Later he added, "Maneuverability of the A-7A, by virtue of its planform and its wing design, is quite outstanding."

The Corsair II went into combat for the first time on Dec. 4, 1967, with the Navy's VA-147, flying off the USS Ranger near Viet Nam; in the first six months of operations, only one aircraft was lost in combat. Other squadrons quickly followed VA-147 action, and the A-7 became a major combat type in short order. Like its namesake of 25 years before, it rapidly gained a reputation for carrying a heavy load into action and then getting back after absorbing a lot of punishment. Whether or not the future will see it with the aura of nostalgia that now surrounds the classic old F4U, only time will tell.

## Dragonfli

(continued from page 19)

The Dragon Fli design is a development of the Slik-Fli-type fuselage, combined with a newer wing design. Three different airfoils were tried during testing before settling on a 15 per cent section with a maximum camber at about 40 per cent. This low aspect ratio was selected primarily for ease of transportation. It does not appear to have any deficiencies, and may have advantages as far as flight performance is concerned. The deep fuselage of the Dragon Fli contributes to stability, particularly in rough air. Like anything else, it also has disadvantages, such as in taxiing in strong winds.

The plans show retract gear, and there is no question but what this is an absolute necessity for contest flying today. Fliers used to think the effect of retract gear was primarily psychological. However, after having flown an airplane with retract gear, I don't think I would enjoy going back to the fixed gear model again, despite the headaches with the less than satisfactory retract gear units that are currently available.

To sum up, the Dragon Fli is a sound design capable of competition performance. Jim Edwards flew one to second place in this year's Nationals, and two others placed in the top 20 qualifiers.

## Natter

(continued from page 50)

place of two plus a sustainer. This was done in order to observe stability during and shortly after launch. No pilot was aboard during these tests. The first manned flight was a glide test in which the Natter was dropped from an He 111. It performed to the pilot's satisfaction, except that the crude pilot ejection system failed and he had to bail out in the more traditional manner. As it happened, this failure should have been taken as an omen. During the one and only manned powered flight, the cockpit opened prematurely at a very low altitude and the plane crashed, killing the pilot. That effectively ended the program.

I have never seen a good set of drawings of the Natter. The plans for the model were drawn from photographs and dimensions given in the books listed at the end of this article. They are as accurate as I could make them, but they should not be regarded as the last word from an air historian's point of view. The paint job in particular should be regarded as an idealization of what the Natter might finally have looked like. Since none of the two dozen or more that were built ever went into service, it is not likely that any of them ever bore Luftwaffe markings.

The model was designed around a standard 1.637" OD rocket body tube. This gives us a scale of (Are you ready for this?) 1:28.35. While this may be a rather odd scale, it does make for a convenient model size.

Although it may look radically different from the common run of model rockets, the Natter is really a fairly straightforward design with the exception of one thing—the wings. Any model rocketeer can tell at a glance that there isn't enough ballast in the entire world to get the center of gravity ahead of the center of pressure with those wings in place. A number of solutions to the balance problem were tried before I arrived at the design shown here. The logic went

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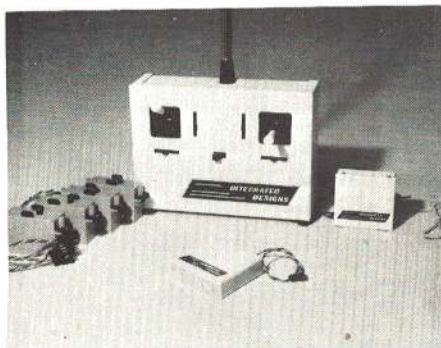
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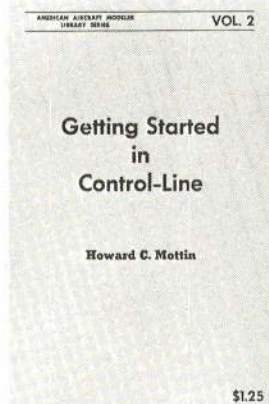
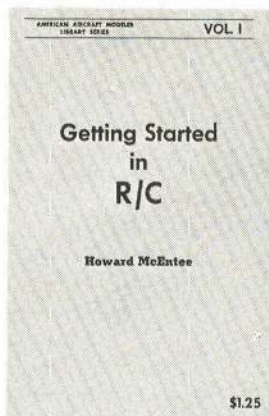


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something like this: "The important thing about a scale model is how it looks when it's on the launcher. Once it starts to move the details are lost." From this point of view the solution is obvious. Jettison the wings.

Since I've had wings come off frequently enough when I didn't want them to, it seemed that it would be easy enough to get rid of them at the proper time. This was accomplished by using a loosely-fitted tongue-in-groove joint which allows the wings to flip off during acceleration.

The other unconventional feature is the tube-inside-a-tube used for the fuselage. This turned out to be an excellent way to make a structure which separated easily and yet was absolutely shake-proof when assembled. It also separates in a very positive manner.

Materials needed to build this model are lengths of 1.637" OD and .767" OD rocket body tubes, a 1 x 2 x 12" balsa block, and a sheet of 1/16" balsa. Other items, such as screw eyes, parachute material, ballast, etc., can probably be found in the scrap box. An electric drill to use as a lathe when turning balsa parts is essential. I really doubt that the model could be built using only hand tools.

Begin construction by cutting and

cementing the 1" thick balsa block so as to make two laminated blocks 2 x 2 x 3 1/2" and 2 x 2 x 2 1/2". When dry, drill into each and install 1/4" hardwood dowels to be chucked in the electric drill for turning. The seam along which the blocks are laminated provides a valuable reference when carving, so try to get the dowels on the centerline and parallel to the seam.

The 2 1/2" block is used for the forward portion of the fuselage. For this purpose it must be lengthened by cementing a piece of 1/2" stock with the grain crosswise to the front (the end opposite the 1/4" dowel) as shown on the drawings. By doing this all the necessary materials can be gotten from a 1 x 2 x 12" block. This step can be avoided by buying a longer piece of 1 x 2" stock and using only 13" of it.

Work is begun on the forward fuselage by chucking the block (it now should be 3" long) in the electric drill and turning the portion which fits into the front of the body tube. Since this portion is fairly short, a hacksaw blade makes a useful turning tool. For bigger contours, I use a Stanley Surform tool. The dowel and drill chuck should be marked so that the piece can always be replaced in the same orientation after removing it to check the fit to the body tube.

When this part of the turning is completed, the result is a rectangular block with a circular boss turned on one end. With the lamination vertical, as shown on the plans, the block is then sawed to the shape shown on the side view of the fuselage, taking care to match the fuselage top and bottom to the turned circular portion. This block is then re-

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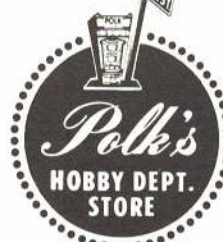
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placed in the drill and turned to a cylinder for its entire length. This establishes the top of the cockpit and the bottom of the fuselage for most of its length.

In order to provide a guide for carving and a smooth surface, a 13/16" dia. circle cut from business card stock is cemented to the front of the block as a nose bulkhead. From here on the piece must be hand carved in the usual solid model style. Cross-sections are provided on the plans for reference. One thing to bear in mind is the fact that the three glass panels forming the windscreen were not curved. A sanding block is a useful tool to use when forming these flat surfaces. Assemble the block and body tube frequently to check the match. Do not glue them together until it is clear that no more turning will be required, then install the screw eye and cut off the dowel before cementing.

The aft section of the fuselage is a completely turned piece. After shaping the external contour, turn circular grooves at both ends of the piece having the same diameter as the outside of the inner body tube. The aft section is then removed from the drill and split along the original glued joint. It is then hollowed out to a thickness of 1/8" to 3/16", leaving a substantial bulkhead front and rear. These are then fitted to the inner body tube using the turned circular grooves as guides.

In order to assure that the two body tubes are concentric, cut a disk of cardboard which has a circular hole in the center to fit the inner body tube and an outside diameter to fit the outer body tube. This is used as a template when cementing the two halves of the aft body and the inner body tube together. The outer body tube is used as a guide during this operation, being careful not to cement it accidentally to the after body.

The tail group is not unusual in any way. Both fins and the stabilizer can be made of 1/8" stock or laminated 1/16" stock. In order to make it stronger and easier to align the interlocking arrangement shown on the drawing was used.

The wings are made of three laminations of 1/16" balsa. The center lamination has a cutout which forms the socket for the wing stubs. The grain of the center lamination should run chordwise. This strengthens the wing and also makes it easier to work when shaping the airfoil. Use a sanding block to get straight leading and trailing edges.

The stub wing is cut to the shape shown on the plans. This makes it easy to line up by eye when cementing it to

the fuselage. After the cement dries, cut the wing to the final shape along the cutting line shown. Better make a few spares while you are at it. While these stubs are easy to break, they also are easy to replace.

When installing the thrust ring, the motor is buried 3/8" inside the aft end of the fuselage. This sneaks the CG forward a bit without adding any weight. The plug which supports the forward end of the inner body tube is a 3/4" length of dummy motor tube. It is installed by inserting it into the inner body tube, coating the very end with cement, and assembling the aft body section to the rest of the model. Be extra careful not to cement the inner tube to the plug!

The model should be balanced before painting. A 3/8" hole is drilled in the nose from the side, as shown on the drawing. With a new A8-3 engine installed, weight is added until the model balances at least 7/8" forward of the separation joint (the line where the after body joins the outer body tube). This will take a lot of ballast. After the ballast is in place, a plug is cemented in over it.

Because of the small size of the recovery compartment, an eight-in. octagonal plastic parachute is about the largest that can be accommodated. It should be protected by enclosing in a bond paper folder, otherwise the ejection charge is liable to melt it. The chute is attached to the screw eye at the top of the after body which also anchors one end of the shock cord.

The shock cord should be as long as possible and still be crammed into the model. Three feet is an absolute minimum. The only trouble with this model occurred when a short (two feet) shock cord slammed the two halves of the fuselage back together and broke the tail. The shock cord is packed by partially assembling the model with parachute in place, leaving an approximately 1/4" gap through which the shock cord can be poked into place before completely closing the assembly.

Flat enamels give the best scale effect for painting. I used an approximation of the RAF "slime and sewage" with a



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white belly. Insignia were cut from  $\frac{3}{4}$ " black and white vinyl tape. A red belly band at the separation joint added a touch of color.

Flying is quite conventional. Even at its relatively heavy weight, an A8-3 engine gets the Natter off the launcher with more than adequate acceleration. It still will be going up when the recovery charge blows. Stability is excellent, but I recommend using a 54-in. launcher rod as insurance. Be sure that the wings are good and loose. If one failed to drop off it would almost certainly wreck the model.

Plans for the Natter were drawn from photographs in INTERNATIONAL MISSILE AND SPACECRAFT GUIDE, by Ordway and Wakeford (McGraw-Hill, 1960), and HISTORY OF ROCKETRY AND SPACE TRAVEL, by Von Braun and Ordway (Crowell Co., 1966). Dimensions are given in ROCKETS, MISSILES, AND SPACE TRAVEL, by Ley (Viking Press, 1951).

## Bandersnap

(continued from page 35)

around a  $\frac{1}{4}$ " diameter glass or metal tube inside dry Japanese tissue. Use several pieces of No. 810 Scotch Tape to keep the tissue from unrolling. Wet tissue and bake form for a half hour at 150 degrees in the kitchen oven. When the form is cool, carefully remove the rounded blank from the form and glue the edges together, keeping the seam straight.

**Tail Boom:** The tail boom is fabricated by the same methods, using a Micro-X or Micro-Dyne tapered steel universal tail boom form. A one-time purchase, it can be used for all future indoor models. A tapered hardwood form may be carved, but it is a lot of work and the commercial forms are highly superior.

**Glue:** Regular amber Ambroid Cement thinned down about fifty per cent with acetone makes an excellent indoor model cement. Use it sparingly to avoid warping the light structure. Glue is heavy, so don't overdo it.

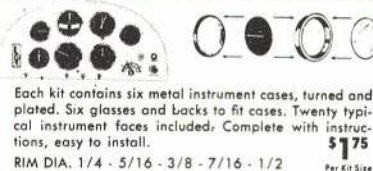
**Wing and Stab:** The wing and stab are built inside thin cardboard templates as shown. Use a piece of carbon paper to trace wing and stab outlines on thin poster cardboard (available at about 25 cents a sheet at any arts and crafts shop). After the templates are cut out, cover the building board with a thin sheet of polyethylene plastic, because glue does not adhere to it readily.

Pin the templates to the building board. Wing or stab spars are held in place inside the templates by any handy small weights. Then the ribs are cut to proper length and glued in place. Thanks to the plastic sheet, the finished part is easily removed from the board. If too much glue had been used, slip a razor blade between the board or template and loosen the one or two offending glue joints. It is a simple matter, but move slowly and with care.

This type of indoor construction (taught to me by DC Maxecuter and indoor expert, Bill Bigge) is quite different from previously published and widely used techniques, but it does work well.

A single template may be used for the whole wing, but from force of habit I use one template for the flat center section of the wing and a separate template for the wing tips, including dihedral break compression ribs. The wing tips are then tack-glued to the center

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## Bandersnap

(Continued from page 85)

section with the wing flat, ready for covering. On larger models, this makes for more efficient use of a choice piece of indoor spar stock. The wing is covered flat, add to dihedral after covering.

Curved spars for wing tips and stab are wet with warm water and bent around aluminum forms. The wet spars are then baked in the kitchen oven at 200 degrees for about five min. Forms are easily shaped from strips of soft hobby-shop aluminum.

Prop Bearing: The prop bearing can be made from a small piece of thin aluminum alloy. However, beginners often have problems, and Micro-X makes an excellent prefab bearing with the hole already drilled. Simply cut it to proper length and glue it to the model.

Wing Bracing: The usual indoor instructions frighten a beginner with tales of elaborate jigs needed for bracing. This is to prove that the designer is a fantastic craftsman and a real genius. It also convinces the novice that building such a model is beyond the skill of a mere mortal. This kind of nonsense scared me out of building indoor models for years and I missed a lot of fun.

My "elaborate" bracing jig (see photo) is a 3" wide sheet of ¼" balsa. One end of the jig is set on the workbench and weighted down with a quart can of supersonic 1000 ("Blast" or "This is IT!") racing fuel will do just as well).

The bottoms of the compression ribs are tack-glued to the sheet of balsa. Note the small block of 1/16" sheet under the left wing compression rib just

behind the leading edge of the wing, which assures proper wash-in for flight adjustment. String the brace wires and glue the brace points. When dry, carefully cut wing loose from the board.

Wing Mounting: The wing posts are lengths of 1/16" balsa sanded round. Take care not to taper them, since the posts are a friction fit in the paper tubes and must be moved up and down for flight adjustments. If, at the flying site, the posts are too loose, a drop of water will cause them to swell and make a tight fit in the tube.

Paper Tubes: Beginners often have real trouble making the paper tubes in which the wing is mounted. Actually, this step is quite simple. Cut out several 1 x 1½" pieces of Japanese tissue. Moisten the edge and start to roll it around the end of a short piece of 1/16" diameter wire or metal tubing. Then coat the remainder of the paper with thinned-down cement and roll the tube between two fingers. A little water on the outside of the tube will help if the paper tries to unroll itself. As soon as the paper tube is rolled, push it off the wire before it starts to dry.

Prop: The propeller is built one blade at a time on the building jig.

Model Weight: Bandersnap is meant to be flown at small sites with low ceilings where weight is not as extremely critical a factor as it would be under higher ceilings. Build it strong enough so that it will handle easily.

Flight Adjustment: Like most indoor models, Bandersnap is designed to fly in a left-hand circle. In general, it should be flown as slowly as possible, just off the stall for maximum duration. Build a 3/32" wash-in the left wing panel to compensate for torque. Depending on model weight and air conditions, an 11" loop of .030 to .040 indoor Pirelli is about the right power for this model.

Bandersnap should not be flown in competition with larger models at major high-ceiling sites. Under these conditions, a scale effect gives the bigger planes an advantage. In the smaller low-ceiling sites, where most beginners get their early indoor experience, Bandersnap is hard to beat! It is meant for the builder who has a fair amount of knowledge and skill, especially with the simpler easy B models. Junior, or older modelers with little experience, would do well to construct an Easy B model first. Both Mirco-Dyne and Micro-X feature Easy B kits for the novice.

## Wedell-Williams

(continued from page 23)

up, a crude black race No. 2 smeared on the Wedell-Williams' side. But on July 1, Roscoe bettered his own East-to-West-Coast record and won the 1933 Bendix in 11 hr., 30 min. Topping his old friend Jimmy Wedell by 28 min., Turner also beat him out in the three-kilometer Shell Speed Dashes at 280.247 mph.

The Thompson was flown on July 4th. Leading on the first lap, Roscoe cut a pylon in the hazy sky. On the second lap, he recircled the missed pylon and relinquished the lead to Jimmy Wedell in NR278V. By the time Turner was back on the course, NR278V was a mile ahead of his NR61Y. But within another ten-mile lap, Turner was in the lead and first across the finish line.

Roscoe was draped with flowers, presented the Thompson Trophy, and about to make his acceptance speech over national radio, when an official announced



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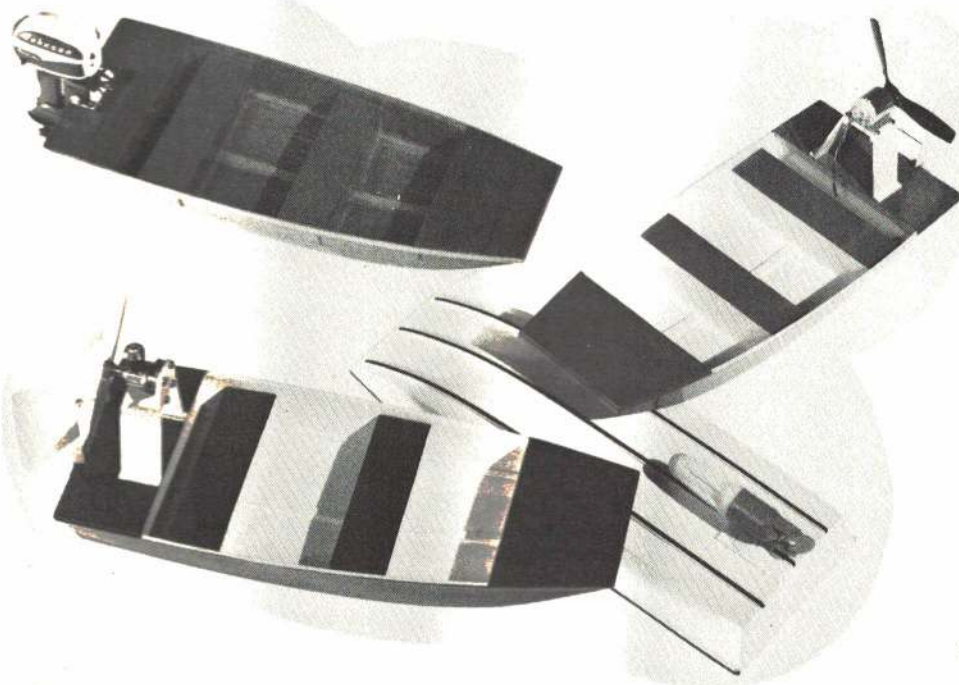
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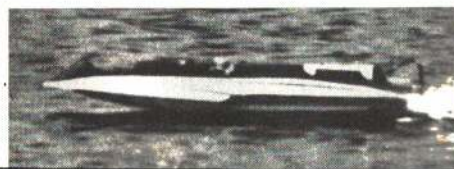
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Turner had been disqualified for not recircling the missed pylon on the same lap. Without protest, Roscoe handed back the trophy and he and Don Young, heads down, plodded across the field. Later, Roscoe explained that immediate recircling of the missed pylon would have meant certain collision with another racer. Col. Turner's humility after disqualification endeared him to the American public.

Next came the 1933 Chicago International Air Races (Sept. 1-3) with prize money and dazzling trophies put up by such sponsors as Krim-Ko, Frank Phillips, Baby Ruth, Hotel Sherman, Atlas Brewing Co., Aero Digest, and Illinois Gov. Horner. Chicago attracted the greats among the 1933 racing pilots.

The NR61Y originally entered the race as No. 17, but no current Bendix winner could fly with a number other than the one with which he had won this famous race. So Roscoe's Wedell-Williams had a white No. 2 neatly painted on the fuselage and right lower and left upper wing tips. The advertiser was changed too. On the fuselage sides, under the cockpit in a circle, and also

on the wheel pants, "Ring-Free Special" appeared in red, white, and blue. They represented the Macmillan Oil Co. A new cowl whose frontal area was slightly smaller than that on the Bendix-winning craft was installed. The front eight inches were not burnished aluminum, the rest was. On the fuselage, between the landing wires, "Bendix Equipped" and "H. T. Spark Plugs-Smith Controllable Pitch Propeller" plugged other accessories used by NR61Y.

Roscoe entered the Shell Speed Dashes Sept. 1, but Jimmy Wedell, who also changed to a P&W Wasp Sr., promptly set a new world's speed record of 305.33 mph. Roscoe took second at 289.9 mph and Gehlbach was third with 272.06 mph in his Wedell-Williams. Again the Wedell-Williams racers dominated a major event! In the Frank Phillips Trophy Race, flown the next day, the Ring-Free Special took the lead until stripped gears in the engine slowed the craft in the eighth lap. Turner collected \$333 as Phillips' lap winnings, \$600 for second place in the Shell Speed Dashes.

Roscoe's dreams for holding both coast-to-coast records came true Sept. 25, as he bettered Haizlip's 1932 time of 10 hr. 19 min. by 10 hr. 4 1/2 min. for the West-to-East Coast flight. Only the No. 2 had been deleted from the aircraft for this record run.

After the Wasp Sr. engine broke a crankshaft, Roscoe installed a new P&W Hornet engine (Spec. No. T1D1, Serial No. 1853), boosted to 1000 hp. Using a Hamilton Standard propeller, the craft was tested Feb. 9, 1934. It was still fitted with the smooth cowl; however, the paint scheme was now overall gold-bronze. The cowl announced in black letters, "Powered by Pratt & Whitney Hornet."

Turner's Ring-Free Special arrived at Detroit's Wayne County Airport, March 24, to do work for the Maxon Advertising Agency. While there, Roscoe decided to take a crack at Wedell's world speed record. Bad weather prevented some of his flights, but Roscoe finally set a new record from Detroit to Pittsburgh, May 3. Two days later, at Detroit, the NR61Y tried again. One lap bettered Wedell's record by .02 mph, but this time broken oil lines stopped the flight. Further attempts were discontinued. However, on May 11, the Wedell-Williams set a new Detroit-to-New York record.

After returning to Burbank, Turner made an effort to gain more speed by installing a smaller cowl, so snug that the rocker-arm housings of the Hornet fitted into teardrop bumps on the cowl. The new gold-bronze cowl bore the single word "Hornet."

For the 1934 Bendix, Turner added an advertisement for the H. J. Heinz Co., famous for their 57 varieties of food. A white race No. 57 in a red disc replaced the Macmillan ad on the fuselage. But that company was still represented. The wheel pants carried Macmillan's trademark, a blue and white piston and rod in a circle.

After Jimmy Wedell was killed in a trainer crash, his NR278W was taken over for the 1934 races by the renowned Doug Davis. In early morning, Aug. 31, the Bendix race from Burbank to Cleveland began. The weather was bad. When Davis crossed the finish line in Cleveland, barely beating the deadline, he became the '34 Bendix winner.

Back at Burbank, fuel leaks kept NR61Y and Roscoe from taking off but,

on the next day, Turner broke his own West-to-East record by flying to New York's Floyd Bennett Field in 10 hr., 2 min., 39 sec.

At the National Air Races in Cleveland, Sept. 2, Davis took first in the Shell Speed Dashes with the time of 306.21 mph. Roscoe's 295.46 mph was good enough for second place.

The Thompson Trophy Race Sept. 3, drew eight entries. After a racehorse start, Davis took the lead, Turner flying a close second. On the eighth lap, behind the grandstands, Davis missed a pylon and tried to recircle it in a very high-G turn. NR278V went into a high-speed stall and crashed, carrying the famed Doug Davis to his death. NR61Y took over first place and Turner won his first Thompson race.

After the 1934 race, Roscoe's fame and popularity continued to grow. Heinz began "Col. Turner's Flying Adventures," a syndicated Sunday comic strip, in the national newspapers. A regular Saturday morning radio program about aviation featured Col. Turner as host.

In the summer of 1935, the Hornet was completely overhauled and tests were conducted on the engine. Roscoe then set a new record from Los Angeles to San Francisco on Aug. 23. The NR61Y again carried the Macmillan advertisement on its fuselage—"Roscoe Turner's Macmillan Ring-Free Special." The race number 57, now in black, was retained but moved aft of the cockpit, on the fuselage fabric. A listing of the events won and national records set by the aircraft now appeared between the landing wires on the fuselage.

Benny Howard's Mr. Mulligan, which looked more like a commercial plane than an air racer, was the surprise of

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(Signed) Harvey E. Cantrell, Business Manager

the 1935 National Air Races. Taking off from Burbank in the Bendix Race, Howard and co-pilot Gordon Israel used oxygen to fly at 26,000 ft., high above the miserable weather. Below, the rest of the entries dodged thunderstorms and fog.

After takeoff from a fuel stop in Kansas City, both Howard and Israel forgot to retract the wing flaps. They went undiscovered until just outside of Cleveland! Mr. Mulligan's wheels touched down on the Cleveland-Hopkins Airport runway, with Turner's NR61Y only 23½ sec. behind. For a short while, no one was sure who had won, then Howard was proclaimed the winner. As Roscoe still sat in the cockpit of his Wedell-Williams, Vincent Bendix handed Benny Howard a first-place check for \$4500, and Turner \$2500 for second.

Event No. 12 on the 1935 National Race Day Program was the Thompson, that year's richest single race in prize money. On Sept. 12, seven racers took off and Roscoe bent the throttle on NR61Y to take the lead. When he was ahead by seven and one-half miles and only 20 minutes from the finish line, the 1000-hp Hornet blew up.

As smoke poured from the cowl of the golden racer the crowd stood silent. Turner was struggling to gain altitude for bailout. But, as the craft headed earthward, no parachute was visible. Turner was riding the Wedell-Williams down! It nearly stalled out several times, but finally it landed—directly in front of the applauding grandstand crowd.

Roscoe later told the crowd and radio listeners, "Everyone is saying tough luck, Roscoe. I don't think so, for when you can walk away from an aircraft like that, I think that's good luck. In fact, I think I'm lucky as hell!" When NR61Y caught on fire, Harold Neuman took over the lead with Mr. Mulligan. He won the \$6750 prize for a 220.194 mph time.

Nineteen thirty-six was a year for racing aircraft crashes, the NR61Y among them. With its paint scheme unchanged (except for the race No. 67), Roscoe flew it out of Burbank, Aug. 30, for the Bendix lineup in New York. Over the big mountains, the Hornet began to misfire and finally quit. Once more, Roscoe elected to try saving the aircraft. He attempted a landing on the rugged terrain of Arizona's Zuni Indian Reservation, but the NR61Y ground-looped.

Everything aft of the cockpit was a shambles, the wings were bent, landing gear wheel pants ripped. Roscoe survived, but suffered broken ribs and many cuts and bruises. He returned to Los Angeles by rail, refusing a stretcher off the train. The 1936 National Air Races found him in the grand stand at Mines Field.

In Chicago, Matty Laird was building Turner's new racer for the 1937-39 season. He also rebuilt the Wedell-Williams. Dept. of Commerce, Bureau of Air Commerce, Form 466 (6-1-35), signed by Laird Aug. 20, 1937, certified that the entire structure, including wings, tail surfaces, landing gear, and engine mount, had been rebuilt. A complete recovering and refinishing of the gold-bronze paint scheme was included. Hamilton Standard had repaired the propeller. Two days later Roscoe arrived in Chicago to test his rebuilt Wedell-Williams.

The bump cowl had "Pratt & Whitney Hornet" painted on it, and the fuselage



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carried the Ethyl Corporation insignia. Under the cockpit appeared "Roscoe Turner's Ring-Free Comet." The Macmillan Oil Co. placed its ad on both the Wedell-Williams and Roscoe's new Turner Special racer, the Ring-Free Meteor. Race No. 25 replaced the No. 67 on the fuselage, and the Laird Planes triangle insignia appeared on the fin. With the N deleted, the license now read R61Y.

The Turner Special was Roscoe's choice for the 1937 Bendix and famed aerobatic pilot Joe Mackey was selected to fly the Ring-Free Comet. Fuel leaking problems again arose, this time with the Turner Special, and Mackey led the racers into St. Louis. Here it was noted that oil was being thrown out of the breather, and several hours were spent trying to locate the difficulty. Mackey finally filled the craft with oil, continued to Cleveland, and came in last. The oil problem was never solved. Engine trouble forced the craft out on the 17th lap of the Thompson Trophy Race.

During 1938-39, the Wedell-Williams was flown very little except in the National Air Races at Cleveland. The "Laird Planes" was removed from the fin, and Mackey placed fifth in the 1938 Thompson. A "Champion Spark Plug" insignia then was added to the wheel pants and the license number changed to NX61Y. Mackey placed sixth in the 1939 Thompson Trophy Race.

WW II threatened after the 1939 racing season, and the National Air Races were discontinued. The Wedell-Williams was stored in the Jim Borton hangar at Cleveland-Hopkins Airport. Roscoe retired from air racing after his third Thompson win in 1939 and took the Turner Special back to Indianapolis with him.

In 1940, Col. Turner loaned the Wedell-Williams to the Thompson Museum for display but, because of lack of space, it remained suspended from the ceiling in the Borton hangar until the Museum finally had room for it in 1947. It appeared as it had in 1939, except that the ship's 1932-39 records now were painted on the fuselage behind the cockpit.

The new Frederick C. Crawford Auto and Aviation Museum opened at Cleveland's University Center in 1965, and all the Thompson Museum's displays were moved there. Today, the Wedell-Williams is as Joe Mackey last stepped from its cockpit.

Other interesting items associated with this famous aircraft and its era are on display at the Roscoe Turner Museum in Indianapolis, Ind. Fittingly, it is dedicated to America's two greatest air races: the Thompson and the Bendix.

#### TURNER'S 1932 WEDELL-WILLIAMS as on ink drawings

Model No. 441POLM Racer, Mfg.: Wedell-Williams Air Service Corp., Patterson, La., Mfg.'s Serial No. 109, Registration No. NR-61Y.  
Span: 26 ft., 2 in. Chord: 5 ft., 3 in., at root, 5 ft., at tip. Area: 107.81 sq. ft. Airfoil: Wedell's own, 4 in. thick at deepest point.  
Stabilizer chord: 2 ft., 2 in., at root. Elevator chord: 1 ft., 5 in. Elevator span: 8 ft., 6 in. Fin root chord: 3 ft., 7 in. Rudder chord: 1 ft., 9 in. Rudder height: 4 ft., 9 in.  
Length: 21 ft., 4 in., spinner to TE of rudder. Width: 4 ft. at firewall.  
Fuel: No. 1 tank, 147 gal., No. 2 tank, 51 gal. Oil: 14 gal.  
Engine: P&W Wasp Jr. 2A, 985 cu. in. disp., Serial No. 133, 375 hp. Bore: 5 3/16 in.; stroke: 5 3/16 in.  
Weight: 1500 lb. empty; 2206 lb. gross.  
Propeller: Hamilton Standard, Hub Model No. 5978E, Blade Model No. 17A230B. Manufacturer's Blade Serial No.: 46319 & 46318, Hub Serial No. 21669. Propeller dia.: 7 ft., 11 in.  
Landing gear tread: 5 ft., 3 in.

#### COLOR SCHEME

as it appeared at the Thompson Trophy Race, Cleveland, Ohio, September 5, 1932, and on inked drawings.

Gilmore Cream: Overall color  
Gilmore Red Trim Color: NR-61Y Reg. No.'s., all edge trim on wing, fin, rudder, stab., elevator; Reg. No. NR-61Y on rudder; mfd. by on fin, landing gear fairings and inside of wheel pants.  
Gilmore Red with Black pinstripe: GILMORE on wings; GILMORE RED LION on fuselage and wheel pants; GILMORE OIL CO., LTD., on fuselage, striping on cowl and fuselage.  
Black: All 121 racing no.'s., No Stop, No Push, and Wedell-Williams Air Service Corp. on fin.  
Yellow Gold with Black Features: Lion figure on fuselage and wheel pants.  
Wedell-Williams insignia on fin.  
Blue: Triangle.  
Yellow gold: WW in triangle.  
Yellow gold with black pinstripe: Wing and arrow.

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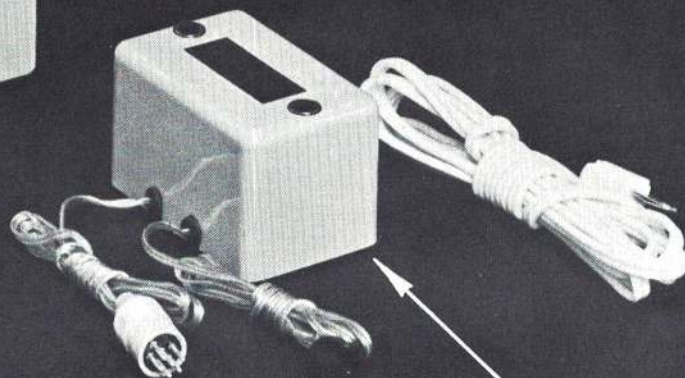
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