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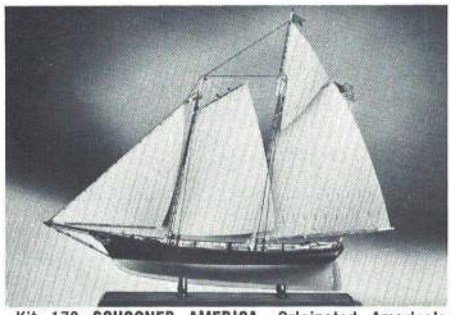

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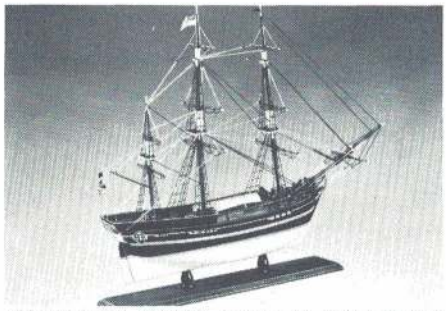

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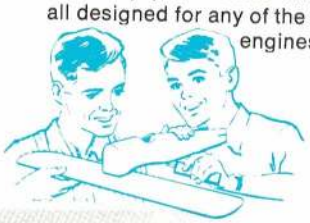

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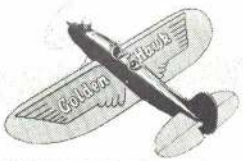

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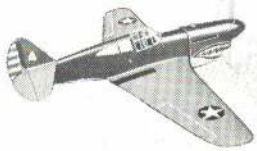

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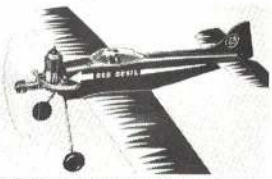

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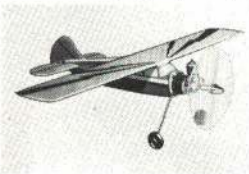

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AMERICAN aircraft modeler

COVER PHOTO: With only the projecting cylinder head to give it away, Mark Frankel's V-tailed Bonanza model looks exactly like the prototype. Plans for his Bonanza and Debonair are found in this issue. Cover photo by the designer.

WILLIAM J. WINTER — PUBLISHER **EDWARD C. SWEENEY, JR.—EDITOR**
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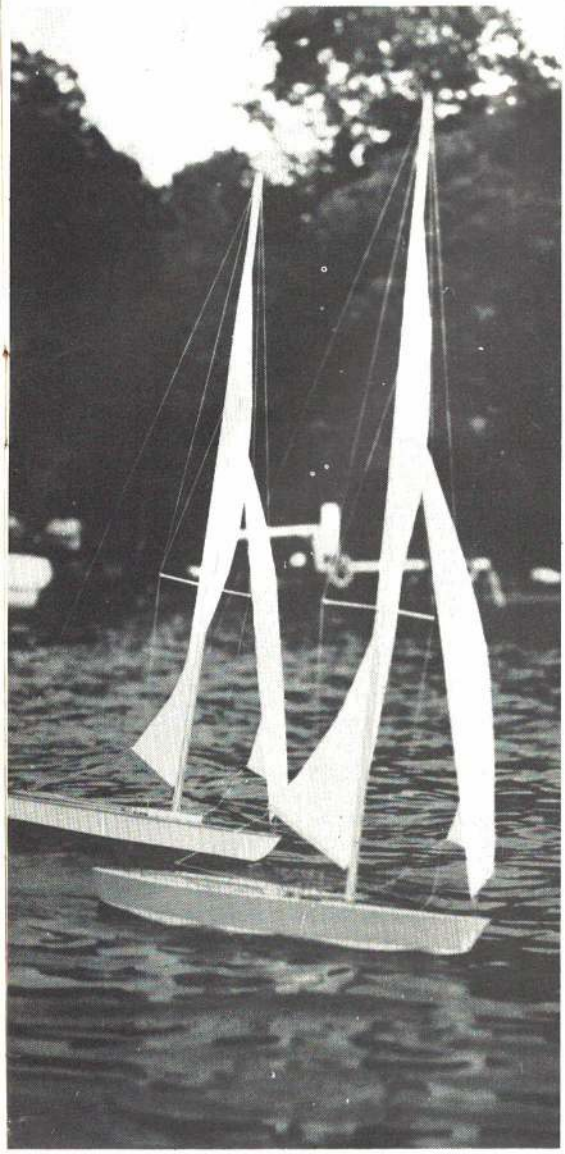

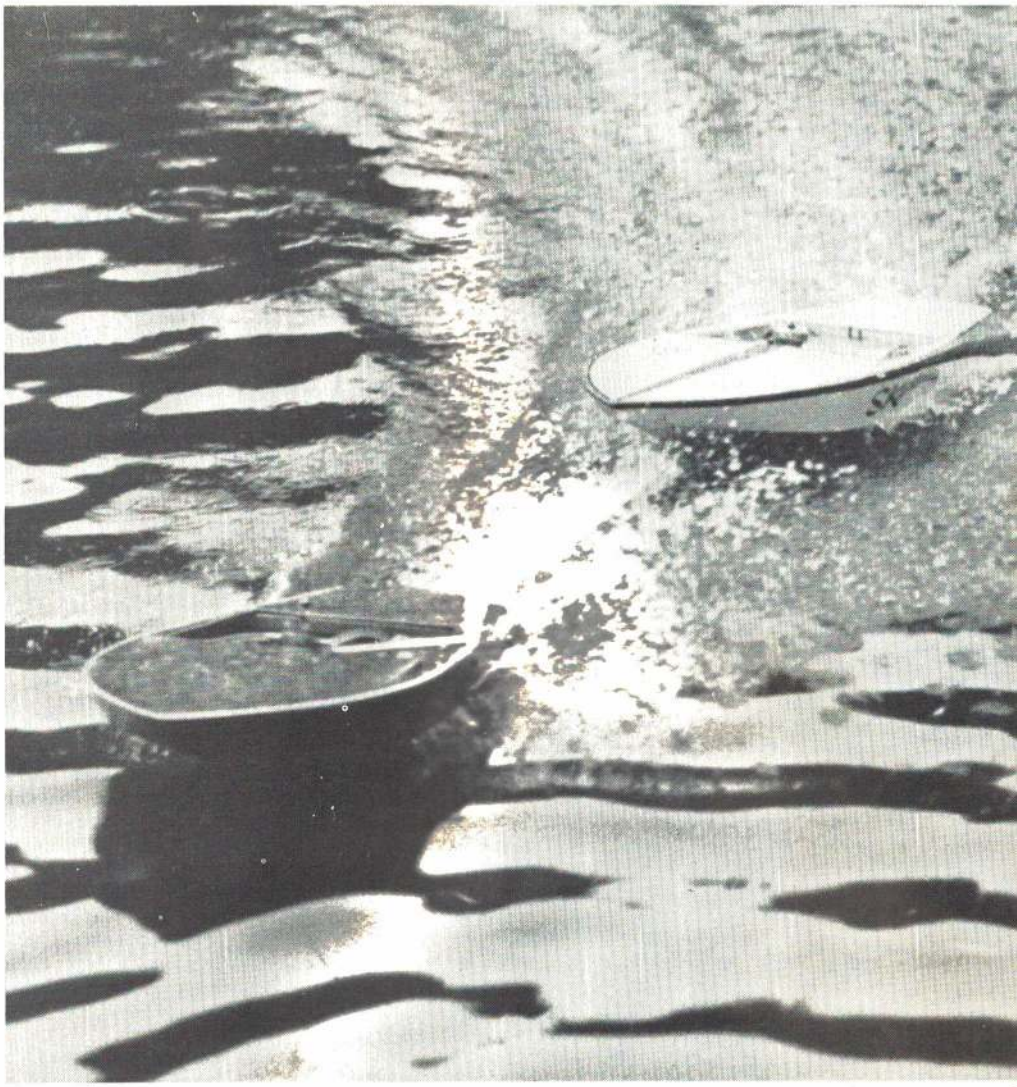

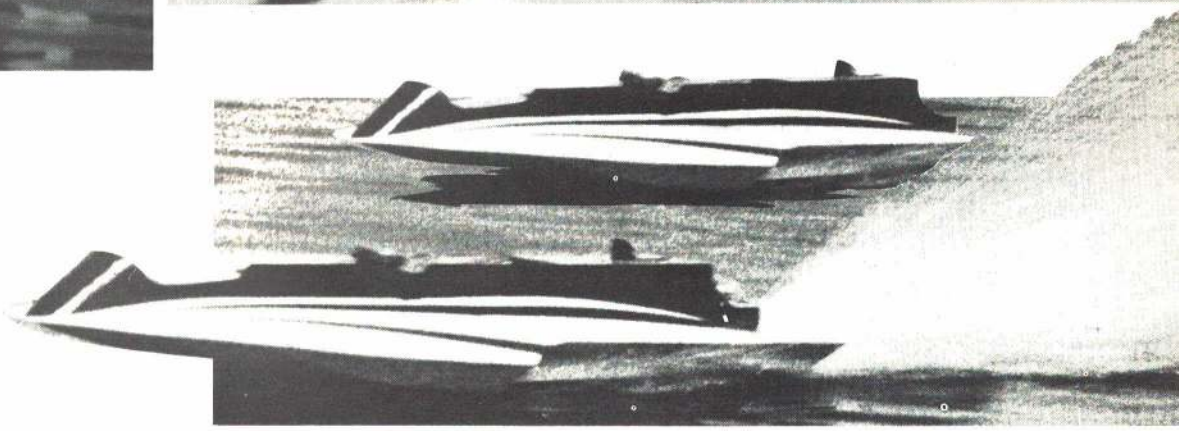

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straight and level

THE GUY WE CAN NEVER FORGET

IN OUR PRESENT day hobby there are many distinguished designers, builders, and fliers, yet there is no one person who stands out like a Babe Ruth, or a Jimmy Brown–no superman. The very idea seems corny. Yet there was once just such a man, Jim Walker, whose exploits and personality were legendary. He did more for model aviation than anyone before, or since. Periodically, and for the sheer enjoyment of it, it seems fitting to recall this incredible guy who held us all in awe. This editorial is reprinted from the November 1968 issue of **AAM**.

JIM WALKER was the greatest. Since he left us, model aviation has never been the same. He brought to this hobby, and business, an unbelievable combination of soaring ideas and ideals, manufactured products of unsurpassed ingenuity, and a spectacular showmanship that left us all agog. He was a Gulliver among Lilliputians. With him ended a golden era. But, what he did still touches us all.

He was many things. The best salesman model aviation ever had. A major manufacturer whose ingenuity and imagineering held others in awe. He was a prolific inventor. A fantastic showman. A legend in his own time. Blessed with an almost superhuman coordination, he did things with model airplanes that no one ever did before, or since. He was a hero to the kids. A Pied Piper for all of us–through he led us always to bright places. He was the circus come to town. The catalyst that ignited a Nationals. A magician who held us spell-bound. And, maybe, a bit of a lovable ham. He upstaged everybody. Wild and wonderful things always happened when you were with him. As a lone tree draws lightning, he attracted the darndest adventures.

Many remember him for this three-at-once control-line act and his Sabre Dance. Others for his wins of the RC event at the Nats, both before and after the war. The U-Reely handle was his–it came out over 20 years ago! The Interceptor folding-wing catapult gliders–the Army even used them for target practice–and the Hornet ROG. The Ceiling Walker, balloon tanks, The Fireball (on floats, too!), the Firebaby. He wasn't just first with many things–he was there for a generation before others caught up. Many never did. Genius, expert competitor, manufacturer, an inspiration for kids, inventor, he was everything. Whatever you were, he was too. But mostly he was a flamboyant showman whose knack for turning people on would be the envy of the best public relations man in any field. A modern-day Barnum, he substituted the word "hobbyist" for "sucker." A hobbyist was born every minute and Walker was out to sign 'em up.

We first met this cosmic force of a man in New York shortly before the war. He had come to demonstrate in a hall, his U-control Fireball. None of us knew what he was talking about. We came, we saw, but we were not conquered. Jim had rigged a double set of lines so he could instruct the press in flying this strange on-wires airplane. A brick on a string–and that's what all the free-flighters said at the next Nats when he demonstrated it at Chicago. He flew, and flew, and flew–all day, every day. And they watched with deadpan faces. It was this very magazine, come to think of it, which then published U-control scale model plans–and the always interested scale fans (who make the world go around, and don't kid yourself) took to the idea like pigs to mud. The model airplane world was turned completely upside down.

By the time of the first Olathe Nats Jim had perfected his three-at-once act for the Sunday demonstrations. We all went home remembering Walker, rather than the Blue Angels! He had three McCoy 29-powered Fireballs, sitting there with engines throbbing–like the start of a team race. Waiting on the helpers to get all mills tuned, Jim would stand expectantly in the center of the circle, a helmet on his head. In each hand he held a U-Reely. The third ship's lines ran to a pylon on his helmet. Its motor-control button was clenched in his teeth. All three had two-speed ignition; he flew tight formation without a slip. Eventually, he added a PA deal in his helmet and would explain what was going on as all three ships zipped around like angry bugs, motors zinging up and down to keep position. (It was rumored much later that he managed four ships simultaneously!)

He was in demand at sportsman shows. By now he really had an act. The star attraction was his radio-control lawnmower. This thing had gotten national publicity in popular-science type magazines–with Jim in a hammock, sipping a glass, while buddy mower ran up and down the lawn. Millions laughed. The mower, incidentally, was rendered reel-less later, a practical concession after he had followed horses in a Seattle parade. (Jim was fond of telling about the guy standing on a theater marque who laughed so hard he fell off and broke a leg.)

Before a crowded house at the Sportsman's Pier in Chicago, Jim made his grand entrance, followed by the docile mower. A control switch was hidden in his belt buckle. Off to the side of the tanbark ring stood the three orange-colored Fireballs. Bowing and gesturing, Jim strode toward center-circle. Unknowingly, he hit the control switch. The jealous mower took off on its own, sneaked up on the defenseless Fireballs and spewed forth a cloud of orange dust. It brought down the house. The crowd kept roaring, "Encore, encore."

Jim played a U-Reely handle like Al Hirt tootles a trumpet. A virtuoso. For his Sabre Dance his two-speed ignition Fireball, with a pin on its tail, would go into an abrupt climb, hover motionless, then back down slowly to burst a balloon on the ground. A quick recovery climb and the Fireball circled in level flight while Jim took the applause.

Or he would run out from a side-line crowd at the Nats–this happened in Minneapolis, if memory serves, when Jim had been banned as a distraction to the crowd who ate up his antics–a Fireball, engine running, right at his finger tips. As he went, he'd pay out lines to steal the show. If the wind was light, he'd let out 200 feet of lines. The sight of a Fireball almost free-flighting around a 400-foot circle is something no one could forget. Jim, incidentally, kept his radio frequency secret because we all loved to louse up his mower act with clandestine handheld transmitters. With the mower marching around him like a crack drill team, passing between his feet, and stuff, it was no time for such monkeyshines! Poor Jim never knew what happened but he'd stare us through and through!

During that early New York visit, he dragged the Polk brothers from theri shop to see the Fireball fly. Conveniently at hand was the block-long post office on the city's west side. Nothing would do him but to fly in front of the steps. The crowd was immense. Buses stopped. Cars stopped. Nobody could move. Out came the Emergency Squad in special trucks and flashing head lights and deafening klaxon horns. When the same thing happened in Chicago, Jim was insulted when only one cop on a motorcycle was dispatched. Jim got even by handing the lines to the cop. Not being told to pivot with the model, the man was soon tied up by steel wires.

Jim had an unbelievable mastery of models. For him they'd do everything but talk. Once, going into a buyer's office, he noted an open window on each side of the desk in the corner. So he tossed a glider out of one window just before shaking hands. The obedient bit of sheet balsa circled around the corner of the building, came in the other window, and back to Jim's hand. What buyer would say, "No" after that? Jim could toss gliders with an infinite variety of motions, backhand, around his back, a kind of upside-down, upward flip, to the right, to the left, anywhere. And the darn things always came to roost in his hand.

He had a barrel of tricks. A little knick in the prop permitted him to catch the wound-up prop in the wire landing gear. He casually would hand-glide the model. When it struck the floor, the prop would spring free, and the ship would power-circle around the group–totally ignored by its pilot. He had the Ceiling Walker–in fact, it was a bust, and he ended up with a warehouse full of the things. It was just a stick with a prop on top and another on the bottom. It would bore straight up to the top of a ten-floor building. He'd hand these things out in any large city street, and soon dozens of the copters would be sailing on high. He did this in New York one day, summoned us down by his car phone-as well as the entranced buyer from swank Abercrombie and Fitch.

There was a night parade up Broadway. It so happened–as it always seemed to happen–that Jim was on hand. He slipped the searchlight operator a fiver to follow his Interceptor gliders in flight. As the caravan went through Times Square, the crowd was treated to a rapid-fire launching of gliders high into the sky. Walker never missed a chance to show model planes to the public.

He invented a sound-control glider. This creation had a diaphragm built into its side. Jim ran beneath tooting on a horn, steering the thing about like any RC rudder job. Behind the project was a vast amount of trial-and-error research. Testing response of the "receiver" to various sounds, Jim walked out of his house one night, and down the street. He was loaded down with noise-making devices–including whistles, a drum (to hear him tell it), and even a revolver. When he fired the gun in an empty lot, the nervous neighbors called the cops. Climbing out of the cruiser–it is unknown what effect the siren had upon the model back in the basement–the burly arm of the law inquired what in the name of Ned was Walker doing. Noting Jim's little pop gun, the intrigued cop dragged out his own bigger shooting iron, and

(Continued on page 89)

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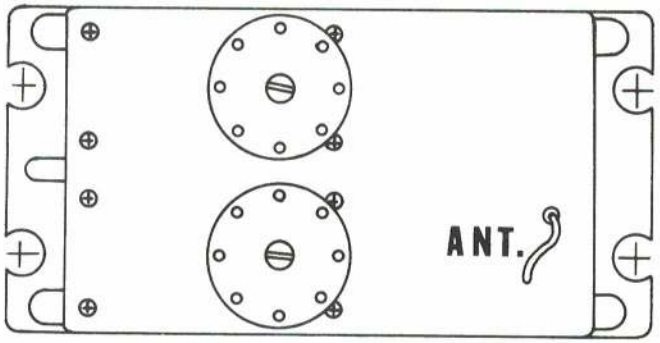

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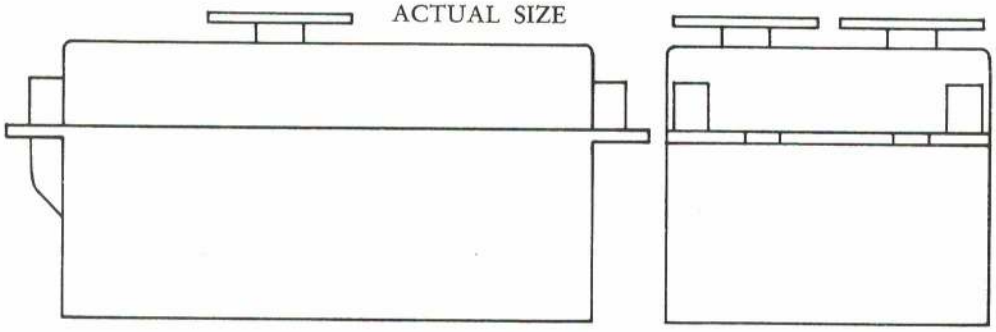

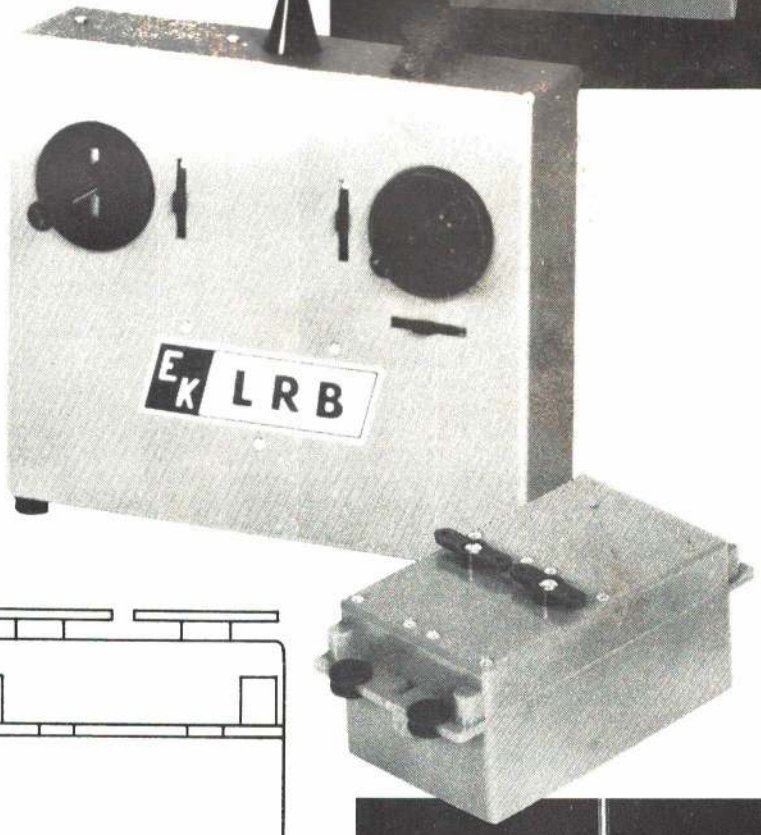

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One Q: alive, well and living in. . .

More data on the GHQ–up to about 1934 the engine was known as the Loutrel Aero Motor, sold by the Loutrel Specialty Co., Brooklyn, N.Y. The Loutrel had a 7/8" bore and 3/4" stroke. It seemed to have disappeared from the market about 1934 or 1935 and reappeared in 1936 or 1937 as the redesigned GHQ. It now sported a 15/16" bore and 3/4" stroke, a drawn sheet-metal piston and inferior machining throughout. The increased bore size gave the engine a fatter, or more squat, appearance.

A picture of the original Loutrel may be seen in an ad which appears in the June 1934 *Universal Model Airplane News*. In the late thirties, I acquired a GHQ that would not run. It lay around for about eight years. One day I re-examined it and discovered that the bypass holes in the piston did not time properly.

I lathe-turned a proper piston, made a bushed dural con-rod, new crankshaft, and fitted a Cyclone engine needle valve assembly. The engine was run-in for several hours on a lathe. A mahogany prop 13" in diameter, approximately 8 pitch, and weighing one oz., was installed and it was ready for testing.

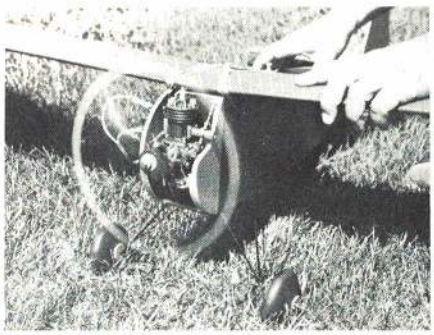
With the switch off and a finger closing the carb venturi, the prop was flipped twice for prime. The third flip, with switch on, produced a couple of pops and with the fourth flip it roared into song. It consistently started so easily that I decided to build a plane for it. That year (1946) I chose the wonderful model, Flying Lab, designed by Walter Schroder. I took the plane to the Notre Dame parking lot and fired it up. It literally flew out of my hands and continued to fly beautifully for ten years until I retired it.

Many fellows in the vicinity were attracted by the unusual rumble of the GHQ and sauntered over to see what I had stuck in the nose of my bird. Their eyes would bulge in disbelief, and they walked away mumbling colorful words about an engine called GHQ.

The flying weight of the plane is three lb. She always flew the same pattern–a gentle, 15-degree climb, circling left in 200-ft. dia. circles. When the engine cut, it would swing to larger right-hand circles, touch down on two wheels and in about 25 ft. the tail would settle. A beautiful sight indeed.

I would love to fly her again, but have no sites large enough to use. Photos were taken the other day–it shows the GHQ at 6000-plus rpm, plenty of thrust to fly the plane.

The GHQ could have been a good engine if. . . . The bug in the ointment was the piston. Regardless of how much compression it seemed to have, the rounded domed head of the stamping caused it to lose compression at speed; the misaligned bypass holes didn't help, either.



My piston is made of cold rolled steel; it has a 3/32"-high baffle on the bypass side; the head is flat and the juncture of the head and piston sides is sharply cornered. At 1/16" below piston top are three V grooves about .005" deep. These grooves retain oil and aid compression at speed. My breaker points are set at .020 gap and in a position that the engine fires when the piston is a 1/32" to 3/64" before top dead center. The replacement con-rod and crankshaft were not necessary; I just like to make things. The needle valve replacement was necessary.

I have been flying models for 45 years now and enjoyed every minute of it. I now dabble in RC, but will never, never lose my love for the grace and beauty of a large, well-trimmed free flight.

F.J. Dombeck, South Bend, Ind.

Since a number of readers have written about their successes with the GHQ engine, so familiar to tens of thousands of old-timers, we have included one more letter on this lively subject. The Flying Lab mentioned by Mr. Dombeck was designed by your publisher, and built and flown by him and Walt Schroder. Walt was a keen FF competition flier in those days. The two of us ran up a one minute plus total on three out-of-sight flights in a Hicksville, N.Y., contest, so high was the wind. The ship was lost on all three flights, recovered after phone calls on the first two, then swallowed by a reaper on the third. We got back the engine three months later.

–Publisher.

Appreciates Hannan

I would like to see more articles by Bill Hannan. I have made several of his models and particularly enjoyed the Baka Bomb. With the assistance–and alibi–of a twelve-year-old neighbor, two of the original have been built, plus an enlarged and modified version. All of them "get up there and do something." After all, that's what a kid expects when he puts in his time.

Quite obviously, this request establishes me as a beginner, so it follows that I could use an article on rubber motors too. Something on the what and the why of everything from one loop to those fat snakes I've seen dangling out of the noses of big free flight jobs.

Perhaps the subject of rubber could be combined with wood. I've carved a few propellers from balsa and hardwood, but need to know more on how to lay out the outline to obtain the proper pitch. How about an article or series on this subject?

Ralph Scott, Sacramento, Calif.

Event for purists

The section of your February "Straight . .and Level" concerning Bob Lopshire's ideas on non-flying (pure) scale at the Nats, aroused much interest here at Guillow's. After thinking about Bob's comments, we wanted to get some idea of how many non-flying scale purists there are in relation to those scale purists that fly.

We checked the recent returns of questionaires packed in our largest scale kits, the Thunderbolt and the Stuka. Thirty-eight percent of the modelers who answered the questionaires reportedly built for non-flying scale only. There are probably hundreds of these non-fliers who would enjoy participating if the AMA would establish a contest event just for them.

We would be pleased to consider sponsorship if "non-flying scale" becomes a new event at the Nats. It seems to be a paradox that we, a manufacturer of hundreds of thousands of scale kits per year, have had little reason to promote the Nats. Hopefully, our interest will be revived.

John Murray, Paul K. Guillow, Inc.
Wakefield, Mass.

John's letter has been forwarded to the Academy of Model Aeronautics. We have received several favorable comments.
–Publisher.

Roadable background

The material on the Aerobile (Nov. 1970 AAM) was excellent, except for one statement. The propeller was never removed, as has been the case in other attempts to build roadable airplanes. It was de-clutched by providing for the slackening of the drive belts, and an automatic brake provided to prevent "windmilling" while driving.

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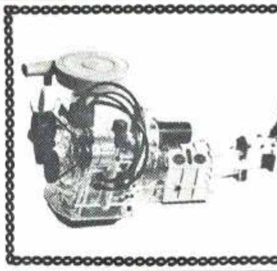

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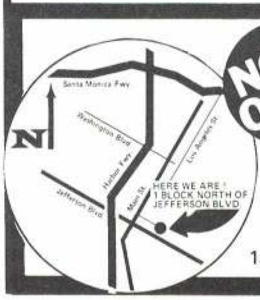

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The photo of the roadable portion taken at Silver Hill, which you published, leads me to say that the plane is now fully assembled. Would it not be interesting to your readers to take a color picture and lay it alongside of the one shown on the cover?

The machine at Silver Hill was number seven of the series, the first six being called the Arrowbile. Number seven was three-place and had a 150-hp Tucker engine, instead of the Studebaker. The wing-detaching mechanism also was greatly simplified.

Waldo D. Waterman, Smithsonian Liaison Committee, San Diego, Calif.

Self-induced disaster?

I heartily agree with the letter from T.A. Cimino in "Modeler Mail," May **AAM**. I too haven't been active in the last 15 years. I am beginning to build again, and my main interest is still free flight.

It seems that in several events, tactical flying ability and sophisticated gadgets far outweigh the worth of the model. The Nordic man either has to be a track star or have an acrobatic model. All that matters is that he catch his five thermals. Similar comments could be made for Wakefield and power events. I speak about towline gliders because that used to be my specialty.

An alternate solution to the problem, rather than banning all of the esoteric devices: either require all contestants to fly in heats with a maximum time limit for getting the plane airborne, or off the towline in the case of gliders; or, simply give the modeler a reasonable, but restrictive, time to get his model airborne or off the line.

I would favor the latter: the time limit should be short enough to minimize the effects of gadgets such as the thermal sensors, and give anyone who can pull a glider overhead on a line, wind up a rubber motor, or flip a prop a feeling that his model has a chance.

I wonder if free flighters might be cutting their own throats. How many novices are scared away from competition when they read of the level of sophistication and expensive equipment that seem to be necessary to compete in the open category?

Phillip Hartman, Atlanta, Ga.

Unbalanced format

Oh, joy! Happy days are here. The April **AAM** had construction articles for two RC planes. This, naturally, was in addition to several other excellent articles on RC. Now all the magazine has to do is add an RC boat column and reinsert articles on slot cars. . .

The aforementioned issue tends to make CL look like a dying sport, even though several of your advertisers have seen fit to bring out new CL kits. It has become quite apparent that the FF boys aren't the only ones who need to have a separate society, along with a newsletter to cover their sport.

Richard E. Gallup, Levittown, Penna.

As a matter of fact, there is a movement afoot to organize a CL society. AMA President John Clemens has recommended it. Anyone having views on CL coverage in the magazine is encouraged to write this column.
–Publisher.

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8"	4-6	65¢
9"	4-6-7	85¢
10"	3½-6	85¢
11"	4-6-7-8	$1.00
12"	6	$1.50

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5¼"	3-4	30¢
6"	3-4	30¢
7"	4-6	40¢
8"	4-5-6	45¢
9"	6-8	50¢
10"	6-8	55¢
11"	4-6-8	65¢
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7"	3-4-6	40¢
8"	3½-5-6-8	45¢
9"	4-5-6-7-8	50¢
10"	3½-5-6-8	55¢
11"	4-5-6-7¾-8-8¼	65¢
12"	4-5-6-8	70¢
13"	5½	80¢
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JUMBO SCALE RETURNS

by BILL WARNER

ABOUT TWO YEARS AGO, Ken Hamilton of the N.A.R. Flightmasters (Los Angeles) reminisced about his boyhood experiences with a huge seven-foot wingspan rubber scale model. What followed was a fantastic revival of interest in these behemoths of Pirellidom, as well as the birth of a new event on the Flightmasters calendar: Jumbo Scale! These ships, with a minimum wingspan of 48 inches and average weight of five to ten ounces (sans rubber), make a most impressive sight, floating effortlessly in a silent sky. For sheer majesty, these huge craft are hard to match.

The first Jumbo contest drew over a dozen ships, and the number of these models grows at each successive meet.

Most Jumbos are built from prewar model plans, making one appreciate the advances which have been made since. For instance, most models in those days were hand-wound, and the rubber motor was built in before the plane was covered, which left no provision for stretch-winding and made replacement difficult, to say the least. Models of those days often were caricatures of the real aircraft, with frequent and often flamboyant deviations from scale. Wings mounted soldily to fuselages which were anything but crashproof, poor motor peg locations, and unsound undercarriages are but minor inconveniences. Updating the design is part of the challenge! Anyway, although extra points were awarded to ships built from prewar model plans, many were simply scaled from prewar aircraft.

Two contest requirements were established: the plane had to ROG, and it had to have a pilot. To insure compliance with the latter, heavy emphasis on points in scale went to the pilot.

Performance ranges from the 30-second, absolutely scale flights by Bill Stroman's geared B.E.2C to three-minute maxes by Hal Cover's semi-scale Lanzo Puss Moth or Andy Faykun's Fairchild 82. Although the majority of entries are high-wing monoplanes, builders like Jim Hill with his enormous Pesco Special provide the variety needed for a really interesting event.

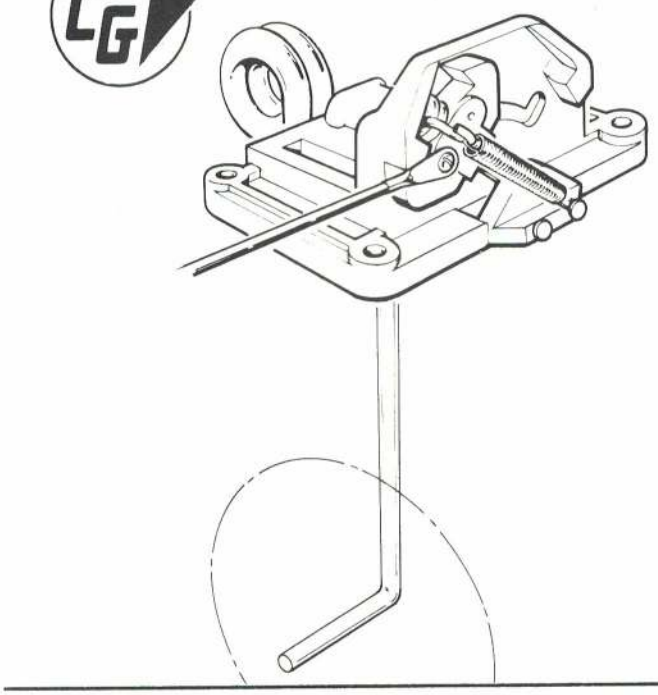
Folding props, although banned by rules, often are employed as break-away designs for longer prop life. Another unusual aspect of the event is the ingenuity of some builders in regard to their pilots. These range from Santa Claus riding atop the cabin of Russ Barrera's Puss Moth to Bill Warner's wolf-man.

Those who have the itch to get away from the usual types of rubber-powered ships available today may drop a line to John Pond, 4135 Avati Dr., San Diego, Calif. 92117 for a list of reasonably-priced Jumbo scale plans, many dating 'way back.

(More pictures and story on page 62)

Top left: Hal Cover winds Puss Moth while his family holds. Silk-covered, flies very well. Lower left: Jim Hill shows his unusual FF Pesco Special. With hat, event's CD, Carl Hatrak. Top center: Trick picture, bulb is big-scale balloon, model is Bill Warner's Megow Taylor Cub Jumbo. Left: Before completion, the Pesco Special. Note 4-blade prop. Above: Bill Stroman uses stooge while winding his RWD-8.

CARL GOLDBERG



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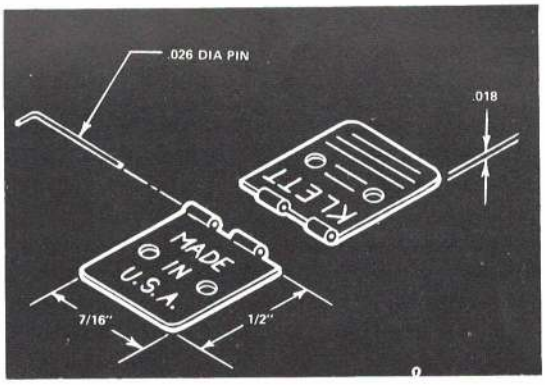

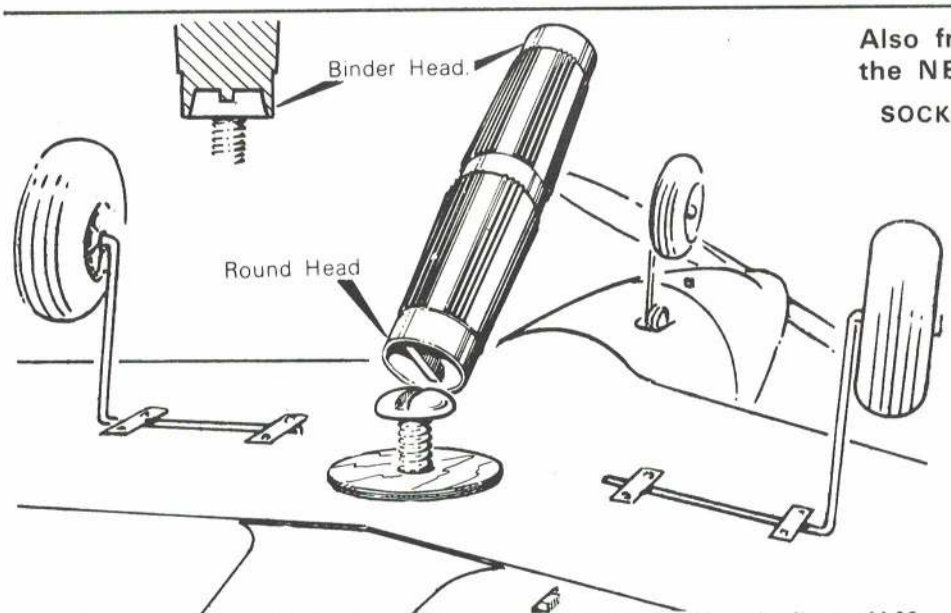

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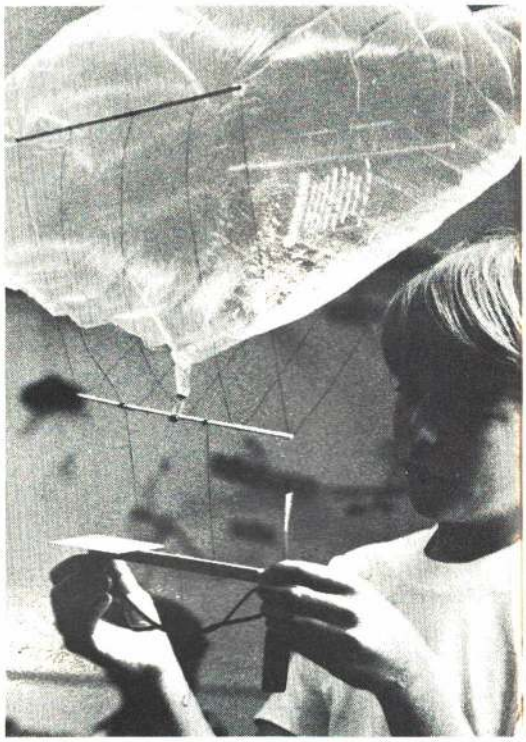
One demonstration model is worth one thousand pictures. This autogyro was furnished by expert Ray Caswell.



Student-made blimp has heat-sealed dry cleaning bag with drinking straw for a filler. Climbs slowly under power.

HOW WOULD YOU LIKE someone to offer you a classroom, an indoor flying site with a 45-foot ceiling, the Los Angeles Coliseum, all the supplies needed, gifted youngsters to teach in classes of 20 or less, a lab assistant of your choice, carte blanche to write a basic course in aeronautics and aerodynamics through aeromodeling—and pay for teaching the class? A modeler's dream?

Well, two summers ago that dream came true for me. Les Schneider, director of the Summer Science Workshop program at the California Museum of Science and Industry in Los Angeles, asked me to do just those things. The SSW for gifted kids consisted of classes in everything from backyard ecology to computer programming. Over the course of an eight-week summer session, over four thousand students ranging from first to ninth graders participated. Sessions ran two weeks each, with two 2-hr. classes per day, a total of twenty hours of instruction per student.

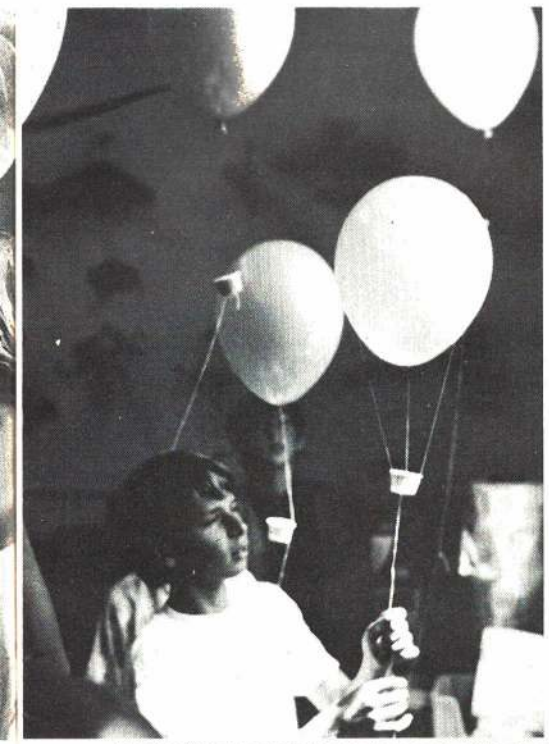
For the most part, my class was to be an activity course, consisting primarily of building and flying models. Therefore, the twenty hours was divided roughly into one-third theory, demonstration, explanation, etc., one-third building sessions, and one-third flying sessions. The twenty hours total time had to be pretty well organized!

Each student paid a registration fee of about $20 for the course, as well as a two-dollar lab fee for supplies and models which could be kept after the class was over.

Basic objectives of the course were: an understanding of why things fly, a basic technical vocabulary pertinent to aeronautics, good habits of craftsmanship, and application of the scientific method to getting the

For gifted kids, the Summer Science Workshop program
at the California Museum of Science and Industry stresses understanding of why 'things' fly.

by HAROLD (BILL) WARNER



Helium-filled aerostats are balanced with clay to hover between floor and ceiling. Also flies up to 30 miles.

Author explains CO2 experimental X-15 about to be run down a 100 foot Mylar line at a scale speed of 2400 mph.

About to be catapulted into flight is this tail-less model made from a Jetco kit. Boy, rear, holds AMA Delta Dart.

students' planes to fly well.

Basically, the kids built four flying machines. We started with a free balloon, helium-filled, ballasted with modeling clay and a guide "rope" of heavy string. The second model, a mini-glider made of 1/32" light balsa sheet with a 1/16" hard balsa fuselage, was followed by a heavier catapult glider (such as the JASCO G-12) when there was time. For the rubber-powered ship, we chose the JASCO G-18 for outdoor flying or the Super Sleek Streek (modified ready-to-fly model; see June 1971, AAM), which served indoors and outdoors. The final project was the Insect or Rogallo flex-wing design (April 1970, AAM).

Because of the short time available for construction, tissue-covered models proved too difficult. We also found that most of the parts had to be prefabbed, with dihedral angles jig-sanded and prop shafts ready-formed, etc. When it was time to build, each student was required to bring a large cardboard box for storing his tools and models and for preventing loss or breakage.

Building sessions usually began with a how-to demonstration for each important step. Kids who completed the step early could look at displays or browse at the library table stacked with aeronautical encyclopedias, model magazines, Zaic yearbooks, plans, etc. A large supply of more advanced plans on ditto sheets was always available for advanced students to take home.

We always seemed to have extra help in addition to my hired lab assistant, since several students or interested modelers were usually around to help the beginners over the

(Continued on page 50)

As maneuver and radio requirements changed,
this eight-year-old design has undergone continuous development. A great flyer.

PHOENIX 5

by DON LOWE

THE PHOENIX IS "A beautiful bird. . .used as a symbol of immortality," exactly the right name to see my series of airplanes through many major and minor modifications. I designed the Phoenix 1 to meet a need for something different and beautiful, as well as for aerodynamic advantage–thus, the swept-wing design. Other requirements were good rough air stability, equal stability upright and inverted, and being groovy (whatever that means). Having fulfilled those prime objectives in 1963, the Phoenix design has been refined ever since.

The early configuration was an advanced design concept for accomplished modelers and never was intended for the beginner, although many Phoenix 1's have been built and successfully flown by the novice. As with all highly-swept wing designs, the stall was a little nastier than a straight wing, but certain features, such as a 17 to 19 percent root to tip wing taper for softening the stall, were incorporated. Some say swept-wings are too nasty to fly, but I feel any experienced flier who can recognize a stall condition and can handle a Taurus or Kwik-Fli can safely fly the early Phoenix design. For those less accomplished or for the advanced flier, the present Phoenix is easy to fly and has stall characteristics second to none!

Over the years, the design has had many modifications, such as varying sweep from 12 to 25 degrees (per panel); raising wing and lowering thrust line; changes in nose and tail moments; changes in wing section and area; changes in fuselage profile, offset thrust, etc. The Phoenix 5 is designed primarily for best performance in the AMA and FAI patterns,

Plane on left has fiberglass fuselage, retracts, acrylic lacquer. Other, enamel; follows plans.

and no weaknesses in executing current competition maneuvers (including snap rolls) are apparent. (See chart for chronology of the Phoenix design evolution.)

Phoenix 2 and 3 basically explored the effect of sweep variations. Primary findings indicated that increasing sweep may improve lateral stability but hurts performance in pitch. Increasing sweep also hurts performance for the wingover or Figure M, since it decreases the tail moment–unless the fuselage is lengthened or tail area increased considerably.

Phoenix 4 was a move toward the AMA "grab-bag" maneuvers where high maneuverability and snap rolls were required. The airplane also was made smaller to increase speed. The faster they fly, the more impressive they are, and the better they roll. (Ever watch a Formula I or II do axial rolls? Beautiful!) A switch to a symmetrical airfoil improved the outside, and reduced sweep made it more docile and helped pitch and yaw. Results were gratifying. The Phoenix 4 was very fast, yet had terrific slow speed characteristics. The airplane also knife-edged extremely well, even without the wide fuselage.

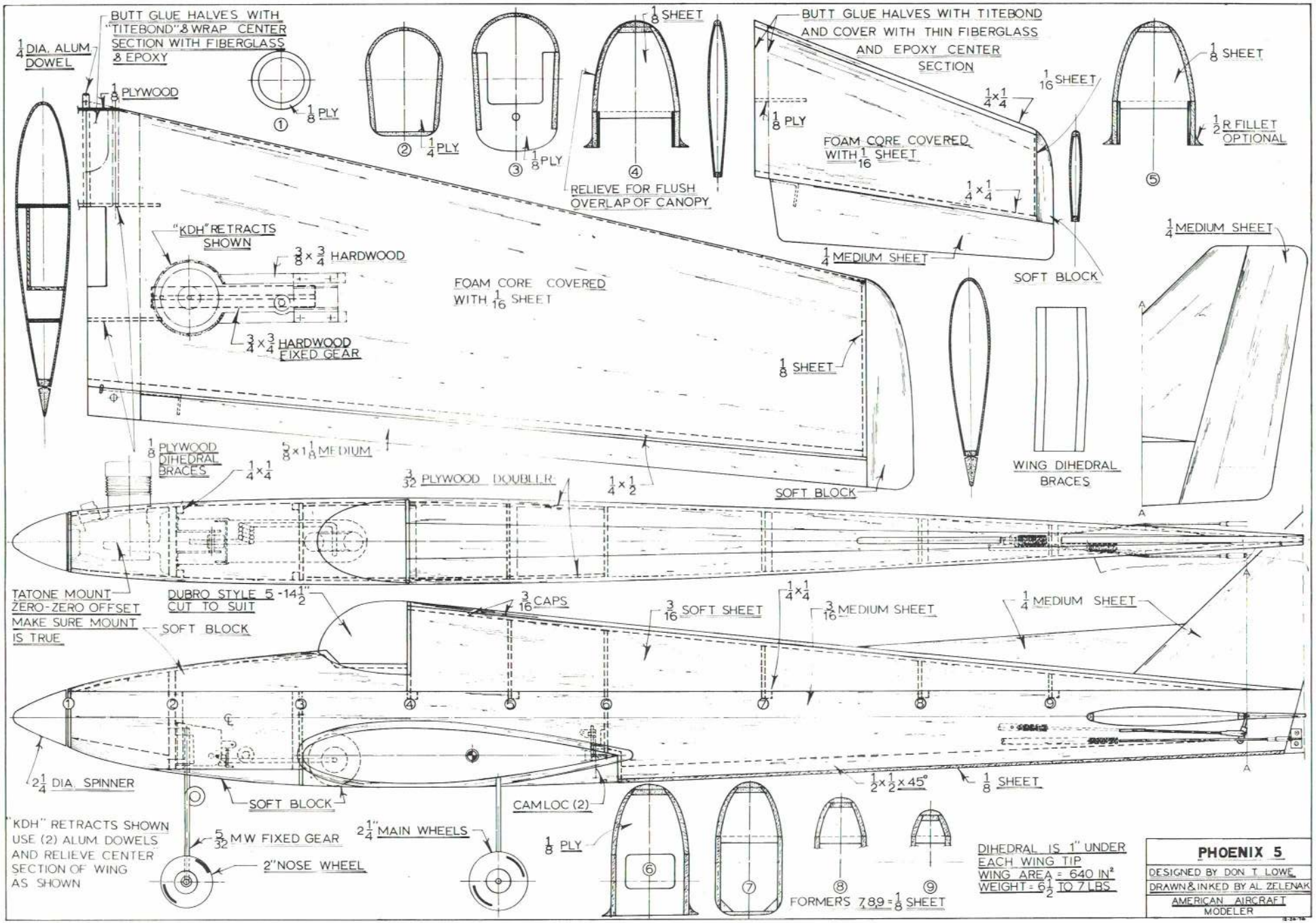
Phoenix 5 employs the successful Phoenix 4 wing. The nose moment was increased to improve looks; and the tail moment was increased to help pitch and yaw. The horizontal tail was lowered and the wing raised to get thrust, and to get the wing and tail more in line. Fuselage depth was increased to help knife-edge and all rolling maneuvers. Results? As far as I'm concerned, there isn't a better airplane around. A number of good designs are available and can win, but the big difference these days is the pilot.

My present fixed-gear Phoenix 5 with Marvelite-covered foam wings weighs 7 lb. My son's ship with cardboard-covered foam wings weighs 7 1/4 lb. Another Phoenix 5 with fiberglass fuselage, balsa-covered foam wings, and retract gears weighs 8 lb. This one is extremely fast and is not nasty, but it does land faster than the 7-lb. model. Seven lb. is about the best flying weight, since the airplane is good in a wind, lands easily and flies through the manuevers easily with a good 60 up front.

Construction

Only a few construction details need

(Continued on page 74)



In the early days of WW II, even the tough, lumbering AT-6 was fitted with guns and a bomb rack.

TEXAN WITH TEETH

by DORIS I. REEVES

IN THE DESPERATE DAYS just after Pearl Harbor, American forces in the Philippines grabbed anything with wings and threw it into the air against the Japanese. Included in the obsolete air force so gathered was a handful of North American A-27's.

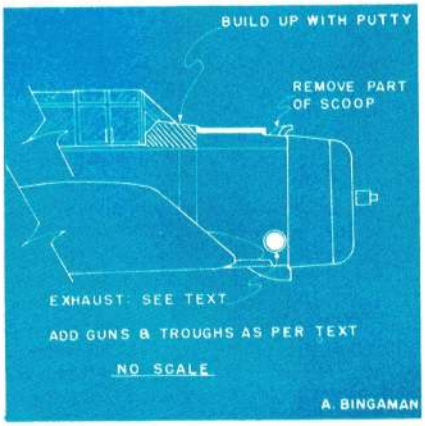
Although classed as an attack bomber, the A-27 actually was nothing more than a souped-up AT-6 Texan, fitted with four .30-caliber machine guns and a bomb rack. Ten of them had been built for the Royal Thai Air Force, but none of them got there. In the fall of 1941, with war clouds looming and Thailand slipping into the Japanese orbit, Thai aircraft orders were taken over by the U.S. Army. The A-27's, rated as obsolete for combat, were shipped to the Philippines for use as trainers.

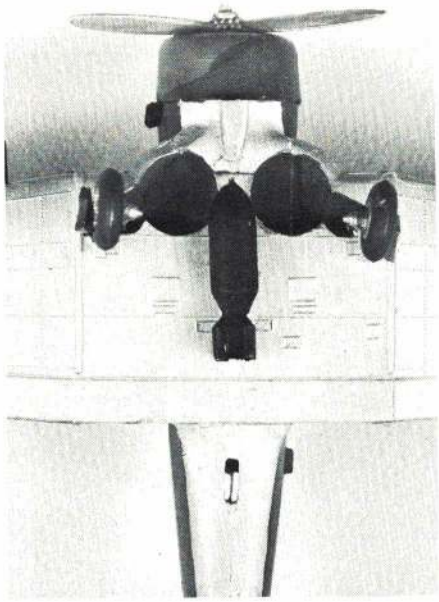
The Japanese attack of December 8, 1941, put most of them out of action, but several planes were later patched up and used for reconnaisance, liaison, and even occasionally for the bombing and strafing for which they were designed. Although records from this period are scanty, apparently all ten A-27's were worn out, bombed out, or otherwise demolished by the time the Philippines fell in April.

To make a model of the A-27, I used an Airfix Harvard (AT-6) kit in 1/72 scale, although the Hawk kit or the Aurora kit would work just as well.

The fuselage is built first, following the kit instructions and adding interior details as desired. However, do not add the antenna or the fuselage scoop at this time. The wing can be built and set it aside to dry.

Next, build up the gun housing on the nose





(see drawing), using AMT body putty, and at the same time fill in the locating holes for the scoop on the left side of the fuselage and the exhaust location on the right side and on the cowling. The putty can be shaped quite easily and smoothly if fingers are dipped in thinner first. Let these areas dry for at least 24 hours and, when they are thoroughly solid, sand smooth.

Next, drill holes for the wing guns, pitot tube, antenna, and nose guns, and hollow out the gun-troughs on the nose, using a small rat-tail file. Wings and tail surfaces are now glued to the fuselage.

The kit's two-bladed propeller must be replaced with a three-bladed job. I used one from an old Airfix Val, and painted it silver. Install it in the cowling, then glue the cowling to the fuselage.

The next step is to paint and install the landing gear. Wheels are painted with Pactra's hot-rod primer; wheel hubs and gear legs are Pactra's flat aluminum.

Now take the unused fuselage scoop and cut off the rear half, rounding the top edge as shown on the drawing. Glue this onto the top center of the fuselage, just behind the cowling. The canopy goes on next, after trimming the front edge to fit over the gun housing.

The model is now ready for painting. Upper surfaces are an irregular camouflage pattern of dark earth and dark green, for which I used Humbrol's RAF Camouflage Set. The camouflage is carried over to the underside of the cowling, although all other undersurfaces are natural metal. I used Pactra's flat aluminum for this, as it gives a good weathered metal look.

Machine guns and pitot tube are added next. I used cut-down guns from an old B-24 in the junk box but, if you don't have a junk box, cut-down straight pins will work just as well. The bomb is optional and also came from the scrap box. As a final touch, add a circular exhaust on the right side of the fuselage. I found a 1/16" section cut from the plastic stem of a cotton swab to be an ideal fit. Paint this black before gluing it in place.

Decals are the U.S. stars with red centers, taken from the kit. They are placed on the top and bottom of both wings. Since the insignia was simply painted over the original Thai markings, no U.S. Army markings were used on the lower wings. Tail stripes are hand-painted, red and white horizontal and blue vertical.

BONANZA

by MARK FRANKEL

THE FIRST TIME I saw a Bonanza was during a Sunday excursion to the local airport with my father. I couldn't have been more than five or six years old at the time, but the airplane's distinctive looks left a deep impression. At that time, the Bonanza design was relatively new, having been type-certified in November 1946, and its radical appearance implied that it was an ultra high performance lightplane.

Over the past 25 years, the Bonanza has undergone several changes. The most recent model, the V35TC, is a 285-hp turbocharged version of that swift looking, V-tailed aircraft I admired many Sundays ago. The Bonanza line also includes a conventional-tailed model, the E33, which was introduced in the early 1960's under the name of Debonair. Essentially, it is a 225-hp Bonanza with a conventional tail (the horizontal stabilizer was taken from Beechcraft's T-34 Mentor). It looked so attractive I resolved to build a scale model.

Generally such an urge passes before I can clear the drawing board and reach for my T-square, and the Bonanza was no exception. I rationalized that I'd rather be flying than building; besides, I didn't have any three-view drawings. Alas, *Flying* (July 1968) ran a cover picture of a chrome yellow and white E33 with black trim and I could resist no longer. The local Beechcraft dealer was able to supply Bonanza brochures, as well as the address of Beechcraft Marketing Services in Wichita. Beechcraft promptly sent drawings of their entire line from the Musketeer to the King Air.

Initially, I decided to build the conventional-tail E33 instead of the V35TC because I was leery of stability problems with the V-tail version. I also elected to incorporate a non-scale flat-bottomed airfoil to lift the model's projected ten pound weight. My fears were unwarranted on all counts. The completed model flew at well under ten pounds; the scale airfoil on my second Bonanza proved to be far more efficient; and the V-tail provides as much stability as any conventional-tailed configuration.

The plans show both the V35TC and the E33 versions. The only differences between the two models are in the wingtips, the rear window outline, and the tail. To build the E33, cut that tail projection (shown on the plan's second sheet) and join it to the fuselage side view at the broken line.

The fuselage is simple to build. Basically it is a box of 1/8" balsa sides with 1/4" sq. cross members. A 3/8" balsa roof is glued to the tops of formers running from F9 to the back of the windshield former. The roof line has a slight curve, making it necessary to score the 3/8" sheet above F5 and F6 to allow its proper seating. 1/16" balsa sheeting fills in the area between F7 and F9. The roof is then carved and sanded to the cross sections shown on the plans. The bottom of the fuselage from the trailing edge of the wing aft is 1/16" sheet.

The windows are made from sheet celluloid and are glued in place with a nitrocellulosic glue, such as Ambroid. The windshields on my Bonanzas are also cut from sheet celluloid; however, this won't reproduce

True-scale models of Beechcraft's best-known aircraft. Conventional construction and a delight to fly.

the full-size Bonanza's slightly bubbled windshield as shown on the plans. If the bubbled windshield is desired, it can be molded from a male form. (The "Jungster" article, p. 20, Aug. 1969 **AAM** contains an excellent explanation of molding.) After the windshield and windows are in place, the 1/16" balsa window frames are glued in the appropriate positions.

The cowling is made with fiberglass cloth and Hobbypoxy Formula II over a styrofoam mold. Four layers of a medium weight glass cloth were contact-cemented to the styrofoam form and then coated liberally with Hobbypoxy. After the Hobbypoxy cures, the styrofoam can be melted out with dope thinner. The outside of the cowl is made perfectly smooth by filling the low spots with Epoxy-lite and sanding with 60 grit paper. The cowl is held to the fuselage by wood screws that are driven into maple blocks attached to the firewall.

The tail surfaces are shaped from lightweight 1/4" balsa sheet. If the V-tail version is being built, care must be taken to ensure that the tail is set at 0 degrees incidence. When done properly, the dihedral joint should be perfectly parallel to the thrust line. The leading edge of the V-tail will not rest on the 1/8" sides because of the shape of the fuselage. When the V-tail is glued firmly between F9 and F10, the triangular gap between the 1/8" fuselage sides and the tail is filled with scrap 1/8" balsa. The E33 tail does not pose any alignment problem, since the stabilizer rests directly on the 1/8" sides, thus setting the tail at 0 degrees.

The wing is made using an Armalite polystyrene core covered with light 1/16" balsa sheeting. Since the wing is rigged 5 degrees positive at the root and 0 degrees at the tip, a foam wing is probably the easiest and certainly the most accurate means of construction. A built-up wing could be employed if it were built without the wash-out and the wing incidence reduced to 2 degrees or less. I built the original wing without wash-out, but the maiden flight taught me that a wing without this much positive incidence yields the most unexpected and unforgiving snap rolls possible.

Further research at the local Beechcraft dealer determined that the full-size Bonanza has pronounced wash-out. A new foam wing was cut and the results were quite different. When the wing stalls, it has no tendency to drop a tip; in fact, the ailerons seem to remain entirely effective throughout the stall. This certainly supports the argument that Dave Platt and others have made: a scale aircraft tends to fly best with the scale airfoil and force arrangement.

If one of the newer lightweight radio systems is used, installing a fully detailed interior should be easy. The servos can be hidden under the seats, while the battery and receiver can be placed near the firewall under the fuel tank. The current Bonanza brochure provides some excellent interior shots which are valuable for adding detail to the model. Take care, however, to keep the aircraft's weight at ten pounds or less.

Various general aviation publications as well as local airports are good sources of inspiration for scale color schemes. The colors

Photos by James Lipshutz and Robert Harris

DEBONAIR

Left: Taking off in a snappy climbing turn is the V-tailed Bonanza. Below: Ready to taxi out, the Debonair responds to gently advancing throttle. Except for tip shapes, tail surfaces and rear window outlines, the two craft are basically similar.

on my E33 and V35TC were taken from a Beechcraft ad in *Flying*. I brushed three coats of Kampel's clear dope on all wood surfaces, sanding with 220 grit paper between each coat. Then the model was entirely covered with heavy Silkspan and given two more coats of clear. This was followed by four liberal coats of sanding sealer. At this point, the aircraft should be set aside for a week to allow the sanding sealer ample time to dry.

Next, the model should be sanded with 320 wet or dry paper until all high spots and all evidence of wood grain are removed. This is probably the most important step in a good finish and it must be done properly to insure a good base for the color. If any grain or unevenness persists, recoat that area with sanding sealer and resand when dry.

The color coats were sprayed on, using about 10 percent lacquer retarder to aid the paint flow and prevent any blushing. The color, like the sanding sealer, should be allowed to dry for a week before it is rubbed. If the spray has left any "orange peel," wet sand the surface with 400 grit paper. I used DuPont's 202 orange rubbing compound for the initial polishing and followed this with the fine 606 white compound. By now the airplane should have a mirror-like brilliance and is ready for waxing. Any good automotive wax or Jubille household wax will enhance and protect the finish.

The radio system should be installed to give the control surface movement indicated on the plans. I used five servos: throttle, ailerons, flaps, elevators, and steerable nosewheel. The V35TC uses no rudder, while the E33 does. Actually, the elevators act as a rudder when the V-tail is banked since one tail surface becomes vertical. Thus a slight application of up elevator in conjunction with an aileron command will give a beautifully coordinated turn.

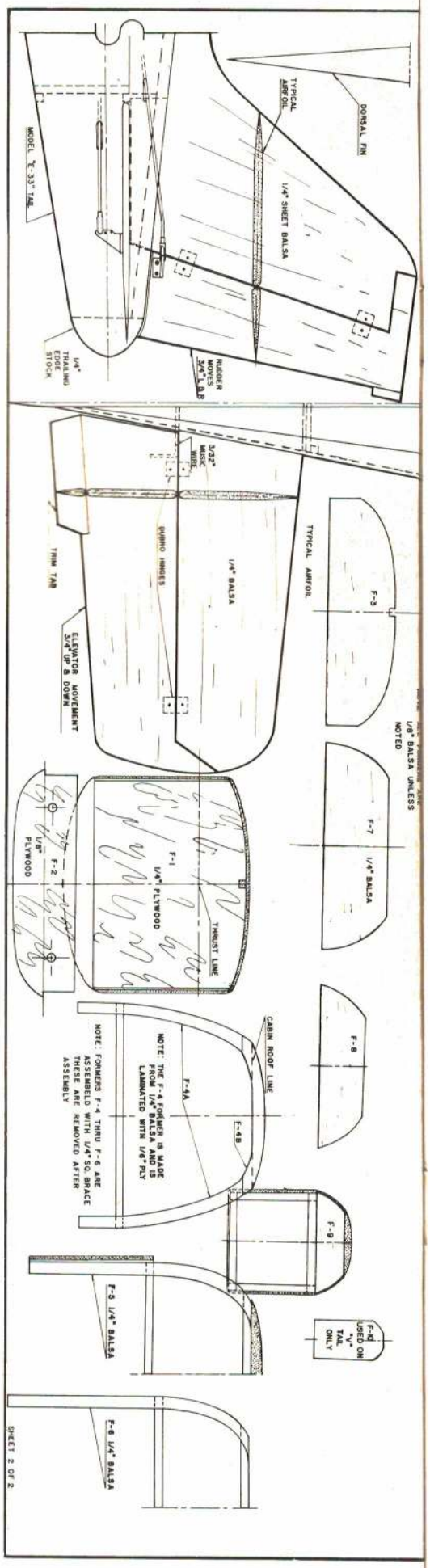
Test flights should be made off a paved surface if possible; a scale model needs all the speed it can get before lift-off. I have stalled my Bonanza when taking off from a grass field because it was unable to build sufficient speed. Use only a slight nudge of back pressure on the stick to get the model airborne; it is always better to run out of runway into the weeds than to force the airplane into the air before it is ready.

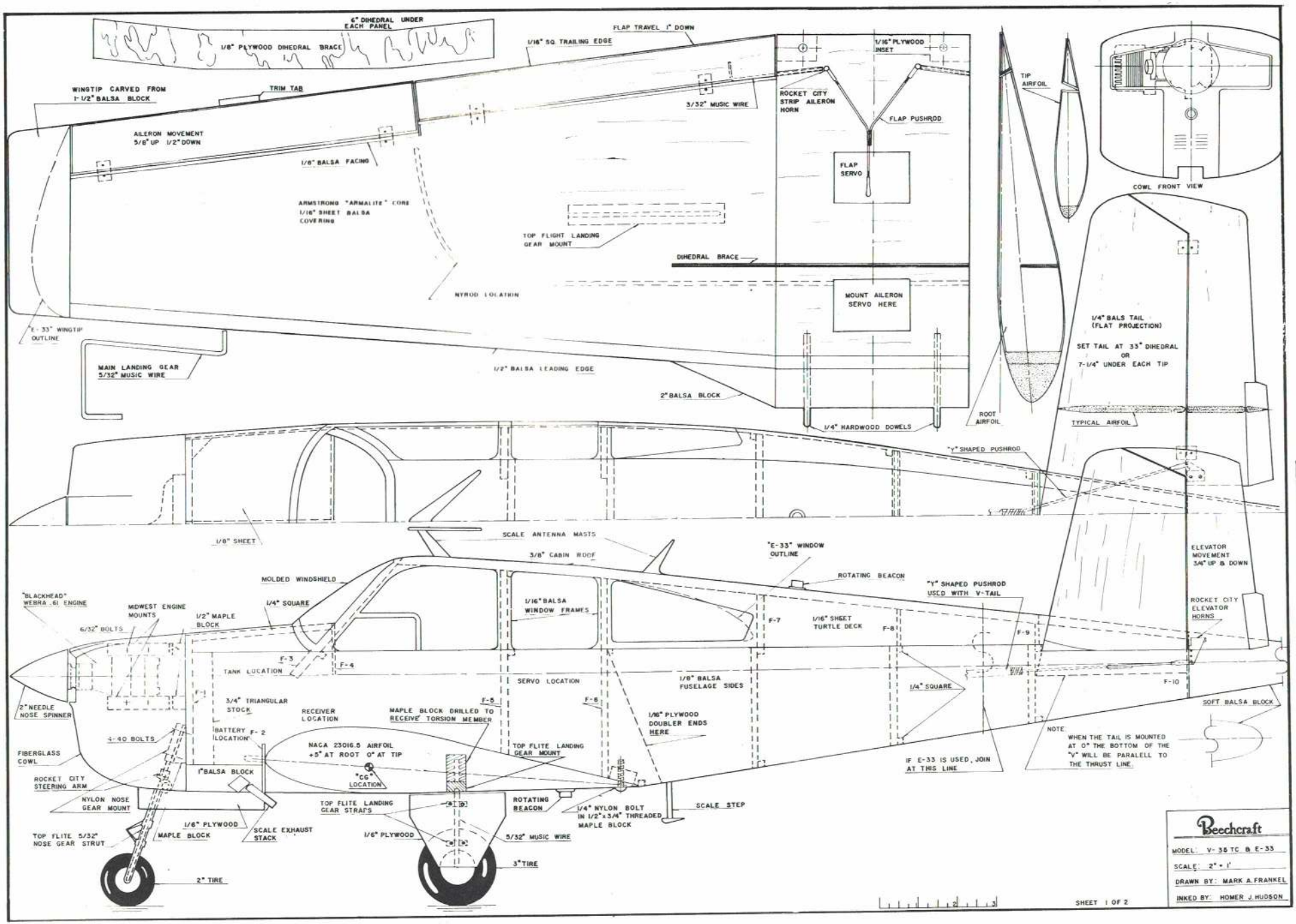
Either version is highly responsive on all axes. The only difference between flying a scale model such as the Bonanza and a typical pattern aircraft is the scale model's higher stalling speed. The flaps help to compensate for some of the problems associated with a high stall speed. I was skeptical about the

effectiveness of flaps on a model until I tried them. With the power reduced to one quarter throttle, lowering the flaps will produce a slight nose down pitch. The ailerons remain completely effective throughout the entire range of flap travel.

Power should not be chopped completely until the Bonanza is over the edge of the runway with about ten feet of altitude. A touch of up elevator after the power has been cut will produce a gentle flair that will set the aircraft lightly on its main landing gear. I may install retractable landing gear for additional realism. Several reliable units are on the market now, and my new Webra 61 Blackhead should more than compensate for the added weight.

The effort involved in building the Bonanzas has been well worth it. Whenever they are flown, these highly attractive models receive much attention from spectators and modelers alike. Either version builds as easily as a typical pattern model and is twice as much fun to fly.





FULL SIZE PLANS AVAILABLE—SEE PAGE 70

i.f.o.

"Wonder of wonders, the thing started to pulse
and move toward me, riding atop a three-foot column of smoke!"

by RICHARD P. WOODWARD

THE I. F. O. SAUCER began life as one of those "I wonder if this crazy thing could fly" projects. Early in 1964, I threw together some balsa in the form of a flying saucer. This first I. F. O. had the same diameter and basic dimensions as the 049-powered saucer presented here, but it also had a 16-segment outer rim and four wire landing gear struts for that science fiction movie touch.

After the first day's testing, that saucer almost ended on the discard pile! Without much thought about how or why the model should fly. I just tuned the engine to maximum rpm's, set the saucer on its wiry landing struts, and watched as it rose slightly into the air, trembled, and did an immediate flip onto its top. After a few more of these trials, and with the structure showing signs of these mishaps, I decided to let it crash in style with a spinning hand launch. Wonder of wonders, the thing started to pulse and to slowly come toward me riding atop a three-foot column of exhaust smoke! Thus was born the series of Identified Flying Objects.

Since the initial flights of I. F. O. No. 1, the model design has been changed to add strength to the structure and for better flying qualities. The outer rim was changed from the segmented structure to a laminated circular rim for improved appearance and ability to take rough landings. An X brace framework added to the inside structure interlocks the radial spars and further increases the strength. The 049-powered model presented here is capable of flights of about 500 feet in altitude and distances on the order of a quarter-mile.

Prevailing weather conditions do greatly influence the flight of the saucer. A thermal current will cause it to rise like an elevator. Since there are no fixed control surfaces, it will generally travel wherever the wind happens to blow it. However, it often pauses to hover over a location, only to tilt and soon resume its course. Surprisingly, the I. F. O. is very stable in the air. It will often withstand wind-bouncing which might destroy the stability of most contest aircraft.

Theory of Flight

The I. F. O. saucer is really a flying gyroscope. Thrust from the engine provides the direct lift, while torque causes the entire structure to rotate at about 150 rpm. (This rotation generates the pulsing sound made by the saucer in flight.) The greater slope on the bottom surface of the saucer compared with the top surface is intentional. As the saucer leans in any direction, it also tends to ravel in that direction. This slope is intended to exert a correcting force for restoring the horizontal spin of the saucer. Often after launching, the saucer will skim the ground for a distance before it returns to its proper attitude and begins a slow climb.

The landing of the saucer also is completely unconventional. It has no glide. Rather, when the engine stops, torque is exerted which causes the saucer to immediately spin in the vertical plane and go into a sort of dive. If the engine cuts back into running, the saucer will often continue this slow dive clear back to the ground. Otherwise, the dive will last only until the saucer has lost most of its spinning speed. Following this short dive, it will begin to flip-flop like a dead leaf and gently return to the ground. Thus, the large surface area and light weight result in a parachute-like effect, but with less stability.

Construction

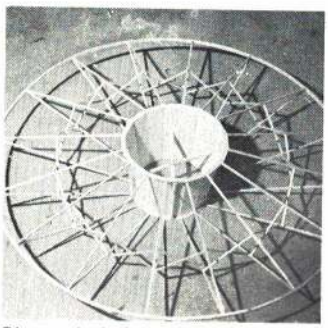
Since engine thrust provides the entire lift for the saucer, it is important to select the wood carefully to minimize total weight without sacrificing strength where it is needed. A strong outer rim not only protects the saucer on rough landings, but provides additional spinning moment for the gyroscope stability effect. The inner body may be generally lightweight; however, the motor mount members must be strong enough to absorb the motor vibration. Otherwise, engine power would be lost and the mounting would probably eventually fail as well. As in the construction of any well-built model, take the time to obtain a really true fit between the pieces. The model will look better and will last much longer.

Center Body: Begin the center body assembly by making two segmented inner rings—one each for the top and bottom of the center body. They should be made of lightweight contest-grade balsa. These rings initially are joined together by four of the eventual 16 segments of the center duct sheeting. Glue the segments of the sheeting at 90-degree spacings, making sure the two rings are properly aligned with each other. When the first four segments are dry, fit in the remaining twelve segments to form a conical center body.

Next, the four spruce engine supports are glued to the outside walls of the center body as shown on the plans. These vertical supports are sanded somewhat to reduce unwanted weight. Finally, the engine bearers are notched and glued to the vertical supports. A small hole must be cut through the 1/16" sheet wall so that the engine bearers are

(Continued on page 48)

I. F. O. looks amazingly real, is thrown like a frisbee. An eerie sight.

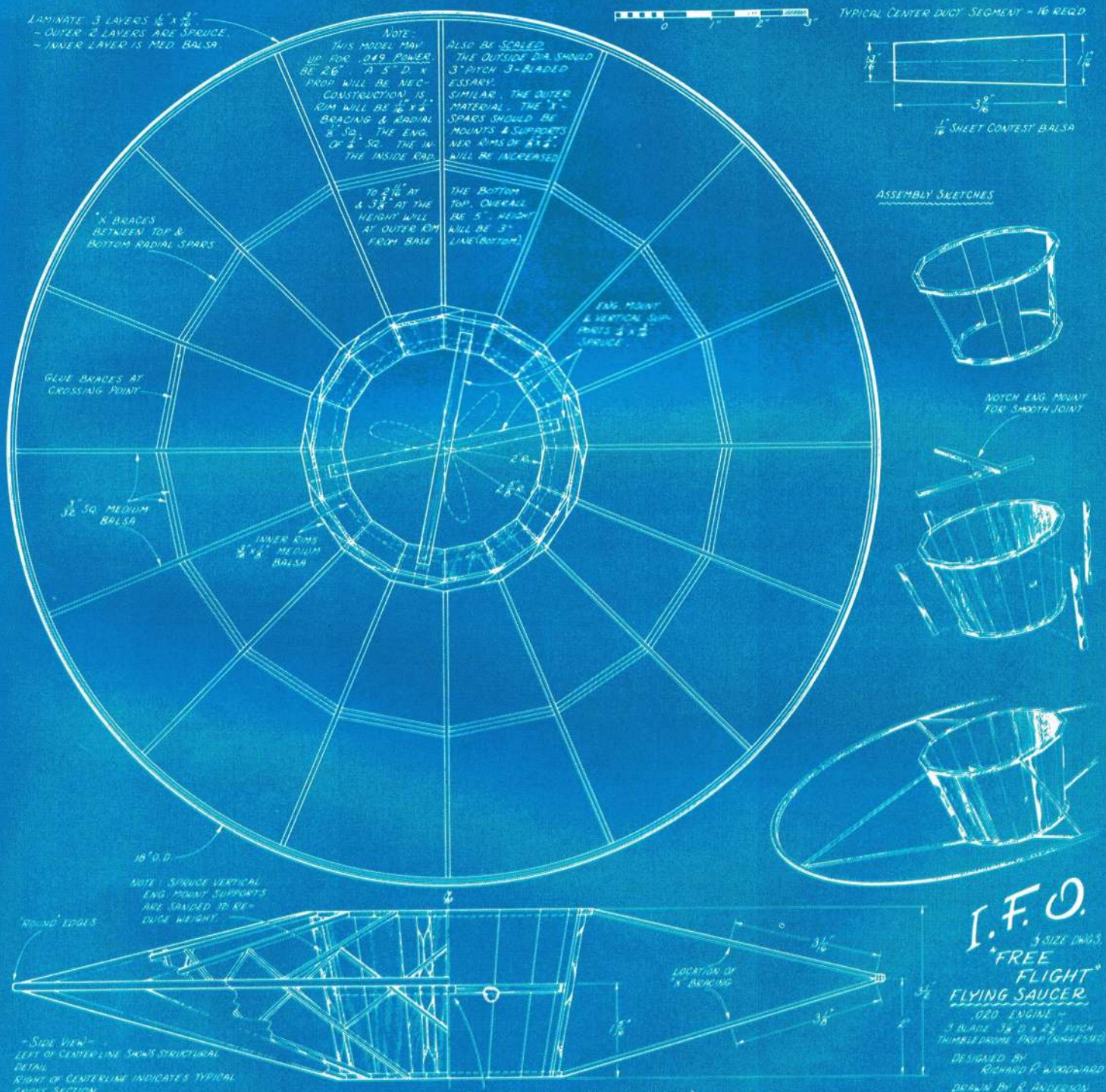


Strong but lightweight structure. Engine mount X adds rigidity.

Stan Cook shows saucer side view, asymmetrical cross section.

Saucers first appeared at 1969 Nats and caused much interest.

Official U.S. Navy photo



I.F.O.

3 SIZE DWGS.

"FREE FLIGHT" FLYING SAUCER

.020 ENGINE

3 BLADE 3" D. x 2 1/2" PITCH THIMBLEDROME PROP (SUGGESTED)

DESIGNED BY RICHARD P. WOODWARD

DRAWN BY R. ANDERSON

FULL SIZE PLANS AVAILABLE—SEE PAGE 70

CURTISS SB2C-1

A 15-powered sport model of the uncommon Navy Helldiver.

by PAUL SCHAAF, JR.

THE CURTISS SB2C-1 HELLDIVER served well and diligently during WW II. It was conceived in late 1938 to meet Navy requirements for a new scout/dive bomber aircraft. Early models were plagued with faults such as excessively high stall speed, lack of stability, weak landing gear, etc. However, modifications were made and, after Pearl Harbor in December, 1941, a crash production program was instituted.

A year later, the first SB2C-1 was delivered to the fleet squadron. Another year passed before these Navy bombers first saw combat in an airstrike against Rabaul. The mission was a complete success and the Helldiver finally paid off on its years of development. It weighed five tons and had a 50-ft. wingspread. Approximately 6000 of them were built.

Relatively few models have been made of the SB2C-1, so I decided to have a go at making a U-control model, more in the stunt mode than in scale. The configuration has been kept fairly faithful except for fuselage width, which was reduced to simplify construction.

Construction

Fuselage: The sides are constructed of 1/8" balsa sheet and held apart by 3 formers of 1/8" sheet. The wing slot must be cut out prior to assembly. The top and bottom curvatures of the fuselage are made from balsa blocks, hollowed out to approximately 1/8" wall thickness. The bottom is constructed from 2 blocks, one front and one rear.

The front of the canopy is made from a solid balsa block, but the rear section is constructed of thin cardboard shaped and cemented over two formers (D-D). The canopy frame is made of strips of masking tape painted white before being placed in position.

The rear deck of the fuselage is 3/16" sheet balsa and supports the stabilizer. A balsa block is cored out to about 1/8" wall thickness, notched for the stabilizer, and cemented on top of the 3/16" sheet.

Before the final block is cemented on the fuselage front, the gas tank is installed, using pieces of scrap balsa. The fuel intake line goes through the fuselage top and the vent line goes to the bottom. Drill a hole in former A-A for the fuel line to the engine. All fuel lines must be assembled with the tank and led out of their respective openings before the fuselage is completed. The fuel line to the engine must be the proper size, so that the fuselage does not have to be cut apart to put in the correct one. My tank was a Perfect No. 8 Medium Junior Wedge.

The firewall is made of 1/8" plywood, 1/32" smaller all around than the final finished shape of the fuselage to allow for the cardboard flaps which are cemented to the cowling.

The cowling is carved from a balsa block and hollowed out to accept the engine. It is attached to the fuselage by No. 2 1/2" wood screws which go through the cowling and are fastened to two hardwood 1/4 x 3/8 x 3/8" blocks cemented to the firewall. These blocks must not interfere with the motor or Tatone motor mount.

The engine is mounted at an angle so that the exhaust port comes flush with the outside surface of the cowling, permitting exhaust to leave the model freely.

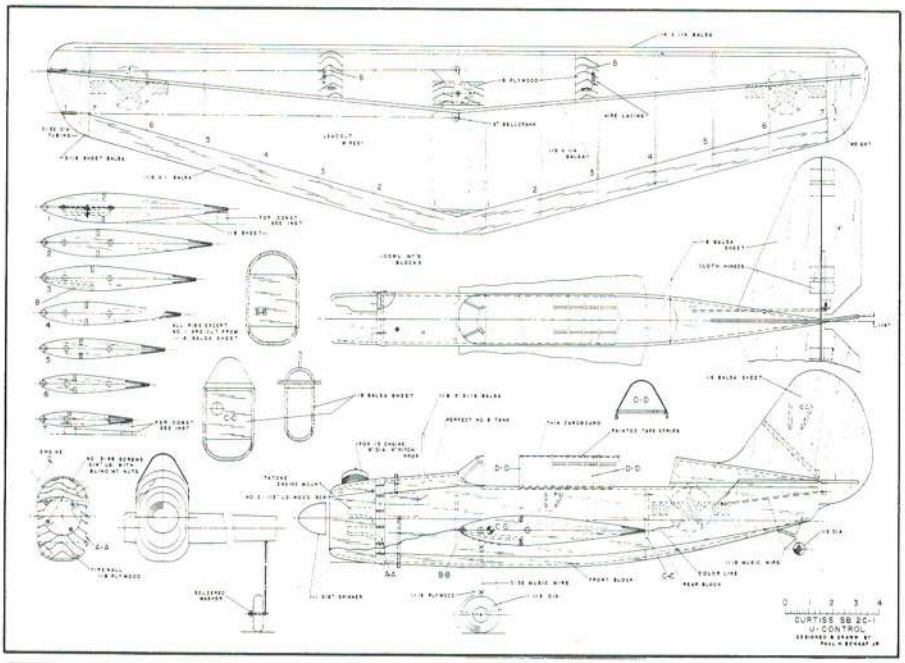
Wing: The wing is slightly more difficult to build because each rib on each panel is a different size (see plan). The leading edge is 1/4" sq. hard balsa; spars are 1/8 x 1/4" hard balsa; and the trailing edge is two strips of 1/16 x 1" balsa cemented together at the rear. Wing tips are from 3/16" balsa sheet stock.

The wing is made in one piece. Wing ribs are cut from 1/16" sheet, except Rib 1 which is from 1/8" sheet. Before assembly, holes for the leadout wire are cut on the ribs that go in the left panel.

A strip of 1/2" sq. balsa is pinned to the workboard in a V describing the trailing edge position. The lower trailing edge sheet is then pinned at its correct angle to this 1/2" sq. strip. Next, the lower spar is pinned to the workbench so that at Rib 1 it is flush with the surface. (Sandpaper the required angle from Rib 1 to the center of the wing.) At Rib 7, a 5/16" piece of balsa is placed under the spar to provide the correct wing taper by reducing rib height. Both wing halves are built in the same manner.

The ribs are cemented to the spar and the lower trailing edge. Before the cement dries, the leading edge is placed in the rib slots. The leading edge is at one level for the entire wing length. The assembly must be pinned securely while it dries. Then the top spar and top piece of the trailing edge are added. Gusset and filler blocks are added in center area; the

(Continued on page 72)



FULL SIZE PLANS AVAILABLE—SEE PAGE 70

Blue Ribbon Review

ROYAL CLASSIC 6-CHANNEL IN THE SWINGER ARF

by FRED MARKS

THIS MONTH'S SYSTEM comes from such an imposing array of offerings that I had to peruse the Royal Electronics Brochure to see which model it was. It proved to be Model 202003, Sport 70 Series, which means that it is a six-channel system with dual Royal sticks. Once that was determined, the Sport series provided a great many more options. It offers a choice of servomechanisms, including the RS-1 (Royal's mechanism); the Kraft KPS-9, KPS-10, KPS-11, and KPS-12; and the Orbit PS-3 and PS-4. Further still, the battery pack may be 225 mah, 450 mah, or 600 mah.

We chose to test the KPS-12 servos because they permitted the most compact airborne installation. The battery pack tested was the 450F (450 mah). Total airborne weight for this combination is 10.2 oz.; with the 225 F pack, it is 9.0 oz. The test system was on 72.08 MHz and may also be obtained on 27 MHz and 50-54 MHz.

Clockwise: Complete Royal Classic 70 as tested is compact and light. Note use of transformer-isolated dual charger. Transmitter antenna collapses to very short length. New but conventional-design receiver and IC decoder are built on double-sided PC board. Two-deck servo amp in tiny KPS-12 mechanism. From Denver, Colo., comes the new Carol Craft Splinter ARF model. Ready-to-fly, this one came out at 6.5 lb. Physical appearance of transmitter innards is exceptionally neat and orderly. Encoder mounted to battery box (not seen).

Royal Electronics has a friendly chap named Sid Gates as its keystone. This Denver-based company began with the F&M line of single-channel and reed equipment, all of which are still available. Then, about three years ago, Royal produced the Classic digital kit system, also still available. The new 70 series represents a complete departure from the older system. The Classic 70 we tested is an essentially all-new design by Bob Boyce and Chris Peterson.

The transmitter is housed in a deep blue vinyl-clad aluminum case, 7.5 x 6 x 2". The Royal stick faces are white molded nylon, as are the trim levers. Channels five and six are positioned by two sliding linear trim potentiometers near the bottom of the case and are exceptionally smooth. The antenna is rather surprising in that, for the 72 MHz band, it collapses to 3 7/8". The receptacle

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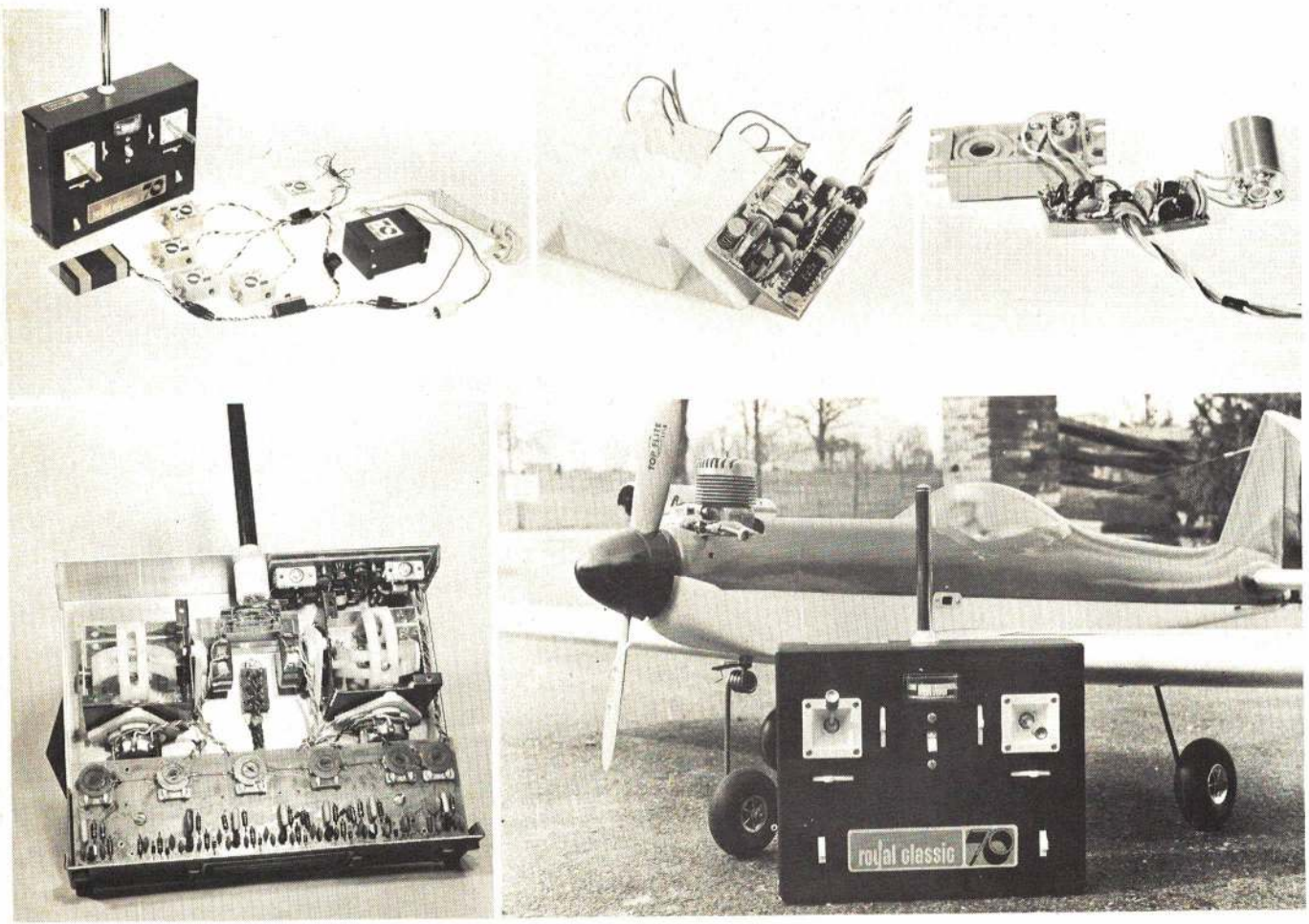


In production from 1914 to 1926, the 504 series became more famous than our own Jenny.

TOPS IN TRAINERS—AVRO 504K

by DON BERLINER

IT WAS A LOT LIKE the Curtiss Jenny: a flimsy-looking biplane which was used for primary training in WW I, then had enough basic quality to last far longer than anyone expected, and ended up as one of the earliest classics.

The years of design, development and proving which are so common today, were unknown when the Avro 504 first appeared on the scene, less than 10 years after the Wright brothers' first flight. It was sketched out by Avro founder, A.V. Roe, early in 1913, construction began in April, and the first test flight was at the old Brooklands racetrack in July of the same year. The unsophisticated test program was quickly completed, with the only major change to the original design being the replacement of the novel warping/semi-hinged ailerons with more conventional—and effective—hinged ones.

The purpose of the hurried effort was to create a useful airplane for the Royal Flying Corps and for the Royal Naval Air Service, although their cooperation on the joint project is remembered with little joy. But WW I was on the horizon, and airplanes just possibly might play a role. Just what the role would be, no one really knew. As a result, the Avro 504 and its contemporaries were not designed for any particular function but simply as military airplanes. The whole idea of heavier-than-air flight was still new, and special-purpose airplanes were yet to evolve.

The craft that Avro produced was expected to do anything for which it was needed, just like humans in the military. While its reputation was eventually made as a primary trainer, its beginnings were much more colorful. Following RFC acceptance tests at Farnborough, it was put into limited production in November 1913. War broke out the following April and the 504 became a combat airplane, even though its top speed was only 81 mph and it needed almost two minutes to climb to 1000 ft.—thanks to a Gnome rotary engine which was supposed to put out 80 hp, but was probably closer to 60 hp.

A few 504's had been completed by the time fighting began, and the first ones arrived near the front in France in August 1914. Just a week later, one was shot down by German infantry fire, becoming the first British airplane ever lost in combat. That machine had been on an observation mission, but the air war soon took on a more sinister note.

In October 1914, a 504 was fitted with a single Lewis machine gun to be fired by the observer who sat, rather awkwardly, in the front seat. This airplane made what may have been the first strafing attack on a ground target when it shot up a German train. On Nov. 21, the Navy's first four Avros were loaded with four 20-lb. high-explosive bombs, each, for a surprise raid on the Zeppelin sheds at Friedrichshafen, Germany. Three managed to take off and dropped most of their bombs on or near the target, damaging one Zeppelin and doing great damage to the gas works. One of the 504's was shot down.

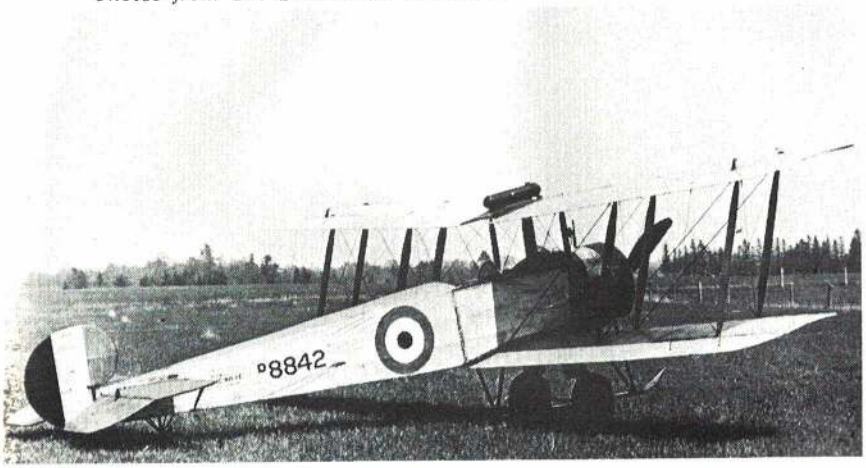
Several months later, two 504's attacked Zeppelins in the air, with limited effectiveness. One Zeppelin was able to outclimb its attacker, while the other suffered minor damage from the four bombs dropped on it. The performance of the Avro was obviously not up to the demands of combat operations, and they were soon withdrawn from active service and turned over to training units which needed them badly.

Still, non-training uses for the 504 were not ignored and experimentation proceeded, as the rapidly developing air war changed its nature. For long-range reconnaissance and anti-Zeppelin patrols, a special version was produced with a large fuel tank occupying the front cockpit and giving an endurance of eight hours. Some of these had a cutout in the center section of the top wing through which the pilot could fire a machine gun upwards at 45 degrees.

Lack of power was the biggest problem for the early 504's, and all sorts of engines were tried in an effort to give the type some much-needed performance. Rotary engines were the big thing in those days, and so Gnomes, LeRhones and Clergets were tried

(Continued on page 64)

Photos from The Smithsonian Institution



Specifications

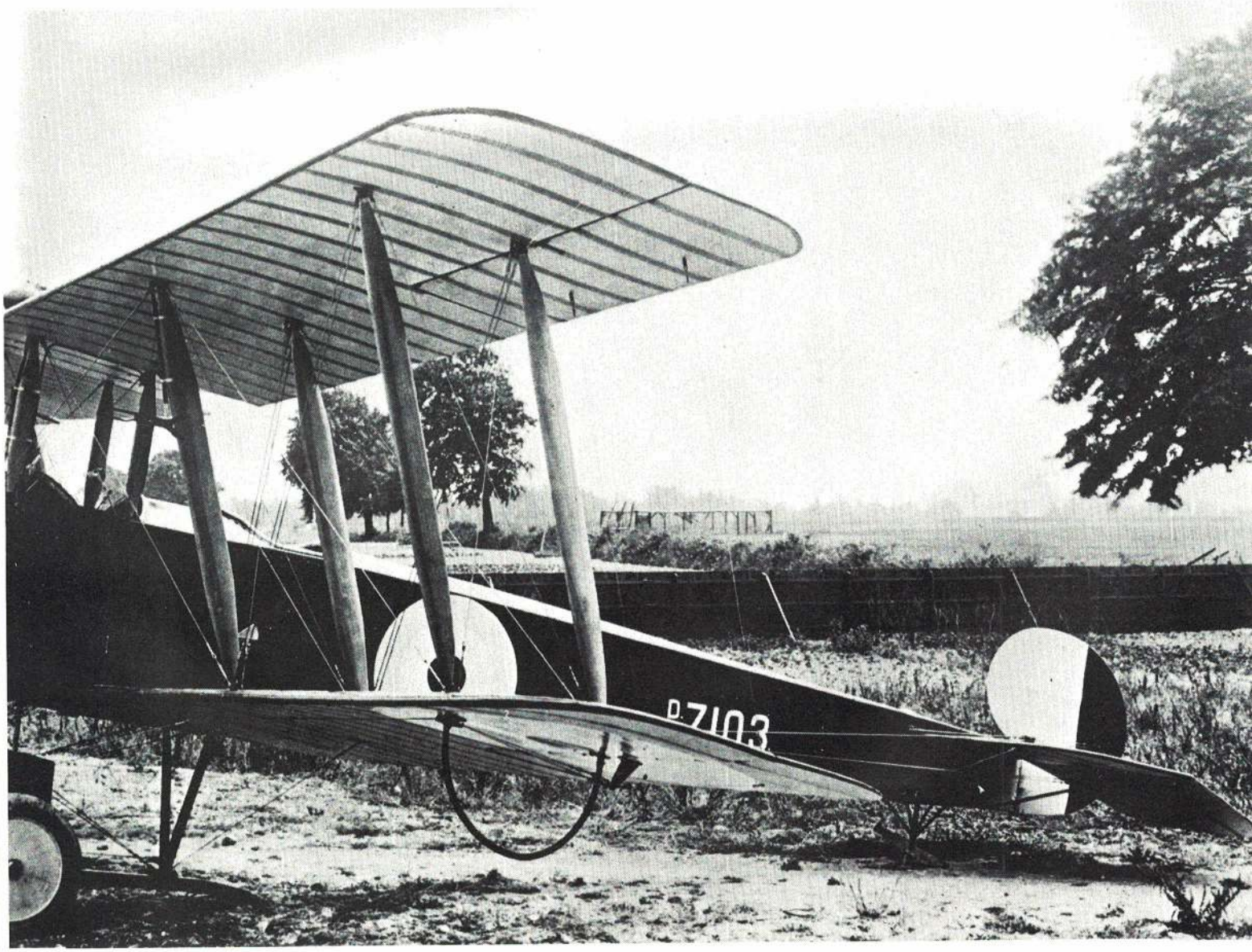
Length—29'5"
Wingspan—36'
Wing Area—330 Sq. ft.
Height—10'5"
Interplane Gap—5'6"
Dihedral—2½ degrees
Incidence—4 degrees
Prop Diameter—9'

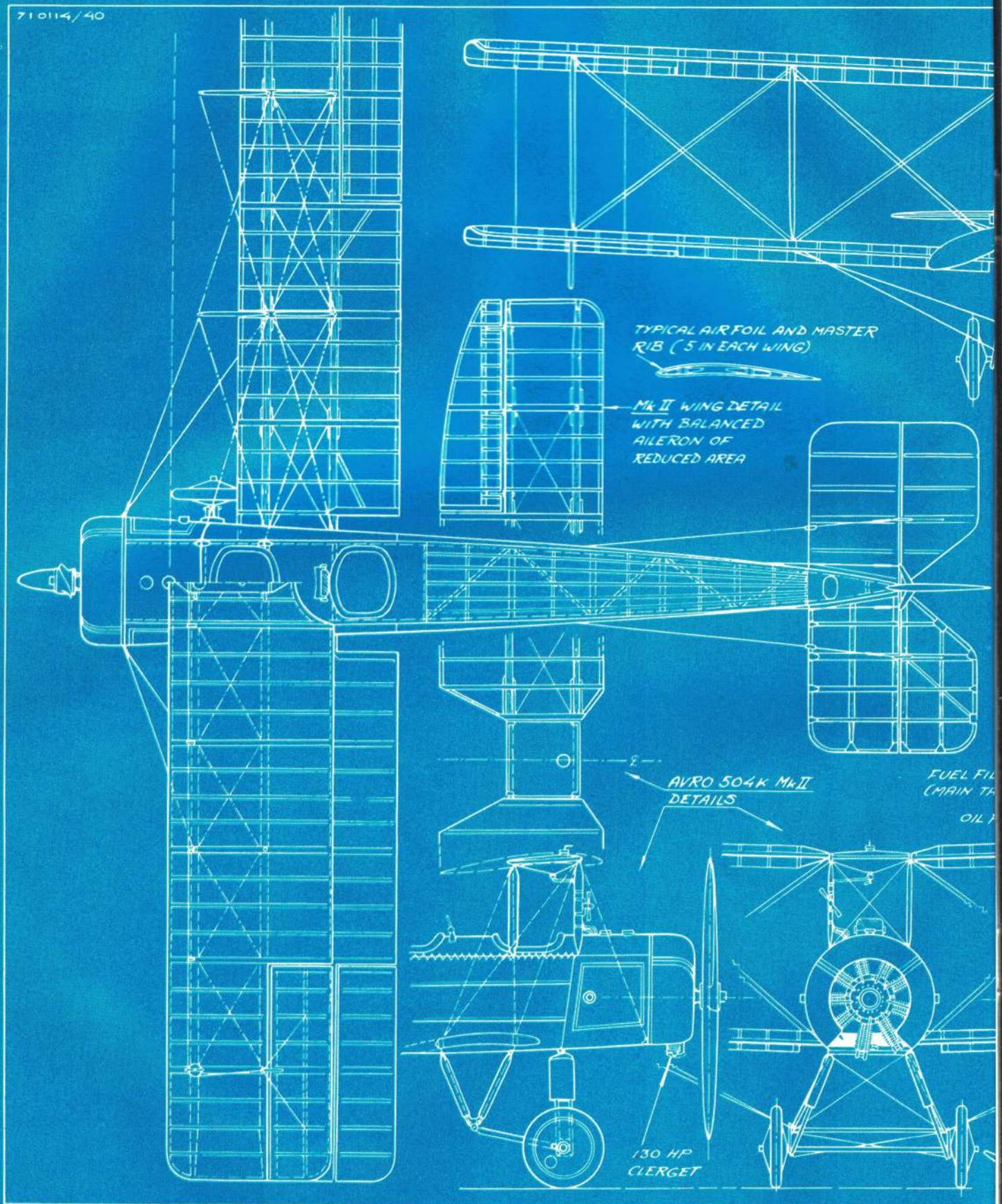
Performance (504K, La Rhone engine)

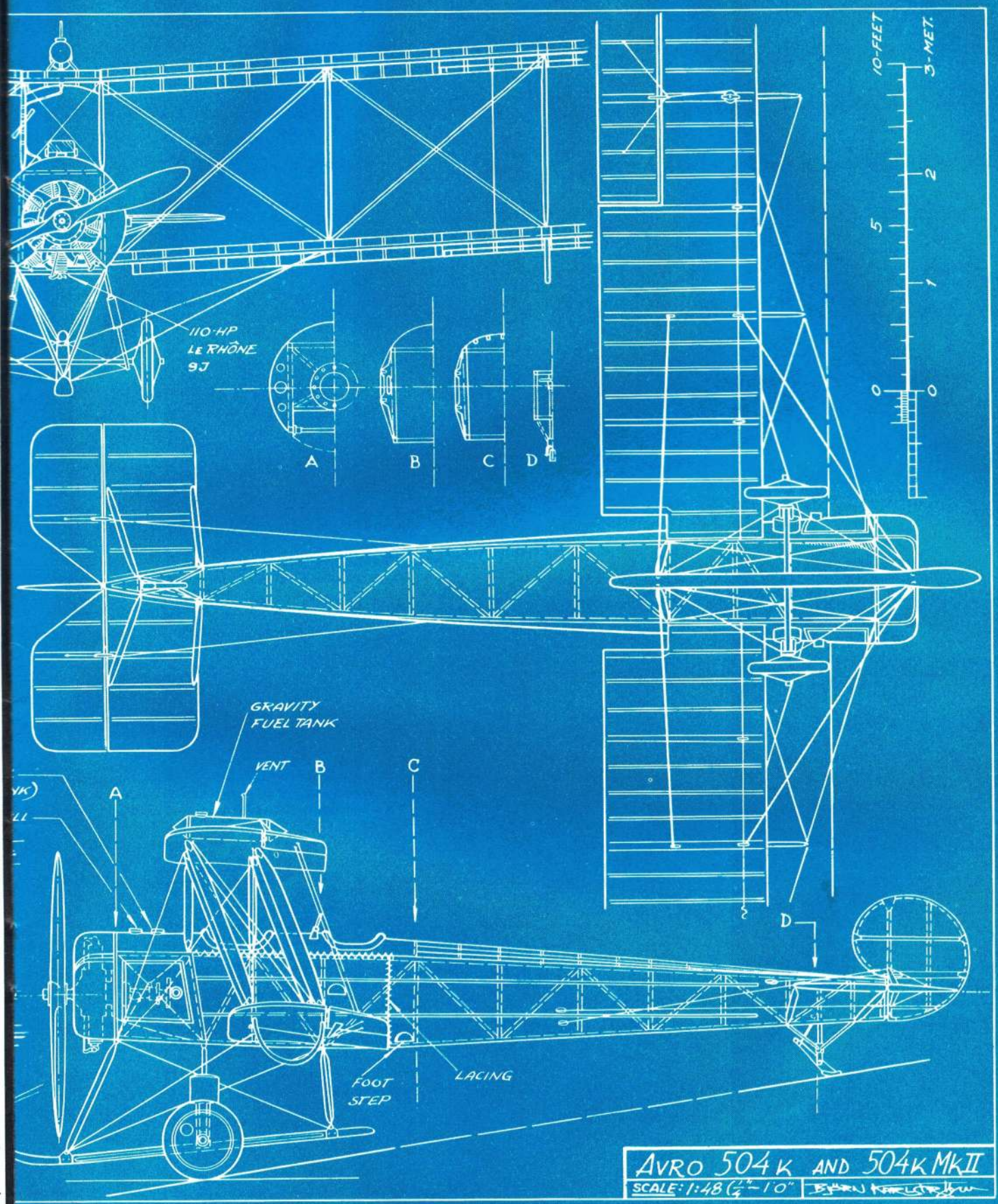
Maximum speed, sea level—95 mph
Maximum speed, 10,000'—85 mph
Climb to 3500—5 min.
Climb to 10,000—16 min.
Service ceiling—16,000'

Weights (504K, LeRhone engine)

Empty—1231 lb.
Loaded—1829 lb.




71011G/40
TYPICAL AIR FOIL AND MASTER RIB (5 IN EACH WING)
Mk II WING DETAIL WITH BALANCED AILERON OF REDUCED AREA
AVRO 504K MkII DETAILS
130 HP CLERGET



AVRO 504K AND 504K MKII

SCALE: 1:48 (¼" – 1'0")

TAIL-LESS TALE

Flying wing contest, put on annually by the Northrop Modelers, is a big hit with California's extroverted designers.

by BILL WARNER

A HANDFUL OF MODELS ushered in the first all-flying-wing meet which the Northrop Modelers, based in Hawthorne, Calif., sponsored four years ago. Now, literally dozens of odd craft participate in this unique yearly contest. It is noteworthy that the FF gas event was won last year by H.A. (Johnny) Johnson, one of the test pilots on the original Northrop Flying Wing! (See p. 34, Dec. 1970 AAM.)

Picking one's way among the almost seventy weird aircraft on the grass during the last meet, at Los Angeles' Model Airport, the spectator could not help but be fascinated by the variety of subjects! Designs ranged from Bob Serna's scale-winning RC model (which unfortunately was wiped out in a crash), to Bill Krecek's Butler-and-Edwards-type "paper airplane" configuration (020 FF Scale). A flock of Insects (Rogallo-wing rubber jobs, April 1970 AAM) infested the site.

One of them, built by Junior Joel Rieman of Sepulveda, won first in the Rubber/Jetex event on the strength of a seven-minute out-of-sight official. Towline was won by another Junior, Kelvin Pardoe, whose well-designed entry also placed in rubber when a prop was installed. Top man in RC was Jim Kelly with an H-10 semi-scale wing.

Finely finished plaques were awarded on the basis of endurance and the many excellent, breath-taking flights which were made. The real attraction of this meet was the absence of the run-of-the-mill plane, designed to win a specific categorized event but offering little excitement in design. The Northrop Modelers certainly deserve more than a casual tip of the hat for their continued sponsorship of this growing and highly stimulating event.

Kenny Hannan designed, flew this rubber job.

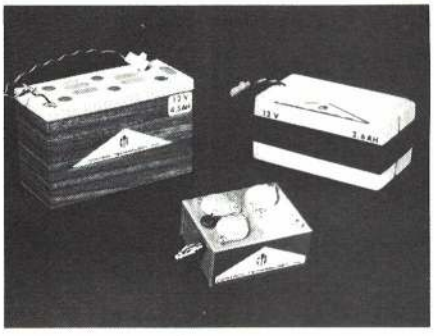
CO2 powers Bill Hannan's scale Northrop.

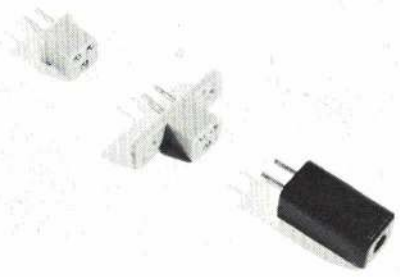
Similar designs by Kelly and Bill Pardoe have variations—one a pusher, the other a tractor. Model at left is more stylish. Right: Bill Krecek's Jetex 50 swept-wing.

Upper left: Walt Mooney brought along a terrific traffic sign, Brown CO2-powered. Above: Mad scientist Bill Watson used a 06 diesel-powered Rogallo wing machine, underpowered, so it was towed aloft with motor running to make a powered descent. Left: Granger Williams flew a reduced version of a 1946 design, 020-powered, very stable.

new products check list

by FRANK PIERCE





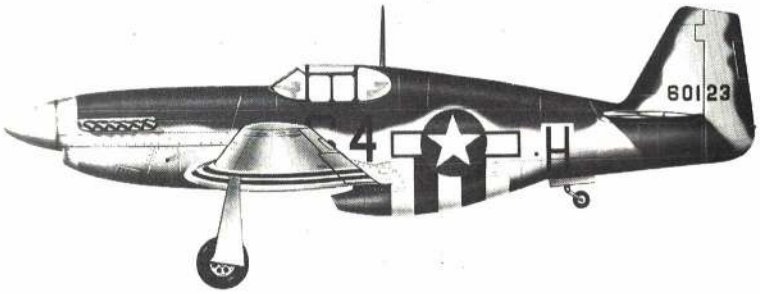
Arco Publishing/Book of Balsa Models. By Bill Dean, this book has 62 large pages, dozens of simplified plans, everything the beginner needs for successful balsa modeling. Not only planes but cars and boats too. Lots of easy-to-read, step-by-step photos to ensure success. Originally published in Great Britain. $2.95. Arco Publishing Co., Inc., 219 Park Ave. South, New York, N.Y. 10003. Available to hobby trade from Sig Manufacturing Co., Inc., 401 S. Front St., Montezuma, Iowa 50171

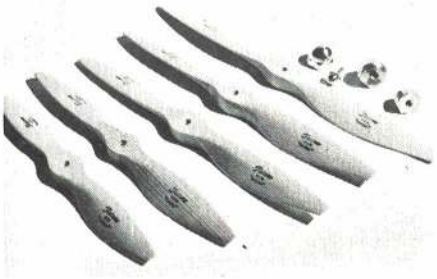
Dean's Custom Chrome/External charging connector. Permits fast, easy charging of airborne battery pack without removing wings. Three-pin design, central connector mounts permanently on fuselage, accepts external power input. Third connector goes to battery harness to permit quick disconnect and removal of battery pack if desired. $1.10. Dean's Custom Chrome, New Freedom, Penna. 17349

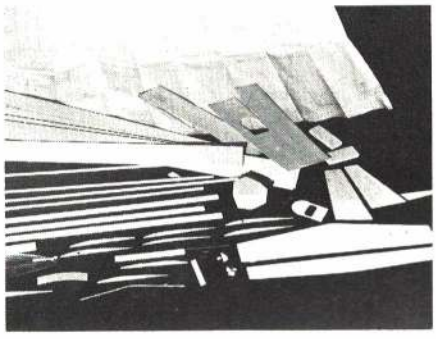
Control Technology, Inc./Electric power accessories. MD-3 Super Driver uses digital receiver input to control forward and reverse speeds of electric boat motor. Fully transistorized, unit completely replaces conventional speed-control servo unit. Low current drain, will not overheat. Also, rechargeable 12V CTI battery pack, fully sealed, long-lived, comes in 2.6 AH or 4.5 AH capacities. Super Charger, quick charger for above, provides automatically regulated cut-off at full charge. Write for complete specs. Control Technology, Inc., 344 Hamilton, Birmingham, Mich. 48011

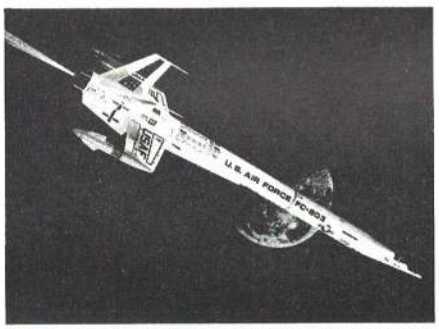
Wing Mfg. Co./Hinges. Lightweight, strong and completly hidden when mounted, hinges use wooden pins for smooth, high-strength control operation. Won't vibrate or pull out. 30 hinges plus mounting pins, $1.00. Wing Manufacturing Co., Box 33, Crystal Lake, Ill. 60014

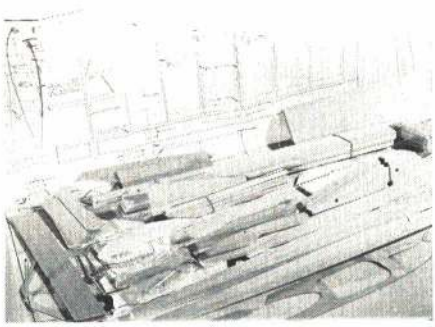
Sterling Models/New additions. RC sailplane, 70" model of popular Schweizer 1-26D, features all die-cut balsa and imported birch plywood, complete hardware including necessary RC fittings, power pod material, decals, canopy, etc. Warp-resistant construction. $19.95. Also, RC model of sailing schooner America. 51 1/2" overall, yacht can be operated rudder only, or full-house with rudder and full sail control. Printed, die-cut birch plywood decks, tapered spars and booms, scale rope and chain, metal fittings, all decals. Beautiful in the water or in the living room. $34.95. Sterling Models, Belfield Ave. and Wister St., Philadelphia, Penna. 19144

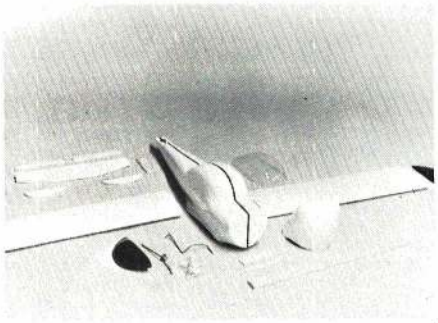












Tatone Products/Props and nuts. A new line, Twister props are cut from straight-grain wood, precision-cut for true pitch and precise balance. Fuel-resistant finish. 9/6 and 10/6, $ .75; 11/6, 11/8, and 12/6 for $ .85. Other sizes to come. Also, machined aluminum acorn prop nuts for all engines, 1/2A to 74. For 1/4" shaft, 15 to 35 engines, $1.00; for larger engines with 1/4" and 5/16" shafts, $1.25. Steel acorn nut for Cox 049, $ .79. Tatone Products, 4719 Mission St., San Francisco, Calif. 94112

Estes Industries, Inc./Interceptor rocket. Spectacular, eye-catching design, Interceptor uses detailed pre-formed plastic wing pods, nose and tail cone and conventional balsa construction. Four-color decals for beautiful detailing. 26" long. $4.95, less engine. Estes Industries, Inc., Box 227, Penrose, Colo. 81240

Top Flite Models/Mustang P-51. For the increasingly popular Standoff Scale activity and designed by Dave Platt, kit has many new features and time-saving ideas. Builds in 30 working hours. Flies on 40 to 60 engines. Conversion shown for Mustang series A through D models included. $40.00. Plane was shown at Toledo, but missed by AAM—our apologies. Top Flite Models, Inc. 2635 Wabash Ave., Chicago, Ill. 60616

Astro Flight/RC sailplane. Monterey is designed for two-channel digital control and features all-balsa monocoque airframe, solid rudder, elevator, stab and fin. Flying weight with RC, 2 1/2 lb. 100" span with 16:1 aspect ratio and Eppler 387 airfoil. Tapered spars, die-cut ribs and formers, plastic canopy, nylon fittings. $29.95. Astro Flight, Inc., 2301 Cheryl Place, Los Angeles, Calif. 90049

Bridi Hobby Enterprises/Dart Cart III. Stunt and sport RC profile plane, kit features pre-cut and indexed balsa and complete hardware of highest quality. Full-house flying weight is 3 1/2 lb.; 19 to 50 power recommended. 46" span, 540 sq. in. area. $29.95. Bridi Hobby Enterprises, 23625 Pine Forest Lane, Harbor City, Calif. 90710

Kyosho/Galaxie. Uses high-strength geodetic wing construction and 1/2A power. Galaxie holds three firsts in free flight competition. 49" span, 312 sq. in. area. Precut and shaped balsa, hardware, tissue. $5.95. Kyosho Corp., 1636 E. Edinger, Unit N, Santa Ana, Calif. 92705

Vic's Custom Models/RC Ercoupe. Deluxe fiberglass kit of popular twin-rudder private plane, model features foam core plastic-covered wings, balsa rudder and stab, all fiberglass fuselage and cowl. Full hardware, plastic canopy. Flying weight, 5 1/2 lb., 35 to 60 power, 62" span. $69.95. Deluxe interior option, $6.95 extra. Vic's Custom Models, 618 Cowpath Rd., Montgomeryville, Penna. 18936

WHERE THE ACTION IS

CONTROL LINE

SPORT AND SCALE BILL BOSS

Non-Flying Scale: To most modelers Scale means Flying Scale, but there is another kind—non-flying, its enthusiasts construction scale airplanes for the sheer joy of building and, after the project is finished, they sit back and regard the model as just another wonderful accomplishment.

One such modeler is Tom Manning, who says, "This may seem strange to you, but I do not build to fly. I have been building large scale (usually 1" - 1') model planes for 35 years and have never flown one." Tom usually builds from kits. When he can't find a particular subject in kit form he does scratch-built type.

His models have been featured at the local hobby shop, have been on television, and have appeared in the local newspaper as a feature item. Tom certainly has shown that non-flying scale can be just as rewarding as the flying type.

Tom Manning and fleet of non-flying scale models. His favorite is the F-100.

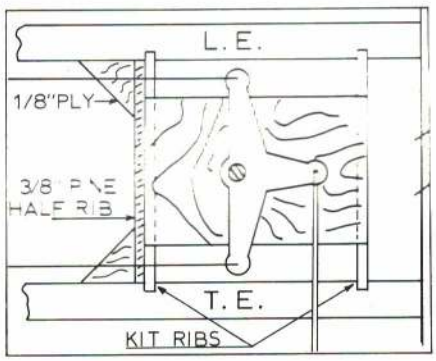
AAM's February 1971 editorial page was devoted to comments by Bob Lopshire, AMA's public relations man, on the value of a non-flying scale event at the Nats. He pointed out that by not including the non-flying scale modeler we deprive ourselves of the opportunity to learn from them, and lose out on the all-important appeal which such models have to the public.

Lopshire's ideas have been taken one step further by a proposal to the Scale Contest Board for the establishment of an official AMA Non-Flying Scale event. Any of you with thoughts pro or con on this matter should write to your AMA District Scale Contest Board Members and send a copy to AMA headquarters.

Bellcrank Mounting: Marv Wentz, (Technical Editor of the San Jose Aero Modelers Newsletter) has this to say about improving the bellcrank mounting. When flying a new model, have you ever had the bellcrank platform fail in flight as you eased into the first inside loop? If the crank platform is installed as illustrated on many kit plans, this may happen.

Tom Dennison has a better way to install a nearly break-proof bellcrank mount assembly. Combat ships have to stand a lot of g forces and, if the bellcrank mount doesn't fail under these circumstances, it shouldn't fail anytime, including that dreaded moment of all moments, the pull test.

Here's how it's done. Install a false rib of 3/8" pine or mahogany against the inboard wing rib to which the bellcrank platform mounts. Brace this rib with triangular pieces



of 1/8" plywood. Use a generous amount of epoxy to hold the added parts in place. This method creates a U-shaped yoke with additional bearing surface, plus (and this is a big plus) greatly increased strength to this section of the wing structure.

Compression Ignition: One major deterrent to the more widespread use of diesels is the lack of readily available fuel. However, diesel fuel is the easiest of all fuels to home-brew and the ingredients are available everywhere.

A good starting point is a mix consisting of equal parts of ether (Merk Motor Ether, Walgren's), kerosene (hardware store), and two-stroke motor oil (gas station). This is not the greatest fuel in the world but it works, is cheap, and can be easily mixed. If necessary, truck diesel fuel can be substituted for kerosene, and the motor oil can be replaced by castor oil or even medicinal mineral oil. Try a diesel, it can be fun.

This suggestion comes from the Aero Angels Newsletter (Chicago, Ill.).

Public Relations: The Cholla Choppers M.A.C. (Tucson, Ariz.) is to be commended for their efforts in bringing our great sport to their local senior citizens and the handicapped. "Hanger Talk," the Cholla Choppers Newsletter, had a rundown on three separate flying demonstrations and static displays put on by the club.

The first event was a static display at the Tucson's Senior Citizens Fair in Armory Park. The second, in support of the Mesa Corsairs, was a flying demonstration at the Arizona School for the Deaf and Blind. The third event, in connection with the celebration of Arizona and Aerospace Day, included flying demonstrations of Fast and Slow Combat, Precision Aerobatics, Goodyear, and jet aircraft at the Davis-Monthan A.F.B.

A word of thanks to the Cholla Choppers for their efforts in behalf of promoting model aviation.

The eyes have it! Josef Fain concentrates on balloon-busting, while Dad keeps him steady.

SPEED AND RACING JOHN SMITH

ARF Speed Models: The list of CL Speed components available from suppliers grows every day and with a little bit of shopping, an Almost-Ready-To—Fly speed ship can be bought right off the shelf. Starting with a pan, Tatone will even drill it to fit the engine: add a modified engine from any of half a dozen engine builders. Pick up a wing-spar-spar spacer from Technamics, and they'll fit the assembly to the pan, drill the spar for the control unit and also supply a metal stabilizer. Order a dolly from Brassel and a bladder tank kit, again from Tatone.

All the modeler has to do is carve a top, which is no big job. So, for about $125 to

Elusive time of 9.0 is pointed out. Bernie Stadium just missed it at the King Orange.

$135, a B job can be put in the air and be very competitive. While the price may seem high to the beginner, any active speed flier will tell you building from scratch probably costs more and possibly gives less results.

The suppliers listed above can supply the needed materials, so can many others who also stock these and other specialized parts. (Check the ads in this magazine.)

Custom Gas Tanks: Many times a special size or shape of gas tank is needed. When building a custom tank, try these tips. Shape a block of wood the size of the tank and use it to make sure the tank will fit the space available. It also provides a jig around which to construct the tank. Always allow a narrow lip of material to bend around the corner to strengthen the solder joint.

When installing vent and feed tubes, try

140-mph-Rat Racer has Aldrich S.T.40, Technamics wing-tail units. By Dick Kosby.

putting in the hole with a tapered scriber or punch. Lay the tank material on a block of pine or very hard balsa and gently tap the tool's sharp end through the tank material. Do not make the hole too big, since a tight fit is what is needed. The metal is dimpled into the hole, but don't file off this material. Put the tubing in the hole and fill the surrounding well with solder. The resulting joint will be very strong.

Try to design tank construction so that it can be completed with all tubing in place before the last end is installed. Now is the time to clean out the inside, removing loose solder, remaining flux, grit, etc. Once that last end is installed, it is too late to clean out all the greebles that will clog the line or needle valve and cause a good run to go sour. Use an old tooth brush, tooth pick, and lacquer thinner to loosen up all the dirt. Wash out the tank one more time with clean thinner and solder on that last end.

Now is the time to test the tank for leaks. It's a lot easier to find them now than it is when the fuel is running out around the tail skid at a contest. Plug all vents with tubing, except one. Attach a long piece of fuel line to the open line, dunk the tank in a bowl of water, and blow. Look for bubbles, which would indicate a leak. If any appear, resolder and test again.

(Continued on page 89)

CARRIER AND STUNT JOHN BLUM

National Control Line Society: Alvin Sugar (129 Brixham Pl., Schaumburg, Ill. 60172) is spearheading efforts to form a National Control Line Society. The organization is to be similar to the NFFS and hopefully will lead to better understanding and communication among control line enthusiasts.

Utility Parts Box: Holding models for repairs has always been a problem. Bob Ellis suggests using a kitchen dish drainer of the rubber-coated wire variety. The wires can be reformed to mate the model's landing gear or

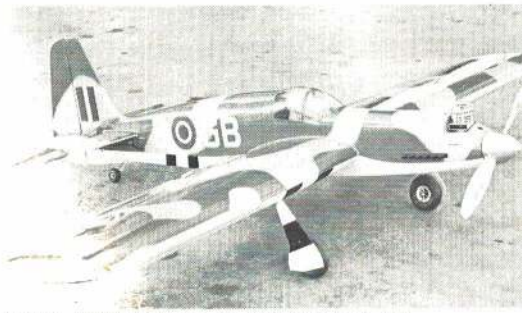
Hinton's model as shown in 3-views. Years ago the Blue Angels flew this plane too.

wing and to present an ample base for holding the ship. Additional bends can be made to form loops at the top sides and ends to store tools, battery, fuel can, etc.

Semi-Scale Stunt: Wilbur Hinton supports the trend toward semi-scale in stunt models. Unique in appearance when compared with today's average stunter, the F9F has large fillets and sports a foam wing with 18 percent airfoil and 607 sq. in. area. Wilbur's model is powered with a Fox 36X BB, which with four head gaskets and a 3/16" dia. intake will approach the desirable four-cycle aspect during flight.

The Gieseke Nobler: To the competition stunt flier, Bob Gieseke's Nobler is perhaps as famous as the original Nobler. In response to questions from many modelers, Bob says his model is almost stock with a few exceptions. They are as follows: (1) landing gear is vertical in the fuselage for better looks; (2) tail-wheel gear is longer for better landings with the ship sitting only slightly nose high; (3) model's nose is 1/4" longer; (4) wing is 52 1/2" long, with the stock airfoil thickness increased from 1/16 to 1/8"; (5) stab-elevator is 21" long for more turning ability and is tapered only slightly;

(6) fuselage shape is changed to give more side area and make the straight-line manuevers look better; (7) flaps are 1/4" less in chord and slightly shorter to make the model corner faster, letting the model go from up to down control without the tail's getting light; (8) weight is 42 oz.

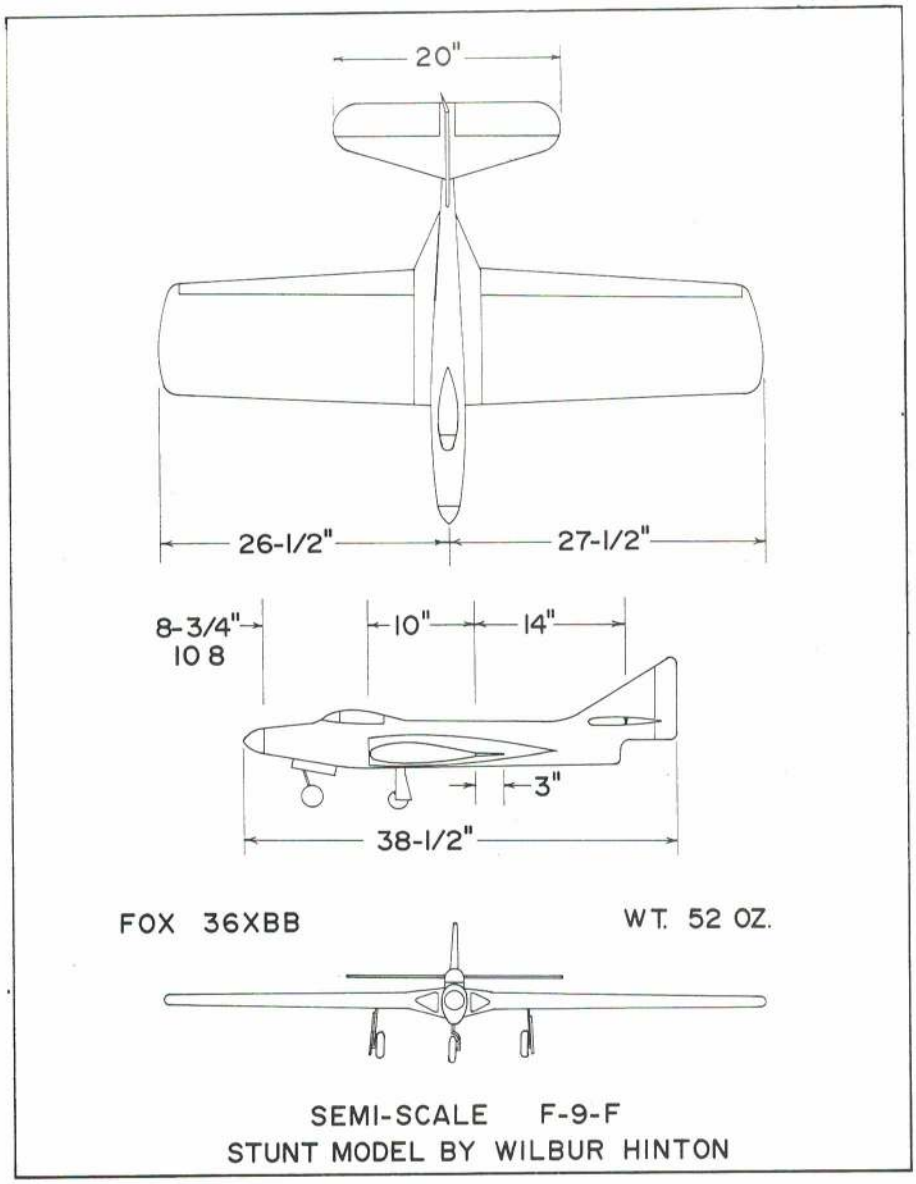


A future AAM feature, Al Rabe's latest, the Mustunt. Many new features. Not scale.

Bob says that the lighter model flies slower and still gets around the corners without building up speed in the wind. This requires precise alignment.

Bob advises beginners not to be "snowed" by anyone, but to make up their own minds, as to what is good for them. He also advises them to watch the better fliers and see how their models fly, but to realize that not all models work for all people. And, above all, build airplanes and practice.

(Continued on page 88)



RADIO CONTROL

SPORT AND PATTERN DON LOWE

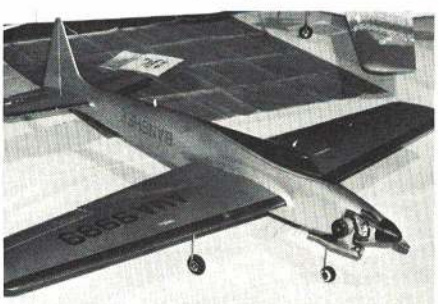
"Holy Toledo"!: These words probably echo the sentiments of those who made the trek to Toledo for the Annual RC Show. It was an extravaganza which has no equal. Into one exposition hall are literally stuffed displays by most of the RC industry with the latest goodies, plus hundreds of new RC model creations in every category and thousands of enthusiastic modelers. Each year the affair gets bigger and better and more crowded.

I spent three days and still didn't have time to examine closely half of the new products and displays. My biggest impression of the show was the quality of construction and finish of the models on display. Most were professionally done and revealed the maturity this hobby has reached. The scale ships were extraordinary in detail and workmanship, as usual, as were the pattern and sport ships.

The Rampant by Jerry Worth uses tandem or bicycle landing gear with wing tip skids.

Jerry Worth's award-winning new pattern design, Rampant, was flawless in every detail. The ship was so beautifully constructed that it seems a shame to risk it in the pattern wars. Jerry employs a tandem or bicycle fuselage-mounted landing gear with wing tip skids. I've been wanting to try this and will be interested to see how it works out. Should be a landing gear solution for those high mounted mid- and shoulder-wing designs.

Jim Martin's new mid-wing Banshee design also looks good and proved to be extremely fast in the flight demonstration. With thinner wings, retracts and sleek contours, speed seems to be the thing this year.

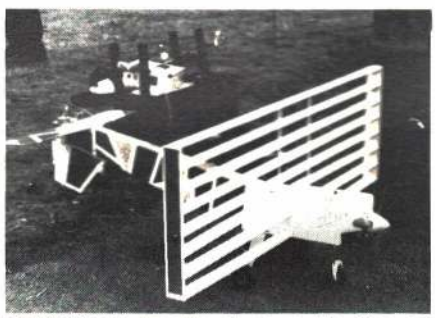


"Jersey" Jim Martin's fast-flying Banshee. Retract-equipped; ProLine and Webra.

Another enjoyable part of the Toledo show is renewing acquaintances and gabbing with fellow modelers. Especially pleasant was an evening spent with Mr. Sawada, director of the Engine Dept., Ogawa Model Mfg. Co., Japan (OS); Mr. Takamatsu of OK Model Co., Japan; Nationals Champ Jim Kirkland; and "Wild" Bill Welker of World Engines. Although the language barrier made conversation difficult, the international language of modeling made the evening well worthwhile. Jim Kirkland, who has recently joined World Engines was full of new ideas, so expect to see the Kirkland influence at World Engines.

Dave Gierke produces RC airplanes with absolutely incredible finish detail. His XP-40Q won not only the best finish award but also the best racing design prize (Formula II).

Shulman System: Leon Shulman's organizational and operational procedures for running RC contests have been publicized recently. A note from Leon reports a most gratifying response from contest directors. Those interested in streamlining operations and getting in more flights will find these procedures helpful. For details, contact Leon at 42 Blake Ave., Crawford, New Jersey 07016.



Eight-winged novelty plane really flies. By Dick Francis, it is named Flying Blind.

Venetian Blind: Dick Francis recreated a weirdy from the past. Several years back I saw a man carrying Flying Blind in an Air Force film called **Aviation Oddities.** This thing was created by some inventive nut back in the early days of aviation but it never got off the ground. Dick's RC version actually flies! This ship has eight 45-in. wings, 2-in. chord, and a Clark Y airfoil totaling 680 sq. in. It has four ailerons with two on each of two wings and a Veco 50 for power. He says that it flies fine but glides like a rock and needs power on for landing. It does axial rolls and spins. Dick deserves the "Hero of the Month" Award.

(Continued on page 88)

PYLON RACING BOB MORSE

Class A Racing: The Marin R/C Club (San Francisco, North Bay) sponsored a race for fun for the Class A (Quarter Midgets) fliers, at Hamilton Air Force Base.

Many spectators and a few curious Formula I fliers were there. Nine ships entered the racing. Don McCullough of the Pioneers washed out his ship in a test flight, but the remaining eight aircraft completed all their heats.

Gary Korpi and Nick Maire of the Pioneers finished first and third, respectively, with young Walt Reece taking second place with his Little Toni and one of the most amazing engine assemblies seen to date. (We'll try to get Walt to describe it later.) We heard it is a five or six-year-old Supertigre with the front rotor carburetor hole plugged with balsa, a strange rear rotor assembly, and clearly the fastest engine in the field (and there were some pretty professional engines there).

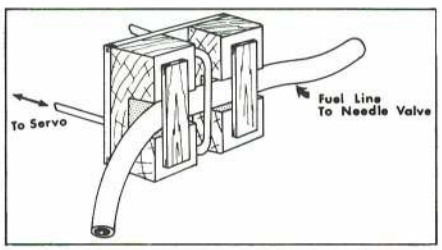
Monthly Racing: The Pioneer R/C Club (Sunnyvale, Calif.) decided to stage a racing afternoon the third Sunday of every month from March through September. Formula I and II and Class A will be flown. Every AMA member within traveling distance is welcome to participate in these races.

Class A (Quarter Midget) Racing Rules: In April, we reported on the efforts of several dedicated members of the racing fraternity to formulate a set of Quarter Midget rules, which would combine the best features of several sets of rules gathered from around the country.

Hot Canary, coming in AAM next issue, is scale and odd. Model by Bob Seigelkoff.

The District 10 Vice President has formally submitted to NMPRA President, Pete Reed, a proposal to adopt these rules on a provisional basis. Now that this first step has been taken, it appears that 1971 might be the year that Class A will become an official and nationally-recognized racing event.

If you are at all interested in this event, contact your NMPRA district vice president and discuss your opinions with him.



Fuel Shutoff Devices: Last month, the new K&B fuel shutoff device was discussed (we're flying ours now). Bob Siegelkoff (the Hot Canary designer) has devised a simple homemade device to do the same job (see sketch).

The two main blocks are cut from a grooved landing gear block with the groove opened up a little to let the fuel line slide through easily. The thin ply plates trap the fuel line in place. The wire pushrod is bent as shown to provide alignment as it moves. Adjust the pushrod so that as the servo approaches its shut-off position, the 1/16" wire pushrod squeezes the fuel line into the notch between the two blocks, ergo, engine shutoff.

Elliptical-winged Shark is new from Francis Products. Fast, groovy Formula I.

New Products, Formula I: We have just flown Joe Foster's new racer, the Shark. With its elliptical Spitfire-type wing and with flying characteristics as good as its appearance, it is one of the prettiest ships we've seen.

In the first monthly Race-for-Fun event at the Pioneer R/C Club field, the ship was clocked at 1:41, 1:39.6 and 1:38, pretty good times for the 3rd, 4th and 5th flights on a new bird. Francis Products, P.O. Box 874, Cupertino, Calif.

Class A: The quarter midget gang around the country should be mighty happy. In addition to the Andris Little Toni and the K&K Ballerina mentioned in the April column, Francis Products has their new scale P-51 flying, a pretty addition to anyone's racing stable. It is designed by Joe Foster and available now.

GLIDERS AND FAI HOWARD McENTEE

Winch-Launch Pulley: The pulley stuck in the ground a thousand feet from a glider winch has to be rather special. It takes quite a beating and if not made correctly can give the towline a beating too. A line that breaks shortly after the glider is released can cause a tragedy! Therefore, Dave Burt and his SOAR buddies worked out a low-cost pulley based on a commercial frame.

To make it, buy a galvanized iron or steel sheave (another term for pulley), remove the pin and roller (which are discarded), and clean the frame of all flashing and burrs. Turn out a new aluminum roller which has only minimum side clearance in the frame. The frame and roller then are drilled for a tight running fit on the 1/4" hardened steel axle. The latter must be retained in the frame by roll pins, cotter pins, or other means. Music wire probably would do a reasonable job as the axle, since the average home builder isn't going to be able to drill holes in a hardened steel pin.

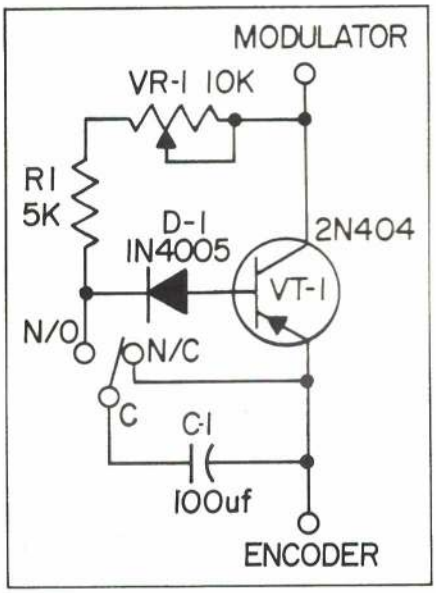
Of vital importance are the two crescent-shaped shims, which prevent the towline from jumping off the roller face and jamming along the side of it. These shims must be just as close to the roller edges as possible, while still allowing clearance. Dave suggests putting masking tape on the ends of the axle pin to prevent the line from snagging there. Plain angle iron makes a fine anchor post. It is driven into the ground with the "point" away from the winch. A heavy steel plate welded to the top allows driving into hard ground.

SOAR Sponsors Glider Meet: Dave Burt said that SOAR will sponsor a Nats glider meet this summer. Location is not certain yet. It probably will be closer to Glenview, but far

(Continued on page 86)

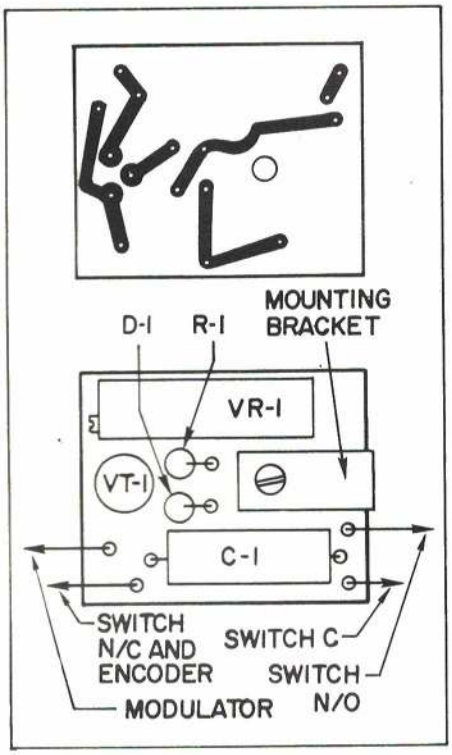
AERO/ELECTRONICS FRED MARKS

More Flexibility for the POD: The Pulse Omission Detector (this column, Nov. and Dec. 1970 **AAM**) received quite a favorable response. One suggestion was developing the technique of quickly counting "one" or "one potato" or something of this sort for the length of time to hold the omission button down. J.A. Tillingham writes, "I found your article on POD just what I needed to extend the capability of my Heathkit system. I presently have several model boats which have various auxiliary functions; some now controlled by POD.



"When I built the POD, I did not use the S-4 servomechanism suggested, but substituted instead a Royal Model 7 Rudder servo. This drum (switching) type servo has a very quick response, which made it easy to accidentally hold the command too long and step past the next position of the servo. I felt the best solution was to control the duration of pulse omission from the transmitter (other than manually). Thus, I installed a circuit (Fig. 1) to give a controlled command duration and to avoid overstepping a servo position. Fig. 2 presents the printed circuit and component layout used.

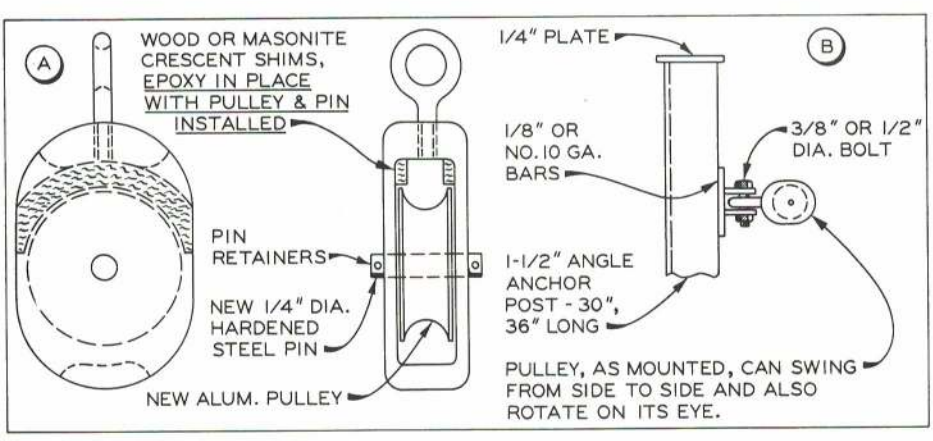
"When the button is pressed, the 100 microfarad capacitor appears as a short between emitter and base of the 2N404, biasing it strongly off, thus preventing encoder output pulses from reaching the

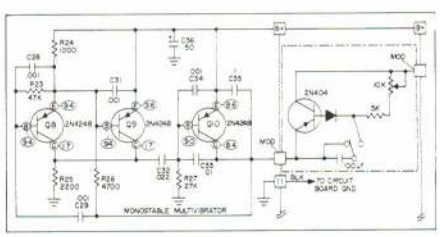


modulator. The capacitor time constant is determined by the 10K potentiometer and the 5K resistor. When the capacitor voltage level reaches the transistor switching voltage, the transistor, once again biased on through the resistor and potentiometer, begins conducting, thus restoring input to the modulator. This completes the cycle until another command is given. A miniature 10K, ten-turn trim potentiometer was used to control the duration of the pulse within certain limits. Greater latitude in omission duration may be had by increasing (for longer duration) or decreasing the value of the 100 microfarad capacitor. The connections to the modulator and encoder output, as shown in Fig. 3, provide the necessary operating voltages.

"I have built an additional POD using the S-4 servomechanism and found the arrangement equally effective."

The schematic from Mr. Tillingham (Fig. 3) is for the Heathkit transmitter. However, if you are sufficiently knowledgeable of the circuitry of your transmitter, the arrangement can be adapted.





And a Tip of My Own: Several systems have used the Antenna Specialists Co. fittings for attaching the transmitter antenna. These fittings have two difficulties: the antenna works loose when the transmitter is used and it is all too easy to unscrew the entire fitting from the transmitter if tightened too firmly to avoid having the antenna work loose. The solution consists of fitting a 2-56 screw or a round-head sheet metal screw to the center grommet of the upper fitting. This works quite simply: the screw head prevents the

shoulders at the edge of the fitting from contacting and "seizing" against each other. The micarta "gives" sufficiently to provide a spring action and the contact area is so small that the fitting just cannot be unscrewed inadvertently, no matter how much it is tightened down.

See drawing, next month's issue.

SCALE CLAUDE McCULLOUGH

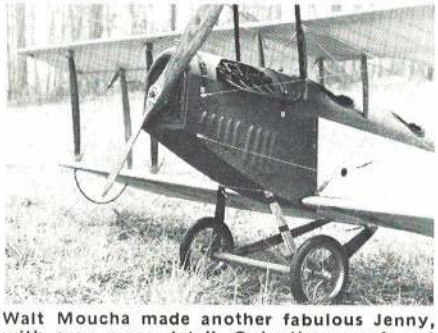
Walk Before Running: Scale modelers are born dreamers and their dreams are never of simple models. Retract gears, rotating gun turrets, loaded bomb bays—all so interesting. And engines, lots of engines! Take this letter, typical of many which come in to AAM: "I am trying to get started in RC and install an outfit in a B-36 model I have already bought. Could you please send me info on the best way to RC the B-36?"

The reply used to be automatic—forget it, it won't work. But that was B.C.—before Chicago, when Drummond and Burgin not only did it but made it look easy. Easy? Walt Burgin, for example, had many years of RC behind him with countless hours of pattern glider and sport flying. His prior scale accomplishments included such diverse types as a nine-ft. Taylorcraft, Pitts Special, Stearman bipe and a twin-engined PBY Catalina flying boat.

More than two years of effort, experimentation and knotty problem-solving went into the big six-engined bomber. While it was based on the CL kit, which our letter writer evidently has, the base went no further than the main outlines. All of the plywood parts and control line tolerance of weight were unacceptable and a specially selected balsa structure was substituted. The final result was a historic success and an inspiration to every scale nut. But the indispensable factor was the builder's broad background of experience.

So to our letter writer we say, don't give up the dream of an RC B-36, just delay it a while. Get some flying time on a medium-sized trainer (little ships are too jumpy for beginners) like deBolt's Livewire Champion. Start in scale with a stable and forgiving high wing along the lines of the Sig J-3. Putting a cockpit and detailing on the Piper can be just as rewarding as on a hot fighter or racer and the Cub is a lot less likely to scatter your painstaking work all over the runway.

As flying skills improve, progress to light wing loading low-wingers with ailerons. Perhaps then a simple multi-engine ship to provide preparation for the demanding requirements of a half a dozen vibrating



Walt Moucha made another fabulous Jenny, with even more detail. Only the grass is not scale.

power plants. When you know without asking exactly how a B-36 should be RCed, that is the day the great project can commence.

(Continued on page 87)

FREE FLIGHT

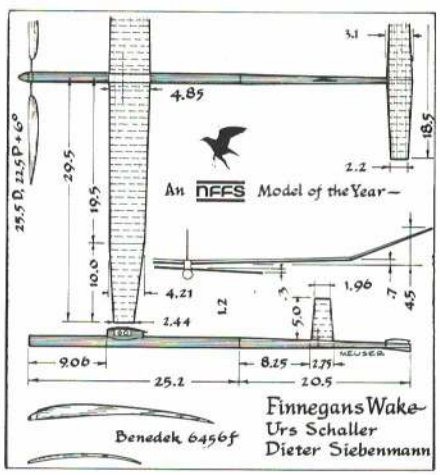
SPORT BOB MEUSER

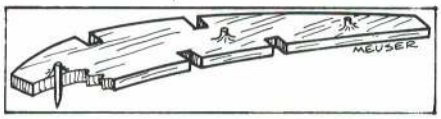
Finnegans Wake: Siebenmann, Gainsli, and Schaller, the three modelers who make up the team representing Switzerland at the World Championships to be held in Sweden at the end of June, all use the same model: Finnegans Wake. Originally designed by Siebenmann, Schaller flew one at the 1969 World Champs. The model was awarded a Model of the Year Award by the National Free Flight Society at the NFFS Symposium. Urs Schaller was on hand at the Nats to receive the award and, sadly, lost one of his models in the competition.

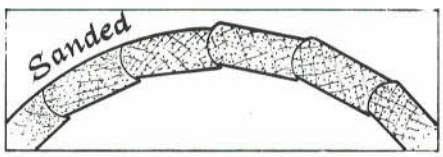
Perhaps the greatest Wake of all time, Finnegans Wake sports at the very least all of the proper goodies: all-sheet covered wings of high aspect ratio; sawtooth "3D" turbulators; a narrow, indoor-style prop which has blades starting two inches from the hub; "Theodorsen" prop (we wonder if Theodorsen himself would recognize half of the model props he is credited with having designed!); blades hinged way out so the blades of the folded prop are well separated from the fuselage during the glide to avoid aerodynamic interference; aluminum-tube motor tube flexibly joined to a conical sheet balsa tail boom, Montreal auto stop to lock the prop to the nose when the torque drops below a certain predetermined value; ball-bearing prop hub; thin, highly-cambered stabilizer covered top and bottom with 1/64" sheet balsa; flexible plastic Graupner prop spinner (anyone know of a source in this country?).

As if that isn't enough, it also sports a timer-operated automatic stabilizer that starts out with zero angle of incidence, pops up to minus 1 2/3 degrees after about four seconds, and kicks the rudder over to the right just

FF World Champs take place in Sweden at end of June. Host country modelers will fly this fine design, Finnegans Wake. NFFS rates it as one of the best for Wakefield flying.







(Continued on page 85)

SCALE WALT MOONEY

Got a Problem!: A letter in the mail says, "Got a problem! Can't make a kit-built scale model fly!!!" Guess We've all had that problem at least once. The question is, what can be done about it?

Models are kitted for many reasons: it was a great flyer; it won at the Nats; it is a popular light plane; it is an interesting design; it was a famous fighter, or bomber, or trainer; it was flown by a famous pilot. Only the first two reasons are likely to result in a model which really will fly if trimmed properly for flight. Usually the other reasons result in beautiful display models whose flying capability is not the primary attribute.

I once knew a WW I pilot (not an ace, mind you) who admitted to me that he had only been attacked by an enemy plane twice and had escaped both times by letting go of the controls. The airplane he was flying at the time was so unstable hands off that he never knew what it would do if he let go, and evidently neither did the enemy. An exact scale model of his airplane probably wouldn't fly very well either!

Appearance is important in a kit model and, therefore, it must be close to exact scale. Many WW I models need larger horizontal tails, and quite a few need larger vertical tails in order to fly well and adjust easily. Almost all of them need an increase in dihedral. Most WW II models need more dihedral and larger horizontal tail than scale. Most of them have enough vertical tail, and some even a little too much.

High-wing airplanes generally seem to make the best flying models. Therefore, for a kit scale model which will be a good flyer, select a kit of a high-wing light plane. Then plan to modify the design for more dihedral and larger horizontal tail.

Laurence L. Shepler, who wrote this letter, is having trouble with a kit-built high-wing light plane, I have built that model on several occasions and mine don't fly very well either when made exactly as the kit is designed. The kit tail is scale size, and the resulting model is not quite stable enough to fly easily. It can be balanced to glide nicely with a forward center of gravity and up elevator, but then under power with any kind of reasonable downthrust it is very likely to loop or at least pitch up and stall. If the center of gravity is put about a third of the way from the leading edge to the trailing edge and the model is

Shock-absorbing landing gear on Indoor Eagle Rock bipe. Structure is nearly scale.

adjusted for power flight, it will dive in the glide.

One possible way out of this dilemma, short of building a new larger tail, is to increase the length of the rubber motor until the model is landing under power. Most indoor scale modelers fly their ships in this fashion and get away with beautiful flights, even though the model would be a disaster in the glide, power-off.

A turbulator might help on a problem model such as this. My reasoning, based on some turbulator experience on Wakefields and towliners, goes like this. A small model will have a short wing chord and thus tend to develop laminar separation, especially if the airfoil is a good smooth one. If this one is trimmed to glide with the flow which changes the downwash over the tail drastically and loops the model. A turbulator on the wing—such as a piece of thread a quarter of an inch from the leading edge—should keep the flow attached and allow the glide trim to be nearer the power trim setting.

I've had turbulators on towline gliders require a tail angle of incidence change of as much as five degrees.

Model Notes: Jack Arnould has built a really beautiful model of a Citabria. With a 24-in. span and lightweight structure, it is an excellent flyer.

Another beautiful model is the Eagle Rock Biplane built by Sal Alu Jr. Built for indoor scale, the model spans 27" and weighs two oz. Wheels and engine exhausts were formed on a Vac-U-Form toy. The plane has all scale ribs in the wing and shock absorbing gear.

GLIDER AND RUBBER BOB STALICK

Design Your Own: Every modeler, sooner or later, decides he can design and build his own model. He has specific ideas and usually, the first effort incorporates many features of a model which has been successful for him. However, the result seldom flies as well as the original.

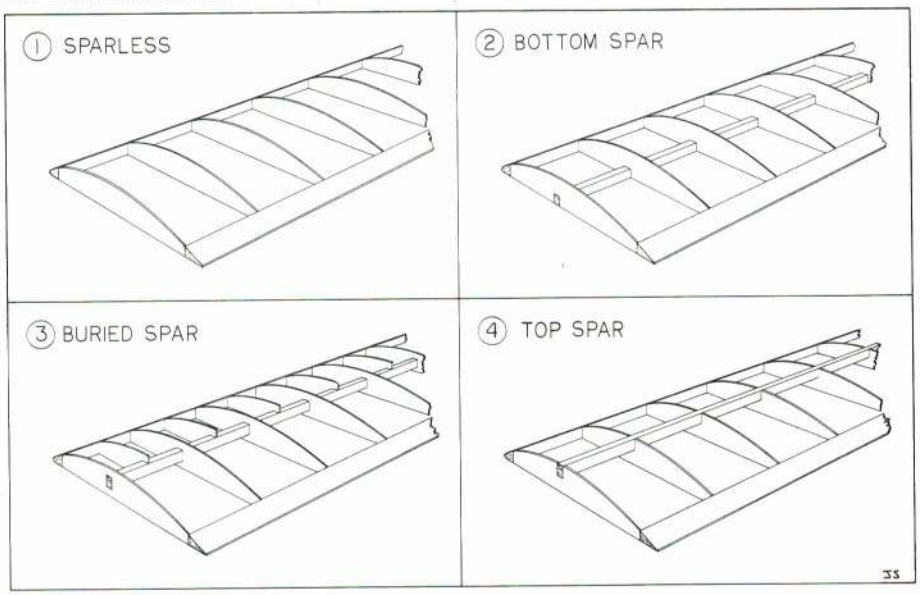
Beginning this month and for the next several issues, a review of wing and stab structures will be presented. Since the uses of each type vary, it is important to remember that what may be desirable in a wing structure for an unlimited rubber model may not be desirable in a Nordic A-2 stab. However, the important basics for all models are: (1) warp free structure, (2) maintenance of the designed airfoil shape, and (3) adequate strength and flexibility for the stresses put onto the model. Four examples are illustrated this month. They are presented roughly in improving order—that is, the second is somewhat better in the above listed three basics than is number one, etc.

The first example is the sparless structure and is seen in some of the smaller Jetco towline gliders. It is a simple and easily constructed system but suffers from lack of warp resistance. It can be improved upon greatly by using a wider leading and trailing edge with closely spaced ribs, as in the "Ritz" wing.

In the second example, the bottom spar adds more rigidity than the first does, but because of spar location it is not really much more warp-free. Again, more closely spaced ribs (or false ribs as in No.3) would aid in maintaining proper airfoil shape. This structure was used on the earliest Starduster power models.

The buried spar, with false ribs, in this example, does an excellent job of maintaining airfoil shape and tends to be no less rigid than No. 2. Most larger models use more than one buried spar, but in order to provide adequate spanwise strength, quite a bit of spar thickness is required. Usually, the buried spar is used in conjunction with other types of spar structure. Most of Carl Goldberg's free flight designs employed the buried spar system.

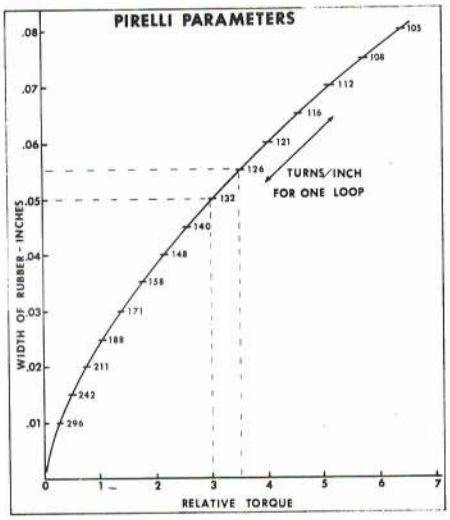
The top spar arrangement is shown in the fourth example. This is a very rigid construction method, and by using false ribs, it will maintain a good airfoil shape. However, it has one failing in common with this month's other three examples: none is really warp-resistant. This spar structure design has been employed successfully by the Brooklyn Sky Scrapers Club as evidenced by Bob Hatschek and Bill Dunwoody's numerous designs.

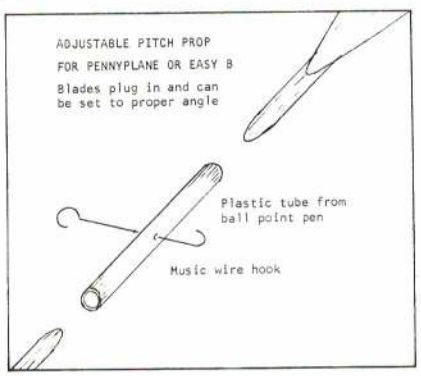


INDOOR BUD TENNY

Indoor Horsepower: Indoor models are powered by rubber bands, and every indoor flier should know something about his power plant. Most commonly used is Pirelli rubber, which is imported from Italy and sold here by hobby dealers and mail order supply houses. These sources usually stock only 3 mm and 6 mm (1/8" and 1/4") widths, so the narrow strips used for indoor models must be ordered from indoor suppliers or must be cut by the fliers from strips of the commercial stock. These narrow strips are then made into loops by tying the loose ends to close the loop.

How Much Power?: Before making the rubber motor, the flier must decide what size rubber to use—that is, how wide a strip (all Pirelli comes 1 mm thick, or about .04") and how long a loop to use. The loop needs to be little longer than the distance between the hooks on the model; an experienced flier can usually guess the proper width of strip for test





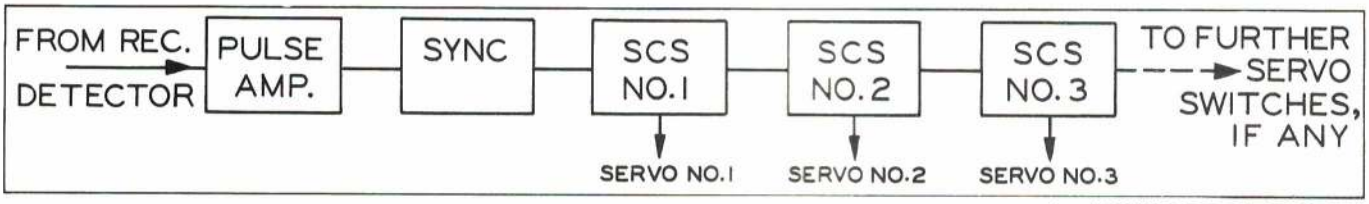
flying. The less experienced flier must pick a width of strip and try it. The chart of Pirelli parameters will help him determine several things about his motor. The numbers along the curve show the maximum number of turns each motor will stand; multiply the length of loop by the number opposite the width of strip. For example, a 16" loop of .05" rubber will take 16 x 132 or over 2100 turns.

Test Flying: Try half turns for low ceiling sites, proportionally more turns for higher ceilings. Adjust the model and the number of turns so that the model almost reaches the ceiling. If the model lands with many turns, use a wider strip. The lower edge of the graph shows about how fast the power output increases as width is increased. For example, .055 rubber puts out 3.5/3 times as much torque as .050 rubber, or about 16 percent more torque.

(Continued on page 86)

getting started in RC

Operation of digital receiver and servos is not by black magic. This discussion is in layman's language.



by HOWARD McENTEE

DIGITAL ENCODER OPERATION was described here last month and data on digital systems in general and on RC transmitters were reviewed. The reader now should have a rough idea of how the digital transmitter operates, why the pulses are timed as they are, what happens when one moves the control sticks. Next, what happens to those pulses when they are sent out over the air?

The receiver picks them up and removes the pulses from the RF carrier which conveys them from transmitter to receiver– a process termed demodulation. All digital systems, even the simplest, utilize superhet receivers. Data on this type of receiver was given in Part 28 of this series (p. 33, March 1970), with further receiver information in Part 32 (p. 42, July 1970). A review of this information is important.

Following the second detector shown in Part 28, the digital receiver has a pulse amplifier of one or two stages. This circuitry also may reshape the pulses to a form most suitable for operation of the following circuits and can, as in the Heath system, provide further noise immunity. The sketch shows the pulses going "through" a sync circuit. This isn't actually what happens but the process is difficult to describe briefly in layman's terms.

Suffice it to say that the sync section of the decoder controls the voltage supplied to the SCS (silicon-controlled switch, a special form of semi-conductor) chain which follows, so that these SCS's turn on and off in proper step with the pulses incoming from the transmitter.

The first pulse of each frame (the reference pulse) turns the first SCS on, the second pulse turns it off again. As it turns off, SCS No. 1 sends a pulse to turn on SCS No. 2. The third pulse turns off No. 2, and in turn shoots a pulse to turn on SCS No. 3. This sequence continues down the chain of SCS's, as long as the pulses continue for every frame.

There is one SCS circuit for each servo; each SCS sends power to its own servo only for the brief period that it is turned on. Turn-on is triggered indirectly by incoming pulses from the transmitter, while turn-off is triggered directly. Thus, each SCS conducts only during the interval between each two incoming pulses, and current goes to each servo only as long as the SCS tied to each servo conducts.

This period is shorter if a transmitter control stick is moved one way, longer if it is moved the other. Thus, while moving the transmitter stick changes the spacing between adjacent pulses of equal length, by the time the pulses reach the servos they are of varying length. Even so, each pulse is still very short in relation to the total length of each frame.

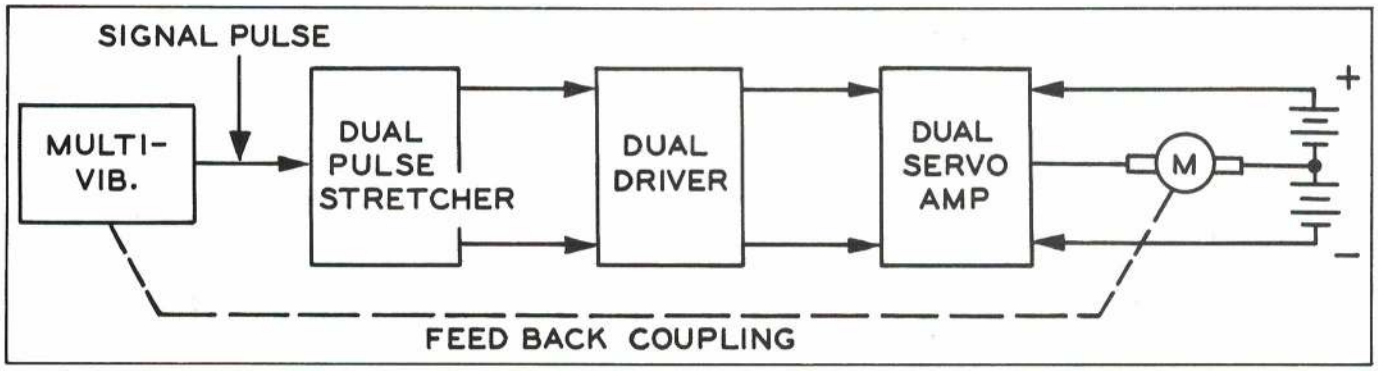
The SCS is a compact metal-cased unit, but some makers prefer to use a direct-coupled pair of common silicon transistors (one PNP and one NPN) which will do the same job at less cost, and some claim these transistor pairs can be more uniform. The Heathkit GD-19 system utilizes SCS's, but their three-control GD-57 system has transistor pairs for servo pulse switching.

The pulses from the decoder are applied to a comparison circuit in each servo amplifier, also to a mono-stable multi-vibrator. The latter simply is a circuit which holds a steady state (with its output transistor turned off in this case), but which will briefly reverse this condition upon the application of a pulse. Thus, for every pulse from the decoder, this MV (also termed a one-shot) does reverse, to send a pulse of about 1500 microseconds to the comparison circuit. In the Heath system, 1500 microseconds also is the spacing between adjacent pulses.

The length of the incoming pulse is checked against that from the servo MV. If there is no difference in length between the two, no voltage is sent to the servo motor. If the receiver pulse is longer, a positive voltage goes to the pulse-stretcher; if the receiver pulse is shorter, it gets a negative voltage. Either will cause the servo motor to turn, but in opposite directions.

In the servo amplifier, dual everything following the comparison circuit is needed, since one pulse stretcher (actually an amplifier circuit), driver and servo motor amplifier will turn the motor one way, while the opposite stretcher, driver and amplifier will turn it the other. It also takes a pair of batteries to do this (two cells for each side,

(Continued on page 77)



CARL GOLDBERG

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And More NEW ACCESSORIES . . .

STEERABLE NOSE GEAR

Versatile — steering arm can be to either side, or slightly up or down, or mounted on bottom with extra collar in slot. Steering arm is nylon, stiff enough for good control, yet can flex under shock to protect servo. Collar is hardened steel — won't strip like brass. Screw is hardened steel, too. You can really torque it and get good grip on music wire strut without a flat. Try it, you won't get it to strip out easily.

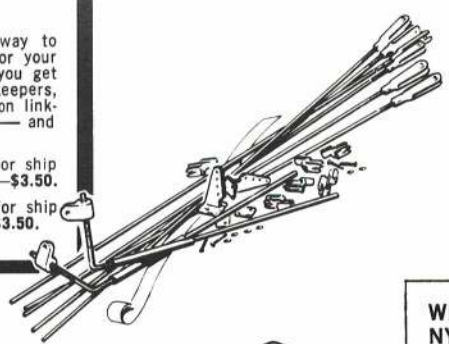
Complete steerable nose gear, with nylon bearing, 5/32" plated music wire strut, extra collar, blind nuts, screws and washers—**$2.50.**

NEW—MAJOR R/C FITTINGS SETS

Here's the economical way to buy the major fittings for your multi ship. In one set, you get all the horns, links, keepers, bellcranks, or strip aileron linkage, and hinge material — and at a saving.

R/C Fittings Set No. 1 for ship with standard ailerons—**$3.50.**

R/C Fittings Set No. 2 for ship with strip ailerons—**$3.50.**

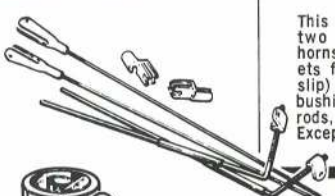


CONTROL HORNS

Our new horns have the upright part rising from the center of the base for maximum stability. Holes are right size for 1/16" wire; nut plate for simplest mounting. Long horns or short horns, with screws—**50¢ for 2.**

WIDE NYLON TAPE

This nylon reinforcing tape is extremely tough when applied with epoxy around the center when joining wing halves. 2½" wide x 5 ft. — **50¢**

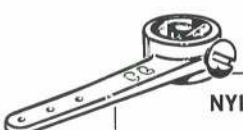


STRIP AILERON LINKAGE

This complete set has two threaded aileron horns; two nylon brackets for fine, safe (can't slip) adjustment; brass bushings; Snap-Links and rods, and Snap'R Keepers. Exceptional value—**$1.50**

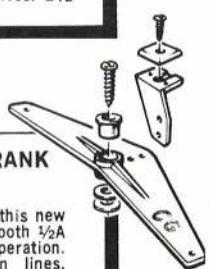
NYLON BEARING

One-piece design mounts to firewall without alignment problems. Includes blind nuts, screws and washers — **75¢**



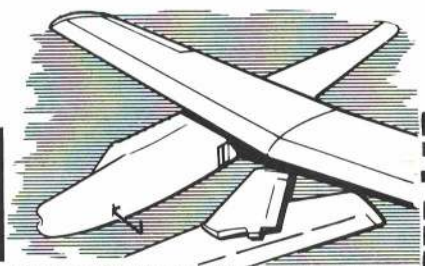
NYLON STEERING ARM

Hardened steel collar and screw — **75¢**



½A BELLCRANK and HORN

Made of nylon, this new set provides smooth ½A control line operation. Easy on dacron lines, too. **25¢.**



REPLACEMENT FOAM WINGS, ETC.

To go with your own design fuselage. Proven efficient Ranger 42 foam wing gets you in the air quickly, $3.95. Stab and vertical fin, set $1.95. Assembled Ranger 42 fuselage, plus bearers, nosegear, etc., **$8.95.**

P. S. For best service, see your dealer for items you want. If not available, write direct; add 35 cents per item (75 cents outside U.S.). Minimum order $1.00.

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CARL GOLDBERG MODELS INC.
2545 W. Cermak Rd., Chicago, Ill. 60608
I am sending 20 cents for 8 pg. Illustrated Catalog with "Recommendations on Starting in R/C," Basic Explanation of R/C Equipment, and Radio Control Definitions.

NAME_____

ADDRESS_____

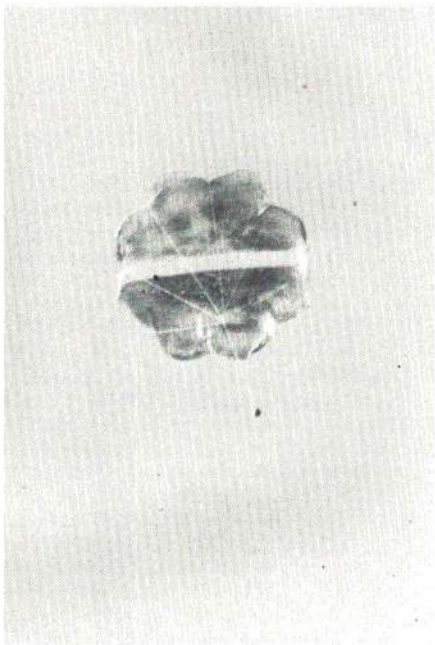
CITY_____

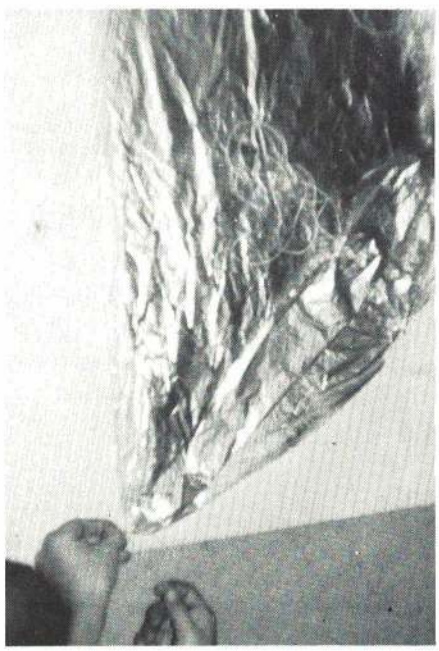
STATE_____ ZIP_____

A cleaners-bag parachute that goes up carrying a message!

THE PARABALLOON

by JACK BALE





LOOKING FOR SOMETHING to fly that is quickly built and very inexpensive? Then try a paraballoon—the parachute that goes up! Constructed of materials costing not over six cents, it provides many thrills as it climbs slowly out of sight.

Not only are paraballoons fun to watch, but they also are an accurate means for spotting thermals at the local free flight field. By keeping a log book of the times and dates of chutes released, data can be provided on existing thermals for given days and times during the year.

Another interesting experiment is to place a note in the weight capsule, requesting the finder to return the card and to state where and when the paraballoon was found. At least ninety percent of the over 275 chutes I have launched flew successfully. The furthest distance one traveled, according to replies received, was over 50 miles. And that was over a nearby range of 5000-foot mountains! As you can see, these things fly!

Construction

Materials needed include: one standard large-size plastic cleaners bag, a spool of button or carpet thread, one plastic capsule (from a gum or merchandising machine), a marking pen, and scissors. Before beginning construction, cut nine 48" lengths of thread and make a note to be included in the capsule.

The paraballoon is easy to build, but accuracy in two areas is important. The plastic must be cut in a perfect half circle (the bag forms two layers of material), and the shroud lines must be exactly equal in length after tying.

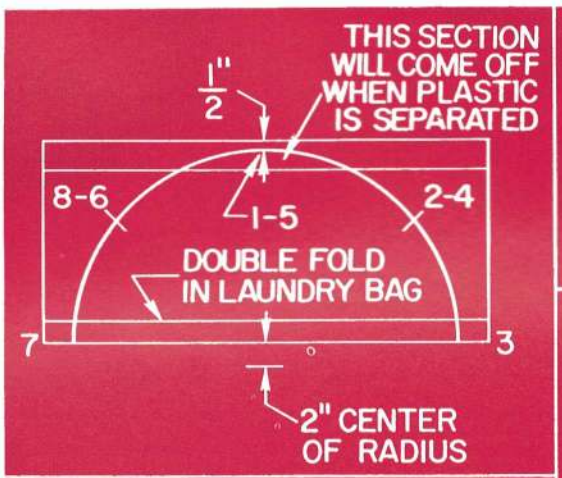
Canopy: Check the bag to make sure it has no holes and lay it out so that any lengthwise seams will be at the upper and/or lower edges (see drawing). Mark off a semicircle on the plastic, lowering the center of radius two inches below the bag's lower edge (see photo). When drawing the arc, keep its top half an inch down from the edge of the plastic. Cut exactly on the line. If the upper edge of the arc included any part of the seam, peel off the extra layer of plastic.

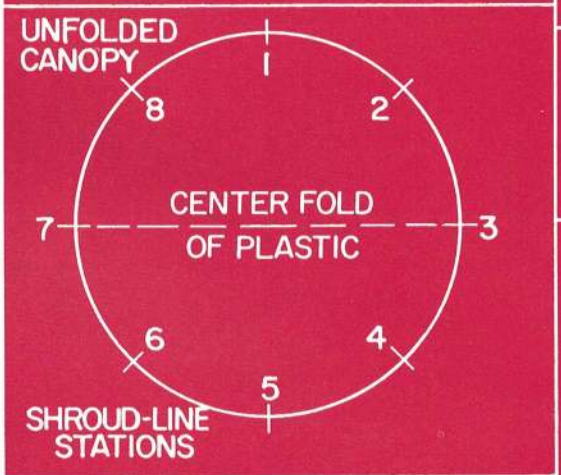
Shroud Lines: Separate small sections of plastic at the semicircle's corners, and tie one line to each corner. At the top center of the arc, tie one line to each side of the doubled plastic. Mark off locations centered between top and sides. Tie one line at each location. If

(Continued on page 64)

Paraballoon is launched by an overhead upswing. Boy's left hand holds the message capsule.

It caught a thermal! These easily made parachutes go up on the lightest lift. Note shrouds.





Felt-tip marker shows cutting line on the folded plastic. Fold is at bottom of picture.

Tie shrouds to small pieces of the edge at eight evenly spaced points.

No. _____

THERMAL SURVEY

PLEASE SEND CARD STATING WHERE AND WHEN FOUND TO –

NAME _____

ADDRESS _____

ZIP _____

No. _____

No.20 –
LAUNCHED AT BALL-FIELD 9:30 A.M. 8/20/69
O.O.S. STRAIGHT UP.
– CARD SENT FROM 5 MILES AWAY – N.E.
8/31/69

No.21 –
LAUNCHED AT BALL-FIELD 10:05 A.M. 9/1/69
5000' THEN DRIFTED EAST O.O.S. AT 10:15

No.22 –

LOG BOOK SAMPLE PAGE

SAMPLE NOTE FOR CAPSULE

"SUPER DELUXE" PILOT ARF'S

There are various degrees of almost-ready-to-fly airplanes. Some are finished to a higher degree of almost ready to fly-ability than others. If you look at some of these Pilot airplanes, I am sure you will agree they have added an extra dimension into the art of preparing an almost-ready-to-fly model. To get a real nice job on the Cavalier, which is the flagship of the Pilot line, you should spend two evenings. This includes radio and engine installation. The other planes should finish up in an evening. Wherever possible, the aileron and rudder are on and hinged. The Cavalier and the Shell Fly "B" are superb low wing, high performance, airplanes. The high wing symmetrical section Sky Wagon with its long tail moment is an especially fine acrobatic trainer. The Olympia and the Cessna Cardinal are excellent 3 channel beginner's models. The little Piper Cherokee, being a low winger, might frighten some beginners but, with the dihedral that this model has, it is a beautiful and docile 3 channel airplane. We would recommend a 60 size engine for the Cavalier, a 40 for the Shell Fly "B" and the Sky Wagon (or maybe a 35), and a 15 to 19 for the Olympia, Cherokee and Cardinal. Because of the extra effort that has gone into these Pilot kits they are a little more expensive, inch for inch, than many almost ready to fly models. For somebody who highly values his time, we think that even at the slightly increased price the extra finish is well worth the effort.

CAVALIER

Wing Span	63.78"
Length	49.60"
Wing Area	635 sq."
Engine	60
R/C Mech.	4 Ch

$69.98

CESSNA CARDINAL

Wing Span	63.78"
Length	35.43"
Wing Area	397 sq."
Engine	15 to 19
R/C Mech	1-3 Ch

$34.98

SHELL FLY B

Wing Span	51.21"
Length	39.4"
Wing Area	480.5 sq."
Engine	30 to 40
R/C Mech.	4 Ch

$49.98

CHEROKEE

Wing Span	46.48"
Length	35.23"
Wing Area	387 sq."
Engine	15 to 19
R/C Mech.	1-3 Ch

$34.98

SKYWAGON

Wing Span	52.75"
Length	40.55"
Wing Area	485 sq."
Engine	30 to 40
R/C Mech.	3-4 Ch

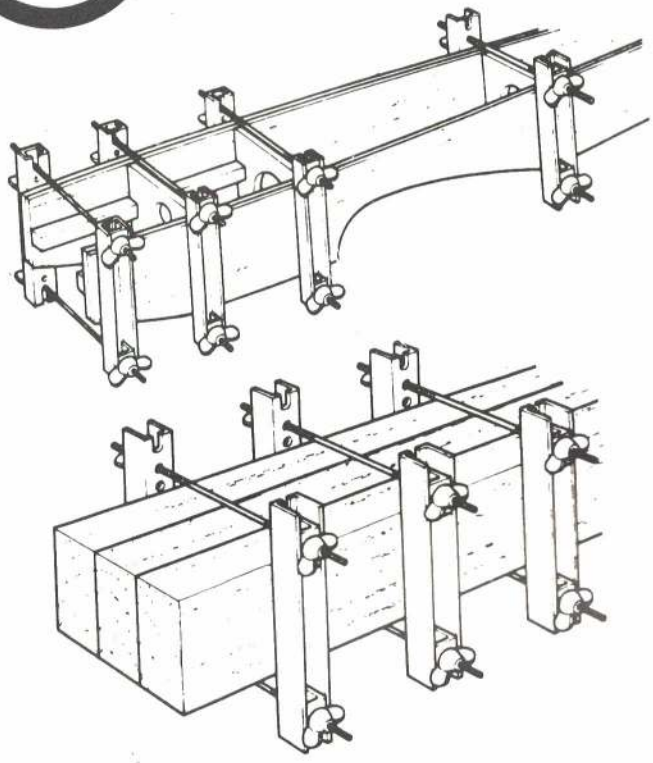
$49.98

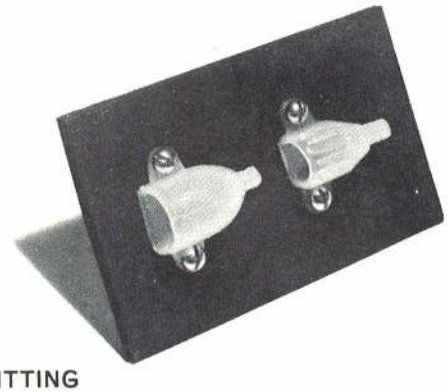
OLYMPIA

Wing Span	46.06"
Length	34.25"
Wing Area	379 sq."
Engine	09 to 19
R/C Mech	1-3 Ch

$34.98

I. M. PRODUCTS ACCESSORY LINE





RAM AIR FITTING

This is an air scoop package, contains two scoops to a package and comes complete with the wood screws necessary to mount them to the side of your fuselage. These air scoops act like a supercharger and the air rams into the scoop and then on into your fuel tank. You connect the vent line from your fuel tank to the back of the scoop. Our tests indicate that the real payoff on these air scoops is in the idle. They just seem to make the engine run a lot more solid than without them. It is something we have needed for a long time. Incidentally, there are two different sizes in each package, one large and one small.

.50 Catalog No. IM0065

GRIP TUBING

This large heat treat tubing is used to hold a push rod wire into a push rod dowel. The small size works very well with ¼ inch dowel. The large size is recommended for use with 5/16 inch square balsa push rods. Another very clever idea from IM Products.

Push Rod Keeper Tubing, Small .99 Catalog No. IM0066
Push Rod Keeper Tubing, Large .99 Catalog No. IM0067

"H" CLAMPS

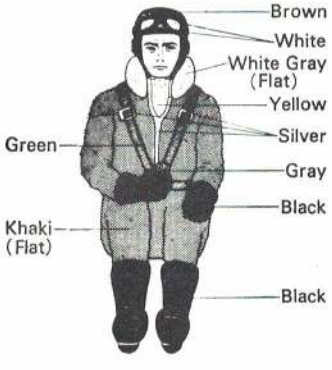
These clamps can be used in fuselage construction or many other ways in the workshop. This is something we have needed for a long time to keep fuselages square, etc. These are packed two in each package.

2.50 Catalog No. IM0068

PILOTS

One of these pilots is 2 inch scale, the other is 1½ inch scale. These pilots come in white plastic. We recommend that you use some sort of enamel to paint the pilots. The pilots seem to be made of a material similar to that which tanks are blow molded from. These are really sharp for open cockpit type aircraft. In order to form these pilots it was necessary to make them so that the legs come off. These can be put on permanently with a little plastic cement.

1½ inch scale IM Pilot 2.50 Catalog No. IM0069
2 inch scale IM Pilot 2.95 Catalog No. IM0070



PORATED, CINCINNATI, OHIO
Telephone 513-793-5900

I.F.O.

(continued from page 24)

mounted directly to the spruce vertical supports.

Outer Ring: Building the outer ring is quite simple. First, cut the spruce strips to the proper length of the perimeter, which works out to 71.64 in. for the 26-in. dia. 049 saucer, and 56.52 in. for the 18-in. dia. 020-powered model. With the outside spruce layer of the rim clamped to form a circle, glue and clamp the additional spruce and balsa layers to form a ring made up of three layers of laminated wood. Building on a flat surface, force the ring into a circular shape as it is built, since it is impossible to shape it once the glue sets. I found that the small paper clamps, available at most office supply stores, work well for clamping the wood strips for the outer rim assembly.

Final Assembly: Now comes the job of joining these two sub-assemblies. Again working on a flat surface, secure the center body so that it is unable to move. Using about six blocks of the proper height to hold the outer ring at the proper position, carefully center the outer rim concentric with the center body. Now begin to glue in the radial spars—first bottom, followed by top, at 90-degree spacings. Be careful not to dislocate the outer rim as the spars are put in place. Once the first four pairs of radial spars are in place and glued, installing the remaining spars is quite easy. Finally, install the X bracing between the spars, and the framework construction is complete. A word of caution: the radial spars and X braces should have a snug fit before gluing, but should not be forced into place. If they are forced, the completed saucer will bulge at various locations.

Finishing is the same as for most lightweight free flight models. Cover the framework with a light tissue, etc., and thoroughly fuel-proof with clear dope. Since the pigment of colored dope adds unnecessary weight, use it sparingly. Be sure to seal the inside of the center body duct, since this area really gets an oil bath in flight.

Thimble Drome three-bladed props are suggested for both saucers. The 049 saucer was tested with several different props, and the three-bladed 5-in. dia., 3-in. pitch prop seemed to give the best results. Because it was designed recently, the 020-powered saucer has had little flight experience. However, by running a series of tests with an 020 engine and using different commercial propellers, I found that the 3 1/8 in. dia., 2 1/2-in. pitch, 020 three-blade prop generated 4.55 oz. thrust—only slightly less than the maximum thrust of 4.60 oz. measured with a 6-3 prop. Since the three-bladed prop is much more compact in the saucer duct, I also designed the 020 saucer for this propeller.

Flying

This is one model which always flies "right off the bench." Before releasing the model, adjust the motor so that a definite lift is felt—enough to carry the saucer. Adjusting the model for flight if just that simple. If it tries to lift out of your hand, it will fly; otherwise don't even try to launch it! To launch the model, give it a quick, controlled clockwise spin as viewed from above, and release the model. The motor torque will take over and maintain the spin for the rest of the flight. It must have this initial spin for stability.

Be nice to your scratch-built rocket.

You've invested a lot of time and energy in your beautiful bird, not to mention some pretty tedious work. If you want it to perform to match your craftsmanship, you won't try to fly it with second-rate engines and accessories. You'll use the best: the Cox family of model rocketry components. See them and our line of fine, beautifully detailed, ready-to-launch model rockets at your favorite store.

Cox Solid Fuel Engine and Cox Safety Igniter.

Premium Fuel: It may be rated in newton-seconds instead of octanes, but it's still the best. Why? Because Cox Solid Fuel Engines provide a better power-to-weight ratio in the standard .69" x 2.75" casing than any other manufacturer's. Which means that you get more usable power out of a lighter package. And this year, Cox is introducing the most potent member of the line: the D8. The D8 produces 50% more power than was previously available in standard .69" x 2.75" casing. All Cox engines feature dense, highly visible tracking smoke.

Positive Ignition: Cox Safety Igniters* provide fail-safe arming because the igniter is plugged into the electrical circuit prior to insertion into the engine. No "micro clips" or groping around the base of an armed rocket required.


Cox Model Rocket Launch System.

For a Winning Start: The precision engineered Cox Model Rocket Launch System has adjustable legs, remote launch controller with safety key, "systems go" check light, and a safe 20 feet of wiring. Plus additional features like a 36" launch rod, segmented for easy take-down and storage, steel blast deflector plate, and the launch base holds 8 "D" cells (not included) for dependable single engine ignition time after time.

Cox Altitude Finder.

High Performance Requires Fast Tracking: Cox's ready-to-use Altitude Finder is a quick, easy way to pinpoint the angle and height of your rocket's apogee. As the rocket reaches maximum height, the Altitude Finder's trigger is released, locking the direct readout gauge in position. The rocket's altitude is read directly in feet with no immediate calculations or trigonometry tables required.

Power Brakes: Cox Parachutes come pre-cut with shroud lines and snap-swivels attached. An elastic shock cord is included to guarantee that your favorite bird won't do a pancake landing from 800 meters. In 12", 16" and 20" diameters.

COX

L. M. COX MFG. CO., INC., a subsidiary of LEISURE DYNAMICS, INC.
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*pat. pend.

(continued from page 15)

rough spots. An important feature of the building session was inspection of trouble spots such as poorly-glued joints, misaligned wings, etc. It's much better to catch them before they dry and result in a flight disaster. Kids were encouraged not to work on class projects at home. The ones who did invariably made horrible mistakes which had to be re-worked, if possible, the following day.

Co-ordinated with the building sessions were activities such as slides and films on history, theory, and practice of aeronautics, demonstrations with models and lab apparatus of air pressure, airfoil operation, control surfaces, center of gravity, torque, thrust, drag, lift, effects of dihedral and sweepback, moments and stability, jet power, airscrews, construction features, and explanations of various unusual flying phenomena such as ornithopters, frisbees, rotary and rotating wing models, asymmetrical configurations, etc., depending on time available.

Plenty of time for questions was allowed. When knowing the exact technical terms to explain something conflicted with just knowing why it happened, we concentrated on the understanding end of it. If a kid of eleven can show why a little positive incidence in a wing is a good idea, need he remember what it's called? Ditto sheets with such information were given out so that he could look it up if he should need to know!

Flying indoors in the lovely armory adjacent to our classroom or outdoors in the Coliseum or on a large parking lot nearby was a proving ground for the theory. After some hardy souls disobeyed the rules of aeronautics and crashed a few times, they were most receptive to a repeat of the explanation of how warped balsa wings and ailerons on a real airplane make it roll. A "Go" box with several winders, extra rubber, thread, scrap balsa, cement, clay, and five-minute epoxy was a must. So were oil and rubber lube, which the kids kept forgetting.

The main object of an introductory class or workshop of this nature is to make learning fun and to make it meaningful. When the graduate leaves the workshop, he takes with him several models to experiment with; some ditto sheets with useful information and explanation which may become clearer to him as he continues (hopefully) in modeling; some feeling for experimentation and use of the scientific approach to model building and flying; and a sheet containing the addresses of model magazines, plans suppliers, sources of materials, a bibliography of readable books on flight, and information on the AMA. Where he goes from here is up to him!

Frank Zaic, designer of the JASCO G-12 and G-18 and a good friend, was very helpful in many respects, giving freely of his time and material to the classes.

Inflation fighters

For what you'd pay for somebody else's propo rig ...you can buy the whole Heathkit® R/C line.

How's that for beating inflation!

Heathkit "Spectre" 1/8 Scale R/C Car

Only complete car kit on the market today . . . at any price. One-piece chrome plated steel chassis is a true frame . . . tracks & handles like a Gran Prix machine at scale speeds of 200 mph. Adjustable caster & toe-in, special formula rubber tires and independent front suspension give "Spectre" cornering traction at speeds that put other cars off the track. Car comes complete with high-impact plastic snap-on body, chassis, wheels & tires, fuel tank & tubing, R/C equipment case & foam padding, gears, axles, servo linkage & mounting tape, all hardware, decals, numbers . . . everything except engine & R/C electronics.

Kit GD-101 R/C car only, 11 lbs. **49.95***

Assembled GDA-101-2 Veco .19 R/C engine, 1 lb. **29.95***

Heathkit 3-Channel R/C System

Reliable digital circuitry for interference-free operation. Powerful transmitter with pre-assembled RF section has trim controls that leave sticks always centered. Receiver housed in virtually indestructable 2 oz. nylon case 2¼" L x 1 1/16" W x 1 5/32" D. Double-tuned front end, RF amplifier, dual AGC and ceramic IF filters for peak performance. System includes 2 servos with 2 linear and 1 rotary output each for extra versatility. Rechargeable nickel-cadmium battery packs in both transmitter and receiver with built-in charger.

Kit GD-57, transmitter, receiver, 2 servos, batteries, charging cord, switches and soldering iron; specify 27 MHz, 53 MHz, or 72 MHz (for planes only), 8 lbs. **129.95***

Kit GDA-57-1, transmitter, battery, charging cord, (specify freq. desired). 5 lbs. **54.95***

Kit GDA-57-2, receiver only (specify freq. desired), 3 lbs. **34.95***

Kit GDA-19-4, 1 servo, 1 lb. **21.50***

Heathkit 5-Channel R/C System

Powerful transmitter has pre-aligned & assembled RF circuit. Kraft sticks with thumb lever trim adjustment. Flat-pack rechargeable receiver & transmitter batteries. 2.3 oz. receiver has ceramic IF filters for sharp selectivity. Four servos. Choice of 5 frequencies in each of 3 bands. Includes soldering iron.

Kit GD-19, 11 lbs. **199.95***

New Heathkit Servo Simulator

Use it in field contests for making servo adjustments while transmitter is impounded. Takes place of both transmitter and receiver to power servo directly while making adjustments. Can also be used for charging both receiver and glow plug batteries. Powered from either 120 VAC or optional internal battery. Comes complete with extra connectors for receiver battery and servo. Battery not included.

Kit GD-206, 2 lbs. **19.95***

GDA-19-3, optional battery, 1 lb. **9.95***

Heathkit "Thumb Tach"

Measures RPM of any rotating device . . . propellers, gears, flywheels, shafts, etc. Two ranges; 0-5,000 & 0-25,000 RPM. 3% accuracy. No direct connection . . . uses reflected light pulses, can't load engine. Unlimited uses in R/C modeling . . . needle valve adjustments, comparing fuels and glow plugs; indicates power loss, shows peak in RPM you can't hear. Fast, easy assembly.

Kit GD-69, 2 lbs. **19.95***

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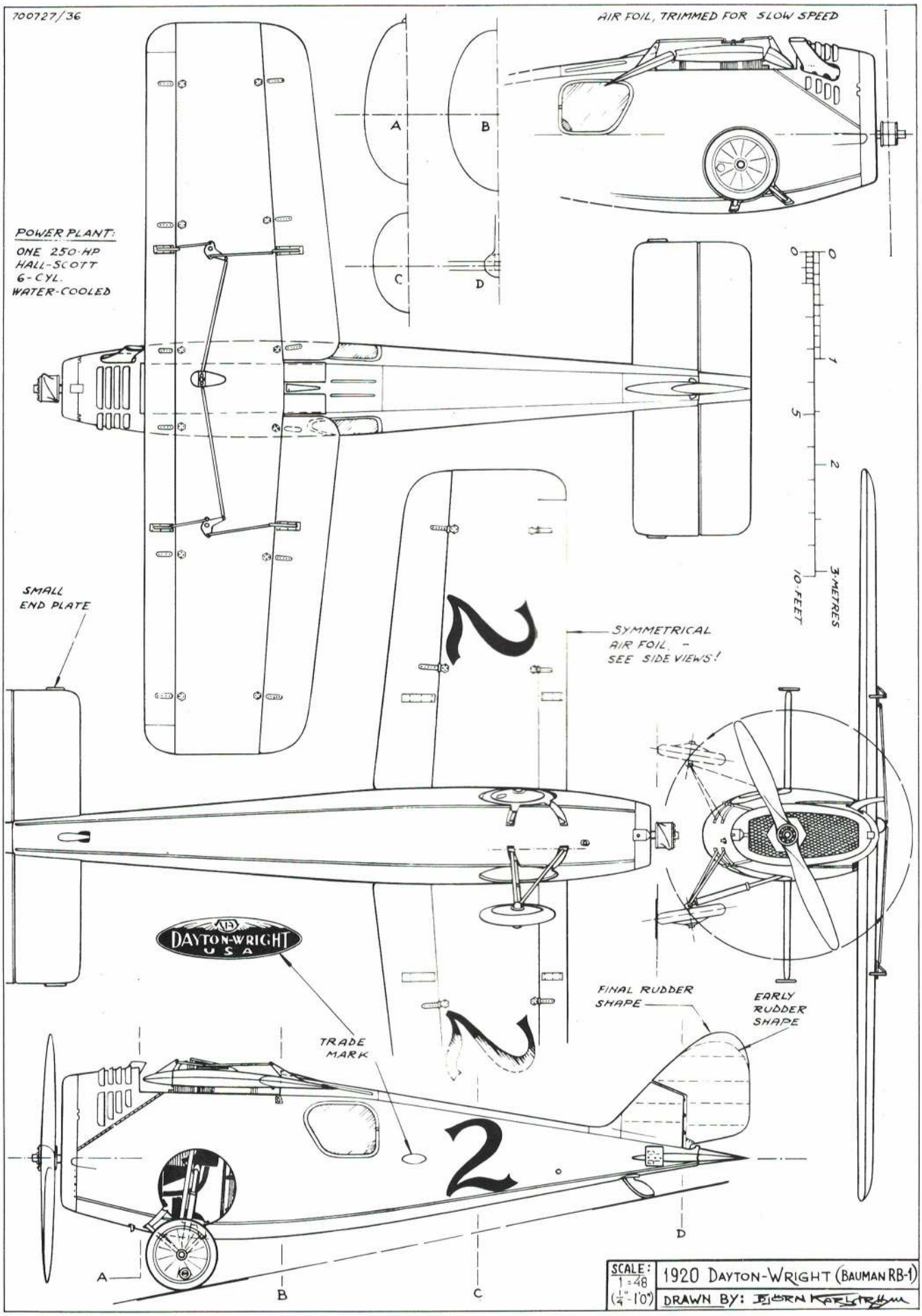
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1920 DAYTON-WRIGHT (BAUMAN RB-1)
DRAWN BY: BJÖRN KARLSTRÖM

JULY 1971

MODEL AVIATION

Official magazine

A.M.A. NEWS

Academy of Model Aeronautics • 806 Fifteenth Street N.W., Washington, DC 20005

1971 National Model Airplane Championships

Where: Glenview Naval Air Station, Ill. (north of Chicago)
When: July 26-August 1

The prime aim in organizing the Nats this year is to duplicate the imminently successful operation of last year, only cleaning up a very few ragged edges that existed, and revising the event structure ever so slightly to take into account present interests and needs. More compliments were heard from contestants in the 1970 Nats than from any other that we can recollect. The changes, therefore, are few.

In **Radio Control** the upper class of Aerobatics this year will be Class C (was Class D in 1970). Classes A and B will be the same as last year, flown on Sunday only. FAI Pylon Racing will be flown this year instead of Formula II; full FAI rules to be used, including the standard fuel and muffler (silencer) requirement.

Indoor events are the same this year as last, but the schedule has been reversed so that HL Glider and Scale will be flown on Monday; rubber-powered events (Stick, Paper Stick and Cabin) on Tuesday. Site is the International Amphitheatre in Chicago at 4300 S. Halstead St. It has a ceiling of 87-foot height and floor size of 283 by 123 feet.

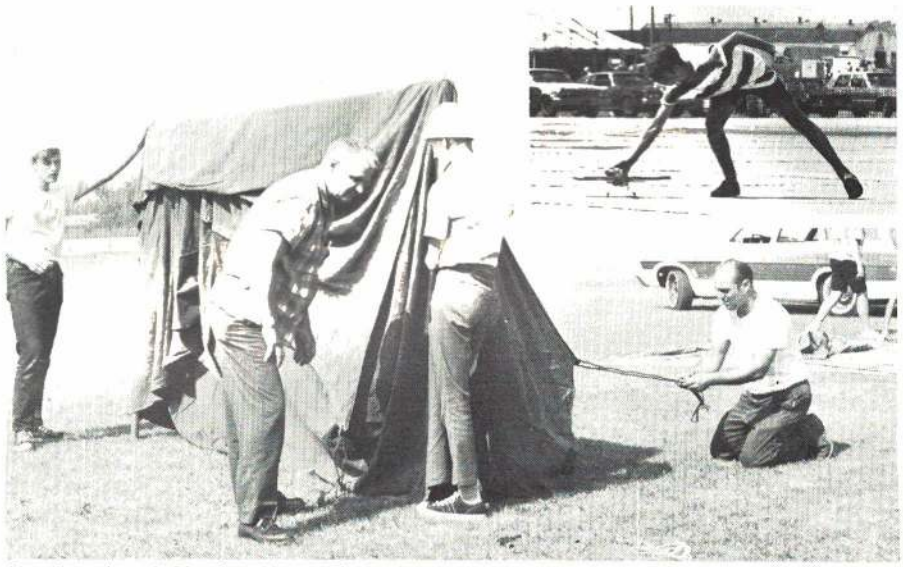
The **Control Line** daily schedule has been revised by moving the three ½A events (Speed, Proto and Profile Proto) to Wednesday, then by moving back the other Speed events by one day each. See the competition schedule farther on.

Scale events in Radio Control and Control Line will be the basis for selecting 1972 U.S. World Championship teams as per details in the May **AAM**, page 59. The four Scale events (RC, CL, Outdoor FF and Indoor FF) will all be run by AMA rules. A National Scale Champion will be named for the first time this year, points awarded as per details in Section 3 of the AMA rule book.

Fees. Event entry fees for Open age flyers are increased from $1 to $2 for FF, CL and Indoor events (advance registration basis), and increased from $5 to $7 for RC events. Also, Open age users of Navy barracks (males only, limited to approximately 200 berths) and on-station camping space will be charged $1 per person per day. The increased fees are to help cover AMA's increased costs for 1971 as explained more fully in the minutes of the Executive Council meeting elsewhere in this issue.

Note that fees for Junior and Seniors have not been increased. Junior and Senior AMA members may still enter

(continued on next page)



Camping aboard Glenview Naval Air Station for the National Contest is becoming increasingly popular. Current rules allow practically any kind of sleeping type trailer or private tent. Photo from the 1970 Nats shows the Robinsons (Pa.) and Giffords (N.J.) putting their Boy Scout type training to use. Inset shows David Adamisin making a fast CL Scale Racing "catch." Popularity of event last year has caused restructuring into separate Junior, Senior and Open competitions. Nats entry forms available from AMA HQ. Send stamped pre-addressed envelope.

Notice—Nats Late Entry Deadline Strictly Enforced

For many years no late entries were permitted at the Nats. All entries had to be made in advance, by mail, without exception. Some hardships resulted in a modification of that policy so that, since 1965, late entries have been accepted but with a stiff late fee penalty to discourage abuse of the privilege.

The fact is that late entries pose a critical time and paperwork problem. With a thousand or more Nats entries each year, the complexities of entry processing are far greater than at any other meet. The effort requires that most of the work be done in advance by HQ personnel—it's too late to wait until Nats time except for a comparative few.

It is also imperative that a rigid cutoff time be imposed for all late entries. Thus Monday is the only day permitted, and the absolute deadline is nine p.m. that night. Even so, the effort requires several people working until midnight or later to complete the processing before the next day's events.

The Monday nine p.m. deadline is strictly enforced. It must be, in order to be fair to all. The best policy is to avoid late entry if possible. For Open entries it's expensive. Those in doubt concerning Nats travel plans will probably be better off to enter in advance by mail anyway —the Nats no-show policy is to credit the basic entry fee toward the following year's AMA membership, so any loss will only be in event fees. This can be a relatively cheap hedge against the late entry cost.

For someone who doesn't enter in advance and is in danger of arriving late—past the nine p.m. deadline on Monday —he may have someone else enter for him. The only requirement, besides the fees involved, is possession of the entrant's AMA card (or payment for same —duplicate membership fees will be refunded by HQ after the Nats).

Remember: avoid late entry if possible; if not, heed the requirements and understand that they are rigid—the disappointment you save may be your own.

the Nats for the basic registration fee of only $2 (either in advance by June 21 or late at the Nats on Monday only); and the basic registration fee for Juniors and Seniors still covers entry in two events. There will be no barracks charge for Juniors and Seniors (but availability is limited) and no charge for camping on station. That's a great bargain all around!

Nats Entry Details

Better hurry if you are to enter in advance, by mail, as entry forms must be postmarked no later than June 21. After that date, entry forms must be presented at the Nats, in person, and will be subject to substantial late fees. Nats entry forms available upon request from AMA HQ, 806 Fifteenth St., N. W., Washington, D.C. 20005. Send stamped, self-addressed envelope for priority return.

Advance Basic Entry Fee: Junior and Senior AMA members—$2.00, includes two events; Open members—$10.00, does not include any events. **Additional events** (for all age categories) are $2 per event, except RC which are $7 per event.

No-Show Policy. An AMA member who enters in advance but who, for any reason, is unable to attend will automatically have the basic entry fee credited to next year's AMA membership. This policy, together with increased late entry fees, is intended to encourage advance entry by all who consider attendance a likely possibility.

Late Basic Entry Fee. Same as advance fee for Juniors and Seniors, $25 for Open members. Additional events for late entries or events added at the Nats for advance entries (all age categories) are $3 per event, except RC which are $7 per event. **Note: no late entries or event additions after 9 p.m. on Monday, July 26.** No changes or substitutions of events may be made, nor will any refunds be made for any events not flown.

Mechanics fee, advance or late, is $2. Provides identification and field access privileges equivalent to contestants. Available to AMA members only, but members of a contestant's family may obtain a special Nats-only AMA license upon payment of $2 additional fee.

Nats Housing. First come, first served, with highest priorities going to contestants in the order of return to AMA HQ of entry blanks. However, housing priority must be claimed by 2 p.m. Monday, July 26. Users of barracks must provide their own sheets, blankets, towels, toilet articles, etc.

Camping will be permitted aboard the air station, for males and females. Sleeping type trailers or private tents are required. There will be no electricity or water hookup available. Lavatory and shower facilities may be very limited and may not be nearby.

Meals will be available aboard the air station to a maximum of 1,000 contestants and mechanics, both male and female. The cost is 25¢ for breakfast, 50¢ for supper (no lunch).

Nats Entry and Competition Schedule

Monday (July 26). **Registration** for all those pre-entered by mail—8 a.m. to noon, 1 p.m. to 5 p.m. and 7 p.m. to 9 p.m. **Housing Priority** must be claimed by 2 p.m. **Late Entries and Event Additions**—1 p.m. to 5 p.m. (except Indoor late entries accepted at 10 a.m. or earlier if possible) and 7 p.m. to 9 p.m. **this day only. Transmitter Processing**—8 a.m. to noon (priority for Form. I & FAI Pylon). **RC Pylon Form. I & FAI Qualifying**—1 p.m. to 5 p.m. **Indoor HL Glider and Scale**—9 a.m. to 9 p.m. **Transmitter Processing** (all RC events)—7 p.m. to 9 p.m.

Tuesday (July 27). **Registration,** only for those pre-entered by mail—8 a.m. to noon, 1 p.m. to 5 p.m. and 7 p.m. to 9 p.m. Those pre-entered by mail may also register Wednesday through Saturday during the hours of 8 a.m. to noon and 1 p.m. to 5 p.m. **RC** Pylon Form. I & FAI Qualifications—8 a.m. to 5 p.m. Transmitter Processing (all RC events)—7 p.m. to 9 p.m. **Indoor** Stick, Paper Stick and Cabin—9 a.m. to 9 p.m.

Wednesday (July 28). **FF** B Gas and Nordic Glider—8 a.m. to 5 p.m. **CL** Open Rat Race, Senior Stunt, ½A Speed, ½A Proto Speed, ½A Profile Proto (Jr. only) and Junior Combat—8 a.m. to 5 p.m. **RC** C Pattern Qualifying—8 a.m. to 5 p.m.

Thursday (July 29). **FF** ½A Gas, Wakefield Rubber and Helicopter—8 a.m. to 5 p.m. Scale—8 a.m. to 1 p.m.; **CL** Jr. & Sr. Rat Race—8 a.m. to 1 p.m.; Junior Stunt—1 p.m. to 5 p.m.; A Speed, FAI Speed and Open Combat—8 a.m. to 5 p.m. **RC** C Pattern Qualifying—8 a.m. to 5 p.m.

Friday (July 30). **FF** A Gas and Unlimited Rubber—8 a.m. to 5 p.m. **CL** Scale Racing, Open Stunt, B Speed, B Proto Speed and Senior Combat—8 a.m. to 5 p.m. RC C Pattern Finals and RC Scale—8 a.m. to 1 p.m.; FAI Pylon Finals—1 p.m. to 5 p.m.

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Saturday (July 31). **FF** FAI Power, HL Glider and Coupe D'Hiver Rubber—8 a.m. to 5 p.m. **CL** Scale—noon to 5 p.m.; Open Stunt Finals, C Speed, Jet Speed and Carrier I, II and Profile—8 a.m. to 5 p.m. RC C Pattern Finals and RC Scale—8 a.m. to 1 p.m.; Form. I Pylon Finals—1 p.m. to 5 p.m. A & B Pattern Frequency Registration—1 p.m. to 4 p.m.

Sunday (August 1). **FF** C Gas and Rocket—8 a.m. to 1 p.m. **CL** FAI Team Race and J. Walker Stunt Finals—8 a.m. to 1 p.m. RC A & B Pattern—8 a.m. to 1 p.m. Model Air Show—2 p.m. to 4 p.m.

Special RC Information

Class C Pattern will be flown in two stages—Qualifying and Finals. The Qualifying flights on Wednesday and Thursday will be from four flight lines and utilize a shortened pattern consisting of (1) Takeoff, (2) Four Point Roll, (3) Figure M, (4) Horizontal Eight, (5) Reverse Cuban Eight, (6) Slow Roll, (7) Top Hat, (8) Landing and (9) Spot. All entrants will fly as many qualification flights as time allows, but only complete rounds will be counted. The top 20 entrants, based on their two best Qualifying flights, will compete in the Finals on Friday and Saturday, flying the full Class C schedule of maneuvers from two flight lines. **Classes A and B Pattern,** just as last year, will be flown simultaneously on Sunday from four flight lines; flying will continue for as many complete rounds as time allows.

RC Scale will be flown from two lines simultaneously with the Class C Pattern Finals on a shared-time basis. This is a concept successfully proved last year to make more efficient use of the time available. For the first half of the event period, Scale will have exclusive use of about half of the radio frequencies while C Pattern Finalists are using the remaining frequencies. Halfway through the day's flying session, Scale and Pattern will exchange groups of frequencies.

Pylon Formula I and FAI events also consist of Qualifying and Finals, with the 20 fastest Qualifiers in each event (after adjustment for the Formula I handicap) advancing to the Finals. Compliance with the FAI silencer rule will be required. Use of commercial mufflers will meet the requirement, provided no alteration is made which would result in a noise increase over the stock unit. For homemade or modified mufflers, noise tests will be made to assure that sound levels are not higher than equivalent commercial units.

Stock fuel will be supplied by the contest management at no charge, courtesy of Midwest Products Co.

Special FF Information

The max flight limit, including flyoffs, will be three minutes, except for those events which already have a lower flight limit specified by the rules. AMA Gas events will have a max engine run of 13 second ROG, 10 seconds HL; flyoffs will be with engine runs reduced two seconds for each successive flight, but not less than five seconds will be required.

Get to Know Your AMA District Officers

CLIFF PIPER

AMA District I Vice-President (Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island)

Clifton A. Piper has been involved in air modeling activities for 36 of his 46 years. Living in the small community of Atkinson, N. H., Cliff's work takes him across the state line to Malden, Mass., north of Boston, where he is manager of a chain store for the W. T. Grant Company. Cliff and his wife, Charlotte, are the parents of a married daughter, Margaret; Patricia, a 15-year-old; and 8-year-old Robert C. Piper. Showing his complete devotion to the hobby, Cliff called attention to the fact that his son's initials are "RC", but frankly it is doubted if Cliff and Charlotte were thinking of model planes when Robert was named!

Radio Control is Cliff's present main hobby interest, but Free Flight and Control Line held his attention in past years. Adding variety to Cliff's leisure time activities, he enjoys ham radio and camping outdoors.

Piper is serving his second term as vice-president of District I and has held a Contest Director's rating as a Leader member in the Academy for several years. Among other qualifications, Cliff is a charter member of the Boston South Shore RC Club, life member of the Hampshire County (Northampton, Mass.) RC Club, Hampshire County RC Rally Conference founder, and is 1971 vice-president of the New England RC Modelers, Inc. Cliff has accepted the responsibility of directing tabulation operations for the past several years at the National Contest. He was a write-in candidate for the AMA presidency last year.

President's Memo

Who are our AMA officers? I am sorry to say that many in the membership haven't the slightest idea. Even if they do know an officer's name, it is usually only a name. It has long been my feeling that we need to do better than that in order to make our dues money pay off better. We need to be aware of who is serving us and how well they are serving us. With this knowledge we can choose the best talent offered in future elections. This is simply protecting our own investment!

As one of the officers serving you, I believe firmly in action instead of just promises. I am starting with this issue a series of biographies of AMA's primary officers. I hope that you, as members, after we introduce you to the members of AMA's Executive Council, will have

AMA President John Clemens

found it interesting and important enough for us to continue on through appointed officers and other AMA leader-type people. This is all part of a great desire and effort on my part as president to improve our AMA communications and increase our knowledge and awareness.

Be sure **you** know who **your** district vice-president is! He is **your personal** point of contact and your representative in the handling of AMA's affairs and decision-making. In the AMA section of many issues of **American Aircraft Modeler** is a whole page devoted to a map of the eleven districts and a listing of all officers. **Who** to contact and **how** is also printed on that page. To update your knowledge of **your** organization, the page is worth your study.

Find out who your officers are, and if possible get personally acquainted. You will find they are fine folks, and you never know when you might need them to help make your hobby more fun. And please remember to thank them! They work at **no salary**, and their only "pay" is some inward satisfaction and a word of thanks from you!

John E. Clemens
AMA President

In civic and community activities Piper has been a Lion and a Rotarian, is past president of the Chamber of Commerce of Easthampton, Mass. Cliff brings a businessman's wisdom to our Executive Council, also an enthusiasm for youth programs in AMA activities.

RON MORGAN

AMA District III Vice-President (Pennsylvania, Ohio, West Virginia)

Ronald E. Morgan has enjoyed model airplaning for 27 of his 35 years. Ron lives with his wife, Jane, in the small community of Scotland, Pa., about 50 miles southwest of the State Capitol at Harrisburg. He is employed as a school teacher (vocational type) by the Commonwealth of Pennsylvania at the Scotland School for Veterans' Children and holds a degree of Bachelor of Science in Education, teaching grades 1 through 12. There is a greater-than-usual demand on Ron's time and devotion since the school is one for orphan children. Many of Ron's evenings are taken up in "extra duty" directing model airplane and rifle clubs in the school.

Belonging to the Chambersburg (Pa.) Modelaires Club, airplane modeling is Ron's first-love hobby, with his primary interest being in Radio Control. He also enjoys electronics and traveling. A close friendship with AMA's secretary-treasurer, Earl Witt, has led to these two fine AMA "servants" traveling to many of AMA's meetings and functions in Earl's private airplane.

The year 1970 saw Morgan start a two-year term as AMA District III vice-president. His other services to AMA have revolved mostly around the National Contest, serving as a member of the Nats administrative staff since 1962 and as either Nats director or Nats manager since 1965. Ron has been an important member of one of AMA's most experienced, most responsible, and most knowledgeable groups, the Nationals Executive Committee, since 1966. His most valuable and dedicated service to AMA has been as "advance party" (of one!) to the last five Nats to coordinate the AMA-Navy efforts, moving aboard the Naval Air Station Nats site an average of 35 days before the meet. This unselfish service gesture on Ron's part has probably been the most important and notable improvement in the Nats in recent years. The success of this important liaison with the Navy is due greatly to the handsome, mature boyish charm of this tall, quiet, good looking young fellow.

BOB STALICK

AMA District XI Vice-President (Washington, Oregon, Idaho, Alaska)

Robert D. Stalick, despite his youthful 33 years of age, has a long record of devoted service to modeling and to his family and community. With a bachelor's degree in speech and a master's degree in education, Stalick is currently serving as assistant principal (second in command) of the 1850-student Albany Union High School in Albany, Oregon. Albany is about 60 miles south of Portland, Oregon, and is the community where Bob and his wife, Barbara, are raising their own crop of "students," having a girl age 9 and two boys ages 7 and 6.

Free Flight is Bob's primary hobby pleasure, having been actively engaged in it for about 12 years. His other hobby interests are a clue to the progressive aims he has in life, leaning toward dramatics activities and creative writing. Bob is presently active in the Albany Chamber of Commerce, is a teacher in the Boy's Club, and in the past was active with the Kiwanis Club.

Bob has served as a very active District XI vice-president since 1965. During that time, as a pioneering service to modeling in his area, Bob originated the AMA district meeting concept five years ago, a practice now being urged in all the other AMA districts as a great membership activation and service device. Stalick has been on the FAI Free Flight Advisory Committee from 1969 until the present, is one of the founders and a current Board Member of the National Free Flight Society, as well as being a writer for **American Aircraft Modeler** magazine. The Willamette Model Club, Inc., is Bob's club affiliation where he has served as newsletter editor of the **WMC Patter** for ten years. Bob has a natural youthful self-assurance and enthusiasm that makes him a fine leader in both his work and his hobby, and a credit to his community.

Cliff Piper, District I V.P.

Ron Morgan, District III V.P.

Bob Stalick, District XI V.P.

Winter Executive Council Meeting

February 26, 1971
Holiday Inn—Maumee, Ohio

Meeting began at 9:30 a.m., with the following present: President, **John Clemens,** Dallas, Tex.; Secretary-Treasurer, **Earl Witt,** Chambersburg, Pa.; Executive Director, **John Worth,** Fairfax, Va.; District Vice-Presidents: I, **Cliff Piper,** Atkinson, New Hampshire; II, **Bill Boss,** Laurelton, N.Y.; III, **Ron Morgan,** Scotland, Pa.; IV, **Cliff Telford,** Bethesda, Md.; V, **Jim Perdue,** Athens, Ala.; VI, **Glenn Lee,** Batavia, Ill.; VII, **Jack Josaitis,** Dearborn, Mich.; VIII, **Murry Frank,** Wichita Falls, Tex.; IX, **Stan Chilton,** Wichita, Kans.; X, **Charles Broadhurst,** Sacramento, Calif.; XI, **Bob Stalick,** Albany, Ore. Note: Associate VP's Telford and Lee were proxy delegates for **John Patton** (IV) and **Al Signorino** (VI).

President Clemens opened the meeting by congratulating all present, noting that this was the first time that the council had all AMA representatives in attendance—prior meetings had come close to full attendance, but one or two districts had not been represented. At this meeting, through the use of Associate Vice-Presidents, full representation had been achieved.

New information questionnaires were distributed for council members to fill out. These were announced to be used as part of a forthcoming program intended to inform the AMA membership with background and personality information concerning AMA officers, for the purpose of helping members become better acquainted with their representatives. Through such a program it is hoped that AMA members develop improved confidence and knowledge concerning those responsible for AMA decision-making. It was noted that too often in the past such decision-making had been clouded by lack of familiarity with the officers involved.

The meeting then proceeded in accordance with the agenda as previously published and distributed through the AMA **Monthly Mailing,** to AMA clubs and officers:

A. Financial Review of 1970 AMA operations.

Worth summarized the previous year's financial statement which had been previously mailed to council members. He noted that despite increased costs of operation, largely due to inflation, the great increase in AMA membership had resulted in a substantial surplus. Worth then asked for council guidance concerning 1971 expenditures in several areas, with a view toward effective use of surplus funds.

1. Scholarship program. The council unanimously approved a continuance of the program with budgeting as per 1969: 10¢ to be taken from adult member dues, so as to add approximately $2700 to the program fund. Boss then moved, seconded by Piper, that the AMA Scholarship Committee be authorized to allocate funds and make awards for the '71 program, within the budget—unanimously approved.

Stalick noted the need for improved promotion of the program through chartered clubs and school systems. Council discussion also indicated a need for promotional literature and publicity through other magazines and also club newsletters. Stalick was also recommended for addition to the Scholarship Committee, now consisting of Telford as chairman, Art Schroeder, and John Worth.

2. Frequency Committee Fund. Worth noted that while the council had approved, at the 1970 Nats meeting, the financing of the committee operation out of AMA general funds instead of member contributions, the current council should review that decision. Piper made a motion, seconded by Frank, to reaffirm the previous council approval of a $2,000 budget for continued committee operation during 1971.

It was pointed out that the funds were primarily for retaining legal counsel and directly associated expenses for the purpose of monitoring and advising on Federal Communications Commission matters pertaining to Radio Control operations and use of frequencies. The decision for AMA funding was intended to be an appropriate means of providing a direct benefit to a majority of AMA members —RC'ers in general and especially sport flyers.

B. World Championships.

Witt and Worth, members of the current RC/WC Executive Committee, reported on financial aspects of World Championships planning. They indicated that a basic obligation of $12,000 was involved concerning transportation, lodging and feeding of contestants, supporters, and officials, with the possibility of up to a total of $20,000 being required if state aid concerning site facilities is not available (some aid expected from the government of Pennsylvania, but the amount had not yet been determined).

The need for signing of contracts with a charter airline and a meet headquarters motel was explained, and council authorization to proceed was asked. It was also pointed out that various forms of income (sponsorships, concession sales, parking, general admission, contributions) were expected to pay off the financial obligations—a break-even operation was likely if good weather for the meet weekend resulted in a large spectator turnout.

Frank made a motion, seconded by Boss, that the signing of contracts and a commitment of up to $20,000 be authorized for the World Championships—approved unanimously. Council discussion further suggested that additional publicity be sought through publications other than those of the hobby industry (such as through sport magazines, company house organs, etc.) for maximum promotion of model aviation through this event.

C. Nats Status.

Clemens and Worth described recent discussions with Navy officials concerning current and future National Meet hosting. They indicated that the 1971 event had been approved, but with the understanding that AMA would assume responsibility for providing the materials used in the meet (such as portajohns, tents, workbenches, grandstands, pylons, etc.). The Navy had typically spent approximately $15,000 per meet on such items in past years.

Through repair and utilization of last year's leftover material, volunteer civilian labor, and more frugal use of supplies, the Nats Executive Committee hoped to hold the direct cost to AMA down to about $5,000 for the 1971 operation. To cover this additional cost for the Nats it was proposed to seek additional sponsorships, increase event fees, and initiate a service charge for berthing and camping at the Nats.

The council then considered some specific recommendations of the Nats Executive Committee:

1. Fees. Worth motioned, seconded by Chilton, that event fees for Open age contestants only be increased from $1 to $2 for FF, CL and Indoor events, and from $5 to $7 for RC events (advance entry only, with basic entry fee to remain as for 1970); also that berthing aboard the station, whether barracks, tents or trailers, be charged a service fee of $1 per day per Open age participant. Approved unanimously.

2. Events. Witt, as chairman of the Nats Executive Committee, presented NEC recommendations for the 1971 Nats competition event schedule. The schedule had been worked out the previous day at the committee's Nats Planning Conference. The recommended schedule was based on the highly successful 1970 Nats with only a few changes:

a. Substitute FAI for Formula II RC Pylon Racing.

b. Substitute C for D RC Pattern.

c. Shift CL speed events so that ½A Speed, ½A Profile, and ½A Profile Proto are held on Wednesday; FAI and A Speed on Thursday, B and B Proto on Friday, C Speed and Jet on Saturday.

d. Swap Indoor event days so that glider and scale are held on Monday, rubber events on Tuesday.

Ed Shipe appeared before the council prior to the Nats event discussion and expressed the opinion that if FAI Pylon was held at the Nats it should be without mufflers. Worth later noted that Pete Reed, NMPRA president, had indicated a NMPRA poll had shown a majority favoring all FAI rules, and the F.A.S.T. Club of California was likewise in favor.

Telford made a motion, seconded by Stalick, that the recommended schedule be approved, with the exception that FAI RC Pylon be flown without the muffler requirement or that Formula II be held instead of FAI. Considerable discussion followed concerning how the muffler rule would be enforced. Worth described a sound level meter which had been tested by the AMA Muffler Committee and recommended for use as an AMA noise standard. It was noted that the Nats Executive Committee had accepted a procedure for use of the meter at the Nats, together with a program of pre-Nats publicity concerning how contestants could check their entries in advance for assurance of noise level compliance at the Nats. Vote on the motion showed one for, two abstentions, eleven against.

A motion by Chilton, seconded by Broadhurst, to accept the NEC event schedule recommendations without modification passed unanimously.

D. HQ Incentive Program.

Worth described specifics of an employee retirement and income savings plan which had been approved in principle at the 1970 summer council meeting. At that time the council had asked for more detailed information before a final vote would be taken.

The proposed plan would provide for AMA and employee sharing of inputs

RC World Champs Follow-Up

Response to the appeal for contributions to help finance the RC Aerobatic World Championships at Doylestown, Pa., September 15-19, has been most gratifying. Over $2,000 was added to the RC/WC Fund during March to bring the fund total to over $4,300. The basic goal for RC/WC Fund contributions is $20,000, approximately $1.00 per adult AMA RC member. **Contributions are tax deductible!**

The biggest boost to the fund came from the annual **Toledo RC Conference.** The **Toledo Weak Signals,** an AMA chartered RC club in Ohio, held their usual big AMA raffle in connection with the conference. Not only did the club give away three proportional RC sets, they also contributed $1,316 to the RC WC Fund! This is the greatest Toledo contribution yet, topping previous year donations by several hundred dollars.

The **RAMS** of Seattle, Wash.. also held their annual show recently; they too made a big donation from proceeds collected there. They sent a $300 check for the fund, and also issued a counter-challenge to the **DC/RC Club:** "We hope this spurs the DC/RC Club and others on to even greater contributions to the RC/WC Fund."

Significant is the contribution made by the **Association of Model Airplane Clubs of Greater New York.** This is an organization of modelers who are primarily Control Line flyers. They recognize that the World Championships is an event with great public relations potential for all of model aviation, and their support reflects this interest. The **Greater St. Louis Modeling Association** has made a donation for similar reasons.

The complete list of fund contributors to date:

Toledo Weak Signals RC Club	$1,316.25
Bud Anders/Larry Leonard (Calif.)	300.00
Radio Airplane Models of Seattle	300.00
DC/RC Club	205.10
Robert Lopshire, Cochranville, Pa.	200.00
Dr. W. B. McAvoy, Greenock, Pa.	100.00
Dr. & Mrs. Walter Good, Bethesda, Md.	100.00
Northern Virginia RC Club	100.00
Jeremiah Courtney, Washington, D.C.	100.00
Tucson Radio Control Club	100.00
Twin City Radio Controllers (Minn.)	100.00
Tatone Products, San Francisco, Calif.	100.00
Alamo Radio Control Society (Tex.)	100.00
Leon Shulman, Cranford, N.J.	75.00
Palm Beach Aeronauts RC Club	58.00
Signal Chasers, St. Louis, Mo.	54.00
Assn. of Model Airplane Clubs of Greater New York, Inc.	50.00
Bergen County RC Club (N.J.)	50.00
Delaware Radio Control Club, Inc.	50.00
Lehigh Valley RC Society (Pa.)	50.00
Monmouth Model Airplane Club (N.J.)	50.00
J. William Knepp, Middleburg, Pa.	50.00
Houston Radio Control Club (Tex.)	50.00
Vortex Model Engineering (Calif.)	50.00
Lakeland RC Club, Inc. (N.J.)	50.00
Bucks County RC Club (Pa.)	50.00
Lou Andrews, N. Reading, Mass.	50.00
Marin RC Group (Calif.)	50.00
Long Island Aero Radio Society (N.Y.)	50.00
Michigan Radio Control Society	35.00
Keystone RC Society, Inc. (Pa.)	35.00
Twin Ports Model Airplane Club	35.00
New England RC Modelers (Mass.)	30.00
Susquehanna Valley RC Club (Pa.)	27.00
Don McGovern, Flying Models	25.00
Goodyear Model Aircraft Club (Ohio)	25.00
Spaceport RC'ers, Inc. (Fla.)	25.00
Top Out, Jerry Kleinburg	25.00
Flying Knights MAC (N.Y.)	25.00
Western Ohio Radio Control Society	25.00
Bill Peel, Mogadore, Ohio	25.00
John M. Taulman, Albany, Ga.	25.00
West Suburban R'CRS (Ill.)	25.00
RC League of Orange County (Calif.)	21.87
Aero Telemechanics RC Club (Ill.)	20.00
Spirits of St. Louis RC Club (Mo.)	20.00
Cy Jannke, Missoula, Ont.	20.00
Beaver County MAC (Pa.)	20.00
Sky Rovers RC Flying Club (N.Y.)	20.00
RC Prop Busters (Conn.)	20.00
RC Modelers of Baltimore (Md.)	20.00
Peninsula Channel Commanders (Calif.)	20.00
Keystone Clippers RC Club (Pa.)	19.00
Greater St. Louis Modeling Assn. (Mo.)	15.00
Suffolk Falcon Club (N.Y.)	15.00
Shoo Flyers Model Airplane Club (Ohio)	15.00
Shawnee Mission RC Club (Kans.)	15.00
Cumberland Aircraft Model Soc. (Md.)	14.00
Flite Streaks Model Club (Md.)	12.00
State College RC Club (Pa.)	10.50
Ralph Brooke, Seattle, Wash.	10.00
John J. Condon, Bellrose, N. Y.	10.00
Edward L. Henry, St. Louis, Mo.	10.00
Kings Co. Radio Controllers (Calif.)	10.00
Niagara County RC MAC, Inc. (N.Y.)	10.00
C.S.R.A. Flyers MAC (Ga.)	10.00
Robert Caplan, Centereach, N. Y.	10.00
Harley Michaelis, Walla Walla, Wash.	10.00
Jay Jackson, Salt Lake City, Utah	10.00
Milwaukee Area RK Society (Wisc.)	10.00
Cliff Piper, Atkinson, N. H.	5.00
Arthur Laneau, Boston, Mass.	5.00
Warren Caldwell III, Houston, Tex.	5.00
Skylarks Model Airplane Club (Pa.)	5.00
Stephen D. Jernigan, Tulsa, Okla.	4.00
Miscellaneous (less than $5)	8.50

to the program, with a minimum of $5 per month deduction from salary and a maximum of 5% of salary (but not to exceed $1,000 per year). The employee participation would be voluntary rather than required, with a minimum of one year's service before being eligible. All money would go into a tax-sheltered annuity serviced by an insurance company—no taxes would be paid on the money paid in (until withdrawal); dividends and interest would be accumulated.

The net cost to AMA was estimated to be approximately $3,000 per year at current salary levels and staff size (twelve employees at present, approximately half would participate). Worth and Witt indicated the need for such a plan to help attract and retain career employees to AMA, noting that extensive civil service employment in the D.C. area made fringe benefits a vital element in competition for employees. Worth further noted that the dollars spent by AMA for such a plan would be more effective than the same amount distributed as salary increases.

Stalick motioned, seconded by Perdue, to accept the incentive plan as presented. Approved unanimously.

E. Safety Codes.

Worth outlined the history and desire for an AMA Safety Code, in two areas of concern:

1. The concept of a Safety Code as the basis for insurance coverage, in place of references to competition rules. It was noted that the National Association of Rocketery uses such a code for insurance purposes, and it has been a successful means of broadening coverage. For AMA it seems particularly applicable since most model flying is done outside of competition and it has been difficult to interpret what is covered in terms of sport flying.

The basic idea is to have a code which says, in effect, that coverage is based on how flying is done rather than what is flown. Under such a concept we could be freed from size, weight, and power limitations, except for extreme cases.

A specific proposed safety code was reviewed by the Executive Council. It had been submitted by the AMA Safety Committee as the end result of about two years of effort and several preliminary drafts. The proposal was a simplified one-page version with sections applying to combined airplane model categories and also the separate ones of Free Flight, Control Line and Radio Control. Supplemental codes were also submitted covering RC car and boat operation.

The council review showed a need to further simplify the proposed code. The consensus was that the code was too specific in terms of distances and procedures, with the possible result that a slight difference in operation could negate compliance with the code and perhaps lose insurance coverage. The council, therefore, recommended that the Safety Committee rework the code for presentation at the next Nats council meeting in July, with the aim of finalization by September 1 so as to permit inclusion in 1972 insurance coverage.

2. Safety codes concerning RC car and boat operation were tabled while a more basic question was reviewed: how far should AMA go in accommodating and encouraging RC car and boat activity by AMA members?

Discussion quickly indicated that this question needed more time than the council had available at this meeting. It was obvious that many views were involved. At one extreme was the attitude that AMA was for airplanes only and that cars and boats should not be accommodated. The opposite view was that AMA should embrace all interests and take advantage of the potential for more thousands of members. In between was the view that many airplane flyers wanted some consideration and insurance protection for occasional car and boat activity.

There seemed to be general agreement that a means was needed to separate those with a car-only interest from those with an interest in airplanes. Some fears were voiced that car interests could dominate AMA if the current explosive growth in RC car activity continues. To prevent this, some suggestions were offered concerning the establishment of a car division or affiliate, to avoid mixing of membership.

It was finally agreed that a study group should be created to produce recommendations for council reconsideration in the near future; for decision by the Nats council meeting. Clemens then appointed Broadhurst, Piper, Signorino and Worth to be the committee for further guidance on the problem.

The question concerning car and boat safety codes is to remain tabled until

the committee report is produced. In the meantime it was noted that the current AMA insurance policy provides protection for car and boat activities. This has been part of the insurance coverage since 1967, having been added during the term of former president Cliff Weirick in response to west coast requests.

F. Muffler Standards.

Worth reported that the sound level instrument, described in the earlier council discussion of the Nats FAI Pylon event, was now a stock item in over 900 Allied/Radio Shack stores across the country. At a retail price of just under $40.00 it was well within the means of most clubs, many Contest Directors, and all manufacturers. Since it was available nationally it could be recommended as a basic standard for establishing noise standards where necessary.

Council discussion made clear that any move in this direction should stress the fact this would be a matter for local decision, that AMA was not imposing any requirement concerning mufflers, except in special circumstances such as the Nats situation already described. With that understanding the council supported the idea of promoting the use of the noise level meter for those who might need it—this was in keeping with a similar council view of a year before, to the effect that when a suitable low-cost instrument became available its use should be promoted.

Worth suggested that HQ purchase a number of the instruments, to be made available on a rental basis to clubs and Contest Directors. Meanwhile an article would be prepared for magazine publication, to inform all members concerning the instrument and the AMA Muffler Committee's recommendations concerning its use.

G. Nats Photography Problem.

This item reflected complaints that Nats Scale event layouts and procedures prevented AMA members from taking pictures while providing no such discouragement to the model press. The concensus seemed to be that something better could be done for our own people and that this was a necessary facet of PR, since local reporting of the Nats could be positive or negative depending upon spectator treatment.

Nats Executive Committee members on the council advised that the subject was already getting considerable attention in current Nats planning, with the Nats Scale and RC Directors working on new field layouts for their events. It was also noted that Al Signorino, who had originally requested council consideration of the problem, would be coordinator of planning concerning same.

H. AMA PR Program.

A brief review of past PR efforts and a recommendation by Worth was made for continuance of the program and budget on the same basis as the previous year; with approximately $12,000 being allocated—divided between direct reimbursement to Bob Lopshire for PR services and also supporting supplies and expenses. A motion by Witt, seconded by Morgan, to approve the amount budgeted and the nature of the PR effort, was approved unanimously.

Two other PR items were deferred for review later in the year. The first was for consideration of a fulltime PR staff position operating out of HQ. The other was for an AMA funded film project. A total of from $30,000 to $40,000 would be involved, and the consensus was that we should pursue such budgeting only after knowing our financial status concerning the World Championships. The latter event was acknowledged to be AMA's major PR effort for 1971, and any other major PR budgeting should be deferred for consideration as potential 1972 efforts.

I. Fellowships/Distinguished Service Awards.

1. One nomination for an AMA Fellowship was made by Boss, seconded by Morgan. Approved unanimously.

2. Two nominations for AMA Distinguished Service Awards were made by Morgan, seconded by Boss. Approved unanimously. Another nomination was made by Worth, seconded by Broadhurst. Approved unanimously.

The council then agreed that announcement of these honors would not be published until the awards were made. Following the awards, publicity would be released through the magazine. This procedure was to be followed so that the element of surprise would be involved. In each case a special occasion would be chosen for public award and recognition by peers of the recipient.

J. Officer's Guidelines Project.

Clemens announced that a long sought goal of many past presidents had finally been achieved, largely as a result of work by Boss, District II Vice-President, working with the HQ staff. The goal was to provide each AMA officer with a set of guidelines, including duties and responsibilities of his position, together with samples of HQ documents which might aid the performance of the job.

Clemens displayed a thick loose-leaf type book of material which had been accumulated by Boss in his previous term of office. Similar books were then distributed to all other vice-presidents at the meeting, and it was revealed that all other district officers—Associate VP's, Contest Board members, Contest Coordinators—would receive such books as soon as they could be assembled by HQ.

A major benefit of this effort is expected to be more effective AMA representation by district officers. The guidelines package enables each officer to answer directly most questions concerning AMA operations, eliminating the necessity of constantly seeking information from headquarters. Consistancy of representation is also more likely—each officer has the same information.

As evidence of appreciation for the work in producing the guidelines, the Executive Council stood and applauded Boss and thanked him for a job well done. Clemens further commended Boss for helping make one of the president's first campaign pledges come true, about six months earlier than had been thought likely.

H. Club Trophies Via AMA.

Worth outlined a proposition which had originally been suggested by Perdue, District V VP. The concept was for HQ to make available to clubs a plan whereby trophies for contests could be purchased at a discount and on credit. The object is to make it easier for clubs to sponsor meets, both by reducing trophy costs and by enabling them to wait until the meet is over before having to pay for them.

Council discussion revealed immediate agreement on the discount arrangement but considerable reluctance concerning any credit plan which would have AMA assuming credit risks for clubs. The concensus was that HQ should seek an arrangement whereby clubs could order directly, with 60 or 90 day billing for delayed payment and for each club to be responsible for its own orders.

The executive director said he would negotiate for this. He also noted that

196 mph was top average RC speed for Vern Smith and Gus Geissinger in FAI World Record Trial April 17-18—close to 198.8 mph record. Cliff Telford photo.

Chicago Aeronuts member Dave Linstrum ready to launch his penny-weight indoor model at recent club contest. Aeronuts pioneered this less delicate indoor class. Rick Lyons photo.

Dan Deluca's original "Pathfinder" RC aerobatic model performs as nicely as it looks. It's all Super MonoKoted, including the red, white and blue decorations. Ritchie Woznicki photo.

the plan resulted from discussions with the manufacturer of our Nats trophies, who was interested in both our national and local meet business. Considering that AMA buys over 500 trophies each year for the Nats alone and sanctions over 500 other meets each year, the business potential is significant.

I. Changes In Officer Appointments.

A review by all council members indicated only one change to be made from the April magazine listing—deletion of the Louisiana Associate VP for lack of activity on behalf of AMA. Some new appointments were anticipated by several VP's, but these were to be made in the future on an individual basis.

J. Nats Future.

Perdue had previously circulated a letter voicing concern over the year-to-year uncertainty of Navy hosting and suggested positive planning for alternatives. Council discussion indicated general agreement that the Navy had the most to offer and that any alternatives would be poorer and more expensive substitutes. The consensus seemed to be that so long as the Navy was willing, even though uncertain on a long range basis, we should continue to work in that direction.

Worth noted that the uncertainty had been a fact of life for many years, going back to 1964. He indicated that alternatives were available and that AMA was steadily getting in a better position to host the Nats independently, although more time would be needed to develop that capability. Basically, however, no alternative was as satisfactory as the current arrangement so another approach was recommended only if Navy hosting is cancelled. It was further pointed out that our 1971 World Championships experience would be helpful in strengthening our capability and should be considered a step in the direction Perdue suggested.

K. Hall of Fame.

Worth reported that the Washington State Air National Guard, sponsor of the 1969 and 1970 Hall of Fame ceremonies, was unable to continue and has relinquished administration to AMA. Renewal of the program, on a revised basis, was being developed as an AMA-only effort, and a specific proposal for this was to be presented to the council at its July meeting.

(continued on page 83)

CONTEST CALENDAR

Official Sanctioned Contest of the Academy of Model Aeronautics

June 5-6—St. Clet Quebec, Canada. Great Grape FF Gathering. Site: 3 x 5 miles flat country near St. Clet. M. Segrave CD, 95 Front Ave., #108, Brockville, Ont..

June 5-6—Cleveland, Ohio (AAA) The Cleveland Sport Race and 4th Annual "500" and FAI CL Team Selection. Site: Cleveland Model Flying Field. Bob Sargent CD, 1964 Wright Ave., Rocky River, Ohio 44116.

June 5-6—Nashville, Tenn. (AAA) Mid-South 8th Annual RC Championships. Site: Percy Warner Park. B. Reuther CD, 216 Vaughns Gap Rd., Nashville, Tenn. 37205.

June 5-6—Lincoln, Neb. (AA) Lincoln Sky Knights 12th Annual Midwestern Open RC Meet. Site: Arrow Airport. R. Brimhall CD, 630 Broadview Dr., Lincoln, Neb. 68505.

June 5-6—Dahlgren, Va. (AA) National Capitol RC Tournament. Site: Naval Weapons Lab. B. Violett CD, 64 B, Rt. 1, Clarksburg, Md. 20734. Sponsor: **DC/RC Club.**

June 5-6—Spencerport, N.Y. (AA) 12th Annual N.Y. State RC Championships. Site: Spencerport. T. Salvemini, Sr., 6 Valley Ln., Avon, N.Y. 14414. Sponsor: **Radio Control Club of Rochester, Inc.**

June 5-6—Valley Park, Mo. (AAA Gateway FF, CL & RC Championships. Site: Buder Park. R. Underwood CD, 4109 Concord Oaks Dr., St. Louis, Mo. 63128. Sponsor: **Greater St. Louis Modeling Assn.**

June 5-6—Shreveport, La. (AAA Louisiana State Model Airplane CL Championships. Site: Hibby Park. W. Lank CD, 3143 Rotan Ln., Dallas, Tex. 75229.

June 5-6—Dallas, Tex. (B) Dallas Pylon League Meet. Site: Samuels East Park. S. Fly CD, 513 Murl Dr., Irving, Tex. 75060. Sponsor: **Dallas RC Club.**

June 6—Colorado Springs, Colo. Pikes Peak Fun Fly 7th Annual Meet. Site: Pikes Peak RC Field. B. Hayhurst CD, 1219 Oswego, Colorado Springs, Colo. 80904. Sponsor: **Pikes Peak RC Club.**

June 6—Bristol, Conn. AA Hi-Mark CL Model Classic. Site: Edgewood School. J. Smith Jr. CD, 265 Witches Rock Rd., Bristol, Conn. Sponsor: Hornets Model Airplane Club.

June 6—Mankato, Minn. AAA Mankato Modeleers Regional CL Model Airplane Contest. Site: New Municipal Airport. J. Cattrysse CD, 806 Center St., N. Mankato, Minn. 56001.

June 6—Howell, Mich. 3rd Annual MWRCS RC Pylon Jamboree. Site: MWRCS Club Field. J. Josaitis CD, 23633 Lawrence, Dearborn, Mich. 48128. Sponsor: **Midwest Radio Control Society, Inc.**

June 6—Hadley, Mass. (A) Hampshire Showdown RC Air Races. Site: H.C.R.C. Flying Field. R. Barkowski CD, 32 Lyman St., East Hampton, Mass. 01027. Sponsor: **Hampshire County RC'ers.**

June 6—Wilmington, Dela. (A) Dela. RC Thermal Soaring Meet. Site: McLennans Church Rd. T. Sterner CD, 903 Prospect Ave., Wilmington, Dela. 19809. Sponsor: **Delaware RC Club.**

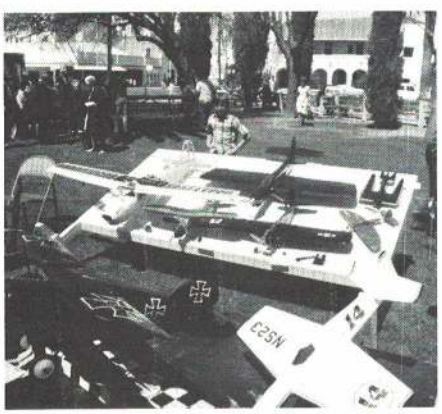
June 6—Little Rock, Ark. (B) 2nd Annual MARCS Fun-Fli. Site: Little Rock. F. Osborne CD, 18 Mohave, N. Little Rock, Ark. 72116. Sponsor: **Mid-Arkansas Radio Control Society.**

June 6—Lancaster, Ohio FORKS ¼ Midget RC Pylon Meet. Site: FORKS Field. J. Slater CD, 809 Forest Rose Ave., Lancaster, Ohio 43120. Sponsor: **Fairfield Ohio Radio Kontrol Society.**

June 6—Elsinore, Calif. (A) Thermal Thumbers FF Meet for Cat. II. Site: Lake Elsinore. M. Keville CD, 5407 Pimenta Ave., Lakewood, Calif. 90712. Sponsor: **Thermal Thumbers.**

June 6—Wausau, Wisc. 4th Annual Fun-Fly. Site: Club Field. K. Sparr CD, P.O. Box 441, Wausau, Wisc. 54401. Sponsor: **Wausau RC Sportsmen, Inc.**

(continued on page 80)



The Cholla Choppers Club exposed many new people to modeling last March during Tucson's Sun Fair. A portion of the club's display is shown in left photo. At right, Mr. and Mrs. Walter Cross, in their 70's, were particularly interested in the vintage scale models—may have brought back fond memories. Ed Hagerlin, whose photos are shown, suggests this activity to other clubs.

AMA News Extra . . .

DETAILS: 1973 FAI FREE FLIGHT PROGRAM SEMI-FINALS, FINALS

Despite many different proposals for changing the concepts employed in the previous team selection program, the 11-man advisory committee headed by Program Administrator Dave Linstrum has voted to retain the former program details for regional Semi-Finals and a single national Team Finals. New this year, however, is an arrangement to partially defray costs of Semi-Finalists who qualify for the Team Finals. The adopted formula for reimbursement, proposed by Charlie Sotich (Chicago Aeronuts), takes into account Semi-Final placing and distance to be traveled. Money comes from program entry fees, the FF program having achieved a substantial surplus from former years.

Qualifying Trials. How to enter and how to qualify for the Semi-Finals (with a 14-minute flight total) was explained in the June AAM, page 61. Qualifying must be accomplished by August 1, 1971. Events consist of Wakefield Rubber, A-2 Towline Glider and FAI Power.

Semi-Finals are planned for Labor Day weekend 1971 at seven sites throughout the country--tentatively Taft, Calif., Tacoma, Wash., Denver, Colo., Tulsa, Okla., Bong, Wisc., Tullahoma, Tenn., and Galeville, N.Y. Entry fees per event: $5 for Opens and Seniors, $2 for Juniors. One event (eight rounds) per day will be flown. The number of Semi-Finalists at each location to advance to the Team Finals will be by the formula N = L/C x K, where N equals the number of flyers advanced, rounded to nearest whole number; L equals the number of flyers in an event at one Semi-Final; C equals the number of flyers in that event in the country at all Semi-Finals; and K equals 30, a constant to result in a manageable Team Finals. At least one flyer will advance in each event from each Semi-Final regardless of the number of entrants. Also, anyone making at least 95% of the winning time will be advanced.

Team Finals. The conclusion of the team selection program will take place over Labor Day weekend 1972. The location will be chosen following the Semi-Finals by vote of all those eligible to compete in the Team Finals, including the 1971 FF World Championship teams. The team Finals entry fee is fixed at $12.

MEMBERSHIP MEETING

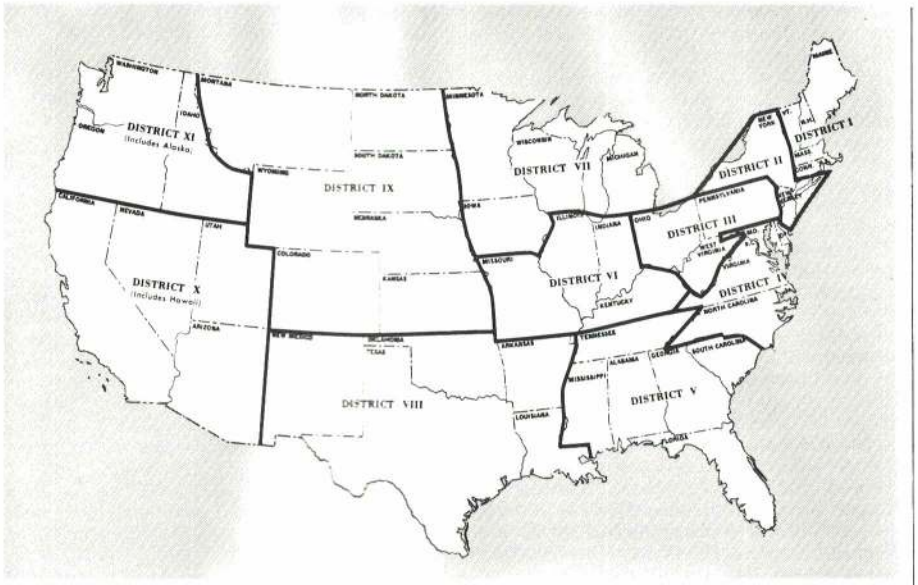
As provided by the bylaws, the Executive Council is calling for the regular meeting of the AMA membership during the National Contest at 6:30 pm on Wednesday, July 28, 1971.

DIRECTORY OF AMA OFFICERS

Which officers live in your district? Select correct address when writing officers.

HOW TO USE

Over 150 AMA members serve as volunteers on various committees which determine operating policies of Academy activities—many are listed here. Members are invited to communicate their comments, suggestions, proposals, or complaints by writing to the appropriate committee at any time. Note that the Executive Council and Associate Vice-Presidents represent area interests for general AMA policy matters. Wherever district numbers are shown, write to the nearest address in your area. It is recommended that a copy of any correspondence be sent also to AMA Headquarters.



EXECUTIVE COUNCIL

President: John E. Clemens, Box 64573, Dallas, Texas 74206
Sec.-Treas.: Earl Witt, Longview Trailer Ct., R.D. #2, Chambersburg, Pa. 17201
Executive Director: John Worth, AMA HQ, 806 15th St., N.W., Wash., D.C. 20005
Vice-Presidents
I: Cliff Piper, Highland Avenue, Atkinson, New Hampshire 30811
II: William Boss, 145-24 223rd Street, Laurelton, New York 11413
III: Ron Morgan, School for Vet Children, Scotland, Pennsylvania 17524
IV: John Patton, Route #5, Frederick, Maryland 21701
V: James Perdue, 111 Christopher Ave., Athens, Alabama 35611
VI: Al Signorino, 11959 Glenvalley Dr., Bridgeton, Missouri 63042
VII: Jack Josaitis, 23663 Lawrence, Dearborn, Michigan 48128
VIII: Murry Frank, 2933 Blankenship, Wichita Falls, Texas 76308
IX: Stan Chilton, 446 Ida, Wichita, Kansas 67221
X: Alex. R. Chisolm, 1589 W. Celeste, Fresno, California 93705
XI: Robert D. Stalick, 1120 Shady Lane, Albany, Oregon 97321
NAA Rep.: Gen. Brooke Allen (USAF Ret.), NAA, 806 15th St., N.W., Wash., D.C.

GENERAL COUNSEL

J. Courtney, c/o AMA HQ, 806 Fifteenth St., N.W., Washington, D.C. 20005

ASSOCIATE VICE-PRESIDENTS

I: John Ross, 19 Sterling Dr., Dover, Massachusetts 02030
II: Art Schroeder, 18 Spencer Road, Glen Ridge, New Jersey 10601
J. Moynihan, 123 Evergreen Drive, Tonawanda, New York 14150
III: Ray DeLaVeaux, 1316 Gilham, Philadelphia, Pennsylvania 19111
Ralph Pennetti, Wharrey Dr., R.D. #1, Swickley's, Pennsylvania 15143
Albert Seidowski, 21460 Sheldon Rd., Brookpark, Ohio 44113
IV: Cliff Telford, 8612 Rayburn Road, Bethesda, Maryland 20034
Thomas Baker, 406 Hawthorne Road, Kings Mountain, North Carolina 28080
William Conkling, 915 Thornbriar Court, Hampton, Virginia 23361
V: Frank Schwartz, 2400 West End Avenue, Nashville, Tennessee 37203
Jerry Wagner, 274 East 9th Street, Hialeah, Florida 33010
Warren Lawrence, 2210 Tilson Circle, Decatur, Georgia 30032
Henry Williams, Jr., 3 Alpine Drive, Taylors, South Carolina 29867
VI: John Blum, 2417 Glen Place, Granite City, Illinois 63040
Glenn Lee, 102 West Mandrake, Batavia, Illinois 60510
Dave Burt, 3048 Central Street, Evanston, Illinois 60201
VII: Frank Morrissey, 14100 West Park Ave., New Berlin, Wisconsin 53151
VIII: Bud Tenny, Box 545, Richardson, Texas 75080
Calvin Scully, 3566 25th Street, Apt. C, Port Arthur, Texas 77640
IX: John Kelly, 7020 E. Colfax, Denver, Colorado 80220
Jim Mowrey, R. R. No. 2, Box 56, Kinsley, Kansas 67547
X: Robert Barnes, 3020 Ala Napuaa Place, Apt. 304, Honolulu, Hawaii 96818
John Pond, 4135 Avati Drive, San Diego, California 92117
Joe Bridi, 23625 Pineforest Lane, Harbor City, California 90710
Bob Meuser, 4200 Gregory Street, Oakland, California 94619

Correspondence for the committees, representatives and administrators which follow should be addressed to the proper committee or individual and sent c/o AMA HQ, 806 Fifteenth St., N.W., Washington, D.C. 20005. Upon receipt of such mail HQ will resend it to the proper individual and/or send copies to the entire committee if the response required needs to be representative of the entire group.

NATIONALS EXECUTIVE COMMITTEE

John E. Clemens, Dallas, Tex.; Ron Morgan, Scotland, Pa.; Pete Peters, Dallas, Tex.; Ed Shipe, Santa Barbara, Calif.; Pete Sotich, Chicago, Ill.; Earl Witt, chairman, Chambersburg, Pa.; John Worth, Washington, D.C.

SPECIAL COMMITTEES

Junior Committee—Ed Abram, Ouaguaga, N.Y.; **Safety Committee**—Al Signorino, Bridgeton, Mo.

FAI CIAM REPRESENTATIVES

Coordinator—Maynard Hill, Silver Spring, Md.; **Radio Control**—John Patton, Frederick, Md.; **Control Line**—Steve Wooley, Belpre, Ohio; **Free Flight**—Dave Linstrum, Buffalo Grove, Ill.; **Scale**—LeRoy Weber, Rio Vista, Calif.; **Rockets**—G. Harry Stine, New Canaan, Conn. **FAI PROGRAM ADMINISTRATORS: Control Line**—Laird Jackson, St. Davids, Pa.; **Free Flight**—Dave Linstrum, Buffalo Grove, Ill.; **Indoor**—Bud Tenny, Richardson, Tex.; **Radio Control**—Tom Rankin, Ellicott City, Md.

RC FREQUENCY COMMITTEE

Walt Good, Bethesda, Md.; Ed Lorenz, chairman, Pougkeepsie, N. Y.; Howard McEntee, Ridgewood, N. J.; John Phelps, Liverpool, N. Y.; Paul Runge, Higginsville, Mo.

CONTEST COORDINATORS

I: Elvin Brine, 191 South Riverview, Haverhill, Massachusetts 01830
II: Warren H. Truppner, 67 Raymond Avenue, Staten Island, New York 10314
III: Ken Reber, Route No. 2, Shippensburg, Pennsylvania 17257 **(East)**
Marge Weisenbach, 4568 West 146th St., Cleveland, Ohio 44135 **(West)**
IV: Alice Jawitsky, 6408 Marietta Avenue, Baltimore, Maryland 21214
V: Tom McLaughlin, 4140 Fern Court, Pine Glades, Pensacola, Florida 32503
VI: Whalen Webb, 15722 Vine Avenue, Harvey, Illinois 60426
RC: Al Signorino, 11959 Glenvalley Drive, Bridgeton, Missouri 63043
VII: Odell Marchant, 2004 N. Hillsboro, Minneapolis, Minnesota 55427 **(West)**
Walter Hamma, 14750 Kilbourne, Detroit, Michigan 48213 **(East)**
VIII: S. Franz, 2933 Blankenship, Wichita Falls, Texas 76308
IX: Ray R. Combs, R.R. No. 1, Box 712, Morrison, Colorado 80465
RC: Jim Brittian, 1613 East Iron, Salina, Kansas 67401
X: Don C. Farnsworth, 301 Carl Drive, Visalia, California 93277 **(North)**
Lee Polansky, 865 West Huntington-1, Arcadia, California 91066 **(South)**
XI: Albert Grell, Route 1, Box 165, Tangent, Oregon 97389

CONTEST BOARD COORDINATOR

Don Lindley, 301 East Elizabeth Drive, Crown Point, Indiana 46307

Bold type below indicates Chairman of Contest Board

CONTROL LINE CONTEST BOARD

I: John Ennis, 165 Grafton Street, Brockton, Massachusetts 02401
II: Jean Pallet, 30 Emerson Road, Brookville, Glen Head, New York 11545
III: Laird Jackson, 523 Meadowbrook, St. Davids, Pennsylvania 19087
IV: William Pardue, 1201 Surrey Drive, Greensboro, North Carolina 27408
V: William D. McGraw, 1325 Carol Drive, Memphis, Tennessee 38116
VI: Arthur J. Johnson, 1818 Oslo Drive, Rockford, Illinois 61108
VII: Arthur Adamisin, 22454 Fairfax, Taylor, Michigan 48180
VIII: B. F. Davis, 1613 Carl, Fort Worth, Texas 76103
IX: John R. Mason, 2214 South Pine Crest, Wichita, Kansas 67221
X: Pete Brandt, 5817 W. Ironwood, Palos Verdes Peninsula, California 90274
XI: Keith Loutocky, 1419 South 48th, Tacoma, Washington 98408

FREE FLIGHT CONTEST BOARD

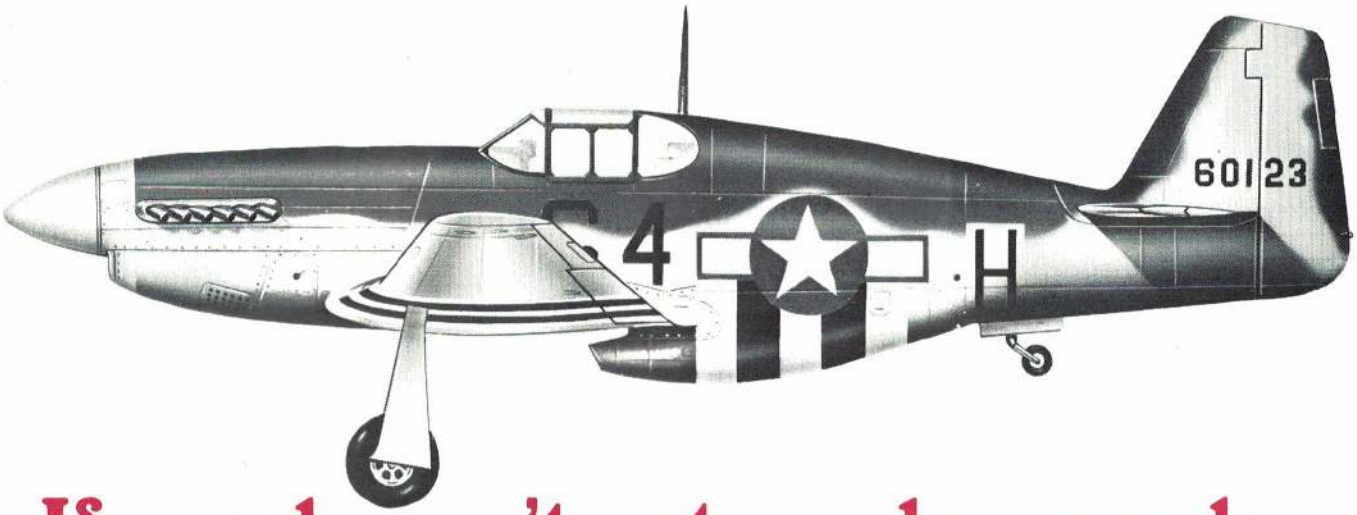
I: Henry Struck, R.F.D. No. 2, Hamburg, Old Lyme, Connecticut 06371
II: Ed Fronczek, 34-14 Broadway, Long Island City, New York 11106
III: Floyd Miller, 1313 Brookridge Drive, Columbus, Ohio 43220
IV: Joe Boyle, Jr., 219 Shenandoah Road, Hampton, Virginia 23361
V: George C. Pickel, 1631 Steen Drive, Clarksdale, Mississippi 38614
VI: James Gremel, 8618 Jo Court, Berkeley, Missouri 63134
VII: Phil Klintworth, Jr., 27701 Lenox, Apt. 202, Madison Hts., Mich. 48071
VIII: Buzz Averill, 2314 Palomas Dr., N.E., Albuquerque, New Mexico 87110
IX: Frank Monts, 6519 Marjorie Lane, Wichita, Kansas 67221
X: Mel Schmidt, 1140 Sturbridge, La Habra, California 90631
XI: John Lenderman, Route 2, Box 460, St. Helens, Oregon 97051

RADIO CONTROL CONTEST BOARD

I: Harvey Thomasian, 369 Brigham Street, Northboro, Massachusetts 01532
II: A. P. Sattler, 29 Waldorf Plane, Schenectady, New York 12307
III: Howard Grogan, 1326 Wakeling Street, Philadelphia, Pennsylvania 19124
IV: George Hill, 4106 Breezewood Lane, Annandale, Virginia 22003
V: Don Coleman, 527 Pecan Street, Box 436, Citronelle, Alabama 36522
VI: Bud Atkinson, 734 North 6th Street Terr., Blue Springs, Missouri 64105
VII: Peter Waters, 31219 Kendall, Livonia, Michigan 78154
VIII: Dan B. Carey, 6312 Klamath Road, Fort Worth, Texas 76116
IX: Loren Tregellas, 3003 S. Everett, Wichita, Kansas 67217
IX: W. C. Northrop, Jr., 9542 Hightide Drive, Huntington Beach, Calif. 92646
XI: Ralph Brooke, 3431 South 19th Street, Seattle, Washington 98188

SCALE CONTEST BOARD

I: Richard Sherman, 408 River Road, Tewksbury, Massachusetts 01876
II: John Condon, Sr., 89-09 247 Street, Bellrose, New York 11426
III: Edward Wisser, 1521 Summit Street, McKeesport, Pennsylvania 15130
IV: Hurst Bowers, 1649 Birch Road, McLean, Virginia 22101
V: Lee Webster, 1000 Sycamore Circle, Manchester, Tennessee 37355
VI: Frank Beatty, 2556 Pontoon Road, Granite City, Illinois 62040
VIII: Claude McCullough, Box 40, Montezuma, Iowa 50171
VIII: John Casburn, 6508 Normandy Road, Fort Worth, Texas 76112
IX: Don Johnson, 12604 West Virginia Avenue, Denver, Colorado 80228
X: Russ Barrera, 1451 LaHabra Street, Lake San Marcos, California 92069
XI: Earle Moorhead, 275 South View Place S., Salem, Oregon 97302



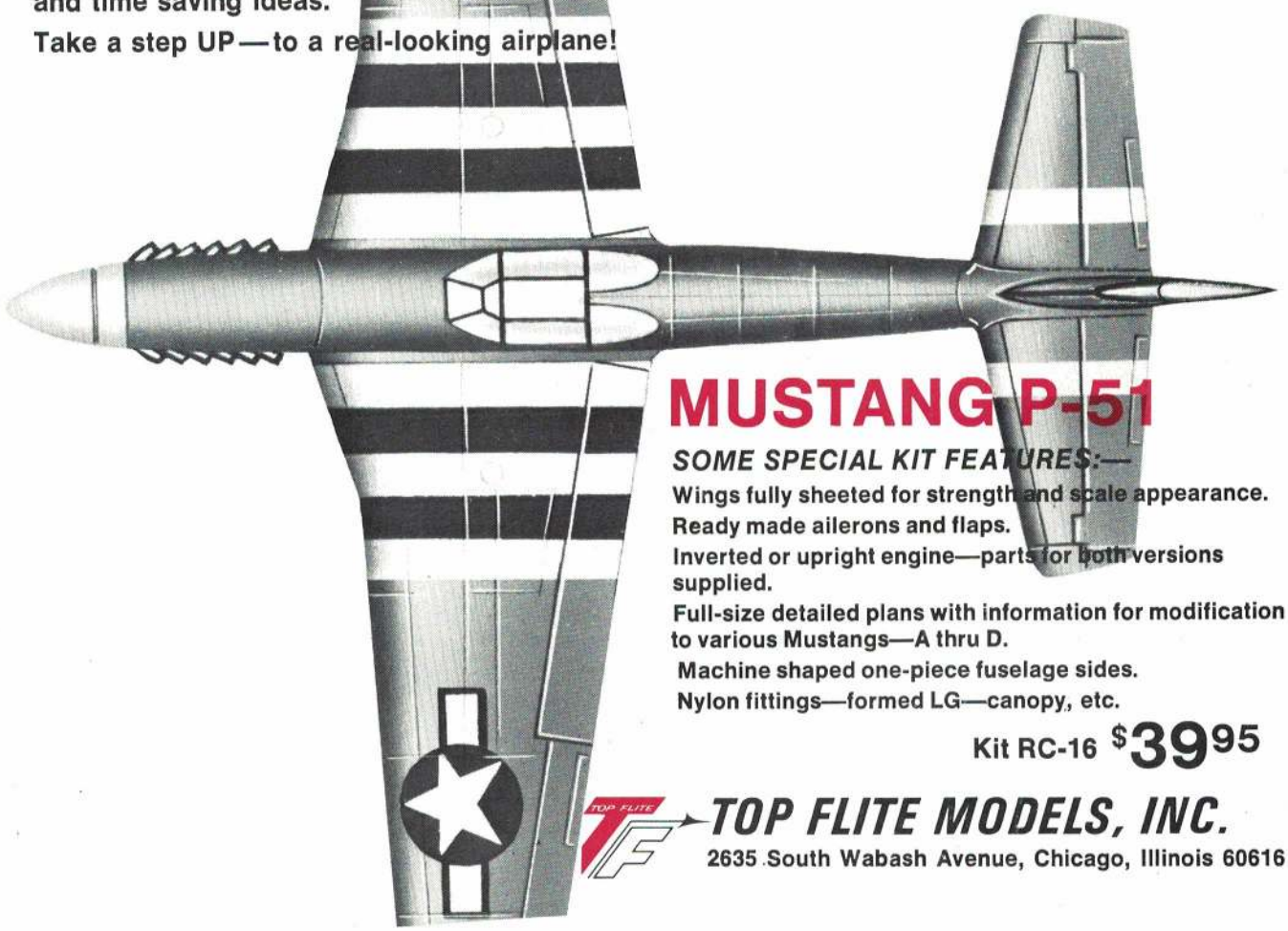
If you haven't yet made a scale model, there's no excuse—Now!

Our new Radio Controlled P-51 Mustang is a *Standoff Scale* model. You can build it in about the same time a Kwik-Fli takes, but when you're through, you've got a model that only a ruler can tell from a true scale plane.

This means that in the same building time of your next sport or pattern R'C, you could have instead *this Mustang* . . . an authentic looking plane that flies like a sport model — no tricky handling.

Designed by Scale Champ Dave Platt, wing span is 60" for .40 to .60 engines and full house R'C. The flaps can be stationary or operable. And like all Top Flite kits, it has exciting new features and time saving ideas.

Take a step UP—to a real-looking airplane!



MUSTANG P-51

SOME SPECIAL KIT FEATURES:—

Wings fully sheeted for strength and scale appearance.

Ready made ailerons and flaps.

Inverted or upright engine—parts for both versions supplied.

Full-size detailed plans with information for modification to various Mustangs—A thru D.

Machine shaped one-piece fuselage sides.

Nylon fittings—formed LG—canopy, etc.

Kit RC-16 $39.95

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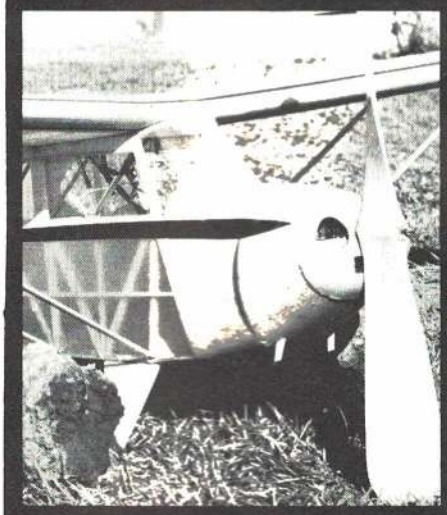
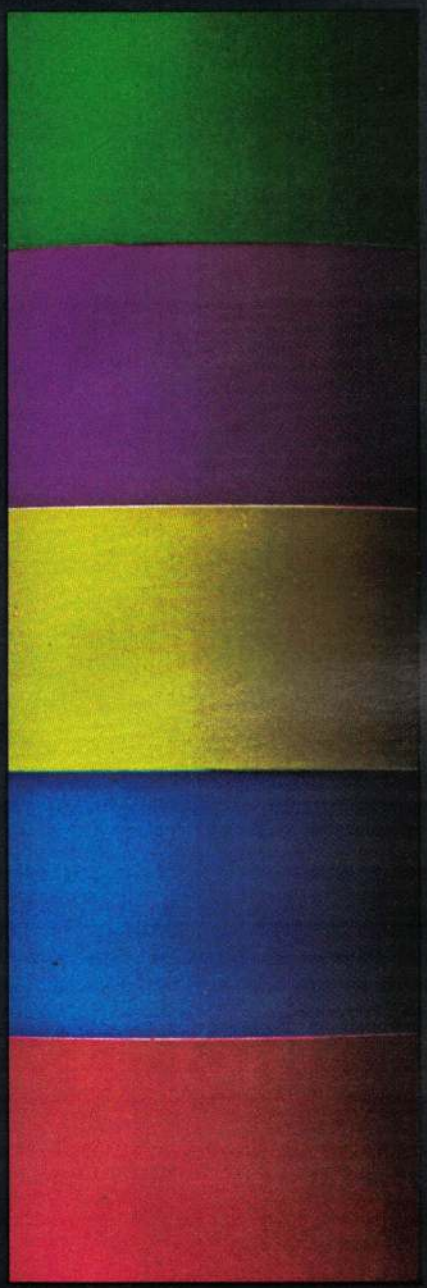
ON THE SCENE

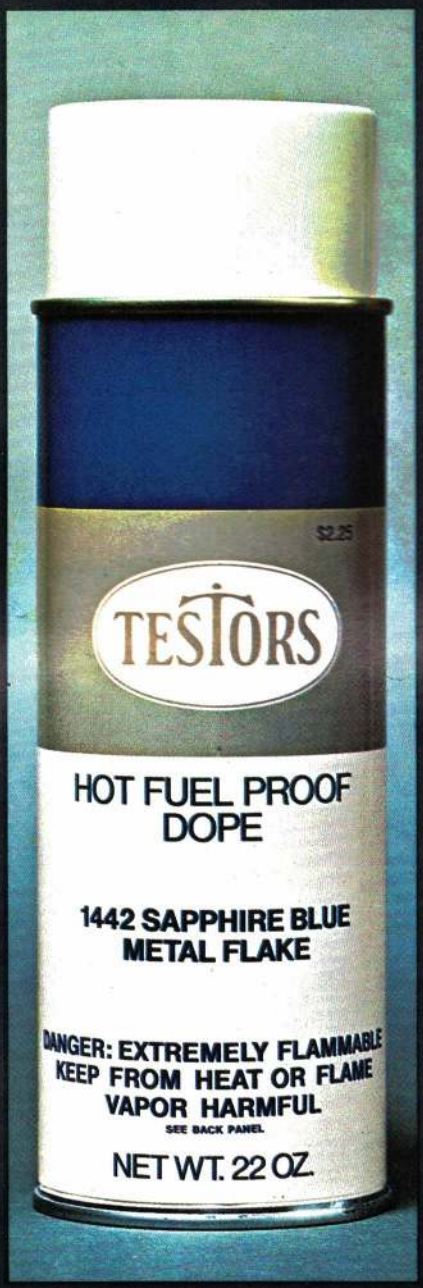
CONTINUED



Top: Beautifully-built Jumbo by Kingsley Kau. Center: Bill Stroman's huge BE2c from Aeromodeller plans. Geared prop. Above left: Mooney's entry. Both free-wheeling prop and pilot required. Above right: Jack Elem's Cessna A-W. Left: Launching of Haight's Bellanca Skyrocket.

HOW TESTORS TAUGHT AN OLD DOPE SOME NEW TRICKS





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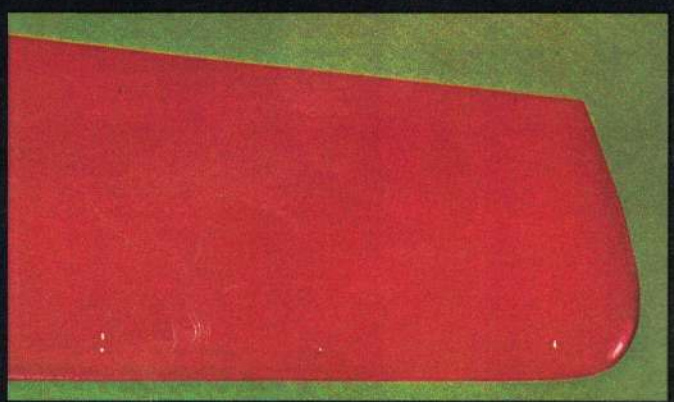

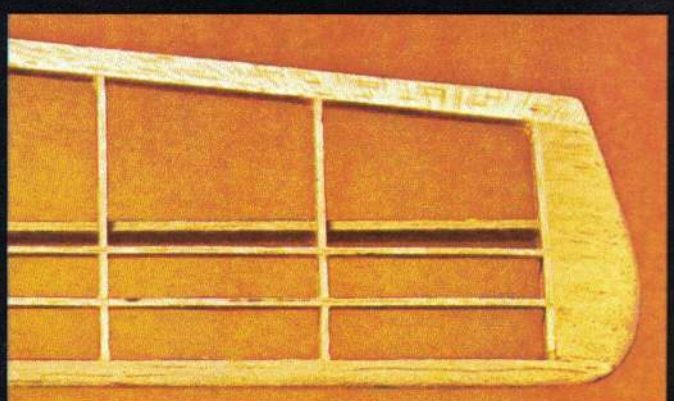

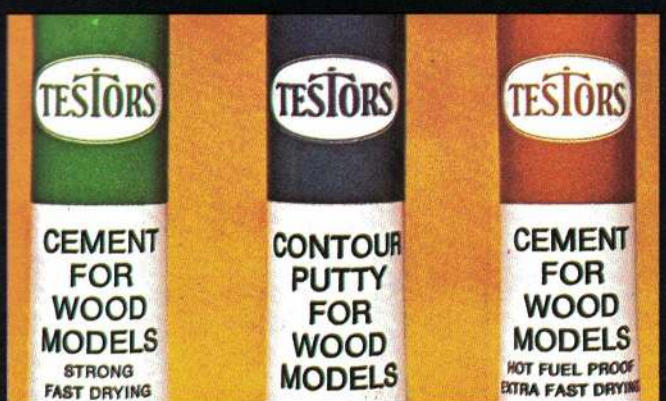

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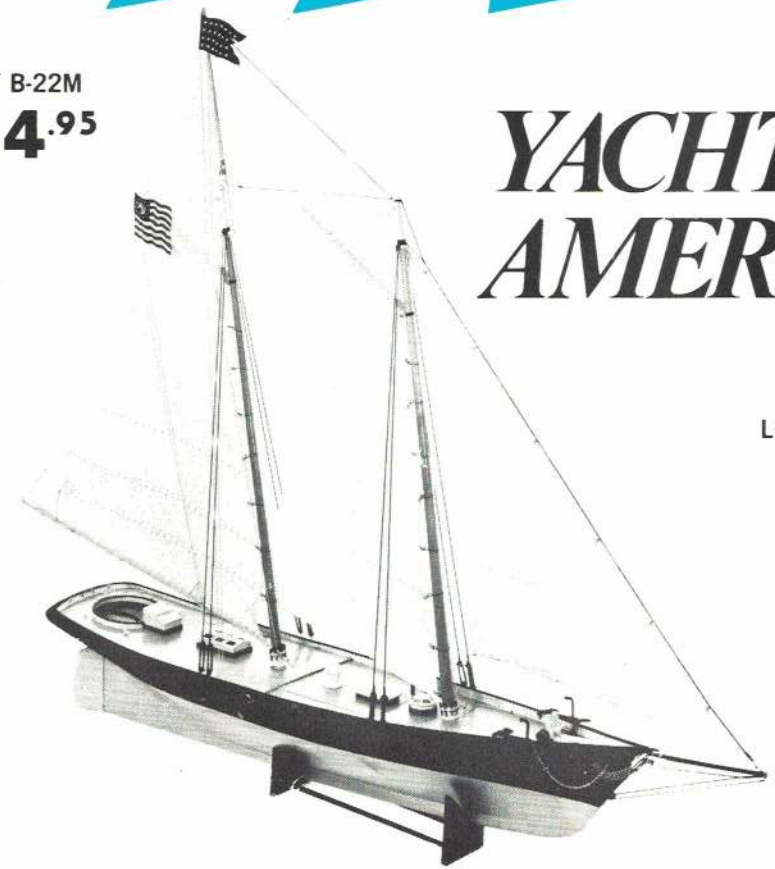
IN THE AIR!

KIT B-22M

34.95

YACHT AMERICA



LENGTH: 51½"
HEIGHT: 41"
BEAM: 8½"

Single Channel Rudder Control to Full House Rudder & Sail, etc. Operation

A FINE OPERATING SAILING MODEL . . .

This magnificent model is a true scale replica of the YACHT AMERICA as it was rigged between 1851 and 1859. Designed by George Steers, and built by W. H. Brown of New York, it was launched May 3, 1851. At 170 tons, it was 95'6" long, 23' beam and had an 11'6" draught. In June, the AMERICA sailed across the Atlantic to accept the challenge of the British Royal Yacht Club to a race around the Isle of Wight. The victor would win the Hundred Guinea Cup, which is now known as The America's Cup. The win of the race around the Isle of Wight started The America's Cup Races which has been successfully defended by American vessels for over 100 years. The AMERICA served both sides with distinction in the Civil War. It was destroyed in a collapse of a protective shed in 1944. Kit features accurately die cut Balsa and imported Birch plywood that makes assembly relatively easy for most anyone. Other features are: • Die-Cut Birch Plywood Decks with planking grooves printed in • Tapered Masts, Booms, Spars, etc. • Miniature Rope in scale size and color • Fine quality Sail Cloth • Chain • Dozens of exquisitely detailed Cast Metal Fittings, as well as Hardware and Special Metal Fittings for rigging • Simple step-by-step Plans showing all phases of construction and operation.

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Rimfire

High Performance
Radio Control Model

SPAN: 56" AREA: 525 sq. in. WEIGHT: 2½ lbs. (Less R/C) ENGINE: .29 to .45

ASSEMBLES QUICKLY AND EASILY . . .

Years of design refinements and flight testing have gone into this superb flying machine. Beautifully engineered in its classic simplicity, RIMFIRE builds fast with its "Table Top" Warp-Free construction, into a rugged and exceptionally attractive ship. And fly! . . . Well, as good as you are, is the RIMFIRE! If you're a contest performer, so's the RIMFIRE. Kit contents • Full Length One-Piece Die-Cut Fuselage Sides • Full Length Carved and Hollowed Fuselage Top • Formed Gear includes Steerable Nose Gear assembly • Hardware includes all special Nylon R/C fittings, Threaded Rods, as required for COMPLETE LINKAGE • ALUMINUM ENGINE MOUNTS • Canopy • Decals • Wood Nut & Nylon Screw Wing Mounting • Shaped Ailerons • Simple step-by-step Plans, etc., etc.

. . . SUPERBLY RESPONSIVE IN FLIGHT

AVAILABLE IN CANADA

SPAN: 70" AREA: 500 sq. in.
WEIGHT: 1¾ lb. (Less R/C)
SCALE: 1¾ in. = 1 ft.

KIT FS-28

19.95

SCHWEIZER 1-26D R/C SAILPLANE

Unbelievably realistic and unusually responsive to R/C command, with excellent penetration. The magnificent silent flight must be seen to be appreciated. Power Pod material included. Superb engineering is reflected in the rugged Easy-to-Build assembly and Warp Resistant construction. Beautifully pre-fabricated with many finished parts, this kit features • Top quality Balsa, extensive use of imported Birch plywood as required structurally; all cleanly and accurately Die Cut • Hardware includes all Nylon R/C fittings required for Full House linkage • Crystal clear Canopy • Turned Nose Cone • Scale Decals • Simple, yet complete step-by-step Plans and Instructions, etc., etc. . . . DETACHABLE WING PANELS FOR EASY TRANSPORTATION.

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Sterling Nylon Fittings are manufactured from pure virgin nylon. Nylon used is the most solvent resistant type and is insoluble in common acids, oils, greases, etc. Molded to exact specifications, these Fittings are tough and extremely durable. The use of Sterling Nylon Fittings on Radio Control Models is highly desirable, since it eliminates electrical noises.

They're NEW!

The Paraballoon

(continued from page 44)

it is easier, open the chute after cutting and mark off eight equal sections and tie one line to each.

Open up the canopy and then bring all lines together where they are tied. Straighten lines and tie all of their loose ends together. These shroud lengths must be exactly equal or the chute will not fly.

Weight Capsule: Obtain a small plastic capsule from a gum machine and drill a small hole in one end. Slip the remaining single line through the hole and tie on a small washer. Tie the line's other end to the eight shroud lines. Insert the note and a small rock (the size of a large pea) in the capsule, and the paraballoon is ready to go.

Flying Instructions

The best launching time is in the morning, around nine to ten, before the wind kicks up. Pick a good spot away from trees and power lines.

Open the canopy and let the shroud lines untangle. Pull the paraballoon forward, allowing the canopy to fill with air. Holding onto the weight capsule with one hand, swing the canopy up and overhead with the other (see photo).

With a smooth motion, release the paraballoon, making sure the canopy is opened fully. If it is not, repeat the launching procedure until the chute flies freely. If the canopy continues to collapse, add a small weight at the capsule and launch again. Let the paraballoon fly by itself, even if it doesn't go up immediately. It will fly parallel to the ground and hunt out the thermals. When one hits, up it goes, automatically.

As it rises and gets higher and harder to see, lie down on the ground and shade your eyes. Keep the paraballoon's position in reference to a tall object on the ground. Should you lose sight of it, the reference point will help to relocate it. Once you lose sight of the chute, it is very hard to spot again.

Of the 275 paraballoons I have made, every 25th one had a nine-foot diameter chute with nine-foot shroud lines. Construction was similar except that 12 lines were used, instead of eight. To make this larger chute, use a 9 x 12' plastic drop cloth (used by painters). Make a 4 1/2-ft. arc and tie on the shroud lines at 12 equidistant locations.

Use an empty half gallon milk carton for the weight compartment. This monster takes a lot of muscle to swing up and launch but it is well worth it to see it climb slowly upward with the sun glinting off the plastic as it goes out of sight.

Tops in Trainers

(continued from page 28)

with varying degrees of success. Some of the later models of the 504 were equipped with more modern radial engines, but the airplane made its reputation with rotaries and their infamous torque and spray of castor oil.

After a dizzying succession of variations on the original theme, the 504J appeared in the autumn of 1916 and brought with it stability. This was the first major production version and quickly became the RFC's standard trainer. British authorities remember the 504J as the airplane which made possible a radical change in flight training based on methodical demonstration and explanation. While modern training methods are vastly more sophisticated, they owe their origins to the Avro of 1916.

A serious shortage of 100-hp Gnome rotary engines forced the use of several different engines in the 504J. Problems connected with modifying the engine mounts to take larger engines entailed enough changes to warrant re-numbering the airplane, 504K. It was this version which really established the reputation of the type for all time. In addition to thousands built in Great Britain, quantities were produced in Canada, Australia and Russia. Had the war not ended when it did, Canada would probably have replaced its Jennys with Avros, and the U.S. might even have done the same. Only a few were delivered to the U.S., and they were used in France for aerobatics instruction.

After the war, the 504J and 504K remained as the standard trainers of the RAF (created in 1917 from the RFC). The last 504J's were retired in 1921, but the 504K continued in service for many years after that. The fame of the machine spread. About 100 went to Australia, to be joined by others built there. Twenty went to New Zealand, where they were used by private training and transport firms. At least a half dozen went to South Africa and were used until 1929. The Netherlands bought 36 504K's in 1919-1922 for military training. Japan adopted it as its standard reconnaisance airplane, buying 30 from Great Britain and then producing more on license. Still others were sold to China.

Back home in Britain, the Avro was sold as surplus in considerable numbers to private owners who used them much as the Curtiss

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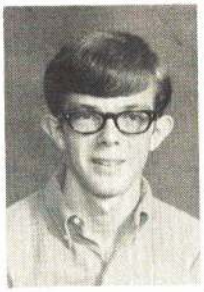
OUTSTANDING COMPETITOR DESIGNED BY JIM CLEM

Grady Turner Wins Senior 1/2A and C Gas With His Witch Doctors

Grady Turner, competition free flight modeler from Longview, Texas, captured both Half-A Gas and "C" Gas in the Senior division at the 1970 Nats, flying Jim Clem's famous Witch Doctor designs. Congratulations, Grady, we will be looking for you at the 1971 Nationals!

WIN WITH A WITCH DOCTOR!



ZLIN AKROBAT

1969 NATIONALS WINNER!

4TH IN WORLD CHAMPIONSHIP

KIT RC-23

ENGINES-.60

WINGSPAN 70"

$39.95

The Zlin Akrobat is an outstanding scale model of one of the finest aerobatic airplanes ever produced. It won the full-scale aerobatic championships in 1967. Proportions of the airplane are such that it makes an ideal R-C model. Construction is standard built-up balsa fuselage and a foam wing sheeted with balsa. Maxey Hester, the designer, won the 1969 Nationals and placed fourth in the World Championships.

FAIRCHILD PT-19

WINGSPAN 72"

KIT RC-2

FOR ENGINES .45 to .60

1958 NATIONALS R-C SCALE WINNER!

WON 2nd PLACE 1967 NATIONALS!

$38.95

The Sig Fairchild PT-19 is one of the classic R-C scale kits, time tested and a reliable competition flyer. The very first Nationals Radio-Control Scale event at Glenview NAS, Chicago, in 1958, was won by Bill Bertrand with a blue and yellow beauty. During the Nats R-C Scale at California's Los Alamitos Naval Air Station in 1967, Maxey Hester placed second, flying his PT, as one of the magazines later reported, "like a pattern job". The big 72" wingspan provides plenty of wing area to carry a good finish and lots of detail. Powered by engines .45 to .60, flight is stable and realistic. Kit features a one-piece molded cowling, five sheets of detailed plans and instructions, six sheets of authentic decals and stacks of die-cut balsa and plywood. A model you will really be proud of owning.

SEMI-SCALE CHIPMUNK

WINNER OF 1969 NATIONALS!

CONTROL LINE STUNTER

$13.95

KIT CL-3

Sensational performer? Yes, but dependable as well. Mike Stott has made nearly a thousand flights with his sleek Sig Chipmunk. Three Nationals are among the many contests listed in his plane's logbook, crowned by 1st place in CL Precision Aerobatics at the 1969 Nationals meeting at Willow Grove, Pa. Get the winning habit with your own version. The kit includes:

- MOLDED BUTYRATE CANOPY
- DETAILED FULL-SIZE PLANS
- DIE-CUT SIG BALSA AND PLYWOOD
- ONE-PIECE MOLDED ENGINE COWLING
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- FOR ENGINES .29 to .40
- WINGSPAN 54"

YOU can win 1971 SIG "Nats Award"!

That's right - if you win at the 1971 NATIONAL MODEL AIRPLANE CHAMPIONSHIPS (July 26 through August 1, at U. S. Naval Air Station, Glenview, Chicago, Illinois), with a model built from SIG BALSA (or Basswood if balsa is not used) or a SIG KIT, you will be eligible for one of the many valuable Sig "Nationals Awards".

As in previous years, awards will consist of "Sig Model Supplies Certificates", which may be redeemed for any of the thousands of different model items available from Sig Manufacturing Co., Inc., 401 South Front St., Montezuma, Iowa 50171 - and will be mailed to all 1971 Nationals Winners who qualify.

$200.00 SIG CERTIFICATE will be awarded to each contestant who wins a FIRST Place with a model built from a SIG KIT (excluding Dart and Cub kits).

$50.00 SIG CERTIFICATE to each National Champ (Open, Senior & Junior) who uses SIG BALSA to build any of the models he enters in the Nats.

$20.00 SIG CERTIFICATE to each FIRST Place Winner who uses SIG BALSA in the construction of his winning model (most Nats winners use Sig).

CHAMPION CITABRIA

Accurate Scale Model of America's Most Popular Sport Plane

WON 4th PLACE IN R-C SCALE 1968 NATIONALS!

KIT RC-15

R-C SCALE MODEL FOR ENGINES .36 to .45

$31.95

The Sig Citabria is an easy model to build but packs a lot of competition potential. Like its full-scale counterpart, aerobatics come naturally. Maxey Hester's prototype ship, flying at Olathe NAS during the 1968 Nationals, placed 4th against more complicated designs. Great, too, for a Sunday afternoon's sport at the club field. Check the following features:

- Formed Aluminum Landing Gear
- Removable Wing Struts
- Concealed Radio Gear
- Molded Plastic Wheel Pants
- Nylon Control Horns & Bellcranks
- Nylon Wing Screws
- Authentic Decals
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- Full-Length Fuselage Sides
- One-Piece Molded Engine Cowling
- New Hidden Landing Gear Mount
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Jenny was being used in the U.S.–for training, barnstorming and elementary business purposes. Both airplanes were cheap to buy and maintain, and operated easily out of small, rough fields. In addition, they seemed especially well-suited to quick, and often crude, modifications. More than 10 years after the end of WW I, there were still more 504's in civil use in Great Britain than any other type.

But the life of the 504 as a military trainer was not limited to the gradual phasing out of old machines by the RAF and other air forces. In 1922, the 504N was introduced and

began to replace the 504K as the standard trainer, remaining in service until the early 1930's. Most of these had 150-hp radial engines, but some were built with the 130-hp Clerget rotary and were called the 504 Mk. II.

The final production version was the 504R which first appeared in 1926. Like many of its predecessors, it was built with a variety of engines. The basic Avro 504, therefore, was in production from 1914 until 1926–quite an amazing record for any airplane in this period. Even more surprising was its service life: from pre-WW I in Great Britain until the early days of WW II, when a few were still being used by the Greek Air Force.

Of some 8000 that were built, only about a dozen remain. Most are 504K's: two in the Canadian National Air Museum at Rockcliffe, Ontario, and two more in storage for the soon-to-be-completed RAF Museum at Hendon, north of London. The Shuttleworth Trust, at Old Warden Aerodrome in England, owns the only 504 which is still flown in air displays. Others belong to museums in Denmark, Norway, Finland and Australia.

Versions and Variants

504—prototype flew in July 1913; powered by 80-hp Gnome, changed to 80-hp Gnome Monosoupape; crashed Aug. 6, 1914.

504—first production order for 12 for Royal Flying Corps, 1 for Royal Naval Air Service in mid-1914; 1st British plane downed in combat.

504A—shorter ailerons; 80-hp Gnome.

504B—for RNAS; mostly 80-hp Gnome, some 80-hp LeRhone; new vertical tail.

504C—RNAS long-range, single-seat recco version of 504B; 80-hp Gnome.

504D—like 504C, but for RFC.

504E—10 built as trainers; 100-hp Gnome Monosoupape.

504F—one 504C with 75-hp Rolls Royce Hawk.

(continued on page 72)

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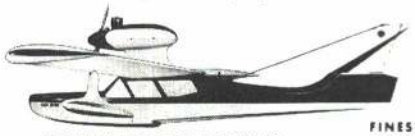

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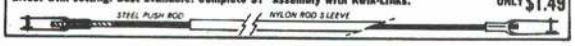

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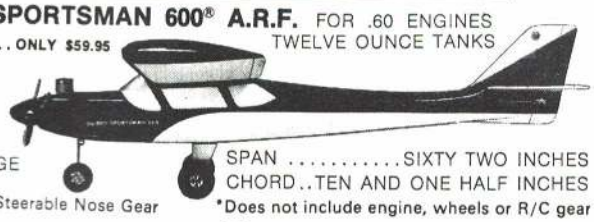

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Steerable Nose Gear
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Hinge Pin Locked In Place

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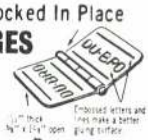

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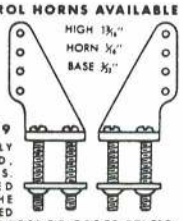

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The Original DU-BRO KWIK-LINK

EACH 49¢

Control Yoke Assembly for any control linkage. Allows easy removal for on-the-field adjustments. 4" rod. Split coupling sleeve. **Cat. No. KL-48**

12" KWIK-LINK Cat. No. KL-12 49¢

R/C TANK FILTER

- Combination Weight And Filter
- Designed To Fit All Clunk Tanks
- Made of Sintered Bronze To Give the Ultimate in Filtering

98¢ ea.

DU-BRO DURA-V-LINK

For use with Du-Bro Dura-Connectors and Du-Bro Dual Take-Offs. Also ideal for other servos with five-tooth drive take-offs. Spring steel. **Cat. No. DVL-1**

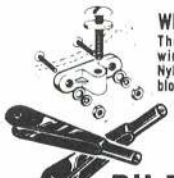
49¢

WING BOLT SET—WB2

Complete set of 22 PIECES

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

ONLY $1.25



75¢

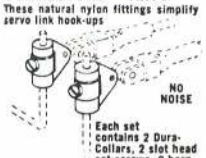
DU-BRO KWIK-LINK CLEVISES

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

Strip Aileron Horn Wire

CONNECTORS— AH79

These natural nylon fittings simplify servo link hook-ups



Each set contains 2 Dura-Collars, 2 slot head set screws, 2 horn connecters

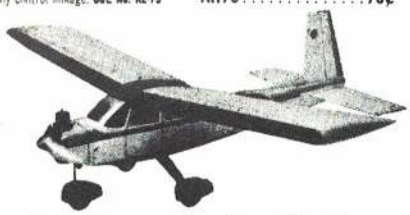
AH79 . . . . . 79¢

DU-BRO SERVO MOUNTING HARDWARE PACK

Hardware for one servo—4 ea. bolts (3-48), washers, spacers and blind nuts. **Cat. No. SM-55**

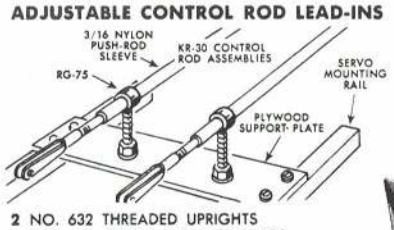
SET 55¢

FIVE PACK ALSO AVAILABLE: Ideal for multi-channel—enough hardware for 5 servos. **Cat. No. SM-239 $2.39**



DU-BRO RG-75 ROD GUIDES®

ADJUSTABLE CONTROL ROD LEAD-INS



2 NO. 632 THREADED UPRIGHTS
2 3/16 I.D. SLEEVE RETAINER RINGS
2 632 STEEL HEX. LOCK NUTS
2 NO. 6 FLAT WASH. 2 NO. 6 SPLIT WASH.
2 632 BLIND MOUNTING, STEEL NUTS.
REQUIRES LESS SPACE—SETS UP FAST
POSITIVE MOUNTING. **RG-75 12 PIECES 75¢**

Aero Commander Specifications

Wing span—49". Wing chord—8". Wing area—388 sq. in. Length—36". Flying wt.—3 lbs. 12 oz.
Installed fuel tank mount. Motor Mount MM1 included. $34.95

*Does not include engine, wheels or R/C gear

SCREW (No. 2) Sheet Metal (20)
60 PIECES SS 120
SMALL SERVO
WASHER (FIBRE) (20)
SPACER (20)
MOUNTING HARDWARE
DRILL 1/16" HOLE
Enough For Five Servos **$1.20**

LONG WRENCHES

6 INCH REACH

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

LW98, pair . . 98¢

DU-BRO DURA COLLARS

4 EACH 69¢

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

DU-BRO MOUNTING BOLTS & BLIND NUT SETS

For mounting engines—large or small. 4 ea. bolts, flat washers, lock washers and blind nuts per set. (15 pcs.) Four sizes:

MB256 2-56 x ½" **39¢** **MB440** 4-40 x 1¼" **45¢**
MB348 3-48 x ¾" **39¢** **MB632** 6-32 x 1¼" **45¢**

WHEELS featuring the 6 Spoke Dura-Hub

REGULAR

NH-1	WHEELS 2¼"	2.59/pr
NH-2	WHEELS 2½"	2.79/pr.
NH-3	WHEELS 2¾"	2.99/pr
NH-4	WHEELS 3"	3.19/pr
NH-5	WHEELS 3¼"	3.39/pr
NH-6	WHEELS 3½"	3.59/pr

175R	WHEELS 1¾"	2.19/pr
200R	WHEELS 2"	2.39/pr
225R	WHEELS 2¼"	2.59/pr
250R	WHEELS 2½"	2.79/pr
275R	WHEELS 2¾"	2.99/pr
300R	WHEELS 3"	3.19/pr
325R	WHEELS 3¼"	3.39/pr
350R	WHEELS 3½"	3.59/pr

LOW BOUNCE

Low Bounce "SLICKS"

225S	WHEELS 2¼"	2.59/pr
250S	WHEELS 2½"	2.79/pr
275S	WHEELS 2¾"	2.99/pr
300S	WHEELS 3"	3.19/pr

Cherokee Arrow Specifications

Wing span—49". Wing chord—9⅛". Wing area 447 sq. in. Length 35½". Flying wt. 4 to 4½ lbs.
Steerable Nose Gear NG1—Motor Mount MM1
Aileron linkages AH79 and LB89 included. $39.95

*Does not include engine, wheels or R/C gear

ORDER . BUILD . . FLY . . . NOW!

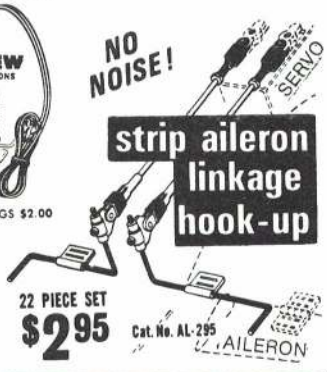
DU-BRO KWIK GLOW

KG-200 GLO-PLUG CONNECTOR

THE IDEAL GLOW PLUG R/C ENGINE CORD SET. SLIM 1⅜" BY ¾" ONE PIECE BRASS BARREL SNAPS ON TO PLUG. NO FLIMSY SPRINGS OR CONNECTIONS. WIRES FIRMLY ANCHORED IN TOUGH PLASTIC—CAN'T JERK OUT. EXCELLENT ACCESSORY FOR TODAY'S KIND OF R/C MODELER. ENGINES .10 AND UP. APPROX. 24½" LONG.

KG-200 WITH ATTACHED BATTERY LUGS $2.00

NO NOISE!



Complete . . . fully adjustable . . . can be used on any high, mid or low wing plane.

22 PIECE SET $2.95 Cat. No. AL-295

DU-BRO SOCKET HEAD BOLT & BLIND NUT SETS

For those who prefer socket head bolts. 4 ea. bolts, flat washers, lock washers and blind nuts plus one Allen wrench per set. (11 pcs.) Two sizes:
Cat. No. SH4—4-40 x 1"
Cat. No. SH6—6-32 x 1"

SET 98¢

DU-BRO BLIND MOUNTING NUTS

Can be used on ⅜" plywood (without sticking thru) and thicker. 4 per pkg. 4 thread sizes:

Cat. No. BN256 (2-56) **Cat. No. BN348** (3-48) **Cat. No. BN440** (4-40) 4 EACH 25¢
Cat. No. BN632 (6-32) 4 for **30¢**

Prices & specifications subject to change without notice.

P.S. For best service, see your dealer. If not available write direct.

Mail order prices, F.O.B. factory.

DICK'S DREAM PLANE KIT
For the Beginner or Expert!
(Designed especially for pulse)

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

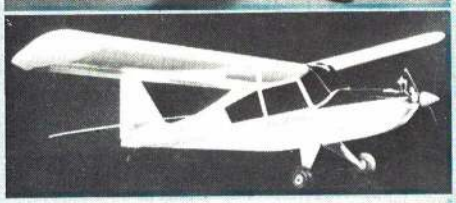
This kit of the Dick's Dream, designed by Owen Kampen, has been extensively test flown in various parts of the country. It has several innovations which are for the small breed of airplane specifically, and with the foam wing the beginner is assured of overcoming a big drawback to success. Features crutch type fuselage construction to assure line-up and accuracy.

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 taper wing foam sections), 5½" 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, Tee Dee .020 with the Commander R/O Baby Twin will do the job--it'll do everything in the Rudder Only book!

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



RUDDER ONLY PLANE PLANS

We are offering plans especially for flight proven small planes. They are for PULSE R/O, and require systems of no more than 3 oz. Build small--have a ball!

SKAMPY

Goodyear type mid wing by Owen Kampen, especially for Ace taper foam wing; R/O Pulse.
No. 13K101—Skampy Plans $1.00

CITABRIA

Semi-scale by Roman Bukolt. 34" span--has details for built up wing, but may be used with our foam wing. R/O Pulse.
No. 13K30—Citabria Plans $1.00

NOMAD

Ted Strader's design, this 48" glider with power pod, up-dated with Russ Merrill's Rudder-Only installation. Simple to build. NOT for foam wing. Has probably given more people their first R/C thrill than any design ever published.
No. 13K12—Strader's Nomad Plans $1.00

ACE R/C INC.

HIGGINSVILLE, MO. 64037

SEE YOUR DEALER FIRST! If he can't supply you, order direct from the factory. Quick Service. Minimum order $3.00. Remit by Money Order, bank draft or check.

Dear Friend:

Our mini foam wings are really moving on. It is clear from our mail that the scratch designer and builder is having a field day.

Sometime ago in this column we said that Bob May of Moore, Oklahoma had built a Mini Stick using rudder only pulse and our constant chord foam wing. A photograph of that plane is shown.

Bud Atkinson is at work on a Micro Cat, which is along the lines of his famed Aristo Cat series. Bud also says he has several ideas for semi scale jobs using both the constant and taper sections, and he hopes to be developing these as the season goes on.

John Chapis of Maryland has developed a semi scale P-38 with an .049 (one) which at 23 oz. flies beautifully on rudder only.

Owen Kampen has developed a bi-plane which uses two taper sections, and which is showing exceedingly great promise.

Upstarts, Bonzos, Cassutts, and other race types are being built by the hundreds--probably many more are being started. It appears as though 1/2 A Midget Racing will be the fun deal that all of us who had a part in developing it hoped it was to be.

Last month we mentioned the Ace-High Glider. We want to say just a bit more about that this month.

The Kampen-designed Ace-High was a Toledo show stopper. We received many inquiries concerning plans and/or a kit.

We're happy to tell you that plans and construction article for it will appear in American Aircraft Modeler in the near future.

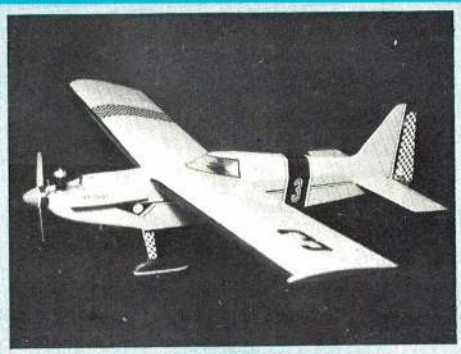
We said we would have a kit. We WILL. We're holding up the info concerning price and availability until we are certain of all angles.

We're quite proud of our production record of our two plane kits so far. On the Dick's Dream we announced January delivery--we missed by just four days. On the Upstart we announced May delivery--we beat our promise by about a wek. We want to uphold that record with the Ace-High kit. So watch for announcements when we are absolutely certain we can deliver as promised!

Keep 'em pulsing.

Yours sincerely,

Ralph F. Runge



KAMPEN'S 1/2 A RACER UPSTART CUSTOM KIT

The Upstart by Owen Kampen is the first in a series of 1/2 A Midget Race-for Fun Airplanes! Featured in RCM, this event is catching on like wild fire.

Upstart has 34" span, 6" chord, 200+ sq. in., an overall weight of 20 to 26 oz., designed specifically for two channel R/C systems or two servos of any digital set. For use with rudder and elevator only. Rudder response is so effective that ailerons are not required! Motor control is not used.

The Ace kit contains our constant chord foam wing, and is a deluxe Custom kit with all of the balsa and ply-wood parts band-sawed and precision-sanded from prime Micro-Cut.

This means that this is the highest quality possible and assures you of a kit that will go together accurately and quickly.

Does not contain wheels, linkage, covering material, optional spinner, or other accessories.

No. 13L102—Kampen's Upstart Custom Kit 10.95

ACE MINI FOAM WINGS
Ideal For New 1/2 A Racers!

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

The constant chord measures 35" span, width is 5½". Area is 192.5. Weight about 3 oz.

The taper section is 35" span, center is 5½" which tapers to 4". Area is 166.24. Weight is just over 2 oz. Come in two 17½" pieces which may be easily epoxied for desired dihedral.

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

TOPCOTE

Top-CotE by Quick-N-Easy Products is a polyester film covering material that is applied with heat--or in case of foam wings will adhere with its own tackiness. Weighs less than 1/4 oz. per square foot and will accept dope, lacquer or epoxy paints by brush or spray. Will not wrinkle on planked or foam surfaces. Crystal Clear or Silver Chrome.

No. 24L160—TopCotE Clear 26 x 60" $3.95
No. 24L161—TopCotE Chrome 26 x 60" 5.95
No. 24L162—TopCotE Clear 26 x 120" 6.95
No. 24L163—TopCotE Chrome 26 x 120" 10.95

By special arrangement a size of 26 x 20" is offered which is just right for covering one Ace Foam Wing. Available Clear or Chrome.

No. 24L164—TopCotE Clear 26 x 20" $1.45
No. 24L165—TopCotE Chrome 26 x 20" 2.15

NICKEL CAD STARTING BATTERY

We have some more surplus 4 ampere hour nickel cadmium wet cell starting batteries. These are unused surplus, and have been filled, but will need to be charged before initial use.

Measure approximately 1/2 x 2 x 6" over all, and are 1.25 volts.

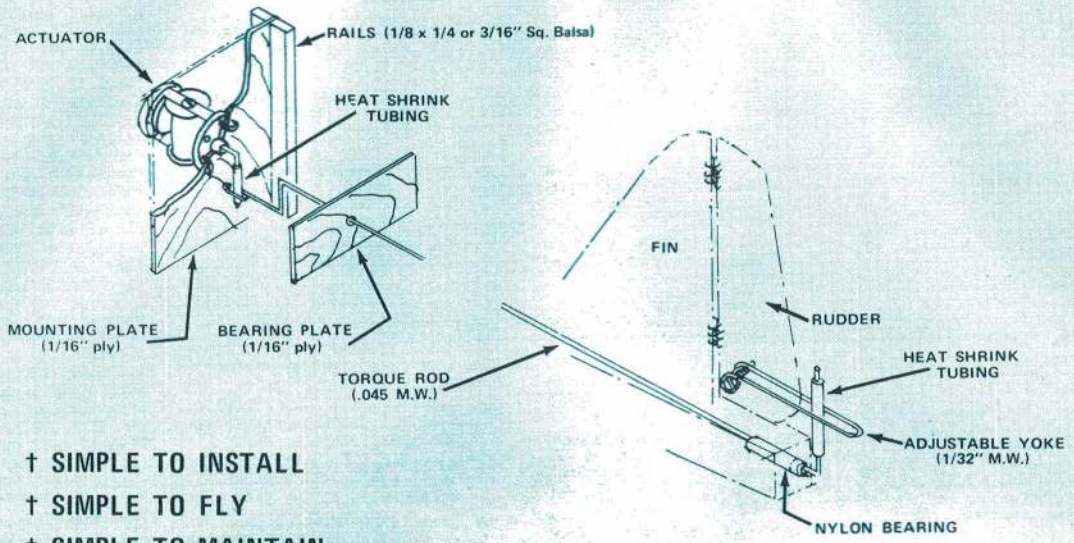
Will save you money in the starting of your Glo Engine and may be adapted for this use with any of the available type of connectors.

No. 38K2—Surplus 4 ampere hour wet nickel cadmium starting battery $2.95

(Add 50¢ handling-postage)

PULSE PROPORTIONAL .. Best Choice for You!

THE SIMPLE SYSTEM--



† SIMPLE TO INSTALL
† SIMPLE TO FLY
† SIMPLE TO MAINTAIN
† SIMPLE TO REPAIR
† SIMPLE TO OWN – (Prices begin at $59.95)

Designed for the new small PRACTICAL flying machines. These designs really fly--and fly well; not in the novelty class. Easy to build, low in cost, inexpensive to fly. Fly in limited areas.

RUDDER ONLY PULSE IS:

* FULLY PROPORTIONAL

* LIGHTEST WEIGHT--2.5 oz. for the Baby w/225 ma nicads.

* LOWEST COST--begin at $59.95! (less batteries and charger).

* SIMPLEST--only one moving part, easily serviced and maintained; noise free.

* VERSATILE--Arrange to suit your particular installation. You can go up or down in size without obsoleting your receiver or transmitter. Simple changes of battery packs and actuators allow change at will. Or add Motor Control to Standard or Stomper--using same battery pack.

* GREAT for Beginners--FUN for Experts.

ALL UNITS ARE COMPLETELY WIRED, TESTED, GUARANTEED

COMMANDER R/O PULSE COMBOS With All Batteries And Charger

Our Commander R/O Pulse Combos are available in 4 sizes for most sporting needs from the smallest to the larger aircraft--or boats.

The Baby is for .010 to .020 jobs. Has two 225 ma Nickel Cadmiums and the regular Baby Adams. Airborne weight is 2.5 oz.

The Twin Baby is for hot .010 to .020 jobs. As above, except uses Twin Baby actuator. Airborne weight is 2.9 ounces.

The Standard uses the Single Adams for more power for .049 to .07 size. Uses larger capacity nickel cads. Airborne weight is 4.5 oz.

The Stomper uses the Twin Adams actuator for up to .15. Airborne weight is 4.9 oz.

No. 10G15—R/O Baby Combo	$69.95
No. 10G15T—R/O Twin Baby Combo	72.95
No. 10G16—R/O Standard Combo	71.95
No. 10G17—R/O Stomper Combo	74.95

26.995, 27.045, 27.095, 27.145 & 27.195 MHz
Specify frequency desired

BASIC PACKAGES--less batteries, charger --Prices begin at $59.95. See catalog.

BEST SELLER

We're on the SECOND Printing of our 1971 Handbook Catalog! The demand exceeded expectations. One of the reasons is that it contains the most comprehensive information and data for Pulse Rudder Only published anywhere. Send coupon and $1.00 today. Refundable on your first order.

Don Dewey says: "This should be in the library of every modeller!" Walt Schroder says: "An exceptionally well done job."

NEW HANDBOOK-CATALOG
(Completely Revised)

Our NEW Handbook-Catalog has been completely revised to make it easier to locate items you are looking for. More items on less pages, to save you time.

Also contains complete info on what makes Pulse Rudder Only work and why it is your best bet.

Price is just $1.00 via THIRD CLASS MAIL. Refundable on your first order of over $5.00.

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Guaranteed delivery anywhere. Orders over $5.00 sent prepaid. Orders under $5.00 please add 50¢ for postage and packing.

SUDDEN SERVICE PLANS

No. 0101, Undone I — R/C Pattern plane for 60 engine for new maneuvers and lightweight equipment. Wing span 59". $3.50

No. 0102, Skyvan — Semi-scale twin 049-powered STOL transport. Simple construction, all-balsa. For C/L. $1.50

No. 1191, Scimitar — Unusual-looking R/C stunter. High-speed maneuvers, clean tracking. 60 engines. Low-tail Rivets look. By Joe Foster. $3

No. 1192, Ryan Mailplane — Light, F/F, with plenty of details. For rubber indoor or outdoor. Plan has scale views. $1.50

No. 1193, Mig 21d — 40-powered C/L version of Russian fighter is fast, stable flyer. By Roland Baltes. $2.50

No. 1194, 1937 Gas Model — Half-size 049 copy of great old-timer. Has durability and easy-to-fly characteristics. Frank Ehling. $2

No. 1091, Halberstadt — Nearly scale R/C WW I fighter with semi-symmetrical 6' wings. 60-powered. Two sheets. $4

No. 0791, Pusher Galore — Bill Hannan's all-sheet, rubber pusher for Tenderfoot. Looks like supersonic transport. $.75

No. 0894, Voltswagon — Trainer and stunter by Marsh for electric tether flying with slot-car motors. Plans for the pylon included. Great club activity. $1.50

No. 0794, Skimmer Airboat — Sled-type fun watercraft by Paul Hook. .09 engine, R/C rudder, throttle. $2

No. 0991, Flashby I — Rakish-looking all-balsa ROG by Wayne Brown. For the Tenderfoot. Tricycle gear. $1

No. 0992, Fouga Cyclone — Scale model of jet-assisted French sailplane, by Nick Ziroli. Gains altitude easily on 09 engine. A two-piece 7-ft. wing. For R/C. $3.50

No. 0993, La Jolilta — Profile 15-powered Goodyear C/L racer by James Kloth, fast, groovy. On mild fuel and engine does 85 mph. $1.25

No. 0892, Taylor Cub F-2 — Sport, F/F, scale, .020. Stick-and-tissue. By Schreyer. $1.75

No. 0893, Martin MO-1 — Rare WW-1 era monoplane, carrier fighter ideal for Class 1 Carrier. Ailerons keep lines tight at low speed. By Reeves. $1.50

No. 1181, Junkers D-1 — Joe Tschirgi 1918 fighter, proportions for perfect R/C scale. .45 engine. Low-wing has 500 sq. in. $2.50

No. 0191, Curtiss-Wright Jr. — Robert Hawkins transformed open-cockpit pusher of thirties for single channel. First step into RC scale. Span 44". Use .049. $2.50

No. 0192, Skyraider — Mottin's Navy Carrier, fast, light, .40's or .60's. Easy construction. $2.50

No. 0193, Cutie Coupe — Coupe d' Hiver F/F by Dave Linstrum. Quick to build with all-sheet surfaces. Your first rubber contest model. $1.75

No. 0291, R/C Nobler — Ed Sweeney's conversion of famous C/L stunt ship. A highly maneuverable R/C. Only .40 for all AMA/FAI stunts. $2.50

No. 0491, Emeraude — Duke Crow reduced famous home-built to R/C size (65"). .40 to .60, does stunt pattern. Gentle. Two sheets. $3.75

No. 0591, Small Fry Special — Mottin's C/L trainer for Tenderfoot. Easy to build. An .049. $.75

No. 0592, Messerschmitt Bf. 109E — R/C, semi-scale by Munninghoff. Mean look of efficient fighter. Two sheets. $3.75

No. 0593, Manta — Howard Kuhn's Boost Glider for model rockets easy to build from sheet. A winner. $.75

No. 0691, Jr. Sky Squire — R/C sport-trainer by Jess Krieser, .09 to .19. From Galloping Ghost to multi-digital proportional. Span 48" (416 sq. in.), 3 lbs. $2.50

No. 0692, ½A Sky Squire — Small version famous Sky Squire. 1 ch. rudder-only, or rudder, elevator and motor on Galloping Ghost. Only 22-28 oz. $2

No. 0693, Mustang — Rabe's great near-scale C/L stunt. Flies pattern with ease. ST 40. Over 57". $2

No. 0792, Rivets — Speedy, responsive R/C. Owen Kampen design for .020. Adams Baby Actuator, rudder-only. $1.75

No. 1183, Corrigan — James Wilson's unique ½A C/L stunt model. Flies tail first! Stable like big stunt ships. Easy to build, 23". $1.75

No. A693, Sweeper — Windy Urtnowsky's giant, C/L stunter, 78" span. .60 up front. Many trim adjustment features. $2.75

No. A695, Lady Maxiey — Brian Donn's A/2 Nordic towline. Davis 3 foil. Ritz construction. $1.50

No. A697, Dwarf Dip III — Easy to fly, rubber Coupe de Hiver by Charles Sotich, a winner! For small fields. Warp-resistant. $1.50

No. A691, E A A Biplane — Nick Ziroli's scale R/C uses .40 engine, full house gear. 38" wings, semi-symmetrical foil, box-and-stringer fuselage. Two sheets. $2.50

No. A692, Miracle Worker — John Blum's C/L trainer. Combat, carrier, stunt. Easy-to-build profile. .35 engine. $1.50

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No. 1293, A/Wonder — Simple all-balsa A-1 towliner by Bob Stalick. Ideal for beginners at towline events. $1.50

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No. 0202, Push-Air — For Brown's tiny CO2 engine. Simple F/F by Ehling, like Curtiss-Wright Jr. $.75

No. 0203, Ole Tiger — Bob Morse's swift Formula I R/C of Bob Downey's famous racer. K&B 40. $3.50

No. 0204, Classical Gas — Haught's C/L stunt for 35, for flyers graduating from profiles. $2

No. 0205, Kestrel — Dave Boddington's delightful R/C rudder-only soarer with 02. $1.50

No. 0302, Bearcat — Al Rabe's stunt C/L was talk of the 1966 Nats. Aldrich customized ST 46. $2.00

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No. 0304, M. K. Sportster — Ho Fang-Chiun's cute cabin free-flight takes 049 power. $1.25

No. 0401, D-H 88 Comet — Scale twin by Skip Williams from Jan. '69 centerspread for .20's. Fast, stable, can fly pylon rules. $3.75

No. 0402, Lively Lady — World Championships winning Nordic by Elton Drew. Well detailed plan. All weather flyer. $3.75

No. 0404, Sweapea — C/L Goodyear by Williamson for club project also is tough trainer. For 35 engine. Balsa cutting guide incl. $2.50

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No. 0503, Royal Marine — By Yuji Oki of Japan, magnificent seaplane with 6' wing. Two 40's or one 60. Graceful lines, smooth flyer, handles easily on water. Two huge plan sheets, every part shown in detail. $8.00

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No. 0603, Waco — Delightful bi-plane, stick and tissue, rudder-only RC on 09 to 020 for FF. Very well detailed plan. $2.50

No. 0701, Suds — Nimble RC for sport or competition. One-piece construction, 40 to 60 engines. Build fast from standard balsa sizes. By Joe Dolan. $4.25

No. 0702, Contender — Military-like RC, also Sport/Stunt type for 35-60. Tri-gear, removable no-dihedral wing. Fast building. By Dave Platt. $4.25
Special Offer: Get both Suds and Contender plans for only $7.00

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THIS MONTH'S PLANS

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No. 0704, Helldiver—Semi-scale CL model of WW II torpedo bomber builds fast and is rugged. $1.50

(continued from page 66)

504G—504B's converted for RNAS as gunnery trainers.

504H—504C modified for first shipboard catapult experiments.

504J—major production version; first were modified 504A's; 100-hp Gnome Monosoupape or 80-hp LeRhone; ordered late 1916, used until 1921.

504K—most common version; some were converted 504J's, others first ordered as 504A or 504J; 100-hp Gnome Monosoupape, 110-hp LeRhone, 130-hp Clerget or 100-hp Sunbeam Dyak.

504K, Mk. II—504N with 130-hp Clerget; mainly civil.

504L—504K with twin floats; 130-hp Clerget or 150-hp Bentley B.R.1.

504M—few built in 1919; enclosed 3-seat tourer; 110-hp LeRhone or 150-hp Bentley B.R.1.

504N—built 1922-1931; replaced 504K as standard RAF trainer; like 504K, with 150-225-hp Armstrong Siddeley Lynx; civil version had Armstrong Siddeley Mongoose.

504O—504N with floats; Armstrong Siddeley Lnyx IVc.

504P—side-by-side trainer.

504Q—one specially built with twin floats and enclosed cabin for Oxford University Polar Expedition.

504R—Gosport built 1926; 504K with 100-hp Gnome Monosoupape, 100-hp Bristol Lucifer or 150-hp Armstrong Siddeley Mongoose.

504S—504R with Bristol Lucifer.

519—2-seat fighter with 504 wings, modified 504E fuselage; 150-hp Sunbeam Nubian.

536—stretched 504K; four passengers in rear seat; 130-Clerget or 150-hp Bentley B.R.1.

546—Limousine; 536 with enclosed passenger cabin; 150-hp Bentley B.R.1.

548—504K with two-passenger rear seat; 80-hp Renault or 90-hp RAF Ia.

548a—548 with 120-hp ADC Airdisco V-8.

552—504K on floats with 200-hp Wolseley Viper.

582—Tourer; 504N with special high-lift, symmetrical-airfoil wings.

Tops in Trainers

Curtis SB2C-1

(continued from page 26)

bellcrank is 1/8" plywood and its gusset plate and the wing tips are 1/8" sheet balsa. Rib 8 is cemented to the landing gear plate to provide an area for wing covering.

Four 2" finishing nails in the outer wing tip provide normal outer wing weight. The wing is covered with Silkspan, except for the center area which is left open to permit cementing the wing to the fuselage before completing hookup of the pushrod to the elevator. Leadout wires and a 2-in. Perfect Bellcrank must be added before covering the wing. Leadout wires pass through 3/32" dia. brass tubing at wing tips. The tubing must be cemented securely since it takes quite a bit of strain during flying.

The 3/32" dia. landing gear wire is attached to the 1/8" plywood panels located on the wing. I sewed the wires to the plywood with soft brass wire and used plenty of Titebond cement.

Finishing: Sand all balsa parts with No. 300 sandpaper. Give the entire model two coats of clear dope and sand again. Give the balsa parts two coats of sanding sealer and sand once again with No. 300 sandpaper. The open area is covered with Silkspan.

The top half of fuselage, where indicated, top of the stabilizer, rudder, and top of the wing are painted dark blue; the lower fuselage surface, underside of the wing, and the stabilizer are painted light grey. Finishing Touch decals are added as shown, together with serial numbers, and two plastic pilot heads. Decorating the model is up to the individual, but it is worth spending some time to do it right. Appearance increases the pleasures of any model.

Flying

The plane is powered by a Fox 15, which pulls it along smartly. The engine is supported by a Tatone short 15 mount, attached to 1/8" plywood by blind mounting screws on the inboard side so that the mount angles out a little for maintaining positive tension on the lines. The engine needs a needle-valve extension. For mine, I soldered a 1/8" dia. section of brass tubing and bent it at right angles past the cowling for easy turning.

The model must be slightly nose heavy so that it is not too sensitive on the lines. I used 52-ft. lines, .012 dia.; 35-ft. lines may be used by those who don't mind turning a little faster.

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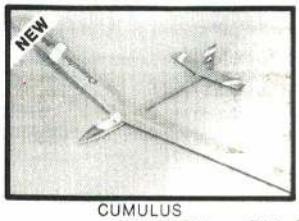

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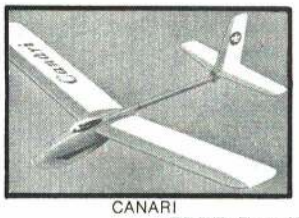
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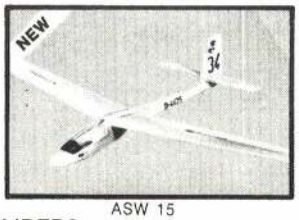

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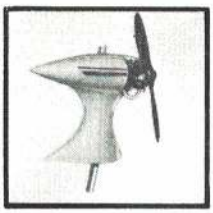

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Phoenix 5

(continued from page 16)

discussion, since I believe in structural simplicity. Fuselage sides of 3/16" medium balsa are made from 4 x 48" stock and are doubled with plywood in the saddle area because of the thin section at the canopy. Build up the turtle back by gluing the sheeting to the side pieces first and allowing to set. Then moisten, glue and pin or tape the soft 3/16" side sheeting to the 3/16" cap. Do both sides together to prevent twisting the fuselage. When dry, glue the second 3/16" cap on top and shape to the cross section shown.

A drum sander (obtainable at many hardware stores) is handy for hollowing out the forward top fuselage block. Fill in around the nose with scrap and shape to the circular nose former and cross sections shown. Pre-drill landing gear, engine mount holes and fuel feed and vent holes prior to installation of the firewall in the fuselage. Former 3 is shaped to cradle a Sullivan 12-oz. square tank. Do not use a round tank because vibration will turn it. A BK nose gear was used on the fixed-gear Phoenix, but many other types are suitable.

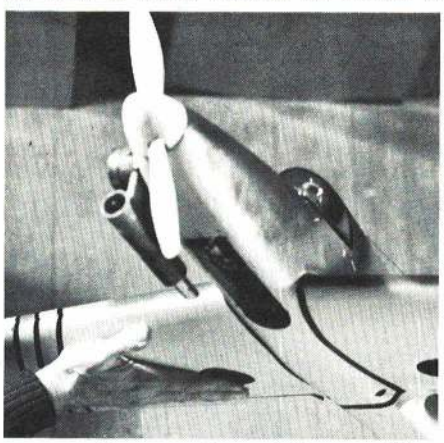
To strengthen and enhance appearance, fillets around the horizontal tail and vertical fin are made of Epoxolite, Snowite, or other filled epoxy or polyester materials. Use a constant 1/2" radius fillet around the wing.

Use the hot wire method to cut the wing and horizontal tail from patternmaker's foam. Sheeting may be 1/16" medium or 3/32" balsa soft sheeting, 1/64" plywood Marvelite or .025", 5-ply construction paper (available from print shops). The 1/16" balsa, Marvelite and construction paper form around the leading edge of the wing without difficulty. Anything harder than soft 3/32" sheet will be difficult. Do not attempt to wrap the leading edge of the stab but use separate top and bottom sheets.

A technique for a good bond with minimum glue weight is as follows. Sand the foam cores smooth after cutting. Paint the cores with a light coat of No. 3 shellac, which is applied with small pieces of cellulose sponge. This smooths it on and keeps excess to a minimum. Use the shellac treatment on

the cores to seal the foam and minimize the amount of glue needed. Shellac also seals the foam against penetration of solvents, which results in softening and the unbonding of finishing materials when applied later.

Balsa sheeting for the complete wing half is pre-glued and then applied to the wing. Other materials are large enough to wrap the wing half. Draw the entire skin pattern on the sheeting before applying glue and leave about an inch of excess material all around to



accommodate any minor misalignment. When drawing the pattern, locate the wing leading edge parrallel to the material grain.Otherwise a good leading edge wrap cannot be made.

Super Weldwood Contact Cement is applied to the skin and core with small pieces of cellulose sponge. When using this glue, it is important to coat the cores with shellac since the glue is very thin and will soak into untreated foam.

To apply wing sheeting, coat the foam and sheeting with contact glue and allow to set. Lay sheeting on a flat bench, align and stick down the trailing edge. With someone holding the sheeting, roll the wing onto the sheeting toward and around the leading edge, being extremely careful to pull tightly and press firmly when rolling around the leading edge. Continue the operation, rolling back to the trailing edge. Ensure good allover contact by rubbing firmly.

Join the wing panels after covering and wrap the joint with light fiberglass cloth and epoxy. Use a sander to grind down the front of the wing to the flat shown and inset the plywood piece. I use a 1/4" aluminum dowel and run it back to a 1/4" hole in the dihedral brace.

The ailerons cannot be made of standard trailing edge stock because of their thickness at the leading edge. This yields a desired soft aileron response around neutral.

Assembly

Set the wing, tail and engine at zero-zero. I have tried offset thrust on this design but never could trim the airplane properly. (Offset seems to work on Phoenixes 1 through 4.) Balance is not too critical; just try to get close to the balance point shown. If it sits on the nose gear hard enough to steer that will be safe. When a Phoenix 5 with the CG 1" behind that shown on the plans was flown recently, it had no bad characteristics.

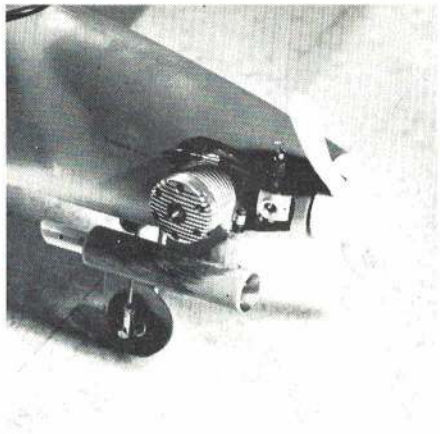
Set up the ailerons with zero differential. Rake elevator horns forward 15 degrees as shown to provide more down than up. Keep the elevator horns as close as possible to the fuselage. Rudder throw should be the maximum possible, expecially for the

wingover or Figure M. The elevator pushrod is simply a single rod back to forked Du-Bro Kwik-Links. Keep bends to a minimum and try for a straight shot to the elevator horns. A little angling out through the side slots will be necessary. Bend against the sides of the fuselage to give stability and to form a guide for the twin Kwik-Links.

Keep pushrods as straight as possible to preclude buckling and poor control. Always use the maximum of wood and a minimum of wire. Never use 90-degree bends. Should they seem necessary, rework the installation to eliminate or reduce the bends. A good test is to apply a load to the surface. If the pushrod buckles before the servo moves, it isn't good enough. As preliminary control settings use the following: 1/4" up and down for ailerons; 1/2" up and 5/8" down for elevators. The rudder on my Phoenix moves 1 1 4" right and left. These movements may be adjusted to suit individual taste and style of flying.

Flying

The not-so-expert will find this airplane a little on the fast side, because of its clean design and small cross section. It is by no means nasty and simply goes in the direction it's pointed. It will land hot unless the pilot flares. It can be held off to a good angle of attack without stalling and it settles in very well. Main gear landings can be made without touching the nose for a touch and go. Every maneuver, including the knife edge, can earn ten points if the flier is proficient enough. I have done 180-degree turns in knife edge.



Standard knife edge is automatic without corrective elevator or ailerons if trimmed properly.

The ship will not loop in knife edge, but it is not designed for that maneuver. Spins upright or inverted are easy, with a little more lead required for recovery from upright. Snap rolls are a "snap," with quick recovery either inside or outside. Slow speed or partial throttle maneuvers are fun, since the ship handles well at slow speed.

Fiberglass fuselages are available on a custom, limited-order basis from Jim Masters, 7410 N. Dakar Ave., Dayton, Ohio. Weighing about a pound with beam mounts and firewall installed, they incorporate a beautiful deep wing fillet and a solid canopy area.

DESIGN EVOLUTION OF THE PHOENIX

	Wing Area	Wing Sweep	Wing Section	Other
Phoenix 1	720 sq. in.	23 degrees	Semi-symmetrical originally, 17 to 19 percent root to tip	
Phoenix 2	720 sq. in.	15 degrees	Semi-symmetrical originally, 17 to 19 percent root to tip	Decreased tail moment
Phoenix 3	720 sq. in.	25 degrees	Semi-symmetrical originally, 17 to 19 percent root to tip	Raised wing Lowered engine
Phoenix 4	640 sq. in.	12 degrees	Symmetrical originally, 17 to 19 percent root to tip	Shortened nose and tail moment Raised wing
Phoenix 5	640 sq. in.	12 degrees	Symmetrical originally, 17 to 19 percent root to tip	Lengthened nose and tail; increased fuselage side area; raised wing; lowered tail

Getting Started in RC

(continued from page 42)

applied both to drivers and to motor amplifiers). This is why a center-tapped battery is needed for the model's control equipment. The full voltage of the four cells is utilized everywhere in the system except for those last amplifiers and the servo motor.

A pulse stretcher, as was noted, is simply an amplifier. But the pulses to the servo from the decoder are of very short duration and must be lengthened so that the servo will receive practically steady power whenever it is required to turn, rather than a series of very short kicks of power. The stretcher is really just an electrolytic capacitor of about 1 mf which effectively lengthens the output pulses of the stretcher amplifiers to give more steady power to the motor. Actually, most servos can be felt to move in pulses, but their output is far more steady than it would be without the stretching feature.

One more vital servo amplifier feature is the so-called feedback setup. Supposing the servo receives pulses from the decoder such that it has to move in either direction—how does it know when to stop? The feedback coupling does the trick, and consists of a variable element for the monostable MV linked mechanically to the output gearing of the servo motor.

In Heath servos, the variable element is a capacitor (as was the case in the original Kraft KPS9 servos, since Heath utilizes much Kraft circuitry under license). One maker (F&M, no longer in business) relied on a variable inductor—a movable iron core inside a coil of wire.

In any of these cases, the end result is the same. The servo motor drives the variable circuit element which changes the servo multi-vibrator period or length of pulse. If the decoder pulse varies from that of the servo MV, the servo motor runs until the MV pulse is the same length as that from the decoder, when power to the servo motor is cut. Thus, the servo automatically follows the movement of the transmitter stick, and stops when it reaches the degree and direction of stick movement.

Digital servos have only one adjustment—the exact setting of the feedback element. This must be done when the servo is first assembled so that the servo will center when transmitter control sticks are centered. If one servo in a system does not center correctly, but other servos in the system do when attached to the same receiver output, it's a sign of either a defective servo or the need for this feedback adjustment. However, don't tinker unless you are sure of what you are doing!

We hope this discussion clears up some of the mystery of why and how digital systems operate—and will not convince the user the whole business is done by black magic!

Blue Ribbon Review

(continued from page 27)

for the antenna protrudes only 1/4" above the case, and the primary support comes from the molded portion visible inside the case.

The Royal sticks are smooth with little play at center. Centering seemed a little strong until we started to actually fly and then it was not noticeable. Royal states that "the Royal Dual Stick is manufactured for the non-contest flier" and, presumably, recommends the deluxe system incorporating Kraft sticks for greater precision. However, I have "flown them all" and I don't see that much difference. But then, I'm a sport flier. The servo at the other end of all systems has more deadband in any instance than stick deadband.

The transmitter is straightforward and is beautifully constructed, with wiring routed and tied as neatly as any I've seen. The encoder is mounted, along with the fifth and sixth channel pots, onto a nylon battery case containing a 6V pack of 1.2 ampere-hour cells. The encoder is timed by a free-running multivibrator at around 30 frames per second. The six individual control pulses are set by half-shot multivibrators, with the direction for each determined by the broad adjustment pot visible on the decoder board. Motorola silicon transistors are used throughout the transmitter. Stable capacitors are Amperex mylars. The control pots appear to be Japanese-made and are of a hot-molded carbon type.

The RF section is a separate module located at the top of the case. RF filtering is extensive via miniature chokes. The output stage is unique in that three output transistors are used in parallel. All tuning is via trimmer capacitors. An RF output meter completes the circuitry. This transmitter uses a 6V supply, which is unusual. The power output is not diminished; thus, battery drain is higher, and 1.2 ah cells are used instead of the customary 600 mah cells. Transmitter weight remains at about 2.5 lb.

The receiver is housed in a high-impact plastic case 1 5/8 x 2 1/4 x 3/4" and weighs 1.7 oz. Eight leads emanate from the receiver: antenna, power, plus six signal leads. These terminate in two Brunner plug blocks, featuring gold-plated pins with maximum contact area. This insures that contact does not become intermittent. However, great caution must be exercised when unplugging servo and power plugs. No pulling on those wires!

Electronically, the receiver is new and makes use of integrated circuits for decoding. A double-tuned front end is followed by three 455 KHz IF stages. At the last stage, the signal is detected, the IF frequency removed, the output fed back to all three preceding stages and the front end for fast-acting AGC, and, finally, the detected signal is passed on for squaring and amplification. A squaring amplifier then produces the necessary clock pulses for decoding. The clock pulses are also coupled to a synchronization pulse stretcher, i.e., the synchronization stage is set by the first clock pulse and is held off by each following pulse until a discrete interval after the last pulse.

The clock and sync pulses are fed to a pair of triple J-K flip-flop integrated circuits, i.e., one flip-flop per channel. Since four flip-flops are required for the four-channel set, both

IC's are required. The beauty of IC's is that they are insensitive to the number of incoming channels and may be operated by a transmitter of from one to six channels. Thus, going from four to six channels involves no modifications to the receiver, except the addition of plugs and wiring for servos, and additional transmitter functions.

The decoder works as follows. The first flip-flop is turned on by the first clock pulse (at the same time the sync stage is set) and comes on for the duration of the first control pulse, i.e., until the second clock pulse is received. The first flip-flop is then held off by the sync pulse and cannot come back on for the duration of the frame. When the first flip-flop goes off at the receipt of clock-pulse number two, it turns on the second flip-flop which stays on until the third clock pulse is received, then goes off. (In all cases, we are speaking of the Q output of the flip-flops and the appropriate term is that the flip-flop "changes state.") Thus it goes until all clock pulses are received and the sync stage resets all flip-flops prior to the next frame of pulses.

One construction feature is unique to the receiver: a double-sided printed board is used to ease the problem of reaching IC pins without using jumper wires. All resistors are 1/10 watt, and silicon transistors, again from Motorola, are used throughout.

The test servos used were the Kraft KPS-12 servomechanisms and the Royal Electronics amplifier. This amplifier accepts a positive going pulse, converts the control information to an error signal and responds with an output thrust of approximately 3 1/2 lb. on a disk output at 1/4" radius for a torque of 0.9 in.-lb. Our servos were operated on the longer bar-type output arms at a radius of 3/8" and proved quite adequate for control of the Splinter airplane, despite extremely stiff control hinges. The KPS-12 weighs 1.2 oz. and is 1 7/8" in length, 3/4" in width, and 1 3/4" in height (to the top of the output wheel). This is rather academic in view of the number of servo choices for the unique needs of the modeler.

Presumably, the same servo amplifier is used for all servomechanisms. To fit the KPS-12, it is a two-deck affair, interconnected via flexible leads. Dacron foam is used to separate the decks and then both are wrapped with filament tape. Electronically, the servo-amp design is basically the same as for the original Classic servo. However, different transistors are used for better gain, and feedback is changed for greater stability. Servo-amp performance is excellent by any standards. Resolution, as measured by the ability to return to neutral without hysteresis, was plus and minus 0.75 degrees of wheel rotation without load. Further, the servo exhibits no greater than 0.75 degree error lag in either direction of travel—something which can be said for few servos other than those featuring bridge amplifiers.

The airborne pack is completed with the battery pack and switch harness. Because of the Brunner plug block, a male plug must be used on the output. Do not lay this plug down on metal objects which could cause a short between the pins. To minimize this problem, a separate charging plug is provided on the back contacts of the power switch. The 450F battery pack is 2.5" long, 1.45" wide, 0.62" high, and weighs 3.0 oz. This size battery pack gives four hours of continuous operation between charges; the 6V transmitter pack gives five hours between charges.

A separate, transformer-isolated dual charger is provided. The transmitter and receiver packs may be charged independently. Charging is indicated by a light bulb for each circuit.

The only criticisms of the system are the difficulty in unplugging servo plugs from the Brunner plug block and the need for slightly better packaging of the servo-amplifier. This system performs quite well and should satisfy the needs of any users, notwithstanding the slight deadband of the sticks. If that is a

hang-up, go ahead and get the set with Kraft sticks!

The Carrol Craft Splinter

The Carrol Craft Splinter is an ARF (Almost Ready-to-Fly) contemporary sport-stunt model, with a 60-in. span and 610 sq. in. wing area. It is designed for a 45 to 60 engine. The test model weighed in at about 6.5 lb. with the Classic set, a Webra 61 engine, and a full 10-oz. fuel tank.

The following steps are necessary to prepare the Splinter for flight. (1) Assemble the wing halves, using epoxy and covering the joint with a plastic reinforcement. (2) Install a bulkhead to seal the engine compartment (at the top only) and install the tank and engine. Be sure to install the nose gear before finally setting the engine in place. The engine compartment should be coated with epoxy before installation of the engine.

(3) Cement the stabilizer in place and add a set of tail fillets which strengthen this area tremendously. (4) Add the wing and stabilizer tips. (5) Add the pilot, cockpit decorations and canopy.

(6) Sand the balsa ailerons, elevator, and rudder to smooth shape and cover (we used MonoKote). Add hinges where required and attach to the appropriate surfaces. Be sure to use pins or toothpicks to ensure the integrity of hinge attachment. (7) Add trim and install the main gear.

Total time for completing the preceding steps was about twelve hours, and trim was kept to a minimum. A few minor criticisms of the construction and instruction can be made. The wing tips did not fit well, but were made to do. They really should extend back to the aft edge of the strip ailerons. Second, the polypropylene hinges provided are absolutely too stiff, and I recommend using regular pin-type hinges instead. Those with the kit were used in the test model but added an unnecessary load to the servo. DuPont Plastic Cement (not household cement) is recommended by Carrol Craft for "heavy load" areas and for attaching the canopy. I feel Silastic under the tail fillets would be better, since the plastic cement doesn't appear to stick well.

These suggestions are made only to assist in the assembly of the model and are not intended as criticism of a ruggedly built, light plastic model.

Since the weight came out quite light compared to most ARF's and to most contemporary stunt models, we expected a nice performance and were not disappointed. Initial warm-up, range check, and ground taxi proceeded smoothly. The bird handled well on the ground and was flown from a grass field. An inveterate "stick and rag" flier, I found the Splinter much to my satisfaction. It takes off like a scalded cat and will climb as long as desired. That extra pound of weight saved surely makes a difference. The Splinter, in expert hands with a good 60 engine, certainly is capable of the AMA and FAI patterns. However, a 12-oz. tank must be fitted instead of the recommended 10-oz. tank which we used.

Pitch maneuvers were superb; the ship tracks through them with no tendency to wander or fall off. Rolls were relatively slow because of the stiffness of the hinges mentioned earlier. Snap rolls and spins take a lot of rudder so don't back off on the 45 degrees travel called out in the instructions.

Landings with the Splinter are excellent. It has no tendency to snap or stall at reasonable approach speeds and response, even when dead stick, is excellent. All in all, it is a delightful bird to fly and a real contribution to the ARF field.

AMA Contest Calendar

(continued from page 59)

June 6—Harvey, Ill. (AA) Chicago Model Masters CL Meet. Site: Dixie Square Parking Lot. W. Webb CD, 15722 Vine Ave., Harvey, Ill. 60426. Sponsor: **Chicago Model Masters.**

June 11-12-13—Monroe, N.C. (A) 17th RCNC RC Invitational Meet. Site: Monroe RC Club. B. Helms CD, 800 Tyvola Rd., Charlotte, N.C. 28210.

June 12-13—Erie, Penn. "Beginners Day"—models for public display. Site: Amco Field. M. Blue CD, 22 Hall Ave., Lake City, Penn. 16423. Sponsor: **Erie Model Controliners.**

June 12-13—Elkgrove, Ill. (AA) 10th Annual Chicagoland RC Contest. Site: Mile E of Rt. 53 on Higgins Road. D. Wehrheim CD, 1841 W. Fletcher St., Chicago, Ill. 60657. Sponsor: **Chicagoland Radio Control Modelers, Inc.**

June 12-13—Snohomish, Wash. (AA) Pattern A-B-C/N-C/E RC Meet. Site: Snohomish Model Airport. R. Moore CD, 8219 215th S.W., Edmonds, Wash. 98020. **Sponsor: Seattle Radio Aero Club.**

June 12-13—Houston, Tex. (AA) Houston RC Club Annual RC Contest. Site: Mabray Field. B. Striegler CD, 5831 McKnight, Houston, Tex. 77035. Sponsor: **Houston Radio Control Club.**

June 12-13—Pensacola, Fla. (AAA) Fiesta of Five Flags Southeastern FF & RC Model Airplane Championships. Site: RC-Corry Field, FF-8A. T. McLaughlan CD, 4140 Fern Ct., Pensacola, Fla. 32503.

June 12-13—Sacramento, Calif. (AA) Cordova Model Masters 1st Annual RC Meet. Site: Mather A.F.B. O. Roseberry CD, 6440 Melrose Dr., N. Highland Calif. 95660.

June 12-13—Kansas City, Mo. (AA) Kansas City RC Annual Meet. Site: Lake Jacomo. B. Drummond CD, 9115 Charlotte, Kansas City, Mo. 64131. Sponsor: **Kansas City Radio Control Association.**

June 12-13—Forth Worth, Tex. (AAA) Texas State CL Model Airplane Championships. Site: Fort Worth Model Park. P. Davis CD, 1613 Carl, Fort Worth, Tex. 76103. Sponsor: **Cowtown Circle Burners Model Airplane Club.**

June 13—Chicago, Ill. (AA) Aero Angels 6th Annual CL Meet. Site: Forest Preserve. D. Hardt CD,

7371 Lincoln Ave., Lincolnwood, Ill. 60646. Sponsor: **Aero Angels, Inc.**

June 13—Lake Elsinore, Calif. (AA) Flightmasters 2nd Annual Scale ROW FF & RC Meet. Site: Lake Elsinore. C. Hatrak CD, 3825 W. 144th St., Hawthorne, Calif. 90250. Sponsor: **N.A.R. Flightmasters.**

June 13—Hadley, Mass. (A) Hampshire County Thermal-Aires Meet. Site: H.C.R.C. Flying Field. J. Papageorge CD, 104 Rocky Hill Rd., Hadley, Mass. 01035. Sponsor: **Hampshire County RC'ers.**

June 13—Dayton, Ohio (A) Spring CL Fly-In. Site: Dayton. J. Haupt CD, 3908 Necco Ave., Dayton, Ohio 45406. Sponsor: **Dayton Buzzin' Buzzards.**

June 13—Haymarket, Va. (AA) Third Annual FF Meet for Cat. II. Site: Snow Hill Farm. J. Clawson CD, 1846 Lusby Pl., Falls Church, Va. 22043. Sponsor: **Fairfax Model Associates.**

June 13—Chagrin Falls, Ohio (AA) 7th Annual E.M.A.A. Old Timer FF Contest. Site: Savage Road. V. Didelot CD, 32907 Charmwood Oval, Solon, Ohio 44139. Sponsor: **Erie Model Aircraft Assn.**

June 13—Endicott, N.Y. (A) 6th Annual Northeast RC Pylon Championships. Site: Tri-Cities Airport. R. Noll CD, 96 Pine Knoll Road, Endicott, N.Y. 13760. Sponsor: **Aeroguidance Society, Inc.**

June 13—Van Nuys, Calif. (AA) Valley Circle Burners FAI CL Meet. L.A. Model Airport. W. Netzeband, Jr. CD, 580 N. Hollister, Pasadena, Calif. 91106.

June 13—Queens, N.Y. (AA) Forest Park M.A.C. Third Annual CL Contest. Site: Flushing Meadow Park. J. Droesch CD, 86-17 108th St., Richmond Hill, N.Y. 11418.

June 13—Lakewood, N.J. Novice Only RC Meet. Site: Lakehurst N.A.S. A. Schroeder CD, 18 Spencer Rd., Glen Ridge, N.J. 07028.

June 13—Sioux Falls, S.D. (AA) Flying Eagles Model Club Spring CL Meet. Site: Fairground. J. Donovan CD, 1409 Thompson Dr., Sioux Falls, S.D. 57105. Sponsor: **Flying Eagles Model Club, Inc.**

June 13—Lakehurst, N.J. FAI Indoor Elims. (Team Selection). Site: Lakehurst. C. Russo CD, 143 Willow Way, Clark, N.J. 07066. Sponsor: **East Coast Modelers.**

June 13—Hastings, Minn. FAI Qualifying FF Trial. Site: Webers Air Strip. H. Langevin CD, 4854 Aldrich Ave., S., Minneapolis, Minn. 55407. Sponsor: **Minneapolis Model Aero Club.**

June 13—Council Bluffs, Iowa (AAA) Eighth Annual CL Model Meet. Site: Iowa School for the Deaf. J. Dreier CD, 1918 Ave. B, Council Bluffs, Iowa 51501. Sponsor: **Balsa Busters.**

June 19-20—Des Moines, Iowa (AA) 2nd Annual RC Scale & Pylon Contest. Site: D.M. Modelaires Field. J. Bonanno CD, 261 S.E. Rose, Des Moines, Iowa 50315.

June 19-20—Denver, Colo. (AA) 13th Annual Mile Hi RC Meet. Site: Lowry AFB. H. Geller CD, 6920 E. Exposition, Denver, Colo. 80222. Sponsor: **Mile Hi RC Club.**

June 19-20—Fort Worth, Tex. National RC Fun-Fly Championships. Site: Fort Worth. B. Lutker CD, 6029 Walraven Circle, Fort Worth, Tex. 76133. Sponsor: **Fort Worth Thunderbirds.**

June 19-20—San Jose, Calif. (AA) Wavemaster Annual RC Contest. Site: Wavemasters Field. K. Wilson CD, 728 Bolivar Dr., San Jose, Calif. 95123. Sponsor: **San Jose Wavemasters RC, Inc.**

June 19-20—Dayton, Ohio (AA) Wright Brothers Memorial Annual RC Meet. Site: Wright Patterson Air Force Base. D. Lowe CD, 5936 Clar-Von Dr., Dayton, Ohio 45430. Sponsor: **Western Ohio Radio Kontrol Society.**

June 19-20—Kent, Wash. (AAA) BMA Model Aeronautics Scholarship FF, RC, CL & Indoor Contest. Site: Boeing Space Center. J. Crosetto CD, 14809 SE 54th, Bellevue, Wash. 98006.

June 19-20—Olney, Md. (A) DC/RC E.C.S.S. Soaring Meet. Site: Rigg's Field on Rt. 108. J. Stargel CD, 10625 Greenacres Dr., Silver Spring, Md. 20903. Sponsor: **DC/RC Club.**

June 19-20—Greenville, S.C. (AAA) South Eastern RC Championships. Site: WCRC Club Field. T. Neves CD, P.O. Box 10115, Greenville, S.C. 29603. Sponsor: **Western Carolina Radio Control Club.**

June 19-20—Dallas, Tex. (AA) Sun & Fun Annual FF Meet. Site: Mesquite Park. J. Murphy CD, 1305 Academy Dr., Arlington, Tex. 76010.

June 20—El Cajon, Calif. (A) Mission Bay Prop Twisters Monthly CL Meet. Site: El Cajon Model Airport. W. Edwards CD, 4470 Brighton Ave., San Diego, Calif. 92107. Sponsor: **Mission Bay Prop Twisters.**

June 20—W. Suffield, Conn. (AA) Nor-East RC Air Races. Site: NCRCC Field. R. Granville CD, Fernwood Ln., Sonners, Conn. 06071. Sponsor: **Northern Connecticut Radio Control Club.**

June 20—Lincoln Park, N.J. (A) East Coast Scale CL Championships. Site: G.S.C.B. Airdrome. E. Dickson CD, 36 Vreeland Ave., Clifton, N.J. 07011. Sponsor: **Garden State Circle Burners M.A.C.**

June 20—Watertown, Wisc. (AA) Circlemasters CL Meet. Site: Watertown Airport. R. Brotz CD, 1800 Cardinal Ln., New Berlin, Wisc. 53151. Sponsor: **Circlemasters.**

June 20—Salem, N.H. (AA) Salem Model Airplane CL Fair. Site: Salem High School. R. Sherman CD, 408 River Rd., Tewksbury, Mass. 01876. Sponsor: **Lawrence Air-Istocrats.**

June 20—Valley Park, Mo. Combat Cash Bash CL Meet. Site: Buder Park. G. Frost CD, 22 Glynn Dr., Florissant, Mo. 63031. Sponsor: **Hot Heads M.A.C.**

June 20—Ohio City, Ohio (B) SHOO Flyers RC Club Contest. Site: Club Field. D. Kraner CD, RR #1, Ohio City, Ohio 45874. Sponsor: **SHOO Flyers MAC, Inc.**

June 26-27—Portville, N.Y. Southern Tier RC Fun Fly. Site: Route 305 So. B. Brown CD, 1255 High St., Bradford, Penn. 16701. Sponsor: **Olean Model Airplane Club.**

June 26-27—Abilene, Tex. (A) Abilene Open RC Invite. Site: Seebee Park. R. Howard CD, 4235 N. First St., Abilene, Tex. 79601. Sponsor: **Abilene RC Society.**

June 26-27—Wallops Isl., Va. (AA) MARKS Annual RC Meet. Site: Wallops Island. H. Jones CD, 59 Aigburth Ave., Baltimore, Md 21204. Sponsor: **Mid Atlantic Radio Kontrol Society.**

June 26-27—Marshall, Tex. (AAA) N.E. Texas FF & CL Model Airplane Championships. Site: Marshall Airport. T. Southern CD, 303 Eden Dr., #35, Longview, Tex. 75601. Sponsor: **Northeast Texas Model Airplane Club.**

June 26-27—Wichita, Kans. (AAA) 11th Annual Midwestern FF, CL & RC Championships. Site: 13th & Webb Road. J. Mason CD, 2214 S. Pinecrest, Wichita, Kans. 67218. Sponsor: **Wichihawks.**

June 27—Near Kerman, Calif. (A) Fresno Monthly FF Gas Meet for Cat. I. Site: Near Kerman. F. Gallo CD, 1725 Kenmore Dr., W., Fresno, Calif. 93703. Sponsor: **Fresno Gas Model Club.**

June 27—Hillsboro, Ore. (AA) Nor'Westers Annual FF Meet for Cat. II. Site: Hillsboro. J. Lenderman CD, Rt. 2, Box 460, St. Helens, Ore. 97051. Sponsor: **Nor'Westers.**

June 27—Denver, Colo. Old Timer Fun Flight Meet. Site: E. Colfax Airport. W. Baldridge CD, 1464 So. Lafayette St., Denver, Colo. 80210. Sponsor: **Model Museum Flying Club.**

June 27—Three Rivers, Mich. (AA) 6th Annual GRIMES Old Timer FF Meet. Site: Airport. W. Cain CD, 4326 Kennilworth, S. E., Grand Rapids, Mich. 49506.

June 27—Lockport, N.Y. (A) United RC Pylon Racing Circuit. Site: Lockport. H. DeBolt CD, 49 Colden Ct., Cheektowaga, N.Y. 14225. Sponsor: **Niagara County Model RC Club.**

June 27—Hempstead, N.Y. (AA) Meroke 7th Annual RC Meet. Site: Mitchel Field. R. Geyer CD, 913 Washington St., Baldwin, N.Y. 11510. Sponsor: **Meroke Radio Club.**

June 27—Valley Park, Mo. United States Model Aerobatic CL Championships. Site: Buder Park. T. Niebuhr CD, 1170 S. Florissant Rd., Florissant, Mo. 63031. **St. Louis Yellow Jackets.**

June 27—Rockford, Ill. (AAA) Rockford Aeromodelers Annual CL Contest. Site: Riverdahl Park Model Airplane Field. A. Johnson CD, 1818 Oslo Dr., Rockford, Ill. 61108. Sponsor: **Rockford Aeromodelers.**

June 27—York, Penn. (AA) York Line Tamers Annual CL Roundup. Site: Caterpillar Tractor Co. R. Denues CD, 2560 Sunset Ln., York, Penn. 17404. Sponsor: **York Line Tamers.**

June 27—Cleveland, Ohio (AA) Flite-Masters 4th Annual CL Contest. Site: Cleveland Model Field. R. Kolthoff CD, 6408 Lawnwood Ave., Parma Hts., Ohio 44130. Sponsor: **Lakewood Flite Masters.**

July 3-4—Tullahoma, Tenn. (AA) TMAA FF Championships. Site: Arnold Center. O. Stewart CD, 2541 Stinson Rd., Nashville, Tenn. 37214.

July 3-4—Corpus Christi, Tex. (AA) 3rd Annual AA RC Contest. Site: Waldron Field. G. Stephens CD, 705 John Lee, Corpus Christi, Tex. 78412. Sponsor: **Corpus Christi Bees.**

July 3-4—Lexington, Ky. (AAA) Mid-America CL & RC Championships. Site: Kearny Field. L. McFarland CD, P.O. Box 8177, Lexington, Ky. 40503. Sponsor: **Lexington Model Airplane Club.**

July 3-4—Orange, Mass. (AAA) 1971 Yankee FF Championships. Site: Ft. Devens. R. Harlan CD, 15 Happy Hollow Rd., Wayland, Mass. 01778.

July 3-4—Springfield, Mo. (AA) Springfield RC Club RC Contest. Site: Springfield RC Club Flying Field. G. Langston CD, 1300 W. Locust, Springfield, Mo. 65803. Sponsor: **Springfield RC Club.**

July 3-4—Baton Rouge, La. (AA) Bayou State CL Championships. Site: F.S.U. Forestry Bldg. G. Cleveland CD, 540 Gebelin St., Baton Rouge, La. 70802.

July 4—San Jose, Calif. Delta Dart Fun Fly. Site: 10th & Alma Sts. K. Wilson CD, 728 Bolivar Dr., San Jose, Calif. 91123. Sponsor: **San Jose Wavemasters RC, Inc.**

July 4—Washington, D.C. (AA) & FAI Team Selection—CL. Site: Bolling Air Force Base. J. Dent CD, 9932 Clearfield Ave., Vienna, Va. 22180. Sponsor: **Fairfax Model Associates.**

July 4—Mentor, Ohio (AA) Fourth of July RC Races-Firecrackers Classic. Site: Club Field, Tyler Blvd. B. Penko CD, 21151 Westport Ave., Euclid, Ohio 44123.

July 9-10-11—Spokane, Wash. (AAA) Spokane CL & RC Internats. Site: Spokane In'l Airport. R. Hepker CD, 142 ADW, Spokane In'l Airport, Spokane, Wash. 99219.

July 10-11—Tullahoma, Tenn. (AA) 12th Annual Airfoiler RC Meet. Site: Airfoiler Field. L. Webster CD, 1000 Sycamore, Manchester, Tenn. 37355. Sponsor: **Airfoiler Club.**

July 10-11—Oklahoma City, Okla. (AA) TORKS 12th American RC Annual Meet. Site: to be announced. C. Brownlee CD, 3033 Rolling Stone, Oklahoma City, Okla. 73120. Sponsor: **TORKS.**

July 10-11—Chesapeake, Va. (AA) TRC 5th Annual AA RC Meet. Site: Fentress Air Field. M. Woolard CD, 301 Haledon Rd., Chesapeake, Va. 23320. Sponsor: **Tidewater RC Club.**

July 10-11—Oklahoma City, Okla. (AAA) Sooner State Model Aviation FF & CL Championships. Site: 128th & N. Western. M. McGee CD, 1805 N. Tulsa, Oklahoma City, Okla. 73107. Sponsor: **Oklahoma City Exchange Club.**

July 10-11—Oak Corners, N.Y. Sky-Rovers RC Hobo Meet. Site: Club Field, Hayes Road, H. Ford CD, 11 Stephans St., Clifton Springs, N.Y. 14432. Sponsor: **Sky-Rovers Finger Lakes RC Club.**

July 10-11—Davenport, Iowa (AA) Davenport RC Society 3rd Annual RC Meet. Site: Scott County Park. C. Fox CD, 1841 W. 4th St., Davenport, Iowa 52802.

July 11—Westminster, Md. (A) Westminster Aero Modelers CL Meet. Site: Westminster Shopping Center. R. Pease CD, 65 E. Main St., Westminster, Md. 21157. Sponsor: **Westminster Aero Modelers.**

July 11—Columbus, Ohio (AA) 6th Annual Eastland CL Championships. Site: Eastland Shopping Center. C. Hemmerly CD, 5607 Sandalwood Blvd., Colombus, Ohio 43229. Sponsor: **Capital City Controliners.**

July 11—Aurora, Colo. MMM Qualifying FF Trials. Site: E. Colfax Air Park. G. Batiuk, Jr. CD, 3066 So. Upham St., Denver, Colo. 80227. Sponsor: **Magnificent Mountain Men.**

July 11—Urbana, Ill. (AA) "Aeronauts" 9th Annual Model Plane RC Meet. Site: Illini Airport. J. Fasimpaur CD, 310 E. Benham St., Tolono, Ill. 61880. Sponsor: **Champaign-Urbana Aeronauts.**

July 11—Hastings, Minn. FAI Qualifying FF Trial. Site: Webers Air Strip. D. Monson CD, 131 W. Wentworth W., St. Paul, Minn. 55118. Sponsor: **Minneapolis Model Aero Club.**

July 11—Buffalo, N.Y. (A) United Pylon Racing RC Circuit. Site: Buffalo. H. DeBolt CD, 49 Colden Ct., Cheektowaga, N.Y. 14225. Sponsor: **Erie County Model Aircraft Assn.**

July 11—Hastings, Minn. (AA) Annual Summer FF Meet for Cat. II. Site: Webers Air Strip. D. Monson

CD, 131 W. Wentworth, W., St. Paul, Minn. 55118. Sponsor: **Minneapolis Model Aero Club.**

July 11—Elsinore, Calif. (A) San Valeers Sun & Fun FF Meet for Cat. I. Site: Lake Elsinore. T. Hutchinson, CD, 880A Magnolia, Pasadena, Calif. 91106. Sponsor: **San Valeers.**

July 11—Canton, Ohio (AA) 11th Annual Canton RC Meet. Site: Canton Club Field. J. Yarger CD, 1100 Browning Ave., North Canton, Ohio 44720.

July 11—Van Nuys, Calif. (AA) Valley Circle Burners FAI CL Meet. Site: L.A. Model Airport. W. Netzeband, Jr. CD, 580 N. Holliston, Pasadena, Calif. 91106.

July 17-18—Abilene, Tex. (AA) Prop Twisters 3rd Annual CL Contest. Site: City Airport. E. Thomas CD, 5349 Harwood, Abilene, Tex. 79605. Sponsor: **Key City Prop Twisters.**

July 17-18—Menomonee Falls, Wisc. (AA) 1st Annual Pre-Nats RC Warmup. Site: Aero Park Airport. F. Morrissey CD, 14100 West Park Ave., New Berlin, Wisc. 53151. Sponsor: **Milwaukee Flying Electrons, Inc.**

July 17-18—Oilville, Va. (AA) R.A.R.C. 11th Annual RC Contest. Site: RARC Field. C. Foreman, Jr. CD, RFD #4, Box 683, Mechanicsville, Va. 23111. Sponsor: **Richmond Area Radio Control Club, Inc.**

July 18—Ohio City, Ohio (A) SHOO Flyers RC Club Contest. Site: Club Field. D. Kraner CD, RR #1, Ohio City, Ohio 45874. Sponsor: **SHOO Flyers MAC, Inc.**

July 18—Newark, Ohio Licking County 5th Annual RC Club Meet. Site: Nethers Farm. A. Dupler CD, Box 186, Millersport, Ohio 43046.

July 18—W. Suffield, Conn. (AA) Nor-East RC Air Races '71 Site: Club Field. G. Sawn CD, 6 Audrey Ln., Enfield, Conn. 06082. Sponsor: **Northern Connecticut Radio Control Club.**

July 18—Davenport, Iowa (AA) 14th Annual Model Airplane CL Meet. Site: Davenport Airport. D. Mairet CD, 3009 Westmar, Bettendorf, Iowa 52722.

July 24-25—Abbeville, S.C. Piedmont Fun-Fly. Site: Abbeville Co. Airport. L. Nash CD, 722 Greenville St., Pendelton, S.C. 29670. Sponsor: **Greenwood Radio Aircraft Modelers.**

July 25—Milpitas, Calif. WAFFC Third Annual FF Meet. Site: Milpitas. R. Douglas CD, 5303 Calderwood Ln., San Jose, Calif. 95118. Sponsor: **Oakland Cloud Dusters.**

July 25—Odessa, Tex. (A) Odessa Prop Busters RC Club Pattern Meet. Site: Prop Busters RC Airport. S. Hood CD, 4110 E. 37th, Odessa, Tex. 79760. **Odessa Prop Busters RC Club.**

July 25—Jamestown, N.Y. Flying Aces, Inc. RC Meet. Site: Jamestown. W. Johnson CD, 62 Widrig Ave., Jamestown, N.Y. 14701.

July 25—Near Kerman, Calif. (A) Fresno Monthly FF Gas Meet for Cat. I. Site: Near Kerman. F. Gallo CD, 1725 Kenmore Dr., W., Fresno, Calif. 93703. Sponsor: **Fresno Gas Model Club.**

July 25-26-27—Near Glenview, Ill. (A) NATS Week RC Glider Event. Site: Pending. D. Burt CD, 3048 Central St., Evanston, Ill. 60201.

July 26-Aug. 1—Glenview Naval Air Station, Ill. (AAAA) National Model Airplane Championships. Traditional Events. For Nats entry blank send pre-addressed and stamped envelope to: Academy of Model Aeronautics, 806 Fifteenth Street, N.W., Washington, D.C. 20005.

July 31-Aug. 1—Pocatello, Idaho (AA) Pocatello Glue Angels FF & CL Invitational. Site: Pocatello. E. Culver CD, 231 Fairbanks, Pocatello, Idaho 83201.

AMA Council Meeting

(continued from page 59)

Council discussion indicated general support for the basic idea and appreciation to the Washington State officials for having initiated the program. Continuance of such a program was agreed to offer an additional opportunity for publicity and promotion of model aviation and those who have contributed to its progress.

L. Scale Contest Board Jurisdiction.

Boss asked for clarification concerning Scale rules involving Control Line models. It was the council consensus that the Scale Contest Board would be responsible for all Scale matters, regardless of type of flying involved.

M. Ballot Mailing Problem.

Boss inquired concerning problems involved in 1970 mailing and what was planned for 1971. Worth reported that an outside mailing firm had been used for the 1970 mailing, with poor control and mailing errors, complicated by mailing materials which were susceptible to handling problems by the automatic machinery involved. Through use of another firm, better materials, and closer supervision, better results are anticipated for the 1971 mailing.

N. Redistricting.

Broadhurst inquired concerning past history of AMA redistricting proposals, including the report of the former Redistricting Committee which was headed by **John Pond.** It was noted that the committee had recommended against redistricting in favor of the current associate vice-president plan of regional and special interest representation. Worth agreed to send a copy of the report to Broadhurst; also to Perdue and Stalick who asked for same.

O. Control Line Controversy.

Lee reported on unhappiness in his district concerning special rulings made for 1971 Carrier rules. He explained and illustrated why he felt the rulings should not have been made.

General discussion pointed out that the AMA by-laws provided authority on rules matters to the Contest Boards rather than the council; also that the official Contest Board procedures permitted the special rulings, even though factors other than safety were involved. It was noted, however, that the procedures were in the process of revision and that future rulings would be subject to Contest Board review.

The council consensus was that a review should also be made in the current situation so that the special rulings should not exist solely as decisions involving only the CL Contest Board chairman and the AMA president. It was also agreed that a statement should be published in the AMA **Competition Newsletter** for information to the membership concerning the background of the rulings, including the history of contributing prior decisions and the nature of the emergency which produced the rulings.

P. Control Line Association.

Clemens described the need and hope for Control Line interests to get together to help resolve and minimize future controversies concerning rules, noting that much of the current disagreement stemmed from lack of any obvious majority opinion—two areas of the country were strongly represented by loud voices on opposing sides of a question, without much indication how others around the country felt or how widespread any agreement was concerning the various viewpoints.

Clemens noted the success of organizations working within AMA on behalf of special interests—NMPRA for RC Pylon, NIMAS for Indoor, NFFS for Free Flight—and expressed his intent to help Control Line flyers help themselves by AMA guidance if sufficient interest should develop for formation of a CL association.

Q. Adjournment.

Noting that the council had been in session all day and had completed actions on all original agenda items, plus many more, Clemens praised the council for its enthusiasm and dedication. This was a successful example of AMA's New Momentum, he added, and closed the meeting with thanks to all present. Meeting was adjourned 5:30 p.m.

Follow AMA Rules
Fly Safely!

Meuser on FF

(continued from page 40)

before the prop folds. Perhaps a motor-torque-operated auto-stab-rudder would be a hair better, but if the rubber is consistent it can't make any difference whether the control is by torque or by time.

Also notice that the rudder is cambered, flat side on the left. But, the model flies in the opposite direction to what the camber would indicate—to the right both under power and in the glide. Now, they have a theory about this, but you wouldn't believe it! They believe it, and it seems to work!

For more details on Finnegans Wake, see the 1970 NFFS Symposium report, and the Free Flight News Yearbook, 1969.

Non-Slip Rib Template: Three pins stuck through the plywood rib template, epoxied, and snipped off after the epoxy sets, will keep the template from shifting. Let the points protrude about 1/16" farther than the rib thickness. Use 1/4" medium-hardness balsa for a cutting board. Place the template diagonally across the cutting board so that the single-edge razor blade doesn't tend to follow the grain. Use 1/32" plywood for chords under 6"; 1/16" for larger chords; brass or hard aluminum sheet if you are a perfectionist.

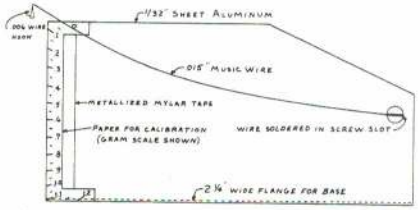
Balsa Planking: Planking a fuselage having an oval cross section by the usual method is quite a chore. The edge of each strip must be carefully beveled to fit the adjacent strip; otherwise the joint must be filled with glue, which adds to the weight and makes sanding the fuselage to a smooth contour difficult. However, Sig "rounded edge planking" eliminates these difficulties. The planking strips are 5/32 x 1/4 x 36" and are cut from medium-soft balsa. One edge is convex, the other concave, so even when they meet at an angle they fit together perfectly—an old boatbuilders' trick. Perfect for that old-timer or scale fuselage, or for a streamlined engine pod for a big Starduster.

Tenny on FF

(continued from page 41)

Make a new motor from larger strip, but use fewer turns to begin with; the higher torque will cause both a higher climb and greater usage of turns. After adjusting the model as before, check the number of turns left to see if the rubber size is correct. In similar fashion, if the first test flights run out of turns before landing, choose a smaller strip. Small adjustments can be made by lengthening or shortening the loop. Lengthen the loop if the model runs out of turns and shorten it if it lands with a few too many turns.

How Much Does It Weigh?: The beginning indoor builder is delighted when his first model flies. Then, if he wants better flights, the usual procedure is to build a lighter model. The ideal approach is to keep building lighter and lighter models until they break from handling, then build heavier parts to replace those that break. Some kind of scale is necessary to weigh each part of a model as it is finished, and careful records need to be kept. By checking his records, a flier can decide which parts need to be heavier or lighter.



The sketch shows a spring scale which is easy to build and can be calibrated by using weights from a laboratory balance set. It is a good idea to make two or three scales, each with a different sensitivity. Use a different diameter wire for each scale. Experiment with wire sizes until the most sensitive scale has a range of about .1 gram or .004 oz. The calibration will be linear, so if two or three points are calibrated, intermediate divisions can be drawn in.

McEntee on RC

(continued from page 39)

enough away to prevent any radio interference.

SOAR expects to operate by the AMA RC glider rules which are the revised provisional FAI rules (p. 80 of the new rules book). They now specify maximum line length of 300 meters (984.25 ft.) and ten-minute flight max. One point is given for each second of flight, one point deducted for each second the glider is in the air after the ten-minute limit. Fifty extra points are given if the glider comes to rest (not necessarily touching down) in an 82-ft. dia. circle.

Dave says SOAR already has so many prizes pledged that two classes, divided by wingspan, may be run. The meet is to be held July 26 and 27. Sunday, July 25, will be devoted to test flying and tryouts of proposed new glider rules.

1971 Soaring Tournament: The LSF-sponsored affair again will be held Aug. 28 and 29, at Nelson's Hummingbird Haven, Livermore, Calif., and will be cohosted by the North Bay and South Bay Soaring Societies. Full details are not settled yet, but entry may be limited to 100 contestants plus the top 10 contenders in a new Scale Sailplane category. Full information may be had from LSF, Box 2606, Mission Sta., Santa Clara, Calif. 95051.

Gliders at Toledo: Quite a few commercial gliders were shown, but the display of RC gliders by individuals was a disappointment, considering the full set of trophies set up this year in the category. Dave Reidel's Ares topped this judging. Perhaps with more floor and table space available in 1972 (a large expansion of the Lucas Co. Exhibition Hall is promised), the glider builders will feel there is ample room for their relatively huge craft!

The commercial displays also were disappointing, for only few new U.S. made glider kits were exhibited. The 70-in. span Schweizer 1-26D by Sterling was one, and it appears to be a close to scale copy of the real thing. Sterling is pleased with reception of their earlier Schweizer 1-34, so here is one concern we apparently can count on to fill the void in U.S. glider kits.

Dumas Products has a smaller Evolution with a 66-in. span with wing tips in place, 42-in. span with them removed. The craft has a 1/2A engine in the nose. For glider kits in the competition category, we still have to rely on imported kits, which will be distributed to many hobby shops.

Nelson Model Products has several new German kits, including the Graupner Cumulus, an ARF job of beautiful construction and design that lists at close to $100! Others cost far less, but require more work to build. These have plastic fuselages of various sorts.

Midwest Models showed the E-Z-Juan, a West Coast design with simplified lines and all-balsa construction. Aristo-Craft has enlarged coverage of the German Hegi line, including a true-scale Schleicher ASW 15. The plane spans 3000 mm, including a fiberglass fuselage and a complete set of hardware.

Penford Plastics is importing kits for the 118-in. span Darmstadt D-36 Circe. It also has a fiberglass fuselage, with built-up balsa wings (pine spars). As an interesting feature, the wings do not have the usual tip washout; instead, the same result is achieved by making the tip area leading edge more blunt than the rest of the wing LE.

A beautiful 82-in. span, all-molded plastic, powered glider from the Pilot line was exhibited by World Engines. The powerplant is in a pod above the wing which did not appear to be removable.

Toledo showed much interesting glider-type equipment. Many two- and three-control radio systems were shown. Of even more interest were three two-control bricks—unit assemblies of receiver, decoder and two servos in a single case. These seem ideal for many gliders and are very easy to shift from one ship to another.

The World Engines and EK Logictrol units may be had in three-control form, but the third servo must be external to the brick (EK also makes a basic two-control brick, W.E. makes only a three-control, Kraft has only a two and does not offer three).

The W.E. unit may be of special interest to glider builders, since it incorporates their new Low-Boy servo. These servos may be removed from the receiver section of the brick and mounted separately, if necessary. The servos measure about 3 1/8" in length, 1 3/16" in height, 23/32" in width, including lugs and output arms; both linear and rotary outputs are provided. Some gliders are so long and skinny in the nose area that even the smaller conventional servos are a tight fit, but the Low-Boy configuration might do the job.

McCullough on RC

(continued from page 40)

Scale Data Sources: The Smithsonian Institution, National Air and Space Museum, Washington, D.C. 20560, has available a number of blueprints of historic aircraft, mostly 3/4-inch to the foot on 23 x 31" plates. Ask for "Drawings of Historic Aircraft" list which provides prices and ordering instructions.

References Wanted: Column readers who know of sources of scale material, drawings and photographs such as government bureaus or museums are asked to send details so they can be added to those previously published in the above department. Proper documentation is the first requirement for a good scale model, so let's get all of the information storehouses traced down and listed.

Jenny No. 2: Walt Moucha Jr.'s amazingly realistic new 2 1/2"-1" JN-4 is ready for test flights. Powered by the new Ross four-cylinder 1.2 cu. in. engine, it has exact detail right down to the lettering on the tires and nameplate in the cockpit. Would you believe 360 ft. of pinked tape and rib stitching? Or 250 ft. of .018 CL cable for flying wires, cinched up by 90 turnbuckles—each one safety wired? He's now working on an FAI specification Piel Emeraude—object: 1972 U.S. Scale Team.

Lowe on RC

(continued from page 38)

FCC On the Prowl: Those who think an FCC license is not necessary since the agency never checks—wise up! Not only is a license required by law, but it also indicates to the FCC our strength in numbers, and thereby helps to obtain and hopefully to keep the frequencies assigned for RC use. The Fort Ord R/C Flyers (Pacific Grove, Calif.) report the club flying site was visited by the FCC. They not only checked for licenses but required demonstration by the six-meter types of their ability to send CW key. So please do not fly without a license—it makes things look bad for all of us if you're caught. Twenty bucks seems like a lot of money for a license, but it's only a small percentage of the investment in that super-duper retract 100 mph special.

Democracy at Work: The Oily Birds "Squawk Sheet" (Port Arthur, Tex.), reports that they now are accepting control line modelers into their formerly all RC club as full-fledged members and with the right to run their own affairs. They will use a section of the club field which they will improve for their own needs.

Sounds like a fine idea, since ukie types and RC'ers have a lot in common. As long as the local facilities will permit combined operations it would work out fine. Those who are trying to prevail upon local authorities for a flying site should combine forces with all local modelers—there is strength in numbers. Certainly it should be possible to combine RC and UC without operational interference. Keep those cards and letters coming.

Blum on CL

(continued from page 37)

Carrier Model Questions: Many questions are asked concerning throttle linkage, fuel meter, flaps and hook linkage, retractable and stationary landing gear, etc. Regardless of the method adopted by each flier-competitor, these final selections are as distinctive as the choice of the model. As Bob Gieseke says above, not all things are satisfactory for all people. So it is with Carrier. Not all models nor all equipment can be tailored to all Carrier fliers.

Internal linkage alone creates a variety of choices and offers (based on the standard three-line system): (1) coupled throttle and release of simultaneous hook-flap; (2) separate arrangement of throttle and then releasing a coupled hook-flap by actuating extreme up or down; (3) a combination of items one or two with the addition of releasing the flaps individually by clips coupled to the throttle pushrod.

Which should the novice choose? Profile Carrier offers not only a fine event, but also creates a real proving ground for experimental linkage systems in an inexpensive manner.

The coupled throttle pushrod, which in turn releases the flap-hook from an extreme fuselage tail position is perhaps the most widely used method. It offers an external release for internal linkage, is most foolproof during operation and reload, and is the simplest to release dependably in the air.

The second most common system is a flap-hook arrangement which is released by the pilot's actuating extreme up or down elevator, depending again on personal preference. A holder, such as a piece of brass tubing or wire clip, attached to the rear end of the elevator pushrod releases a catchhook which is fastened to the tailhook. This makes the throttle completely independent of the release linkage, thus giving the pilot more opportunity to enter slow speed prior to dropping the flap-hook. In extreme wind conditions one may not want the flaps released.

The disadvantage of linking the flaps directly to the hook via a pushrod is that arrested landings at over 25 mph force the flaps to return to their neutral position too abruptly, causing damage after a series of landings. Thus, the individually spring-loaded flap, released by a clip on the throttle pushrod, has been developed. More wire bending and adjusting is needed with this system, but again it is left to choice.

Straight and Level

(continued from page 6)

in the cause of aeronautical science, emptied it into the air.

It follows that a supercharged guy like Jim would be a bundle of nerves. They were forever advising him to take up a hobby! Whatever he took up, he excelled in. His model railroad setup included a crane (so he said) which deposited him in the center of things. A golfer, he established a scientific way—another service!—of testing golf balls. A born prankster, he pocketed extra lively pellets and, when some sharpie would spot Jim-the-duffer on a course, ready for fleecing, somehow they'd end up in this driving match—must we go on?

He'd give away his shirt. He loved kids and they loved him. He'd stop his station wagon, loaded with ready-to-fly Firebabys, put on an act, catch the crowd, and then offer one free to anyone who would start the engine. He was true to his word and would hand out dozens, if not hundreds.

He'd gimmick anything. A simple wire mechanism on his demonstration Ceiling Walker allowed the copter to strike the ceiling, where the props would stop driving allowing the thing to sink vertically to the floor. On striking the floor, the props would release and power it back to the ceiling. Up and down, up and down. If you were working at a bench in the work hangar at the Nats, he would slip one of these jobs under the bench were it would bounce up and down.

He won radio at the Nats—several times we think. Before the war he flew a modern-looking trike-gear ship—the first—which taxied out, maneuvered on the ground, took off and looped. Once, when Jimmy Slagle (the phonomenal bare foot kid of the Wichita Nats) was practicing at the Minneapolis Nats, he and Jim fell to topping each other. Jim had his Fireball—which was not supposed to be a stunt ship. So Jim finally said, try this, and executed a perfect step-stairs climb to a higher altitude. And, you have trouble with those corners on a square?

Jim was impatient with us all. None of us ever did enough! Back before AMA set up programs to get teams to world championships, the Wakefielders begged every red penny in sight. At one hobby industry convention in Chicago, Ed Lidgard made a pitch for money to get the Wakefielders overseas. The silence was deafening. Up popped Jim who announced, "You guys make me sick; here's $5,000 for them!" And, that's how they got to Europe that year. If he liked you, you'd get a surprise carton every year, loaded with kits and ready-to-fly things of all descriptions. Out to convert the world to model airplane flying, he was pretty well on the way when he abruptly left us.

It fell to us to write Jim's obit. Ending it, we had said that, "You knew him, too. Everytime you pick up a U-control handle, you will think of Jim Walker."

There are no giants these days in our hobby. Competition is so diversified that the days of the individual stars—the Walkers, the Kordas, the Grants, the Goldbergs—are gone forever. But, we shall never run out of the great things Walker left us. He'd put back the fun in model aviation.

We would all do well to remember such a man. We badly need another. —Publisher.

Smith on CL

(continued from page 87)

Check Those Props: Give every prop in the tool box a good visual check. Look over the hub section for stress cracks, split blades, and balance. Overtightening of the prop nut sometimes will squeeze the hub and fracture the fibers. So easy on the wrench! Also boil all nylon props in water at least a half hour and let them cool in the water. Cold weather and nylon props do not get along well together. And when adjusting that needle valve, stand to the rear of the prop arc. Too often fliers lean over the prop of an engine turning 1800 rpms and adjust the valve. If the prop decides to shuck a blade at that time, three guesses where the blade will go.

What To Do Before You Call The Fire Truck: There is nothing worse than a fire in the work shop, so here are several hints for using propane torches. When the torch is not in use, unscrew the burner head. If the valve is not closed tightly, the gas will bleed off. And overtightening ruins the soft valve seat. (If you've ever tried to use your torch and found the tank almost empty after a short while, you'll know what I'm talking about.) The loss of gas is only one problem. Propane will ignite from furnance pilot lights or any open flame. Some spray paint manufacturers use propane as a propellant so keep it away from fire. Use adequate ventilation with any spray can.

Events Schedule Change At The Nats: The 1/2A events (Speed, Proto, and Profile Proto) may be flown on the first competition day (Wednesday). In the past these events were flown on Saturday. Those planning to enter these events should check the Nats schedule for this possible change.

FAI Finals: These finals are scheduled for Cleveland, Ohio, Labor Day weekend. Send team fund donations to FAI Fund, Control Line, AMA, Washington, D.C.

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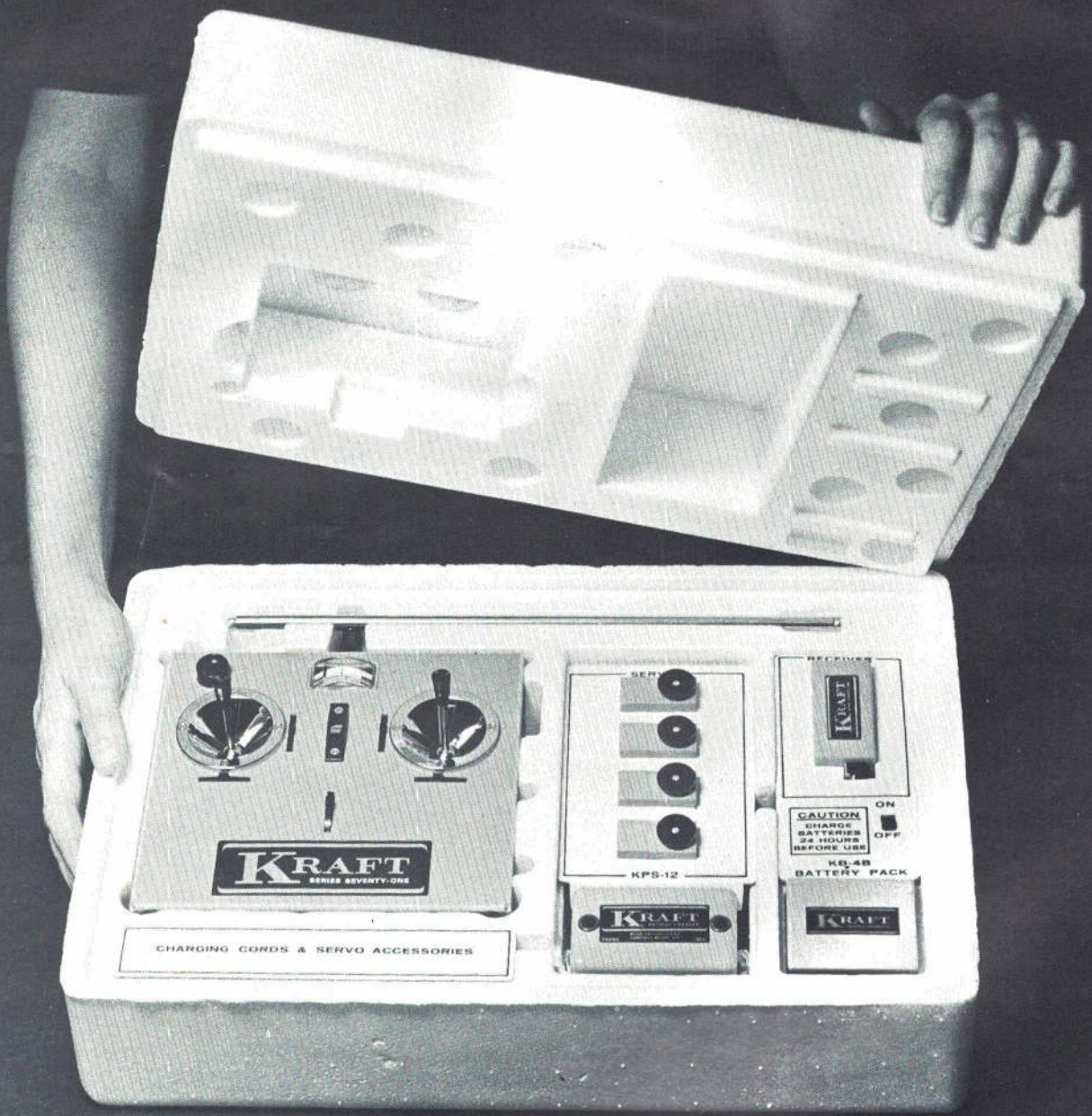

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