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MODELER

FEBRUARY 1969

60c

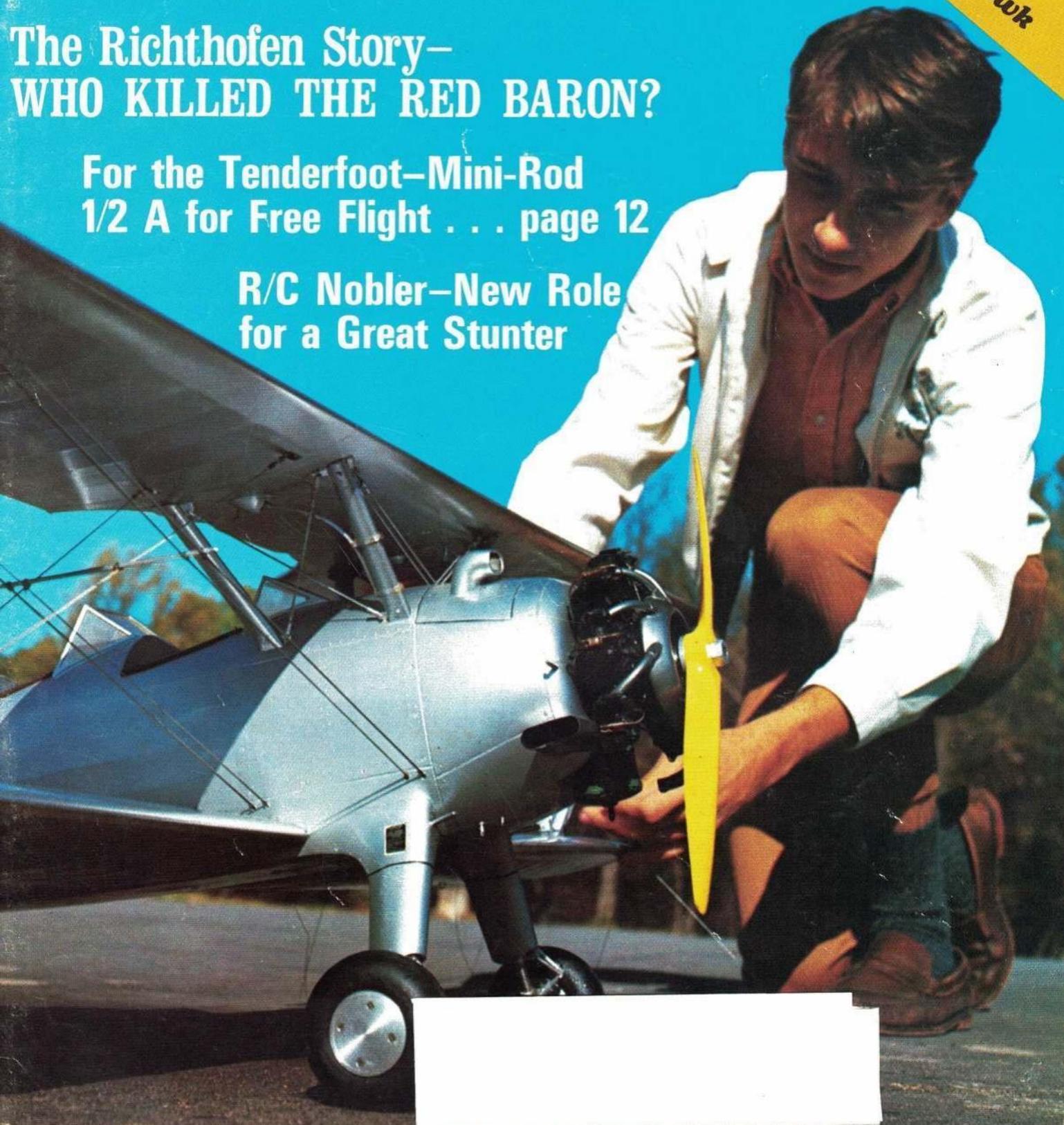
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FULL-COLOR CENTERSPREAD
Curtiss F9C-2 Sparrow Hawk

The Richthofen Story—
WHO KILLED THE RED BARON?

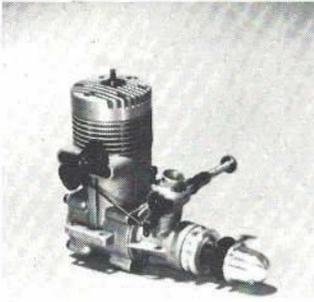
For the Tenderfoot—Mini-Rod
1/2 A for Free Flight . . . page 12

R/C Nobler—New Role
for a Great Stunter



O.S.

ENGINES



OS MAX H60 F.I. & R.I.

There are two engines in this series. The first engine to come was the rear valve engine. This is the more powerful of the two because the breathing intake on this engine is better. In the first place, the actual intake size is larger and, in the second place, the passage to the valve in the drum valve is larger. It is impossible to cut a hole this large in a crankshaft because of strength problems. If you are looking for power in an OS 60, we recommend the rear valve engine. The one other advantage is that the needle valve is out of the way of the propeller. To competitors who value reliability and steadiness in an engine over power, we strongly recommend that you observe the front valve OS Max H60 R/C as this engine exhibits these qualities in a very genuine manner.

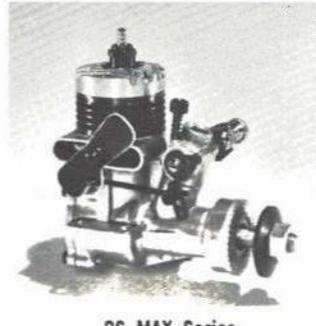
MAX H 60 R/R/C \$39.98
MAX H 60 F/R/C 39.98



OS MAX 40 Series

This is a recent OS series and was specifically designed for the 40 engine size. The engine without a throttle is a good rat race engine and the engine with a throttle is a good Pylon racing engine. The engine with a throttle is also an excellent size engine for a model like the new Goldberg Cessna. This engine is quite powerful for a 40 size and will turn a large prop. We see these engines being used in airplanes as large as a Top Flite Taurus. Or, for that matter, almost any other good size full house airplane.

OS MAX 40 STD. \$16.98
OS MAX 40 R/C 22.98



OS MAX Series

Many model builders think that the OS 15 and the OS 19 are just about the same with a lot of interchangeable parts. This is not really true as there are enough individual parts in the OS 19 to define it for us as a series by itself. Most of these engines are sold as R/C engines, however, we do stock a few standard 19s. The engine with a throttle has a beautiful idle and is very much the same type of engine as 30 and 35S series as described above.

OS MAX 19 Std. \$10.98
OS MAX 19 R/C 15.98

OS MAX 15 Series

The R/C version of this engine is probably the most popular OS engine that we sell. Probably the reason for the popularity of this engine is its easy handling characteristics, its good idling characteristics and its long life. Furthermore, OS probably more than any other engine manufactured is more capable of producing an extremely light, extremely compact and beautifully executed small engine in this size.

OS MAX 15 Std. 10.98
OS MAX 15 R/C 15.98



Phil Kraft is shown with his new Flea-Fly. We are happy that Phil consented to permit us to put his picture in our OS ad this month because Phil is using an OS 19 in the airplane. Phil certainly demonstrated to everyone at the RCIA Indianapolis Masters Tournament that you can do just about everything with a little airplane like this that you can do with a big plane and we sure are going to see a lot more small—possibly 19 size airplanes—flying soon with full house proportional.



OS MAX 50-58 Series

In this series the Max 58 is an extremely light yet quite powerful R/C engine. Ounce for ounce, this engine is about as powerful as anything you can put in your plane. This would be an engine that you might want to put in a small plane like a deBolt P-Shooter so that you can keep the airplane light and still have a lot of power. Here is another engine with excellent idling characteristics. Either the 50 or 58 engine has plenty of power for the Lanier or the Dee Bee plastic and foam airplanes. Incidentally, the Max 58 is shipped with a muffler plus the necessary parts for a conventional exhaust throttle. Both the 50 and 58 are 10 ball bearing engines running with light weight aluminum pistons and rings.

MAX 58 R/M \$34.98
MAX 50 R/C 34.98



MAX-S 30, 35 Series

This is a very popular series OS engine. For the displacement these engines represent just about the minimum in weight and bulk. The OS Max 30 R/C or, for that matter, the 35 hardly weigh anymore than many 19 R/Cs. The idle on these engines is extremely good and they can be operated right out of the box without a long extensive break-in. These engines are used for Galloping Ghosts in airplanes like Goldberg's Falcon 56, Sterling Tri-Pacer. These are also used for hot Andrew's H-Ray's and for Sterling Mambo Specials.

OS MAX-S 30 Std. \$14.98
OS MAX-S 35 Stunt 14.98
OS MAX-S 30 R/C 19.98
OS MAX-S 35 R/C 19.98



OS MAX 10 Series

This engine has come along after the 15 and 19. Here again, we have a completely new and individual engine. The crankcase castings smaller than that used for the 15. There is also another difference. This engine has a sleeve rather than fins cut in a metal sleeve as on the 15 and 19. OS has recently added a stop screw on the throttle of this engine.

OS MAX 10 Std. \$ 8.98
OS MAX 10 R/C 11.98

OS PET II Series

OS claims to have sold over 100,000 of these engines. The engine has a lot of power and is rather easy to handle, however, the big feature on this engine is economy and it only costs \$5.98 with the R/C selling for \$6.98.

OS Pet II Std. \$ 5.98
OS Pet II R/C 6.98



OS RADIO CONTROL

This equipment is covered in more detail in World Engines Catalog — 75¢. Pictured above is the OS Full House Proportional. OS also manufactures 2 and 3 Channel Proportional. In addition to proportional, OS manufactures a nice line of single channel gear and accessories. They have a small Pixie transmitter, a Superhet receiver, a line of single channel servos, a line of escapements. Also, they manufacture 7 Pin and 4 Pin Connectors.

OS 4 Channel Propo \$350.00
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OS Tx Stick Kit 14.98
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1 Ch. Pixie Tx 19.98
1 Ch. Pixie Rx Regen. 13.98
1 Ch. Minitron S/Het. 32.98
1 Ch. Rudder Servo S103 13.98
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VOLUME 68, NUMBER 2

FEBRUARY 1969

COVER PHOTO: WW II Stearman Cadet, second in Open C/L Scale at '68 Nats, was built by Ernest R. Violett. Ernie's son, Brian, admires the 7 lb., .45-powered ship with its operating cockpit controls, shocks and fuel tank with gauge. Scaled 1½" to 1"; from A.A.M. plans.

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STRAIGHT AND LEVEL



The trend toward scale and realism in our aircraft is one of the most significant changes in years.

ABOUT this time of year the staff is hard pressed to close up the American Aircraft Modeler Annual. The E.T.A.—estimated time of arrival as the big plane pilots call it—is March 4 on the newsstands. This “thirteenth issue” is a special experience for its editors as well as its readers. What should it contain? How can it be designed to fulfill audience expectations for something super, for the new and different? Should it, as so many annuals do in many other fields, parade the events and developments of the preceding year? Or should an annual have a theme: Tell what air modeling is all about, or perhaps, how to get into model building? (In passing, it should be mentioned, just so you cats won’t go crazy with curiosity, that the 1969 edition is jammed with plans of all types.) But, whatever treatment is selected, there is always the provocative problem of what to do for a lead.

What’s the action? One supposes that modeling is much the same all the time. Oh, you can always discover startling changes if your back-issue file goes back far enough.

Scale is where the action is. People want their models to look like airplanes. Realism is the keynote. Everywhere you turn, the phenomena is evident. In radio control, Goodyear racing snowballs in popularity. R/C stunt airplanes are given scale motifs. The ships may not be true scale, but you have the feeling you are looking at well-known air-show stunt craft, or latest service-type jets, or familiar biplanes out of the past. Sport jobs—radio, rubber or gas free-flight—show an especial fondness for cabins, cockpits, and basic, pleasing planforms and profiles to be seen at any airport. There is a revolt from the standard, the monotonous. Even on the ready-to-fly models, guys alter vertical tail shapes to escape enforced conformity with their neighbors’ planes, by highly individualistic color schemes and markings. U-control stunt craft have sprouted such finepoints as rivet lines and “don’t lift here” small-lettered signs.

Yet, in designing the Annual lead around the theme: “Scale—Where the Action Is,” one has the feeling of having been here before. The average sport modelers, the guys who build alone, who don’t ride the contest trail, always did go for realism. When free-flight faltered after World War II, industry surveys indicated that lack of realism was at fault, that common sense required replacement of pylons with cabins. Smart manufacturers have always had scale models—though you’d hardly know that scale and realism were vital, judging by competitive types of aircraft, which became kits.

The kids had fun building Fokker D-7’s, Cessnas, Cubs, etc., but the older modeler, who is the hard-core of all magazine audiences, and strangely dependent upon kitted designs of championship models, went on blindly year in and year out. So, it is very good indeed, to find that the

most important message of the year for that Annual lead, reveals a long overdue revolution.

Why can’t *your* model look like an airplane?

* * * * *

SPEAKING of revolt, editors these days are troubled—or they should be troubled—by the problems of how best to cater to audience demand. It is gospel, of course, that any magazine must give the reader what he demands. The customer is always right, but the real question is, does the reader really know what he wants? Judging by the hardening cast of the magazines, there is considerable doubt that we publishers and editors always make correct interpretations.

Free-flighters have long protested what they consider inadequate coverage of their field. (Incidentally, they contribute very few articles to a magazine.) “Our” free-flighters are momentarily content—we managed to find a handful of contributions. Now the control-line people protest that they are being short-changed. Radio people are more demanding than both put together.

Any magazine policy seems too political at times. It is putting the cart before the horse, to cater to so many different groups with this or that column and standard features. Regardless, you must have three model designs every issue—R/C, F/F and C/L. You’ve got to throw in a solid radio department, maybe even an extra article. Give something to the plastic modeler. The scale buff—he requires plans and articles. So, you start every issue with two-thirds of the contents set in concrete, as it were. Rather than buy votes by pleasing all special interests, how much better it would be if any editor could simply put out the best danged publication he could dream up.

Articles and plans on helicopters and ornithopters, on design fundamentals, the hopping-up of engines, the ABC’s of covering and finish, adjusting a free-flight, elements of U-control, how-to-do-its of all kinds. One wonders if the reader, demanding this or that column, is best served when he gets that column. If every demand were faithfully met, the reader would reject the results.

One of these days, editors may join in this spirit of revolt, to put out the publications they think best. When they do, we’ll stop seeing such things as brand-name transmitters staring at us from covers, and full-page pictures of manufacturers pushing buttons. Discussing the beginner problem with us, a well-known manufacturer remarked of our printed notice, that A.A.M. would lead off each month with its Tenderfoot series, “But, can you afford to take such a risk? Can you get by with it?”

Revolt? We took the risk. We are getting by with it. The response is roughly 400% greater than anticipated. Now, we desperately need such contributions. And, there is nothing to be had. No one *demands* beginner stuff! Yet, everybody wants, enjoys, it. What do they really want?



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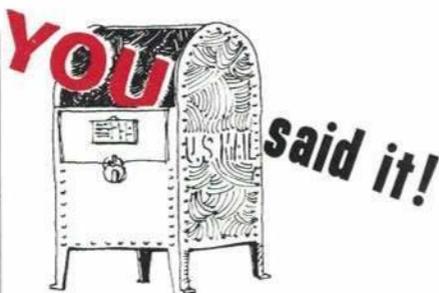
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Junior for R/C gliding

I must commend you on a fine editorial that appeared in the October, '68 issue.

I am a junior AMA member, 15 years of age, and have been seriously interested in R/C gliding for a long time. Your editorial cinched it for me. I want to get started in this sport, but I need a little help.

Could you send me any and all information on the "Kurwi" and "Nelson KA6" gliders that were mentioned in the editorial? Also, the scale Libelle sailplane which appeared on p. 28 of the August '68 issue. I would sincerely appreciate your cooperation.

Gary Osoba, Wichita, Kansas

Judging by the glider names, Gary refers to Howard McEntee's editorial for the R/C World section. Our own Jerry Nelson is as good a source as any on radio-control motorless stuff. He is as busy in gliding as a Galloping Ghost actuator going full tilt. We've given Gary, Jerry's address and will forward other such requests to Nelson. Ed.

Tin Goose Epic

In regard to your article on "The Cry of the Tin Goose," in your October issue—congratulations—a little. In 25 years of modeling, yours is the only article on the Ford trimotor that even mentioned the only other owner and operator in the U.S. besides Island Airways—that is the Johnson Flying Service.

Oh yes, two corrections, please. First, no self-respecting pilot would ever call one of them a "Tin Goose." They are "Fords," first, last and always, although they may be occasionally referred to as "trimotors."

Second, it is U.S. Forest service, not Forestry service. (There is a difference. Check with Lassie.)

Now, back to the Fords. I am a professional forester. As such, I received my degree at Montana State University in Missoula, Mont. ('51). Before that, as early as 1944, I worked in the woods for the Forest Service.

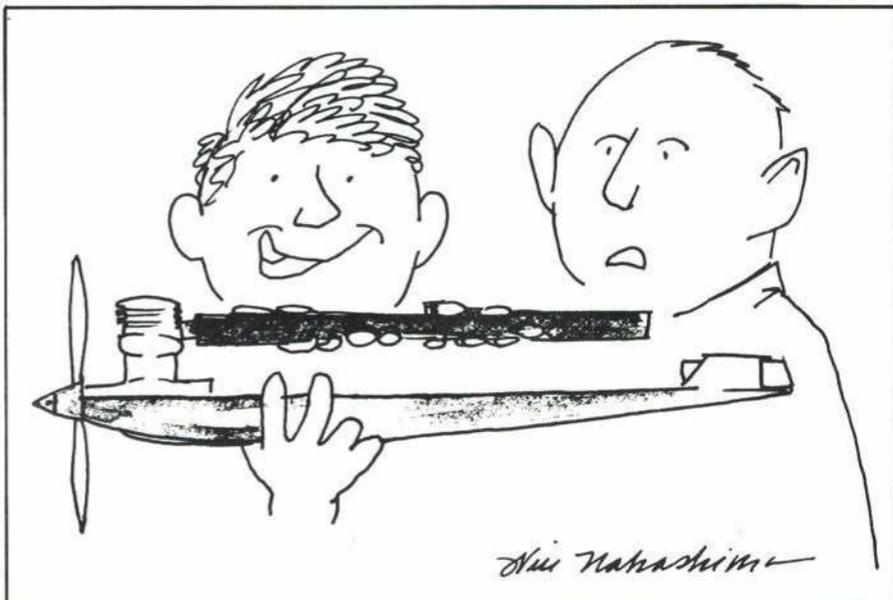
Region 1 of the Forest Service is headquartered in Missoula. This region covers western Montana, north Idaho, eastern Oregon and Washington. It contains a vast amount of primitive inaccessible timberland.

Since 1905, the U.S. Forest Service has been charged with protecting this area from wildfire, whether caused by man or nature. This area is dotted with small fields and landing strips which are used for supplying forces in the back country. (The field at Big Prairie, for instance, is only 1700 ft. long.) With these conditions, it is natural that Johnson (the prime contractor in Missoula for flying service to the Forest Service) would use Fords for this freight work. I don't know how far back Johnson goes, but I do know that in 1936, they were flying freight in the Fords.

In 1939, the idea of dropping men on a going fire was begun and if the first fire jump wasn't made from a Ford, I'll bet the second was. Around 1946, Johnson started using C-47's for Smokejumping because they could haul a larger crew faster, but the jumpers themselves preferred the Fords—at 80 mph the slipstream wasn't so bad.

The characteristic hum of the trimotor has been a welcome sound to firefighters for quite a few years now, and is likely to be for several more.

The procedure for a fire jump is pretty much standard. The Fords carry eight jumpers and their gear. First, of course, the fire is sighted, and a landing spot is selected. Then there is a test chute to check for wind drift, then the men go out. Two at a time for four passes. Under most conditions, the pilot throttles the outboard engines back so that the plane seems to almost stall. That way, the jumpers get almost no opening shock. After they have all landed, they signal the aircraft and the tools are dropped. This supply drop is made at such altitude that the trees are occasionally shaken by the prop blast, but whether the drop spot is in a canyon or a



"Well, you see, during the week I play in the symphony."

mahogany with rez mahogany stain for a darker effect. Railings were made with mahogany strips and brass tubing. The fittings were taken from various kits.

Power from twin Pittman motors (6 v each) operating on one 12 v battery (wet cell) gave a very realistic speed for this 13-pound boat. An Aristomatic compound actuator gave left, right, stop, forward and reverse. Radio was a Citizen-Ship single-channel with an Ace transmitter. All lights worked on a 6 v system (two 6 v batteries in parallel for longer life). This was bow, stern, port and starboard, and interior fluorescent lights. Exterior lights were 3 v grain-of-wheat bulbs. All 3 v lights were tied into this 6 v system. Power from batteries was proportioned to lights and gave ample light for night running which incidentally is more fun than day running.



The lake where I ran this was a parking spot for lovers, and I used to go down there and I could hear "Hey, look at the little boy and his boat." But when I turned on the lights and let her loose, the crowd gathered and love-making came to a halt. Lots of fun though. My wife wants me to make another one. That's unusual, because she's never shown an interest in my hobby until I built this 40" model of a Chris Craft '63 motor yacht.

Enclosed is a picture taken five years ago when I was at Vitro Laboratories. They did a story on these boats in their paper that goes out to employees. The other fellow, right, is Jack Jesset and his Mighty Mo.

Bud Faulkner, Rockville, Md.

Plight of an R/C Junior

I read with great interest the letter "Doesn't really hate R/C," Oct. '68 issue.

This really hit home. My 14-year-old son entered a scale model "Tony" Kawasaki Hien Ki-61 in the April Red Bank R/C show. He was the only Junior R/C entry.

Not one single recognition was made of his plane. He dedicated his entire mid-winter vacation to complete the plane in time, and worked hard to make it scale.

I felt no forethought went into the preparation of categories at the show. Prizes were awarded for the biggest, smallest, most unusual, etc. How come the biggest and smallest, when I felt, as did many others, that good workmanship was lacking?

Contests such as this could very well discourage any youngster from continuing in this hobby. We try to teach our children "fair play" — this was not fair play.

I'm enclosing a picture to show you the wonderful job my son Michael did.

An AMA photographer took his picture at the show, but it was not published. One 14-year-old had a rocket display that won recognition at the close of the show, but this was not R/C.

Mrs. Frank Sansone, N. J.

Continued on page 46

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Radio Control Manual by E.L. Sullivan Jr. \$3.20

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MINI-ROD

BOB STALICK

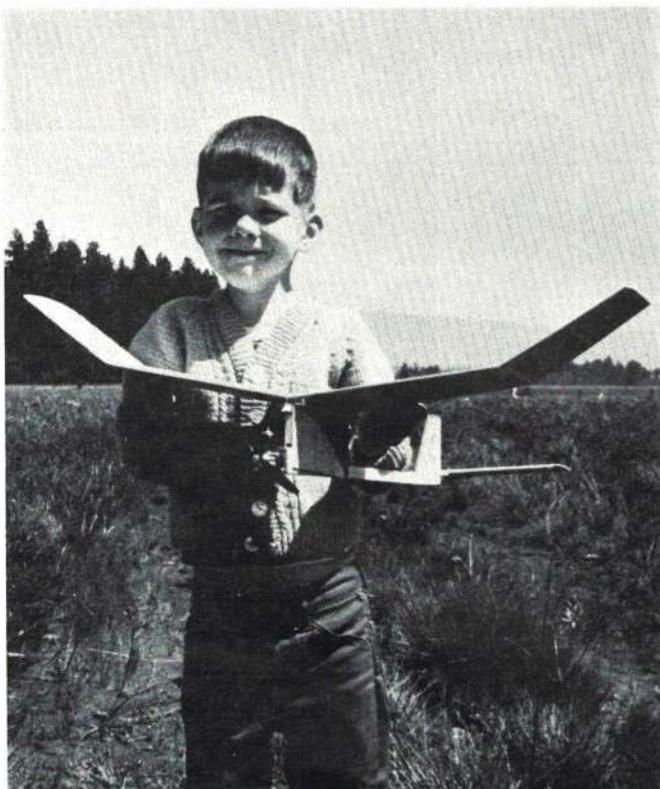
A 1/4A size free-flight (020) that resembles today's big-brother competition designs. Performs like them, too!

IT'S a sunny afternoon with a slight breeze. You unpack the Mini-Rod, measure the fuel into the tank, connect the batteries, flip the engine to life, light the dethermalizer fuse, and launch it into the wind. When the engine stops 15 seconds later, your model is a bright-colored speck in the sky silhouetted against the white clouds. Then the fuse burns through the dethermalizer rubber band, the stabilizer trailing edge pops up, and the Mini-Rod descends slowly into the grass. If this picture stirs your imagination, you can quickly build a good model from the plans on the next two pages. Begin on Friday and fly it Sunday.

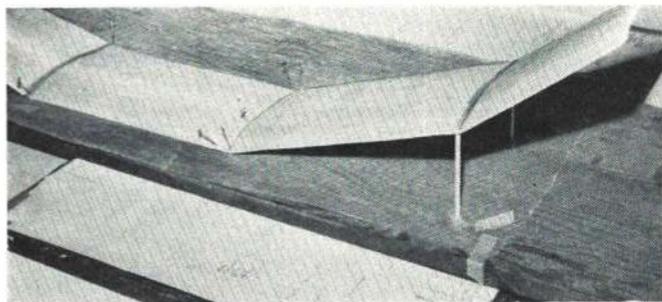
Mini-Rod is the ideal design for the new AMA-HIAA-Navy youth program as the time-target free-flight model. This design was arranged so that you can make your first model from the magazine plan. Mini-Rod is inexpensive, costing less than \$1.50 for materials (less engine). It can be built in two forms. Choose the one you like better. It's rugged in all-balsa form, but it performs better with the built-up wing.

Mini-Rod has been flown with a number of engines from the 010 Tee Dee to a tired old 045 Baby Spitfire. It seems happiest with the 020 Cox Pee Wee or Tee Dee. One Mini-Rod was modified for Jetex 150 power!

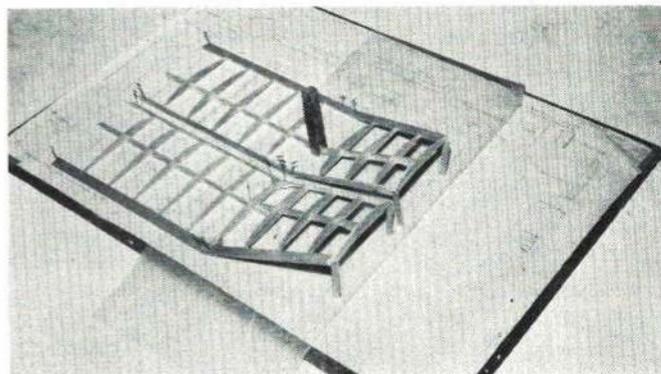
The plans are straightforward, but before beginning to work, obtain all the supplies in the Bill of Materials. Here are a couple of hints for selecting the right kind of balsa wood to do the best job. C-grain balsa — some call it quarter-grain — has a strange mottled or freckled appearance with shiny spots. You will generally find that the lightest and stiffest and strongest wood has this grain. Pick it for wing spars, ribs, leading and trailing edges. Use it where flat sheets are needed as it doesn't bend over curves easily. A-grain balsa is identified by the grain streaks running side-by-side the length of a sheet. It fits over curves — like



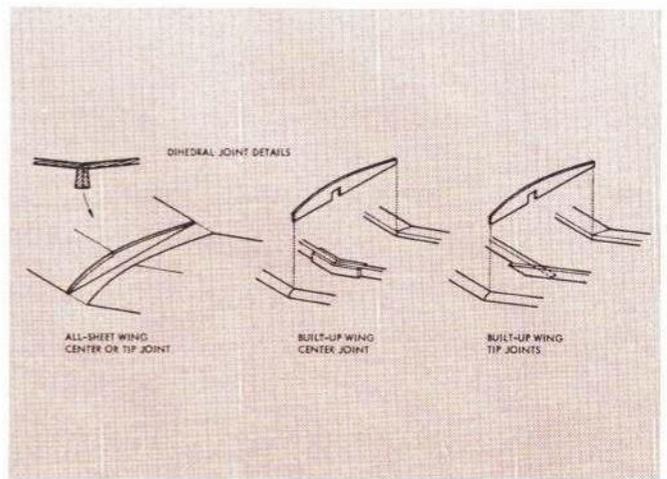
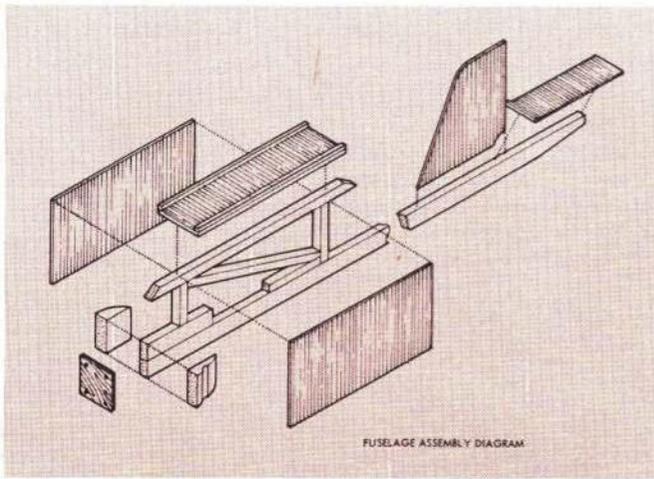
Heh, man, how you like my crate? We admit such a young shaver would need Dad's help to fly Mini-Rod, but it's a quickie model.



Polyhedral wing — one with "double" dihedral — requires putting dihedral in tip first, then center section. Sheeted wing shown here.



Here's how to put in that dihedral when you make the built-up wing. Prop up the tips the required amount with wood scraps.



How the fuselage and wing mount go together. Text tells how to assemble the mount flat on the bench. It's simple and really tough.

Compare these details with pictures on opposite page to help with construction of wing dihedral joints. Work slowly for accuracy.

airfoils—and rolls into tubes nicely (and especially when wet). So look over the wood rack. Choose first for strength and then for lightness. Later on, you can shoot for light weight and compromise on strength.

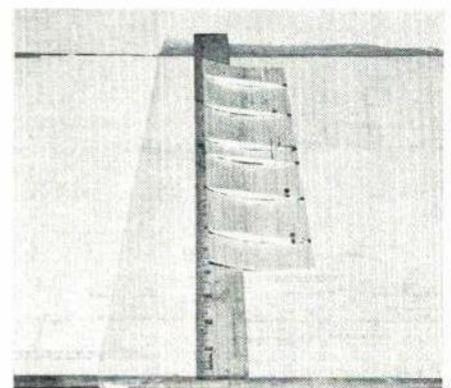
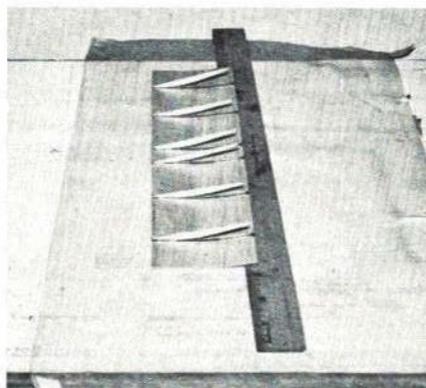
Now that you have chosen the materials and readied tools, pick a nice straight and flat work surface to pin your plans on. Cover plans with waxed paper, then before you cut anything, read the plans very carefully. Notice that there are two different types of wings shown. One is sheet balsa, the other is built-up and tissue-covered. Be careful, don't try to build one wing panel of all balsa, the other with ribs and spars. Even though Mini-Rod would probably fly with this arrangement, it would be tough to trim out. For speed and ease of construction, build the balsa sheet wing first.

Construction:

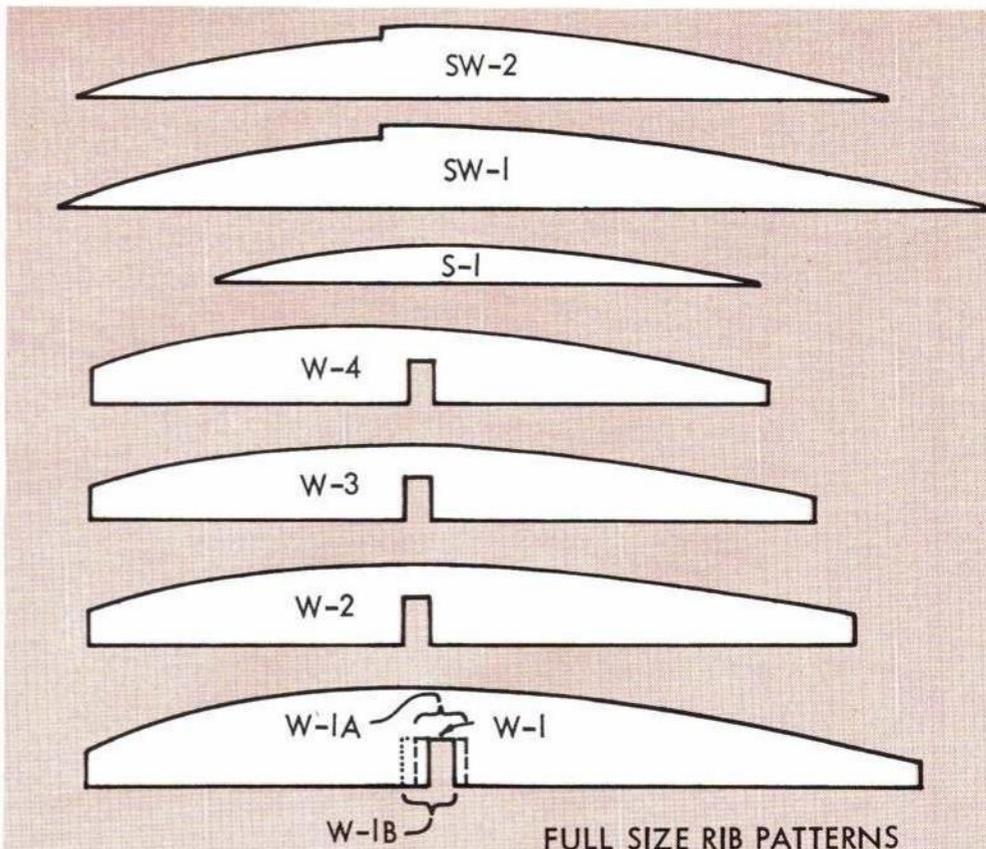
1) Build the sheet wing by gluing a 30" long $\frac{1}{8}$ x 2 sheet of balsa to a similar length of $\frac{1}{16}$ x 3. Be certain that they are glued evenly and securely. I recommend Sig-Bond or similar adhesive. Cut the tapered tip to shape as indicated on the plans, and mark all the rib locations directly on the underside of the wing. This is a good time to sand the topside of the wing to get a good smooth surface joint. Preglue all the ribs and the sheet where the ribs join. Glue in all ribs, except at the dihedral joint, starting at the trailing edge (on the $\frac{1}{16}$ sheeting). Allow this to dry thoroughly. Before gluing the ribs to the $\frac{1}{8}$ leading edge sheeting, dampen the topside with water to allow the balsa to flex more easily, then pin the ribs to the $\frac{1}{8}$ sheet and glue securely. After this assembly has completely dried, cut the wing at the dihedral and polyhedral joints where indicated, then with a large sanding block, sand the ends where the panels join so that they fit when the angle is glued in. Preglue and allow to dry. Glue the tip panels to the main panels, blocking them up as indicated. After they have dried thoroughly, join the two wing halves in a manner similar to that used on the tips.

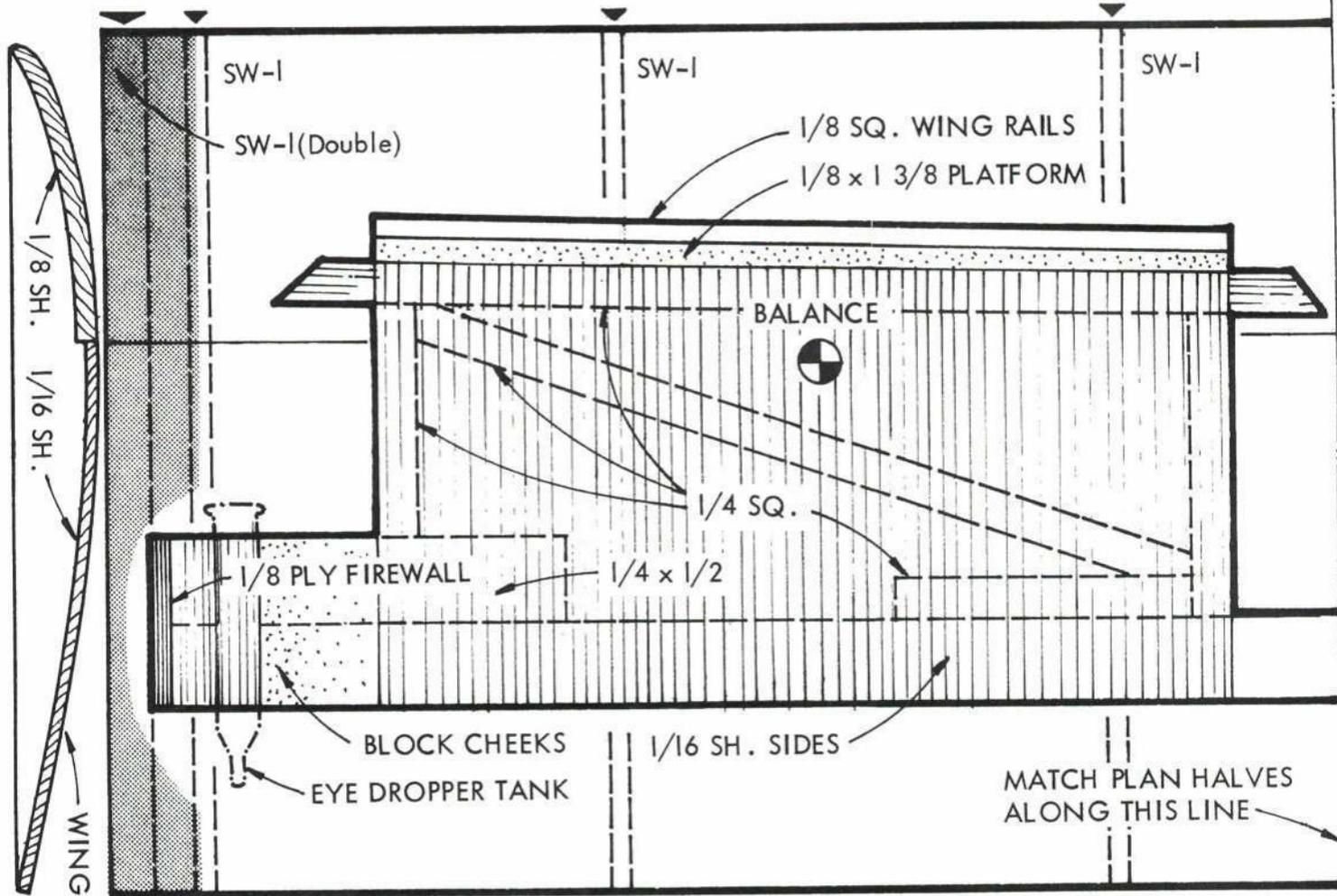
Add the remaining ribs at the dihedral joints. After everything has dried, reglue all joints. Sand all ribs flush at the bottom and at the ends of the wing. Add optional cloth reinforcement at the dihedral joints. The stab is constructed in a similar fashion, with the exception of the addition of the wire hold-down hooks glued and sewn as indicated on the plans.

2) Construct the pylon next. Cut sheet to
Continued on page 74

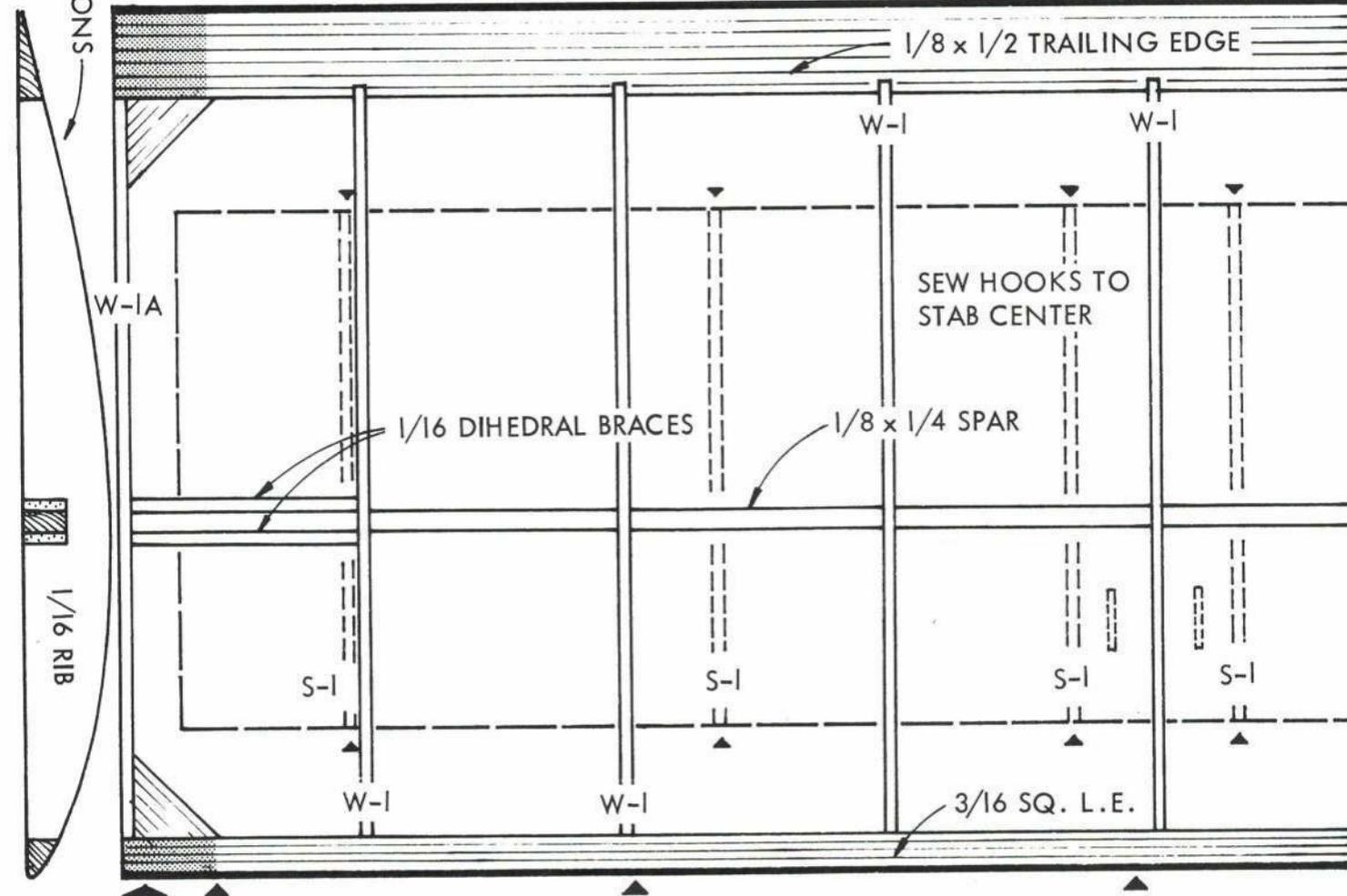


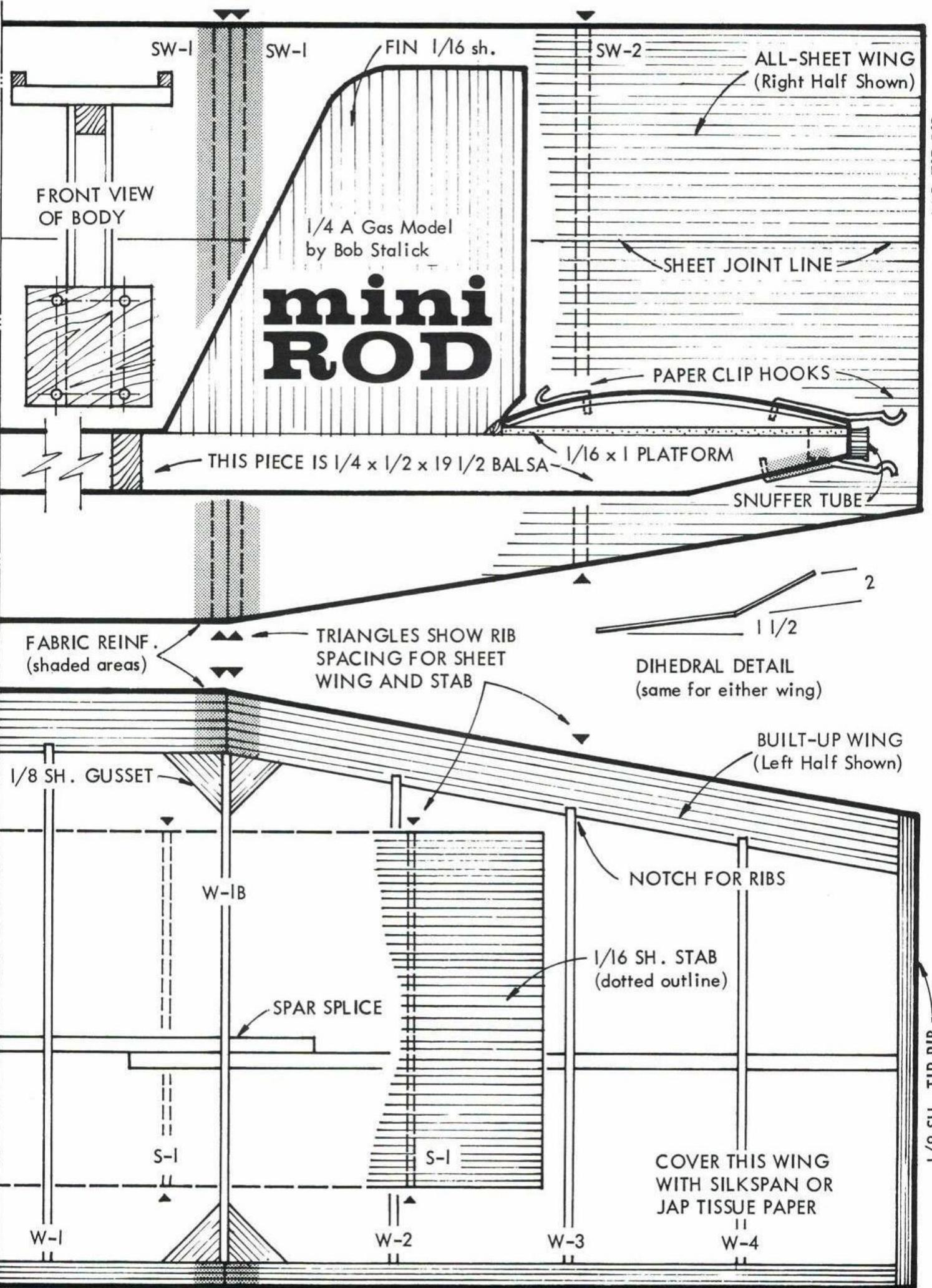
This is how you glue in the ribs on the underside of the sheet-balsa stabilizer. Use a ruler or similar object to bend the sheet as necessary for this two-step operation.





MAKE 2 SHEET HALVES
OR 2 BUILT-UP HALVES





SW-1

SW-1

FIN 1/16 sh.

SW-2

ALL-SHEET WING
(Right Half Shown)

FRONT VIEW
OF BODY

1/4 A Gas Model
by Bob Stalick

mini ROD

SHEET JOINT LINE

PAPER CLIP HOOKS

THIS PIECE IS 1/4 x 1/2 x 19 1/2 Balsa

1/16 x 1 PLATFORM

SNUFFER TUBE

FABRIC REINF.
(shaded areas)

TRIANGLES SHOW RIB
SPACING FOR SHEET
WING AND STAB

DIHEDRAL DETAIL
(same for either wing)

BUILT-UP WING
(Left Half Shown)

1/8 SH. GUSSET

W-1B

NOTCH FOR RIBS

1/16 SH. STAB
(dotted outline)

SPAR SPLICE

COVER THIS WING
WITH SILKSPAN OR
JAP TISSUE PAPER

S-1

S-1

W-1

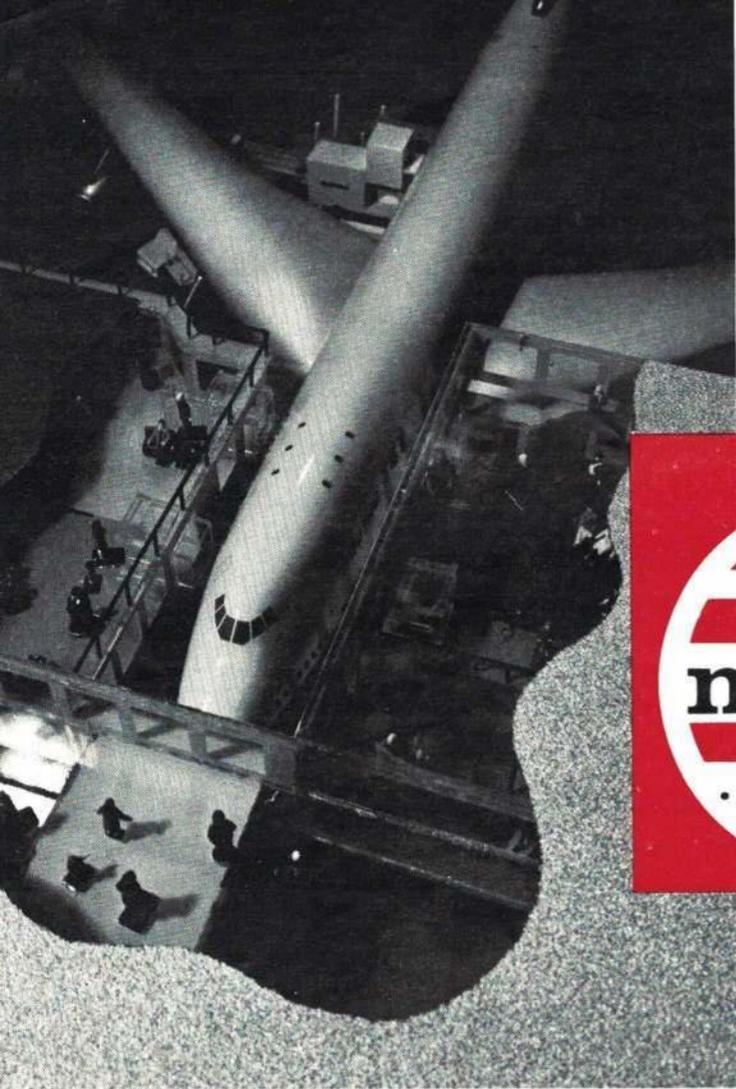
W-2

W-3

W-4

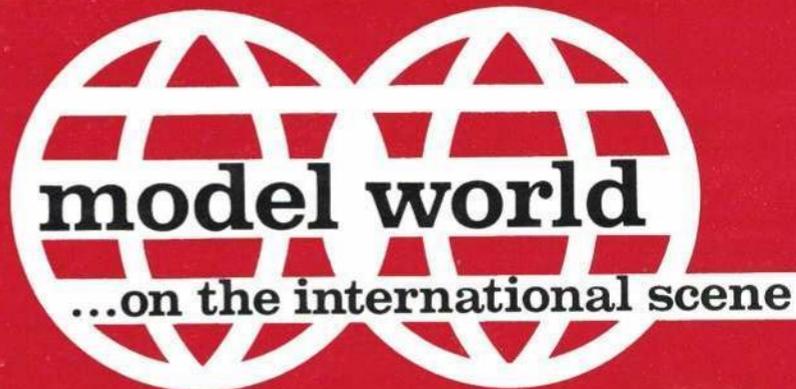
1/8 SH. TIP RIB

LINSTRUM * 8.15.66

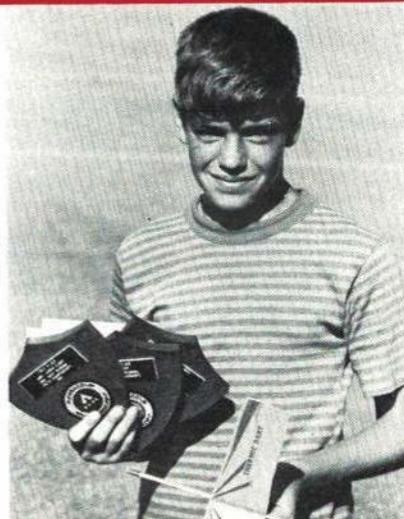


Industrial scale models play star role in study of airport problems with new jets

Left: A 1/100th-scale model of Boeing 747 Jumbo Jet soon to be flying is typical of widespread use of miniatures to help shape the Sky Harbors of the future. Everything in this photo is to a common scale. Facilities and methods for loading and off-loading passengers and cargo are meticulously studied and, in this case, have even resulted in some changes to the aircraft itself. This photo barely implies the scope of this model-study program, some aspects being quite complicated.



Jim Leggett.



Official U. S. Navy Photograph.

AMA-Navy sponsorship of youth continues in 1969

Larry Chidgey, 11-year-old winner of Regional Model Airplane Meet (Pensacola, Fla.), sponsored last year by HIAA, AMA, and Navy, won paid trip to Olathe Nats. Nation-wide program, to repeat in 1969, steps up youth support.

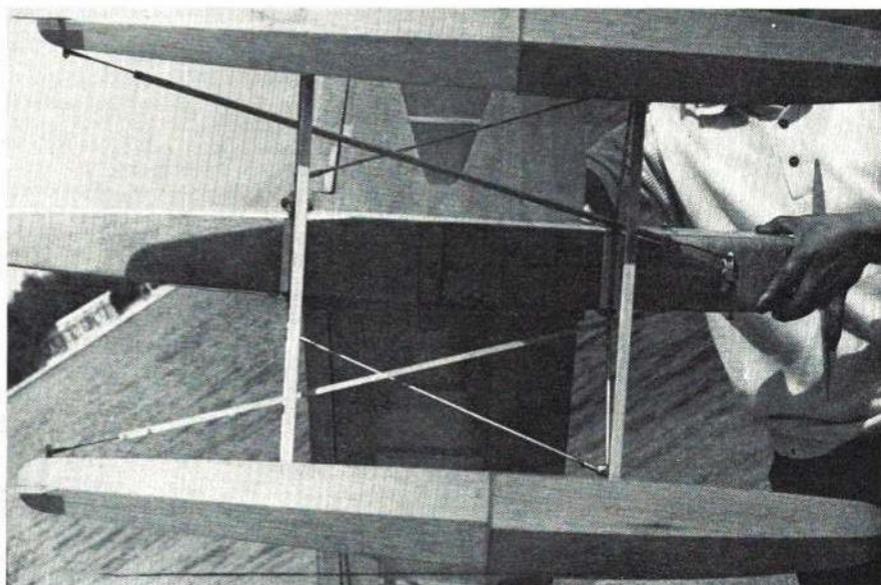
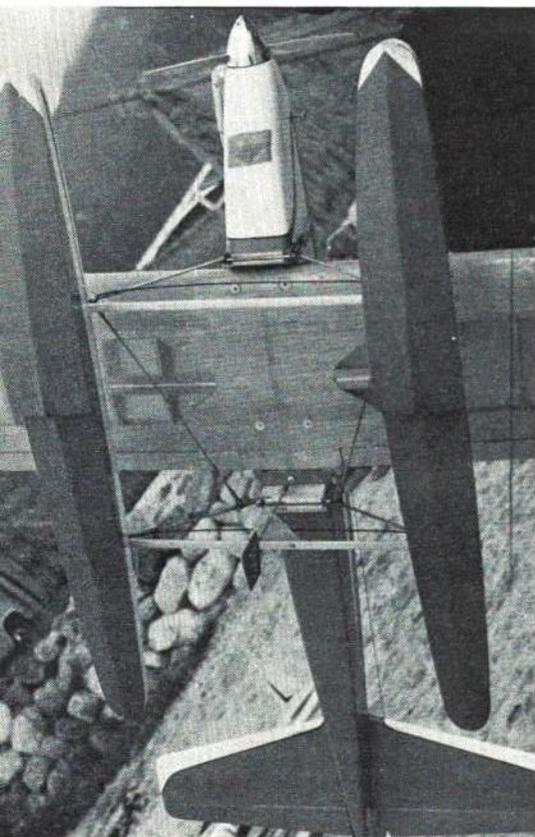
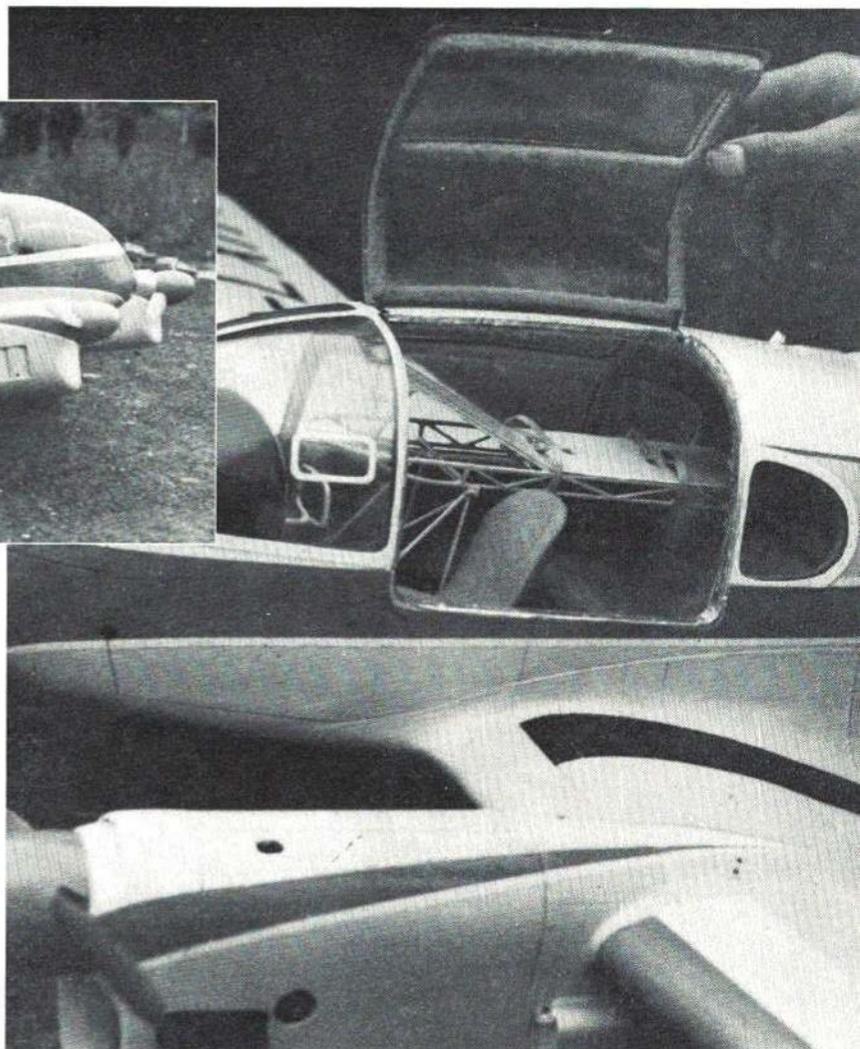
Hawker Siddeley delivers 55-year-old airspeed indicator to Sopwith Pup owner

Left: When Dick King, right, needed an authentic 1913 airspeed indicator for the Sopwith Pup he had rebuilt, Hawker Siddeley test pilot Desmond Penrose hand-carried it to him on delivery trip of DH 125 business jet. Penrose also is an antique-aircraft buff. Having built more than 100,000 aircraft, Hawker Siddeley glowingly stated "... we back them up, even if we have to do some digging in history to help an operator." King is an expert photographer and his Pup appeared on our May 1967 cover.



Czech Aero 145 twin-engine ambulance plane makes unique scale subject

Above and right: From Czechoslovakian contributor Otakar Saffek comes these two fascinating photographs of an Aero 145, a twin-engine ambulance plane, modeled faithfully by R. Felica of that country. It was built to a scale of approximately 1 to 6. Along with other prize scale models, it was seen at the European Control-line Scale Criterium last summer in Czechoslovakia. Were it not for the people in the background, it would be difficult indeed to determine this was a model and not the real aircraft. Wing-tip lights, swiveling tail-wheel strut, and markings reveal painstaking construction in an aircraft which also must be suitably flyable. Close-up on the right, which shows interior seating and the scale stretcher—even the stretcher belts look real—suggests what it takes to win in international competition. And the standards grow tougher each year.



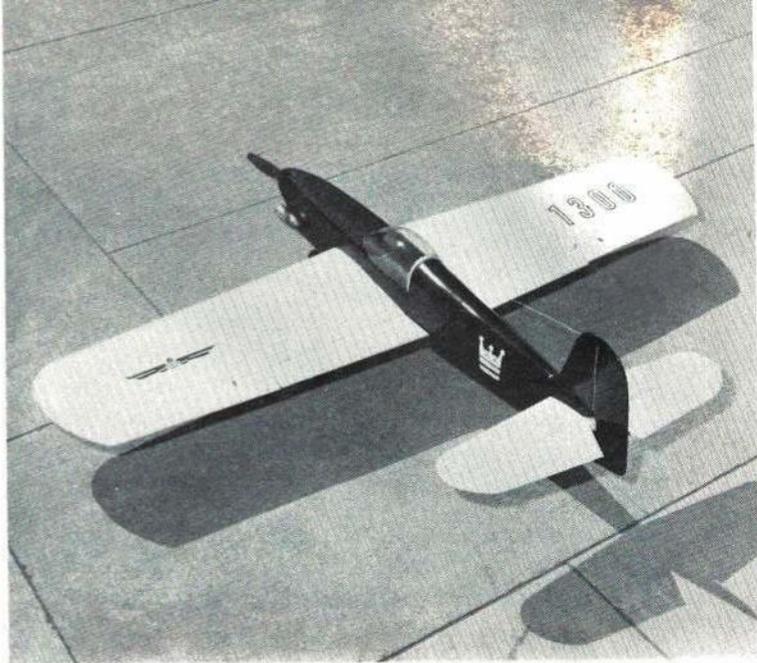
Both, Ritsui Honda.

Japanese seaplanes show useful water-rudder technique

As many a new hydro fan is finding out, a water rudder is a valuable addition which makes for positive steering when positioning the aircraft before takeoffs and after landings. These two photographs from Japanese correspondent Ritsui Honda, taken during last summer's big water meet at Osaka, show two interesting systems. In the photo above, the steerable nose-wheel fixture is connected to two water rudders, one at the rear tip of each float, by means of ordinary pushrods. At left, one water rudder is operated directly from air-rudder servo within the fuselage.



Author holds original 35-powered radio-controlled Nobler which was converted from control-line kit without refinements. It proved feasibility of developing design for contest performance.



With 515-sq.-in. wing area, 5-lb. weight, and well-muffled RC40 engine, Nobler is a lively flyer. Wing is permanently mounted to fuselage, flaps are coupled to elevator function for smoothness.

R/C Nobler

Conversion of a great control-line stunter makes
for a new kind of precision flying.

ED SWEENEY

FOR years R/C enthusiasts have thought that a converted control-line model would be a fine radio model. They are right. Some recommended using flaps coupled with the elevator function, as in control-line flying, on a conventional model, and they are right. Fulfilling these conditions, the R/C Nobler has all the great characteristics of its line-bound ancestor.

Using only a 40 R/C engine (about as much power as the non-throttled 35 con-

trol-line engine), with a wider, slightly longer fuselage, and the control-line flap area split for independent ailerons and flaps, it has a constant-speed, true neutral stability, and unsurpassed smoothness in flight.

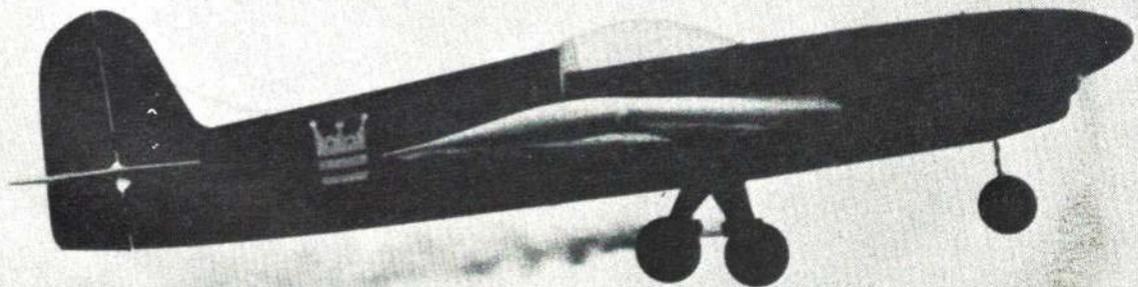
Design changes from the control-line Nobler kit were made only to accommodate equipment installation, a throttled engine, clunk-type fuel tank, and new fuselage structure with extra tail length.

Relatively uniform flying speed is an important factor in the success of a control-line stunt model. In CL flying, control is

direct through the wires, so that an always predictable, constant response is available for accurate maneuvers. The same is true of radio flying. In Noblers, the airfoil regulates the air speed through maneuvers between 55 and 70 mph. Although the weight of the model is a factor in controlling speed, both the control-line and radio versions fly at nearly the same speed. This R/C Nobler weighs about 5 lbs.

Smoothness is the ability of the plane to slice through maneuvers gracefully. Noblers and other control-line models with coupled flaps and elevator fly smoother

Deep fuselage with mid-wing location affords excellent knife-edge flight and steady windy-weather flying. Distinctive lines evident here with plume of trailing white smoke.



out, but will keep circling until you fly it to another position. True neutral stability requires much less effort by the pilot to set up and perform the stunt maneuvers.

Maneuverability also is helped by the smoothness and constant flying speed of the Nobler. It performs all of the FAI and AMA Class-C and free-style stunts. Its roll response is excellent at all speeds. We found that it tends to yaw into turns slightly with the direction of applied roll—this is a distinct benefit in achieving axial rolls and easier landings. Four-, eight- and sixteen-point rolls require almost no down-elevator during inverted portions, and top rudder is not really necessary either. Knife-edge flight is a ball; one can literally cross the entire field with the wings perpendicular—make a quarter roll from level flight and apply full top rudder. The square cornered maneuvers are easy. When one sharply deflects the elevators (and flaps), the plane will make an equally sharp response and without losing much air speed. Corners of the top-hat and square vertical-eight are clearly defined.

The airplane also spins well. Rotation is fairly slow and recovery is instant. It helps to add aileron in the direction of the spin to get the rotation started. Snap-rolls come off with no strain and they are also reasonably slow in rotation. The clue to spins and snaps in the Nobler is having a big sharply deflected rudder to offset the stability effects of the flaps at up-elevator command.

Landings and takeoffs are unlike any other R/C model. Takeoff needs only a small, graceful rotation when flying speed is gained. Yank it off, and it jumps into the air, fully under control, no wing-dropping, no spin danger, no dangerous mushing. Because of the relative wash-out effect of the wing tips when the flaps are deflected in up-elevator command, the plane will never unexpectedly drop a wing tip at any flying speed, even during a stall. Because of this characteristic, landings are best made with up-elevator trim. Throttle back to just above idle, apply up-trim and let the model settle to a landing in a level flight altitude—hands off! We mean with the hands off the control sticks! Wing tips are fully stable, and its altitude is fine for landing evenly on the main wheels. The plane will not gallop or wander during the approach. This kind of landing is safe for beginners too. You experts, can drag it. Remember, the Nobler will stall cleanly power off, but with just a little added power it won't stall.

Fuselage: The structure is designed with two ideas in mind. First, it must be capable of withstanding all bad landings and near crashes in spite of the forces applied through the wing, which is permanently mounted in place. Second, it must be self-aligning during construction. These goals are accomplished when gluing the nose unit to the fuselage sides. The overall structure was designed by an aeronautical engineer. You will never break it unless everything is totally smashed!

The two basic fuselage construction stages are:

First stage: The motor mounts are located in the firewall and forward bulkhead with rubberbands. Screw in place the tank compartment hatch. Mount the nose gear and drill holes for the fuel tank outlets. Trim the motor mounts to fit the engine crankcase, drill the mounting holes, and bolt the engine in place. The fuselage doublers, triangular strips, rear doubler, and tail spacer are mounted on the fuselage sides with contact cement.

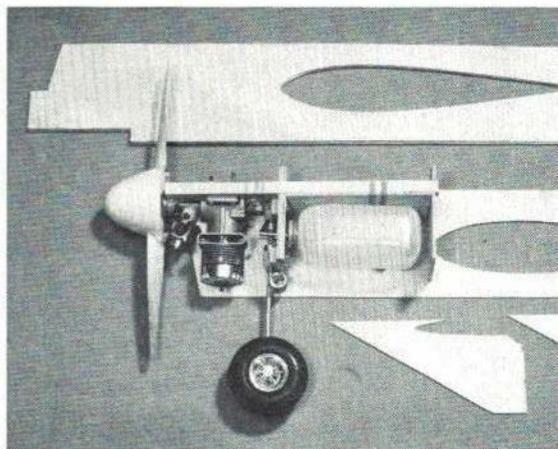
Second stage: Disassemble the motor mount unit and reassemble with epoxy glue, leaving off the tank and nose gear;



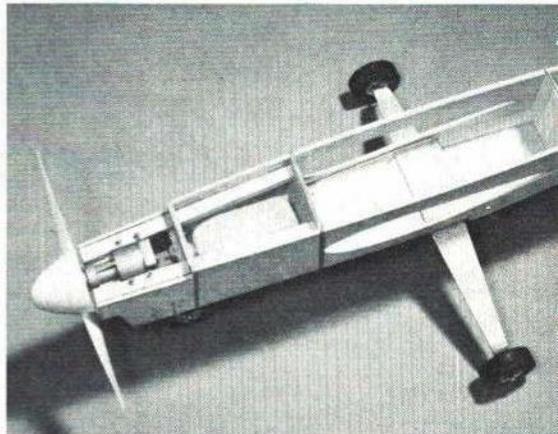
A highly maneuverable aircraft with gentle control responses and limited flying speeds. Also gives relaxed, enjoyable sport flying.

than their counterparts without flaps. Why are they smoother? The required angular rotation of the plane to accomplish a given radius of pitch response is significantly reduced because the relative lift of the wing is variable during the pitch change. While any lift increase increases drag, changing the lift characteristics of the airfoil of the wing is less drag-inducing than just pitch rotation and, hence, the plane does not slow down as much, or rotate as much, in performing. For example, a loop or a sharp turn. However, use of too much flap deflection will cause too much drag and the opposite effect will result. The advantages of coupled flaps is a smoother flight path. This will gain points at a contest.

Another important characteristic of the Nobler is its true neutral stability. The model has no dihedral, no incidence, no thrust off-sets, and a perfectly symmetrical airfoil. The natural aerodynamic traits, in addition to the above factors, produce a model which will remain in almost any attitude it is put into. For example, one can establish a 20-degree bank turn with a touch of up trim and leave the plane alone. It will not spiral into a dive or roll



First stage of fuselage construction gets engine unit aligned, drilled, and bolted as sub-assembly before epoxying together.



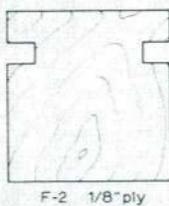
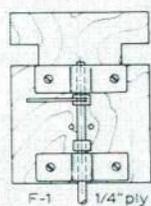
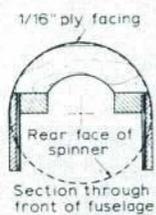
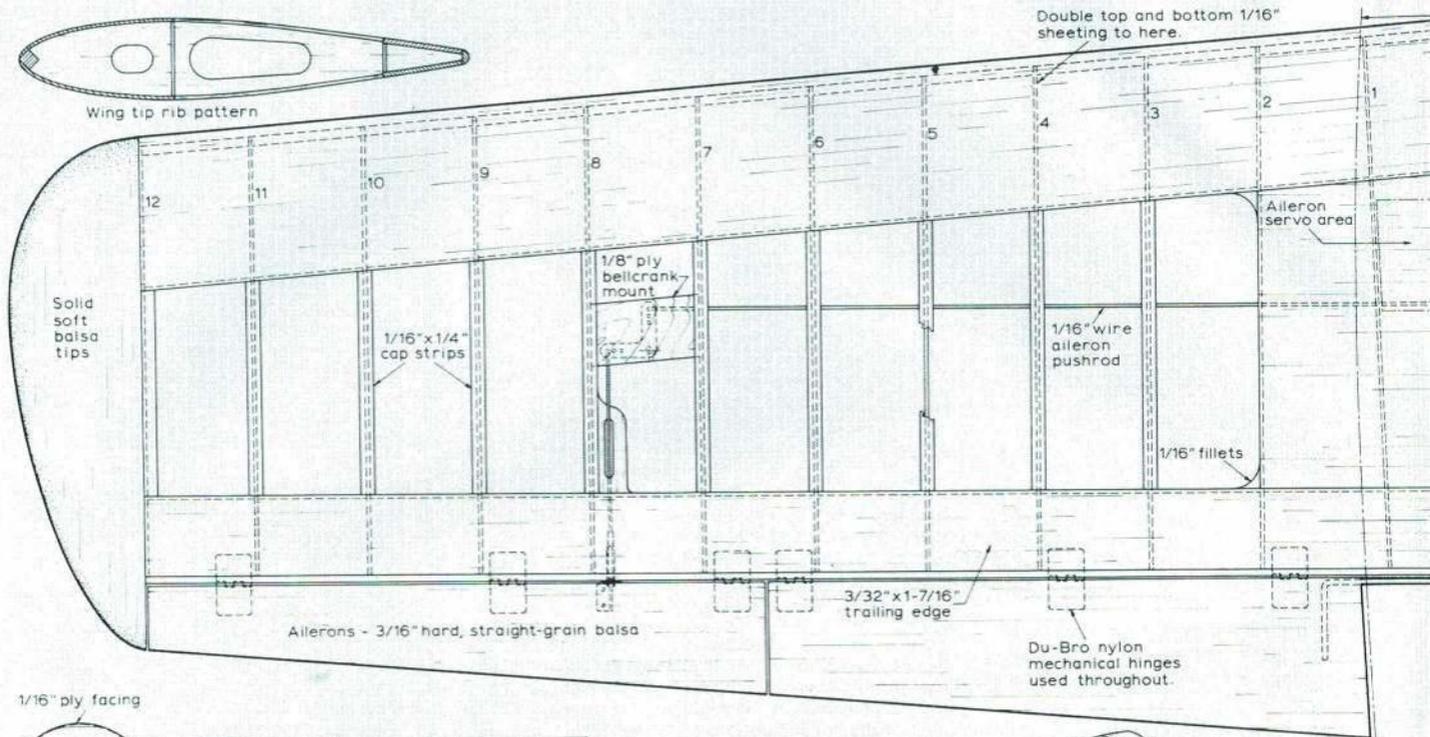
Carefully worked-out assembly procedure and structure gives quick construction, correct alignment, and real crash resistance.



Enclosed but well-ventilated engine, a contoured fuselage, give most reliable engine performance. Note gear mounting.

but bolt the engine in place again. Don't let the tank compartment hatch be glued down. With lots of epoxy glue, mount the fuselage side assemblies to the motor unit, aligning the firewall and bulkhead with the top of the sides, and the maple mounts flush with the forward edge of the sides. Tape or rubber band this together. Place

Continued on page 58



Sketch showing hatch construction. (not to scale)

Hatch hold-down screw

Brass tubing

1/2"

1/8" ply landing gear mounting plate

2-1/2" spinner

Blind mounting nuts

Top Flite maple motor mounts

Blind mounting nuts

1/8" sheet doubler

Hole for 1/8" dowel

1/16" ply facing

1/16" ply facing

3/8" x 1/2" hardwood hatch hold-down. Epoxy securely in place.

1/16" ply fuselage doubler

1/8" sheet sides

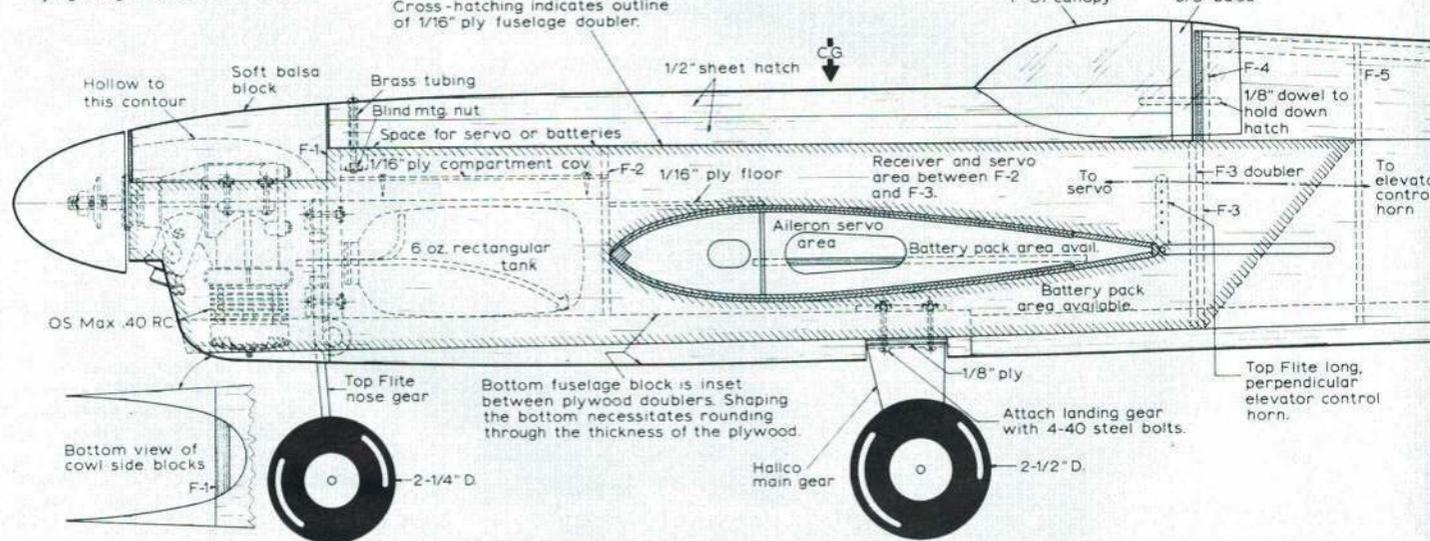
No thrust offsets. Limit size of engine to 45 cu. in. Additional power is not required. 10-6 wide blade prop is recommended. Flying weight should be 5 pounds.

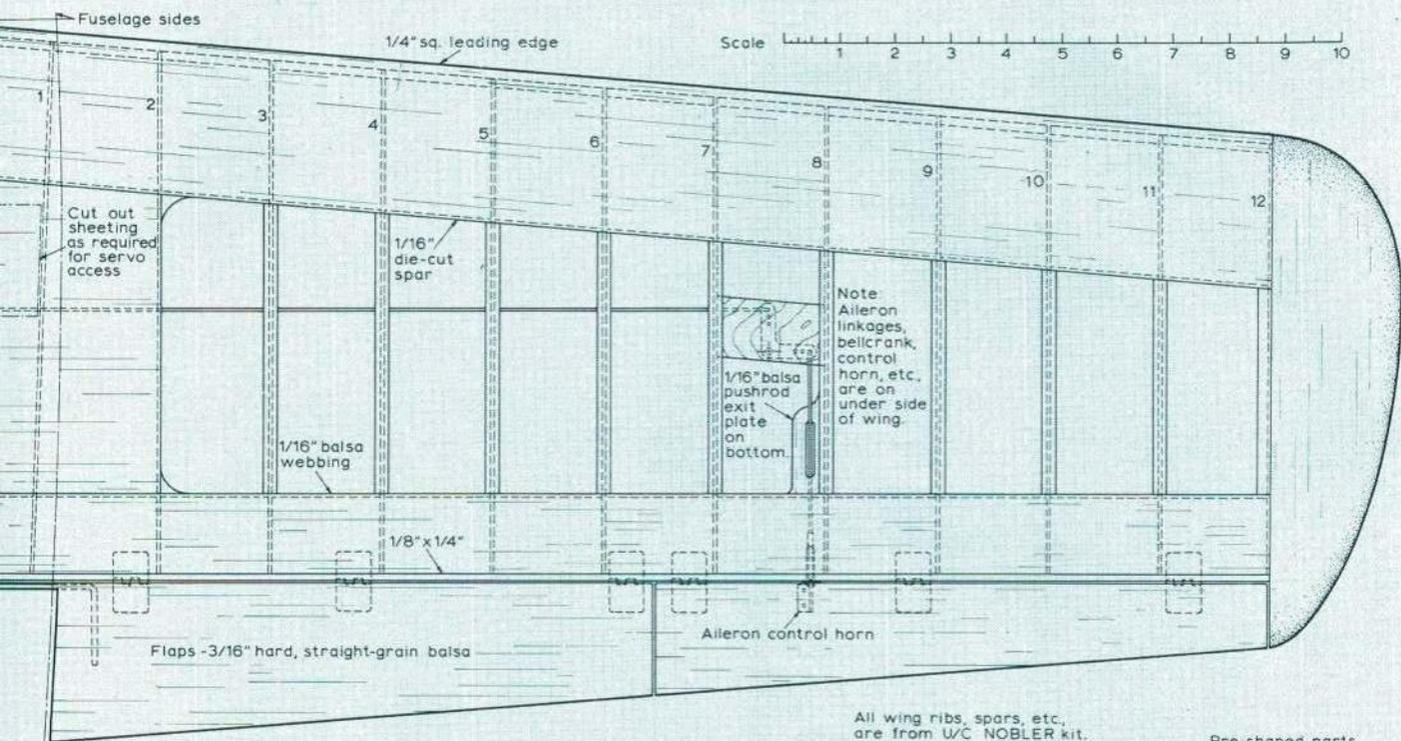
Hatch, wing, and rear turtledeck planking omitted in top view for clarity.

Cut down from large DeBolt P-51 canopy

3/8" balsa

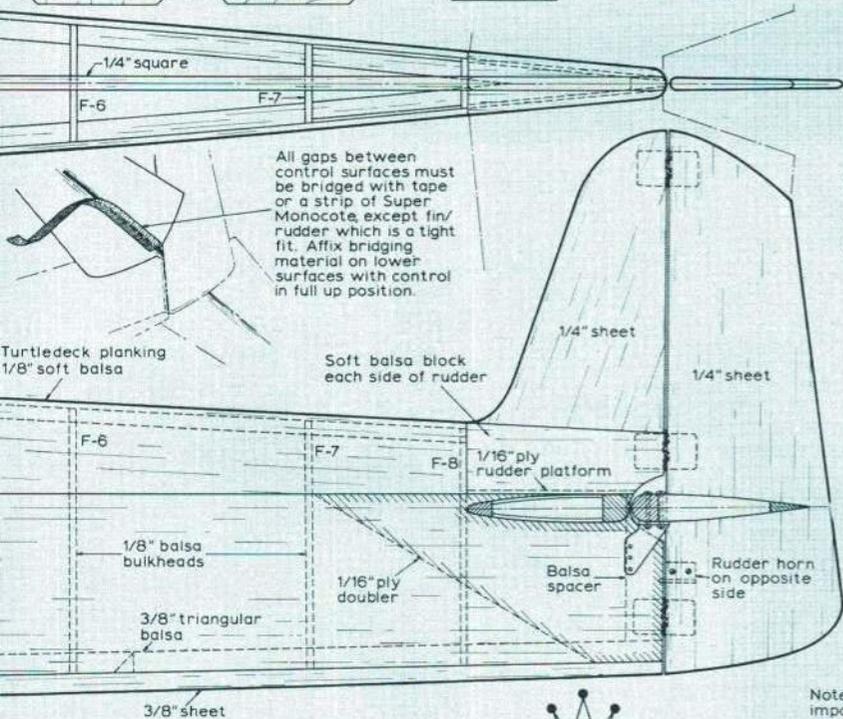
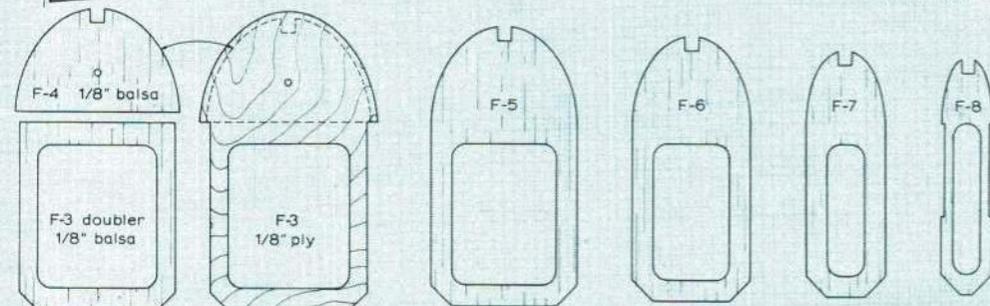
Cross-hatching indicates outline of 1/16" ply fuselage doubler.



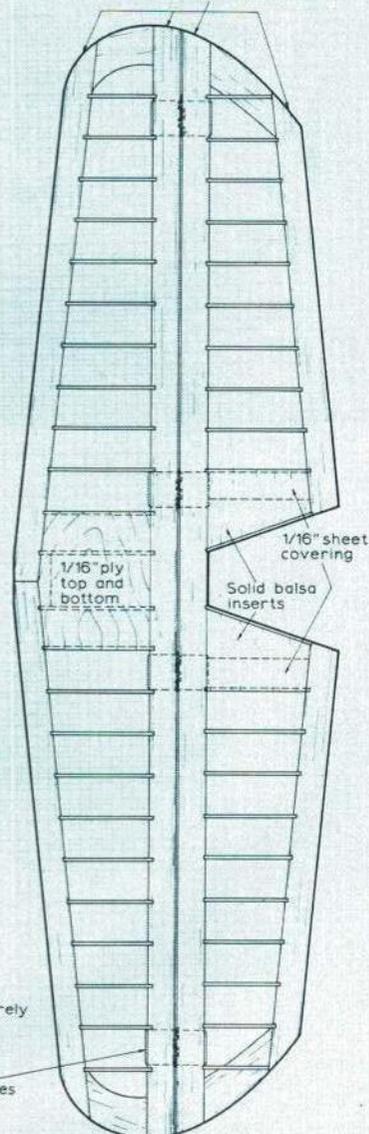


All wing ribs, spars, etc. are from U/C NOBLER kit.

Pre-shaped parts from Nobler kit.



All stabilizer and elevator parts are from U/C NOBLER kit except 1/16" ply center section sheeting and balsa blocks for elevator inserts.



Note: It is extremely important to epoxy the wing and stabilizer securely in place in the fuselage.


R/C NOBLER
 AMERICAN AIRCRAFT MODELER
 REDESIGNED FROM TOP FLITE KIT by ED SWEENEY
 Inked by C. Beawell

A NEW SLANT ON AN OLD CONTROVERSY

The Day the Red Baron Died



Baron Manfred von Richthofen.

Baron Manfred von Richthofen was World War I's Greatest ace with 80 victories. What sort of a man was he? How good a pilot? And just how did he meet his end?

Right: Rare photo of the Baron's Fokker Triplane coming in for a landing. What is the explanation of the missing wing struts? Was this an earlier machine?

WILLIAM J. O'DWYER

Major, USAF Reserve

All photos / Camera Press

AT 10:45 a.m. on the misty morning of April 21, 1918, Baron Manfred von Richthofen's all-red Fokker triplane landed for the last time. The plane bumped, skidded, and abruptly halted in a shell hole. The wheels crumbled. His hand still clutched the stick. There, north of Paris in the Somme Valley, along the Western Front of World War I, the final act of Baron von Richthofen's life was played out. His curtain-call bow was taken at the edge of the British lines.

A trickle of blood ran down his limp jaw. His head was bent, his goggles smashed. The Red Baron, at 25 years of age, Germany's "Ace of Aces" was dead! A single machine gun bullet had pierced his right side, careened obliquely through his chest next to his heart, and exited his left breast.

Clayton Knight, one of "that" war's renowned pilots, a world-famed combat artist-illustrator, who flew deHavillands out of a field near Ypres and who illustrated Floyd Gibbons' book "The Red Knight of Germany" in 1928, spoke to me about that

moment of 50 years ago. In his Redding, Connecticut home, cluttered with a perpetual flow of air combat scenes from his easel, his memory was crisp and vivid.

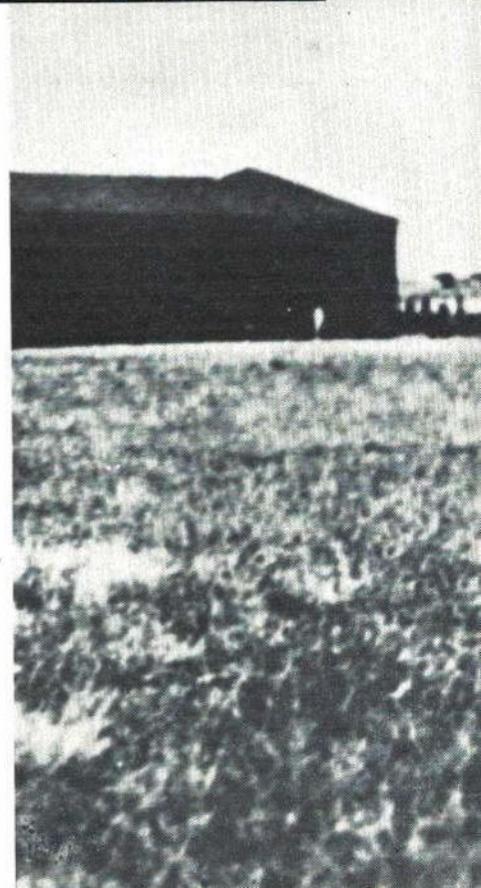
"A sigh of relief passed through the lips of every pilot—all along the Front—who ever dared to go aloft to meet von Richthofen and his Flying Circus, Germany's top killer Squadron. With the Baron's death, the Allies' main psychological dread of the German air arm was broken!"

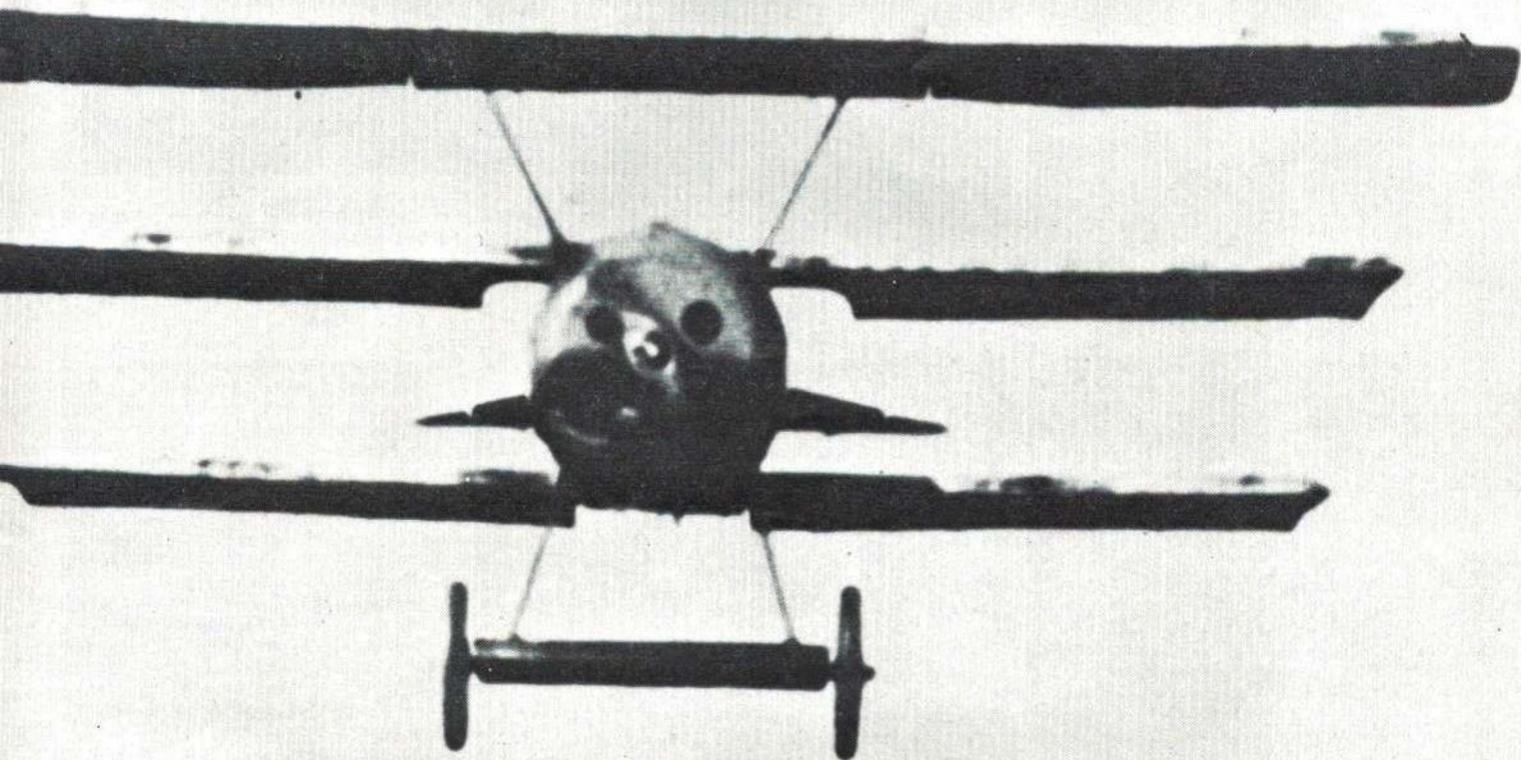
The Baron's deadly talons had effectively ruled the air alleyway from Ypres to Amiens. His twin Spandau machine guns were a special invitation to Valhalla. He gave no quarter. He asked none in return. Eighty who tested this fact became his victims. They were blasted out of the sky. He blazed his name into the pages of history.

Yet, for all this slaughter he commanded respect on both sides of the line. Respect came in boasts from his nation's top Generals who said, "Richthofen is worth two divisions of men in the trenches." While he lived, respect among his enemy was spelled out as fear. At his death it was redefined in the form of a toast.

Lt. Rys-Davids stood with his glass held high. It was at a banquet held in his honor. He had just shot down Werner Voss who had accumulated a total of 48 victories.

"Anybody would have been proud to shake his hand had he fallen into captivity





Richthofen, center, and pilots of his pursuit flight, the Richthofen Squadron. The others from left to right: Festner, Schafer, his brother Lothar, and Kurt Wolf. The dog, Moritz, belong to the Baron. Richthofen carefully analyzed configurations and traits of all enemy aircraft types.

Observations by Clayton Knight

The only living German ace we were familiar with in 1918 was Richthofen, although there were several more who were just as skilled and lethal. Ernest Udet was one, but his *name* meant nothing to us. It was only after the Armistice when he visited our squadron mess in Cologne (#206) that he identified the craft he flew. "Good God, man, you're the Fokker D-7 with the blue wing tips that we were all warned against, after Baron Richthofen was shot down!" He sent further chills up the pilots' spines when he said nonchalantly, "After I cracked that one up I had one with red tips." We hadn't known *that* and our ignorance had been blissful.

Personally, I'm still convinced that Roy Brown's bullets were the ones that finished the Red Baron. I knew Roy intimately after the war and we had long quiet 'pilot' talks. He was never one to make bragging claims and was perfectly willing to give the Australian gunners on the ground the benefit of the doubts that had arisen from their claims. In the split seconds of a dog fight exact evaluations are almost impossible to make as I found out in my last one. I was quite certain that my bullets had riddled the Fokker D-7 that bested me but could only watch it going down momentarily, when other attackers diverted my attention. It was not until nearly fifty years later that Peter Kilduff, on his honeymoon in Germany, visited Oberleutenant Auffarth's family (he was credited with my victory — his 27th) and verified the fact that he, too, had gone into a German hospital on that October 5th, 1918! (A different one from the one I was taken to. We never met except for those brief moments 3,000 ft. over Belgium.)

alive! Manfred von Richthofen is dead. He was a brave man, a clean fighter, and an aristocrat! May he rest in peace."

Rys-David's fellow pilots hailed Richthofen in that toast, to the man.

Who was this unique enemy pilot who inspired such legend and who gained the undying respect of his adversaries?

He was born in 1892 to the noble Prussian aristocratic family of Major Albrecht von Richthofen. His mother was the daughter of the well-to-do von Schickfuss and socially prominent Neudorff families. Honor and deep sense of profound superiority were instilled from his birth.

He was devoted to the traditions of his nation. He rapidly absorbed the heritage of the Richthofen name. The first excitement of "the hunt" was implanted at an early age through the constant teachings of his father. He quickly became an accomplished marksman from the start. Many of his "stalking" techniques were utilized later in battles among the clouds. He applied them well until the day he died.

At 11 years of age his trips to the forests were interrupted when his father ushered him off to military academy at Wahlstatt. He was firmly molded into disciplined manhood, the life of a professional soldier and future officer. Yet, each leave he returned with his father to once more pursue his love of the hunt and the kill in the forests. His walls were adorned with those trophies.

Later, upon graduation from Lichtenfeld Royal Military Academy he attended and completed the final phase of his officer training. It was the War Academy in Berlin. He was then assigned to the 1st Regiment of the Uhlan Cavalry, the pick of Kaiser Alexander III's crack Regiment of 1911.

He saw little room for glory in the Cavalry once war broke out with Russia. His eyes roamed the Western Front when war clouds rapidly spread to include France. He saw the early planes as they droned overhead in an attempt to reshape the strategy of future wars. He saw a golden opportunity to carve a new type of destiny with glory and with fate. Richthofen applied for a transfer to the corps. His legend contains this frank and candid viewpoint which he submitted to his superiors.

"My Dear Excellency:

I have not come to war to collect cheese and eggs, but for another reason . . ."

His transfer was granted! From a brief and uneventful service as bombardier/observer in an early vintage Albatros where he flew along both the Russian and Belgian sectors, he sought the fulfillment of becoming a pilot. He left Captain Holck and the creaking Albatros C-1 behind.

Typical of many student pilots he found flying a difficult science to master. It took a number of examinations before he earned his wings. Crude though these beginnings had been, he did emerge the master in the end. Proof is contained in his record.

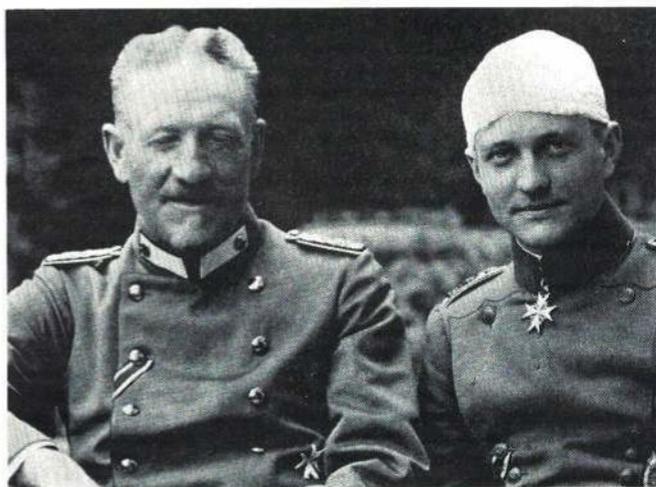
Since his death, myth tends to reduce his abilities as a skilled pilot. A careful review of logic must be made. I share in the opinions of men who flew those planes and who wrote the first laws and dialogue of air-war.

"No one accidentally accumulated 80 kills unless he was the master of his plane," cites Clayton Knight. "Today's generation must comprehend—that air combat occurred only a few years after the Wrights proved man could fly. There were no books of rules. We were all test pilots in every sense of the word!"

Those who thought a stunt pilot defined "the true master" and who belong in war, died younger and quicker than the rest. Anyone who claims Richthofen was not the master pilot has proven to be the pilot of a typewriter alone. Their words knock Manfred von Richthofen's record as being acquired from greenhorn pilots and a number of helpless balloons. "Preposterous," shouts Knight! "Who could determine a student pilot before the fight began? Who but the most courageous would attack a balloon where ground artillery knew the exact height of their tethered observer? A wall of lead awaited anyone who attacked. And when a greenhorn took aim with his machine guns, you became just as dead as though they had been shot down by an Ace."

It was only the cunning who survived. The Baron never fought as a jackal. He met his enemy face to face, outflow him, sought out the stragglers, then drove them into the ground in deliberate tests of his skill. He flew in packs or as one of a pair, but seldom alone. This was enforced air strategy which all nations have adopted ever since. Chivalry ended with the use of guns and the desire to survive. His tactics of superior strategy must never be ignored.

No matter what aircraft he flew, from the early Albatros to the Fokker Triplane, the



Father and son, Major Albrecht Frieheerr von Richthofen with Manfred at Hospital of St. Nicholas in Coutrai in July 1917 after the air ace had been wounded in the head. He had lost consciousness in the long fall, but recovered in the nick of time.

Red Baron knew its every trick and utilized it to its design limits. He had an instinctive touch. He became the author of blood and broken wings among men who knew what it was like to have a gun jammed, to suddenly invent a maneuver born out of last-second desperation, and to invent newer rules as they watched and remembered each other's fatal mistakes. Some luck did come his way as hot lead coursed through his sleeves, his mittens and his planes and his boots. From those close calls with death he knew that the upper hand was held by fate.

Lt. Hauptmann Oswald Boelke, Germany's top Ace at the time, taught him his first skills of air combat in Albatros D-1's. He remembered them well. From that union the legend of Baron Manfred von Richthofen began.

In the Red Baron's own words in his 1918 auto-biography he said, of his first confirmed kill, "I was animated by a single thought: The man in front of me must come down, whatever happens. I had gone so close I was afraid I might dash into the Englishman. Suddenly, I nearly yelled with joy, for the propeller of my enemy machine had stopped turning. His engine was shot to pieces." (The F.E.2b went down. In error he recorded it as a Vickers 2.)

He followed it to the ground. He tore off his first trophy of war, the number on the fabric of the machine.

Boelke had taught Richthofen when he first joined the elite squadron (designed to hold Germany's mastery of the sky). He said, "Fly high! Fly from out of the sun! Single out your opponent, and hold your fire until you are within close range." Boelke congratulated his friend after that first of 80 kills. As a gesture he gave the Baron a beer tankard. It triggered Richthofen's imagination.

"I'll send to my jeweler back in Berlin," he thought, "and have a cup inscribed with the date and type of my victories." Sixty cups were sent home until the scarce metals fell victim to the war. Around them were his earlier animal hide trophies from the forest.

From his first victory on September 17, 1916 his record grew rapidly. By the tenth week he had claimed his tenth victim. To mark those achievements he decided each tenth cup would be made larger. Some interpret this as cockiness. It can be read as confidence.

His eleventh, one of his most significant

victims, was reduced to the symbol of a small silver cup. He was Major Hawker ace of the RAF, who possessed the coveted Victoria Cross, England's highest award, along with the DSO.

Richthofen met Hawker's deHavilland II with his Albatros D-1 at 10,000 feet over the Front. Hawker tried every trick in the book. The fight was drawn deep into German territory as they roared on in tight circles to get on each other's tail. Neither could best the other. Hawker knew his gas was running low and that the fight must come to an end. The Baron, had known this time would come. When Hawker broke and raced toward his lines, Richthofen clung to his tail. They raced over the ground no more than a hundred feet in the air. "He tried to escape," the Baron recalled, "by flying a zig-zag course. That was my favorable moment. My opponent fell with a bullet through his head."

He retrieved Hawker's twin Lewis machine guns. "They were hung over the entry to my dwelling," Richthofen wrote.

By January 4, 1917 Baron von Richthofen bagged his 16th plane. It was the first of other Sopwith Pups to fall to his guns. It brought him his long-sought medal of honor, the Ordre Pour le Merite, his nation's top award. He won it right after Boelke had given him charge of a small band of special hunters. As a commander, his final form began to take shape as a superb pilot, strategist and leader.

"I found myself beyond range to effectively hit my enemy," he told his men, "but a short burst would prevent only the wariest from flying a straight line. As they zig-zagged to dodge the bullets from a single one of my guns, it drew my machine closer to theirs." Then with his victim only five to some 50 yards away, he blasted the deceived enemy out of the air. Battles that began two miles up often ended just above the trees. His all-red aircraft became known as "le petit rouge" to those who watched him fly by.

He defeated his enemy in part through the red colors he displayed. Each man who saw him knew they faced the Baron. He used this psychology to the end. Others in his squadron joined his technique, but the all-red was reserved for the Baron alone.

Flying out of Douai at Jagstaffel No. 11, his record continued to surge on. With the memory of the loss of Immelmann, inventor of the sudden reverse turn, and Boelke his old Commander, Richthofen pounded home the rules he had been taught. He was relentless in his demands for superior skill and cautious strategy. He severely criticized anyone who came home with bullet holes in their tails. Those who failed to heed were transferred. He insisted they fly in packs. "Height is your greatest advantage when you dive down from out of the rays of the sun!" His eager followers watched as his 27th victim spun toward the ground. By the end of "Bloody April" in 1917 he racked up his 52nd victim. Summoned by the Kaiser, hailed during his forced leave, girls flung flowers at his feet and thrust love letters into his hands. He had no time for nonsense. His was a determined obligation to help his nation win the war. During his leave, he hid embarrassment in the spring of 1917 among the trees while he hunted in the Kaiser's forest. All across Germany the young boys had claimed him as their hero.

In his book he wrote how it felt to have your brother fly by your side. Lothar Richthofen drank in every careful bit of Manfred's advice. "It is a great feeling to return from battle with your brother, he would rock his wings and wave. Together we had conquered the enemy!"

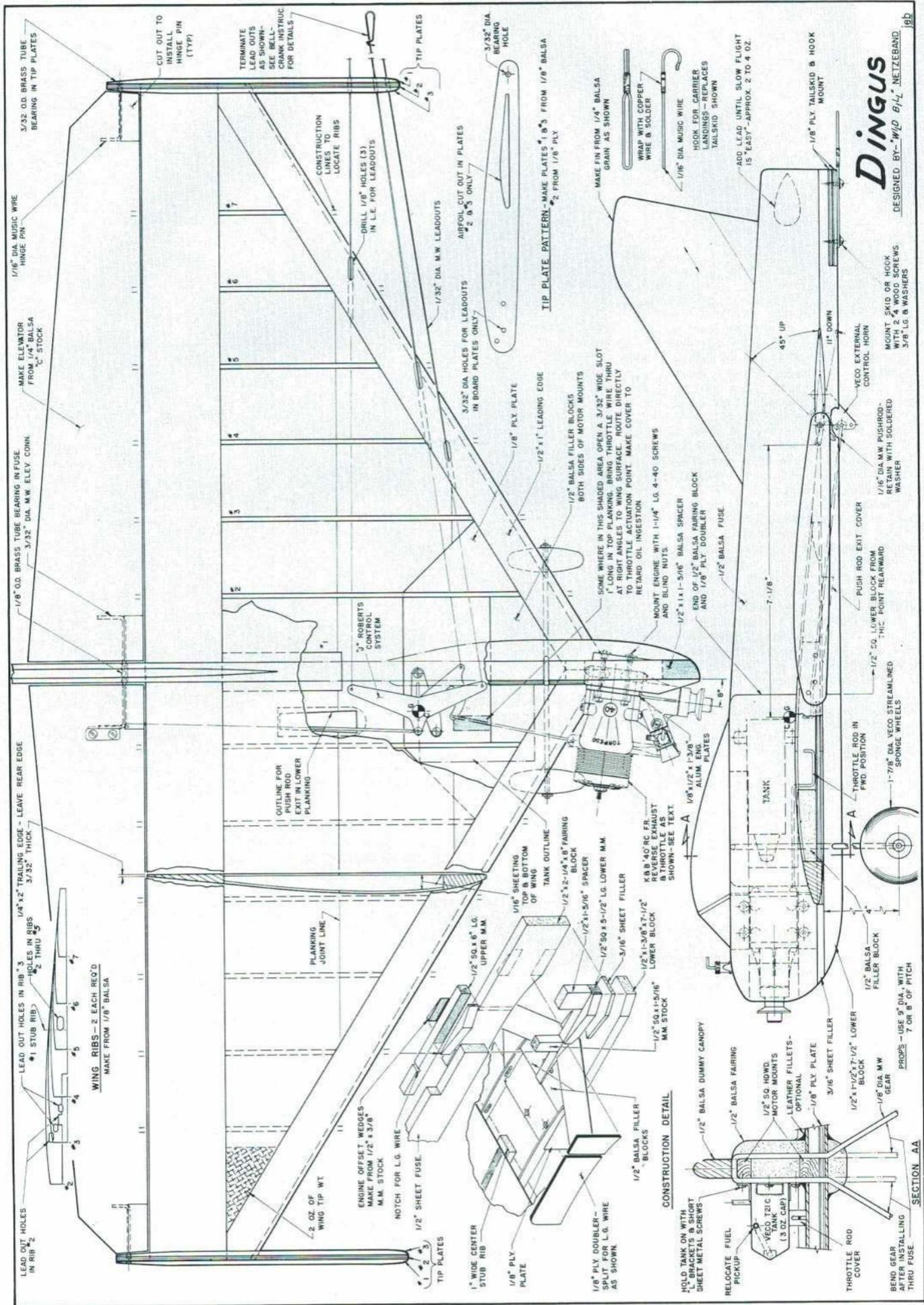
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The Richthofen brothers, Lothar, left, and Manfred stand next to a Fokker Dr. 1. Like most World War I aviators, Manfred disapproved picture taking before a sortie. On the day of his death, such a picture was snapped! The tiny Fokker was amazingly maneuverable and had a high rate of climb. Note the exposed twin machine guns.

Bearer party of six British captains carry the Baron's coffin through a guard of honor on Richthofen's last journey. The highest scoring Ace of World War I, Richthofen was considered by the Germans to be the equivalent of two divisions of troops. His success was largely due to a hunter's mind and his extraordinary marksmanship.





Dingus

DESIGNED BY: WJD B/L NETZEBAND

16b

The Dingus

'Wild Bill' designed this fine-flying delta for non-scale Carrier events. But it is a real fun ship despite its novelty.

WILLIAM NETZEBAND

THE Dingus was designed so I could compete with a delta-wing airplane in the SCCA Non-Scale Carrier events. The Southern California rules were adjusted to allow the Sterling Skyshark, so minimum wing area was established at 200 sq. in. This also allows the flyers to get a "feel" closer to Scale Class I, rather than nursing around a 300 or 400 sq. in. butterfly at low speed.

I didn't depart from the norm, just to be different; the delta will fly slower than a conventional airplane in a safer manner. The delta is stable at angles of attack up to 45 degrees, because it develops high energy vortex flow after reaching conventional stall angles. During vortex flow conditions, the drag is very high allowing the engine to be run from one-half throttle to almost full open. Therefore, slight engine offset becomes effective in maintaining line tension and control force, since the engine thrust is now large enough to be useful.

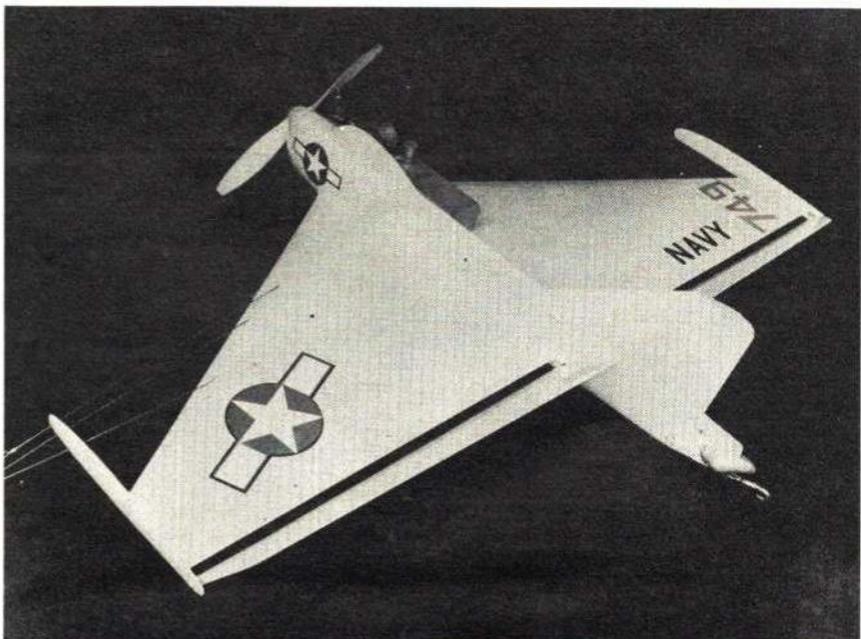
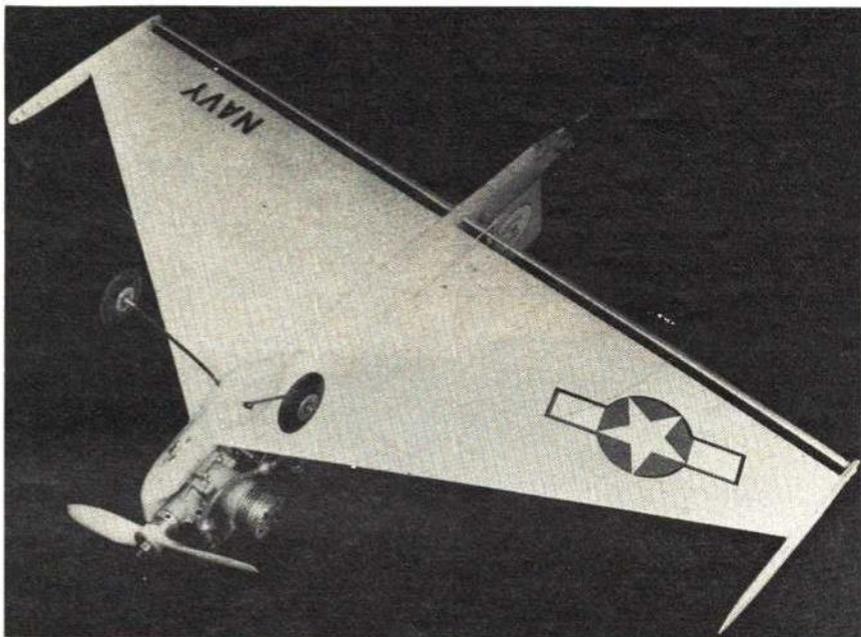
Slow flight under 20 mph is just as solid as full speed. The problem of using a stable CG (center of gravity) location and being able to hold the nose high at slow speeds was solved by designing a relatively huge, slotted elevator. The slot allows high-pressure air from the bottom wing surface to flow over the elevator, keeping it working all the time.

Fact is, the Dingus is the only competition airplane I own that is any fun to fly. Everything else is bred to such a fine peak that one doesn't just go out to fly them.

The Dingus, on mild fuel, is a kick just to horse around and is tough enough to play with. Comes contest day, bolt on a 9-8 Rev-Up prop and tune the needle for K&B speed fuel and you're up to competition peak. We built our own throttle to make the K&B 40 Front Rotor operate on draw fuel feed, since SCCA rules ban pressure fuel systems. We used an old, out-of-production Dynamic AM-3 intake throttle, coupled to an exhaust slide, which gives a very broad-range throttle (16,500 to 2,000 rpm).

The same effect can be obtained with the K&B RC 40 engine with an exhaust slide

These views of Wild Bill's latest creature illustrate what it takes to get high- and low-speed performance for Carrier flying out of a small-area delta. Modified K&B 40 takes care of high-speed flight, powerful slotted elevator controls high-angle-of-attack, slow-flight and landings. Speed range is 18-90 mph. Although competition designed, it is preferred family sport plane — fun, durable, different, and flashy.



added. To install, you must rotate the exhaust stack 180 degrees and turn the intake throttle around so the actuator arm is on the same side as the exhaust. This allows you to reach the throttle mechanism from the bellcrank with the least possible trouble. A simple coupling arm between the exhaust slide and the intake rotor arm will give you a very responsive throttle system, which will go to low speed position by pushing forward. This is conventional for the J. Roberts control system (now Sturdi-Bilt).

If you're not interested in competition, any R/C type engine can be adapted to suit. In fact, the Dingus is probably more of a fun machine than a contest ship. Beneath that high subsonic exterior beats the heart of a pussy cat. She loves kids (to play with, not to eat!). While she's not a beginner's construction project, she's certainly a good trainer, maybe a club project. If one gets dizzy, simply cut back the throttle and fly slow for a while. Competition performance? Hits 92 mph off-the-deck and 18-20 mph low speed. With cinch landings, the scores come out like over 400.

Construction: Please spend some time studying the plans. Most of the facts are there. The wing and most of the fuselage is completed while pinned down on the work surface. This will give you a warp-free wing, not likely to change as the finish cures.

Trace the $\frac{1}{8}$ " ply bellcrank plate, cut it out and install two 4-40 blind nuts for the bellcrank. Cut a slot to clear the B-C pivot pin and pre-install the bellcrank to make sure there is no drag or binding. Once the $\frac{1}{16}$ " sheet bottom planking and trailing edge are pinned down over the plan, you simply start gluing pieces in. Install leadouts and both pushrods on the bellcrank and mount

B-C temporarily. Consult the drawings.

The elevator pushrod is two pieces joined by a $\frac{3}{32}$ " diameter piece of brass tubing. The stub from the bellcrank is cut short enough (4") to drop through the bottom skin cutout after you remove the wing from the board. Be careful that the stub is shaped correctly. The only tricky part is getting the holes through the leading edge at the correct angles and heights. These are drilled before the leading edge is cemented.

Once the leading edge is on, groove the center section for the lower motor mount. Then glue in the $\frac{3}{16}$ " spacer, lower mount and fit the filler blocks. These are carved on top to fit under the top sheeting. Glue in all of the ribs. To get 2 ounces of tip weight, we filled the last panel with melted Cerrobend. This material melts in boiling water and won't burn the wood. You can also use sheet lead or lead wool.

After you cement the basic wing structure, install the bellcrank and finish the top planking. Next pieces to go on are the top fuselage, top mount and the mount spacers. Take care to assure that the mounts are exactly parallel before the cement sets. The 8-degree wedges should be cut as a matched set and carefully installed to present a perfectly aligned surface for the engine beams. This front end is stiff enough to warp the engine case with an undesired loss in power. Let this assembly cure overnight. Shape the elevator and put together the tip plates. One thing bumpy, don't make two left or two right plates.

After you pick up the wing-fuselage assembly, shape the leading edge as shown and sand the glue joints smooth. Pre-shape the $\frac{1}{2}$ " balsa fairing block. Bend the landing gear into a basic "U" shape. The legs should be $9\frac{1}{4}$ " long. To get nice sharp bends with the $\frac{1}{8}$ " dia. wire, try this annealing

procedure: Heat the area to be bent in a flame such as gas kitchen stove until it reaches a dull-red glow, just visible in average room light. Allow this to cool slowly in the open air. Don't quench it. After you make your bends, re-heat it to the same color and quickly quench it in water. The 45 degree bends at the wing surface and at the wheel bearing can be made with a lot of muscle and a little care without annealing the wire.

Install the landing gear before proceeding any further. Make the final bends now and check alignment. The ground attitude may seem a little steep, but this is necessary for quick takeoffs and good three-point landings.

Glue on the engine wedges on both sides of the mounts and then drill the engine bolt holes. Install the blind nuts. Now you can cement and clamp the $\frac{1}{2}$ " filler block and $\frac{1}{8}$ " ply doublers. Proceeding rapidly you can add the lower block, except do not glue on the $\frac{1}{2}$ " sq. lower block yet.

Assemble the shaped elevators over the plans with the $\frac{3}{32}$ "-dia. torque rod and $\frac{1}{8}$ " dia. tube bearing. Then glue in the $\frac{1}{16}$ " dia. tip bearing wires. Check the fuselage notch for the center bearing against the location of the tip-plate bearings. Glue the center bearing to the fuselage and glue the tip plates in place. This installs the elevator. Check the alignment of the bearings so that the elevator has no binds. Glue on the bottom $\frac{1}{2}$ " sq. block.

Install the elevator control horn, being sure to lock the mounting nuts against loosening. Bend the other half of the pushrod and join with a 2" piece of $\frac{3}{32}$ " O.D. (outside dia.) brass tubing. Pull the down (front) line to full down, move the elevator to the 11-degree down position and solder the pushrod splice. Check full up position for at least 45 degrees and clean the solder flux at the splice.

You can now spend some happy, relaxed carving and sanding time after gluing on the dummy canopy and the fin and anything else we forgot.

Before finishing, do the necessary wire bending and fiddling necessary to get the throttle working smoothly, without binding or rough spots. You'll note that we used an extra bellcrank to reverse the motion, providing space between tank and engine for same. There are too many proprietary throttle systems for us to describe their installation. You can locate the tank mounting devices of your choice.

I doped the raw wood with one coat of filler made of: one part each of talc, clear dope, final color dope and thinner. Then came a coat of Silkspan, another coat of filler, sanding with 400 all the way, three coats of clear dope and two spray coats of Hobbyoxy. Naturally you can do what you please. One brush coat of Hobbyoxy will do nicely.

Before going to the field, add enough lead to the rear end to balance the Dingus as shown on the plans. Check your controls, clean the flight lines and be certain the engine throttles reliably before taking off.

Slow-flying goes something like this: Throttle down until she's flying around 30 mph and getting sluggish on control; pop some up elevator. If the nose comes up and she starts to settle, add engine power smoothly until the settling stops. Add more up elevator and more power. From here on, height is controlled by the throttle and speed is controlled by the elevator. Now you practice.

After you gain confidence, try a flashy approach to low speed. While in full-bore flight, start a 90-degree loop; just after you cross the top of the circle headed downwind, chop the throttle closed and hit full

Continued on page 64



Dingus at 19 mph. According to author, deltas can fly more slowly because of high drag at high angle of attack, permitting high-power setting with offset thrust to keep lines tight.



A different type of scale event? Some practical suggestions and a bit on safety.

Different idea for scale rules. Scale model competitions should be encouraged. Present rules leave a lot to be desired to promote the event. More requirements should be established to provide realism, both in flight and in a static condition. What we need are practical scale models and not the kind that are flown only at the Nats.

A revised procedure in judging and flying is required. Scale models should be judged in the same way as the Formula I or Good-year racers are judged. The basic plan form is inspected and given a value, then the model is observed from a short distance for detail in finish. A numerical value is determined for this portion of the judging.

Then the most important value is determined and that is the complexity of the matter. The models at a competition should be grouped together. The more complex subjects should be determined in relation to the other models present. The most complex model is at one end of the group and the simple model at the other end. The other models will fall in place between these two.

For example: Let us assume there are the general type of models such as P-51's, Piper Cubs, Spitfires, PT-19's, Stearmans, etc. All are good-flying, stable, simple, straightforward designs. There are also the more complex ships such as a B-25, B-17, Fokker Triplane, Gee Bee racer, a jet fighter, and so on. No doubt about it, the guy with the B-17 deserves more credit than the guy with the Piper Cub.

It is possible to have exactly 100% scale in a Piper Cub, but to have even 100% scale in a B-17 cockpit is impossible. With this system the complicated design would receive a K factor. A factor of 2 for the B-17 and a factor of 1 for the Piper Cub would be in order. This factor would then be multiplied to the accumulated scale and flying points.

Flying of the model should be judged differently too. The model should perform in a scale-like manner. If the judges have never seen the prototype fly, then the modeler should provide the judges with basic performance data on the real aircraft. Then the judges could determine what scale-like is. So, if this B-17 flies like a pylon racer, then it should receive less points than the scale-flying Piper Cub.

Team flying entries would be allowed. The builder can have someone fly his model for him if he so desires. So many times we have modelers entering ships that could be successfully flown by expert pilots, but when they try to fly their own ship, a crash is the normal result. So why not let an expert fly the model? The model is not judged on individual maneuvers, but on how it flies like the real ship.

The basic idea of cutting down the exact-scale aspect of R/C scale, more flying requirements directed towards scale flying or realism, allowing an expert pilot to fly the

model, and the K factor for difficulty or complexity of the subject, will create more interest in the scale portion of our growing R/C hobby.

What do you think of this proposal?

Glider winch information: Been doing quite a bit of winch-towing with our big gliders with 100% results. The ideal winch is a gas-powered type. We are using a 3-hp



Nice flying Nieuport by the Williams brothers. Won Valley Flyers meet, then Nats.



J. Arrana holds aloft R-E controlled 102"-wing Phoebus. Fliteglas kit, glass fuselage.

Briggs and Stratton engine driving a 12" narrow drum. With the gas winch you can easily reduce the take-in speed of the line, thus compensating for wind conditions and sizes of the sailplanes.

Best take-in speed for such a winch is 25 mph. This will allow full power for towing a 12-ft.-11-lb. glider in dead air. If the wind is blowing, full power is still used for the initial launch segment of the flight. After the model starts to climb, the throttle is reduced until a steady slow rate of climb is established. To release the glider, one simply stops the winch or dives the model slightly. A R/C tow hook on the glider would be a first-class treatment and very practical.

A good towline is nylon twine as used by brick masons, carpenters, etc. It is available in the hardware stores. Normally, it is a 100-lb. test line. A short length of 25-lb. fishline is used as a weak link. This line is located at the hook end of the towline so that it will fail in case something happens under tow. A 50-lb. line is used for the bigger ships.

Tow-hook location on the glider is critical. I have found that an average location for all gliders is on the bottom of the fuselage directly below the leading edge of the wing. This will provide an easily controlled climb without any danger of stalling during the initial takeoff. ROG takeoffs are quite simple and practical, and are a lot more fun than a hand-launch.

The more simple type of winch is fabricated from an automotive car starter driving a large diameter narrow-width drum. Different voltages can provide different take-in speeds. A starter solenoid is used so that a light-weight push-button assembly can be used to turn the starter on. Use a good battery because these motors really draw a lot of current.

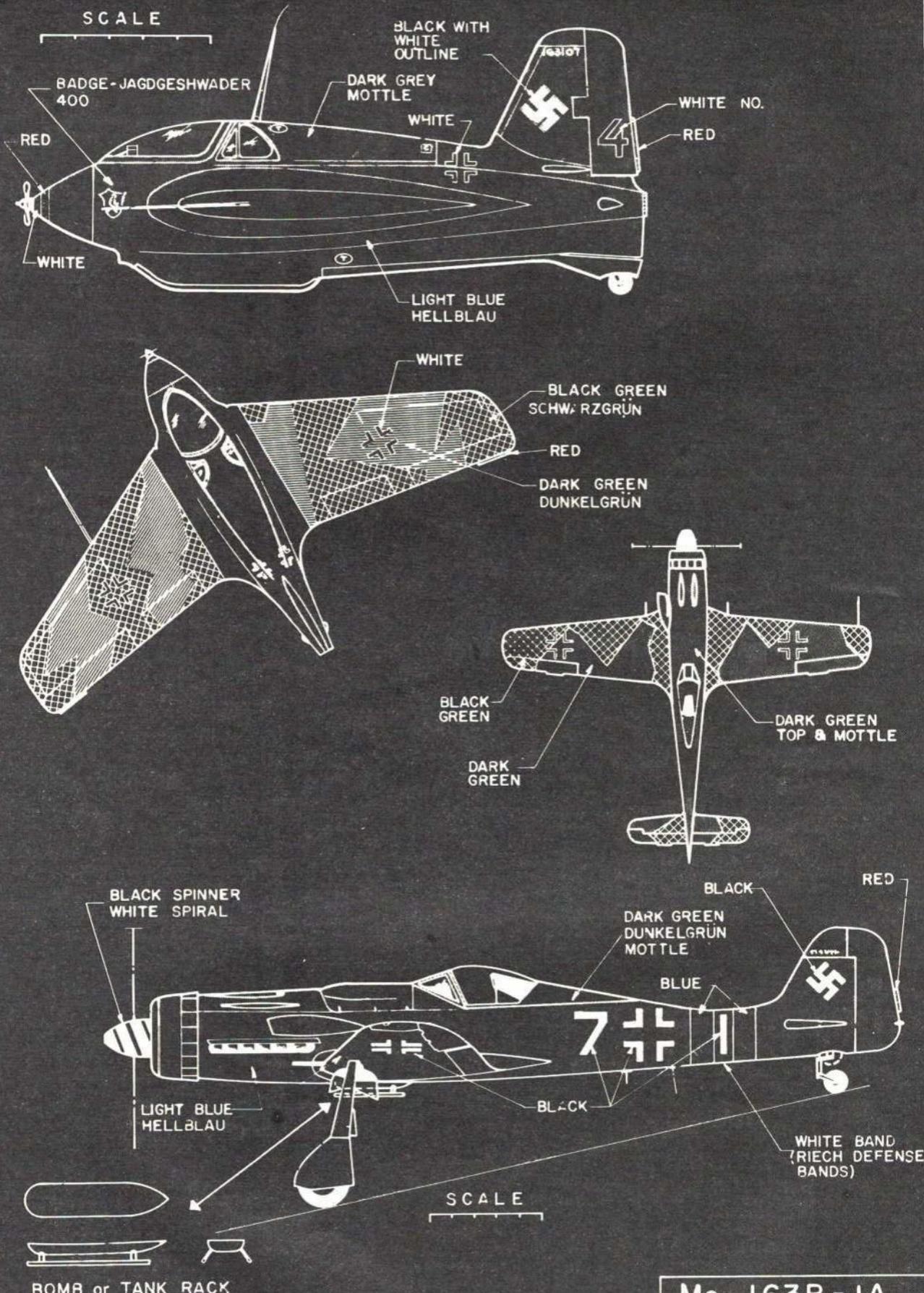
AMA rules, ideas, gripes, etc.: Received a letter from Bill Aaker in Dallas, Tex. He mentioned that I should stress that, any R/C'er interested in our AMA rules should write his local AMA contest board member. Don't write directly to the chairman (Bill Northrop), but, instead, write to your local contest board member. A copy of your letter can be sent to the chairman.

I have received an excellent response from my recent comments on lack of letters to AMA officials. A single letter has been received from my District X about the latest rules changes. Not bad, considering how California is the most populated state and has a very high AMA membership. If this keeps up I might even have two or three letters a year questioning or commenting on our rules.

The letter I received was from Betty Stream of the Birds club in Long Beach. Her main concern was the dropping of the novice/expert category in Class C. The contest board has revoted on this question and the novice/expert category will be retained.

Safety pointer: During the development of our fiberglass KA6E glider I became aware of a potential problem with epoxy resin. Not the Hobbyoxy type, but of some of the commercial grades of epoxy resin. The danger is that the curing agent or catalyst can be very toxic to your hands. Sickness can result. So if you are planning to experiment with some of the commercial epoxy resins, beware of direct skin contact. Try to obtain all possible information on the toxicity of the resin.

New items from the west coast: Fliteglas Laminates of Santa Cruz is now delivering an excellent Phoebus glider. This ship has about a 100" span. When finished, it looks like the real thing. Performance-wise it is a top contender. Price is \$39.95 for a finished fiberglass fuselage and parts to build a wood wing and tail assembly.



Me-163B-1A
Ta-152C-1

CHECKED	J. N. T.
DRAWN	CON GARRETT



Focke Wulf 190 airframe adapted well to the use of more powerful in-line engine. Wing span was increased, nose and tail lengthened, rudder area made larger. Model is modification of existing kits.

Professor Tank's Ta 152C-1

Transform the Focke Wulf 190D into a Ta 152C-1 fighter with a plastic-surgery nose-job.

JOHN N. TOWNSLEY

FOLLOWING the operational success of the FW 190D (the long-nose 190), Professor Dipl. Ing. Kurt Tank, designer of the Focke Wulf 190 series, decided to use a new series of fighters to be designated "Ta 152," although they would retain the basic FW 190 airframe and therefore would not differ too drastically from the FW 190's. Professor Tank was primarily responsible for the design of the new fighters and was permitted to use the prefix "Ta" to apply to them — a distinction rarely accorded.

The first of the new series, the Ta 152A, had wings of slightly greater area; revised plan-form was used and motor cowling lines were cleaned up to give a smooth fuselage line, and fin area was increased 5½". The most important internal change

introduced on the Ta 152 was the substitution of hydraulic, instead of electrical, actuation for the undercarriage and flaps. The Ta 152A did not go into production and after this design was abandoned, the "B" sub-type evolved from the original design. This aircraft was not produced in quantity, but it was the first of the series to mount the new Jume 213E motor with a two-stage supercharger which gave it a top speed of 428 mph at 36,800 ft.

Classed as a medium-altitude fighter, the "C" was the first of the Ta fighters to be produced in any quantity. The C-version was equipped with a Daimler-Benz DB 603L motor. The fuel capacity was increased to 213 gallons by modifying the wing structure to carry extra fuel tanks. Using methanol-water (MW 50) power boost, the Ta 152C fighter had a top speed of 467 mph at 35,000 ft.

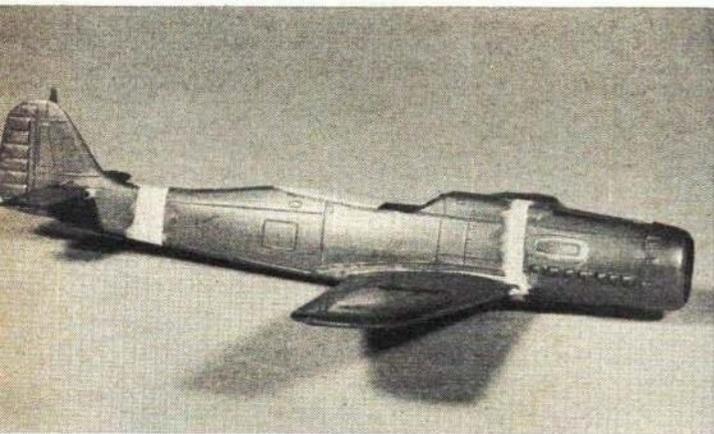
The wingspan of the Ta 152C-1 was 36 ft., 1" and the overall length, 35 ft., 5½".

The D-9's were first used in the late months of 1943 and in the Normandy invasion in 1944. Reports were received from the Allied fighter pilots of a new type of FW 190, with a longer nose and a more prominent air screw spinner. This variant appeared at irregular intervals alongside the more common radial-motored FW 190's.

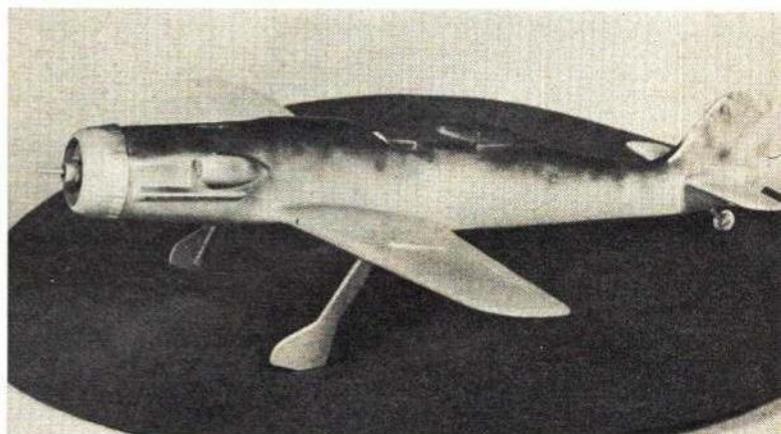
The model for this month's article is constructed from a 1/72nd scale Airfix Focke Wulf FW 190D kit, Model Series No. 6. Lindberg also manufactures an excellent 1/72nd scale Focke Wulf FW 190D-9, which can be converted to the Ta 152C-1. (Additional description is given later in article.)

For the conversion process, several thicknesses of styrene are needed: .010, .020, .040, and .060.

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Section the fuselage at nose and tail exactly from this picture. Added length is made with pieces of sheet .040 styrene plastic. Fill any gaps, contour with body putty, and file to final shape.



At this stage all the spray painting and camouflage markings are applied. All other parts are brush painted before mounting. Note the headrest and supercharger air intake typical of this fighter.



Eric Springer, a chief test pilot for Douglas many years ago, and a WW I SPAD pilot, receives SPAD model built by stewardess La Donna Craver. The contrast — his 1914 flight suit and her 1968 flight suit.

Second Annual Western Aerospace Historical Symposium

FIGHTER- PILOT JAMBOREE

A half century of fighter aircraft development was celebrated at this gathering of celebrities.

ON October 4-5 a significant aviation symposium was held in Southern California. It was sponsored by the American Aviation Historical Society, The American Institute of Aeronautics and Astronautics, The Cross & Cockade Society of World War I Aero Historians, and the International Plastic Modelers Society. Assisting as participants were The American Fighter Pilots Association and the Northrop Institute of Technology Aviation History Library.

A committee from these organizations had selected key figures in the aerospace industry to be honored for their outstanding contributions to aviation progress, and it was decided to award a series of plaques and mementos, including models of planes which were closely identified with the award recipients. For example, a model of the F4F-3 was scheduled to be presented to Admiral John S. Thach, USN (Retired). The Hobby Industry Association of America volunteered to provide presentation plaques, and to assist in the preparation of the plastic model aircraft awards. The models were constructed by members of the Los Angeles Chapter of the IPMS.

To help publicize the symposium, the HIAA set up a simulated model-aircraft production line at the Northrop Institute of Technology. This assembly line demonstrated the techniques used to produce the presentation models, and received television coverage.

Nearly everyone at the Symposium traced their interest in aviation to model building. For instance, Major Richard G. Schaller, explained his Air Force career grew from an early interest in model planes. Fondly recalling Wiley Post's Winnie Mae and a stick-and-tissue Aeronca floatplane, as well as solid models, he said, "I was too poor to afford gas engines."

One of Schaller's first jobs was with Beechcraft, where his model building background helped greatly. Later, he worked at McDonnell Aircraft. When Schaller enlisted, he became a mechanic, working on many types of aircraft, including the rare Bell Airacuda. Later, he became a pilot, served in both WW II and Vietnam. Currently, he is Chief of the Audio-Visual Branch of the Air Force.

Another who credited model building with influencing his choice of the aviation industry for employment is Bill Jones, an illustrator for McDonnell-Douglas Corp. Among his contributions to the Symposium was a series of scale illustrations depicting current fighter aircraft markings. He built airplane models at a tender age, mostly solids. Bill is an active member of the IPMS, AAHS, and the Cross & Cockade Society.

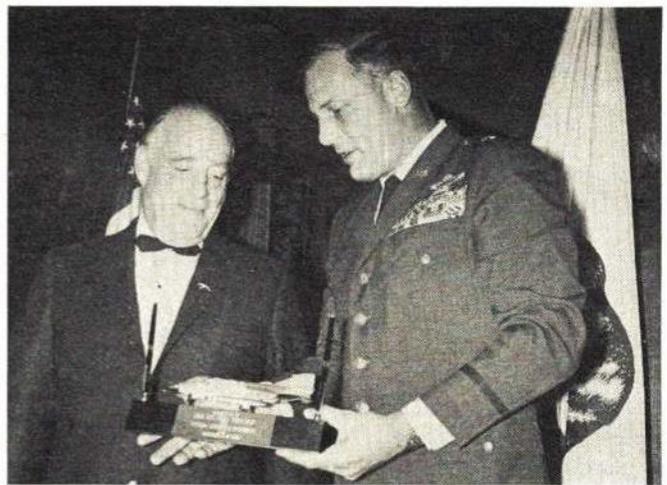
Lloyd Gross is an aerodynamicist at the Northrop Corp. and a member of the IPMS, AIAA, AAHS, and the Cross & Cockade Society. He builds models mostly for relaxation. Lloyd tried both flying and solid models, but switched to plastics because he felt they offered the most satisfaction for the smallest time investment.

Also present during the Northrop gathering was Lt. Col. William J. Horvat, USAF (Retired). Col. Horvat is an avid enthusiast, editor of the AAHS journal, and author of the recently released book, "Above the Pacific." He explained that the AAHS is currently conducting a membership drive, and that model builders are invited to investigate the advantages of joining. Full details are available from the AAHS Secretary, P. O. Box 45-435, Los Angeles, Calif. 90045.

The symposium began on Friday evening, October 4, at the Hacienda Hotel, in El



One portion of plastic model assembly line at Northrop Institute of Tech. shows IPMS members Lt. Col. William Horvat, USAF (ret.), L. Gross, W. Jones, and A. Wilson creating masterpieces.



Brigadier General Robin Olds, USAF, holds Air-Force-version Phantom received during symposium. Looking on is Col. Beirne Lay, USAF (ret.), author of *12 O'Clock High* and *I Wanted Wings*.

Segundo, Calif. The festivities began with a banquet, guests including a virtual "Who's who" of American Aviation: Among them, Jimmie Mattern, veteran aviator; Vance Breese, famous test pilot; Martin Jensen, who placed 2nd in the 1927 Dole race to Hawaii; Ed Weiner, prominent racing pilot, and many more. Since the theme of the meeting was fighter-plane development, fighter pilots were in abundance, including veterans of World War I, World War II, the Korean Campaign, and Vietnam. The Master of Ceremonies was a "Lumber Driver" (bomber pilot), Col. Beirne Lay, USAF (Retired).

Col. Lay commanded the 487th Bomb Group during WW II, until he was shot down in 1944. He holds the Distinguished Flying Cross, Air Medal, and Purple Heart. He is probably more well known to aviation enthusiasts as the author of: *I Wanted Wings*, *12 O'clock High*, *Above and Beyond*, *Strategic Air Command*, and *The Gallant Hours*. He has been nominated for two Academy Awards for screen writing.

The Keynote Address was delivered by Brigadier General Robin Olds, USAF. Here is a man who really fulfilled his early ambitions. Not only did he become a famous fighter pilot, but he also married a movie star (Ella Raines)! Olds was born in 1922 in Hawaii. He was literally raised at vari-

ous military airfields. His earliest memories include the sound of Army P-1's warming up at Langley Field. His first boyhood heroes included Jimmie Mattern, and "G-8 and his Battle Aces." G-8 was, of course, the aerial James Bond of early pulp novels.

Among the visitors to the Olds' home were such stalwarts as Billy Mitchell, Ernst Udet, Roscoe Turner, Paul Mantz, Elliot White Springs, and Eddie Rickenbacker. Small wonder that Robin Olds was entranced with the idea of becoming a pilot! After completing high school, Olds attended West Point, and while there became an All-American football tackle.

After receiving his pilot's training during WW II, he was sent to the European Theatre of Operations, and flew 107 combat missions in P-51 and P-38 fighter aircraft. During the war he served as flight commander, operations officer, and squadron commander. In March, 1945, Olds became Commander of the 434th Fighter Squadron which was stationed in England.

More recently, General Olds served as Commander of the 8th Tactical Fighter Wing in Vietnam, where he flew an F-4 Phantom II. He flew 100 combat missions over North Vietnam, and was credited with destroying four MIGs. Among his military decorations are the Air Force Cross, Silver

Star with Three Oak Leaf Clusters, Legion of Merit, Distinguished Flying Cross with Four Oak Leaf Clusters, Air Medal with 37 Oak Leaf Clusters, Air Force Commendation Medal, British Distinguished Flying Cross, and French Croix de Guerre.

Presently, General Olds is Commandant of Cadets at the U.S. Air Force Academy, where he is in charge of about 3400 Cadets. Olds was quick to assure the veteran fighter pilots in the audience that the youthful pilots of today are worthy successors to the "old-timers."

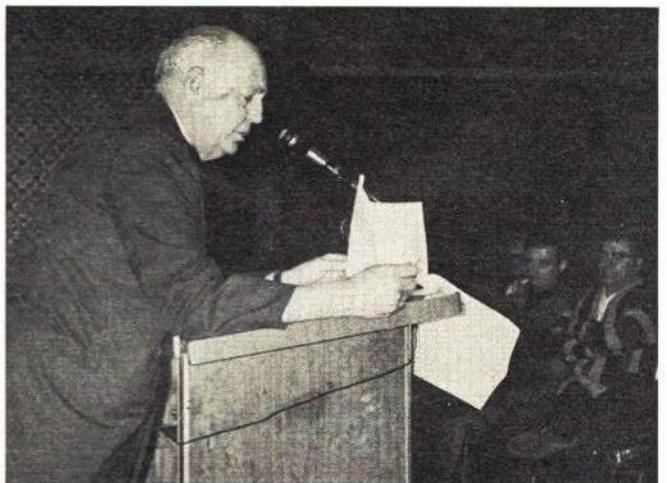
After the banquet, the audience proceeded to an adjacent room which contained displays of aircraft models, paintings, and other aviation memorabilia. The models were provided by the IPMS, and represented the history of fighter aircraft from the beginning of World War I through the present.

On Saturday morning, the symposium continued with a series of lectures on the progress in fighter plane design through the years. The World War I period was ably covered by Captain Frank T. Courtney, former Royal Flying Corps pilot. Courtney learned to fly in 1914 and flew Morane-Saulnier monoplanes in France. He also had the somewhat dubious honor of being shot down by Max Immelmann, who was

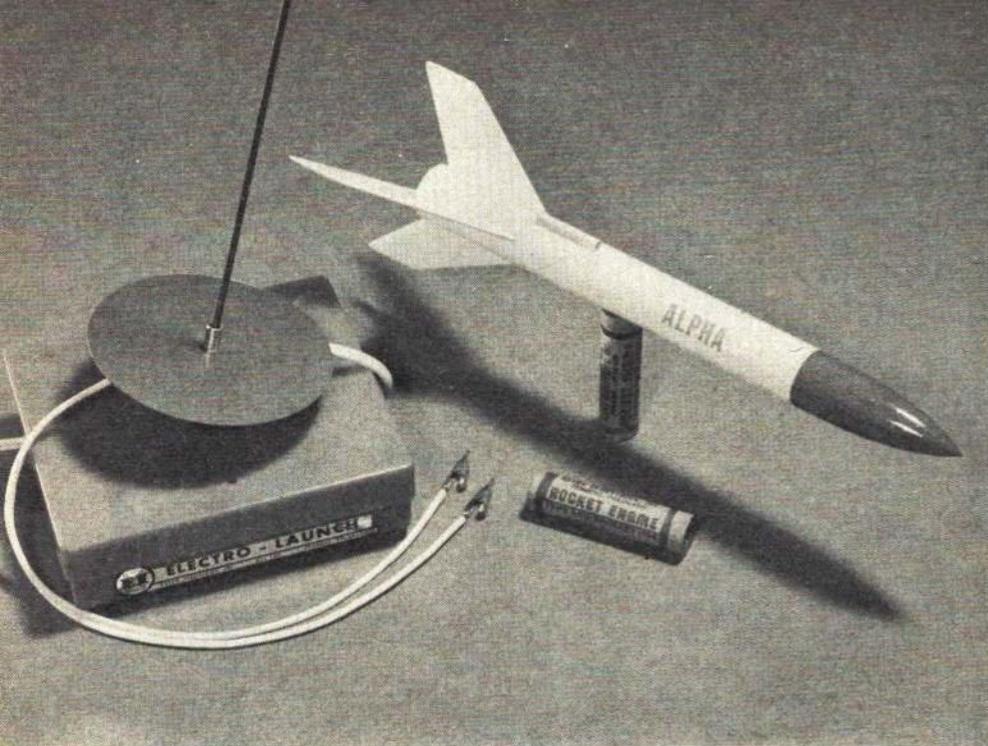
Continued on page 61



Air Force Major Richard Schaller admires Navy Phantom model by Pete Beragnini, an Institute student. Major Schaller traces his aviation career back to modeling before the use of gas engines.



One of the most experienced test pilots in the world, Vance Breese described experiences flying the first North American Mustang P-51, Bell Airacobra P-39, Lockheed Lightning P-38 and Bell P-63.



in any direction. "Where's the best place to start?" is the question.

Realizing that an introduction to model rocketry might be a problem, the larger manufacturers of rocket kits and accessories sell packages called "Starter Kits." These are *complete!* For example, a starter kit will not only include parts for a model rocket but also a couple of engines and the components needed to assemble an electric launching device. If you have no finishing materials—dope, paint, brushes, sandpaper, glue or even an X-acto knife—then starter kits that include these items are available, too. All of these larger, model rocket firms advertise with A.A.M. Check the "Advertiser's Index" on page 82 and write for their catalogs. You'll soon receive a wealth of information and concise data to help you on the route to lift-off.

We obtained Estes Industries' Starter Outfit, catalog no. 671-DSK-65. At \$6.50, postpaid, it contains a rocket kit (Astron Alpha), a launcher kit, four batteries and two engines. A Deluxe Starter Special for \$7.75 (cat. no. 671-DSK-77) includes all of the above plus building and finishing supplies.

Most of the parts of the Alpha are of a paper composition. The body tube is ready-formed of spiral-wound paper. Card-stock rings center the engine tube in the body. Paper reinforcing is used at all strain points. In this way, a very high degree of stiffness is obtained with low weight and small size. Balsa is used only for the nose cone and fins.

Kit design appeared to be efficient yet simple. Parts fall together easily—there aren't many—and they generally serve more than one purpose in the design. As with any kit, it pays to take care, do a good job, etc. But it doesn't take much time, either. Instructions couldn't be more complete. Exploded views and diagrams aid in every step.

First impression of the Electro-Launch kit was that it will survive many a launching. It will handle, as is, rockets weighing up to 6 ozs. Heavier models require that the base be weighted down with bricks or a square of plywood. And it's not recommended that rockets over a pound in weight be used on this launcher. The base holds up to eight D-cell batteries; use only photo-flash types. Four cells (came with the kit) supply six volts. For longer life or greater usage—by a club, maybe—install eight cells and get 12 volts. The launch-controller switch even has a continuity light and a safety interlock.

The instruction pattern followed that of the electronic kit manufacturers. Each

Try Rocketry

Starter kits are available from several manufacturers. They offer the best introduction to Model Rocketry.

HARRY E. HARPS

HAVE you ever had the urge to try model rockets? To see how they are built, launched and flown? We did. Here was something to do, and it obviously demanded skill. But then the scene would fade away.

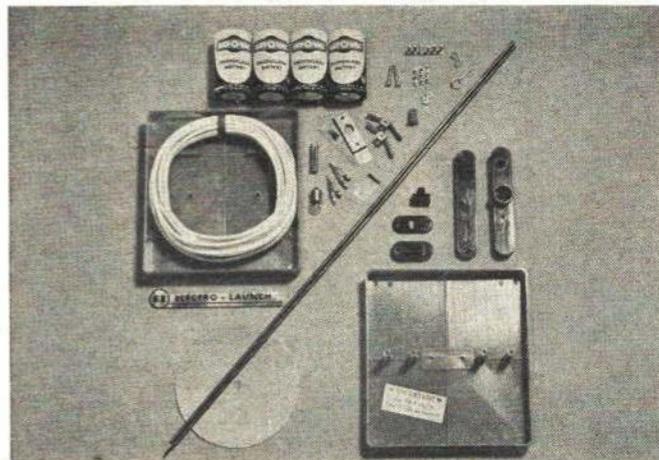
NARAM-10, the annual championship meet for rocketry, pushed us over the edge. Watching the activity, the different classes and types of rockets launched and sensing the competitiveness, one couldn't help but compare this kind of meet with the more familiar free-flight model-airplane contest. They are very much the same.

There are the rules that must be followed; there are the talented and skilled builders and those not-so-skilled. Everyone has his share of wild and erratic, out-of-control flights. Great flights leave the spectators gasping. The wind must be fought and the trees wrestled—if you want your model back. To be successful in either field, model airplanes or rockets, aerodynamics must be respected. And make no mistake, model rocketeers are not refugees from the Fourth of July.

Displays by model rocket manufacturers and the items on sale at the Range Store were impressive and the quantity bewildering. You can start most anywhere and go



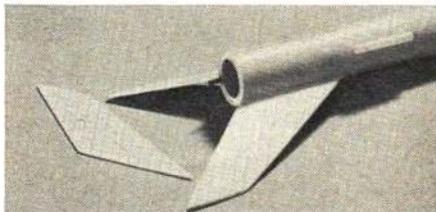
Contents of the Alpha rocket kit lie below nose cone and body tube. At top are the components of the building/finishing kit.



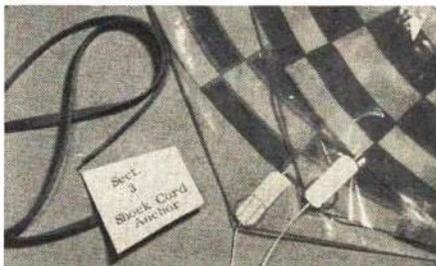
Electro-Launch kit: plastic base holds four to eight D-cell batteries. Metal disk slips over launch rod as a blast deflector.



Engine holder is glued-up from paper tube and strap, metal strip and cardboard rings.



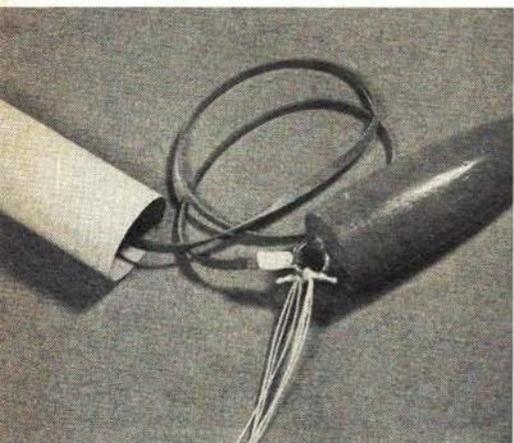
Cut fins from balsa. Furnished template gives location of fins and the launch lug.



Shroud lines fasten to the plastic recovery parachute with adhesive-backed patches.

numbered step was taken in turn and then checked off. As with the model kit, the parts fit well and no trouble arose.

There's no doubt that the engineering of these rocketry kits was thorough. The designers were not going to let you, the builder, goof. So, no cloudy areas, where a misunderstanding might occur, were left behind. In fact, the starter package even contained a comprehensive, 47-page booklet about model rocket construction, design and flight trim. Several plans of popular models are included. This is a good manual for the beginner and a good reference for any rocket modeler.



Chute attaches to nose-cone ring. Shock cord is tied there too. Other end of rubber shock strip is glued inside body tube.

model rocketeer

NATIONAL ASSOCIATION OF ROCKETRY

1239 Vermont Avenue NW, Washington, DC 20005



LEADER ADMINISTRATIVE COUNCIL VOTED OFFICIAL

One of the important items passed by the Board of Trustees at NARAM-10 (NAR Aeromodelling Meet #10) was the official recognition of LAC, the Leader Administrative Council, as part of the NAR organization structure. By now, most NAR members are aware of the excellent contribution made by LAC during 1967-68, their test year. One of their committees has been appointed to draft appropriate by-law amendments to an official constitution ratified by the membership at the meet.

Other news from LAC is their endeavor to publish a much needed, updated booklet entitled "The NAR Section Guide." At this printing, LAC had a draft of three chapters on section newsletters, model rocket workshop lectures, displays and demonstrations, and publicity for local sections and clubs. Your helpful contributions, comments, etc. on these chapters should be sent to Elaine Sadowski of 1824 Wharton St., Pittsburgh, Pa. 15203. She has extra copies of this draft edition for those sections not represented at NARAM-10. (Credit-Jay Apt)

NAR TECHNICAL SERVICES — YOUR BEST SOURCE

Unsure of model rocketry, its advantages, how to set up a launching area, constructing models or holding contests? NARTS is still the rocketeer's best source of this material. Send for an order blank from NARTS, Slot & Wing Hobbies — Dept. F, 511 South Century, Rantoul, Ill. 61866, stating your name and NAR # on the return address.

Some items in addition to the \$1.50 official Saturn plans recently offered by NARTS includes "The Handbook of Model Rocketry" for paperback edition, \$4 and the deluxe edition, \$6; member jacket patches, lapel pins, section guides, technical reports and scale model rocket plans. All items may only be purchased by active NAR members.

LITTLE PACKET TELLS ALL

One of the more interesting items to recently come across our desk was "a little packet of information and forms" from the YMCA Space Pioneers Section of NAR normally presented to new members upon joining. Part of it included material regularly mailed to current members.

What impressed us was the fact that after the new member fills out his NAR application and keeps the other part of the NAR pamphlet, then pays his dues, Space Pioneers hand him: 1) current fall, winter, spring or summer schedule of meetings and launchings; 2) a guide to local and mail order model rocket firms and hobby stores; 3) list of basic model rocket kits suggested for trainees; 4) an information questionnaire on the new member for background and future publicity; and 5) printed rules taken from the NAR 1967 Sporting Code for their next scheduled competition.

Of course, in many NAR sections, a local newsletter often serves the same basic purpose. Other suggestions solicited.

METRO DENVER ROCKET ASSN. 'ACTIVE'

In September MR's editor was contacted by MDRA group which has for several years enjoyed certain interest which kept membership up, competition keen, parents and officials happy. The group, launching from the original NAR range ('58) in an area called "The Hogsback" found their membership falling and local competition not providing the challenge it should to youth. A few members, however, were NAR types.

A visit to the range at the same time MDRA held a contest with the 1967 NAR Sporting Code rulebook, gave NAR the chance it needed. Mel Severe, their president; Jim Delano, secretary; Bill Cooney, treasurer; Gene Killan, v.p.; Vic Cross, photog, and others including parents explained they decided NAR charter and events leading to '69 national competition seemed the only answer if their association would survive.

Larry Loos, NAR #7127, addressed the group, pointing up the benefits of NAR membership and especially how important it should be to claim and with pride maintain the "birthplace of our aerospace hobby-sport."

Press, radio-TV stations covered the contest, gave it their best, talked to officials and NAR members. Visitors to the range included an official of the famous "Denver Rockets" team who the next week contacted MDRA's president on the possibility of sponsoring the association. Mel again contacted NAR which provided many suggestions on ways the famous sports team could effectively sponsor the MDRA.

Have you contacted all MR clubs in your area?

PUBLICITY (VALUE OF) OFTEN UNDERESTIMATED

During Sept.-Oct., a number of sections mailed us copies of articles and photos from local newspapers which portrayed activities of the members. A splendid example came from the Glen Ellyn Rocket Society Section near Chicago, which released details in advance of their Third Annual Public Demonstration held in a large park over the Labor Day weekend.

The advance details successfully alerted the news media, which further announced the event, then appeared on-the-scene with pencil, pad, mike and cameras to record the action. Local U.S. Army displayed a full-size Nike missile.

The Chicago Tribune reported the annual event would have payload, duration and egg-lofting categories, flown according to the NAR code. It also described the GERS section and gave recognition to the parents and sponsors involved. Later coverage after the event featured photos of range activities, which proved instrumental for recruiting and historical purposes.

Now, here are some tips on how your section can do the same:

Continued on page 62

Getting Started in R/C

Suggestions for choosing multi equipment.

HOWARD MC ENTEE

THIS series has been aimed specifically at the newcomer to radio control, and since the majority of newcomers wish to get their start in this fascinating R/C field at a rather reasonable cost, we've stuck mainly to rather simple equipment. But we must agree that some newcomers have the wherewithal to go right into R/C with more expensive apparatus. And even those who don't, might want to know a bit about the terminology of same.

A letter in a recent issue points this up; a reader asks, "What in the world is the difference between multi, proportional, multi proportional and digital proportional?" Let's see if we can clear up this matter for all those with similar doubts.

First, as in most scientific fields, the matter of terminology is paramount. Terms in the R/C field can be most confusing, for the same term can mean several different things in some cases. No wonder some of us are confused! Fifteen years or so ago, there wasn't much doubt; the vast majority of planes (aside from those of a few R/C pioneers) were rudder-only . . . period. And most equipment was what is generally today termed "single channel." But the latter term itself is confusing—let's dig into it.

Up until perhaps five years ago, reed ap-

paratus was the thing for planes with more than one control—and it is still manufactured and in considerable use, though not too much in the competition field. When tuned-reed apparatus began to undergo widespread development and expansion, the "channel" concept and terminology came into general use.

Shortly before reed equipment became widely popular, the apparatus utilized in planes with just rudder control generally required transmission of a single tone to trigger the rudder movement (regardless of what means were used mechanically to move that rudder). This equipment came to be called "single channel." Thus we had widespread use of single-channel transmitters and receivers. Planes fitted with the latter were termed single-channel planes (they often still are today). One of the early systems that allowed more or less independent control of rudder and elevator required the transmission of three different tones between ground and plane. What was more natural than to call this a "3-channel" system, meaning three tones? The concept stuck from then on. The earliest, widely popular, reed equipment required five tones, hence it was "five channel."

Unfortunately, there was a fly in the oint-

ment, for these five-channel systems couldn't handle five controls in the plane. Reed servos required a tone to move them in each direction; thus there had to be two tones (or channels) for each main control. I stress main here because rudder and elevator were considered to be in this category; engine throttle was not considered as important, and the early 5-channel reed systems handled it via the escapement, which could be positioned as desired by the fifth tone (or channel).

As reed systems expanded in complexity and reliability, the throttle escapement was dropped in favor of another servo (which requires two tones in such systems, remember), and further controls were found to be necessary in the plane. Eventually we standardized on 10 channels, which could handle five servos in the model—and thus a 10-channel reed system could also be called a "five control" system.

Most of us try to keep away from the channel concept, as today it is simply too confusing. Proportional systems can't be so easily categorized in number of channels they require (remember that this term really refers to the number of audio tones a system requires). It's much better to speak of "controls." A control can be anything that you want to move remotely in your model—rudder, elevator, ailerons and throttle are considered to be the main and most vital controls. But we also have workable flaps, retractable landing gear, engine mixture control, bomb or parachute dropping mechanisms and many others. All these are controls—let's try to forget the channel method or designation!

To use that forbidden word just a few more times, it is quite possible to have several controls on a single channel! In the early days, ingenious experimenters found

Continued on page 63

SINGLE CHANNEL (one tone used)

SEQUENTIAL

Escapements

Rubber band powered giving one function directly. Rudder.

Basic unit is an SN self-neutralizing escapement which gives left-N-right-N movements in that repeating order.

Compound escapement where one selects left or right without unwanted rudder command in between. Rudder only.

Quick blip an added feature to compound escapements where a fast short pulse causes the escapement to trigger a motor-control SN escapement. Rudder and motor.

Cascading. Use of two or more compound escapements to have rudder, elevator, and motor control.

Motorized single-channel servos are same as escapements but movement is supplied with an electric motor, not a rubber band. They had some development sequence as escapements. Offer more reliability, control power.

PULSE PROPORTIONAL

Motorized pulse systems.

Rudder-only pulse.

Pulse omission detectors added for motor control by sequential device.

Mechanical rate detection for what we call Galloping Ghost.

Mechanical pulse omission for rudder with motor or for Galloping Ghost with motor control.

Pulse rate decoding systems

Mechanical systems are Galloping Ghost.

Electronic systems with two pulsing mechanical servos. Rudder and elevator.

Also go-around or mechanical POD for added motor control. Rudder, elevator, motor.

Electronic systems also, but with feedback servo and lower battery current demand.

Two feedback servos and POD moving one trimmable servo.

Two feedback servos, one with go-around for motor control.

MULTI SYSTEMS

MULTIPLE AND PULSED TONES

Reeds, non-proportional.

Two through 12 tones used offering 1 to 6 functions.

Analog proportional

One or two tones used, giving up to 4 channels with pulse servos.

Two to four tones with various decoding, offering up to 6 channels with feedback servos.

PULSED CARRIER (no tones)

Digital proportional systems.

Three through 8 channels with failsafe and lock-out circuitry initially. Later systems eliminated the failsafe; still later systems also eliminated the lock-out feature as the transmitter-receiver combinations become more reliable. Still up to eight channels. (This means eight functions are offered.) Four-servo, four-function systems are basic units for aileron-rudder-elevator and motor controls.

Technical Notes

Simpro improvement: Usable in every Simpro control system, the simple changes shown here offer positive advantages, require no parts changes or additions. Looking at sketch A, we see a rudder servo driven by a pair of transistors, and powered by the usual two batteries at far right. The Simpro relay is hooked in series with a pair of parallel capacitors (two normally used to attain the desired total capacity with units of standard value). This Simpro circuit goes right across the rudder relay. It would be the same if the rudder servo were driven from a relay instead of from transistors. This works fine, but it has been found that the elevator neutral will shift as the battery voltage drops. This usually happening after several flights.

Also, purists complain that the two electrolytic capacitors may be harmed by the fact that they receive reverse polarity half the time (so far this has never proven to be a problem). But a simple change takes care of both disadvantages. In B, the capacitors run to plus and minus respectively. They are then properly polarized, but more important, the elevator neutral drift disappears! Trick is from Don Dickerson, who states they are not exactly sure why the change makes such an improvement—but it really does. Incidentally, in sketch A, note that it makes no difference in operation whether the capacitors are hooked to left side of servo motor, and the relay to the right, or vice versa; but in B, connections must be exactly as indicated.

Protect that receiver: Heath Company R/C enthusiast Bill Hannah finds that due to glowing mag reports and ads of material called G-Pad, many modelers have been

wrapping receivers in this sheeting and stuffing them in fuselage. Bill notes that any receiver installed this way will very shortly be shaken to bits. G-Pad is *not* intended as a vibration isolator, although it is fine for taking up shock.

Wrap your receiver in soft foam rubber, pack it in fuselage with a sheet of G-Pad in front of it. Foam rubber keeps vibration from reaching set, G-Pad soaks up shock of a crash (put it all around receiver if there is room in fuse—but wrap the receiver *first* in soft foam).

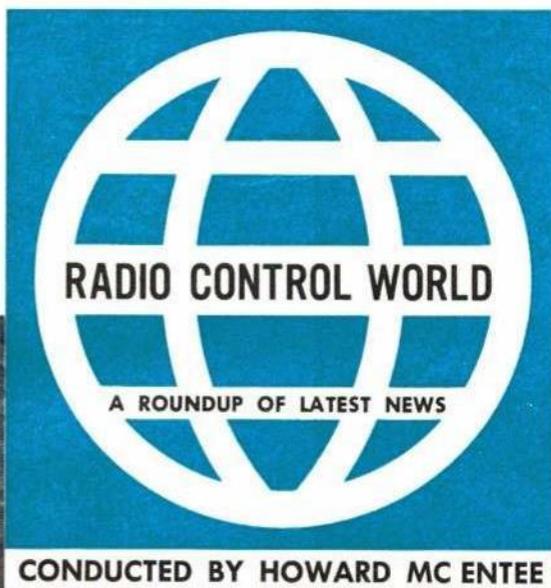
Heath has found that complaints of short range with their R/C systems have been caused by poor wiring arrangements in plane. Antenna should be isolated as far as possible from *all* other wiring, also from battery pack and servos. Bill has been able to triple range of some installations, simply by separating wiring this way. He favors mounting three servos side by side in fuselage, switch on left fuse side, receiver forward of servos, and all wiring between these parts neatly packed between receiver and servos.

Battery pack is usually mounted forward of receiver, with leads to switch down left fuselage wall. Antenna should be routed up and out of fuselage as near as possible to receiver, and as far from servos as practi-

cal. All these comments pertain to any installation, of course, and especially to digital outfits.

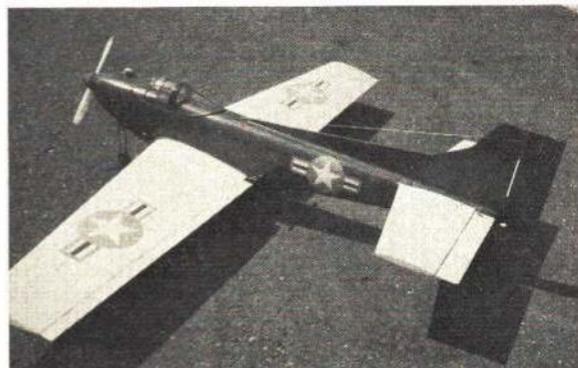
Homemade horn: Simple, light installation suggested by Tom Sanders (83 E. Shore Blvd., Timberlake, Ohio, 44094) is ideal for small planes, costs practically nothing. To prevent possible radio noise from a metal-to-metal joint, Tom applies a length of shrink tubing over the paperclip wire, before he winds the two-turn loop for the pushrod. Tubing is heated to shrink it on the clip wire, loops are made using another piece of wire held in vise as a mandrel, then extra length at bottom of loops is clipped off. Push the wire end through the rudder wood after bending to desired shape and length, sew on a few thread stitches, and cement securely.

Low-cost monitor: Noting that commercially available 27 MHz band monitors are all super-regens and thus useless to tell if there is a signal on your particular spot frequency (they only show there's one somewhere in the general frequency area), Dr. Walter Fischer (925 S. Gilbert, Suite 3, Anaheim, Calif. 92804) suggests a good possibility in the superhet line, a tiny het stocked by Radio Shack (2727 W. 7th St., Ft. Worth, Tex. 76107; also their 200 retail stores around country). It's their Micro-



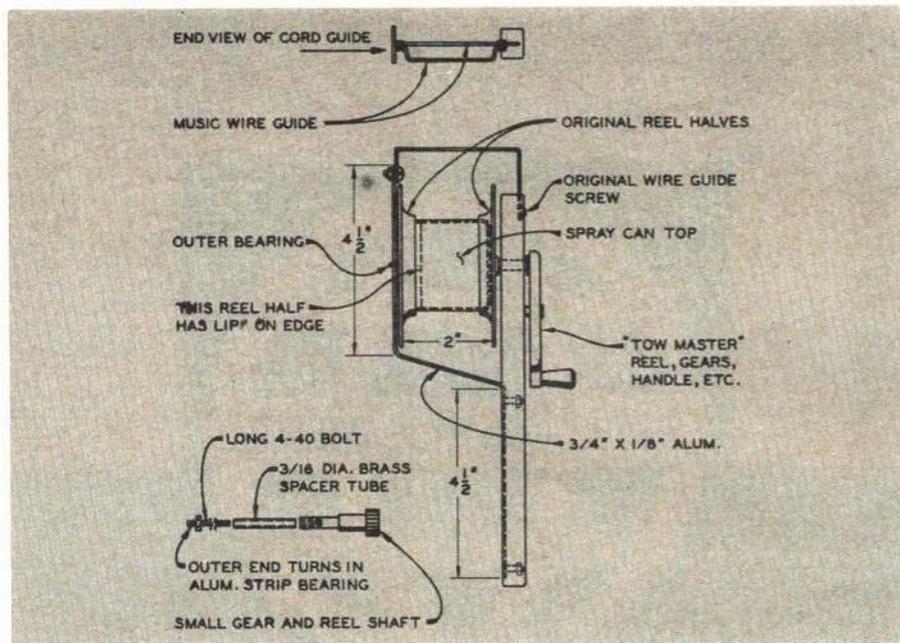
Seen at all-Hydro Meet in Japan was Piper Comanche by Fujimaki with flaps and interchangeable gear—wheels or floats.





"Mistifier" a 60-powered semi-built balsa kit by GRO Industries of Montvale, N. J. Interesting long, large rudder.

Scene at West Coast Champs 1968 scale judging. Piper Pacer, WW I, WW II, Coin fighters, bipes, and racers.



Tow Master winch by F.A.I. Model Supply works fine for R/C gliders but larger reel is needed to store our heavier and longer towline. Mac's modification uses Aerosol can lid.

sonic CB receiver #21-109; costs \$7.95 plus 29c for 9V battery. It comes with a CB channel-11 crystal, and earphone, measures $3\frac{1}{2} \times 2\frac{1}{4} \times 1\frac{3}{8}$. Crystals are easily changeable, and cost \$2.49 from same source (it's not certain they stock R/C rocks, however).

Regular R/C receiver crystals will fit the set; don't forget that such a crystal *must* be 455 KHz different than your transmitting spot frequency — usually on the low side; check crystal in your receiver to make sure. The Microsonic utilizes its earphone cord for an antenna (a 16" telescopic whip is furnished for greater pickup) and volume control.

If you operate on several different frequencies, Dr. Fischer suggests painting the respective monitor crystals in the appropriate flag colors for easy identification. He notes that a weak hum will indicate a transmitter on an adjacent frequency to the one you are monitoring, while a moderate hum shows a signal on your exact spot; this will increase considerably if another transmitter is turned on. Eleven dollars or so for this monitor and appropriate crystal seems a cheap enough price to pay, to protect the \$200-400 you may have invested in your plane!

Compact towline winch: With more R/C gliders flying, more modelers who don't have nearby slope-soaring sites are resorting to the high-start system of getting their

An editorial

'Champion auto drivers tell us to drive (fly) defensively—always expect something to go wrong, or some idiot to make a stupid move.'

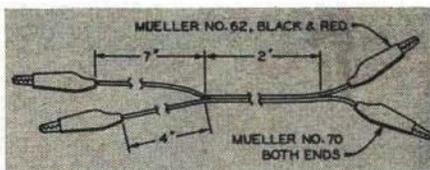
SAFETY on the flying field is becoming of concern to more and more flyers. It astounds us that this hasn't *always* been the case. Foolish and dangerous flying we've seen over the years convinces us that many are convinced Lady Luck is on their side, and that nothing can go awry. *They* will never be affected by interference, equipment malfunction and failure, and certainly never by pilot trouble! How can competent flyers and sensible persons be so stupid?

Planes get faster, as engine power goes upward. Even sport planes travel upward of 50 mph. Many stunters hit as much as 70-80 mph in level flight. We won't go into the math of how heavy a blow a 7-lb. plane traveling at 75 mph can deliver when it hits — be it a house, a car, or a person. Even much lighter

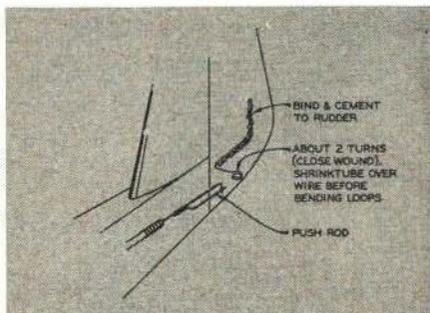
and slower sportsters can deliver a healthy blow; so can powerless planes. We've heard of one case where a modeler was knocked out by a R/C glider. Such craft — and power planes with dead engines — are a special danger. They may not travel as fast, but they can sneak up on you silently from behind!

Even in the smallest sizes, we are not playing with harmless toys! Not only can our planes deliver a devilish blow, but the danger is increased by the meat-chopper on the front end. We hear flyers warned not to stunt, or even fly, over the pit areas, or the spectators. Why do we have to be told this?

Most clubs have safety rules for use at their fields, fitting their own particular conditions. Quite a few clubs are restricting the number of planes in the air at any one time to as few as



Insulated unequal-length starting cables avoid dangerous shorts! McEntee safety tip.



Tom Sanders home-made adjustable control horn is cheap wire piece with twirl at end.

gliders up to several hundred feet altitude. The rubber cord used for high-start is often of reasonable length and can be wound around hand and elbow, as you would wind up a clothesline. But the nylon line which runs from rubber to plane is much longer, takes much more time to wind, can get into a horrible tangle if you are at all careless. Searching for a compact and light winch to adapt to our needs, we discovered the Tow Master sold by F.A.I. Model Supply (6521 N. 3rd. St., Phoenix, Ariz. 85012) for \$4.95 plus 25c postage. It's made entirely from nylon, is very light in weight and smooth in operation. Main mods were to increase capacity of the reel; we use 125-lb. test twisted nylon cord, which is roughly $\frac{3}{32}$ " dia., and about 170' of this would go on the original reel. After mods, 450' of the same cord could be accommodated.

If you order the F.A.I. winch, be sure to specify that you want the reel with the two halves uncemented (same price). Our reel was widened by use of the plastic protective cover from a spray can of "Crew" bathroom cleaner. The open end of this

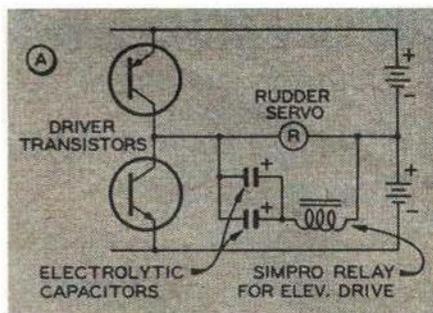
cover was $2\frac{3}{8}$ dia., fitted over the flanged half of the original reel with a little filing of latter. The closed end was neat fit inside the unflanged reel half (after several protrusions had been removed with a hand grinder). A hole was cut in the closed end of the cover, to fit over the internal reel hub. All mating surfaces were heavily scratched and the three parts assembled with epoxy cement. Even epoxy doesn't stick to the plastic very well (with the scratching, it seems to hold, however) and "Goo" might be a better cement.

The small gear of the reel also incorporates the shaft, and is extended as shown. The brass spacer tube is $\frac{1}{4}$ O.D., should be just a trifle shorter than outer reel hub-to-hub distance, so the nut will put a bit of tension on the two halves. With all this bearing overhang, an outboard bearing is mandatory. It's made from a length of Reynolds $\frac{1}{8}$ x $\frac{3}{4}$ aluminum strip (stocked by many hardware stores). Bend as shown, and run the strip full handle length, to stiffen the frame.

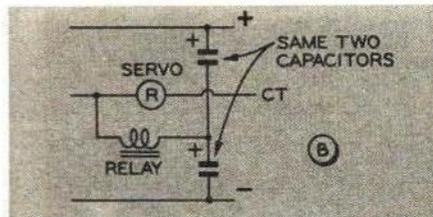
Two bolts hold it to handle, a hole serves as reel axle support. The original cord guide on the reel is removed, and a new one made from $\frac{1}{16}$ music wire. Make the closed portion a bit narrower than reel inside width, to keep the cord from slipping over the reel edges. Bind wire parts with fine copper wire and solder; make sure all guide inner edges are smooth.

Since making the winch, we have found other "Crew" can tops that are of different size. But every spray can has one, so you can doubtless find one that will fit, possibly with a little work on the reel halves. Metal would do just as well, and even cardboard tubing should be fine. With smaller cord than noted above (which is strong enough to high-start very heavy gliders) the reel would hold many more feet, particularly cord of the monofilament variety.

Non-shortening starter leads: Most modelers have seen how wires get red hot and insulation melts when starter battery leads are shorted. Rechargeable cells give most spectacular results when this occurs—dry batteries may just get hot and go completely dead. The starter leads shown here have been used for many years without a single short. This catastrophe is prevented by using insulated clips, and by cutting the two glow-plug leads (left-hand ends) to different lengths. The length difference is considerably different than it appears at a quick glance—note the lengths specified.



Simpro elevator function improvement for purists eliminates reversing polarity on electrolytic capacitors, gives less voltage-caused drift. Suggested by Don Dickerson.



The wire itself is ordinary household twin-lead lamp cord. When you yank the clips off the engine head, the wire tends to straighten out, and the unequal ends are seldom anywhere near each other. The plastic insulators cover all but the tips of the clips, to prevent shorts on nearby metal. Lugs could be used at righthand side, fastened under battery screw terminals, if preferred.

Grassroots

Safety tip: From Hangar Talk, newsletter of Garden Grove RCC (Calif.), a suggestion. Don't turn your transmitter off after you have brought your plane down to a good landing, but some distance away, and upon the assumption that the engine has stopped. This has been done at their field, when plane ran off runway into some light weeds; owner was astounded to see plane suddenly roar to life and rise from ground! Engine had just been idling quietly, flyer couldn't hear it, thought it had stopped. Stray signals advanced throttle and . . . an expensive free-flight plane arose suddenly!

Continued on page 80

three. So maybe this makes for a bit longer wait between flights but at least, when you do fly, it will be with reasonable assurance against mid-air collisions, which seem to be increasing rapidly. In most cases, the pit areas are on one side of the runway, and local rules call for pilots to stand on that same side when flying—not from the center of the runway, not from the opposite side. The dangers of standing on the runway seem too obvious to discuss here.

Why not on the *other* side? Simply because few flyers have good enough depth perception to avoid doing their stunts and low passes directly over the pit area. Most anyone who takes up R/C expects to become a reasonably competent flyer eventually—whether he has aspirations toward contest flying or not. But a flyer is *not* competent until he can handle his plane well, regardless of wind direction or where he stands relative to the runway. If he can do this, he will not need to stand on the "wrong" side of the runway!

Most flyers delight in making high-speed low-altitude passes along the field. How many look first to see if anyone is on the field, or if a plane is taking off or coming in to land? Don't forget, there are almost always engines running nearby; you can't always hear a plane taxiing, or the warning shouts of other modelers. Best solution—don't make your passes over the field

at all, but beyond it where there is much less collision danger, and where you will cause much less damage if you get a sudden serious glitch (this applies only to the other guy, never to *you*, of course!) or you yourself goof.

We hear much about the dangers of Goodyear pylon racing, and despite disclaimers from advocates of this sort of competition, we feel the danger potential is very real. But to their credit, the Goodyear gang harps on safety and practices it. They realize their planes are lethal and govern their races accordingly. Also, the Goodyear competition flyers for the most part are a very experienced group. Unfortunately, the same can't be said of the vast majority of sport and stunt flyers.

Flying safety is a subject we can't possibly cover in this small space, and it's growing in importance as planes get faster, and more and more take to the air. Actually, a great many of the countless facets of safety are just plain common sense. Common sense enough to know that *nothing* is infallible—not the airplane you've lavished so much care upon, not your very expensive radio equipment, not the nut holding the control stick. Champion auto drivers tell us to "drive defensively"—always expect something to go wrong, or some idiot to make a stupid move. Considering the lethal bombs we fly today, should we do any less when we are at the model plane field?

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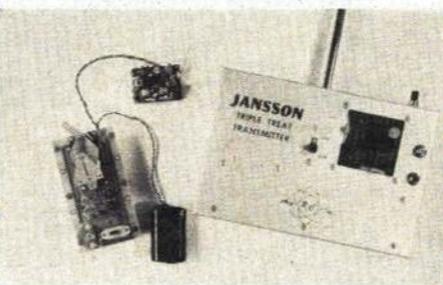
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ACE R/C

SERVES YOU FOR ANY R/C NEED
SERVING YOU SINCE 1953

NEW!



GG PACKAGE #2

The Ace GG Package #2 is the lightest and most reliable Galloping Ghost unit on the market today. Thoroughly flight proven, the package uses Don Dickerson's See Saw Switcher which is unique in that it develops full power with only 2.4 volts.

The See Saw Switcher was expressly designed for use with the Ace Commander DE Superhet receiver which is winning critical acclaim from R/C fans all over the world.

Add to this, the updated Jansson transmitter which has been revised to provide clean RF output and you have a truly outstanding package.

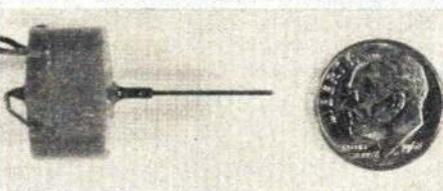
The airborne pack has the Switcher, charging jack, on-off switch and Rand LR3 mounted on an epoxy PC panel measuring 2 1/4 x 4 1/2". The receiver and battery are connected to this board by cables. This allows best weight distribution. Total airborne weight is 5 1/2 ounces, yet the GG #2 works for engines up to .19 and has been successfully used with larger aircraft.

Batteries furnished are the GE 600 mah sintered self sealing vented cells for flights of approximately one hour per charge.

By buying the package you save almost \$20.00 over the individual component costs—AND you get the assurance of a matched and tested rig that will give you hours of pleasure and let you fly, fly, fly—!

No. 10G2—Ace GG Package #2 \$109.95
(Specify frequency desired. All 27 MHz, except 27.255.)

BENTERT ACTUATORS



Smallest, lightest magnetic actuators made. This German import is precision crafted. Small model weighs 7.5 grams and has 50 ma drain on 3 v. Large model weighs 15 grams and has 80 ma drain on 3 v. Single coil, magnetic return.

No. 14K1—Small Bentert Actuator.....\$8.95
No. 14K2—Large Bentert Actuator.....\$8.95

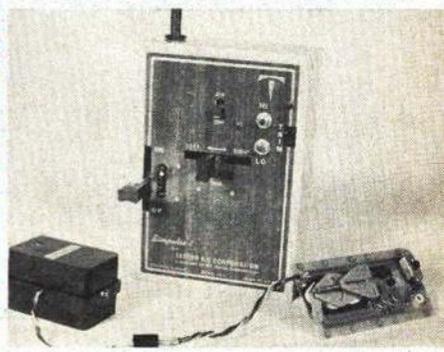
ACE

Accessories Components Equipment

Whether it's Tuflene fuel tubing, or a 2/56 x 1/4 machine screw, or an item from almost any major manufacturer, the chances are good that Ace has it in one of the most comprehensive lines of Accessories, Components or Equipment available anywhere. Our own designer-approved radio kits are added to by lines from E-Bonner, Lanier, Midwest, Bee Line, SPL, Coverite, Jensen, Rocket City, Su-Pr-Line, Sterling, MR, Enya and Webra, etc., etc., etc.

NEW!

DICKERSON—TESTOR CONVERSION KIT



Although intended primarily to convert the Testor Skyhawk to GG operation for rudder an elevator (motor if desired), the kits below are among the most versatile ever offered.

The plane conversion kit will give GG for the Skyhawk, but also may be adapted for airplane up to .19 power! May also be used with almost any other type of receiver—relay or relayless.

RECEIVER CONVERSION KIT

The Dickerson conversion kit for the Skyhawk receiver utilizes some of the components already in the unit, but adds a switching decoder to convert signals for a Rand LR3. Kit consists of PC board for housing switcher, LR3, switch and charging jack on a 2 1/4 x 4 1/2" deck. Contains all transistors and resistors. LR3, connector, switch and charging jack are not supplied.

No. 15K53—Dickerson Skyhawk Rx Conversion Kit, \$11.50

TRANSMITTER CONVERSION KIT

While foregoing may be used with any GG transmitter, this kit makes the conversion of the Testor Simpulse Tx into a two stick GG transmitter easy and simple. Only hand tools required. Basic kit contains all pots, brackets, extra stick assembly (SPST push switches for motor available as extras.)

No. 11K5—Dickerson-Testor GG Tx Conversion Kit, \$11.50

No. 30K3—SPST push switch for motor control (2 required) each, \$4.5

TESTOR RX CONVERSION PC BASE

Printed Circuit base for plane and receiver conversion is available separately for the scratch builder.

No. 28K75—Dickerson-Testor Rx Board, \$3.25

COMING SOON!

The Versapro system to be featured in America's Modeler will be available on a parts package and component basis. Watch our ads and new letters for availability.

NOW MORE-CRAFT GOODIES ARE GOODIER

And there are more of them! From Fair-its at Edge-its to T pins; from 4 and 6 pin connectors to finest grade hookup wire in ten different color packs; from breakaway motor mounts, ball materials, nylon bolts, wing mounts, servo mounts to almost any other accessory not available from other sources. These are More-Craft Goodies—Now produced at Higginsville.

COMMANDER PULSE TRANSMITTER

The Commander Pulse Transmitter is designed expressly for magnetic actuators. Unlike most GG units, which are difficult to convert for Rudder Only, this unit makes effective rudder control with magnetic actuator possible by a width variation of 95/5 instead of the usual 65/35 ratio. Engineered as a complete package, this is not a conversion unit or add-on.

RF section uses powerful silicon transistors. Pulser section uses stable unijunction. Has an electronic centering adjustment to fit your installation in the airplane. Once set, does not require readjustment or constant trim adjustments.

Housed in exclusive Aluma-Sheen anodized finished metal case measuring 6 1/4" tall x 3 1/4" wide x 2 1/8" deep. Uses large 9 volt battery of the M1603, D6 or 276 types for extra long life. Has base loaded antenna which collapses to 9 inches. Nicely balanced for easy-to-fly feel. Spring loaded stick is internally mounted.

Designed expressly for the Commander DE Superhet receiver. With 2 nickel cads and an Adams magnetic actuator, this makes an ideal beginners package.

Quality throughout, rugged reliability, custom crafted; completely assembled, tested and guaranteed.

No. 11K1—Commander Pulse Transmitter \$39.95
(Specify frequency: 26.995, 27.045, 27.095, 27.145 or 27.195)



COMMANDER PULSE DE SUPERHET RECEIVER

This is the first superhet receiver to be produced by Ace R/C! And it is a first in many respects: Small—measures only 1 1/4" x 1 1/4" x 3/8"; Light-weight is about .8 ounce; Relayless-but double-ended (DE) with 1 amp transistors in output for hookup direct to dual coil actuators; Low voltage—works reliably at maximum range on just 2.4 volts; Versatile—works with most any transmitter of from 400 to 1400 hz; Pulses—exceptionally fast.

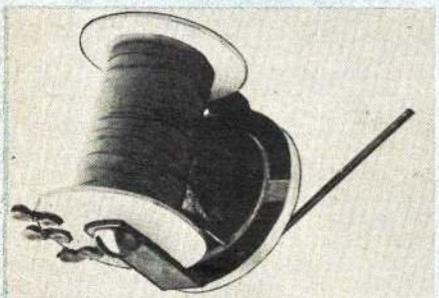
Manufactured by Ace exclusively under license agreements with designers—several circuit breakthroughs found only in this unit.

Works with only minor change on Dickerson Skyhawk GG Conversion kit. Uses highest grade miniature components—completely assembled, tested and guaranteed.

Not only is the Commander the smallest and lightest superhet available today—it is also the lowest priced at this special introductory offer.

No. 12K1—Commander DE SH RX Pulse
Assembled\$26.50

(Specify frequency: 26.995, 27.045, 27.095, 27.145 or 27.195)



ADAMS SINGLE AND TWIN ACTUATORS

Adams Baby Actuator—smallest dual coil made. Only 1/2 oz. Only\$6.95

Other Adams Actuators in low voltage coils in both single and twin magnet assemblies in stock. LV Single \$6.95. LV Twin \$9.95. Improved!

COMMANDER R/O PULSE PACKAGES Ideal for Beginners and Sport Fliers

Get one of the Ace Commander R/O packages and you get the Commander DE Superhet Receiver, Commander Pulse Transmitter, Adams Actuator of the size you want, along with matching nickel cads, and completed wiring harness. AND you save up to \$10.00 over buying singly.

We have the packages as matched sets in three basic offerings to suit your every R/C sporting need from the smallest to the larger sized aircraft. Ready for easy installation.

The Baby Pack is for the .010 and .020 jobs although it can be used with tame .049's. Package has two GE 225 ma BHL nickel cadmium batteries and Baby Adams. With wiring harness and switch, completely assembled.

The Standard uses the LV Single Adams for more power for .049 to .07 size. Is furnished with two GE 500 ma BHL nickel cadmiums. With switch harness, assembled.

The Stomper uses the LV Twin of the Adams line for up to .15 or even .19 size jobs. Comes with two GE 600 ma cylindrical cells. With switch harness, assembled.

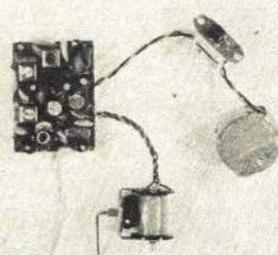
(Charging equipment not furnished.)

No. 10G15—Commander R/O Baby pack.....\$69.95

No. 10G16—Commander R/O Standard 71.95

No. 10G17—Commander R/O Stomper 74.95

(Specify frequency: 26.995, 27.045, 27.095, 27.145 or 27.195)



PROVEN WINNER! ACE VARI-CHARGER



IN KIT FORM OR ASSEMBLED

Will charge nickel cadmium batteries—20 mils to 150 mils. Capable of charging up to 12 volt packs. Indexed dial & simple chart for correct milliamp reading for charging different size battery packs. Completely isolated from AC line supply. An extra deluxe item. New transformer of highest quality. UL approved line cord. On-off switch. 500 milliamp diode. Full instructions.

No. 34K21—Ace Vari-Charger assembled\$8.95

No. 34K22—Ace Vari-Charger Kit 7.50

NEW HANDBOOK-CATALOG FOR 1969!

For the Fun Flyer and Tinkerer

Our 1969 Handbook-Catalog is bigger and better than ever. We specialize in equipment for the Beginner, Sunday and Fun Flyer. More items for the do-it-yourselfer; more products from most major manufacturers, in addition to many Ace exclusives. Greatly enlarged HANDBOOK section. Last year this was called "bible for R/C" "a MUST!" by R/C editors. Price is just \$1.00 POSTPAID. This is completely refundable on your first order! And that order also puts you on our mailing list for our newsletters and R/C Data Service—acclaimed the world over. You can't lose—send your buck on a round trip today. It could be the best dollar you ever spent!



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QUANTITY	STOCK #	NAME OF ITEM	PRICE	TOTAL

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

NEW!

Vogt Tee Dee Throttle Restrictor—Tame that .020 for use with small R/C.....\$2.00

Albin .2 oz Superegen Receiver Kit—smallest commercial unit available. Micro mini components. Complete Kit.....\$12.95

PROPO PRIMER by Howard McEntee, published by Kalmbach, now available. At \$2.00 it is a must for any R/C fan. Takes up where R/C Primer leaves off. #33K25

DUBL-PAK hookup wire—48 feet of 6 of the colors used in today's equipment. 19 strand #38 ultra-flex covering. Six feet each color—total of 48 feet. SAVE! #40L251—\$1.69.

Ace H-D Charger—powerhouse for large nickel cads. Up to 1 amp. Internal adjust with meter and ventilated case. Assembled.....\$13.95

Ace Dual Vari-Charger. Combines features of both above chargers in one. BOTH ranges are metered; BOTH adjustable. Assembled...\$17.95

GE Nickel Cadmium HEAVY DUTY batteries in all sizes. Low prices.

TRANSMITTER SIGNAL STRENGTH METER KIT

Would you like to add a signal strength meter to your Jansson or Commander or almost any R/C transmitter that does not have one built in? This simple Ace kit, while designed primarily for the Jansson transmitter, can easily be adapted to any transmitter that allows just a bit of room in case.

The S/S Meter Kit monitors the RF going into your antenna and is reliable indication of the signal you have from your transmitter.

Simple to install: All components mount on meter except for connections to antenna and case. Kit contains all components, including instructions.

No. 22K17—Transmitter S/S Meter Kit.....\$4.95

NEW PRODUCTS CHECK LIST

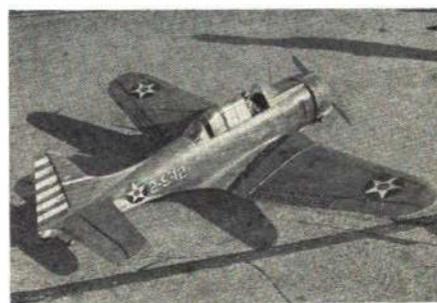
Write the manufacturers for more data; tell them, "I saw it in American Aircraft Modeler."

Jerry Johnson THE MOTOR MAN/ETA Engines. Eta Instruments, manufacturer of ETA Racing Engines (England), has appointed Jerry Johnson THE MOTOR MAN the exclusive U.S. Importer/Distributor. Their line of limited production, high performance engines is well known. Initially, distribution will involve the ETA .29 glow and the ETA Mk II diesel. Both have dual Hoffman ball bearings and hard chrome cylinders. Later, the ETA .29 R/C and ETA .40 Regular and R/C will be introduced. Johnson also carries the Taipan line of engines (Australia). Complete stocks are always on hand. Write: JERRY JOHNSON THE MOTOR MAN, Box 863, Woodland Hills, Calif. 91364.

two choppers (and a two-man crew in each), rocket pods, turrets and decals. A clear stand allows you to mount them in flight formation. Info on above kits from: MONOGRAM MODELS, INC., 8601 Waukegan Road, Morton Grove, Ill. 60053.



RaCar Developments/R/C Race Cars. One-eighth scale R/C race cars are providing a new hobby/sport. They weigh about six lbs. and clock 35 mph in high gear (they do have a 2-speed gearbox-transaxle that can be shifted via radio). Mag wheels, Goodyear tires, independent suspension with torsion bars, shocks, universal joints and a clutch-equipped glow engine are some of the features. Use any 3-channel propo gear to get variable throttle and steering. Body styles, Formula I, Indy and GT, fit the basic chassis. In kit form, prices start about \$125, or fully assembled, prices go from \$200. All without R/C equipment. Practice road racing at home and on a low budget. Brochure is 25c, write: RACAR DEVELOPMENTS, 524, W. Central Park Ave., Anaheim, Calif. 92802.



Sterling Models/Profile Mustang. Count on Sterling for something unusual. This time it's a multi R/C in profile form. On top of that—it's almost ready-to-fly and it should be a perfect R/C trainer. The pre-assembled fuselage needs only the one-piece balsa tail surfaces. Molded foam wing panels are factory finished. Assemble in minutes. Plastic skin on wing requires no finish. A multitude of Nylon horns, push rods, wing screws and other hardware is included. Where does the radio gear go? In the wing—check Howard McEntee's New In R/C in this issue. Kit price is \$34.95.

Sterling is also producing a Polypropylene hinge material (called Poly Hinge) for use on control surfaces. It gives you free movement with little bulk and a countless number of flexes. Poly Hinge will go in each kit as standard equipment. Write: STERLING MODELS, Belfield & Wister St., Philadelphia, Pa. 19144.

Monogram Models/Pylon Racer Kit. From the National Championship Air Races Monogram brings a kit of two, plastic scale racers. Rounding the pylon (included in kit) is the popular P-51 Mustang that has set cross-country records at speeds to 470 mph. The F&F Bearcat won in 1964 at over 355 mph. Both are in kit PA218 at a price of \$1.50.

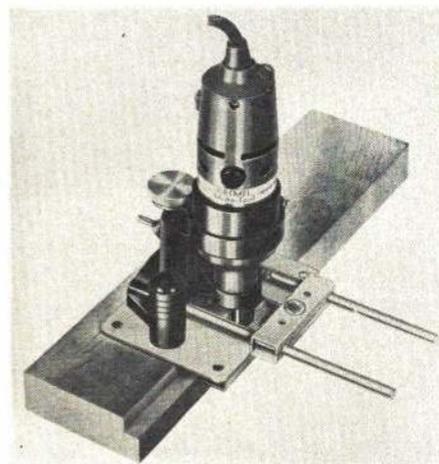
Another pair of aircraft are available from Monogram in a single kit. These AH-1G Huey Cobra helicopters operate in pairs and have seen action in Vietnam. Each kit, PA191, at \$1.50 contains enough parts for

Top Flite Models/Dauntless Kit. The first time in AMA competition history, a model received a perfect score of 450 points in Static Judging of scale aircraft at the '68 Nats at Olathe. The model, Dave Platt's R/C Dauntless, was a replica of a Navy craft on display at the Smithsonian. Platt is presently the chief design-engineer at Top Flite. Judges agreed that his model was flawless in every detail from the retractable landing gear and arrestor hook to the rivets, instrument panel, scuff marks and oil streaks. The Dauntless was built as a prototype for a multi-channel R/C kit soon to be introduced by Top Flite. Mike Schlesinger, Top Flite President, expects to

market the kit with the same attention to detail as the original model. Kit will contain everything from arrestor hook, retractable gear, scale wheels and bomb release to detailed instructions on rivet making and finish procedure. Mike says, "the new Dauntless R/C will be in a class by itself." Write: TOP FLITE MODELS, INC., 2635 S. Wabash Ave., Chicago, Ill. 60616.



L. M. Cox Mfg./TRC Fuel. Cox calls this the "coolest" in model aviation fuels. Specially formulated to cool the operation of R/C engines that have been muffled or cowed. It protects engine parts. Use it wherever you fly if the temperature is high! Also the same Nitro content is retained as that in Cox's "Blue Can" fuel. As Cox claims, "Not magic—just a truly fine fuel." In gallon cans only, at \$7.49 each. Write: L. M. COX MFG., P. O. Box 476, Santa Ana, Calif. 92702.



Dremel Mfg. Co./Router-Shaper Unit. Here's the newest accessory for Dremel's Constant-Torque Moto-Tools. Use it like a conventional router, but there's a difference. This one is lighter and easier to handle. Body is of Delrin plastic and the fence, guide bars and control fittings are steel and aluminum. Depth-of-cut is precisely controlled. And the Moto-Tool may be readily removed for other jobs. Router-Shaper sells for \$9.95; Constant-Torque Moto-Tools from \$22.95. Write: DREMEL MFG. CO., Racine, Wis. 53401.

OUT OF THE PAST-INTO YOUR FUTURE!

NEW SEMI-SCALE R/C KITS FROM AIRTROL!

Fly well with any kind of radio gear from single channel to full proportional equipment. Kits feature vacuum-formed high-impact fuselages . . . molded foam wings and stabilizers. Pre-cut parts. Need no finishing. Cement included in all kits. Less than 3 hours assembly time per kit. Immediate delivery.



\$24⁹⁵

Airtrol ALBATROS Kit #AB-1

A beautiful model of one of the first successful, highly maneuverable combat/scout planes of World War I. 44" wing span. For .10 to .15 engines. Weight: 32 ozs. (less engine and equipment)



\$21⁹⁵

Airtrol MORANE-SAULNIER Kit #MS-1

Another World War I pioneer . . . first to shoot through its propeller. 42" wing span. For .10 to .15 engines. Weight: 22 ozs. (less engine and equipment)



\$21⁹⁵

Airtrol MESSERSCHMITT Kit #ME-109

A faithful kit of the fast, deadly fighting machine of World War II. 44" wing span. For .10 to .15 engines. Weight: 22 ozs. (less engine and equipment)



\$15⁹⁵

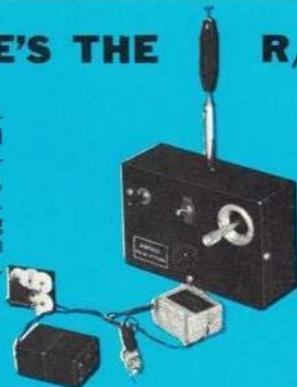
Airtrol CESSNA Kit #150K

Extremely smooth handling . . . easy to assemble and fly. Ideal for the beginner. 44" wing span. For .099 to .15 engines. Weight: 24 ozs. (less engine and equipment)

AND HERE'S THE R/C GEAR TO FLY THEM!

AIRTROL GL-100 Lowest price "Galloping Ghost" on the market. Ideal for the beginner. Simplest and smoothest ghost actuator. 3 functions—rudder, elevator and motor control. 27 mc. freq. Superhet receiver. No wiring necessary . . . simply plug into switch harness. 56" center loaded antenna. Wt. (airborne equip.) 8 ozs.

\$99⁵⁰



AIRTROL R-11 Non-flopping, single channel, pulse control. One function—rudder only. Designed for aircraft up through .19, 27 mc. freq. Superhet receiver. 56" center loaded antenna. Complete less batteries. Wt. (airborne equip.) 6 ozs.

\$69⁵⁰



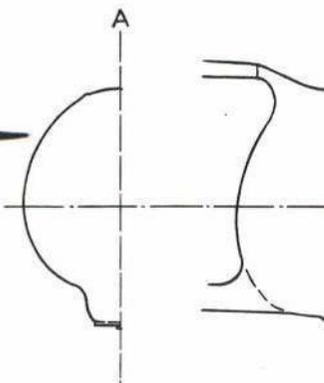
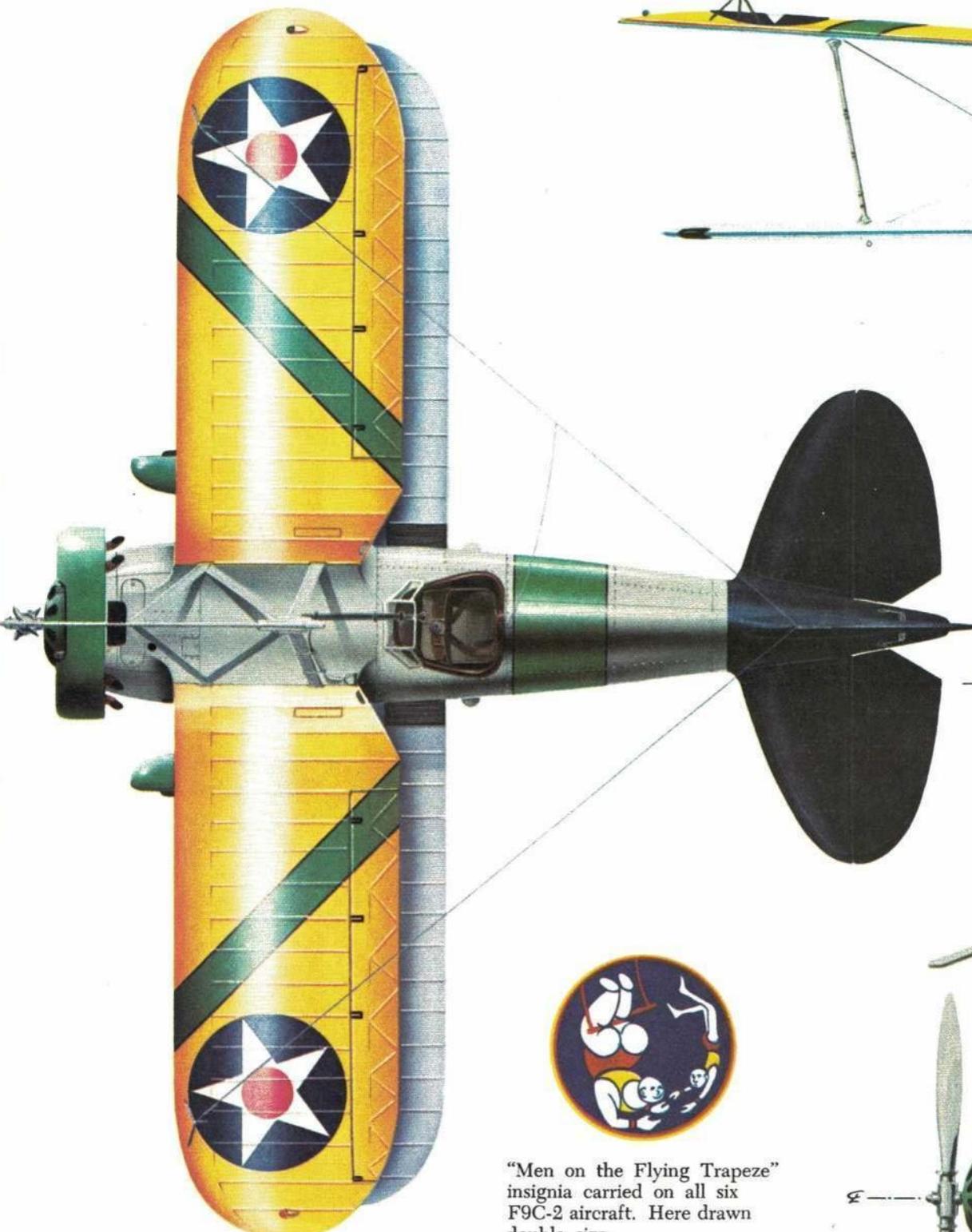
If your dealer cannot supply you—send for FREE literature and prices.

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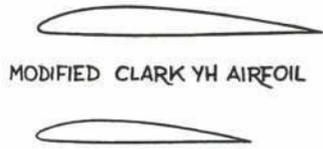
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CURTISS F9C-2

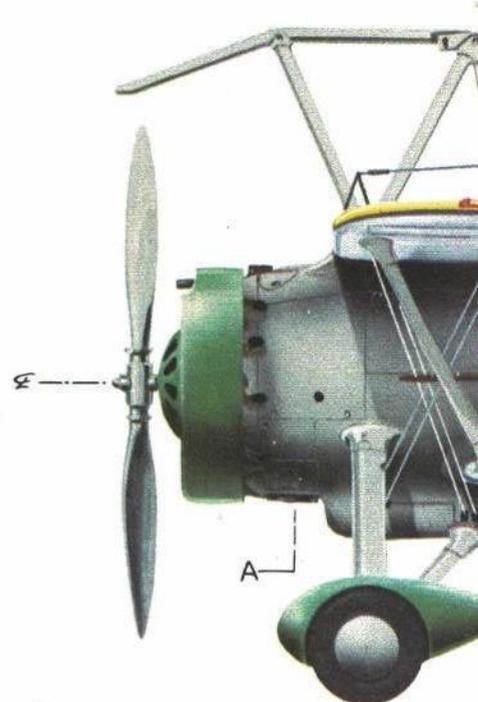
Sparrow Hawk, 438-hp. Wright R-975E3 9-cyl. engine



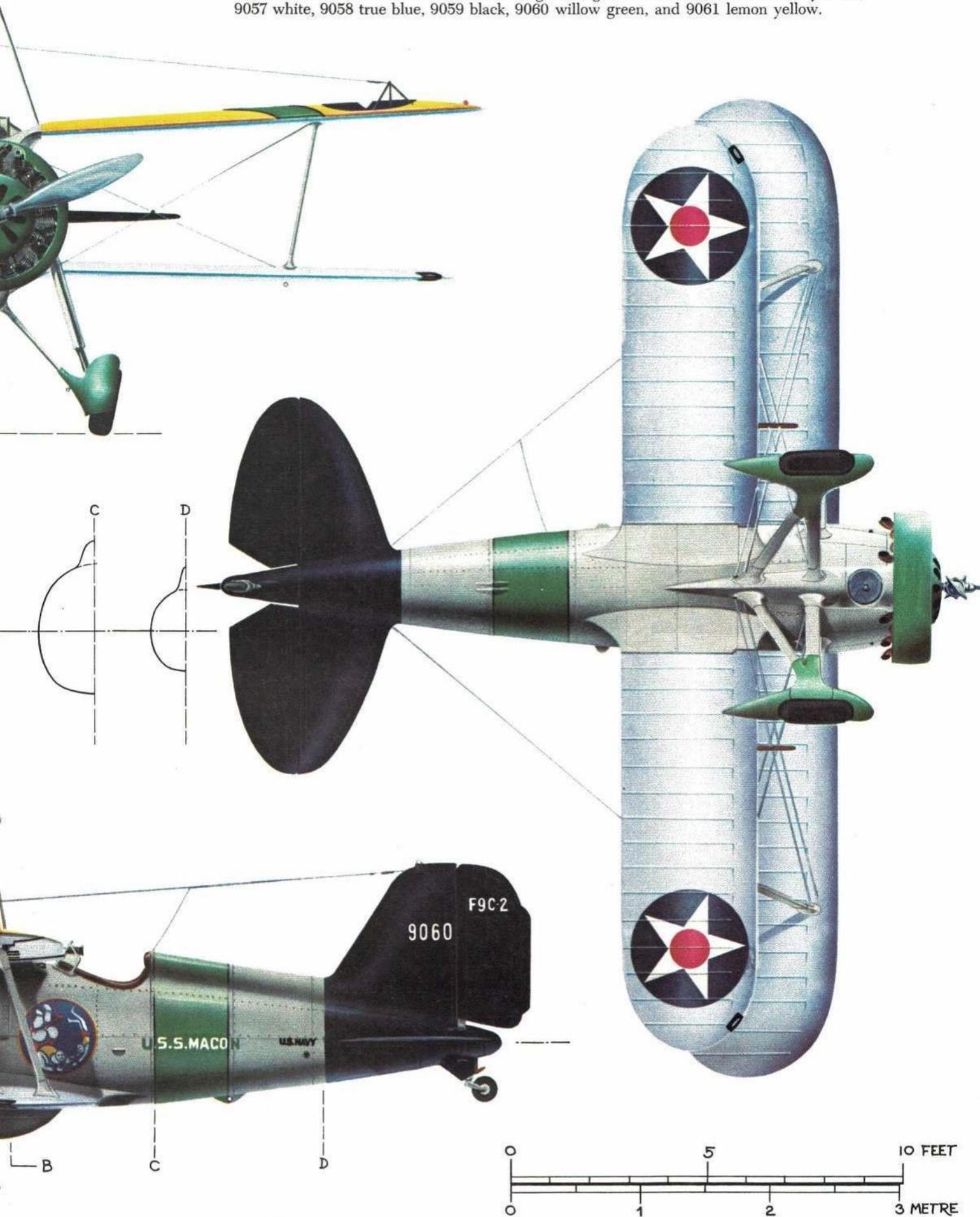
"Men on the Flying Trapeze" insignia carried on all six F9C-2 aircraft. Here drawn double size.



MODIFIED CLARK YH AIRFOIL



Each aircraft was given a distinctive color on engine cowl, wheel spats, fuselage band, and Section Leader's "V" for identification during landing maneuvers. No. 9056 had royal red, 9057 white, 9058 true blue, 9059 black, 9060 willow green, and 9061 lemon yellow.



NOW BUILD THE MIRAGE AND THE LIGHTNING AND THE HELLCAT AND THE F111 AND THE SM 79 AND THE TIN GOOSE



And keep on going.

On and on.

The 1/72 way. The MPC way.

Six new planes for a line of kits that's growing as fast as the Mirage flies.

And here's why you should go MPC non-stop.

First, it's 1/72 scale all the way.

That makes a collection out of collecting.

Next, the MPC quality. All the exacting detail is there, all the authenticity.

That's where a good finished model starts.

Now take value! Like a buck each for the F 111,

Ford Trimoter and SM 79. Do a little comparison

shopping to get the full impact of these prices.

Same goes for the Hellcat, Mirage, and Electric

Lightning at seventy pennies.

And consider the fact that MPC also includes both the authentic markings . . . plus a wild, wild set of customizing decal.

And a modular display stand. And extra customizing parts in the seventy centers.

When you consider everything,

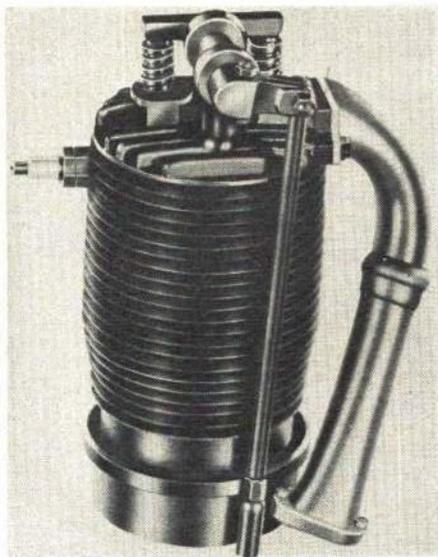
you have to consider MPC,

the new name of the game in plane kits.



**KEEPS RIGHT
ON HAPPENING**

MODEL PRODUCTS CORPORATION, MOUNT CLEMENS, MICHIGAN 48043



Williams Bros./Le Rhone Cylinders. Granger Williams reports that the demand for their "Wasp Jr." and "J-5 Whirlwind" scale cylinders prompted the production of the Le Rhone. A famous engine of WW I, it was used in Sopwiths, Nieuports and Moranes. Surplus units found service by barnstormers. As the previous two replicas, the Le Rhone is molded, in 1, 1½ and 2 inch scale, of a high-impact styrene. Prices are 65c, 85c and 98c. With each cylinder are detailed instructions for assembly on a crankcase mockup. Write: WILLIAMS BROS., 6719 Salt Lake, Bell, Calif. 90201.

Edmund Scientific Co./New Catalog #691. A compendium calculated to coerce the reader into creating clever and crazy things. Whatever your hobby bag, you'll find items of interest in this 148 page catalog. All of them are unusual and generally hard-to-find. And the catalog is good for reference too. It's free. Just send your name and address to: EDMUND SCIENTIFIC CO., 380 Edscorp Bldg., Barrington, N. J. 08007.

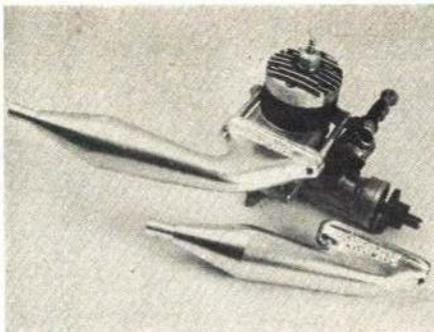


Wing Mfg./F4F Wildcat. Two Superfab R/C scale kits by Wing are now on the market. Scale for each is 1½" to the ft. No short-cuts have been taken; scale is faithful. The Wildcat (top) sells for \$74.95 and has these features: fiberglass fuselage with installed firewall; foam wing and stab cores; balsa wing skins; formed wing and stab tips; landing gear struts and hardware; rudder and elevator surfaces; aileron torque tubes; formed tail wheel strut and sleeve and molded oil cooler, canopy and cowl. Wing's Zero (bottom) has all of the above plus Posittract retractable landing gear; styrene wheel door material and a molded spinner and air intake. Its price is \$89.95. Both designed for .40-.60 engines. Instruction man-

uals are thorough. Query: WING MFG., P. O. Box 44, Morton Grove, Ill. 60053.



Angel Mini-Flite Co./Fly-For-Fun-Series. The Citabria is the first model in this all-plastic series. It's 90% true scale. Lightweight wings have a semi-symmetrical foil and are factory-covered over full-length spars (tips are molded, too). Assembled plastic fuselage has every detail duplicated. Cowl is one piece and removable. There are NO flanges on stab or fin. It's an all white model—you need only apply color trim via dope, paint or Monokote. Use the Citabria anytime; it is equipped with floats and skis and wheel pants. Hardware set includes aluminum motor mounts, Nylon bolts for wing and landing gear and a complete tail-wheel assembly. Span is 44" and overall length 33". With standard gear, four servos and a .19 the flying weight is three lbs. 10 oz. Use it with single or multi channel radio and engines from .15 to .29. Price only \$34.95. Write: ANGEL MINI-FLITE CO., Box 437, Fitchburg, Mass. 01420.



Tatone Products/New Peace Pipes. Long-necked and extended Peace Pipes are Tatone's answer to the wide fuselage and large cowl problem. Trying to fit a muffler around a bulky fuselage and onto an engine can be difficult, if not impossible. But as you can see from the picture, the new types of mufflers have a one-inch extension to give ample clearance. Mufflers are cast in aluminum and come in three sizes: .09-.19; .29-.40 and 45-.65. Price is \$5.95 each. Keep quiet! Write: TATONE PRODUCTS, 4719 Mission St., San Francisco, Calif. 94112.

AMT Corporation/New Plastic Kits. AMT has just released four plastic aircraft kits in 1/72 scale. First, is the Grumman Mohawk OV-1B surveillance aircraft. The full-size ship has been in combat operation in Vietnam since 1966. It has the advantages of high lift and low speed stability with great acceleration. Kit no. A643. Next is another Grumman, the A-6A Intruder—a Naval strike aircraft. Classed as sub-sonic the twin-jet, low-level attack bomber is capable of Mach .9. It has advanced radar gear and a DIAN electronic

warfare system that can be programed for takeoff, evasive action to target, bomb drop and escape from the hostile area. Kit no. A647.

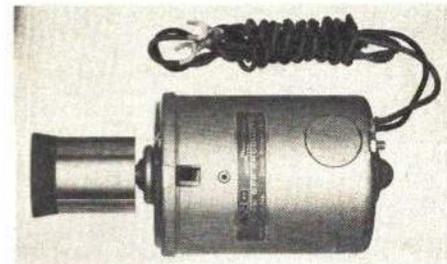
A double sonic recon bomber, the two-seat Vigilante RA-5C is a twin-jet too. Most unusual feature is the bomb bay between the engines. It's a tunnel equipped with rails and a catapult that shoots rearward! Due to the aircraft's speed it is necessary to fire the weapons backwards so the explosions may be cleared. Kit no. A658.

Last is the Super Sabre (F-100D) supersonic jet fighter. This model D can carry additional armament such as Sidewinder or Bullpup missiles plus its regular four cannon. Kit no. A692.

All of these kits are highly detailed and features run from pilot figures, drop tanks, optional position landing gear, and arresting hooks to authentic matte decals. Price is \$1.30 per kit. AMT CORPORATION, 1650 Tenth St., Santa Monica, Calif. 90404.



Rand Mfg. Co./Stick Assembly. A new design in R/C stick assemblies, this one is compact and mounts from behind the panel so no screws are visible on the Tx front. Stick movement is two axis, operating two pots. Centering is positive (can convert to non-centering for motor control) and the modeler can change the feel plus adjust the stick's length. Trim levers (mechanical) change pot position not the stick's. In kit form, less pots, price is \$9.95. Assembled and with 5K pots the price is \$13.95.



Rand's Electric Starter will give you instant starting. High torque motor will flip over any engine from .09 to .60. Great for racing engines, no matter what event is flown. It's powered by a 12 volt motorcycle battery or similar. Four foot leads have spade terminals, there's a push-button switch and the prop driver is molded so as not to damage spinners and the like. Less battery, the price is \$29.95. Write: RAND MFG. CO., 8909 Hubbell Ave., Detroit, Mich. 48228.

Conducted by Harry E. Harps

With clipped wings, semi-symmetrical airfoil, and more power, the old Aeronca Champ has become the aerobatic Citabria.

WILLIAM HANNAN

Displaying the real plane's colorful sunburst paint scheme, our model looks quite exciting. Will average 40 seconds!

CARICATURE CITABRIA

All balsa simplicity with easy-to-follow details produce an attractive and fine flying profile scale model. The real craft is a popular air show performer famous for its aerobatics.

HOW long has it been since you've attended an air show? Chances are good that the next one you see will feature a Citabria or two. This fine product of the Champion Aircraft Company, of Osceola, Wis., is gaining much attention for its aerobatic capabilities. It was my pleasure, recently, to witness a Citabria being put through its paces by an outstanding pilot, Mr. Mike Dewey, who teaches aerobatic flying at Santa Paula, Calif. Also present, was famous Bucker Jungmann pilot, Mira Slovak, who has bestowed compliments upon the good handling qualities of the Citabria. This is high praise indeed!

Our little model can be quickly and inexpensively fabricated, and it is great fun to fly. Average hand-launched flight times have been 30 seconds, with an occasional 40 seconds in good air. For best performance, build it light!

Construction: Trace the outlines of the main fuselage section onto a sheet of heavy tracing paper, which will serve as a template. Transfer the outlines onto a light, but stiff sheet of warp-free $\frac{1}{8}$ " thick sheet balsa, with the aid of a soft pencil, or ball-point pen. After cutting this part to shape, pin it in place over the fuselage drawing, and add the cabin struts, as indicated. Allow the assembly to dry thoroughly before removing it from the board.

Next, taper the rear of the fuselage (as

viewed from the top) for a smooth transition to the thickness of the rudder, as well as to reduce weight. Glue on the $\frac{1}{8}$ " thick nose block sides, and after they are dry, sand them to a smooth contour. The corners of the fuselage may be rounded slightly, except for the wing and tail mounting areas. Drill a $\frac{1}{16}$ " diameter hole in the nose to accept the aluminum tubing prop shaft bearing. Roughen the surface of the tubing, and glue it into place. Force a straight pin into the rear underside of the fuselage, as shown on the drawing, to serve as a rubber-band retainer.

The cabin sides are covered with thin celluloid or even cellophane. The windshield is cut from thin celluloid, and bent to shape. A template is given to assist you with this, but it is best to cut your windshield slightly oversize, and trim it to an exact fit.

My own frustrating experiences with windshield patterns, date back to kits from the early 30's, which is one reason why I usually build open cockpit models! At any rate, try to keep the glue smears minimal while attaching the celluloid. Neatness counts!

Wings: Medium soft $\frac{1}{32}$ " sheet balsa is used for the wing panels. After cutting them to outline, add the $\frac{1}{16}$ " square leading edge reinforcements, and weight them down to prevent warping during drying. The two root wing ribs are made

from hard $\frac{1}{16}$ " thick sheet balsa, while the outboard ribs need only be $\frac{1}{32}$ " thick. Prepare these ribs, by rubbing glue into the top surface of each one. This pregluing will increase their strength, as well as easing assembly. I usually install the ribs one at a time, and hold them by hand until they are dry—which only takes a few minutes, or you may use masking tape to do the job. The root ribs should be angled slightly, so that the correct dihedral angle can be achieved.

After the wing panels have dried, give them a good overall sanding, and radius the leading edges. The wing struts are made from medium-hard $\frac{1}{8}$ " x $\frac{1}{16}$ " strips, sanded to a streamlined cross section.

Tailplanes: The tailplanes require no special attention, other than selection of extra light balsa, from which to make them.

Landing Gear: The wheel pants are built up from $\frac{1}{8}$ " sheet balsa cores, with $\frac{1}{16}$ " sheet balsa sides. The main landing gear unit is made from $\frac{1}{32}$ " diameter music wire, as are the wheel pant retainers, and the tail wheel support. The wheel pant retaining wires may be attached to the main landing gear unit with epoxy, solder or even thread binding and model cement. The $\frac{9}{16}$ " diameter wheels that were used on our model came from an old plastic kit, as did the tail wheel, but they could just as well be made from wood. The pants serve to retain the main wheels, while a drop of cement will secure the tail wheel. The LG fairings are made from $\frac{1}{32}$ " sheet balsa.

Decor: The easiest time to decorate any model is prior to assembly, while the parts may be laid flat upon the work-

Continued on page 73

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YOU said it!

Continued from page 11

Swell wheels

I have been experimenting with ways to make wheels and have come up with light, good-looking ones for indoor vintage-type models, such as your Sommer Monoplane, featured a couple of years ago in A.A.M. (I found it a dream to build and fly.)

But getting back to the wheels, you take a small plastic pill bottle of appropriate size and cut off the bottom. Then file or sand the bottom to the required thickness; then glue a thin piece of plastic on the open edge. This makes a hollow wheel. Now, slip on your rubber tires. Heat a wire and push it through the center of the wheel and you have a handsome pair of wheels.

I am 13 years old and sometimes find it expensive to have to buy things like wheels. I thought perhaps some other boy might be interested in how to make cheap, good-looking wheels.

David Johnston, Scarborough, Ontario, Canada

Indoor fun, too

After seeing the "Manhattan Formula" article in the April '68 issue, I have become very interested in indoor modeling. I have just finished constructing the "Easy B," the indoor model found in the October issue. I am very pleased with the results.

I would like to find out more about indoor modeling and also if there is any club or organization in my area. Please advise me as to the above request and also please tell me where I can secure a copy of the publication "Indoor News and Views."

Thank you for any help you can give me.

Jeff Koch, Corona del Mar, Calif.

"Indoor News and Views" may be contacted at Box 545, Richardson, Tex., 75081. That's the place to find out about anything having to do with indoor. For official contest matters, rules, etc., the Academy of Model Aeronautics, 1239 Vermont Ave. N.W., Washington, D. C., 20005 is the place. Ed.

Will try, sir

You have the best magazine on the newsstands today. Just the right amount of R/C, C/L, and F/F.

Keep up the good work.

John Bodiford, Powder Springs, Ga.

Three years ago, a balanced model mag was — would you believe it? — square. More modelers follow A.A.M. now than any other such magazine in the world. All hobbyists are interested in reading about all kinds of models — and in plans. Ed.

Townsley a hit

I consider Townsley's article in Nov. '68, the best yet. Let's have more of this type.

John C. Fett, Manistee, Mich.

Plastic model devotees have noted the switch in John Townsley's approach. John's never satisfied with himself — which pleases all of us. Ed.

Conducted by Sally Barry



INTERESTED IN JOINING A.M.A.? Over 25,000 did in 1968. Membership details may be had by requesting FREE BROCHURE from above address.

USA's Richmond Tops All in Indoor World Championship

by Clarence Mather

"Terrific!" is the best way to describe the '68 World Indoor Championship. That includes the planning and execution of the contest by the Italians, the flying site, the standard of flying, and the comradeship of the modelers. The twenty-four contestants representing nine countries made this the biggest Indoor Champs yet!

I would like to describe some aspects of the entire trip although a detailed report would fill many pages. So, I'll try to be concise. It began for me with an overnight flight from San Diego to rendezvous with the rest of the team at Philadelphia. Then a day of processing and another overnight flight to Frankfurt, Germany. Apparently AMA HQ did their job well because we had no problems.

The models survived the trip with only minimal damage, due to sturdy boxes, well-packed parts and generally careful handling by airline handlers. They all were very cooperative to our needs. Al Rohrbaugh's king-size box containing ten (10) models received especially tender care when it was rumored among the baggage people that it contained a special radar set!

The modelers were in considerably worse condition than the models since we had gone two nights with just a couple of hours sleep each. Due to time differences, travel, model flying and various other activities we spent little time in bed.

After some hours of recuperation at Frankfurt we crammed the mountain of baggage and boxes into a VW Microbus and set out on the Autobahn — the original freeway. We then discovered that Bud Romak, team manager, is a natural Grand Prix driver! In Europe many drivers use just two speeds — zero and full throttle! If something is in the way, honk the horn and use any lane (or half a lane) to get around. Brakes are used only as a last resort and seem to be regarded as a sign of impotence. Tail-gating and cutting in and out sharply are the usual techniques. It is a tribute to the exacting skills of the European drivers that we saw only four or five accidents during our travels. Anyhow, Romak took to this high-speed bedlam like a duck takes to water, and so we crossed Germany, Switzerland and Italy. Border guards paid scant attention to our luggage until we got to the Italian line. There a couple of young guards took one look at the stuffed Microbus and decided that we were trying to bootleg pizza or spaghetti into the country. They directed us to some other authority, but since they could speak no English and we no Italian we could not figure out where or who. After blundering about for a time we finally got to the big wheel. After opening one model box he gave us admission, and we continued on our way.

In Florence we stopped at the home of Egizio Corazza and were greeted warmly and hospitably by Egizio and his gracious wife. Egizio's models showed a very high degree of construction skill that we were to find the rule rather than the exception among European models.

We arrived in Rome on Monday night and got our first look at the Sports Palace. It is a beautiful building! The Sports Palace is at the extreme south edge of Rome and was built for the 1960 Olympics. It is a circular building with two tiers of seats surrounding a floor diameter of 164 feet (yep, 50 meters). A domed roof arches up from the highest row of seats to a peak of about 115 feet. The roof consists of fluted concrete beams and glass. It does not catch models,

but there is a speaker/lights complex at top dead center that did catch a few high climbers. The Palace is drafty by day, but is an excellent site at night.

We tested our models for many hours over the next few days and found it difficult to get altitude. If we did get good altitude, drift carried the models into the seats. Getting a rapidly drifting model in time to avoid a damaging seat landing was difficult. Sections of the seats were isolated from each other by tall glass panels, thus requiring a trip through corridors and up or down stairs.

Contestants from other countries kept arriving and we had an opportunity to meet persons we knew only as names from these

Turn page

James Richmond, Bensenville, Ill., left, accepts coveted individual World Champion indoor award from Italian dignitary. Championship was flown in the Rome Sports Palace, site of the 1960 Olympics. Richmond's two-flight total of 69 min., 58 sec., beat nearest contender by 28 seconds.



This Is Last Issue for 1968 AMA Members

Only those who renew memberships on time will receive continuing issues of *American Aircraft Modeler* without interruption. Furthermore, those 1968 AMA members who haven't paid 1969 dues by Dec. 15 will get the next issue late — probably not until mid-February — assuming that they renew membership by Jan. 15. And if later than that they won't get the next issue at all. It's simply the mechanics of magazine ordering and mailing.

The March issue is mailed in early January but it's December when copies have to be ordered and the first mailing tape of addresses made up. A second mailing tape is made in late January to get magazines to those who joined between Dec. 15 and Jan. 15 — provided HQ guessed right in estimating how many copies to order for latecomers. After Jan. 15 there's no choice but to forget about the March issue and move on to April.

This is why it's necessary to get membership processing initiated as soon as possible — it's too costly and complicated to do anything else. If you haven't signed up for 1969 AMA membership yet, do it now in order to get the most for your dues money.



L-R: B. Romak, U. S. team manager & C. Mather, San Diego, Cal.; A. Rohrbaugh, Ft. Wayne, Ind.; Cotugno, Italy; Koller, Austria; Wetzel, Germany.

pages. Usually at least one member of a team could speak English, so we had many cordial conversations. Inspecting the models and watching them in action gave plenty of evidence that the competition was tough! The models were well built, light, and cruised at low RPM. They all stuck to shortish motor sticks and booms rather than the long ones used by the American team. The Czech models in particular looked much like Bilgri designs. Many others had narrower chord wings of perhaps 100 to 120 square inches. Vilim Kmoch (Yugoslavia) used a completely flat stabilizer on a model that flew very well.

On Thursday we had our first chance at evening flying. The powerful lights warmed up the air somewhat, and it was definitely more buoyant and fairly stable — much less drift than in the daytime. Our models came to life in this air; Richmond and Rohrbaugh had test flights exceeding thirty-one minutes.

Finally, Friday evening arrived and so did the opening ceremonies. Dignitaries present included a general from the Italian Air Force. Each team marched out to the center of the floor to the strains of its national anthem — a proud moment for us all.

Then came the flying. First to test the air was a member of the host country. The air seemed good, and soon there was a waiting line to fly. Officials wisely held to a maximum of four models in the air at one time to reduce the chances of collision. One of the pre-contest favorites, Kalina of Czechoslovakia, was up high for a good flight but then drifted over into the seats for 28:09. Mather was the first American up. The model stayed right over the floor, climbed to perhaps 95 feet, and did a nice 32:38. Richmond did not climb as high — yet did 32:11. Rohrbaugh climbed beautifully but hung on the center post at 8:54. Corazza of Italy did 32:01 and Koller of Austria did 30:06. Those were the longest flights of round one. Since I was leading, I immediately suggested that we end the contest right then! The suggestion received little support from the others.

In round two the air was cooler and less buoyant. Richmond did 28:37, Mather 27:30 and Rohrbaugh 27:19. None got high. Kalina "leaned on" his winder, and his model was soon up bouncing around the center post. It did not hang, and he got a great 34:44. Hans Beck of Germany, 1966 World Champ, did 32:42, Chlubny of Czechoslovakia 31:46, Koller of Austria 30:13 and Vilim Kmoch of Yugoslavia 30:00, for high flights of that round.

It had been difficult to see the models against the glare of the bright lights, so on Saturday only part of the lights were turned on. That made it easier to see the

models, but the air stayed cooler. Kalina's model climbed rapidly, struck the top, and the tail slid down buckling the tail boom; but then it popped straight again, and the model went on to do a great 34:46! Chlubny did 33:41, Koller 33:06, Kmoch 30:01, Beck 29:58, Rohrbaugh 29:53 and Mather 29:14 for high times on Saturday.

At the end of round four the U. S. team was leading with 179 minutes, 52 seconds. Czechoslovakia had 173:07 and West Germany 171:25. The lead was nice, but Sitar of Czechoslovakia had a low flight in that total, and we knew he could do much better.

Richmond had been flying his very light model which had great potential but had not reached high altitude. So on Sunday he tried a larger motor which collapsed the stick and ruined the model. Then Jim assembled an older, stronger model and put

up a 33:40 flight which still did not reach the top. The last round came up with him needing almost thirty-six minutes to pass Kalina for individual honors. Jim wound the model as never before, and it responded perfectly! The model climbed right up next to the roof, touched a short rope that dangled from the center, then descended slowly for a magnificent 36:18! That was the longest flight of the meet by over one-and-a-half minutes, and it gave Jim a deserved World Champion honor.

Meanwhile Sitar turned in 25:04 and finally a 32:43 to give Czechoslovakia the team lead. Rohrbaugh could not get his model high enough for it to realize its great potential. Mather wound to breaking on the last flights; something twisted to give a power stall. And so the flying ended, thrilling and frustrating, but always exciting.

We were sad to see the contest end and have to start the long journey home, but

Indoor World Championship Results

Name	Country	I	II	III	IV	V	VI	Total*
1. Jim Richmond	U.S.A.	32:11	28:37	—	26:30	33:40	36:18	69:58
2. Jiri Kalina	Czech.	28:09	34:44	33:22	34:46	33:28	04:20	69:30
3. Eduard Chlubny	Czech.	09:38	31:46	33:51	30:32	22:10	33:28	67:19
4. Hans Beck	Germany	03:21	32:42	—	29:58	28:32	33:22	66:14
5. Manfred Koller	Austria	30:06	30:13	23:54	33:06	12:10	13:19	63:19
6. Clarence Mather	U.S.A.	32:38	27:30	29:04	29:14	00:11	00:11	61:52
7. Egizio Corazza	Italy	32:01	26:30	29:02	26:38	23:33	24:39	61:03
8. Vilim Kmoch	Yugo.	06:16	30:00	23:10	30:01	28:58	07:13	60:01
9. Jiri Sitar	Czech.	26:21	11:39	—	00:10	25:04	32:43	59:04
10. Walter Hach	Austria	27:58	28:59	—	26:42	25:17	29:43	58:42
11. Andras Ree	Hungary	27:35	25:38	28:17	29:11	09:49	23:42	57:28
12. Antal Egri	Hungary	11:43	26:40	28:18	28:47	28:34	27:20	57:21
13. Carlo Cotugno	Italy	14:11	08:13	00:04	26:38	15:35	27:54	57:21**
14. Kurt Vogler	Germany	26:41	28:37	—	09:14	22:43	28:40	57:17
15. Al Rohrbaugh	U.S.A.	08:54	27:19	21:45	29:53	24:02	24:52	57:12
16. Harro Erofejeff	Finland	21:29	25:24	17:59	26:32	26:42	28:18	55:00
17. Teodor Straszberger	Yugo.	26:36	21:37	22:42	26:05	25:10	26:53	53:29
18. Werner Wetzel	Germany	26:15	09:08	19:35	27:12	24:33	16:07	53:27
19. Esko Tirronen	Finland	26:48	00:52	—	04:54	21:50	26:36	53:24
20. Leopold Gabriel	Yugo.	17:59	00:12	20:36	24:46	22:49	24:31	49:17
21. Olof Nordlund	Finland	00:12	00:28	18:46	23:31	22:43	10:39	46:14
22. Gyorgy Buzady	Hungary	20:01	01:36	19:23	17:16	17:25	15:50	39:24
23. Germano Masciullo	Italy	12:53	06:11	17:49	18:14	12:20	17:32	36:03
24. Guy Cognet	France	07:10	08:58	12:44	12:18	12:48	11:07	25:06

TEAM PLACINGS

1. Czechoslovakia	195:53	4. Yugoslavia	162:47	7. Italy	151:38
2. U.S.A.	189:02	5. Finland	154:38	8. Austria (2 men)	122:01
3. Germany	176:58	6. Hungary	154:13	9. France (1 man)	25:06

*Total of two best flights. Times shown in minutes and seconds.

**The Individual Official Results sheet listed Cotugno with 57:21 total as shown, but his best two flights total 54:32. The team total shown above is correct, so this correction would place Cotugno in 16th place and move Vogler, Rohrbaugh and Erofejeff to 13th, 14th and 15th places respectively.



L-R: Jiri Kalina, Czechoslovakia; Hans Beck, Germany; Egizio Corazza, Italy; Walter Hach, Austria; L. Gabriel & T. Strasberger, Yugoslavia.

there are many pleasant memories that make it all worthwhile. The associations with the members of our team and all the other flyers were great. It was a pleasure to fly in such a well-organized and well-conducted contest. The tours of the historical sites and beauties of Rome and Tivoli that were arranged by the contest committee were outstanding experiences. The banquet of sumptuous Italian food and the awarding of prizes were fitting climaxes to the whole affair.

We who were lucky enough to participate would like to offer thanks to a number of people: to the Italians for conducting such an excellent contest, to modelers like Joe Bilgri for keeping indoor alive, to Bud Tenny for the NIMAS newsletter that has done so much to keep indoor growing in popularity, and to Bud Romak for doing a fine job as team manager and who supplied us with snazzy turtle-neck sweaters.

Ed. note: Our thanks to the National Indoor Model Airplane Society for permission to reprint this article which first appeared in *Indoor News and Views*, the voice of the NIMAS, Bud Tenny, editor. Information about membership in the society obtainable from Box 545, Richardson, Tex. 75081.

Romak Report

Ed. note: In continuation of the truly outstanding job Bud Romak did as team manager, including successful solicitation of monies to aid the team, his post championship report has much interesting information which we excerpt as follows. Our thanks to him, also, for securing the photos which appear here.

Hungary had one model proxy-flown. The reason for this was that Mr. Varszegi had become very ill, and at the last moment it was decided that Mr. Ree would fly his model. Mr. Ree did a fine job of flying, as the results show; he was high man for the Hungarian team.

The first rounds were from 5:00 p.m. to 8:00 p.m., with a break for dinner which was served at the flying site. The second rounds were from 9:00 p.m. to 12:00 midnight.

Balloon steering was almost nil, but pole steering was in evidence throughout the meet. The American team was not quite as proficient as the other teams with the stick or pole steering. Fortunately, they did not have too much steering of this type on their official flights, but they did some practicing during their test flying.

At round three all teams waited for others to start flying, but soon chaos set in. Team managers could see that time was

running by, and it would be impossible to get all of the flights in during the time left. I was at the official area and got Mather's and Rohrbaugh's names in, but then came everyone else. Richmond's name was given, but by then he was in the eleventh slot to fly; he and five others did not get a start. In order to avoid this bunching up for the remainder of the meet, it was decided that the names of countries would be drawn from a hat. Then each team manager could decide on which team member would fly first, second, or third. This worked out fine — there were no more delayed flights.

All in all this was truly a great World Championship. The times have improved over the past two years where there now is even talk of 40-minute flights.

HQ note: The U. S. team was selected via

Nassau RC Regs May Point to Future

Just as the drivers of "horseless carriages" had imposed upon them various licensing and operating requirements when they increased in numbers, the flyers of RC models may be required to observe somewhat similar rules if they fly in heavily-populated areas, or if the number wanting to fly in a given location becomes very large. No flat prediction of this is being made, but the licensing and operating regulations set forth by the New York Nassau County Division of Recreation and Parks for RC models at its Mitchell Field may provide a glimpse of the future.

At Mitchell Field, a county facility allowing RC model flying, only flyers with the county permit are allowed to pilot a model. There are two types: Learner's Permit and Senior Permit.

The County Learner's Permit is issued to anyone who applies for it if he has the AMA and FCC licenses. Learners must fly under the supervision of a Senior Permit holder. Senior Permits are issued after the Learner is tested by a Certified Examiner for pilot performance in accomplishing six specified flight procedures.

All RC flyers, Learner and Senior Permit holders alike, are required to abide by certain ground and flying regulations. These were installed for safety and common courtesy, with infraction resulting in dismissal from the site and revocation of the permit.

Examples of the regulations: Flying permitted only from 10 am until dusk. Determination of flight schedules by arrival and readiness. Display of frequency flags. Tuning of radio equipment (15 min. max.)

a 1967 program directed by the Academy of Model Aeronautics under the volunteer leadership of Bud Tenny (Texas). Entry fees from the program and additional contributions solicited by Team Manager Bud Romak provided a basic fund which paid for team travel within the U. S., to and from the east coast. AMA general treasury funds paid for the World Championship entry fees ($4 \times \$45 = \180) plus basic team travel expenses in Europe (an additional \$198). This AMA support is typical of that provided to all U. S. teams (two per year) and is in accordance with official policy which budgets 10% of AMA dues income for FAI activity expenses. Each AMA member, therefore, directly and automatically supports the participation of the U. S. in international aeromodeling competitions and meetings.

counted as a flight. Limitation of multiple flying (4 maximum at a time if there are two flight lines). Keeping field clear of equipment and people, and keeping field clean. Requiring mufflers for engines exceeding .15 cu. in.

RC Related to Aerospace

Early this year Dr. W. A. "Walt" Good presented a report on radio-controlled airplane technology to The SAE Committee A-18 for Aerospace Vehicle Flight Control Systems. This was a function of his position with the Applied Physics Laboratory of The Johns Hopkins University.

The report, giving a brief story of the RC model and introducing the concept of the digital servo, was presented to the group which consisted of 70 flight control engineers for aircraft, missiles and space vehicles. They represented most of the major companies and laboratories in the country.

"Two things were apparent after the talk," Good told us. "One was that the digital servo concept, as used by the RC modeler, is new to the aerospace industry. At last we've found something concrete in model innovation which has not been done already in aerospace industry!"

"The second thing of note," Good went on, "was the large number of ex-modelers in this group of engineers. I called for a showing of hands of those who had built model planes at one time in their careers. The response was 65 out of 70 people! I was expecting maybe fifty percent — not ninety plus! These engineers are the ones who design the automatic and manual flight controls for the nation's aircraft such as the Boeing 707, B-70 supersonic bomber, the C5-A troop transport, the Boeing 747, and many others."

New RC Rules Approved for 1969

Pattern Events

AMA's RC Contest Board revised the Class A and B maneuver patterns to put a more clearly defined difficulty gap between the three classes. And the take-off maneuver will be exactly the same in all pattern classes: the FAI type, without Proto Taxi. However, the contestant must demonstrate that he has some control of his model on the ground. After starting his engine, and before takeoff, the pilot must taxi the plane a distance of approximately 10 feet, including a controlled turn of at least 90 degrees, followed by a complete stop. To not perform this maneuver will automatically lose 5 takeoff points. In strong winds, the CD may waive the 90 degree turn in favor of S-Turns, to demonstrate ground control without the risk of nosing over. Requiring this capability is expected to encourage contestants to taxi off the runway at the end of his flight. This saves time, and eliminates the danger of having a helper run out to pick up the plane.

Landing Perfection for 1969 requires pilots in all three classes to bring their planes to a complete stop at the end of the landing run—the flight is over at that point when the pilot announces "Flight Complete." He then is expected to immediately taxi off to the side of the runway or, if permitted, taxi back to the starting box. Since taxiing is not required after the stop it is possible to make a scoreable dead-stick landing, but the pilot is to be downgraded slightly.

New Class A maneuver schedule:

1. Takeoff
2. Straight Flight Out
3. Procedure Turn
4. Straight Flight Back
5. Figure 8
6. Three Rolls (Barrel or Axial)
7. Immelman
8. Three Inside Loops
9. Stall Turn
10. Traffic Pattern Approach
11. Landing Perfection
12. Spot Landing

Four maneuvers are added: Three Rolls, Immelman, Three Loops, and Stall Turn. A total time of 8 minutes is allowed to complete the pattern, including two minutes for engine starting.

For Class A only, the rolls may be Barrel or Axial. This is to encourage entering of aileron-less airplanes, and also for

novice pilots with aileron ships. In any case the pilot must call out which type of roll he will attempt.

New Class B maneuver schedule:

1. Takeoff
2. Straight Flight Out
3. Procedure Turn
4. Straight Flight Back
5. Touch and Go
6. Three Rolls
7. Three Inside Loops
8. Three Turn Spin
9. FAI Rolling Circle
10. FAI Horizontal Eight
11. Three Outside Loops
12. Slow Roll
13. Reverse Cuban 8
14. Traffic Pattern Approach
15. Landing Perfection
16. Spot Landing

Except for takeoff and landing changes, the Class B pattern has Immelman dropped and six maneuvers have been added. A total time of 10 minutes is allotted, including two minutes for engine starting.

Class C Novice and Expert categories for 1969. Basically, Class C has not changed from the 1968 rules, with the exception of the Take-off and Landing requirements previously described. But the "Grab Bag" maneuvers have undergone considerable change, with a total of 20 to choose from. It is now possible to do ten for the first round and then the remaining ten on the second (Contest Director's option). A total of 11 minutes is allotted, including 2 for engine starting.

New Class C maneuver schedule (1 through 7 same as Class B, followed by ten maneuvers selected from the following list of 20):

- *Four Point Roll
- Knife Edge Flight
- Reverse Spin
- FAI Top Hat
- FAI Rolling Circle
- FAI Double Stall Turn
- FAI Horizontal Eight
- *FAI Vertical Eight
- *FAI Double Immelman
- Three Outside Loops
- Inverted Spin
- Slow Roll
- Tail Slide
- Reverse Cuban Eight
- *Cobra Roll
- *Four Leaf Clover
- Loop With 1½ Snap
- *Inverted Reverse Cuban Eight
- *180 Degree Turn
- *Loop with Rolls
- Followed by:
- 18. Traffic Pattern Approach

19. Landing Perfection

20. Spot Landing

The maneuvers marked with an asterisk are those that have been changed, substituted, or added for 1969. The Eight Point Roll was unpopular in many areas, so is changed back to the Four Point (also easier to judge). The word description of the Loop/Snap for 1969 will agree with the rule book illustration, i.e., the Snap-and-a-Half is part of the Loop, not a separate maneuver done between the first and second halves of the loop. The Vertical Square Eight has been eliminated because it was a brute power maneuver, unpopular and relatively unsafe. And, with two variations available on the Cuban Eight theme, the original maneuver was dropped.

Two FAI maneuvers, previously unused, have been added—the Vertical Eight and Double Immelman Turn. Both of these maneuvers are described in the 1968 Rule Book, pages 52 and 53. The other five maneuvers added to the Class C "Grab Bag," entirely new to AMA Pattern Flying, are: Cobra Roll, Four Leaf Clover, Inverted Reverse Cuban Eight, 180-Degree Turn, Loop with Rolls.

Pylon Racing

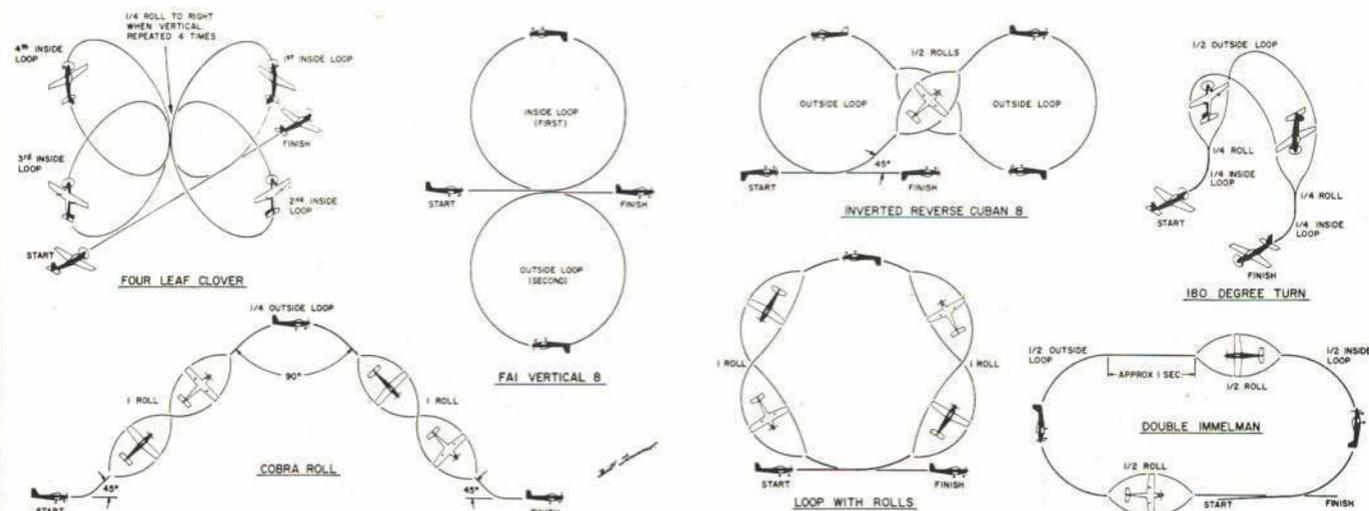
There are two official classes of racing for 1969, with new names. The 1968 "Good-year" or 450 sq. inch scale-class is essentially the same for 1969, under the title of Formula I. The former "600" class, which was provisional for 1968, is official for '69, as Formula II, with detailed revisions to the former rules.

Formula I has new engine and carburetor descriptions: engine must be a production type, assembled from factory available production parts; carburetor must be a working RC throttle type, with single barrel, from factory available production parts.

Formula II is similar to I except that the minimum wing area is greater (600 sq. vs 450) and there is no scale handicap point system. There are, however, minimum fuselage size requirements (7" high, 3½" wide). Other formula II details: only wooden 2 blade fixed pitch propellers allowed.

As per 1968 rule para. 22.3.4, the AMA prop nut okay for scale types, prototypes require rounded 2" min. dia. prop spinner; engine must be cowled except the cylinder head fins may be exposed and cowl may be cutaway to clear the exhaust; wing thickness along span must be proportional to chord (1½" min. root thickness for monoplane, 1" for largest wing of biplane); min. wingspan is 50" for monoplane, 30" for biplane (smaller wing of biplane must be at

Drawings courtesy Model Airplane News



least 2/3 the area of larger wing and the smaller wing min. root thickness is 3/4". The pylon race course layout has been modified to permit spectators within 200 feet of the #3 pylon if the spectator line is on the #1 and #3 pylon side of the course; otherwise the previous 300-foot min. still applies.

Other Rules Actions

A proposal to limit RC operations to under 500 feet, except for special situations, was rejected; no change was made to the current basis for obtaining AAA rating for RC meets; Class I and II "supplementary" rules were dropped for '69, due to comparative lack of activity involving them, in contrast to the obvious success of Class A and B rules.

The above information was excerpted from reports by Bill Northrop, AMA's RC Contest Board chairman.

Record Roundup

The following new FAI World Records should be added to the full listing which appeared in October for an up-to-date picture. Those indicated with an asterisk are tentative.

- No. 4, FF Rubber Speed: Noujny (USSR) 72.8 mph
- No. 8, FF Piston Speed: Alexandre Noujny (USSR) 89.47 mph. (Beats record of 80.63 mph held by U. S. since 1949.)
- No. 16, FF Helicopter Piston Speed: Alexandre Voltchanovsky (USSR) 62.1 mph.
- No. 31, RC Piston Distance, Closed Course: B. Kuncce (USA) 210 mi. (Corrects previous error in distance flown.)
- *No. 24, RC Glider Duration: Vladimir Stefan (Czech) 15h 2m 25s.
- *No. 26, RC Glider Height: Ray Smith (USA) 4908 feet.
- *No. 34, RC Glider Distance Closed Course: N. Malikov (USSR) 101.9 miles.
- *No. 48, RC Piston Seaplane Duration: R. Gunning (USA) 1h 39m 17s. (Previously listed tentative record for D. Gregory not applied for due to timing insufficiency.)
- *No. 48, RC Piston Seaplane Duration: D. Gregory (USA) 2h 8m 40s.
- *No. 51, RC Piston Seaplane Speed: Tom Rankin (USA) 83.79 mph.

New National Records

The following new national AMA records will update the full listing for outdoor models published in November and the full listing for indoor models published last month.

Outdoor Free Flight

Unlim. Rubber Jr. W. Vanderbeek	21:00.0
Unlim. Rubber Op. J. Bilgri	25:57.0
Wakefield Jr. J. Davis	19:24.0
A-1 Towline Sr. G. Myers	17:14.0
A-2 Towline Jr. B. Gibbs	19:21.0
A-2 Towline Sr. G. Myers	19:27.0
Ornithopter Jr. R. Postage	3:21.0

Control Line

C Speed Sr. J. McKinzie	181.92
C Speed Op. Roselle & Frye	198.60
Jet Speed Sr. J. Olson	166.60
Navy Carrier I Jr. J. Gerber	468.00
Navy Carrier I Sr. E. Gross, Jr.	530.23
Navy Carrier II Jr. J. Gerber	463.00
Navy Carrier II Sr. E. Gross, Jr.	542.77

Indoor, AMA Ceiling Cat. I

Paper Stick Op. R. Platt, Jr.	13:06.0
D Stick Op. H. Crane	17:45.8
B Cabin Op. T. Vallee	7:33.0
C Cabin Op. H. Crane	9:42.4

New NAA Magazine at Discount to AMAers

A first-issue aviation collectors item, featuring 4-color illustrated coverage of the National Model Airplane Championships, is now available on newsstands across the country. The magazine is an annual edition, produced by the National Aeronautic Association, in the typical size and approximate format of *National Geographic* magazine. The name is *Aviation Graphic*, and it was produced in cooperation with all the divisions of NAA, including the Academy of Model Aeronautics.

Magazine content, besides modeling, includes soaring, ballooning, parachuting, general aviation, air racing, aerospace, and many other subjects. A special section lists all world records, with aeromodeling a major segment. There are lots of photos—all in color—among the 100 pages. And it's all feature material as there is no commercial advertising. There never has been an equivalent publication on the market.

Never before has model aviation been so favorably presented—as a fully equal partner with all other aspects of aviation. The color photo treatment is exceptional, more than fifteen, covering a wide range—indoor, RC pylon, outdoor free flight (including old-timers), control line. Because of the outstanding presentation, the magazine can be an excellent PR vehicle for clubs to use in promoting local civic understanding and appreciation of modeling as a respectable adult and youth activity.

The newsstand price is \$1.50, but AMA members may obtain one or more copies (clubs should consider group orders) at only \$1.00 each. Send check or money order, along with name, address and AMA number, to: National Aeronautic Association, 806 15th Street N.W., Washington, D. C. 20005.

NAA membership is also available at half price to AMA members—\$5.00 instead of the usual \$10.00. Benefits include a discount on rental cars (just one such rental may save enough to pay for the membership), discounts on aviation magazines and books, NAA news (featuring full-scale world record and general aviation information), a vote in NAA affairs, special life insurance rates. Note also that membership is for a full 12-month period regardless of time of joining. Be sure to include AMA number when applying.

Special Dues Rate for Special Cases

The normal adult dues for AMA members is \$10. However, a special rate is now in effect for either of two situations: 1. those who are currently subscribers to *American Aircraft Modeler* magazine; 2. additional adults in families already having one adult AMA member. In both cases one copy of the magazine is already being provided. The saving from not supplying the extra magazine is, therefore, available to reduce the cost of membership which is priced, for these special cases only, at \$6.

Those who fit in either category may obtain the special rate membership by remitting check or money order along with a current address label from the magazine. In the family member case, only those residing at the same address are eligible—the address label should be the one for the adult in the family who is already an AMA member.

New Control Line Rules Wipe Out Speed Records

Increase in the size of control wire diameters required of control line speed models will start a new series of national AMA records for speed classes beginning in 1969. Existing 1968 flight records for CL Endurance and Navy Carrier remain unchanged.

Other changes to the Official Model Aircraft Regulations effective in 1969, enacted by the 1968 Control Line Contest Board (Howard C. Mottin, chairman) follow. These are applicable to both competitions and records, as well as to sport flying.

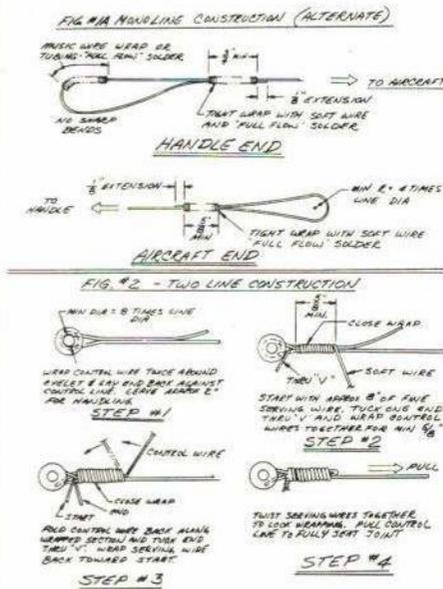
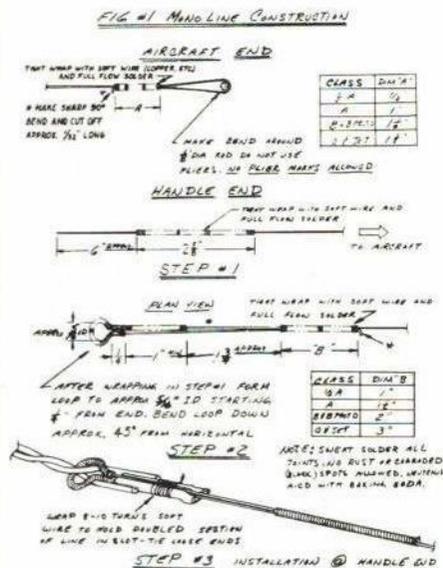
Speed

Minimum wire diameters increased as follows:

	Min. Dia. one line	Min. Dia. ea. line*
1/2A & 1/2A Proto	.014"	.008"
A	.020"	.012"
B & B Proto	.024"	.014"
C & Jet	.031"	.018"

*for 2 or more lines

Line construction shall be of the methods illustrated in figures No. 1, 1A, or 2. The CD may allow alternate line terminations if he can satisfy himself that they are at



least as strong and safe as those shown. **Pull-test** is increased to 40 times the weight of the model. **Whipping** a model more than necessary to get it safely airborne will not be permitted. **Minimum wingspan** for 1/2A Proto Speed monoplanes is reduced to 14"; minimum for biplanes remains 12".

Scale Racing (Goodyear)

Airplane design: must be a model of an actual Goodyear racer (Thompson-type now excluded), and it must be of the profile fuselage type. The inboard cheek cowl is allowed, but the engine must not be enclosed in a cowl.

Rat Racing

Minimum wire diameters of lines increased as follows: .000 to .200 cu. in.—.012", .201 to .300 cu. in.—.016", .301 to .400 cu. in.—.018". **Pull-test** is increased to 32 times the model's weight. **The builder of the model** (in whose name entry must be made) must act as either the pilot or the member of the pit crew who actually starts the engine. Pilots may be changed for each heat, but not during a heat. **Races** will consist of two 70-lap preliminary heats (35-lap preliminary eliminated) and 140-lap feature races. One refueling stop mandatory for 70-lap races; two required for 140-lap races. Scoring is changed to take into account the revised race lengths. **All races** will be run with at least two but no more than three flyers. **The alternate starting system** (para. 16.24e) is eliminated.

Navy Carrier

Revised Contest Board interpretation is that wing dihedral as viewed from the front must be similar to the actual airplane as shown in the three-view drawing. Namely, it must have some positive or negative angle if the drawing shows it. Also, the color of the model should be similar to any traditional Navy-type aircraft paint scheme. **Class II** is more specifically defined to allow engines of from .401 to .650 cu. in. and jet. **A Profile Class** is added to the existing Class I and II. To comply with the rules for the Profile Class, a model must have a profile-type fuselage with engine not larger than .36 cu. in. and wing area 300 sq. in. or larger; 3 .015" lines req'd. (may be multi-strand). The engine must be of the plain sleeve-bearing and front intake type; it must not be cowled-in, nor may it have a pressure fuel system; the engine must also have a factory production-type RC throttle. It is encouraged that the plane outlines follow some type of Navy aircraft, and the paint scheme (color) must be of some traditional Navy type with Navy markings. No bonus points are awarded in the Profile Class, nor are national flight records awarded. **Bonus points for Class I and Class II** may be awarded to a scale model of a carrier aircraft of any nation, provided the model displays the national markings of the using nation. Previously, award of bonus points was limited to models of U. S. Navy carrier aircraft. **Navy Carrier Class I and Class II records** may be set only during the course of normal competition flying at an AA or larger contest.

Dive Bombing and Strafing

In the field layout, the distance from the barrier pole to the first balloon is increased from 10' to 15', and the distance between balloons is increased from 5' to 10'.

Other CB Actions

The 1968 Control Line Contest Board officially turned down proposals to add new classifications in speed events (expert, advanced and novice), to ban tuned exhaust systems, and to limit fuel tank size in the Scale Racing (Goodyear) event.

Once Over

March 1 and 2 are the dates set for the very popular Toledo RC Conference. This will be the 15th running of the event sponsored by the Weak Signals RC Club. In addition to prominent speakers on RC subjects, flying demonstrations (weather permitting), RC movies, trading post, and RC static competitions, the Conference practically has become a trade show for the RC industry. Additional details may be obtained from the Weak Signals RC Club, P. O. Box 5772, Sta. Wernert, Toledo, O. 43613.

Winners of other unofficial events held in conjunction with the '68 Nats not previously reported follow. They were sponsored and organized by the National Free Flight Society. Payload: Jon Davis (Jr.), Mike Richardson (Sr.), Harry Murphy (Open). Clipper Cargo: Bobby Hayes (Jr.), Howard Hill (Open). Coupe d'Hiver: Gerry Geraghty (Jr.), Bill Vanderbeek (Sr.), Carl Perkins (Open).

The U. S. team for the 1969 RC World Championship (Phil Kraft, Jim Kirkland, Jim Whitley) is fortunate in having as its manager John Patton, Frederick, Md. Patton, team selection program administrator, also a candidate for AMA president, attended the FAI RC Judge Course in 1968, providing him with first-hand knowledge of the importance placed on various aspects of maneuvers by international judges. Patton is in steady communication with team members.

The Free Flight Contest Board, Joe Boyle, chairman, ruled earlier in 1968 that a single flight (or set of flights) could result in national AMA records for more than one class if the model's specifications and the timing conditions met the rules for more than one class. This ruling is particularly applicable to indoor models, although it is equally applicable to outdoor models. For instance an FAI Stick class model might also comply with the rules for AMA Class B Stick; if so and if the flight was a very good one, one flight with such model might break both records. Responsibility for applying for multiple records rests with the flyer.

"I do hereby release Elmer Kirschenman and any of his agents or employees from any liability, from any and all claims, demands, actions, or cause of actions on account of death or injury sustained during the course of my use of his property known as Gardner Field, and hold him harmless for any action that may be brought at a subsequent date by any of my heirs, executors or administrators." This form is required to be signed and dated by entrants in contests at Taft sponsored by the Southern California Ignition Flyers. Bruce Chandler, club president, writes that "This keeps the field!"

Thanks are in order to Midwest Products Co. and to Sullivan Products. Midwest supplied special fuel and Sullivan provided fuel bulbs, both used in FAI-class events at the '68 Nats.

The Bristol (Connecticut) Model Airplane Club is going to conduct "work shops" during the winter months to instruct beginners. They will be working mainly with simple gliders, AMA Cub, etc., reports John Eldridge, club secretary.

Richard D. Mathis has accepted chairmanship of the 2nd Annual Symposium of the NFFS. This is planned to be held during the '69 Nats. By the way, the bound volume of papers from the 1st Annual Free

Flight Symposium, over 100 pages, is still available from AMA HQ. Price is \$3.50 to AMA members.

A three-man team to represent the U. S. in the international RC scale contest in 1969 will be selected by a committee rather than by competition. The RC scale contest is expected to be held in Germany in conjunction with the RC Aerobatic World Championship. The committee concept was approved by AMA President Cliff Weirick for a number of reasons but chief among them was insufficient time to organize a well-rounded competition selection program. A key factor in selecting the scale team will be the member's ability to go on his own, as the usual AMA transportation aid provided for World Championships will not be available; this event does not as yet have WC status. Scale Advisory Committee Chairman Bill Northrop (also RC Contest Board chairman) is heading the RC scale team selection committee.

With AMA support, the 12th Annual DCRC Symposium is planned for May 17-18, 1969 — again at the Applied Physics Lab of Johns Hopkins University, near Washington, D.C. The Technical Papers Committee is endeavoring to present a balanced program of RC-related topics on electronics, aerodynamics, servos, engines, new materials, etc.

Free flight engine runs and maximum flights for the National Contests should be reduced from the times prescribed in the AMA rule book if weather conditions warrant. This is the essence of the resolution passed by the National Free Flight Society Board of Directors during the '68 Nats. The AMA Free Flight Contest Board agreed and approved a similar proposal at its Nats meeting.

Snap One for Us

Do you want to know what other model builders are doing? They want to know what you are doing, too. That's one of the reasons we are asking readers of this section to submit photographs for possible publication. Don't let special requirements scare you, as there are none. However, black-and-white prints are desired—but these can be of drugstore print size and quality, so long as they are contrasty. No special camera is needed—some of the best pictures have come from Brownies!

As to picture content, all varieties are desired: pictures of modelers with models under construction, pictures of activities at flying sites, pictures of new model design or construction features, pictures of special construction tools and techniques, interesting views of everyday models with their builders, pictures of club activities, etc. Preferably they should be of happenings. And pictures of all kinds of subjects are wanted: control line, radio control, free flight gas, free flight rubber, indoor, gliders, scale, etc.

At present AMA has no budget for paying for use of these pictures, but full credit to the photographer is assured for all that are used. On the back of each photo submitted (or in an accompanying note) there should be listed the name and address of the photographer; the name, city and state of the person pictured; the name, city and state of the designer of the model pictured; data about the model pictured (engine, prop, RC gear, etc.); a description of the activity taking place, etc.

Address photo contributions to: Picture Editor, AMA HQ, 1239 Vermont Ave., N. W., Washington, D. C. 20005.

AMA News Extra

1968 AMA ELECTION RESULTS

John Patton, Frederick, Md., is the new president of AMA for 1969-70. He received the most votes (36% of those cast), with John Pond of San Francisco, Calif., second (31%), John Clemens of Dallas, Tex., third (26%), and Maurice Woods of Oklahoma City, Okla., fourth (7%). The election was conducted by mail with all ballots required to be postmarked no later than Nov. 15, 1968.

Five regional vice-presidents were also elected for 1969-70: Art Schroeder, Glen Ridge, N.J., District II (New York, New Jersey); Cliff Telford, Bethesda, Md., District IV (Delaware, Maryland, D.C., Virginia, North Carolina); Gosta Johnson, Chicago, Ill., District VI (Missouri, Illinois, Indiana, Kentucky); Bill Lank, Dallas, Tex., District VIII (New Mexico, Texas, Oklahoma, Arkansas, Louisiana); Vic Cunyngham, Sr., Baldwin Park, Calif. (Utah, California, Nevada, Arizona, Hawaii).

The tabulation of votes is as follows:

For President

	Patton	Pond	Clemens	Woods*
District I	126	64	35	1
District II	347	174	131	31
District III	303	106	88	28
District IV	327	39	40	4
District V	95	69	61	56
District VI	213	210	147	32
District VII	129	93	79	5
District VIII	46	50	369	84
District IX	40	73	34	29
District X	149	559	261	37
District XI	26	86	26	22
<u>Totals</u>	1801	1523	1271	329

* Write-in. 20 other miscellaneous Pres. write-in votes also recorded.

For Vice-Presidents

District II:
 Art Schroeder, Glen Ridge, N.J....410
 Bill Boss, Laurelton, N.Y.....258

District IV:
 Cliff Telford, Bethesda, Md.....249
 *D. Orr, Hampton, Va..... 44

District VI:
 Gosta Johnson, Chicago, Ill.....306
 Carl Fries, Crestwood, Mo.....189

District VIII:
 Bill Lank, Dallas, Tex.....288
 Ralph Tenny, Richardson, Tex.....189
 *Jerry Kleinburg, San Antonio, Tex.....65

District X:
 Vic Cunyngham, Baldwin Pk., Calif....577
 Ed Shipe, Livermore, Calif.....376

*Write-in. 14 other miscellaneous V.P. write-in votes also recorded.

A total of 4,944 votes were cast--19% of the AMA membership participated.

By special arrangement with the publisher this page is produced at the very last minute, just before the magazine is printed, to bring you the latest news concerning current Academy of Model Aeronautics events of national significance.

The Montezuma (Iowa) Junior Chamber of Commerce lent AMA a hand last October when it made a surprise presentation of AMA's Distinguished Service Award to Glen Sigafoose during one of its meetings. The award was for production of AMA Cub (and Delta Dart, AMA Racer) kits used in a special Nats promotion at a sacrifice to normal business activity. Shown making the presentation is Jaycee Chapter President Roger Watson, right. With Glen is his wife, Hazel.

Photo by The Montezuma Republican



'69 FF Rules Combine Indoor Sizes, Restrict Tuned Pipes

Major changes to AMA indoor rubber-powered model rules will come into effect Jan. 1, 1969. These new indoor rules, together with other new free flight rules which follow, were enacted by the 1968 Free Flight Contest Board (Joseph V. Boyle, Jr., chairman).

Indoor Rubber classes for 1969 have been established as follows:

- R.O.G. Stick — 30 sq. in. max. (no change)
- H.L. Paper Stick — 100 sq. in. max.
- H.L. Stick — 300 sq. in. max.
- R.O.G. Cabin — 150 sq. in. max.
- F.A.I. Indoor — no change
- Autogiro — no change
- Onihopter — no change
- Helicopter — no change

This means that grouping according to wing size within a class has been eliminated (no more Class A, B, C or D) and minimum size restrictions have been lifted; also, rise-off-water has been eliminated. (R.O.W. Cabin category eliminated; Class B R.O.G. Cabin eliminated as a separate size class, but still eligible for competition in Cabin class; B and C H.L. Stick eliminated as separate size classes, but eligible for competition in Stick class.)

This change is not expected to have any practical effect on competitions, which generally had combined classes anyway, but it will change the national record listing substantially; where a category had more than one size class, the initial 1969 record holder will be the one who had the highest 1968 flight record irrespective of size class.

Official flight definition for indoor rubber models has been changed so that an official flight is recorded each time a model is launched in the presence of a called timer. Even in the event of a mislaunch or minor mishap, the flight time from launch until

the model is caught or touches the floor is recorded as an official flight; however, should the contestant elect to relaunch without rewinding, a new official flight may be started — with the original start being recorded as an "attempt." (Previous 60-sec. and obstruction rules for unofficial flights have been eliminated.) Six "attempts" are allowed to make three official flights.

Free Flight Gas

Effective in 1969, use of a tuned pipe is prohibited for an engine of an AMA category free flight gas model. Use of the tuned pipe exhaust may be continued with FAI rule category models, such as FAI Power.

FAI Category Models

Applicable to Wakefield Rubber, Nordic Glider and FAI Power models, the Contest Board has ruled that Contest Directors of such events flown under AMA sanction may, for competitions only, limit the number of official flights to five or to three. The CB indicates that the FAI rules pertaining to two attempts per flight should be maintained as should all the other FAI rules governing the model and its flight. National AMA records for FAI rule category models are maintained only on the official 7-flight basis.

Executive Council Late-year Actions

Doing business by mail following the annual meetings at the National Championships last August the 1968 AMA Executive Council made the following policy decisions:

1. Approval of special half-price magazine subscription rate for Junior or Senior members.
2. Approval of installment payment for Life member contributions.
3. Approval of team manager appointment principle, giving first consideration to team selection program administrator.

4. Approval of special \$6 adult member dues for family and magazine subscriber situations.

The first item made official the offering of magazines to youngsters at AMA's cost. The second approved the acceptance of a Life member contribution (\$1,000) over a two year period, permitting a more favorable tax situation to encourage such contributions. The third made official a principle which has been in practice in recent years, favoring the appointment of team program administrators as team managers — this backed up Council decisions of earlier years which established that the manager choice was more than a matter of team member preference, with many special requirements indicating that flying ability is a minor factor.

The fourth item provides relief for special membership situations, so that current magazine subscribers do not have to pay full dues and neither do second or third adults in a family which already has one Open member getting the magazine.

Simple Safety — Good PR

The simplest things, sometimes overlooked, frequently can be very effective — and in more ways than one. Consider the relative locations of RC pit and flight areas, for instance.

Following a discussion of flying field safety and the need for it in the *Log Book*, publication of the AMA Chartered Cedar Rapids (Iowa) Skyhawks, John Middleton, club president, said:

"Our main problem this year will be in educating the spectators without causing ill will. Naturally, they want to get close to see what we are doing and how the planes operate. Well, Jack Finn suggested one very good way to control the bystanders, to give them a closer "look-see" and, in addition, obtain an added bonus of protection for our own skins. It is very simple . . . just locate the pit area next to the fence on the south end of the flying site.

"Only the flyers with their starting cells, squirt bottle primers and transmitters would be on the strip. All of the rest of the gear, and those waiting their turn to fly, would be in the pit area. Frequency flag posting would also be there to remind those readying their systems of the active frequencies. The contact with the public from that vantage point would be ideal. Those not flying can be the ambassadors of the club by explaining what the flyer is attempting to do . . . while he is doing it . . . without disrupting his concentration.

What could be more simple . . . and more safe?"

CONTEST CALENDAR

Official Sanctioned Contests of the Academy of Model Aeronautics

Dec. 14-15 — Tulsa, Okla. TGD Outdoor FF Record Trials. Site: TGD Field. B. Hanford CD, 3838 S. 88th E. Ave., Tulsa, Okla. 74145. Sponsor: Tulsa Glue Dobbers, Inc.

Dec. 28-30 — Sebring, Fla. (AAA) 15th King Orange Internationals for FF & CL. Site: Air Terminal. S. Slater CD, 42 Magnolia, Sebring, Fla. 33870.

Dec. 29 — Phoenix, Ariz. (A) Year End Special for CL. Site: West Plaza. N. Lemak CD, 3810 W. Golden Lane, Phoenix, Ariz. 85021. Sponsor: Air-Zona MAC.

Dec. 29 — Fresno, Calif. (A) Fresno Monthly FF Meet. Site: Near Kerman. F. Gallo CD, 1725 Kenmore Dr. W., Fresno, Calif. 93702. Sponsor: Fresno Gas Model Club.

Dec. 29-31 — RCACF Field, Fla. (AA) Tangerine International RC Championships. W. Schoonard CD, 2080 Sharon Rd., Winter Park, Fla. 32789. Sponsor: Remote Control Assoc. of Central Florida.

No applications for sanctioned contests in January had been received at press time.

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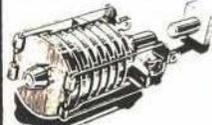


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JET PROPULSION ENGINES

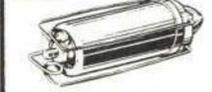
Model Power for Aircraft, Helicopters, Racing Cars, Speed Boats,



SCORPION 600 \$4.00. For contest models. Engine thrust 4 ozs. Duration 7-9 secs. Wgt. 1-9/16 ozs. Lgt. 2 1/4", Dia. 1 1/4"



PAY-LOADER 150 \$2.00. Engine thrust 1 3/4-2 ozs. Duration 7 secs. Wgt. 15/16 oz. Lgt. 3-1/16", Dia. 7/8"



ROCKET HT 50 \$1.50. For space ships and missiles. Engine thrust 4 ozs. Duration 4-5 secs. Wgt. 3/8 oz. Lgt. 1 3/4", Dia. 7/8"



HELL-CAT 100 \$1.00. Engine thrust 3/4 - 7/8 oz. Duration 14 secs. Wgt. 5/16 oz. Lgt. 1 7/8", Dia. 3/4"

ENGINE AUGMENTER TUBES to increase engine thrust:

No. 50 @ 70c
No. 150-600 @ \$1.50.

JETEX FUEL PELLETS
50-10 @ 60c, 50-20 @ \$1.00,
50-20 HT @ \$1.50, 150-10 @ \$1.00,
150-20 @ \$1.50, 600-10 @ \$2.00



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WINGSPAN 54", 49 to .61 ENGINES



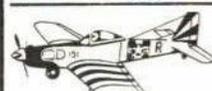
FA200 AERO SUBARU \$54.95
WINGSPAN 54", 49 to .61 ENGINES



CHIPMUNK Single Wing \$64.95
WINGSPAN 62", 49 to .61 ENGINES



WWI SOPWITH CAMEL \$54.95
WINGSPAN 54", 49 to .61 ENGINES



R/C MUSTANG KIT \$34.95
Span 55", Lgt. 43", Eng. 45 & up
Almost ready-to-fly, this kit is a cinch to assemble. One of the most rugged R/C models you can buy.



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Complete with Fittings Set



AMBRO QUICK FLY II MODEL PLANE KIT \$49.95
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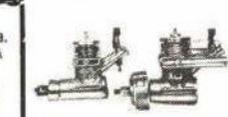
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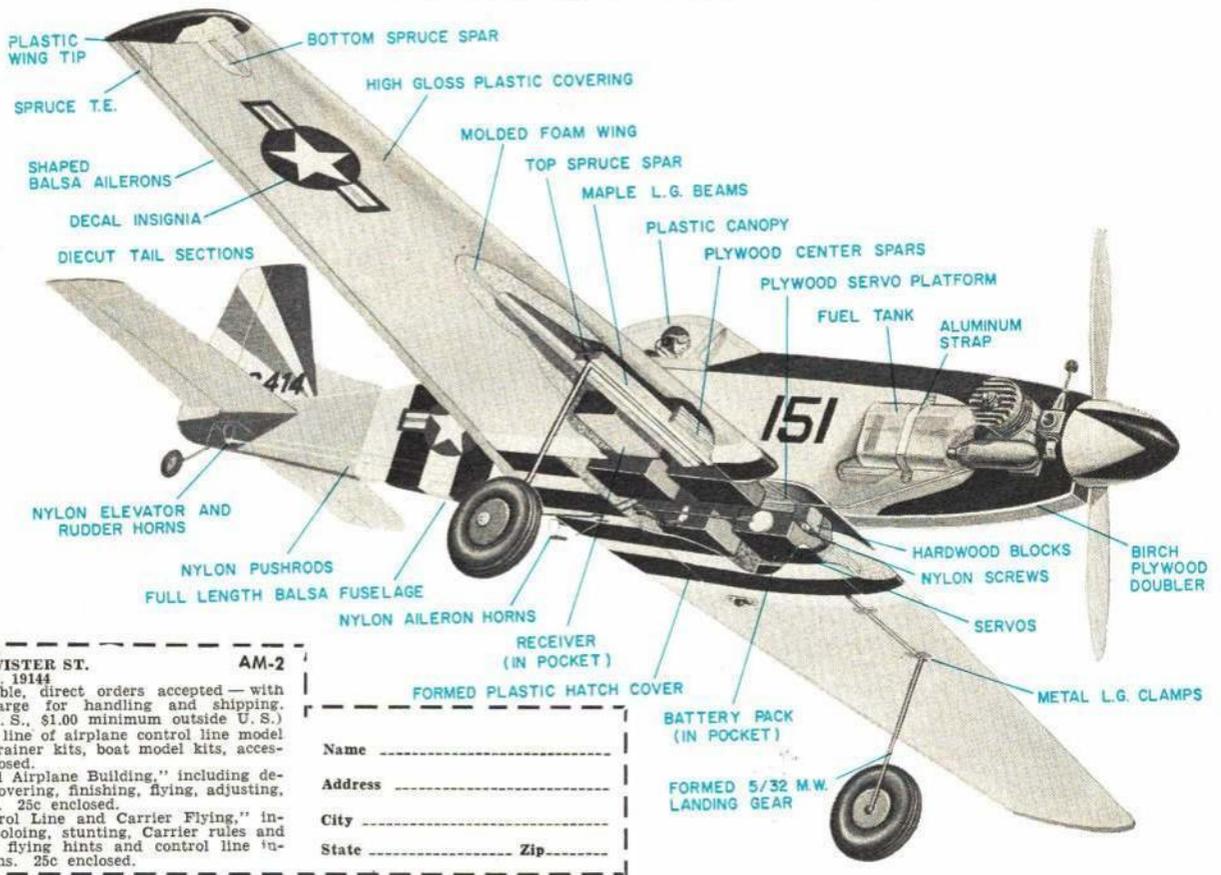
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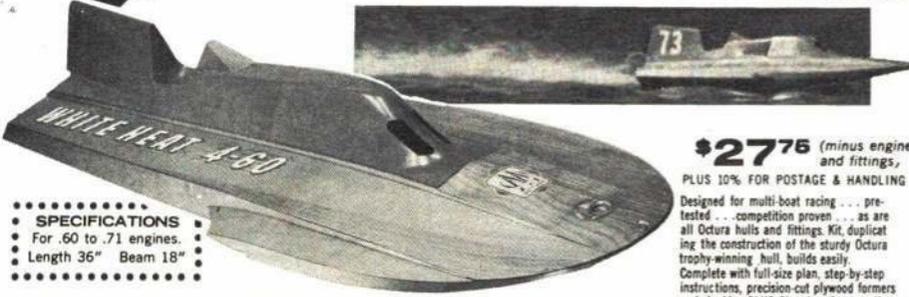
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R/C Nobler

Continued from page 19
 this assembly over the top view of the fuselage on a very flat table and make sure the fuselage sides are perpendicular. Your fuselage will be perfectly aligned when the epoxy hardens. You can also check the alignment further by touching the tails of the sides together and seeing that nothing is distorted compared to the top view. However, let the epoxy set with the tail apart.

With the two basic stages complete and all the epoxy hard, glue in place the rear plywood bulkhead and balsa bulkheads, and finally glue the tails together. Check the final alignment over the top view on the plans, then glue on the bottom 3/8" sheet and top 1/4 sq. stringer.

Trim the nose bottom block to fit in place and also cut out a small section behind the firewall to allow for the nose wheel strut and spring coil. Epoxy the block in place using many rubber bands to hold it firmly to the fuselage and the sides. Fill in the joint between the bottom block and the engine compartment sides with tapering scraps of 3/8 balsa. Make them fit the cut-outs for the spring coil and taper to almost flush with the doublers at the extreme nose. They should also extend slightly below the doublers to provide smooth nose shaping. Deck the top rear fuselage with 1/8 soft sheet balsa. Wetting the exterior side of the sheet will help in bending the balsa to fit the curvature. Epoxy in place the plywood rudder platform.

Make up the hatch with 1/2 balsa. Temporarily cement this in place snugly between the nose block and the rear plywood bulkhead.

With the spinner mounted on the engine shaft, start carving the nose to fit the con-

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tours and roundness of the spinner. Carve the hatch to the same roundness as much as possible. The bottom of the fuselage will require some special attention in shaping because you will be shaping plywood and balsa simultaneously. The goal is to achieve smoothness and roundness from the nose to the tail. Keep in mind that this is the only stage of model building in which weight is reduced as looks are created.

Note how the bottom block is cut out and a piece of plywood is located to mount the main landing gear. Also, locate and glue in the top main landing gear plywood plate inside the fuselage. When mounts are dry, drill and attach the gear with long steel bolts through the plywood-balsa-plywood sandwich into blind nuts in the top plate. Install the nose gear and the fuselage will sit on its legs.

Cut out the rudder, sand it to airfoil shape, and cut the hinge line. Round both surfaces of the hinge line and install the nylon mechanical hinges temporarily. Firmly glue the rudder in place and also the fillets on each side. When dry, contour the fillets into the fuselage shape.

Now it is necessary to have completed wing and stabilizer. Other than the few small modifications from the control-line parts, the wing and stabilizer are built as in the Nobler kit. The few changes can be seen and applied by referring to the plans for the R/C Nobler. Go ahead with all hinging and control horn installation temporarily.

With the ailerons and flaps removed, slide the wing onto the fuselage. Doing so takes patience and some extra trimming of the wing slot. Also slide the stabilizer in place. Do not glue the wing or stabilizer in place until much later. This is done after the fuselage is covered, painted, and trimmed. Likewise, the wing and stabilizer are cov-



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ered, painted, and trimmed before installation.

With the model temporarily assembled, work out your control system installation. The aileron servo goes in the wing, of course. The battery pack can go about anywhere. There are three available places. One, on the tank compartment hatch; two, behind the aileron servo in the wing (flat packs mounted with double-sided servo tape go here conveniently); and three, below the wing behind the main landing gear location. The last location will require access with a hatch on the bottom.

All servos are installed with double-sided tape. Make and install the pushrod systems. Have all functions working properly before proceeding. All of the medium size R/C sets will fit in the Nobler.

Disassemble everything. Take out the R/C gear and pushrods. Remove the landing gears and engine. Slide out the wing and stabilizer. Remove the tank compartment hatch. To thoroughly fuel-proof the nose of the plane, paint the interior of the engine and tank compartments with epoxy glue. Vigorously sand the entire model. Install the rear of the top hatch. This extends above the rear deck of the fuselage and mates to the canopy. Go ahead with cockpit details now, if you choose to have them.

To finish the R/C Nobler is quite easy, as the wing, stabilizer, and fuselage are all done separately. All parts will require covering. We used Super MonoKote on the wings and stabilizer on my Noblers, with Coverite on the fuselage and rudder. This combination produces a strong and lightweight finish. Finishing the Coverite to a glossy painted surface is quite easy. After covering, spray on one or two coats of auto primer for lacquer paints. Do not sand these coats; they are for adhesion only of the filler and finishing paints to come. Now spray Hobbyepoxy filler (three coats), sanding between each coat — this is when elbow grease counts. Use lots of fresh sandpaper and work until you have a smooth glazed surface. It will take about five coats of color dope to get a perfect finish. Let dope dry between each coat, the last coat for about three days. Do the trim painting and then get out the auto compound. Hand-rub the finish until it is as glossy and smooth as a mirror. Put on your decals and glue the canopy in place.

The wing has been covered and also finished to perfection. Slide it in place and glue it firmly with lots of epoxy. Also epoxy the stabilizer in place. You must check the many alignments of the wing and stabilizer before the glue dries or hardens. Install the hinges with epoxy and hook up the control surfaces. Be sure to tape or MonoKote over the hinge-line gap at all control surfaces. Put in the landing gear and install the motor. Repeat your already-worked-out radio control system installation and check it out. With the plane ready to fly, less fuel in the tank, balance the model.

There is one possible chuck-hole to look out for. When you set up the control surfaces before initial flights, do not let the wing's airfoil shape mislead you by optical illusions! Measure the flap movement +3/4". Now arrange the elevator movement (+3/4") and neutral by hooking to the flap horn and elevator horn in appropriate holes. Ailerons should move only slightly farther than the flaps. Set up their neutral to agree with the flaps' position. Rudder set-up is easy — get all the movement you can both ways.

If you are ready for the first flight too, you will not have any difficulty with the R/C Nobler. But, it is different, and bet-

ter, than any plane you have flown before. Here are a few hints to look for and allow for on those first flights. First, allow a slight amount of up-trim at the transmitter trim lever. This will maintain level flight without back pressure on the stick; remember, the plane has no built-in incidence. Shortly after takeoff and climb, throttle back—please. Now trim the ailerons, if necessary, and fly the plane around to get used to it.

The plane does not need all the power of the 40 for fun flying, and you do not need such power on the first flight. Before beginning your first landing, practice and study the model's behavior at slow flight with plenty of altitude. You will notice that a definite stall will develop. The model will drop its nose straight ahead and you will always have aileron control to lift a wing. To make that first landing, give some additional up-trim on the transmitter and throttle back. The model will settle in nose level, slow, and very steady. Just steer it to your landing spot and flare only very slightly. You are down safe and easy.

You will find that with experience, landings in still air at less than 20 mph are easy. This plane never drops a wing in landing configuration, because of the wash-out effect of the wing tips with the downward deflection of the flaps. Spot landing is too easy; you just fly to the spot with the plane level and stable, none of that nose-high wobbling around.

The R/C Nobler will probably be kitted by Top Flite Models, Inc. To build the R/C Nobler right away, author suggests working from a control-line Nobler kit.

Fighter-Pilot Jamboree

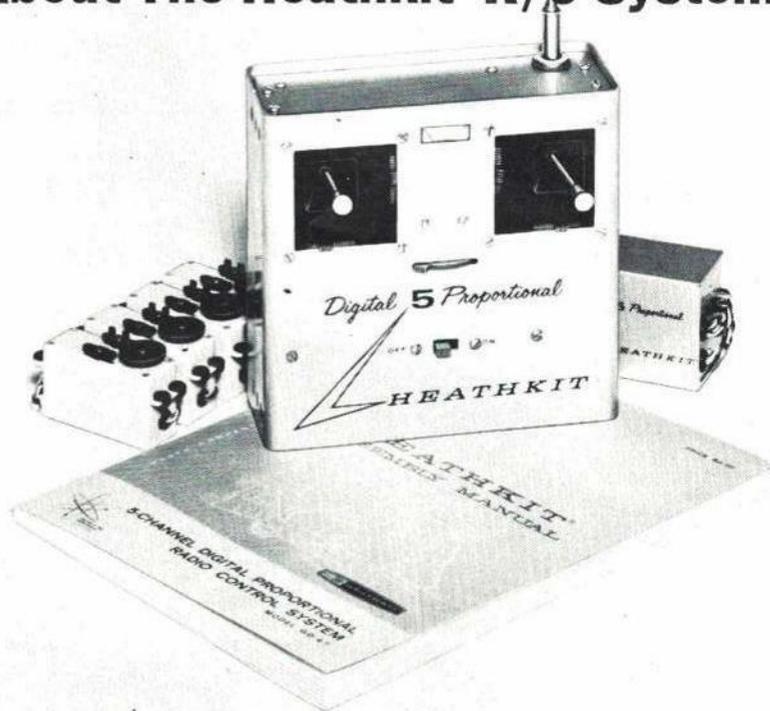
Continued from page 33

flying a Fokker Eindecker at the time. Courtney brought forth some "new" information relative to the development of synchronized machine guns. Readers of American Aircraft Modeler may have seen the several Letters to the Editor regarding this.

It has long been accepted that the first aircraft to feature a machine gun which fired through the propeller arc was a Morane-Saulnier flown by Roland Garros. This machine is known to have fallen into German hands, and was turned over to Anthony Fokker, who, in the brief span of 48 hours, returned with a completely developed mechanical gun synchronizer system to be fitted to Fokker aircraft. Now it seems that this much-publicized bit of history lacked one important detail: According to Courtney, the Morane monoplane which was captured by the Germans was, in fact, equipped with a quite sophisticated machine gun synchronizer which had been disconnected. The metal propeller wedges had been fitted merely as a back-up safety precaution to protect the prop in the event of synchronizer malfunction. Thus, this inert but operational device, which had been developed by Morane-Saulnier well in advance of Garro's unfortunate mishap, was available for the taking. The shrewd opportunist Tony Fokker had only to "lift" the design, and transfer it to his monoplane, which by no coincidence was itself virtually a copy of a pre-war Morane-Saulnier design! It is interesting to note that the Fokkers were called German Moranes by the RFC pilots until they became aware of the true identity of these aircraft.

After WW I, Courtney became a test pilot, and flew a great variety of aircraft, including some of Cierva's early autogiros. Later he came to the U.S. and worked for various aviation firms. Most recently he

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American Aircraft Modeler, July '68: "Builders of this equipment will end up with top grade apparatus at a considerable price saving; even more important to our mind — they will gain considerable knowledge of the workings, so much so that they will be able to cure many troubles themselves, thus saving time and money."

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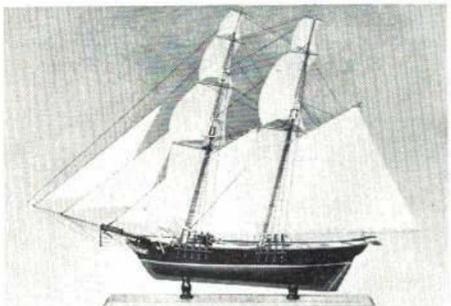
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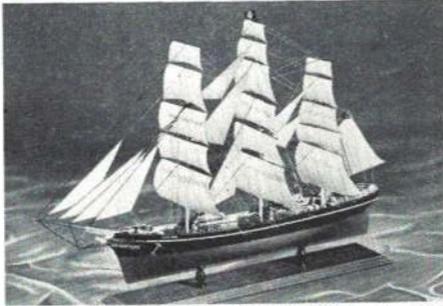
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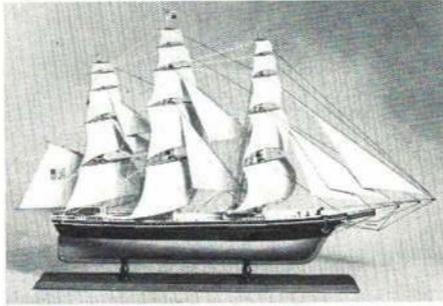
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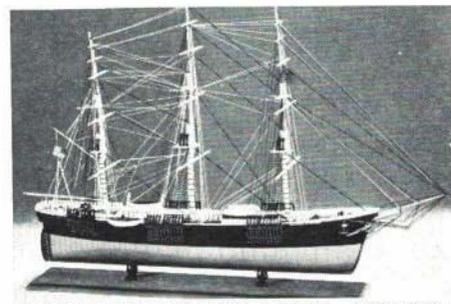
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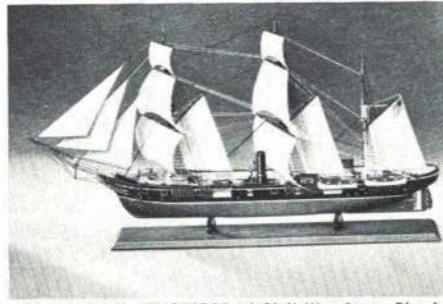
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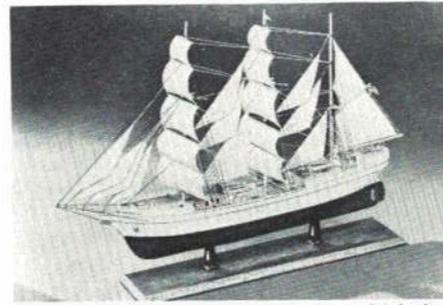
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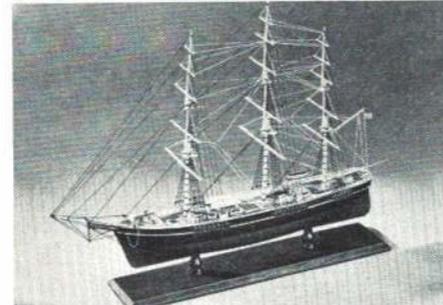
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participated in the development of the Atlas missile and associated hardware.

The next speaker was Vance Breese, who is one of the most experienced test pilots in the world. Breese learned to fly at the age of 13, in the year 1916. He was forced to wait until the conclusion of WW I before beginning his active aviation career, which includes air-mail flying, barnstorming, aircraft manufacturing and consulting, as well as test flying. Breese is probably best known for his testing of WW II fighters, including the P-51 Mustang, Bell P-39 Airacobra, and Lockheed P-38 Lightning.

Breese was hired by Lockheed to analyze problems encountered in their P-38 shortly before WW II. An indication of his value as a test pilot may be garnered from the size of the fee which he was paid: \$300 per hour, plus \$50,000 upon successful completion of the tests! And this was back in 1941! Of extreme interest to flying model builders was the fact that one of the main changes required to correct the P-38's instability problem was a 2-degree resetting of the stabilizer incidence.

Among other interesting airplanes tested by Vance Breese were the Brewster XFA-1, XFA-2, Vought F4U, Seversky P-35, Good-year FG-1, and the Bell P-63. Breese still serves the aviation industry as a consultant.

Following a break for lunch, the symposium was resumed with a panel discussion, presented by The American Fighter Pilots Assoc. This was moderated by Col. Walker M. Mahu'ra, USAFR, and the panelists included Adm. John S. Thatch, USN (Retired); Maj. Gen. Marion E. Carl, USMC; Judge Charles N. Older; Col. Robert L. Baseler, USAF (Retired); and James L. H. Peck.

The afternoon presentation consisted of Fighter Airplane Technology, 1939-1946, delivered by Dr. Ernest N. Sechler, for the AIAA. Dr. Sechler is professor of Aeronautics and Executive Officer of the Graduate Aeronautical Laboratories, California Institute of Technology, at Pasadena.

Final speech was by LCDR. Daniel G. Macintyre, USNR, who spoke on the subject The Evolution of the Modern Fighter Airplane. Macintyre is a veteran of 208 missions in the Southwest Asia combat area, and his flying experience includes flights in such diverse aircraft as the P-51, F9F, FJ-3, F-11, and the current F4B and F4J. He was project officer for the F-111B, and now serves as a consultant to the North American Rockwell Corp.

Model Rocketeer

Continued from page 35

1) One to two weeks in advance of an event, if your section has no public relations officer, simply type the five W's on a sheet of paper: what, when, where, who and why (or how), with enough space to type the information answers to each. Add your name, address, telephone number, and position for the editor or station manager. He will use it as space and time allows.

2) The same day (or next), do the same with the results of the event, providing full names, addresses, parents, guests and civic officials present.

NAR-CIVIL AIR PATROL PROJECT

For sometime (several years), the national headquarters of CAP has been genuinely interested in the application of model rocketry into its aerospace education program for male and female cadets aged 13-18. During the mid 1960's through 1966, contact was continued until CAP drafted a manual outlining a complete program incorporating the NAR Sporting Code.

On Nov. 1, 1967, Mr. G. Harry Stine, NAR's

Liaison Committee chairman, appointed USAF Sgt. Larry Loos, NAR #7127, to work directly with CAP on the project. Larry, a member of CAP for 13 years whose experience was mostly cadet training, etc., had just returned from his post as NAR District Director for U. S. Forces, Europe.

During 1968 he conducted an intensive study into every feasibility of making the program work in local communities. Test workshops, launches and activities were held through the cooperation of Colorado Wing CAP Hq., the Colorado Springs CAP Composite Squadron, Estes Industries, Flight Systems, Inc., and several persons who also were NAR-CAP members.

Larry reported at year's end that he will recommend to CAP that: 1) Cadets who qualify should enter a basic, intermediate or advanced MR class meeting separate from CAP; 2) competition be held through NAR and that CAP unit teams which earn points on the same basis as NAR members, select their best cadets to join NAR and compete in NARAM events.

SECTION CALENDAR OF EVENTS — 1969

March—4th Annual Pittsburgh Spring Convention.

April 12-13 ECRM-3 meet (in Washington, Maryland, Virginia areas—contact Dick Sipes, 5427 85th Ave.—Apt. 101, Lanham, Md. 20801).

May 25 — MAYHAM-1 area (MARS).

June 14-15 WAMARVA-1 meet (contact Dick Sipes).

Flying sessions for the Space Pioneers are: March 30, April 13 & 27, May 11 & 25, June 8 & 22, July 13 & 27, and August 10. Range located at Waveny Park on Lapham Rd., New Canaan, Conn.

Getting Started in R/C

Continued from page 36

ways to operate two, even three escapements from a single channel (this is a single tone, remember), and somewhat similar systems are still available today. The escapements are triggered by sending the proper sequence of tone pulses, and in some cases the pulse timing is most important. Such systems today generally use motor-driven servos, which are more powerful, often more compact, and eliminate the troublesome rubber bands. And the makers of such servos call them "single-channel servos"—we just can't seem to get away from this term!

The simpler pulse proportional systems can also allow two or three controls on a single channel—signifying a single tone, remember. We can have proportional rudder and elevator, plus trimmable throttle from such systems. All this can be handled by a single servo—it's what we term Galloping Ghost. And it is done by varying the length and rapidity with which we send the pulses of that one tone (throttle movement is usually worked by short periods of no tone at all, or a steady unpulsed tone). Utilizing the same pulse sequences, but with separate servos in the model, we have a more complex but much more versatile proportional system—though many still consider it to be single channel. We'd much rather think of it as "three-control, single tone, pulse proportional," but that's too unwieldy a designation. And anyhow, it's doubtful if the beat-up old term, channel, is going to be suddenly dropped, after so many years of constant use!

Now going back to that reader from whom we quoted, the term "multi" came into use to designate any system that couldn't be considered single channel. The latter utilized only one tone, so multi systems were considered to be any that used more than one. In older days, this virtually

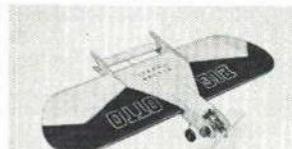
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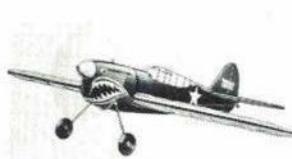
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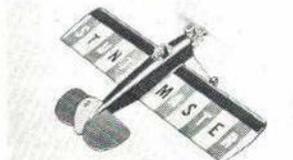
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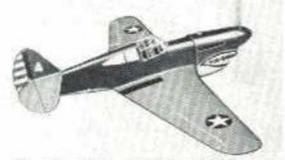
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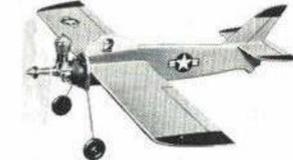
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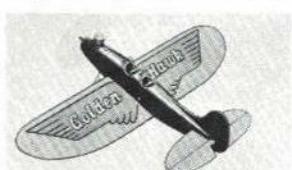
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Kit 74 MESSERSCHMITT ME-109, 18" Carved body, shpd wing \$3.95



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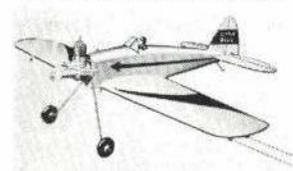
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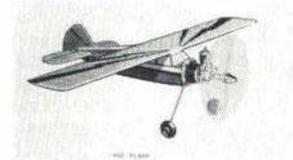
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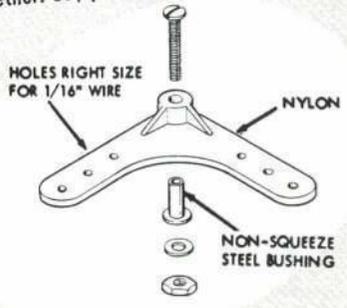
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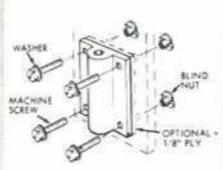


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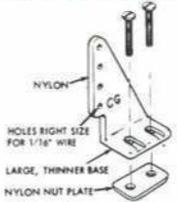
One-piece Nosegear Bearing mounts easily to firewall without alignment problems. If extra steering angle is desired, use 1/8" ply stand-off. Includes blind nuts, screws, etc.60¢

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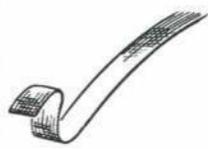
Steerable nose gear with shock absorbing steering arm, molded one-piece nylon bearing. Includes blind nuts, screws, etc.\$1.95

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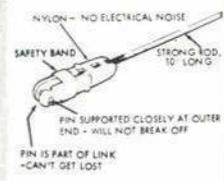
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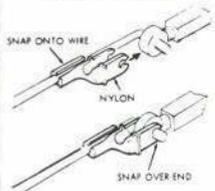
Extremely tough. When applied with heavy coats of cement, it approaches fiberglass. Excellent hinge material. 3/4" wide x 5 ft.25¢

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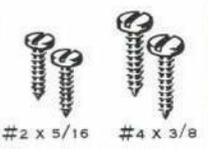
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always meant multi reed systems, but a few early propo systems that required two or more tones were also considered multi.

Let's close the session this month with the thought that model control systems should be thought of — and hopefully designated — by the number of controls they will handle in a model. Single control is generally just rudder only. Two-control could be rudder and throttle, or rudder and ailerons. To our way of thinking, such a designation system clears up much of the ambiguity that has arisen from that much-outmoded, old term — channel.

The Dingus

Continued from page 28

up elevator. As she rotates the nose up and starts falling, start opening the throttle, adjusting the power to drop into low-speed attitude on the downwind quarter. It is a very spectacular maneuver which will dazzle the spectators or jar the timers. You can put the Dingus into slow flight during the eighth lap off the deck, even before the timers read and clear their watches.

One last warning: While flying slow speed, don't make any jerky changes of throttle settings or she'll develop a lateral oscillation. When you get this herky-jerky started, your only chance is to go back into high speed and try again. You'll pretty soon find out what you can and cannot get by with. The simplest way to put her lightly on the deck is to make your approach at 30 mph, chop the throttle about 10 feet off the stern and pump in some up elevator just as you cross the ramp. She'll settle on 3 points without any fuss. If you should ever get tired of flying her, you'll have to cremate the remains. Dingus' are durable.

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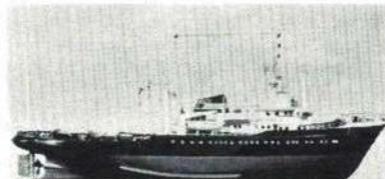
Billing Boats

DENMARK'S FINEST MODELS

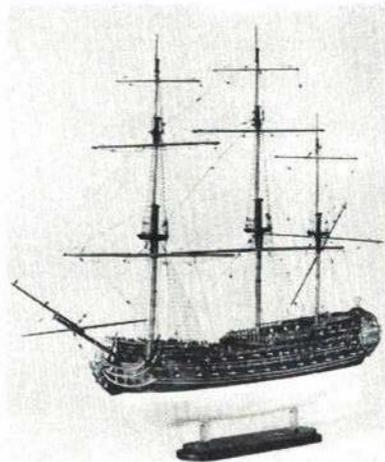
Planked Hull Construction • Hardwoods
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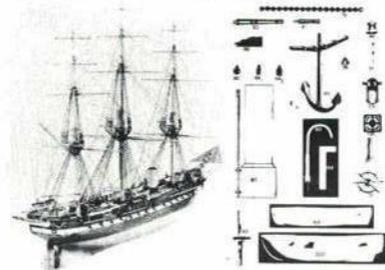
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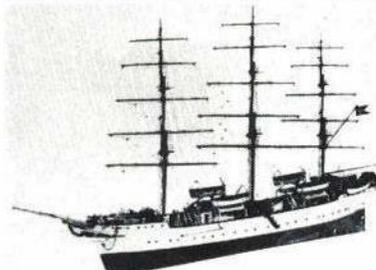
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The Red Baron

Continued from page 25

When Lothar was wounded after being shot down, he sat by his side. He tried to comfort his mother's worry. He wrote home to her faithfully all during the war. From those letters historians have gleaned the portrait of a devoted son and brother.

On occasions, his fellow pilots were critical of his drive to be the top Ace, and his noticeable disdain to relinquish that title. They openly chastized him when, during battle, he fired from right on top of his opponent's rudder. "You might have crashed into him, Rittmeister (Captain), they cautioned. "We were worried!" He replied, "Yes, I know."

His charmed life was not to last forever. Though his skills had risen, so had the odds. On July 6, 1917 with more than 56 planes to his credit, the Baron was shot down. He had a deep scalp wound that removed a good portion of bone from his head. He blacked out. His Albatros D-V plunged to

500 feet before he regained consciousness. He managed to land, staggered from his cockpit, and fell. Miraculously, he recovered in a German hospital. He recuperated with his proud father and worried mother back home. But he was never the same.

He fell victim to a commonly shared superstition about personal photos taken before a battle. He reacted each time a new victim went down in flames. He remarked openly to his men how they had burned curiously. Yet his score went on. By early April of 1918 he recorded his 80th victory.

On the morning of 21 April, Baron von Richthofen who found it difficult to smile about war or relax his strict bearing as a military leader, leaned over and petted his dog next to his plane. Against his wish his photo was taken. It was taken once more as he roared down the field with his squadron to patrol the Front lines. It was the last photo taken of him alive.

At 7000 feet over the Somme Valley, Richthofen left his pack. He saw Lt. May dive for the safety of his lines. May had been

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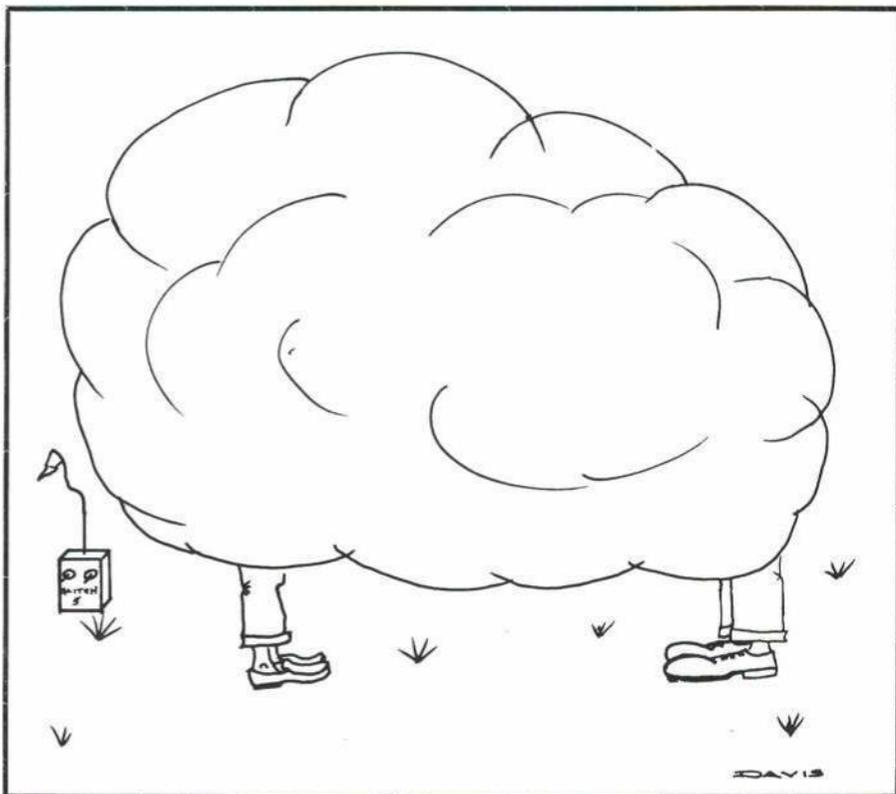
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told only to observe any combat, by his friend and leader of the Sopwith Camel squadron, Captain A. R. Brown. In the midst of a dog fight Lt. May was unable to resist. He tangled with the triplane Fokkers. When his guns had jammed he made for home. Richthofen closed in from overhead to pull in the stray. Lt. May would have been his 81st victim.

Captain Brown saw his friend in trouble. With his throttle fire-walled he dove in hot pursuit. As the three roared down over the bombed out village of Sully-le-Sac, Brown's Camel crept up on Richthofen from behind at four o'clock high. He turned toward the all-red Fokker and raked it with a short burst. He then fell behind by something near to a thousand yards away. In desperate evasive action, Lt. May attempted to shake his pursuer. "Had I known it was Richthofen, I'd have fainted dead away," he later exclaimed.

May felt the bullets from the triplane guns whiz close by to his head and as they whined their way through his wings. As they neared Vaux along the river, Brown fired again. It was from about 1000 yards.

Ground troops watched, fascinated, as the three planes raced past, even with the ridge of hills along the curve of the river Somme. Their height was about 100 feet. For a brief moment the front two separated to allow machine gunner nests to fire. These Australian gunners had claimed other low-flying Germans under similar conditions. It was a broadside barrage. Immediately, chips of Richthofen's aircraft were seen to explode from the front of the machine. The men on the ground watched the plane abruptly lurch into a climb. It turned, banked, dropped its right wing, appeared to come to side-slip, make a three-eighths turn toward the German lines, glide a bit and then crash into the ground.

Men ran out from the trenches and tied a line to the plane. They pulled it away from the hail of German machine gun fire and removed Richthofen's body. He had been dead when they first snuck up to his plane. They saw the blood flowing out of his mouth and his hand held rigid on the stick.

For 50 years now, a controversy has raged. Who gets credit for bringing the Red Baron down? Pilots lay the credit to Brown. Romanticists who find it repulsive to believe a pilot like Richthofen could be felled from fire that came from the ground have supported this theory. Capt. Brown was never certain himself in 1918. It was only later that he felt he had achieved this most important and significant victory. Doctors on the ground failed to perform an autopsy. They did examine the entry and exit of the wound.

The Red Baron's body was buried behind British lines in full military pomp and ceremony. Years later his body was transferred to German soil.

No man who ever flew in "the great war" prompted so many books, articles or legends as the Red Baron brought about. Each one of us have humbly attempted to depict those last brief years of his young life. His color as a pilot has lived on, beyond a greater war which saw his previous record of 80 planes give way to nearly three times that score. His fame was never surpassed.

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Somewhere, high up beyond the sun, the Red Baron will eternally fly the lead. Each pilot who flew in those awful bloody struggles would proudly fly on his wing!

Observations of Richthofen's death: when it occurred; why; maximum time prior to crash in which he could have been shot are based upon latest evaluations made by Dr. Richard Rubinson, head of cardiovascular department at Yale-New Haven Hospital and Dr. Don Powell, in charge of the heart clinic at Yale. Comments by the author, on his research with these men, follow. The Editor

While I re-read a number of excellent reference texts in order to write the Red Baron Story for American Aircraft Modeler, each one left history with the question, "Who shot down Richthofen?"

Though regrets were often expressed that no autopsy was made to determine irrevocable evidence from medical factors, it was openly apparent no one had ever delved into this intrigue from the viewpoint of clinical analysis since 1918 to this present day. If it did occur, it was never explored in writings, or exposed.

I decided to visit the heart clinic at Yale-New Haven Hospital to see if we could determine from the evidence Yale-New Haven's ability to pinpoint when Richthofen may have died—in the air

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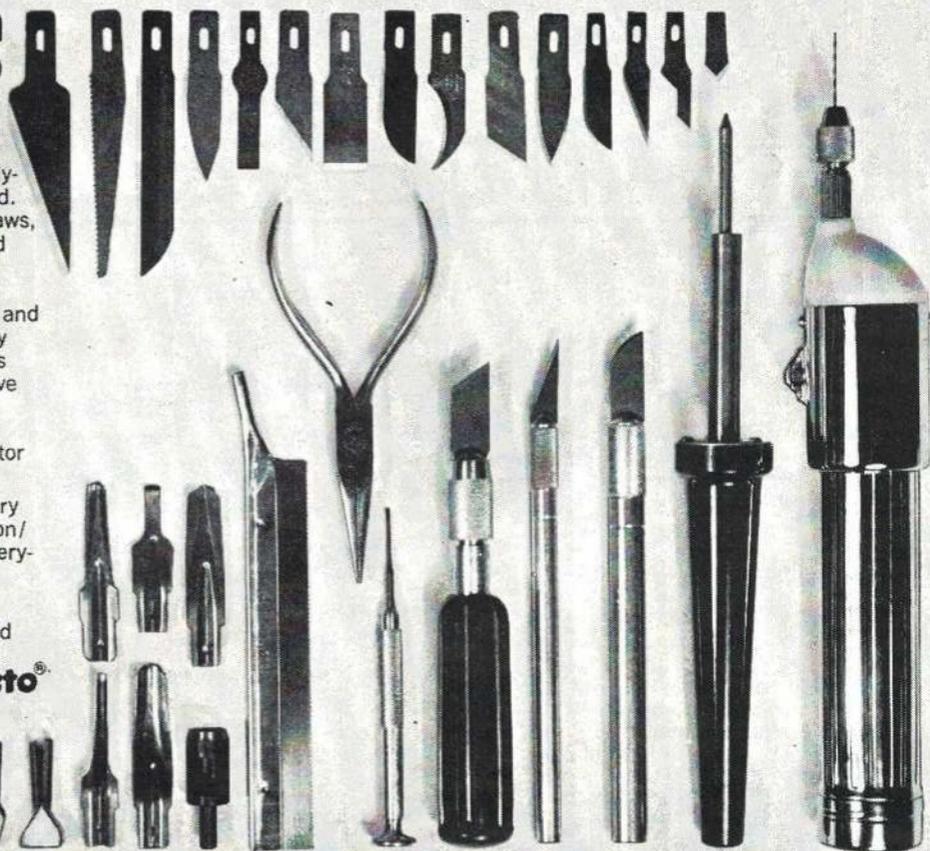
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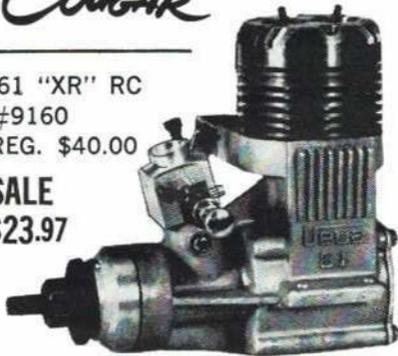
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or on the ground. Nowarra & Brown's book of 1958 had mentioned how the aircraft lurched upward and fell off into a bank, side-slipped a bit, made a three-eighths turn toward the German lines, and crashed just past Vaux. My question was, "Did he lurch at that moment because he had gone the limit of his endurance with a bullet wound in his chest, or was this the evidence of time of bullet impact?"

Some of their replies open up new avenues of thought which would seem to prove both logical and significant.

— Wm. J. O. O'Dwyer

Q. (To Dr. Don Powell) "Would anyone, no matter how intensely pre-occupied with concentrated effort, be able to absorb a hit from a .30-caliber machine-gun bullet and continue his or her former pursuits without showing it had created a violent nervous reaction? A severe trauma of the body's nervous system? Or not notice he or she had been hit?"

Ans. No one could get hit in the chest cavity and continue without noticeable difficulty immediately upon time of impact. There would be violent reaction to such a wound. No individual's concentration could eliminate, psychologically, the fact they were physically, mortally, wounded.

Elapsed time from moment of hit to total unconsciousness would appear to be no more than two or max three minutes. Only a small portion of that time would allow a continuation of the individual's pre-hit actions. Even so, there would be a severe noticeable moment of reaction.

Dr. Powell then referred me to Dr. Richard Rubinson on the fifth floor who heads the Cardio-vascular Department

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for New Haven's Yale-New Haven Hospital. Dr. Powell's opinion was that Richthofen was hit almost immediately prior to his crash at Vaux, allowing only the time to make the lurch, the plunge and the crash. He feels he was dead prior to striking the ground, and if not clinically dead, totally unconscious, as the brain would live on for three minutes.

Q. (To Dr. Richard Rubinson). Now that you have been told of the evidence as stated in Nowarra and Brown's book and as contained in the book written by Floyd Gibbons, would you describe what would have gone on inside Richthofen's body — whether the bullet hit his heart, nicked it, or missed and ricocheted off his spine, the three suppositions offered?

Ans. If the bullet passed through his chest cavity from right to left as stated, there can be no doubt whatsoever that the bullet punctured both lungs. This would instantly cause severe internal bleeding even if it missed the aorta or the heart. The lungs would become flooded with blood and it would rise through his trachia to his mouth, thereby drowning him in his own blood. The fact blood was seen trickling out the corner of his mouth is full evidence such a sequence took place, and especially as he was hit by only one bullet. Nothing else would have caused the blood to hemorrhage out of his mouth. His lungs were overflowing into the mouth.

Q. At what point would he have become unconscious?

Ans. This would depend, but certainly when the lungs were half filled he would have begun to suffer anoxia to the point he no longer could act normally or retain full vision. His brain would begin to starve from lack of oxygen and he would be critically going into the state of anoxia.

Q. Would he have reacted by any immediate sign of being hit? Would it be less due to his concentration on flying and trying to shoot down Lt. May?

Ans. There would be a pronounced reaction, in the form of gasping for air, choking, a rapid and violent lurch or clenching of his arms, and other noticeable reactions. His concentration would be immediately interrupted no matter how deep it had been. It would not matter where he was hit if he was hit by machine gun fire. The fact he was hit in the chest cavity assures an immediate response to the nervous system.

Q. Do you know anything about flying as a pilot from your own experience?

Ans. Yes. At one time I seriously endeavored to fly. I have some time as a student pilot. I know the sense of the control stick and what it would take to move the stick as far as pressures are concerned.

Q. Could anyone hold onto a stick, be hit in the chest by machine-gun fire as Richthofen had been hit, and then continue normal flight attitudes without transmitting evidence of mortal wounds through stick movement? In other words, with his hand on the stick, would he have jerked the stick in any form?

Ans. Certainly he would have jerked his arm. His whole body would jerk! He could return the plane, through determined mental concentration, to its former attitude, but

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only momentarily. More likely he would have tried to land immediately after being hit as his tendency to become unconscious, and choke, and drown, would be rapid.

I would say with his hand on the stick, the stick had to be pulled backward and possibly or logically toward the direction of the arm that held the stick. (Right hand — right bank.)

Q. Would this almost automatically force him to have jerked the throttle backward without actual desire to do so?

Ans. This is highly possible and probable reaction.

Q. Do you feel Richthofen could have been hit prior to Vaux near Sailly-le-Sac by Brown?

Ans. No, I do not. He would have landed much earlier had this been true. I do not believe it was possible for him to have flown to Vaux under those conditions. He would have rapidly gone into the state of unconsciousness or semi-consciousness to the point control of his craft would have been impossible.

Q. How far ahead of the actual crash moment do you feel he was hit with the bullet?

Ans. Almost immediately prior to his plunge to earth. Perhaps just prior to when the plane was seen to leave its normal pursuit of Lt. May.

Q. Does the Australian machine gunner's testimony correspond to what you feel took place?

Ans. It would appear this is so, from both the clinical analysis and from matching it with the reaction norms of a pilot as he uses his body to fly a plane.

In 1918 Brown wrote out his report to the RAF. He did not say he shot down Richthofen. He did say he shot and then observed the red plane crash.

In his accounts for Gibbons' book he did not note Richthofen was turning around in his cockpit to check his tail; rather, the reader is led to believe Brown snuck up from behind un-noticed, at about 4 or 5 o'clock high. (His dive followed Richthofen's. To catch up, he would have to retain the dive all the way to point of being able to get close enough to fire. Had he assumed the level of Richthofen prior to this time, he would have been unable to catch up with the all-red plane.)

In Nowarra and Brown's book, he allowed he had noticed Richthofen turn in his cockpit just prior to his gunfire. This testimony came much later than the testimony given to Floyd Gibbons.

In "War Birds," the accurate verbatim diary copy of an unknown World War I Ace who flew with the RAF, it states where he compared a friend of his being shot down like Richthofen, "from ground gunfire." As he died in 1918, it would appear the common accepted belief of that exact time was that the Red Baron was not brought down by Brown, but by the Australian gunners. Later, sentiment would seem to have entered the picture.

Clayton Knight spoke of how he had interrogated Brown on numerous occasions afterwards. He said he recalled Brown's description of the mortal wound vividly. He said he often spoke with Brown over the years about this event. He then proceeded to describe the shot as described to him by Brown.

"Roy Brown said, (he pointed with his right index finger) the bullet entered the back, just below the neck. It came out of his chest near the center. (He again pointed to his chest.)"

Clayton Knight repeated this testimony twice. I pointedly asked him if he could accurately recall Brown's exact description. He said, "Yes, I just told you." Clayton then re-enacted Brown's movements with his hands and again pointed to the back just below the neck.

I therefore submit that Brown changed his story from his original de-briefing statements, not once, but twice. I further contend there is a significant discrepancy.

I submit the Yale New Haven medical evaluation as a newer, more reliable source of reference for future studies and historian evaluation as to who shot down the Red Baron.

There is one final observation I would like to submit, from the viewpoint of my having been a pilot.

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a flight instructor for both civilian and U.S. Air Force, experienced as a biplane flight instructor for 1,500 hours in a PT-17 and having specialized in aerobatics within the span of my aviation career.

First, I would like to set down the basic movements of a pilot to create a stall attitude of an aircraft.

Power on:

Pull back on stick gradually, until airspeed falls below flying speed and stalls. Use rudders to hold craft straight then release stick. Power can either be reduced or left as is, depending upon needed control to hold craft stable.

Recovery is made to begin once stick has returned forward and nose of craft is allowed to be lowered to gain airspeed.

Power off:

Same as above, except aircraft will break in a cleaner fall. To recover, stick is pressed forward to remove all back pressure on elevator. Recovery in full is made with power to re-assume normal flight.

Spin:

Retard throttle, pull back stick as in power-off stall. Kick full rudder.

Craft will drop to the selected rudder side in a steep fall-off banking turn. With rudder in depressed position, craft will then begin to enter spin cycle.

Recovery techniques here are not necessary, as I contend the Red Baron's Fokker was in a spin attitude at the point of striking the ground. The ground interrupted what would have been the full cycle of a spin. His altitude, his last ditch endeavor to keep the craft in control, will account for the banking diving turn with possible side slip attitude.

The side-slip may have occurred purposely, or more likely from his leg stiffening on the left rudder bar in his death throes or, in an accidental reaction as he slid into unconsciousness, or in instinctive movements which failed to be adequately applied. Such movements would have held the nose from dropping to the point of allowing the craft to plunge nose first into the ground. In a slipping, skidding, turning dive, his craft would have easily assumed a close to normal attitude needed to land the craft, by accident, due to its height relationship to the ground, or at a point of stall. The throttle had to be retarded as evidenced. This must have come on purpose, or by reflex reaction from the shock experience by impact of the bullet.

Caricature Citabria

Continued from page 45

bench. With this particular model, you have a real chance to express your creativity! Although the standard factory trim is interesting, why not brighten up your Citabria with "air show" colors? Stripes, stars, or even checkers can be used to give a really effective color scheme. You might even wish to use the old stunt pilots' trick of putting your name right side up on one side of the fuselage, and upside down on the other. Our little bird has bright red tissue paper stripes, a flat black upper nose section, and a silver prop with a gold spinner. The various wing rib lines, aileron separations, etc., were drawn on with a Pentel marking pen. The remainder of the aircraft was left natural balsa, in the interest of saving weight. (The original weighed approximately 1 1/3 oz. without rubber band motor.)

Assembly: Install the wings, being careful to check for the correct incidence and dihedral angles. Pregluing is recommended here, for additional strength. When the wings are dry, the struts may be added. By starting out with struts that are a shade too long, you can trim them by trial and error to an exact fit. Also, the struts can be used to rectify any slight twists that may have occurred in the wing panels during construction. Sighting across the top of both wings will disclose any misalignments. You might notice that we have elected to omit the jury struts from our model. Somehow, they just didn't look right.

Install the tailplanes, paying particular

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attention to correct alignment. The tail-plane rigging is made from black silk thread.

Attach the landing gear wire and glue it in place. A small strip of silk soaked in glue is applied over the wire, on each side of the fuselage, and pressed down firmly. Next, the landing gear fairings may be added. Note that the fairings are not glued to the fuselage, in order that the landing gear may flex rearward during landings. Finally, attach the wheel pants and the tail wheel assembly.

Propeller: The prop is obtained from a North Pacific "Astro Gnat," which certainly must represent one of the biggest dime's worth available in today's hobby shops. Be sure to take time out to fly the Astro Gnat for a while, just for kicks. It will give you a real appreciation for the efficiency of its tiny free-wheeling prop. (The Astro Gnat is quite capable of vertical takeoffs!)

Remember to add a couple of washers between the prop and the prop shaft bearing, when switching the prop to your Citabria. The prop spinner may be carved from plastic, or it may be molded from plastic, over a balsa wood form.

Flying: We'll trust that you have already attended to any warps encountered during the construction phase. Add modeling clay, as required, to achieve balance approximately at the point shown on the drawing. A few test glides will establish the need for more or less. A bit of rudder and/or wing trailing edge bending should enable you to obtain a fairly straight-ahead glide path. Next, try 40 or 50 hand-wound turns of the prop. If satisfactory results are obtained, start adding more turns with the aid of a mechanical winder. It is easiest to stretch-wind this model from the rear, while an assistant hangs onto the prop.

ROG's are a cinch for this ship, but if you are flying from rough ground, it is suggested that you remove the wheel pants to prevent tripping. Additional details on the full-scale Citabria may be found in the July 1966 issue of *Air Progress*, and the April, 1966 issue of *Flying*.

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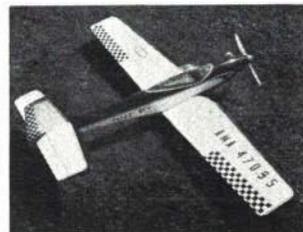
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Mini-Rod

Continued from page 13

size indicated and splice edge-to-edge the two pieces used to form each side. Mark the location and size of the 1/4 balsa strip pylon braces and glue into place. Glue on the other pylon side to complete the structure. Don't glue the pylon to the fuselage yet.

3) Fuselage: The fuselage is simply a piece of 1/4 x 1/2 balsa cut to length and tapered at the rear as indicated. Notice that the front has an additional piece of 1/4 x 1/2

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balsa glued to the top. Add the 1/8 x 1 x 1 plywood firewall, after you have fitted your engine, drilled mounting holes and glued the blind nuts into place. Add the balsa filler blocks to the sides of the fuselage behind the firewall. Sand a groove into the left side block so an eye-dropper fuel tank can be installed.

Right here, a note would be in order to explain how the eye-dropper installation works. You will need to drill a 1/8 to 3/16 hole in the fuel tank of the Pee Wee (make sure you clean out the metal filings from the tank), attach a length of small diameter fuel-line to the fuel nipple on the needle valve in the Pee Wee tank. Attach the other end to the eye-dropper. You can, in this simple installation, visually check the amount of fuel remaining and have a simple and effective fuel timer. Fix the eye-dropper to the fuselage by looping a rubber band around the fuselage and fastening it on each end of the dropper.

Of course you can just estimate the amount of fuel remaining in the Pee Wee tank and hope that the model doesn't get too high on what you think you've got left — this is what I did on the first flight of the model in the pictures. Eight minutes later — no! I didn't light the D.T. (de-thermalizer) fuse — it came down, thanks to cool air, at a good hiking distance downwind.

Glue the rudder onto the fuselage as indicated on the plans, notice the cutout at the trailing edge. This serves as a stop for the pop-up action of the stab when de-thermalized. Glue on the stab platform.

4) After all component parts are completed, trim with colored tissue and give the whole structure three coats of clear dope. Install the engine, prop, stab. Fasten the wing to the pylon with a couple of rubber bands and you are ready for test gliding.

5) Test gliding and flying: Pin or tape the pylon into position and test glide. Move the pylon forward or back until a good glide, with no diving or stalling tendencies, is evident, then glue pylon into place on the fuselage. It may be necessary to raise the front of the pylon somewhat if your model is nose-heavy, or to raise the back of the pylon if your model is tail-heavy. Try to keep the balance point as indicated on the plans as close as possible.

You are now ready for powered flight. As with most pylon models, this one has a normal right power pattern. The model should be launched at a 45-degree angle into the wind and should climb in loose right spirals until the engine cuts, then it should drift into a right glide pattern.

Additional glide turn can be achieved by packing the stab platform so that the right stab tip, when viewed from the rear, is higher than the right tip. If the model tends to loop, add a small amount of down-thrust (engine tilted down) by inserting washers behind the two top bolts between the tank mount and the firewall.

After you have had a few successful flights, you may wish to build the optional built-up wing as shown on the plans. This wing is identical in size and shape to the balsa wing, but it has the additional advantage of a more efficient airfoil and light-

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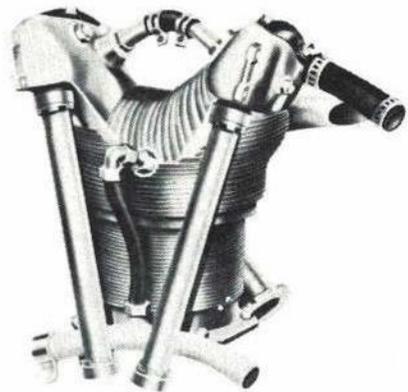


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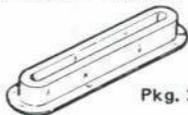
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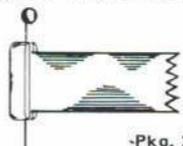


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er weight. Transfer the wing rib shapes onto plywood or stiff cardboard and using these as guides, cut out the indicated number of ribs. Cut the leading and trailing edges to shape and pin into place. Lay the spar onto the plan and glue in the ribs where indicated, after you have notched the trailing edges to receive the wing ribs. Additional details on this type of wing construction can be found in the Jan. '68 issue of A.A.M., in the article "Get Into Free Flight."

This built-up wing can be substituted for the all-balsa wing, although some changes will be necessary in the wing angle due to the increased lift of this wing.

Some suggestions: Build the model with the sheet wing first, then, for a surprising improvement in performance, build the built-up wing.

Always put your name, address, phone number and AMA number on your model. Build your model as lightly as possible for better performance. The model in the article weighed 2¾ ozs., ready-to-fly in the all-balsa form, and just under 2½ ozs. in its built-up-wing version.

Always use a fuse to dethermalize your model, even on test flights, as even models of this type can be lifted high into the sky with a little bit of thermal assistance.

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- 1 - 1/4 x 1/2 x 36" balsa strip for fuselage
- 1 - 1 x 1" pc. of 1/8" thick plywood (In addition, if you plan to make the built-up wing version, the following wood will be needed.)
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- 1 - 1/8 x 1/2 x 36" balsa trailing edge for wing
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- 4 - 2-56 x 3/8 or 1/2" mounting bolts
- 3 - paper clips for misc. hooks
- 1 - eye-dropper
- 1 - sheet Silkspan or Jap tissue

Miscellaneous: gauze or other joint-reinforcing fabric; glue; pins; dope and brushes for finishing.

Professor Tank's TA 152C-1

Continued from page 31

The drawing of the Ta 152C-1, which accompanies the article, is in 1/72nd scale; the Komet plan included is not in 1/72nd scale. Regarding the Komet, I decided to include it because it utilizes almost the same colors as the Ta 152, and I find it advantageous to build more than one model at a time which use the same colors. There are two excellent Komet kits on the market — the Lindberg 1/72nd kit and the Hawk 1/4" kit. The same methods can be applied to the painting of the Komet. There is a detailed color scheme in the April '67

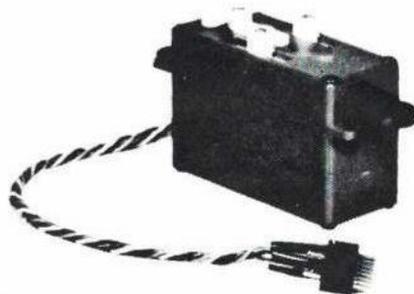
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issue. In this issue, instructions are given for painting the Komet in the "Bomber Nemesis" article, pg. 28.

Instruction for conversion parts: Cement fuselage halves together and when dry, sand smooth. Then saw fuselage into three sections. Trace either end of sawed portion of front section from .040 styrene—two pieces are required. Cement in place as per photo.

Repeat separation and fabrication processes for rear section, using photo as guide. Three pieces of .040 styrene are required. Cement them together when processed and, when dry, cement in place between the two rear sections.

When both inserts are dry, use a small, flat, jeweler's file and fair in smoothly. The two insertions indicated above will make the model the length required for the Ta 152C-1.

If you decide to have the canopy in open position, now is the time to make necessary provisions. Use fine jeweler's saw blade and remove solid portion of canopy. File parallel and flat, so that both sides will be even and canopy will rest evenly when later cemented.

To easily enlarge wingspan, cut wings at wing roots, trace around wing on .060 styrene and insert between wing and fuselage. While this unit is drying, you can add .010 styrene to the vertical stabilizer. Check plan for correct shape of stabilizer.

Canopy in kit cannot be used as it is not correct for the Ta 152C-1, but there are a number of ways out of the dilemma. You can make a wood pattern and use a heated piece of .020 thermoplastic to stretch on mold. A vacu-form unit can be used to advantage if available. Or, you may use my method which was to use a fine jeweler's saw blade or Zona saw to cut an Airfix ME 262 canopy apart lengthwise. File the

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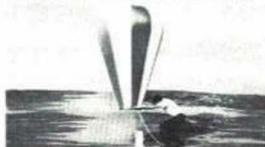
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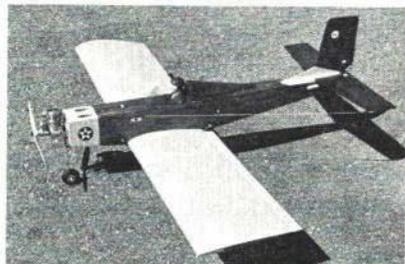
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parts to shape as per drawing in article and cement the two canopy halves together. I found that by using Pactra's clear enamel, I could get a good bond and the cement-line is not too evident. If you are using a Lindberg D-9 kit, you are in luck . . . their D-9 kit has a beautifully blown canopy. However, if you are using the Lindberg D-9 kit, you also will have to make the fuselage longer. Check drawing measurements and proceed as for lengthening the Airfix FW 190 kit. I discovered that the Lindberg kit required only one saw cut near the rear section, almost in the same spot as shown in photo. Only two pieces of .040 styrene are necessary to give correct fuselage length. Check plan.

If you are using my method, cement canopy onto sawed-off cockpit fairing and set aside to dry, then make armored headrest from a 1/4" round piece of leftover scrap plastic on "tree" from old kit. (See photo.) Saw out a flat area about 3/8" long and taper from rear to front, so that in cross-section the armor plate will be half-round when viewed head-on. Cut armor to length shown on drawing and photos, filing and checking repeatedly so that you will have the correct angle. When this is achieved, paint it either black or dark green and set aside to dry.

Spraying: Use standard procedure (as given in kit instructions) for cementing wings to fuselage, tail plane, landing gear, and landing gear covers. When the parts are dry, spray primer coat over entire plane except for the clear canopy which you will have to tape and mask off. The cockpit fairing will also receive a coat of primer.

Blades and spinner on propeller in kit are too small for a Ta 152C-1, so I used Revell's JU 88 propeller. Spray propeller and wheels with primer coat and allow to dry thoroughly.

The bomb also is from the JU 88 kit and is given a primer coat. While parts are drying, you may make the bomb rack using assorted thickness of styrene. Check photos and drawing and cut to shape. Cement pieces together, and when dry, spray it and all other small parts (tail wheel, gears, etc.) with primer.

Camouflage pattern: Spray entire plane light blue, except canopy and canopy fairing. Mask off all areas which are to remain light blue, then spray with dark green. After dark green is dry, mask off area which is to remain dark green and spray with black-green.

On piece of scrap plastic, paper, or cardboard, practice making small dots. These are to be as small as possible, so stop down your spray gun to the smallest opening allowing a spray to come through. Practice

on your scrap with the dark green paint, checking the photos and drawing for test spray pattern. When you can spray your dots easily and to your satisfaction, take the plunge and apply your mottle pattern on model as shown on drawing. You will have to make your camouflage mottle a lighter shade than that appearing on the photographed model, as it is necessary for me to spray mine a little darker for photographic purposes. The best mottle pattern has a hazy appearance and is not too dark, as it is possible to block-in to the point where the color will be almost solid. If this happens, clean your gun thoroughly with thinner (as is always necessary when changing paint colors), and use some shade of blue which was sprayed on undersurfaces. Practice again with the dots in random pattern, then respray over dark area, sprinkling dots gingerly to tone the dark area down.

Detailing small parts: Paint propeller blades and spinner flat black as on model, or, prop black and spinner as shown on drawing. Paint wheel centers dark gray and tires "tire color." After paint is dry on parts, remove masking tape and sand smooth with No. 600 wet or dry any areas where spray may have piled up against the tape edge. Spray entire plane with flat clear. Cement armored headrest into position in canopy fairing. Stripe edge of canopy with dark green, using your smallest brush or model car tape in 1/64" width. Black car tape was used on my model. Paint or tape windscreen and cement in place. Canopy now can be positioned, either partly open or closed, and cemented to model. Cement wheels to wheel struts and cement tail wheel into position.

Now the decals can be added. You will probably have to rummage around in your spare decals cache for the national insignias and numerals which will fit the scale. If you have none, your best bet is to look through the decal supplies at the hobby shops.

Quite a bit of effort goes into building this conversion, but the result is a distinctive, first-class Luftwaffe fighter plane; one of the last in the frantic closing days of the last great war.

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The shipment included the following: 1) Douglas A-4E "Skyhawk"—has decals for Australian and US Navy. 2) L.T.V. A-7A "Corsair" II. Two Navy Squadron insignias: 17th Attack Squadron and 86th Attack Squadron. Both Squadrons were aboard the USS Saratoga. 3) MIG 19 "Farmer-E." Decals for Soviet Union, Cuban Air Force, and East German Air Force. 4) B.A.C. "Lightning" F-MK6. Decals for Royal Saudi Arabian Air Force and for the RAF Fifth Squadron.

There is one more in this series which was not included in the group, so it could not be reviewed. This kit is the French D'Assault "Mirage" III C. Others to be released are: SAAB J-35 "Drachen," Lockheed F-104J "Starfighter," MIG 21, Fiat G91 and Bell UH 18 "Troquois" Helicopter. If you don't have your dealer order some of these you will be missing a rare treat, I kid you not!

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These kits will fill a need for the modeler-collectors who have a space problem. The kits are very well detailed, clean, and with choice of two decals included for different countries.

From Model Products Corporation, 126 Groesbeck Highway, Mount Clemens, Mich. 48043, some new kits which are in the popular 1/72nd scale, and are as follows: Ford Trimotor; Savoia Marchetti, 79 MKII; F-111 (Swing Wing) U. S. Army Air Force.

The kits all have very clean castings, are flash-free, with matt finish decals, and will be popular with the modelbuilders.

Hawk's two new models are the Cessna Super Sky-master in 1/4" scale and the NASA "Explorer 18" (Interplanetary-Monitoring-Platform), the Earth-Satellite scale model. Both are exceptional values; well engineered with precision-fitting parts, full-color decals which eliminate the necessity for painting most of the fuselage on the Cessna. The address is: Hawk Models, Inc., 4600 North Olcott, Chicago, Ill. 60656.

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Radio Control World

Continued from page 39

Illegal flyers note: Many modelers depend upon their homeowners insurance for protection in their model plane flying. Prop Busters (newsletter of Propbusters RCC, Rapid City S. Dak.) mentions that this insurance probably does not cover illegal operation. If you do not have a valid FCC license, you are flying illegally, and may be unable to collect on your policy, according to a recent attorney's opinion quoted in above newsletter. Presumably the same holds true for AMA insurance. Eight dollars for a five-year FCC license seems cheap enough "insurance" to make certain you can collect on your policy, if the need arises.

Active outfit: Though they were organized only last August, the members of River City Radio Control (Mason City, Iowa) have had radio, television and newspaper publicity, have run a fun-flyer for all comers and have printed pilot issue of a proposed newsletter. Corr. Sec. Harold Varellas (R1, Oakwood Park, Clear Lake, Iowa 50428) says nucleus of some ten active R/Cers know that a great deal of gear has been sold in their area, but they seldom saw any newcomers in action. They felt, therefore, that they could be of more help to novice radio modelers if they organized as an active club and sought publicity in the area. (And they also could use some added members to help pay field rental!)

They rent a quarter of a 218-acre farm, moving to a different quarter each year. Harold invites other R/Cers and clubs to get in touch, as RCRC wants to build up an active mailing list.

Competition

'69 R/C World Championships: Our R/C Stunt Team (selected at '68 Nats) consists of Phil Kraft, Jim Kirkland, Jim Whitley, with Jim Edwards as Alternate. John Patton, who directed the '68 team selection program and was R/C Pattern Event Director at last summer's Nats, has been appointed Team Manager for our 1969 FAI R/C efforts.

While R/C Scale has not yet been accepted as a FAI official event, a trial event will be held at the 1969 World Championships (to be held in area of Bremen, Germany) and it has been felt that the U.S. should try to enter a team in this first test. Since R/C Scale isn't an accepted World Championship event yet, the normal AMA team selection process doesn't apply. For same reason the regular AMA team transportation will not be available. Thus scale flyers must be selected not only on basis of scale building and flying ability, but also on their ability to finance the entire costs of trip themselves. It was felt that use of a committee might be the best means of selection; it will be headed by Bill Northrop (who is also Chairman of the Scale Advisory Comm., and the R/C Contest Board).

Nats R/C Scale event: Some scale flyers felt that a Scale try every half hour was indecently rapid, for what has usually been considered a rather leisurely event! However, the entrants were a bit shook by the Scale judging, that took place when the flying was completed. Many have felt in the past that the indoor judges were often far too strict, but opinions seem to be that the balance tipped far the other way in 1968. While we have only reports of others to go on, we gather that the entire group of R/C scale planes was judged in some two hours and 15 minutes, and without any measurements being taken. If true, this does seem a bit incredible, for what is considered to be the premier R/C Scale event of the year. Of course — let's face it — these Scale contestants are in many cases more

than just modelers . . . they are artists! As such, they can be expected to be somewhat temperamental and fussy. But someday perhaps we'll have a Nats where the Scale event makes the large majority of 'em happy!

Toledo '69 coming up: Advance word from Ken Borrer of the sponsoring Weak Signals Club brings news that the 15th Toledo R/C Conference will be held on March 1 and 2, 1969, at the usual place (Lucas Co. Recreation Hall, Maumee, Ohio). Friday at the Hall is R/C Trade Day; booths may be set up starting at 9 a.m. General admission doesn't start until Saturday morning at 9. All features that have been popular in the past will be repeated. Besides the vast commercial displays, there will be flying demos (weather permitting), Trading Post, R/C movies, auction of selected items from Trading Post. There'll be the usual trophies for competitions among the many craft displayed by attending R/Cers (space is available for 225 models).

The raffle this time will be for three complete propo outfits (Kraft, Logictrol and Citizen-Ship). R/Cers are urged to bring their latest projects, models and R/C movies. The sponsors are making facilities available for the expected increased attendance. As in past, Headquarters motel will be the Howard Johnson Motor Lodge, (2450 S. Reynolds Rd., Maumee, Ohio). Write there for reservations, or send to address below for complete listing of nearby motels. Write the Weak Signals R/C Club (Box 5772, Sta. Wernert, Toledo, Ohio 43613).

NERCM hydro meet: Though this large area group has run some 15 well-attended annual meets for stunt, pylon and scale planes, it has in recent years become most famed as the first group to push competition for planes flying over water. The 3rd Annual N.E. Hydro Radioplane Championship was conducted on Sept. 21-22 at Brimfield Dam (near Fiskdale, Mass.). Thirty contestants signed up in eight different classes, for a total of 55 entries.

The 4th Annual will include an event for Scale seaplanes; they will race solo around a 1-mile course, and the speed in mph will be multiplied by Scale judging points to determine winners. Hopefully, several Schneider Cup racers will be on hand. A 10% point bonus will be awarded to planes modeled after any that actually competed in the Schneider races. Any Scale plane will be welcomed, however.

In an effort to encourage smaller planes in this category, a bonus will also be offered to favor planes with smaller engine displacements. All these ideas will be tried out at the NERCM hydro fun-fly next spring, to settle final rules for the fall meet.

1st R.C.I.A. Tournament of Masters: Following notes were taken from the WORK-SHEET of Western Ohio Radio Control Soc. (by Editor Ron Van Putte, Dayton, Ohio). This was the first meet to be sponsored by the Radio Control Industry Assoc., and this year was open only to finalists at the Olathe Nats; 14 of them competed on Sept. 21-22 in the T. of C., which was hosted by Indianapolis R/C Club and Indianapolis Westside R/C Club, C.D.'d by Bill Welker. AMA Class C rules were followed throughout.

Most of the flyers came determined to beat Phil Kraft, which they hadn't been able to accomplish at Olathe. Phil sort of gave the meet away, since he competed with his tiny Flea-Fli, which wasn't really in the running, judging from results. Nine rounds were flown, and winners were judged on their two best flights. Top winners were: 1, Jim Edwards; 2, Jim Whitley; 3, Tony Bonetti; 4, Norman Page; 5, Paul Ennis; 6, Don Lowe.

This meet will be sponsored each fall by the R.C.I.A.; on appropriate years the meet

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will be used to pick the R/C Team for competition in the World Championships. This could not be done in 1968, since Nats plans were too far advanced when R.C.I.A. decided to sponsor an annual meet.

Eastern States Championships: Sponsored by Central Jersey RCC at Sky Manor Airport, Pittstown, N. J., this Oct. 6th season closer in the Northeast was literally swamped with entries. By actual count, there were 98, very possibly more than at any other R/C meet in the country, aside from the Nats. As a result, four flight circles were in use all day long. Every flyer in every event got a prize, no matter where he ended up. Contestants begged the sponsors to run a two-day meet in 1969—but all hands, from CD Leon Shulman on down—are not sure they could last through two days of such hard work. In any case, anticipating a repeat large entry in '69, it is possible the location will be shifted from Sky Manor to some spot allowing much more space, both on the ground and in the air; Lakehurst Naval Air Station is one possibility.

DC/RC 1969 R/C Symposium: The DC/RC's 12th Annual R/C Technical Symposium is scheduled for May, 1969, at the Johns Hopkins University, Applied Physics Laboratory near Washington, D. C.

Planning for the Symposium has already begun with the Technical Papers Committee requesting potential paper presenters to send an abstract or a brief summary of their proposal to Walt Good (9802 Parkwood Dr., Bethesda, Md. 20014). That deadline, December 20, 1968, is past, however you might give them a try. If you have a topic which you think would be appropriate to the Symposium but know of no presenter, please send it in to the Technical Papers Committee so they can find some one.

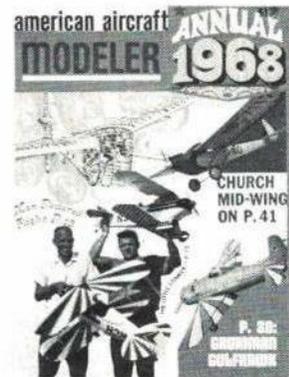
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Scale modelers looking for large props, will find several stocked by R/C Specialties (617 Arrowhead Trail, Warner Robins, Ga. 31093). Available are 18-4 and 18-6 props at \$2.50 each. Other sizes will be stocked, if there is demand.

Improved model of their ARF plane is announced by Gro-Industries (1 Joan Terr., Montvale, N.J. 07654). Mistifier F.R.P. II has span of 60", wing tapered on leading edge, no dihedral. Pair of foam cores have all cutouts, kit includes hardware for main LG, also strip ailerons, metal engine mounts. Stab core is foam; material for fin, rudder and elevators is included. Fuselage of fiberglass, has bulkheads and rails molded in place, smooth surface ready for painting. Finished planes weigh 6 1/2-7 lb. with recommended .56-.60 power. Complete kit costs \$39.95; fuselage available separately, \$21.95.

In addition to in-line and opposed twins of several sizes, Flight Control Products (1937 Simmons, Salina, Kans. 67401) has several smaller engines with throttles, based upon Cox engine parts. Queen Bee .049 has modified Cox 290 cylinder; sleeve-type exhaust throttle gives instant RPM change; with 6-4 prop you get 14,000 RPM high speed, 6,000 low. Can be had with or without tank mount. Bumble Bee .049 uses Cox QZ parts, has intake throttle mounted inside fuel tank. Write for info on entire engine line.

Simprop multi propo line will be marketed in the U.S. by Nelson Model Products, Inc. (8638 Patterson Pass Rd., Livermore, Calif. 94550) and imported from West Germany, where it is very popular. Tentative prices: \$295 for complete three control system, \$425 for five controls. Servos cost \$35 each; crystal sets are \$15 (one transmitter and one receiver crystal, both are easily changed by user—no retuning required.) A "buddy box" setup will also be offered. Price has been set at \$185 for the all-fiberglass completely ready-to-fly Nelson R/C glider. This is less shipping costs and shipping box. Beautiful very high aspect ratio soarer comes painted and ready to use; buyer simply installs radio, attaches wings and flies.

Wide variety of offerings announced for new line of R/C electric-drive cars by North American Hobbies (Rt. 1, Box 255, Petersburg, Mich. 49270). They have two cars, both to 1/18th scale (each about 10 1/2" long); the Rogue Racer is open type body, while Rogue GT coupe is enclosed style. Both fit on same chassis, of fiberglass, that carries wiring between the components. Complete outfit of one car (either body style) two-stick transmitter (one stick for steering, one for speed control), nickel-cad batteries for car motors, battery charger, costs \$129.95. Price includes superhet receiver for car, on any of the 27 MHz spot frequencies. Extra crystal sets are \$8.95. The transmitter, the car and the battery charger all may be had in kit form at much lower cost. Superhet receiver available only in finished form, but a regen receiver is offered as a kit. Price for complete outfit noted above does not include receiver batteries (two pen-cells) or transmitter dry battery; these are standard types. Rouge Racer products may be had through local hobby shops, or if not there, direct from maker.

Zona saws are now being supplied by FAI Model Supply (1112 W. Mission Lane, Phoenix, Ariz. 85021). They come, with blades from thin 1 1/8" long sabre style to a rectangular one 6 1/2" long, in several thicknesses and handle styles. Saw set with one handle, three sizes of replaceable blades costs \$1.95. Concern has other tools for model builders, issues catalog of these and other specialties for the FF modeler (some seem adaptable to R/C uses).

World War I scale buffs can obtain a very complete set of drawings for an R/C Nieuport 28C1 fighter from William Antoine (10 Smith St., Waldwick, N.J. 07463). Size of 2" to the foot gives a model of about 5 1/2" span. Four 36 x 24" sheets to the set; all wings shown full size (both halves, top and bottom wings). Tail surfaces are scale. Only concession to easier building and better flying is use of a thin, flat bottom wing foil. (Prototype has flown well on rudder-only, also with rudder and elevator.) Full house radio installation is indicated, also the principal markings of the "Hat in Ring" squadron. For smaller details, camouflage, etc., builder is referred to Profile #29. Drawings cost \$6 pp.

Low wing stunter called Javelin is new from Harco (290 Thompson Ave., Oceanside, N.Y. 11572). Kit for this 67" span plane includes foam cores for the swept, semi-sym. wings; many pre-cut wood parts; canopy; landing gear components. Finished plane weighs about 7 lb. with standard size full-house multi; flies well on 45-60 engines. All sheeting for the wings is provided. Kit costs \$39.95.

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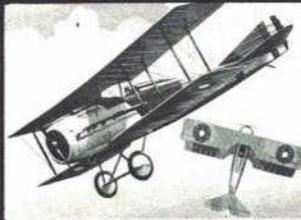
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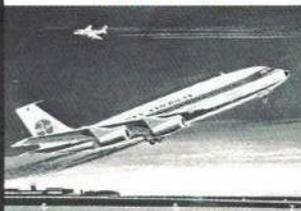
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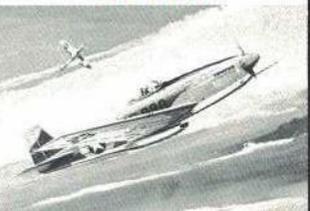
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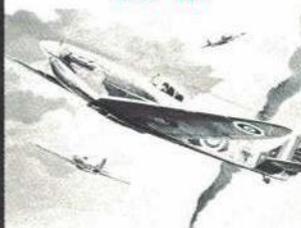
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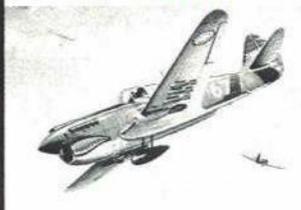
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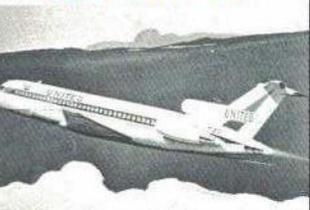
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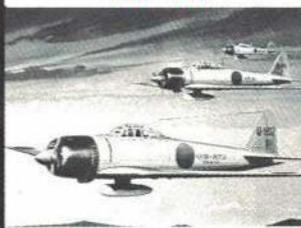
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