AMERICAN AIRCRAFT modeler

JANUARY 1968 • 60c 6/-

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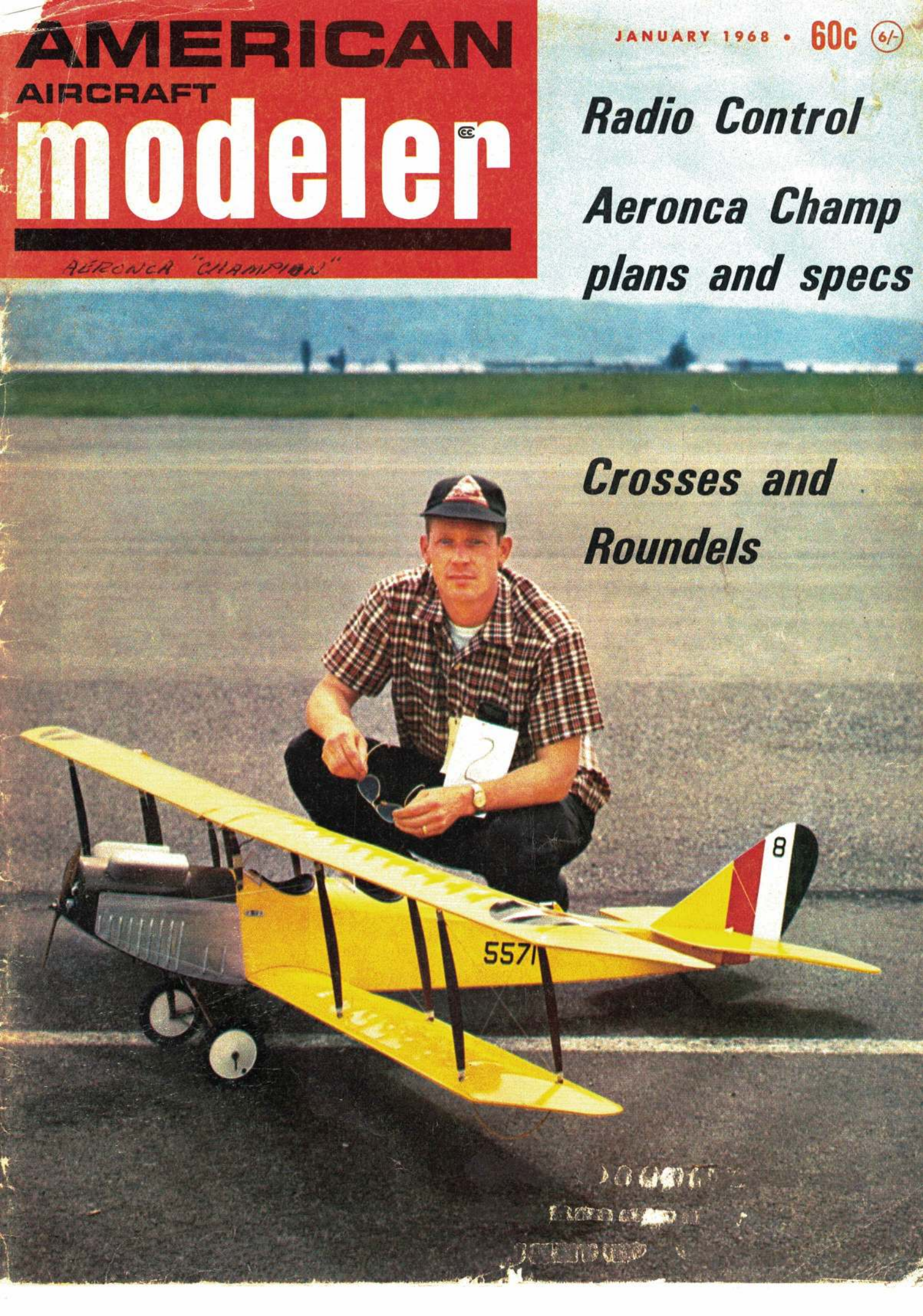
Radio Control

Aeronca Champ plans and specs

Crosses and Roundels



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AMERICAN AIRCRAFT modeler

VOLUME 66, NUMBER 1 **JANUARY 1968**

COVER PHOTO: Huge 8½ ft. Curtiss JN-4 Jenny, built by Richard Hansen, was photographed by George Hickson, at Northwest Regionals meet. Weight is 8 lbs., power an Enya .60. Plans will be published in a near issue.

WILLIAM J. WINTER — EDITOR AND PUBLISHER

Edward C. Sweeney, Jr., Associate Editor — Harry E. Harps, Assistant Editor
Sally Barry, Production Editor

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STRAIGHT AND LEVEL

Does your favorite event seem stuffy? Is your individualism thwarted? Then put the fun back into model aviation!

IS model airplane building too serious these days? Take for example, this January issue. It is, we think, a fair exposition of most of the facets of our dear hobby. But where, oh where, are the light-hearted humorists and flip-side characters who used to make us enjoy a good, hard look at ourselves? The patient airplane widows who got hunk on the chief by secretly selling a surprise article to a magazine, the wild cartoonists who rolled us in the aisles? Bob Godden's Conrad Conrod comes to mind. There was this free flight dethermalizing down, a soft cushion, tied beneath its belly, musical notes coming out of the pylon, whistles blowing, and with sundry other "protective" devices to guarantee the crate reached terra firma without a scratch. So there it was, coming down on a highway and a huge tractor-trailer bearing down. Conrad's miseries made us all feel better. A born loser, we loved him.

When he bought a kit named the buzzard — well, you just knew what he would find in the box. And he had this big gorilla who used to jump up and down on an airpump to start his Dynajet — provided Connie did not run out of bananas. (Do gorillas eat bananas, you suppose?) Yes, modeling had its eccentricities — when we still called ourselves crazy modelers. Nowdays, you can wear a business suit and necktie at a Sunday button-pushing session and no one looks at you twice.

When free flight was the only thing in the world, there at least was the "chase." And, come to think of it, there was plenty of chasing in the early days of radio. Every other flight led to an adventure that would have kept James Bond happy and content. One free flight drifted from the Bronx, north of Manhattan, all the way to Montauk Point, more than 125 miles away — which reminds us of a long winded chase of one guy's RC which we sought to land 90 minutes later, with our little Aerotrol transmitter. Hopped out of the car as the ship circled into a parking lot, flipped on the switch. Then the batteries fell out at our feet!

The free flight that hit the mast of a ship four miles at sea. The one that landed at Chicago Midway — on a runway yet. Perhaps the most determined chase was conducted by Larry Conover who, miles out, came to the Mississippi. He commanded a nearby rowboat and oared his way furiously to the far shore — maybe this was when he settled in Iowa?

The time an airline pilot reported a Cub for stunting over a crowd. It was just an RC. The smugglers who crossed the Rio Grande — the red faced gendarmes confiscated some guy's free flight. Even at the Nats there was an irrepressible spirit. In the work hangar one night a noted speed merchant, bored with his zooming .60, put an OK Cub .049 on a Jim Walker glider, tied a cord to the wing tip, anchored a stick for pylon — and darn near fractured the Nats. Every night into the wee hours interminable races were run, the place jam packed and rocking with noise.

Strange things did go on in the work hangar. Hugh Entrop hand gliding his 24-foot pylon job — yes, two dozen feet! The ornithopter that emerged from the door into the darkness where guys were shooting the breeze in the hot Texas night. Flap, flap, flap it went in unbelievable circling flight. After a split second adjustment to the flitting apparition, cries of quack, quack, quack were heard on all sides. Good gosh, don't we laugh any more?

How about you humorists trying us on for size. If you make the crabby editor crack a smile, A.M. will publish you. Two things: you'd better be funny; and . . . no poems!

If you can't bring off an article, how about your favorite anecdote? Old-timers will recall M. J. Thomas, a dedicated leader from Pittsburgh, who handled the P.A. at radio during the Nats. He had a fog-horn voice with at least seven stages of amplification. In fact, he didn't need the P.A. But when he used it, his was the voice of the Angel Gabriel summoning the modelers to the great spot landing in the sky.

Describing one fantastic flight, he went into ten minutes of the wildest, hysterical description. Then someone spoke into his ear. M. J., in a stage whisper that carried into the next state, was incredulous. "The switches weren't turned on?!"

Many a wise guy played tricks with the P.A. One who caused a mob scene fired up a Dynajet, then waved the tailpipe back and forth before the microphone. Well, sir, they sprinted from every event to witness this earth-shaking flight. It didn't matter that the speed would have been about 1000 mph. And those indoor builders. They make microfilm in your bath tub and will stay up all night to finish a crate for the next day. This one, finishing up at 6:00 a.m. decided to catch a few minutes shut-eye. So, wearing a hat (!) and his shorts he sprinted from the shower and dived into bed. Yeah, he landed on top of his model! And the time Herb Weiss and Hewitt Phillips demonstrated a new technique before an AMA leader-member convention. It used no covering. Instead, the leading edge was positively charged, or so they said, and the trailing edge negatively charged. They wound, and wound, it so carefully. You could hear a pin drop. Here we were to see the greatest development of all time, lift from a flow of electrical particles. So they launched it with loving tenderness. It fell to the floor. What else? Talk about your red-faced geniuses!

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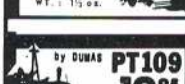

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said it!

Wasn't Done with Mirrors

It wasn't Roland Garros who shot his propeller off in WWI when he used a non-synchronized machine gun firing through the disc. Roland Garros never shot off his prop, even though he used a non-synchronized gun. He had small metal deflector on the prop which deflected the bullets. It worked for he shot down five planes in 17 days. But, he did land in enemy territory because when he went on a silent glide while bombing, he forgot to burn the oil off the sparkplugs, by switching the ignition switch on and off. So curse you, Red Baron!

Bill Marriott, Washington, D. C.

Mr. Corben Liked the Ace

I enjoyed the article in the AMERICAN MODELER. One of the local model builders brought it to me to read the article on the Corben Super Ace.

Mr. Bud Atkinson did a very nice job in writing and brought out some facts that I had long forgotten.

It is quite possible that I spoke out of turn when I suggested to the young man who showed me the article. I told him if he would build a good model Super Ace from the plans we could take a picture of the model, him and myself, and it was quite possible that your magazine would publish it. Don't be surprised if you receive such a picture!

O. G. "Ace" Corben, Venice, Fla.

Scale Modelers Attention

I'm glad to see the articles and drawings by Paul Matt becoming a regular feature of A.M. They are great for all scale modelers. I personally prefer them to other drawings because they are unified and not clogged with details and dimensioning useful only to the museum builder. The background material also is a plus; all scale builders are nuts on history of aircraft.

One of the new rules appearing in the '67 rule book is the addition allowing use of non-scale wheels or skids on flying boats. This would permit the use of the Curtiss boat in the July issue in any flying class without penalty for use of devices to get it into the air. The Scale Advisory Committee is trying to encourage the widest possible selection of prototypes in the scale events. We can't go on building various sizes of Mustangs and Cubs and keep up interest. So the more three-views of rare, old, unusual, etc. planes, the better.

Claude McCullough, Ottumwa, Iowa

Sorry About That

Your magazine does not seem to be as interesting as it was when I first started buying it three years ago. I believe that it could be made more interesting if it was written more along the lines of the (Good grief! — Ed.) magazine. Since becoming AMA publication and going monthly, it has not been as interesting.

D. Dewey, Hancock, N. Y.

Rubber is Wonderful

I am very interested in the development of the juniors in our hobby, but I don't think that lower standards are the answer. Perhaps a separate scoring system for the Junior Class would be a better way to go . . . and let the old men fight it out on a higher level. In this way the youngster is not placed at a disadvantage, while still keeping the standards high enough to give rubber scale the status I feel it deserves. Frankly, I think it's one of the most demanding facets of model flying, simply because the power source is so basically primitive . . . and I'm disappointed that the general feeling about rubber is that it's for kids. The wonderful thing about it is that it can be for kids, since it's inherently inexpensive . . . but it can also be a tremendous challenge to the serious and experienced model builder.

Don Typond, Los Angeles, Calif.

Readers of aviation mags should note that Don now is Managing Editor of Flying Magazine — one of your editor's alma maters. It is doubtful if Don has a peer as a model builder. His rubber-powered scale jobs have a Smithsonian display quality. We hope to show you pictures in a future issue. ED.

Will You Write Him?

I live in Szczecin [Stettin], am 14 years old, and am in the seventh grade. I am interested in airplane and rocket model building. I would like to correspond with a colleague, about airplane and rocket modelling, in Polish, preferably a boy or girl of my own age. I go to a workshop where I make various models.

Adam Kurczych, ul. Mickiewicza 42 8, Szczecin, Poland

Was SO3C a Dog?

I enjoyed your article on the Curtiss SO3C. You did a good job on probably the worst airplane that was ever built in the U.S.A. I was a ferry pilot with VRF-1 at Floyd Bennet Field from early 1942 'til 1945 and had the pleasure of flying many OS2U's (Kingfishers) from Sikorsky in Conn. and the Naval Aircraft Factory in Philadelphia. This ship was in early use for shipboard and patrol during the entire war and with its P&W 995 (450 hp) was a very reliable seaplane.

We had several serious accidents with the SO3C's in the squadron and it was a job to find anyone to get into them.

Giles S. Gianelloni, New York, N. Y.

Getting Started

I am enjoying very much the articles you are running on "Getting Started in Radio Control" by Howard McEntee. I am one of the many he mentions who does not happen to have an advisor in RC, and reading is about my only means of getting information.

M. M. Smith, Oklahoma City, Okla.

Two Left Wings?

I have just read Mr. Franck's letter in your September editorial. I think he has stated the case very well. As a teacher who has tried repeatedly to get young people started in model building, I frequently encounter the same frustrations.

The kids are fascinated by beautiful models and become enthused when they see them fly. Many are eager to begin flying and buy a plastic .049 powered control line. Others start with a School Boy or School Master type with the idea of first flying

them free flight and then converting to RC.

After hastily looking over the plans they begin cutting and assembling with disregard to any proper sequence. Some have even made two left wings, others have built stick rubber models, but stop short of covering.

After a few difficulties are encountered most are ready to quit and turn to the television. The only ones who experience any kind of continuous success are those whose fathers are active modelers. Perhaps Testor's new ready to fly RC ship will provide enough initial success to want to go on.

Howard Hatton

Knows His Stosser

I was interested in the plan of the F.W. 56 Stosser which you published. The exhaust pipes are drawn identical on both sides; this is incorrect, as only the first three pipes on the port side were bent downward. The reason for this was that in a dive with the airscrew backwash, exhaust fumes were carried back into the cockpit.

Reference is made to a "Heine" airscrew of wooden construction, but this is only right in part, as the Heine fitted to F.W. 56's was a metal prop and the "Schwass" was the standard airscrew.

Lastly, the contour of the nose cowling, immediately behind the spinner, omits the subtle inward curve in the front elevation which fairs the spinner into the cowl behind it. This is a common mistake — most photographs of this aircraft, due to the angle, make this feature nearly invisible.

S. J. C. Fenn, Wellington, New Zealand

Hurrah for Free Flight

I wanted to be among the first to thank you for the excellent coverage given to us in the Model Aviation section of your AMERICAN MODELER. Your cooperation in keeping the name of National Free Flight Society before the modeling public is to be commended.

Bob Stalick, Albany, Oreg.

That Man Matt, Again

We want you to know that we both look forward to reading your wonderful magazine from cover to cover. Of all the model airplane magazines on the market, we find AMERICAN MODELER the best. My partner who is most interested in radio control finds this reading the best in it.

Since we build solid scale models for most of the aircraft companies, and private owners, we are always looking for good three-view drawings to work from; we hope you will continue to show drawings by the excellent draftsman Paul R. Matt of "Historical Aviation Albums." This is the type of drawings needed to build a near perfect model.

Chavez & Fogg, San Antonio, Tex.

Deserved Plug

I am sure that there are hundreds of others like my wife and myself who are hoping that you really will publish plans for juniors and give rubber-powered free-light models the magazine space they have been deprived of for so long.

During the past few years we have been building from plans published by the Aeromodeler Plans Service, 13-15 Bridge St., Hemel Hempstead, Herts, England. Many U. S. modelers are unaware of the MAP Plans Handbook which offers an unparalleled collection of out-of-the-rut designs. We have found their service prompt, accurate, and inexpensive.

Dr. and Mrs. Morton Grosser, Palo Alto, Calif.

A.M. Reviews

United States Camouflage WW II, 8½" x11", 32 pages. $3. Published by Scale Reproductions, 1313 W. Abram, Arlington, Tex.

It consists of a reproduction of an AAF Technical order, a compilation of a U. S. Navy camouflage guide, and a set of color chips. The AAF Manual T.O. No. 07-1-1, originally published June 15, 1943, contains sections on the camouflaging of aircraft, specifying the color, shape and paint requirements for all the basic aircraft; sections on the markings and insignia to be used; sections on training and lighter-than-air aircraft.

The compilation of U. S. Navy Camouflage, the work of Jay Frank Dial, contains the official camouflage scheme of color markings and insignia to be used on basic aircraft, showing dates of changes. One page illustrates the Pacific carrier markings as used on the different parts of the aircraft. The 20 color chips are the ones actually used to mix the official camouflage paints.

Russian Aircraft, by Hugo Hooftman, 158 pages. $8.50. Aero Publishers, 329 Aviation Rd., Fallbrook, Calif. 92028.

An extensive collection of photographs and technical data on the heavy transports, long-range bombers, reconnaissance planes, helicopters, jet fighters and airliners of the Soviet Union, this book covers almost everything which is known about Russian aircraft. Many photographs have never been seen in the United States. Information on dimensions, performances, weight, powerplants and armaments has been gathered from sources which were not too cooperative in their assistance, but has been checked against other sources for greater reliability.

Among the aircraft described are the formidable supersonic Yakovlev Fiddle warplane, considered the most dangerous now in the service of the Soviet Air Force; the Beriev Be-10 Mallow, a twin-jet flying boat used in the Soviet Naval Fleet — a potential menace to our Polaris submarine; and the MIG 15, of which over 15,000 have been built — more than any other jet fighter in the world. There are also chapters on aircraft which have made famous long distance flights, such as the ANT-25 which flew Moscow to California non-stop in 62 hours in July 1937; and the many Russian polar flights. A chapter on famous historical aircraft includes the Sikorsky "Illya Mourometz" in 1913, and the monoplane ANT-20 "Maxim Gorky" designed by Tupolev in 1934, which weighed 58 tons and had eight 875 hp engines, two of them in tandem on top of the fuselage. Another chapter describes the Aeroflot, the Russian State airline, which may be called the biggest in the world. At the present time, 2250 aircraft are said to be in Aeroflot use — half of which should be available for military transport duties.

An informative chapter lists the NATO code names given to Russian aircraft. Brief descriptions and some photographs accompany the list of piston-engined fighters, the jet fighters, the piston-engined bombers, the jet bombers, the transport aircraft and civil airliners, the miscellaneous types and the helicopters.

Hugo Hooftman is the best-known Dutch aviation journalist, magazine editor and author of 26 aviation books in Holland.

Sagittarius Rising, by Cecil Lewis, 331 pages. $4.95. Published by Giniger in association with Stackpole Books, Cameron and Kelker Sts., Harrisburg, Pa. 17105.

This is the second edition (the first was published in 1936) of one of the great classic stories of World War I. It is Cecil Lewis' autobiographical account of man's first experiences in aerial combat. At a time when even a simple training mission was an experience in itself, the excitement of these thrilling dog fights is recounted by one of the pioneers. Cecil Brown joined the Royal Flying Corps at the age of 16, and two years later saw flying over the battlefields of the Somme. He managed to survive three separate operational tours and participated in the aerial defense of London. As a test pilot he also flew almost every type of aircraft then in service with the R.F.C.

Brown's exploits and those of other aces such as Ball and Guynemer are vividly portrayed. Lewis' style is pleasant, making for easy reading. George Bernard Shaw says of him: "He is a thinker, a master of words and a bit of a poet." Of **Sagittarius Rising,** Shaw also has high praise: "This is a book everybody should read."

Airliners of the World, by Len Morgan; **Fighter Aircraft of the United States,** by Terry Morgan; **Bomber Aircraft of the United States,** by Terry Morgan; all 8½" x 5½", 96 pages. $1.95 each. Arco Publishing Co., 219 Park Ave. S., New York, N.Y. 10003.

These three attractive booklets are part of a recently published series. The profuse illustrations, many full page, show the aircraft to full advantage.

In **Airliners of the World** will be found

(*Continued on page 72*)

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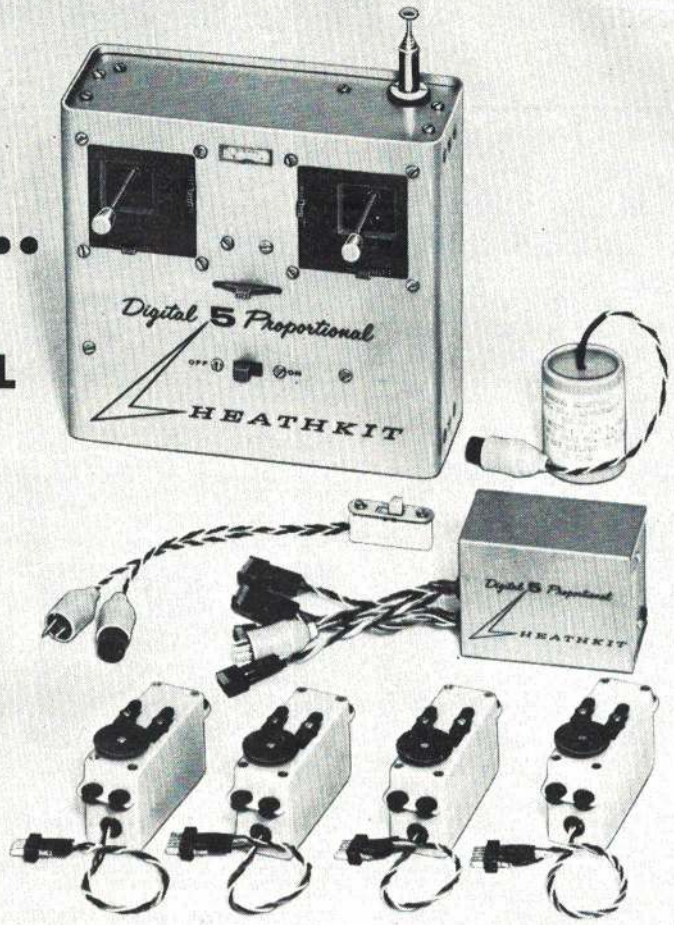

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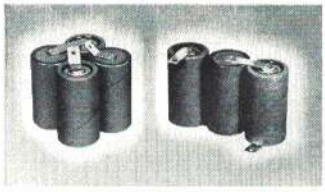

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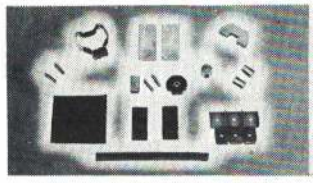

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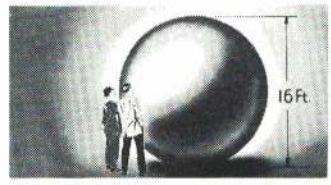

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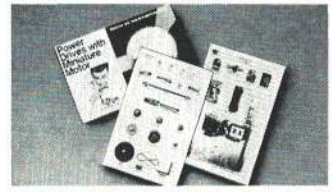

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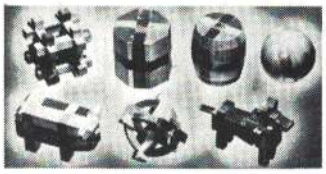

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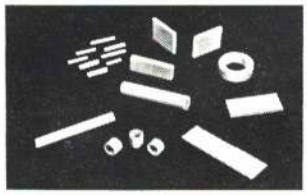

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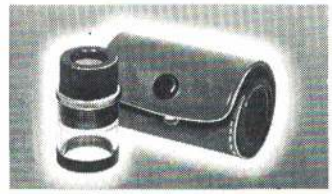

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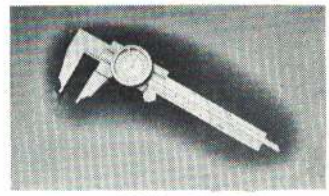

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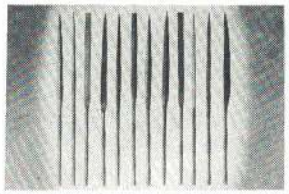

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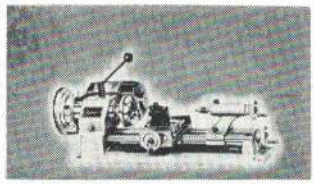

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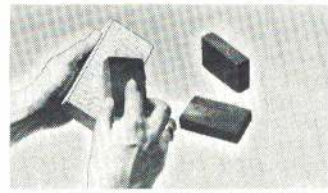

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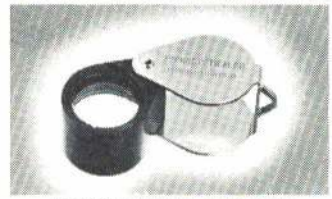

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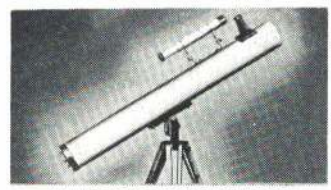

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...on the international scene

They came to Mankato

Vice President Hubert Humphrey was on hand to award the championship prizes at the U. S. model rocketry "Nationals" last August — first time ever in this country that a government official of such high rank participated in an aeromodel event. The occasion was the awards banquet of NARAM-9, the ninth annual meet of the National Association of Rocketry at Mankato State College, Minn., as Charles Duelfer, 16, of Stamford, Conn., was presented the Junior National Championship trophy. Shaking hands with the champ is Leister Graffis, president of the Bendix Field Engineering Co., a principal sponsor of the meet. Also enjoying the show is R. V. Mrozinski, left, staff member of President Johnson's National Aeronautics and Space Council. For a look at what else went on during the meet's four days of competition, see further details in Countdown's complete report, p. 42. Also observing the meet at Mankato were several representatives of NASA, the U. S. space agency, with a view toward possible hosting next year at the Manned Spacecraft Center in Houston, Tex.

Sailplanes over Sazena

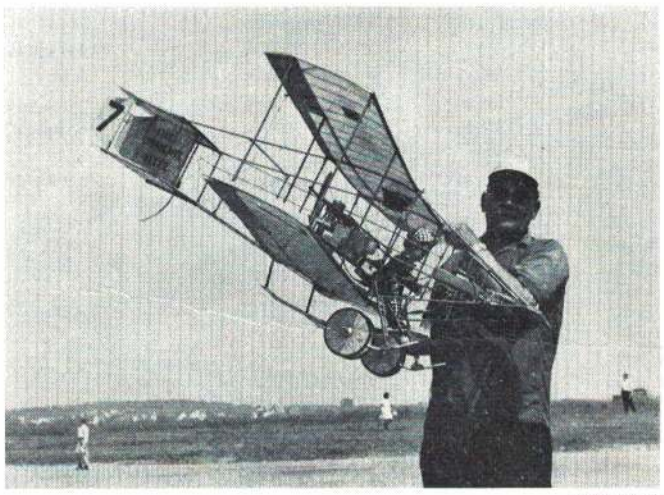
Two of many Nordic type A-2 gliders which flew at the Free Flight world championships in Sazena, Czechoslovakia last August are shown above. Still on the towline is the model of U. S. team member Hugh Langevin. The grace and serenity of sailplane flying has led to the use of the words "Silent Plane Meet" to describe gatherings of soaring enthusiasts. Under rules of the Federation Aeronautique Internationale the towline used to launch Nordic gliders is limited to 50 meters (164 ft.) in length. Maximum weight allowed is just under one pound (14.5 oz.). The three-man team from Czechoslovakia won the 1967 championship. Meet placings and extensive photo coverage was provided in last month's Model World section. The next world championships for Nordics is scheduled for 1969, with Spain as tentative host.

Otakar Saffek

Martin Dilly

Powered by a Windmill

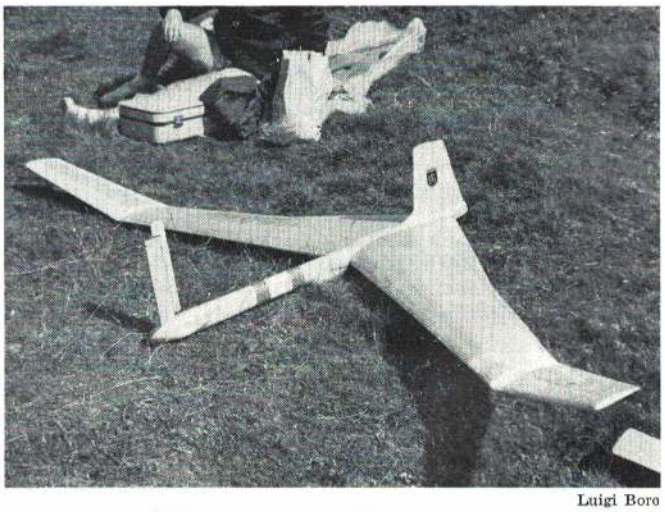
This compressed-air driven model dates back almost 40 years but it's not grounded yet. The model is part of a modern collection of antiques which are intended to be flown. Lt. Commander A. Greenhalgh of Berkshire, England, is the collector and also the builder of many replicas of famous old models. The 1920 Fairy Queen, however, is the original model, built by D. A. Pavely. It weighs 4¼ lbs. and has a wingspan of just over 7 ft. The engine is a three-cylinder rotary valve type of ⅝" bore and ¾" stroke, which swings a 24 in. diameter prop. A compressed air tank 27 in. in length and four in. in diameter is filled to a normal takeoff pressure of 150 lbs. per sq. in. for flights which average one-and-a-half minutes. Bamboo, hardwoods and wire bracing are used extensively in the construction and the model is covered with oiled silk. The collection project also includes the filming of models in flight. Currently being sought are drawings of Joe Erhardt's 1930 and '31 Wakefield winner.



Frank Mock

RC at Weisbaden

At a scale model meet held last June at Weilbach, Germany, near Weisbaden, a Curtiss 1905 pusher was entered by its builder, Hans Wilhelm Knaf. In the famous movie "Magnificent Men and Their Flying Machines" the Curtiss was known as the Phoenix Flyer and Hans' craft was modeled after the movie version. A Super Tigre 56 powered the model and German-made Simprop proportional radio gear was used for control. Flying was done by Germany's Junior Multi Champ, Heinz Elsasser, and was good enough to win second place. At least four of the winning models were of U. S. aircraft and several were built from American kits. Scale interest in Germany is high and there is an effort underway to include the category as an official event at the RC world championships which is scheduled for Germany in 1969.



Luigi Boro

Its nose knows

This tailless model flew very well in Italy last July during the Europa Cup slope-soaring competition held at Monte Tomba. The swept forward wing design showed good longitudinal stability and tracked into the wind just like more conventional models. To aid flight a magnetic or compass steering system is utilized to operate the rudder which is mounted above the nose boom. Compass steering is popular in Europe and official rules for this type of model have been adopted recently by the Federation Aeronautique Internationale. It is anticipated that the Europa Cup event, which has previously been limited to Austria, Germany, Switzerland and Italy, may develop into an official FAI International competition. At next year's Europa Cup meet, scheduled for Spitzerberg, Austria, more extensive invitations are being issued.

Scale at the Smithsonian

One of the most outstanding models in the great collection of the Smithsonian Institution in Washington, D. C., is this one-tenth scale version of the 1911 Johnson monoplane. Authenticity of the model is assured by an unusual circumstance — it was built by the designers and builders of the original airplane! The model was constructed in 1959 by Louis and Harry Johnson of Terre Haute, Ind., who then donated it to the Smithsonian. The Johnson brothers are also well-known throughout the world for the thousands of boats powered by outboard motors which bear their name. The model is typical of the extremely high standards of craftsmanship required of Smithsonian models. Attention to detail is shown by rigging which includes real turnbuckles, spoked wheels, chain drive in the control system. No deadlines plague the modeler who builds for the museum — he is not expected to present his creation until he is ready for critical evaluation by museum experts. This is why the museum has a reputation for quality. That reputation also involves photography, as indicated by the excellence of this photo by the staff of the Smithsonian's National Air and Space Museum.

model world
...on the international scene

Little Luftwaffe

An Air Force officer who has assembled an armada of over 200 model aircraft has also become recognized as an authority on the German Luftwaffe. He is Donald E. Evett, shown on the right discussing one of his many versions of the Messerschmitt 109 aircraft with a German pilot, Major Wilhelm Klapper, who flew the real fighters in World War II. At least 16 of Evett's 109's are shown in the photo, but he has built over two dozen and he is credited with having the world's largest collection of models of this airplane. Evett is a specialist in markings and color and his research in these areas has led to modifications by model kit manufacturers of color schemes and decals to agree with his findings. The uniqueness of his collection, and subsequently an interview on Radio Free Europe some years ago, has resulted in a vast correspondence with modelers in many countries. The correspondence effort in itself has absorbed much of Evett's spare time effort. When he can work on models he averages about two weeks time to assemble and paint each, using an hour or two at a time. Evett has been building models since he was a young boy in the Pacific Northwest. He has continued steadily throughout a career which has included being commanding officer of the West coast headquarters of the Air Force's Communications Services. Collection represents over ten years of spare time work.

USAF photo

Cleveland Press

Special award for best Navy model

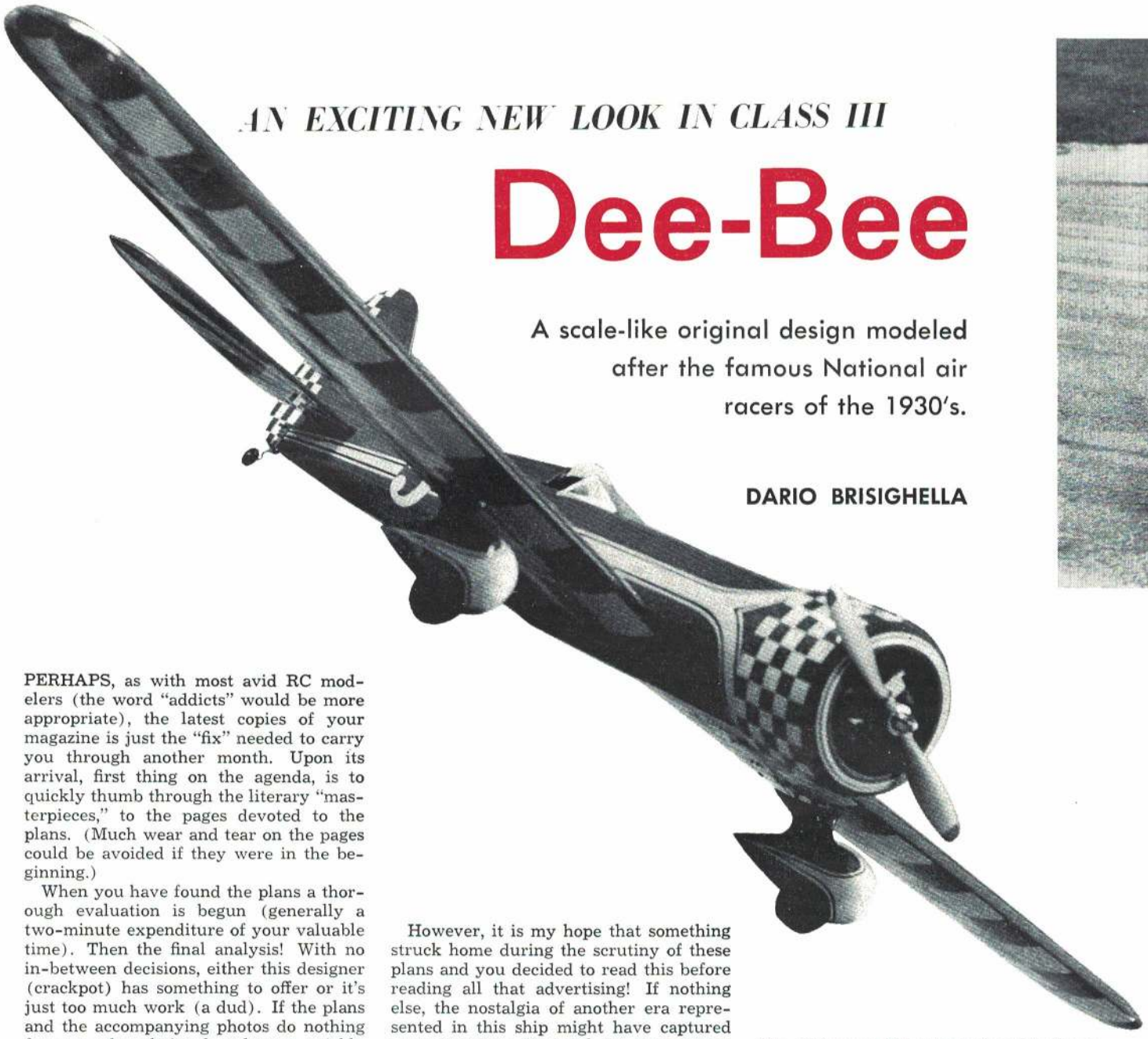
Each year since 1961, at Cleveland, Ohio, the Ellyson Award has been presented for the best scale model of a U. S. Navy type, at the annual National Plane and Space Model Show. The award was originated by Dr. Paul Garber, shown at left, Curator of the Smithsonian Institution's air museum. It has been sponsored by the Grumman Aircraft Engineering Corp., maker of many famous Navy aircraft. The award is named after the first U. S. naval aviator and is given for superior authenticity and craftsmanship. The 1965 winner is shown holding his model which is a special Navy ambulance version of the famous DH-4 airplane of World War I. He is Joseph Birchacek of Ohio, a winner of numerous scale model competitions. His skill is further attested to by the fact that one of his models was accepted by the Smithsonian for museum display. The Ellyson award will be presented again at the 1968 show in Cleveland next April. There are also discussions underway to extend the award to a possible twice a year presentation by including the best Navy scale model at the Navy-hosted annual National Model Airplane Championships. Officials of the Smithsonian and the Academy of Model Aeronautics are cooperating on this project.

AN EXCITING NEW LOOK IN CLASS III

Dee-Bee

A scale-like original design modeled after the famous National air racers of the 1930's.

DARIO BRISIGHELLA



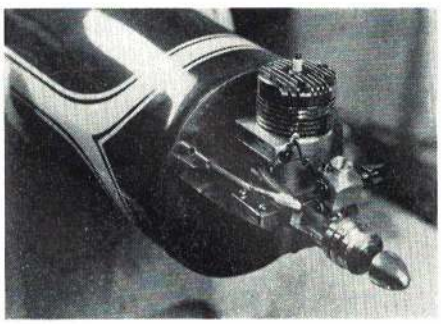
PERHAPS, as with most avid RC modelers (the word "addicts" would be more appropriate), the latest copies of your magazine is just the "fix" needed to carry you through another month. Upon its arrival, first thing on the agenda, is to quickly thumb through the literary "masterpieces," to the pages devoted to the plans. (Much wear and tear on the pages could be avoided if they were in the beginning.)

When you have found the plans a thorough evaluation is begun (generally a two-minute expenditure of your valuable time). Then the final analysis! With no in-between decisions, either this designer (crackpot) has something to offer or it's just too much work (a dud). If the plans and the accompanying photos do nothing for you, a few choice thoughts are quickly aimed at the editor for wasting another issue! The designer's article is left to be read after everything else (including the advertising), or better yet for some other day — then only to see what some of his (hairbrain) ideas are, or whose article he may be accused of stealing them from.

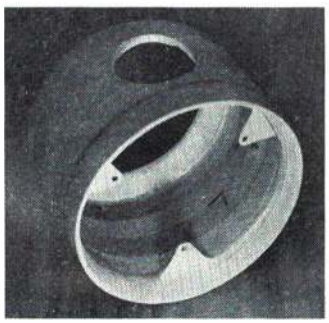
However, it is my hope that something struck home during the scrutiny of these plans and you decided to read this before reading all that advertising! If nothing else, the nostalgia of another era represented in this ship might have captured your attention. National Air Race names like Thompson, Bendix, and Greve, of the 1930's come to mind. And men and planes that made headlines: Holman, Laird, Doolittle, Gee-Bee, Wedell, Howard, Turner, Whitman, Chester, and many more.

The Dee-Bee is a Class III job with a personality of its own. I think it scale-like. It is more Thompson than Goodyear in appearance.

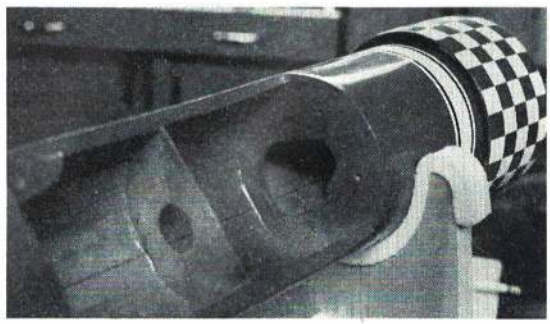
Do miniature Goodyear racers leave you cold? Too much work? Not enough local interest — aside from the ideas of flying, stalling, and landing or crashing all at the same (100 mph) speed? So how about pylon racing sort of unlimited fashion "National Air Racers?" Dee-Bee



A neat-looking front end. Inside the cowl a beam-mounted Enya .60 TV. Note optional polished-aluminum firewall face.

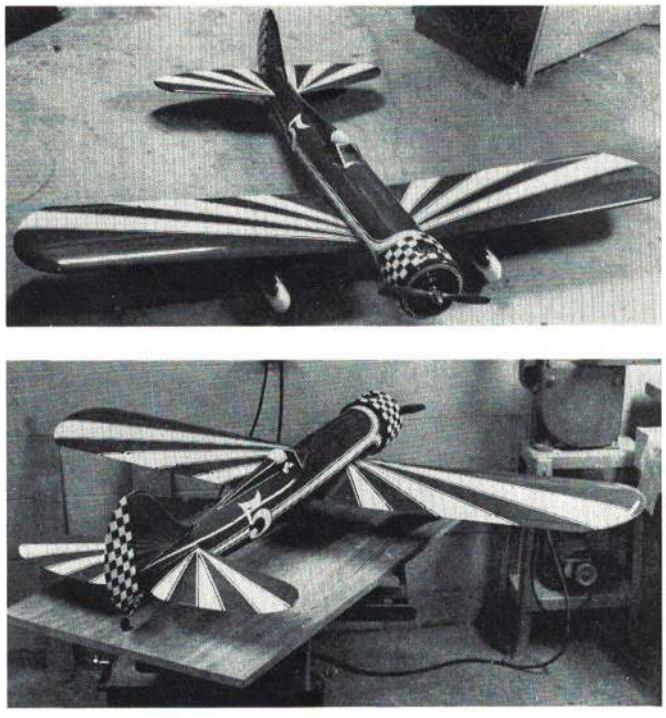


The cowl is made up with cross grained laminations of ¼ in. balsa. Interior is epoxied.



Not really that much more work in a circular cross-section using ¼ in. sides and planking. Equipment compartment could be called "space unlimited."

Dario proudly displaying his Dee-Bee and Vespa designs. These models have the same aerodynamic setup. The shape and paint scheme really make them look different.



From any angle this machine seems real. Yet it's a synthesis of several famous Thompson, Bendix, and Greve Trophy racers. Imagine the yards of masking tape used in the paint scheme!

(sorry Don Brown, but I have the same initials) was not designed with this in mind, but it has some merit, as well as size, that many multi-flyers are accustomed to. The fuselage will accept any equipment (even your tool box); nimble fingers are not required for equipment installation.

Dee-Bee is a scale-like composite of many great National Air Racers. The 1929 Thompson Trophy winner, Doug Davis's Travel Air Mystery ship; the 1931 winner, the Granville Gee-Bee; and the 1933 Thompson and Bendix Trophy winners; the Wedell-Williams Special. (Source, National Air Race Sketch Book, Published by Floyd Clymer, $2.00.) A little of each and, just to be sure of its flying ability, the airfoil and moments from my contest ship, Vespa (A.M. April 1967), and, presto, an instant Dee-Bee. It not only is a crowd pleaser, but a real performer as well — but don't try to convince someone it's a modified Vespa.

It is a known fact that about 80% of today's RC'ers are not contest minded, but rather fall into the category of sport flyers, many of whom are more than adequate builders and flyers. This model offers some qualities for both. For contest work a trike gear is hard to beat, but those hard-nosed judges just might overlook some of those ground handling items for a change, and score you a little higher for your effort against those trike jobs. In any event, the conventional gear jobs offer a lot of self-satisfaction and pride.

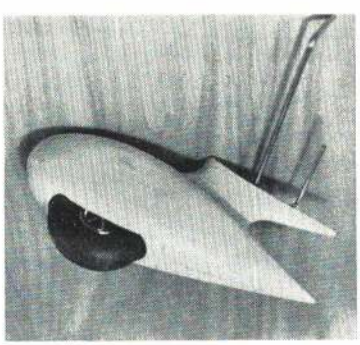
The first real push to build Dee-Bee came from my good friend, John Kozieja, who was never without the same old comment, "when you've seen one Class III ship you've seen them all." I must concur he's almost right but with Dee-Bee he has changed his mind. I'm sure you will agree with him too. I saved all the prototype work by using my Vespa for the platform of Dee-Bee. All I needed was a new shape. (How original can you get; they all need a wing, stab, fin, etc.) And now after flying Vespa for over two years, I'm done changing. Vespa flies very well, so why make Dee-Bee different? Happily, this decision paid off.

You may wonder about the all-sheathed surfaces, the extra weight. Well, many of the National Air Racers were all plywood or aluminum covered. Also I hate sanding dope on silk over open structures. Sure, weight can be saved on an open structure. Also money and, with the cost of balsa today, you could buy black walnut for less. With the space available in the tank compartment you could almost take a crack at the endurance record, and a good definition for the radio-servo compartment would be "space unlimited."

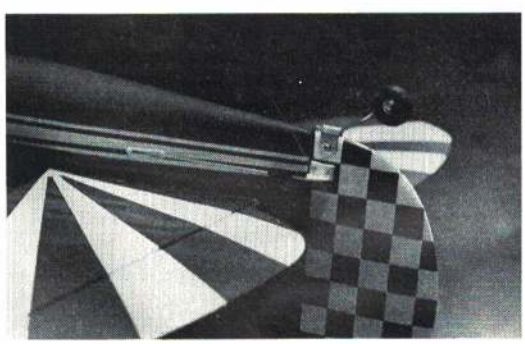
I spent more time on the drawing board, working out the main gear details, than on the building board. To prevent the pants and fairings from poking holes through the bottom of the wing, there are the extra half of a landing gear mount, and the strut braces. The flex needed for really hard landings, is not as great as normally had from single L.G. struts, but with the ability to hold the nose high for three-point landings, and the slight outboard flexing of the gear and shock absorbing wheels, no problems have been encountered. The gear, pants, and fairings really finish off the model. The open cockpit, large circular cowl, and classic paint schemes add to the realism. As to the ailerons, suit yourself. I prefer strips.

Fuselage construction varies from most cylindrical types because I don't enjoy strip planking. Who does? With the ¼" basic sides and the top and bottom blocks, the planking is kept to a minimum. More importantly, these sides and blocks aid alignment and speed construction. Excepting the cowl, the fuselage builds quite easily. Let me add now that Dee-Bee was designed for flying, not crashing,

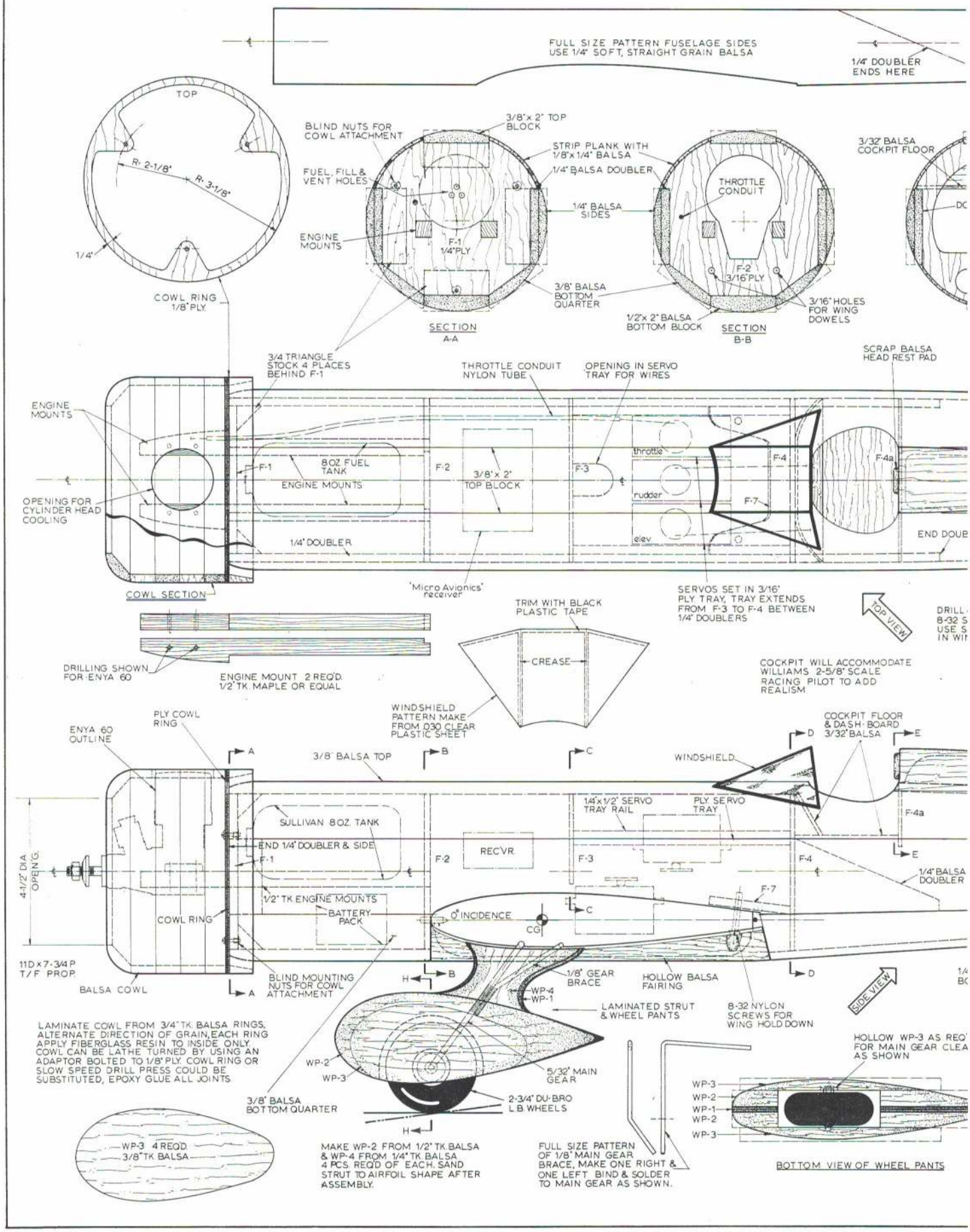
Continued on page 66

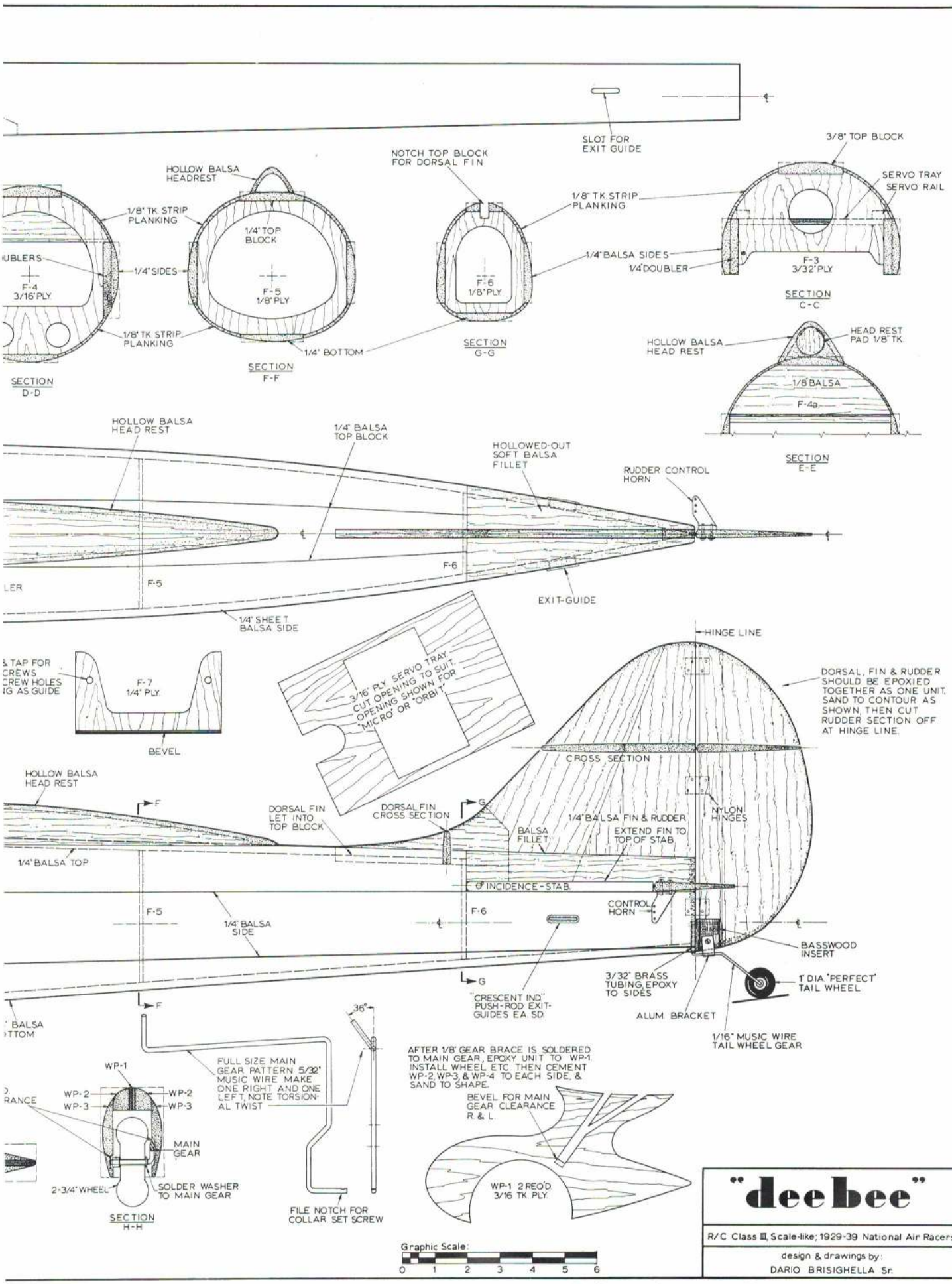


The Low Bounce Du-Bro tires are a must with pants. To prevent fairing poking wing, use two gear wires.



Very simple tailwheel installation with inserted tube-bearing forward of the hinge line of the rudder. Note use of pushrod exit guide.


FULL SIZE PATTERN FUSELAGE SIDES
USE 1/4" SOFT, STRAIGHT GRAIN BALSA
1/4" DOUBLER ENDS HERE
TOP
R- 2-1/8"
R- 3-1/8"
1/4"
COWL RING 1/8" PLY
BLIND NUTS FOR COWL ATTACHMENT
3/8"x 2" TOP BLOCK
STRIP PLANK WITH 1/8"x 1/4" BALSA
1/4" BALSA DOUBLER
FUEL FILL & VENT HOLES
1/4" BALSA SIDES
ENGINE MOUNTS
F-1 1/4" PLY
3/8" BALSA BOTTOM QUARTER
SECTION A-A
THROTTLE CONDUIT
F-2 3/16" PLY
1/2"x 2" BALSA BOTTOM BLOCK
3/16" HOLES FOR WING DOWELS
SECTION B-B
3/32" BALSA COCKPIT FLOOR
3/4 TRIANGLE STOCK 4 PLACES BEHIND F-1
THROTTLE CONDUIT NYLON TUBE
OPENING IN SERVO TRAY FOR WIRES
SCRAP BALSA HEAD REST PAD
ENGINE MOUNTS
F-1
8 OZ FUEL TANK
ENGINE MOUNTS
F-2
3/8"x 2" TOP BLOCK
F-3
throttle
rudder
elev
F-4
F-7
F-4a
OPENING FOR CYLINDER HEAD COOLING
1/4" DOUBLER
END DOUB
COWL SECTION
"Micro Avionics" receiver
SERVOS SET IN 3/16" PLY TRAY, TRAY EXTENDS FROM F-3 TO F-4 BETWEEN 1/4" DOUBLERS
TOP VIEW
DRILL 8-32 S USE S IN WI
TRIM WITH BLACK PLASTIC TAPE
CREASE
DRILLING SHOWN FOR ENYA 60
ENGINE MOUNT 2 REQ'D. 1/2" TK. MAPLE OR EQUAL
COCKPIT WILL ACCOMMODATE WILLIAMS 2-5/8" SCALE RACING PILOT TO ADD REALISM
WINDSHIELD PATTERN MAKE FROM .030 CLEAR PLASTIC SHEET
PLY COWL RING
ENYA 60 OUTLINE
A
3/8" BALSA TOP
B
C
D
E
WINDSHIELD
COCKPIT FLOOR & DASH BOARD 3/32" BALSA
1/4"x1/2" SERVO TRAY RAIL
PLY SERVO TRAY
F-4a
SULLIVAN 8 OZ. TANK
END 1/4" DOUBLER & SIDE
F-1
F-2
REC'VR.
F-3
F-4
1/4" BALSA DOUBLER
4-1/2" DIA. OPENING
1/2" TK. ENGINE MOUNTS
BATTERY PACK
COWL RING
0° INCIDENCE
CG
F-7
11D x 7-3/4 P T/F PROP
BALSA COWL
BLIND MOUNTING NUTS FOR COWL ATTACHMENT
1/8" GEAR BRACE
HOLLOW BALSA FAIRING
WP-4
WP-1
LAMINATED STRUT & WHEEL PANTS
8-32 NYLON SCREWS FOR WING HOLD DOWN
SIDE VIEW
LAMINATE COWL FROM 3/4" TK. BALSA RINGS, ALTERNATE DIRECTION OF GRAIN, EACH RING APPLY FIBERGLASS RESIN TO INSIDE ONLY. COWL CAN BE LATHE TURNED BY USING AN ADAPTOR BOLTED TO 1/8" PLY COWL RING OR SLOW SPEED DRILL PRESS COULD BE SUBSTITUTED, EPOXY GLUE ALL JOINTS
WP-2
WP-3
5/32" MAIN GEAR
3/8" BALSA BOTTOM QUARTER
2-3/4" DU-BRO L.B. WHEELS
HOLLOW WP-3 AS REQ' FOR MAIN GEAR CLEA AS SHOWN
WP-3
WP-2
WP-1
WP-2
WP-3
WP-3 4 REQ'D. 3/8" TK. BALSA
MAKE WP-2 FROM 1/2" TK. BALSA & WP-4 FROM 1/4" TK. BALSA 4 PCS. REQ'D OF EACH. SAND STRUT TO AIRFOIL SHAPE AFTER ASSEMBLY.
FULL SIZE PATTERN OF 1/8" MAIN GEAR BRACE, MAKE ONE RIGHT & ONE LEFT. BIND & SOLDER TO MAIN GEAR AS SHOWN.
BOTTOM VIEW OF WHEEL PANTS

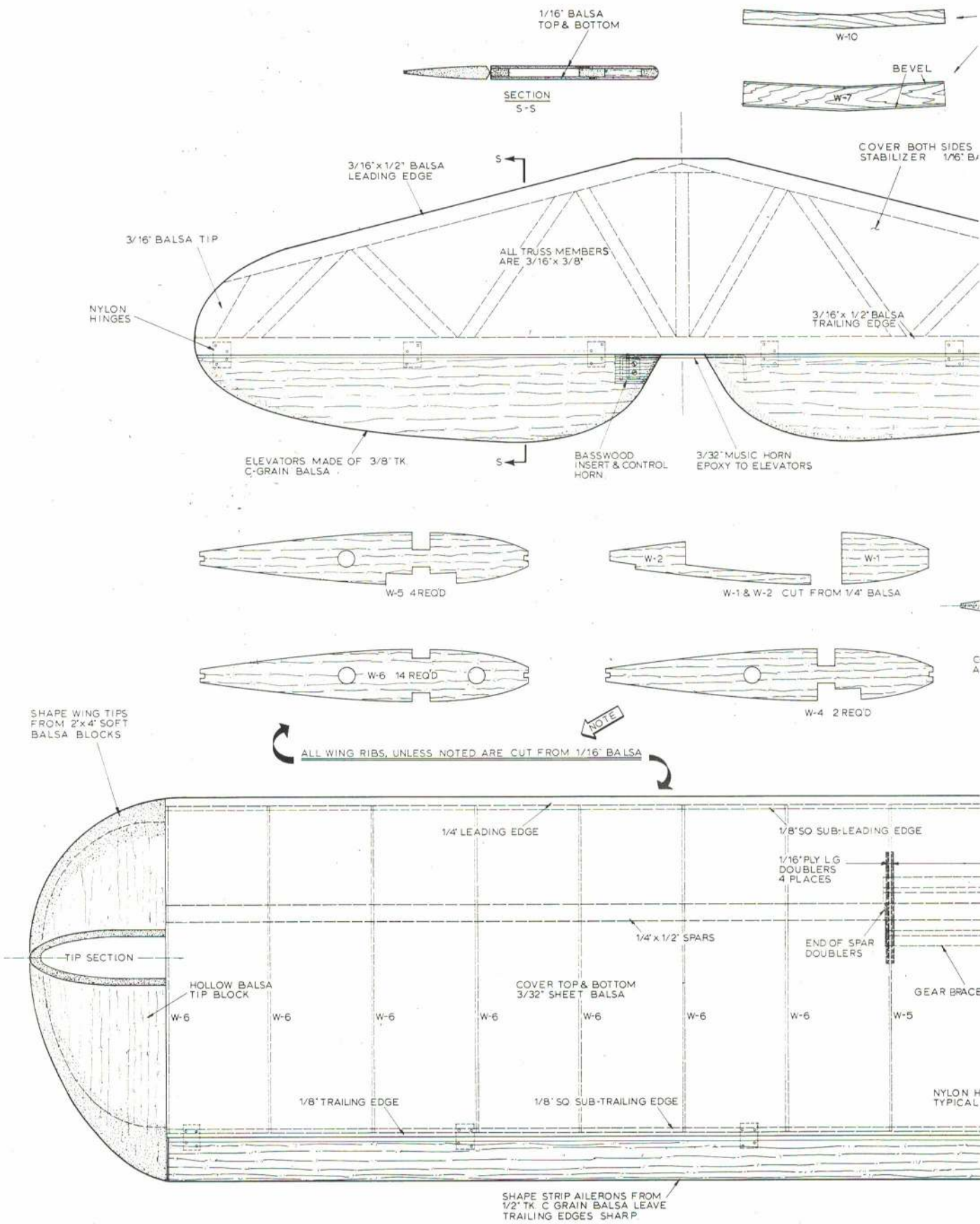


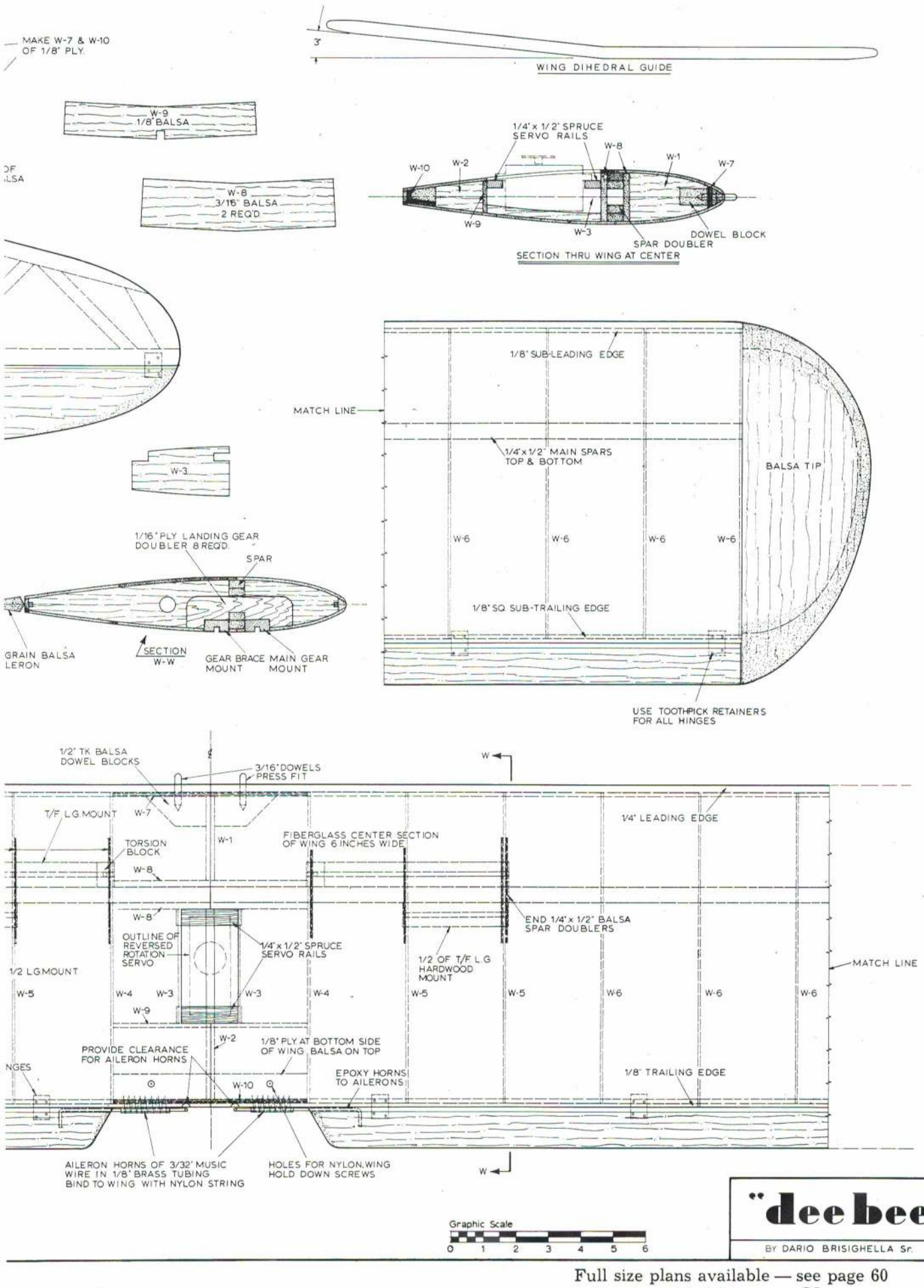
"deebee"

R/C Class III, Scale-like; 1929-39 National Air Racers

design & drawings by:
DARIO BRISIGHELLA Sr.

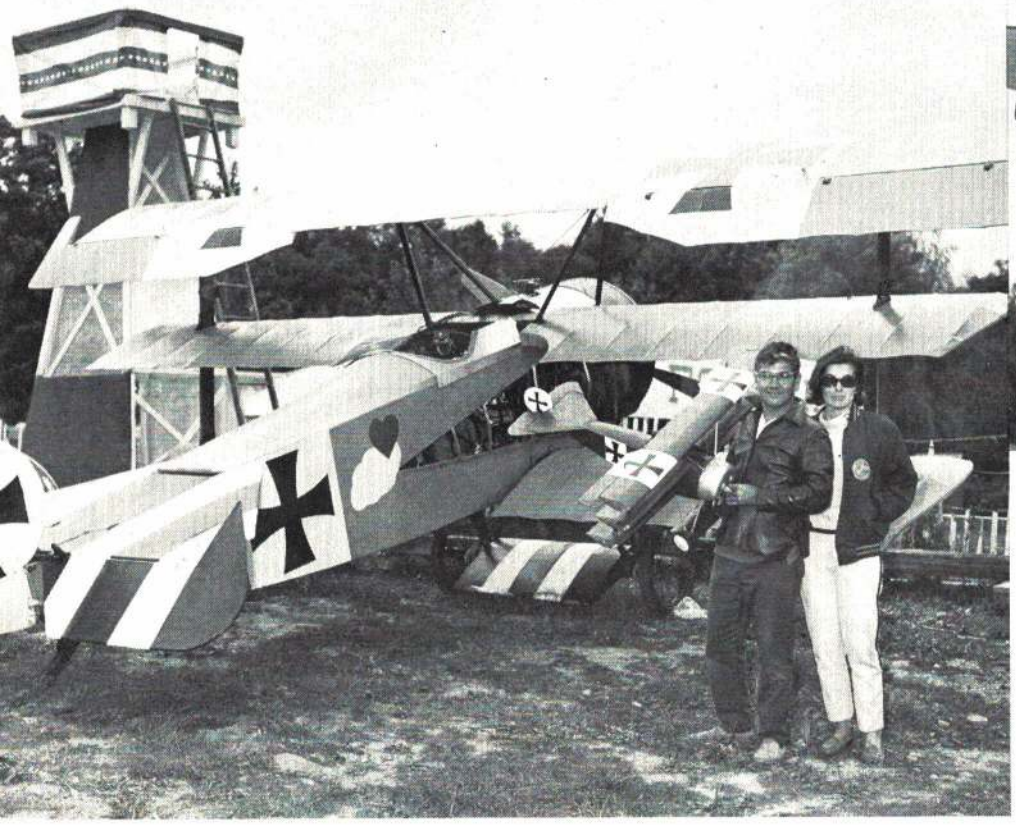
Full size plans available — see page 60


1/16" BALSA TOP & BOTTOM
SECTION S-S
W-10
BEVEL
W-7
COVER BOTH SIDES STABILIZER 1/16" BA
3/16"x1/2" BALSA LEADING EDGE
S
3/16" BALSA TIP
ALL TRUSS MEMBERS ARE 3/16"x 3/8"
NYLON HINGES
3/16"x 1/2" BALSA TRAILING EDGE
ELEVATORS MADE OF 3/8" TK. C-GRAIN BALSA
BASSWOOD INSERT & CONTROL HORN
3/32" MUSIC HORN EPOXY TO ELEVATORS
W-5 4 REQ'D
W-2
W-1
W-1 & W-2 CUT FROM 1/4" BALSA
W-6 14 REQ'D
W-4 2 REQ'D
SHAPE WING TIPS FROM 2"x 4" SOFT BALSA BLOCKS
NOTE
ALL WING RIBS, UNLESS NOTED ARE CUT FROM 1/16" BALSA
1/4" LEADING EDGE
1/8" SQ SUB-LEADING EDGE
1/16" PLY LG DOUBLERS 4 PLACES
1/4" x 1/2" SPARS
END OF SPAR DOUBLERS
TIP SECTION
HOLLOW BALSA TIP BLOCK
COVER TOP & BOTTOM 3/32" SHEET BALSA
GEAR BRACE
W-6
W-5
1/8" TRAILING EDGE
1/8" SQ SUB-TRAILING EDGE
SHAPE STRIP AILERONS FROM 1/2" TK. C GRAIN BALSA LEAVE TRAILING EDGES SHARP



Full size plans available — see page 60

Crosses and Roundels



Nick Ziroli's magnificent SE-5. Careful attention to detail makes it special. It has the same number of ribs as real one.

The large and small of it: Lou Perretti and wife Nancy with this true-scale DR-1 Fokker Triplane. S.T. .60 RR, Logictrol, and flies like the big one. Lou probably flew more than anyone else, too.

World War I Scale Contest at Cole Palen's aerodrome was a rousing success.

The Sopwith Triplane with S.T. .60 and ACL radio flew exceptionally well for Bill Underkofler. Lots of ailerons!

BILL COONS

Photographs by the author

THE action was at Cole Palen's W.W.I airport, where the boys from the Poughkeepsie IBM Radio Control Club on Sept. 23 staged a one-day affair destined to become an annual event. Scale ships by the carload kept pouring in from all over the northeast for the first RC scale contest devoted exclusively to W.W.I aircraft.

It was without doubt the finest collection of vintage model aircraft ever assembled at one time. The authenticity and attention to detail were truly amazing, and as each contestant flew his turn, the applause seemed to place it far above the usual stunt pattern event seen at most contests. This is real spectator sport.

The landing strip was scale to the extent of real stones, rough ground, and a rock or two. Only the large scale wire wheels made it possible to take off and land safely. Several events were offered and most contestants flew in more than one. Included were: scale, W.W.I maneuvers, team dog fights, balloon busting, bombing and landing skills. The Endicott Aeroguidance Society boys made a clean sweep in the victory column. The Poughkeepsie club was host and did not compete.

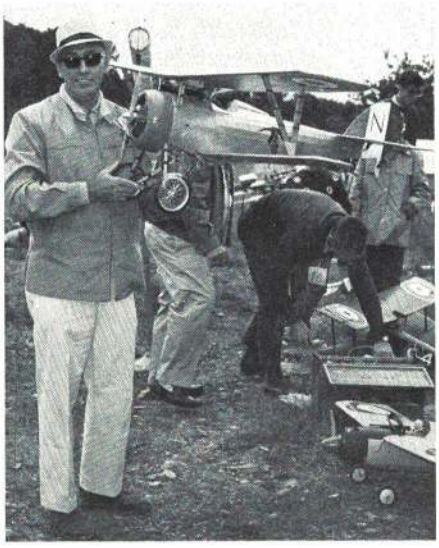
First in scale was Bob Noll, with his Nieuport 27. Bombing and landing skill prize went to Jim Hoover who also placed first in W.W.I maneuvers. The prize for the youngest entrant went to Hale Wallace.

Nick Ziroli's Morane Saulnier turned out to be a real balloon buster. He hit it twice and succeeded in carrying it off for some distance still inflated. Tom Wensel won the worst crash award. Still it wasn't beyond repair.

The real show stopper was the mock aerial dog fight between Hale Wallace's Bristol Bullet and Jim Hoover's Halberstadt. At times they seemed to abandon all thoughts of self preservation and concentrated entirely on making the kill, sometimes only a whisper apart at the breakaway. A real crowd pleaser.

Dick Allen, the contest director, Bruce Blake, and Ed Lorenz, to mention a few, can take a curtain call for this one.

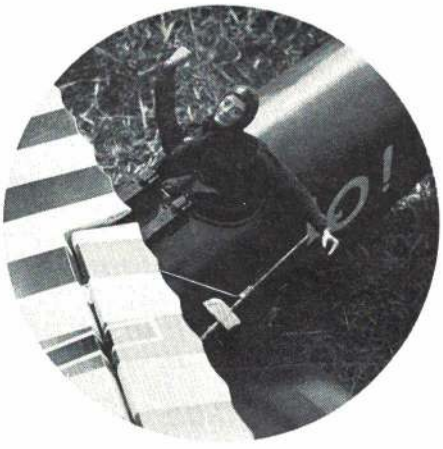
Lou Perretti's Fokker caught an instant before bursting the balloon in that event. It has lots of flying surface area.



Destined soon to be a kit by V.K. Models, the Nieuport 27 by Vern Krehbiel is true masterpiece of modeling — excellent flyer.

RC Columnist Howard McEntee, left, with Cole Palen, who operates the Rhinebeck Aerodrome. He restored the many real WWI airplanes at the field, and put on a real WWI show on Sunday flying those fabulous antiques. Bob Noll, scale winner, on right.

Ralph "Von" Jackson entered a Fokker D-7 equipped with ACL gear and a .60 engine. The model appears to be true scale in its dimensions, but construction simplified.



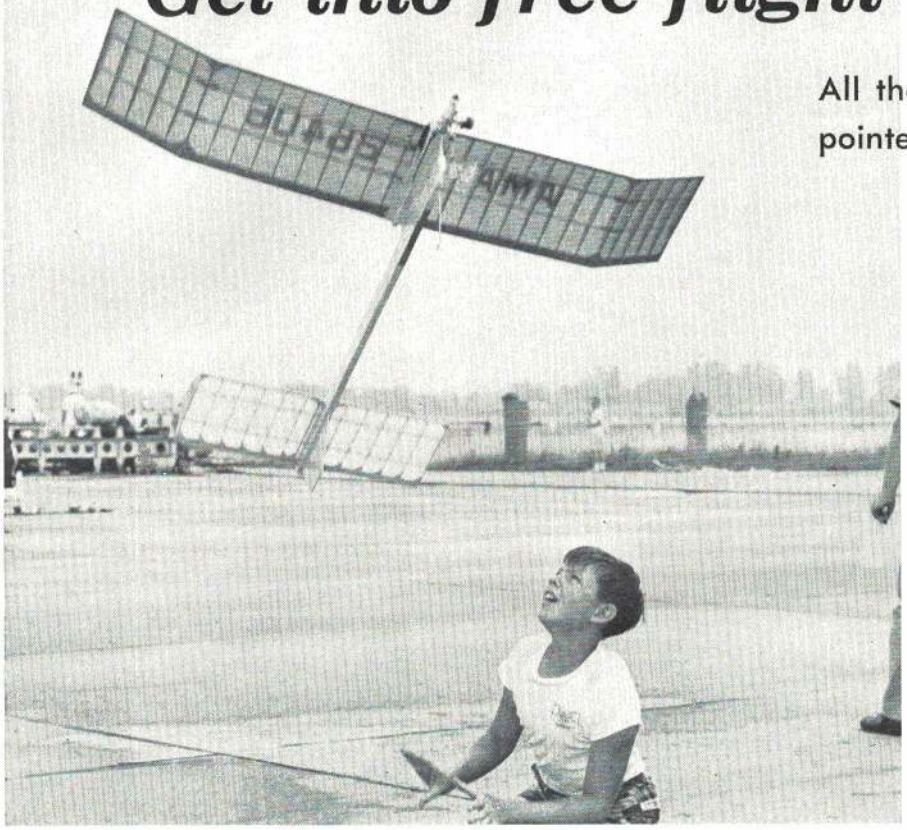
Pilot is "done in" after Tom Wensel's D-7 won the worst crash award.. Wish Snoopy "The Red Baron" was there to see it!

Left to right: Jim Hoover, flying a tough Halberstadt, won the bombing and landing skill event. Bob Noll, first in Scale with a Nieuport 27. Hale Wallace conquered Hoover with a Bristol Bullet in the Dog Fight contest. Many great WWI models were shown and flown. Germany, with most planes, would have won the game.

Ralph and his daughter came to the event dressed in the clothing of WWI vintage — goggles, boots, and all. It takes plenty of time to rig these planes, as this picture suggests.

Joe Tschirgi entered this outstanding Fokker D-8. The camouflage pattern is correct in shape and location of each patch. Hectagons of individually dyed Silkspan! Digimite 4RS on 72 Mhz.

Get into free flight competition



All the basic techniques and many pointers from an expert's experience

BOB STALICK

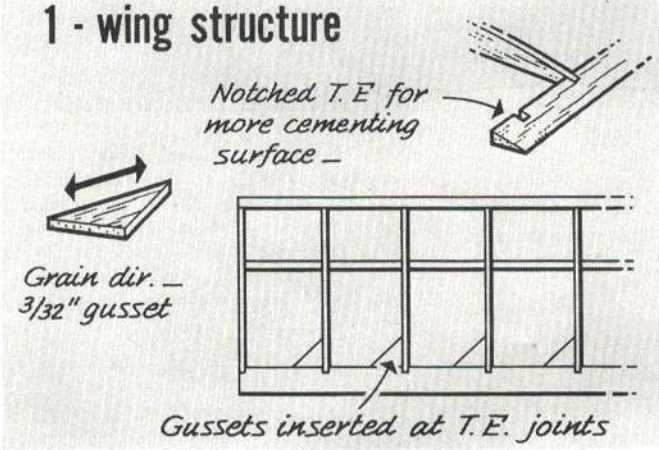
THIS article asks and answers the questions necessary to get you into the air with a contest-winning free flight. If some of the terms are mysterious, you will find a glossary of terms at the end of the article.

Where do I start? You can expect to spend $20 if you buy the "best" new equipment for a ½A contest model. If you already have a suitable ½A engine, the cost might be as low as $5, or less. It all depends on what you already have. Let's assume that you have to start from scratch and that you have a $20 bill.

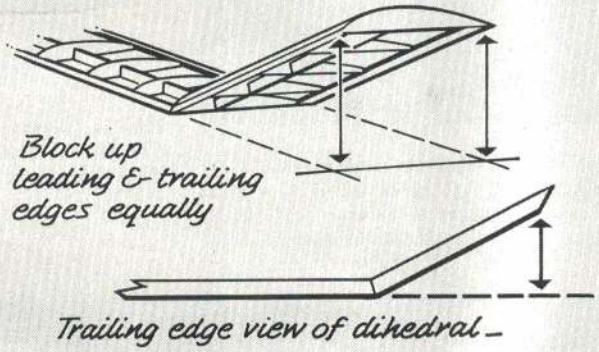
First, we'll want a good contest engine. What kind? Well, after looking at the contest winners columns in the national magazines, we see that practically all of

Young Marty Thompson VTO's a Class B gassie at AMA's Nationals. Ten mad seconds of climb, minutes of quiet gliding.

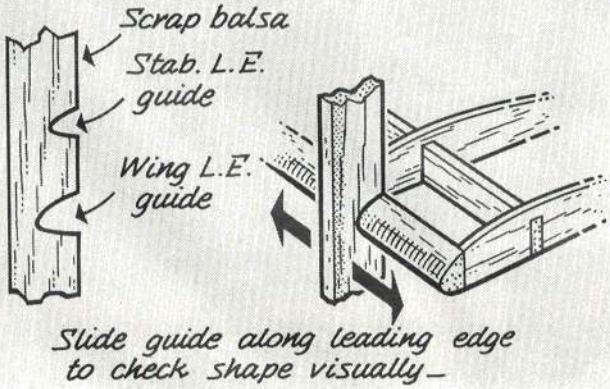
1 - wing structure



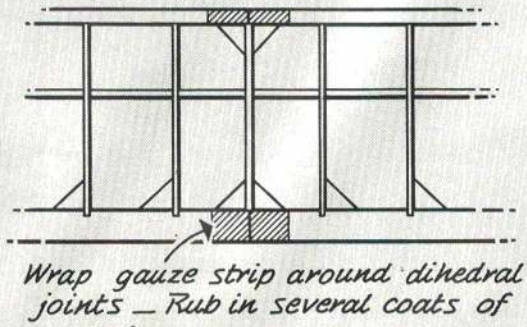
2 - dihedral detail



3 - wing shaper guide



4 - gauzing wing joints



them are using the Tee-Dee .049 — cost $9.95 (plus tax in some places). Next we know that the plane kit must also be a proven winner. Two kits stand out — the Viking and the Starduster. The cost is about the same — $3.50 to $3.95.

A few more things will be needed. First is a timer to shut off the engine, and a fuel tank. A Tatone timer sets us back $4.50 and a Tee-Dee tank mount adds another $1.85. You need glue, clear dope, dethermalizer fuse, perhaps a couple more sheets of Jap tissue (to replace what you will waste), a propeller (6 in. diameter by 3 in. pitch), and fuel.

Building: Clear a space on your work bench (or kitchen table, if it's O.K. — be sure to put a building board down under the plans). Read the plans again, *carefully* this time. Read everything! When the plans are thoroughly understood, carefully cut out all the die-cut parts and pieces that are printed. Use a sharp razor or X-Acto knife. Lightly sand off the fuzz on the edges of the cut-out parts.

Pin the plan down to begin construction of the wing. Cover the wing portion of the plan with a sheet of waxed paper, so the glue won't adhere to the plan. Cut off the leading and trailing edge stock, exactly as indicated, and the spar or spars, too. Preglue all joints. By that we mean to put a light coat of glue wherever the ribs join with the other surfaces, and then rub the glue into the wood with your fingers. Do this to all mating parts.

Notch the trailing edge (Sketch 1). Pin the leading edge to the plan, place the spar in position, line up and pin down the trailing edge. After the pre-glue coat is dry, coat with glue all the joints on the rib and slip each one into its place, making certain that they are snugly pushed down, so that the bottom of each touches the plan. Don't add the ribs at the dihedral breaks yet — they are added later. While all of this is drying, cut diagonal gussets and insert along the trailing edge joints (Sketch 1). This gives additional rigidity and helps to counteract warps.

Allow the wing to dry at least several hours, preferably overnight, still fastened to the plan. If you wish, you can add a fillet of glue to all joints to insure strength. To do this, cut a piece of balsa to a thick point and use this to work the glue around all joints.

The stabilizer is built in the same way as the wing, but don't add gussets along the trailing edge joints, except where indicated. After the wing and stab are completely dry, you are ready to add dihedral and to shape the leading edges.

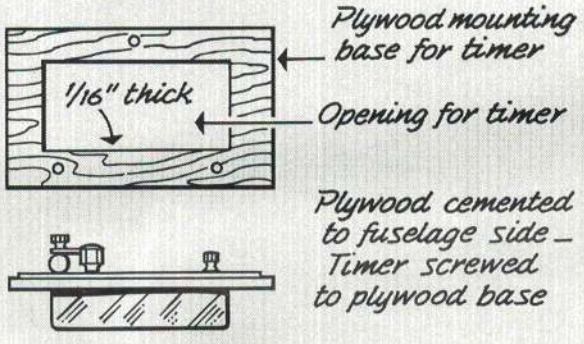
Adding dihedral to wing: Dihedral provides stability in your plane. If you are careful with this step, you will have fewer problems in flying, and fewer warps. Sand a slight angle at the top ends of the leading and trailing edges of your wing where the panels join each other (i.e., where the main panels join to the tips, etc.). Pin the main panels securely to the plan after pregluing all joints. Then, after the glue has dried, add another coat of glue and pin the tip wing sections to the main panels (Sketch 2), blocking up the tips the distance required on the plans. Be sure that the trailing edge half is blocked up the same amount as the leading edge. While this is drying, add the necessary gussets and joint ribs. When this assembly is dry (allow at least several hours), add the dihedral to the center panels — in the same manner as in the tip panels. Again, be certain that both the leading and the trailing edges are blocked up exactly the same amount.

Shaping the leading edges: There is a definite shape prescribed for the wing and stab airfoils. Cut a piece of scrap balsa to this shape (Sketch 3). Carefully carve and sand the leading edges to conform to this shape. Use your scrap balsa guide frequently to check this. When done carefully sand, with extra fine sandpaper, the entire wing and stab structure, removing *all* bumps of glue and balsa. For additional strength, glue a piece of gauze or silk to the dihedral joints on the wing's leading and trailing edges. Rub three coats of glue over it — until it dries to a dull gloss (Sketch 4).

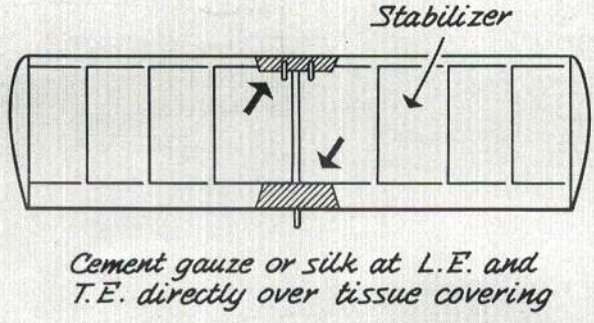
Covering: Covering the wing and stab causes a great concern for most newcomers. It is very easy if you follow these steps:

1) Dope all leading and trailing edges, all dihedral joint and tip ribs, both on the top and bottom. Sand very lightly and dope again. If your model has an undercambered wing (as in the case of the Viking), also apply several coats of dope to the underside of each rib. This predoping gives the tissue something to

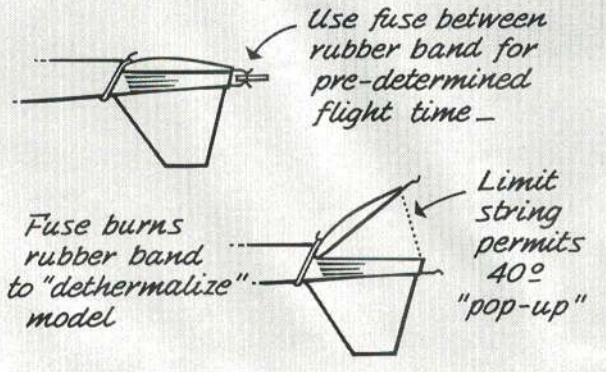
5 - timer mounting detail



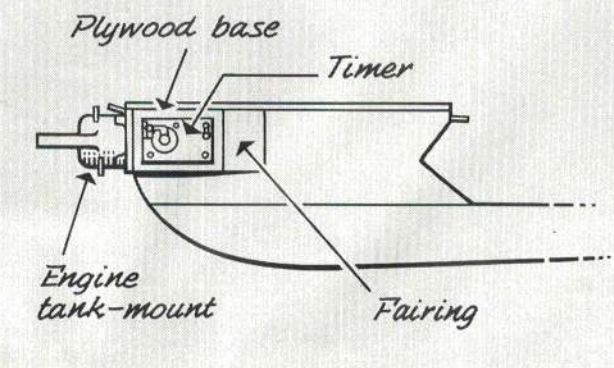
6 - gauzing stab. hooks



7 - dethermalizer limit



8 - timer installation



"grab" onto, stops it pulling away.

2) Cut your tissue so that the grain runs lengthwise (spanwise) with the wing or stab. In order to find the grain of tissue, tear a corner slightly; if you are tearing with the grain, it will be a "straight" tear — if not, the tear will be jagged. Cut the tissue you plan to use at least an inch oversize, so you have some leeway in case of goofs.

3) Always cover the bottom and then the top of the same panel before going to the next panel. Always cover the center panels first.

4) Always dope the leading and trailing edges and the dihedral ribs heavily, then immediately put the tissue over this area. Work out all the large wrinkles by pulling gently and rubbing on the edges of the tissue. Try to pull evenly so the grain remains running *directly* span-wise. This minimizes warpage. It is a good idea to have a bottle of dope thinner nearby along with a brush — just in case you have made a severe mistake in applying the tissue, then you can brush thinner over the offending part, releasing the tissue from the structure.

5) Always lay the tissue evenly on the leading edges first and then pull snugly to the trailing edges. After the dope is fairly dry, dope right through the paper on the leading and trailing edges and the dihedral ribs. If your wing is undercambered, dope through the tissue onto each wing rib bottom. It will be necessary for you to press your finger along this dope line to make the tissue adhere to the underside. After the dope has dried on the bottom of each rib, turn the wing over and add a small bead of dope along each rib bottom where it meets the tissue. This insures that the tissue will not pull away from the frame.

6) After the wing has been covered and has dried, sand the excess paper off carefully and then run your dope brush around the edges to bond the tissue fragments to the wing.

7) Sprinkle water over the entire wing (or stab) and set on a level place to dry. (I use a drawer to allow the wing to set down flat.) This will pull out all the minor wrinkles, and if you set your wing up on its leading edge or on a drawer, it will not warp while drying.

8) Only after the wing (or stab) is completely dry, do you dope it. Usually four or five thin coats of fuel-proof *clear* dope is sufficient. Be sure you have added your AMA numbers to the right-hand top of the wing panel. If you want a high gloss finish, simply keep doping. Some modelers will put on ten or 12 coats of dope, but remember every additional coat will add just that much more weight.

9) Set the wing and stab aside in a level place so that they will "cure" while you construct the rest of your model.

The fuselage: It must be light but strong, therefore pregluing is desirable. Be certain that the wing and stab platforms are level and installed exactly according to plan. The rudder is mounted on the bottom of the fuselage, in the case of the Starduster. Try to align the fuselage so that it is perfectly straight, and care must be taken to see that the rudder is lined up correctly, too.

The motor pod: The motor pod installation is very important. *It must be strong, and exact.*

First: Drill the plywood firewall and mount the nuts (blind nuts are preferred) so that the tank mount can be bolted to it. Check its fit. Make your corrections now. Glue three nuts securely in place.

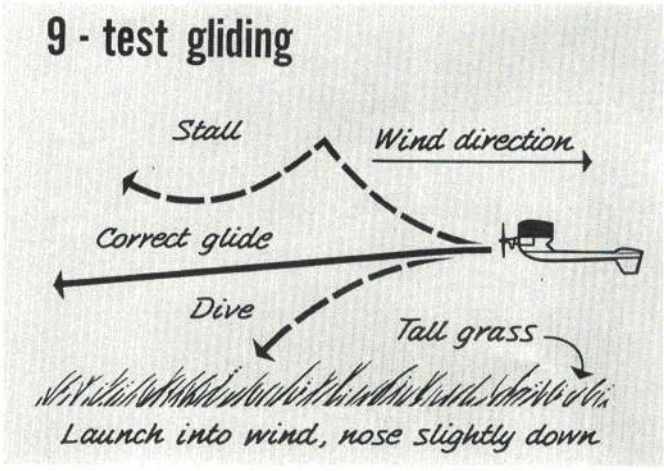
Second: Glue the firewall to the pylon — preglue and use plenty of glue afterwards. Use white glue, if possible, on all hardwood joints. Be sure that the firewall is facing dead ahead with no side, up or down tilt. Reinforce with the gauze inside of the firewall where it joins the pylon, and rub into it several coats of glue.

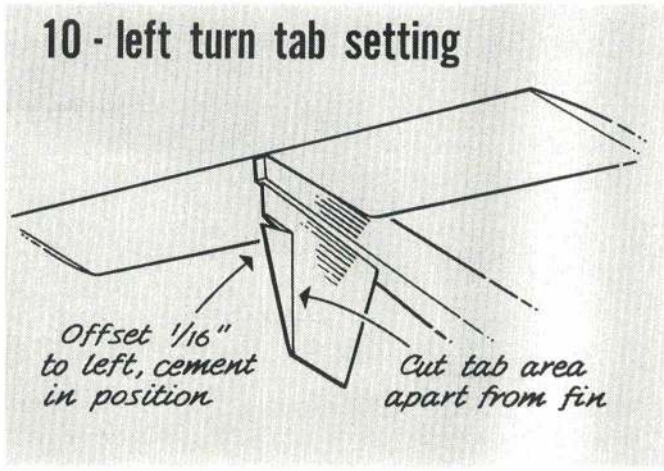
Third: Add the balsa sides, being sure to cut the left side so that it will accommodate the tick-off timer (Sketch 5). Glue on the pod bottoms and end plates.

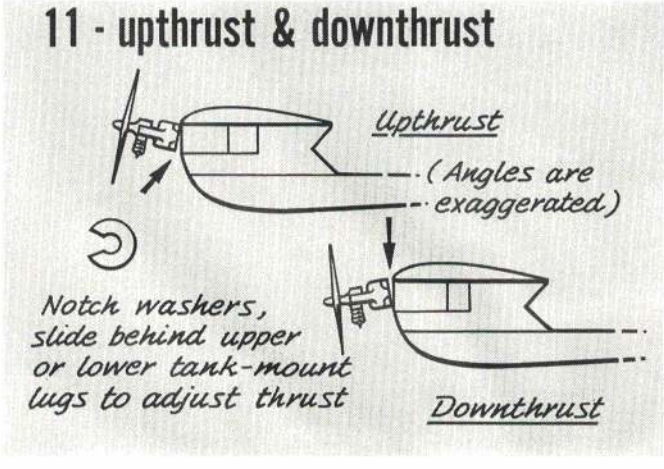
Fourth: Glue a strip of gauze around the entire firewall and then fold it, so that it is also glued to the balsa pod sides and bottom. Rub several coats of cement into the gauze. Allow to dry thoroughly. When doping the fuselage, be certain the firewall area gets six or eight good coats to help seal and fuel-proof it.

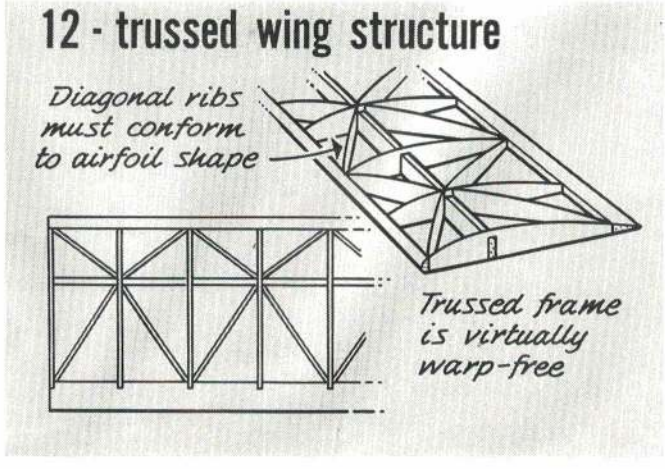
Covering the fuselage: You may not wish to cover the fuselage with tissue, but if you do, you will add considerable strength at only a slight increase in weight. Also,

(*Continued on page 53*)









Aeronca Champion

Over 8,000 of these sport-trainer two-seaters were produced after World War II

PAUL R. MATT

DURING the closing months of World War II a great many aircraft manufacturers turned to the design and construction of a trainer type airplane in anticipation of an overwhelming grass-roots move of Mr. Averageman taking wings. For the most part this dream of grandeur never materialized. Majority of the light, two-place postwar offerings were cleaned up versions of prewar types. While these aircraft were well accepted, none quite received the immediate attention and high praise of the Aeronca Champion.

There are but a few planes that take more of a beating from flyers than the light two-place trainers. Such aircraft must have unique requirements which are not totally necessary in other types. The ideal trainer is inexpensive in initial cost, in maintenance, repair and operation. It must be built strong to withstand wear and tear and its components cannot be too expensive when repair or replacements are necessary. On the other side of the ledger such a plane must be easy to fly, capable of teaching the student the required knowledge of flying. The trainer is basically a simple airplane, a forgiving machine, with enough instruments and equipment to make the training program as complete as possible. A light plane that fills these requirements is thus also suitable for the week-end flyer who has to stretch his purse to make it fit his leisure time involvement. To this end the Aeronca Champion more than filled the bill and, for the operator, paid handsome dividends.

Aeronca (Aeronautical Corporation of America) of Middletown, Ohio did a bit

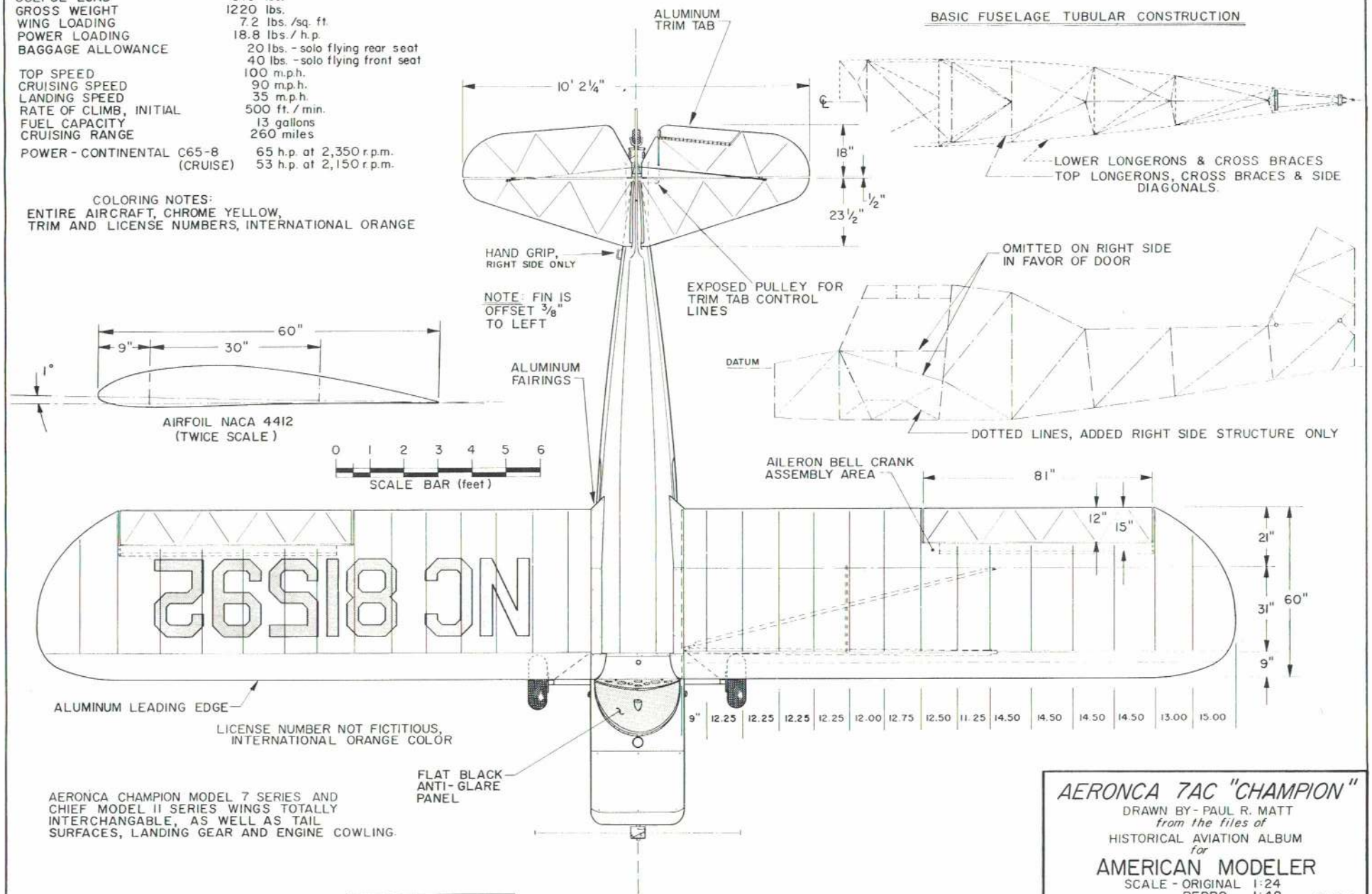
Continued on page 64

Because the Champion was capable of the utility category, it was fitted with floats, skiis, as well as wheels. Although stable, it was capable of mild aerobatics. The present-day version called the Citabria is rated for full aerobatics.

GENERAL SPECIFICATIONS MODEL 7AC, 1945-46

WEIGHT EMPTY	710 lbs.
USEFUL LOAD	510 lbs.
GROSS WEIGHT	1220 lbs.
WING LOADING	7.2 lbs./sq. ft.
POWER LOADING	18.8 lbs./h.p.
BAGGAGE ALLOWANCE	20 lbs. - solo flying rear seat 40 lbs. - solo flying front seat
TOP SPEED	100 m.p.h.
CRUISING SPEED	90 m.p.h.
LANDING SPEED	35 m.p.h.
RATE OF CLIMB, INITIAL	500 ft./min.
FUEL CAPACITY	13 gallons
CRUISING RANGE	260 miles
POWER - CONTINENTAL C65-8	65 h.p. at 2,350 r.p.m.
(CRUISE)	53 h.p. at 2,150 r.p.m.

COLORING NOTES:
ENTIRE AIRCRAFT, CHROME YELLOW,
TRIM AND LICENSE NUMBERS, INTERNATIONAL ORANGE



BASIC FUSELAGE TUBULAR CONSTRUCTION

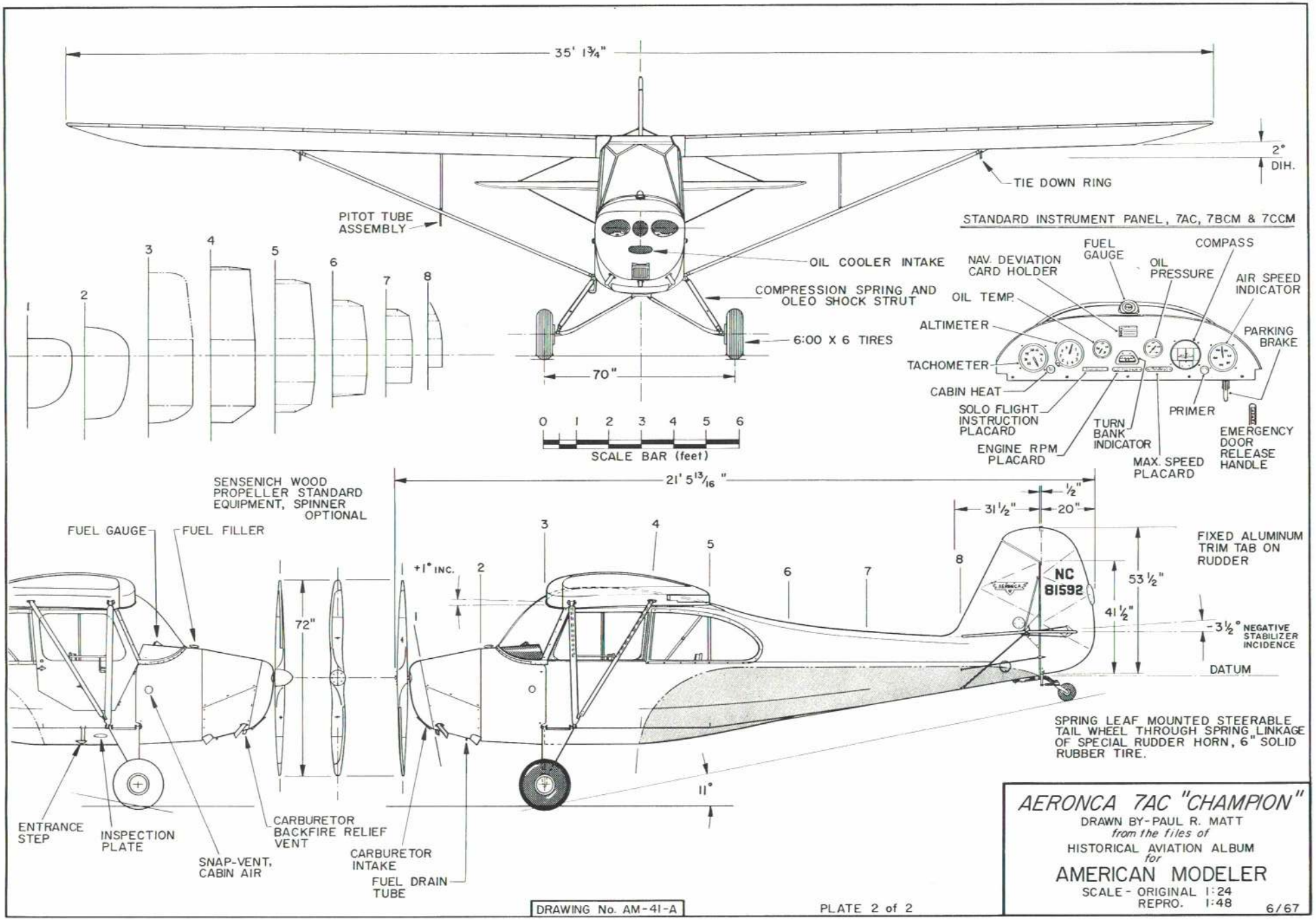
AERONCA CHAMPION MODEL 7 SERIES AND CHIEF MODEL 11 SERIES WINGS TOTALLY INTERCHANGABLE, AS WELL AS TAIL SURFACES, LANDING GEAR AND ENGINE COWLING.

DRAWING No. AM-41-A

PLATE 1 of 2

AERONCA 7AC "CHAMPION"

DRAWN BY - PAUL R. MATT
from the files of
HISTORICAL AVIATION ALBUM
for
AMERICAN MODELER
SCALE - ORIGINAL 1:24
REPRO. 1:48
6/67



AERONCA 7AC "CHAMPION"

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SCALE - ORIGINAL 1:24
REPRO. 1:48
6/67

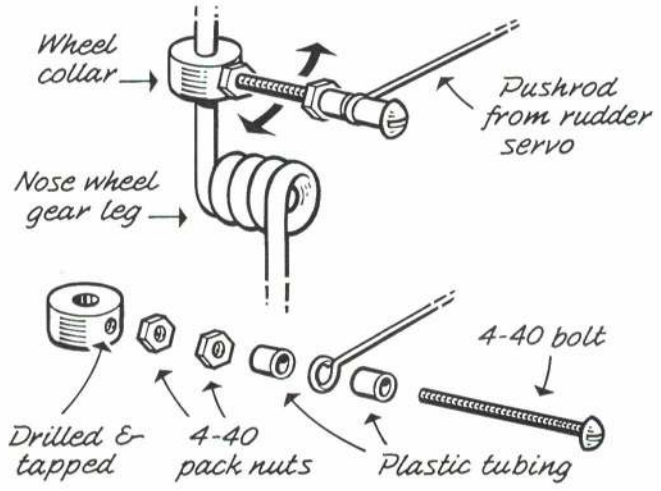
DRAWING No. AM-41-A

PLATE 2 of 2

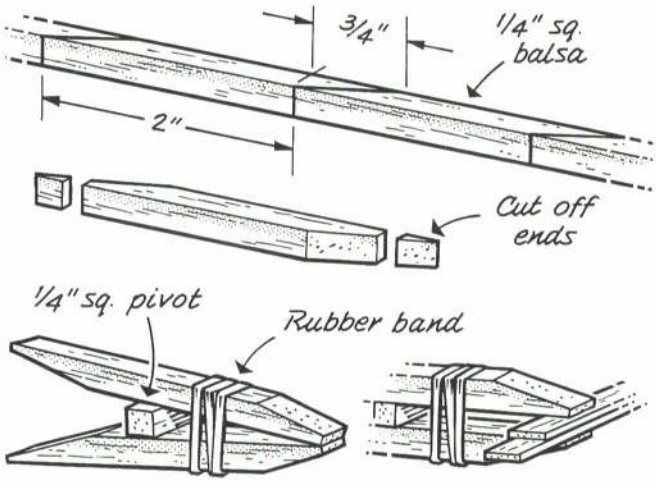
H. A. THOMAS

SKETCHBOOK

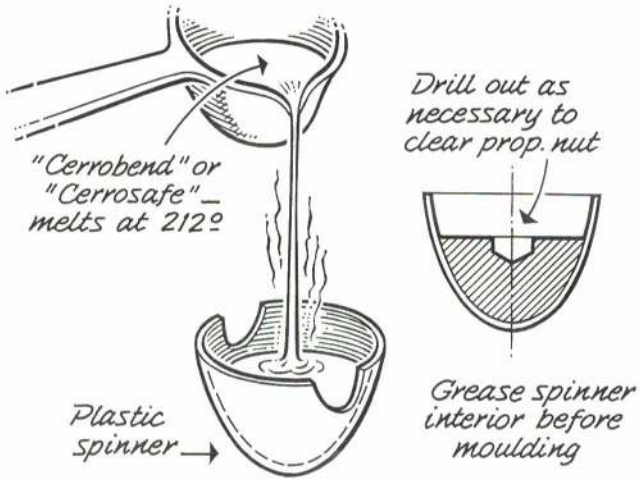
Have a new idea for construction, adjustment or operation of model aircraft or RC? AM pays $10 for each 'hint & kink' used. Send rough sketch and description to Sketchbook, c/o American Aircraft Modeler, Potomac Aviation Publications, Inc., 1012 14th St., NW, Washington, D.C. 20005.



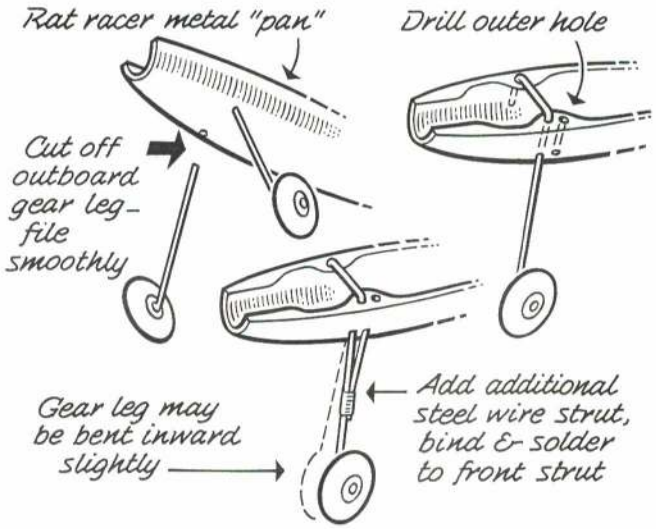
Tested over three year period is this RC nose gear control arm developed by Bob Conner, Ponca City, Okla. Top feature is use of two pack nuts, one to secure arm firmly, the other to eliminate "noise" in servo arm hook-up.



Bob Meuser, Oakland, Calif., recommends use of quickly built balsa "clothespins" which can be made in various sizes. In model assembly, softer balsa clamps do not damage parts as ordinary clothespins sometimes do.



New Zealand architect and model builder Eoin Davidson suggests ballast in plastic propeller spinner when needed for CG trim. Improves starting, makes for smoother running. Material has low melting point, can be poured into greased plastic spinner safely.



For more speed, fewer ground loops, John Schwartz, West Palm Beach, Fla., cuts off outer gear leg of rat racer, adds reinforcing wire to remaining leg and depends on wing tip skid for outboard wing. Designed for metal speed pan.

Halberstadt D-II

This is the Halberstadt D-II flown by the Baron while a member of the famous Kampfeinsitzerkommando Vaux in 1916.

Baron Ernst von Althaus made the plane famous. With it he won his Blue Max. He was so skillful that pilots thought him reckless!

Although rather flimsy looking, the Halberstadt was one of the WW-I's toughest fighters and could withstand very high 'G' loads. Our .29 powered controliner is a solid semi-scale performer.

WALTER MUSCIANO

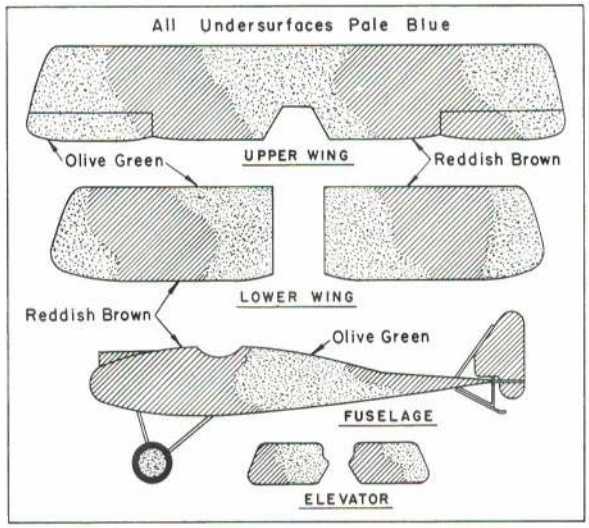
WHEN the Fokker Eindecker proved obsolete in the spring of 1916 the German high command feverishly sought a replacement from three aircraft firms: Halberstadt, Fokker, and Albatros. The Halberstadt design was the first to reach the front in early 1916 followed by the Fokker D-7 and then the Albatros. The latter eventually overshadowed its competitors. The Halberstadt biplane fighters ranged from the D-I to the D-IV but the most popular seems to have been the D-II which was flown by such famous aces as Wintgens, Buddecke, Boelcke, von Richthofen, Berthold, and von Althaus.

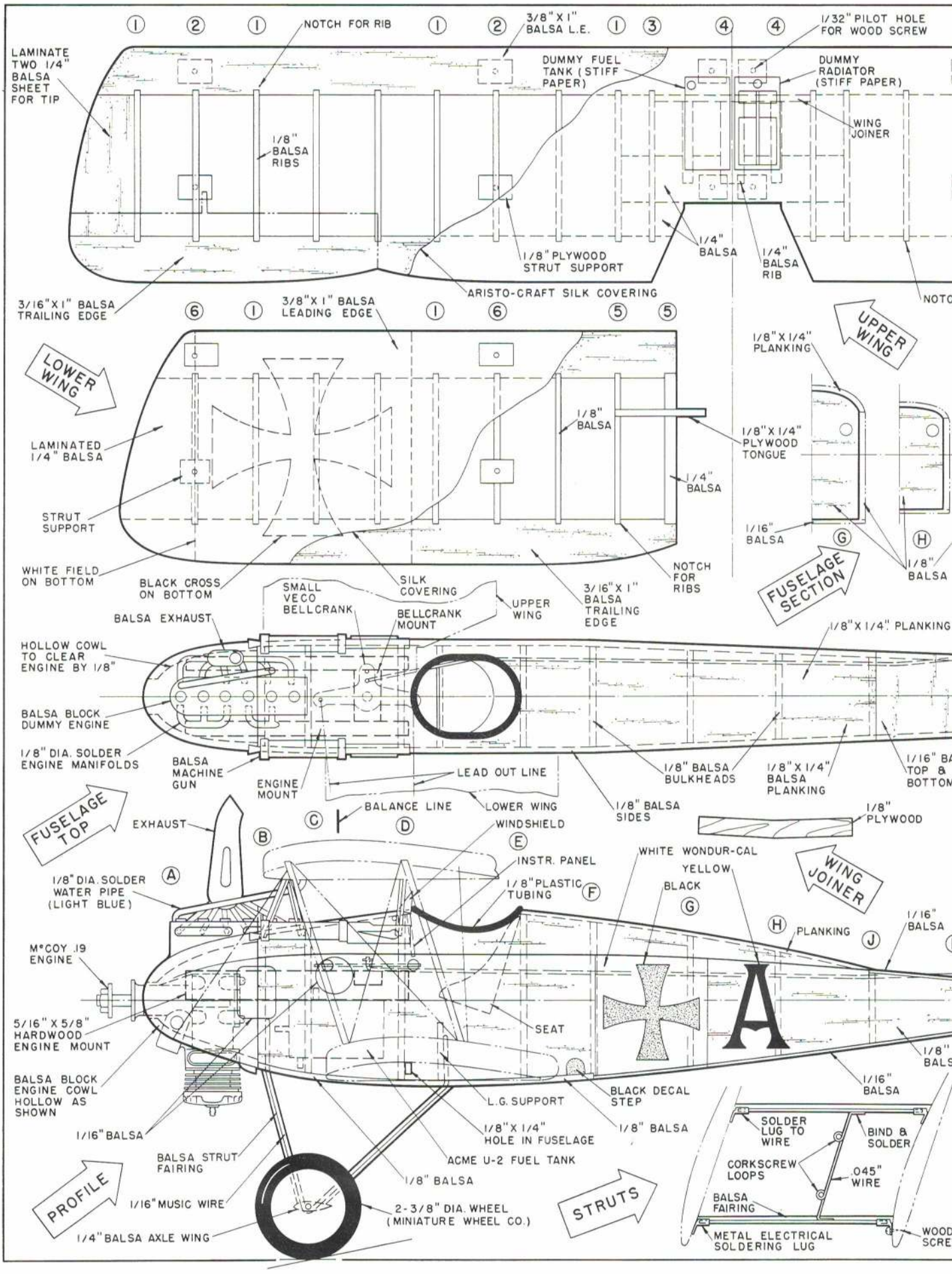
The D-II was flimsy looking, but extremely rugged in the air and could withstand prolonged dives which is something that many of the designs of that period could not. Powered by a 120-hp Mercedes, liquid-cooled, six-cylinder engine, the D-II attained a speed of 90 mph. Normal armament consisted of a single Spandau machine gun mounted atop the fuselage, however many flyers used two guns.

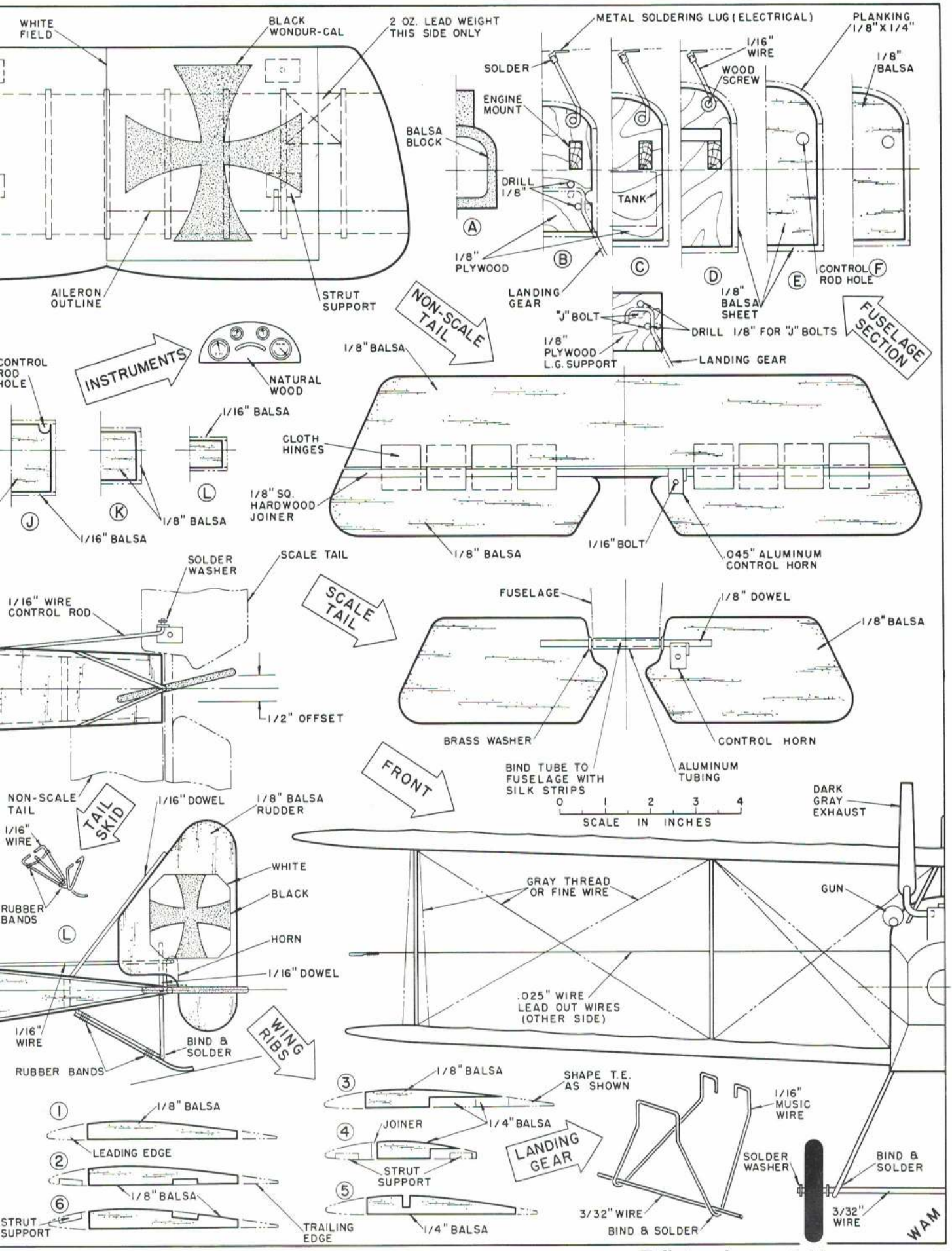
Like many early German planes, the Halberstadt D-II left the factory with wide variations. Exhaust stacks, ailerons, inspection panels varied in shape from batch to batch. Our one-inch-to-the-foot, control-line model duplicates one of the D-II fighters flown by Ernst von Althaus when he was a member of Kampfeinsitzerkommando Vaux. Engines from .15 to .23 can be used. This design has a relatively long tail-moment arm which tends to eliminate sensitive controls but will probably make the model balance tail heavy. The fuselage rear and the tail surfaces should be lightly constructed. A heavy, but not too powerful, engine will also help. The full-size craft had no stabilizer or fin; the entire surface was movable. This may be troublesome for the novice with excessive sensitivity of the controls, therefore an enlarged non-scale tail with conventional elevator stabilizer configuration has been illustrated for those who are interested only in stable care-free flying. Since this project is

Continued on page 68

Of interest here are the rigging wires, fuselage inspection panels, and cabane struts. Right: Camouflage typical only on the Baron's plane.




LAMINATE TWO 1/4" BALSA SHEET FOR TIP
NOTCH FOR RIB
3/8" X 1" BALSA L.E.
1/32" PILOT HOLE FOR WOOD SCREW
DUMMY FUEL TANK (STIFF PAPER)
DUMMY RADIATOR (STIFF PAPER)
WING JOINER
1/8" BALSA RIBS
1/4" BALSA
1/4" BALSA RIB
1/8" PLYWOOD STRUT SUPPORT
ARISTO-CRAFT SILK COVERING
3/16" X 1" BALSA TRAILING EDGE
3/8" X 1" BALSA LEADING EDGE
LOWER WING
UPPER WING
1/8" X 1/4" PLANKING
LAMINATED 1/4" BALSA
1/8" BALSA
1/8" X 1/4" PLYWOOD TONGUE
1/4" BALSA
STRUT SUPPORT
1/16" BALSA
FUSELAGE SECTION
WHITE FIELD ON BOTTOM
BLACK CROSS ON BOTTOM
SILK COVERING
NOTCH FOR RIBS
3/16" X 1" BALSA TRAILING EDGE
SMALL VECO BELLCRANK
BELLCRANK MOUNT
UPPER WING
BALSA EXHAUST
HOLLOW COWL TO CLEAR ENGINE BY 1/8"
BALSA BLOCK DUMMY ENGINE
1/8" DIA. SOLDER ENGINE MANIFOLDS
BALSA MACHINE GUN
ENGINE MOUNT
LEAD OUT LINE
BALANCE LINE
LOWER WING
1/8" BALSA BULKHEADS
1/8" X 1/4" BALSA PLANKING
1/16" BA TOP & BOTTOM
1/8" BALSA SIDES
FUSELAGE TOP
EXHAUST
WINDSHIELD
INSTR. PANEL
1/8" PLASTIC TUBING
1/8" PLYWOOD
WHITE WONDUR-CAL
YELLOW
BLACK
WING JOINER
1/8" DIA. SOLDER WATER PIPE (LIGHT BLUE)
PLANKING
1/16" BALSA
McCOY .19 ENGINE
5/16" X 5/8" HARDWOOD ENGINE MOUNT
SEAT
BALSA BLOCK ENGINE COWL HOLLOW AS SHOWN
L.G. SUPPORT
BLACK DECAL STEP
1/16" BALSA
1/8" BALSA
1/16" BALSA
1/8" X 1/4" HOLE IN FUSELAGE
BALSA STRUT FAIRING
ACME U-2 FUEL TANK
1/8" BALSA
PROFILE
1/16" MUSIC WIRE
2-3/8" DIA. WHEEL (MINIATURE WHEEL CO.)
1/4" BALSA AXLE WING
STRUTS
SOLDER LUG TO WIRE
BIND & SOLDER
CORKSCREW LOOPS
.045" WIRE
BALSA FAIRING
METAL ELECTRICAL SOLDERING LUG

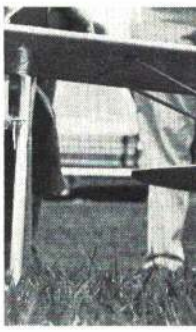


Full size plans available — see page 60

RADIO CONTROL WORLD

A ROUNDUP OF LATEST NEWS

CONDUCTED BY HOWARD MC ENTEE



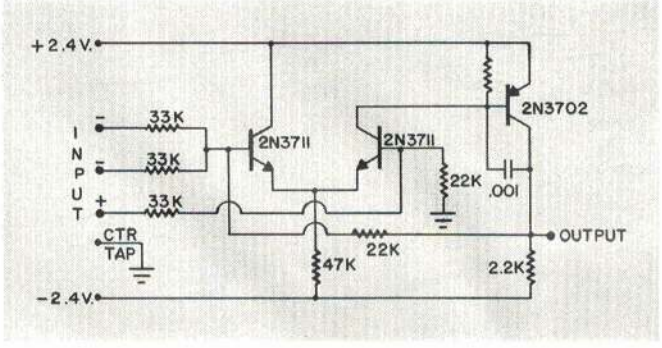
Art Wehnert sends his big yellow White Heat out to try some of that glass-smooth water. For excitement he chased some "mudhens" at the request of a local newspaper reporter.

Dale Daytom's beautiful conversion of Lindberg's Sport Fisherman is electric powered, uses Digitrio RC set for rudder and throttle controls.

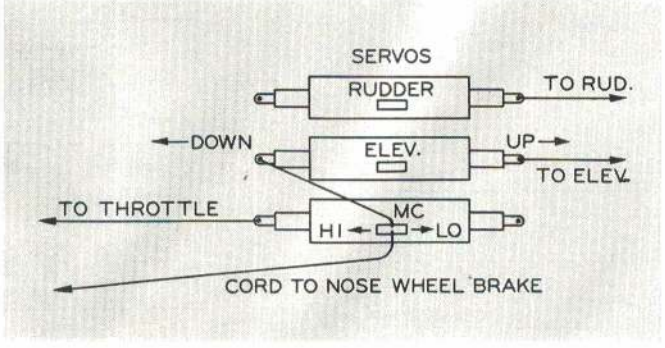
Summing Amplifier. The control system used on Dave Youngblood's Neutrino has proven very successful on that plane, but could also be adapted to other designs, such as butterfly-tail planes which need both steering action (which would be handled by rudder on a conventional design) and elevator action, from a pair of control surfaces. You could also rig up a system with strip ailerons so that they would give conventional aileron action or, by means of a second propo signal fed to the two servos (one on each aileron), you could put both ailerons up or down to any desired amount for flap effect, while still retaining full aileron control.

Such things have been accomplished on deltas, butterfly tails, and such, in the past with mechanical linkages of various sorts. Here is a fully electric deal that works much better (according to several who have tried it) and eliminates tricky mechanical lash-ups. The idea was originated by Udo Birnbaum (Dallas) and proved ideal on the Neutrino. The summing amplifier takes varying amounts of output from two control circuits of a propo receiver (aileron and elevator in this case) and provides a single output to one servo. Note that *two* summing amplifiers are required, one to feed each servo. In Dave's installation, the two amplifiers are built right into the receiver. However, he has provided the layout and P.C. plate drawing for those who wish to make them up separately. One limitation: While these amplifiers should work with most any analog propo system, they will not function on a digital rig.

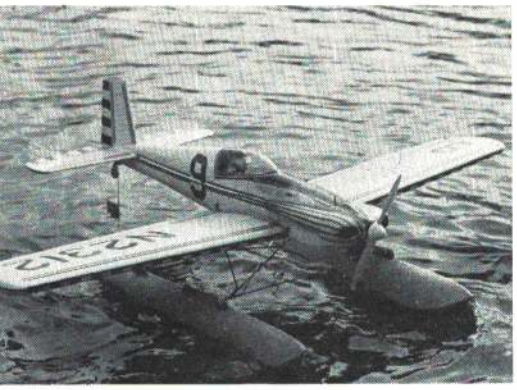
The elevator output lead from the receiver should connect to terminal one of both amplifiers; the aileron output lead goes to terminal two of one amplifier and to terminal three of the other. Output of each amplifier then goes to one of the eleven servos. Both servos should move in the same direction when elevator is called for, while the servos should give opposite motion for aileron stick movement. By putting three terminals and the three 33K input resistors on both ampli-



Dave Youngblood's summing circuit for Neutrino's elevon control.



To free elevator servo strain, Alvin Sager offers this scheme.



Top: Lanier's Goodyear racer on floats is interesting combination; flown at All Hydro meet in New England. Lower: Armand Kote's beautiful scale entry K&B-powered Piper J-3 on floats, with rudder, elevator, and throttle controls. Note the use of additional sub-rudder area.

Nick Ziroli's modern rendition of the 1946 "Swoose." There must be a lot of carving and sanding to achieve those lovely curves.

A pair of beautiful "Pirahana" flying boats by Jim Lacko and Ed Grening Jr. Excellent flying characteristics using S.T. .60 for power. Don McGovern is its designer.

fiers, you will find it much easier to obtain the correct surface movement, rather than having to switch amplifiers (one input connection and resistor is unused on both amplifiers, of course). Resistors R1-R4 may need adjustment, in order to get exactly the same elevator movement from both servos. It has been found that the feedback pots in the servos must be in good condition, and the linkages smooth and free, otherwise you could get a bit of aileron action when you signal only for elevator.

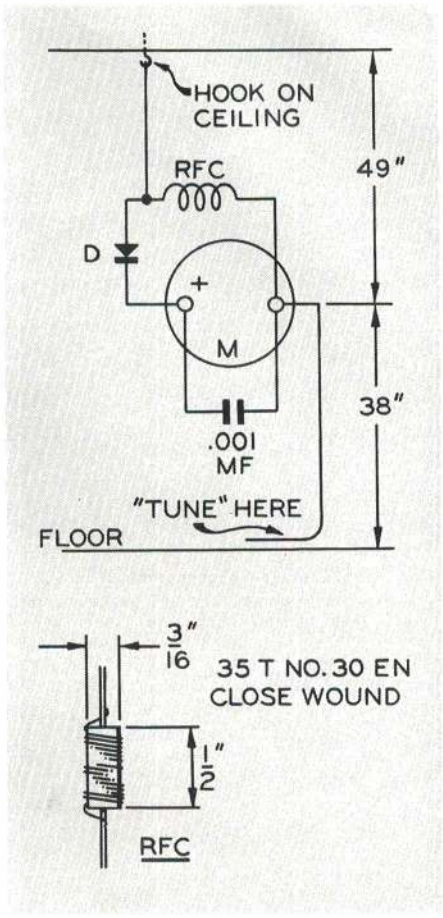
The servos are set up so that with maximum of only one function called for (either aileron or elevator) the control surface movement is about half of what it would be with total servo movement plus trim, and regular linkage. Then, when combined operation of both controls is called for, the servo will not exceed its normal movement. This necessitates control surfaces that will provide the desired plane reaction with about half the usual movement, of course. It's important that the servos be matched in response time and movement.

For a digital system, it's possible the "summing" action could be obtained at the transmitter pots; this has not been tried however. Those interested in trying the summing amplifier will be able to obtain parts kits from Ace Radio Control.

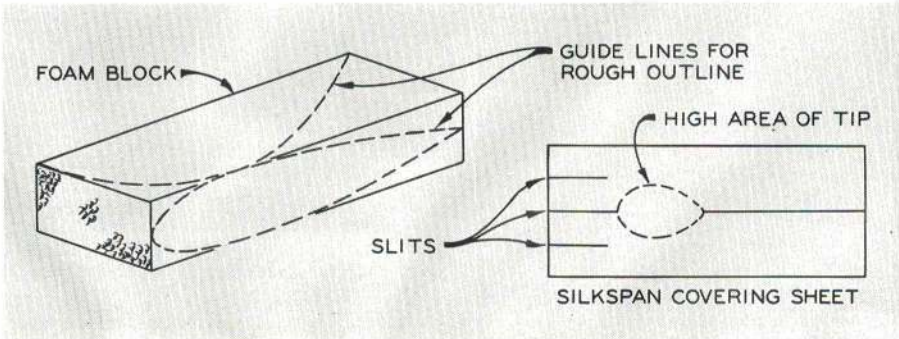
Mechanical Brake Improvement. Actually, the improvement is in the method of *actuating* the brake; some flyers have found that with the brake (or brakes) actuated when extreme down elevator is signaled, there sometimes isn't quite enough of said down elevator left to accomplish certain maneuvers. To assure ample brake action, the linkage must be tight enough to apply the brake fully, *before* the servo reaches full down position.

A neat way to have both full brake operation, and full down elevator for violent maneuvers was seen on plane of Alvin Sager (1077 Blake Ave., Brooklyn, N. Y. 11208). Alvin disclaims originating the trick—we don't know who thought it up. You simply run the brake operating cord so that it is only tightened when you have down elevator *and low throttle* simultaneously. With high engine, for such maneuvers as the outside loop, no brake drag is placed upon the elevator servo in its full down position. Servos shown in sketch are those with both end and top attachment loops for linkages. This idea can be adapted to most any style of servo, even rotary disc types.

Highly Sensitive FSM. One experimenter had need for a very sensitive Field Strength Meter, for use in shop-testing a group of low power 27 mc transmitters; it was felt undesirable to have to retune the FSM for different spots in the 27 mc CB band. Simple setup shown gave fine results, with the transmitters placed about 8 ft. from the FSM (some of the transmitters had extremely low output, too). The trick is to tune the FSM very broadly; while it is "tuned" to the center of the band, tuning is so broad that signals half a megacycle on each side showed no drop in meter reading. The tuning inductance was an RF choke with the specs shown; it's wound on a phenolic form. The rest of the tuned circuit is made up of the antenna whose rough dimensions are indicated and which extends both up and down from the meter, and its associated



High sensitivity field strength meter uses only a choke, a diode, and a capacitor.



Light-weight wing tips with Silkspan on shaped styrofoam block, used by Steve Stevens.

Out for a Sunday flying session, Wes Army getting set to fly Vinnie Stachen's plane. Smooth aerodynamic lines are noteworthy.

Meanwhile, Charlie Olsen launches Royal Coachman. Entered in the javelin event, he's a sure winner. Kraft 6 for three functions.

diode and the .001 mf capacitor. Final tuning was accomplished by varying the length of the section of wire resting upon the concrete cellar floor; about 6 in. here did the trick. The whole rig was resonated to the center of the 27 mc CB by checking with a grid dipper, utilized as a miniature transmitter. The diode may be most any RF type — a 1N295 was used. High sensitivity was assured by use of a 50 microamp meter.

Lightweight Wing Tips. Having no very soft balsa for the tips on a conventional built-up wing, Steve Steven (7813 Gifford, #104, Norfolk, Va. 27518) utilized blocks of styrofoam. They were roughly cut to tip shape by following the guide lines indicated, then rounded to final shape. They must be attached to the wing with some adhesive such as white glue, as model cement dissolves the foam. Dope does too, so Steve covered the tips with silkspan, applied in a single sheet with four slits as shown. White glue was used to attach the tissue, starting at the high area and smoothing the paper over the foam to remove wrinkles. If wrinkles do develop and you can't flatten them, make partial slits lengthwise in each wrinkle, when it may be smoothed out. Steve notes that for very lightweight tips, you could build up a heavier shell of paper over the foam, then when all is dry, remove the foam either mechanically or with dope thinner.

Impressive Monitoring Setup. The Mid-Atlantic Radio Kontrol Society (Bob Tilghman, 2100 Gurney Dr., Fruitland, Md.) had some very impressive monitoring equipment for their second Annual meet, held at the NASA Wallops Island (Va.) Station, June 17, 18. Apparatus seen here should certainly show up any unwanted sigs that reached the area; it was furnished by NASA and covered 27, 50 and 72 mc bands. Two circles were in use both days and fine weather prevailed. Only winners we know were Joe Solko in Class 3 Ex. (who flew a shoulder wing stunter), and Cliff Morris who took Class 2. Solko also took Goodyear Pylon, beating out Austin Leftwich by .2 sec.

Busy RC Boaters. The Desert Model Boat Club (c/o Ted Davis, Phoenix, Ariz.) held its first meeting in January 1967, and Pres. Art Wehnert was elected to preside over the activities of some 30 boatmen. An active season of regattas started soon after; the photos seen here were taken at their Jan. 22 outing. The club expects to maintain activity all year round — their ponds don't freeze up for several months of the year as do those of more northern boatmen!

Simple Foamers. These unique planes were whacked up by Don Hauger (RD #4, Somerset, Pa.) who needed simple (and expendable?) planes on which son Randy could learn button pushing. Most of his craft use $\frac{3}{8}$ or $\frac{1}{2}$" foam sheet for wings, with a $\frac{3}{16}$ to $\frac{3}{8}$" wood leading edge stiffener. Spans have ranged from 34 to 44", and the wings are just plain flat — no airfoil. Nose block is 2" thick foam back to the wing, with $\frac{3}{8}$ or $\frac{1}{2}$" foam sheet for fuselage top, bottom and sides from there to tail. Nose block is drilled to hold batteries, and a Fahnstock clip holds one battery lead for a switch. Escapements do the steering, Cox Baby Bee provides power. Several biplanes have been built to same general specs, seem to fly at almost scale speed. As Don says, these craft are not much to look at, but for only 50¢ to $1 each for materials, and a night's work. . . . ! Each plane lasts a couple of months, provides several hundred flights before being retired. Engines are held on with rubber bands, making them easy to change from one plane to another, and allowing ready change of thrustline. These planes have also been flown on pulse, and Don even whomped up a twin engine (two .049's) job. Latter had the same flat wing, but foam fuselage sides were stiffened with cardboard. Several flying boats have also been flown, using engines up to .09. When he wrote us, Don had a 34" bipe with .09 Enya TV and Galloping Ghost underway, and expected to start a 72" span J3 Cub and a Waco bipe of same size. A $\frac{1}{8}$" ply crutch will be used to stiffen fuselages of these bigger jobs.

Glider Speed Try. On July 23, Hans Schumacher, German electronics manufacturer (who also produces the Bellamatic II and all other RC servos sold by the Graupner hobby concern) made several tries for the glider speed record, with the tiny plane seen in our photo (Mr. Schumacher adjusting tail). He was not successful but was expected to try again. The glider spanned about 39" and weighed about 41 oz. and was equipped with Graupner digital propo gear. It was towed behind a car on a 300 meter line. The Strong-Hahn RC glider speed record of 58 mph apparently still stands, though Hahn, Maynard Hill and others have tried to break it several times since it was set in early June. Meanwhile, we read in the FAI Record Attempt Newsletter, that four new RC glider records have been set by Georg Freidrich of Germany. All were made late in July and are: Duration, 12 hours, 2 min., 13 sec.; Straight Line Distance, 11.6 miles; Closed Course Distance, 84.5 miles; Altitude, 4265'. Latter two broke records previously held by U. S. flyers.

In the RC Power Plane field, several new marks were racked up at the DC/RC FAI Trials (over Labor Day week-

Example of simplicity — Don Hauger's son Randy shows off a "Simple Foamer." Built with just slabs of styrofoam, no airfoil.

end, at Dahlgren (Va.) Naval Weapons Lab. A ding-dong battle between Bill Northrop and Maynard Hill ended with latter in possession of a tentative new power landplane altitude mark of 19,500', and seaplane altitude mark of 18,500', both set with a 6' span plane powered by Supertigre .60 and with PCS radio. For the ROW record, the plane was fitted with a pair of Gee Bee floats.

ROW takeoffs were from a small pond about half a mile from where the optical tracker and radar equipment were situated. The flyers had to ride in a convertible to the tracker and climb aboard for the balance of the flight. Then, when the plane had been brought down low enough for easy visibility, another convertible trip was made back to the vicinity of the pond for landing. The planes do not have to land on water after such flights, but must come to a standstill within 500 meters of the point of takeoff.

Don't Mix Catalysts! Note from a Safety Bulletin sent to us by Howard Hatton (Box 568, Hopatcong, N. J.) stated that explosions and injuries have occurred when the catalysts utilized for polyester resin and epoxy resin were inadvertently mixed together. The two types of catalysts are entirely different and should be clearly marked so that they will never be mixed. Since modelers use both types of resins, keep these facts in mind — and keep the materials well separated!

Sound Wave Control? Note from Michael Schwab (Fox Division, USS John W. Weeks DD701, FPO, New York, N. Y. 09501) asks for info on building an underwater control system that operates by means of sound waves, rather than via radio. If any of our readers have data on such control, or know where same may be found, get in touch with Mike. (We'd like to hear about such a control system too!)

Mufflers Mandatory. One of a growing number of clubs that require use of mufflers by all members is the newly-formed Burlington Co. RCC, we learn from member Hank Clark (1130 Monmouth Rd., Mt. Holly, N. J.). Club is looking for additional members. They fly everything from the simplest single-channel planes up to multi reeds and propo. Besides mufflers, new members must be AMA members and have valid FCC licenses.

Abbreviated FCC Rules. When a modeler applies for an FCC Citizens Band license, he is first required to obtain a copy of Vol. VI of the FCC rules (it costs $1.25). This Volume contains all pertinent rules on Citizens Band licensing; it also contains a large amount of material of no use to the prospective RCer whatever, and much of the useful material is in complex technical language, definitely confusing to the average non-electronics type modeler. The AMA has felt for some time that this volume should be greatly simplified and clarified, to include only material of express usefulness to RCers. Rather than having to send $1.25 to the Government Printing Office for Vol. VI, the idea was to print up a quantity of the excerpted material and offer it to RC manufacturers for packing (along with an FCC license form which most of them now include) with RC transmitters. Unfortunately, money could not be found for this project. It seems a shame to us that this must be dropped; wouldn't this be an ideal project for the Radio Control Industry Assoc. to carry out?

Retract Gears. Some interesting notes on the Dmeco retractable landing gears appeared in recent issue of Windy City Newsletter (Chicagoland RCM, 3600 W. Fullerton Ave., Chicago 60647), written by member Frank Madl, who has much experience with the units. Frank found that while quite a few modelers owned a set of the units, few were used for two reasons: they caused rather serious interference to the receiver (use of separate LG batteries rather than relying on the receiver batteries cures much of this); since the LG units operate in sequence as they were originally made, if one gets out of sequence with the others it is almost impossible to get them to sequence correctly again during flight. CRCM member Ken Hardy designed a new P.C. switch board that allows all the LG units to retract or extend in unison; it requires two switches for best operation and Frank utilizes a separate servo with a switch mounted so it is actuated at both servo extremes to handle this chore.

Space Control propo was found to be quite tolerant of the servos, especially after spark suppression was applied to the servo motors. A Kraft propo outfit seems completely immune to them. Some users have reduced the rather high current drain of the gear units by replacing the motors with the same type Jap motors used in current propo servos; these are a little slower in operation (which isn't so important when all the gears operate in parallel) but are 100% reliable in starting. It has been found advisable to pull the wheels up against pads of foam rubber, to eliminate vibration between various parts, which leads to elongated holes and cause overall "slop" between the parts. The cam with switch fingers on later units should be locked to its shaft to avoid slippage; older units with switch mounted to base of the frame can be converted to the more desirable later version using a revolving disc cam and switch assembly. Frank feels the retractable LG contributes greatly to improved plane performance, due to reduced drag, and better relationship between center of pressure, center of lift and CG. He notes that with just a little care in lubrication and maintenance you can get practically trouble-free use from these retract units.

Pylon Rained Out. The 12th Annual RC meet of the Aeroguidance Society (held at Endicott, N. Y.) on Aug. 19, 20 was favored by better weather than usual in some ways (at least it wasn't as cold and windy as we've seen in the past) but rain was a problem. A fair number of Pattern flights were made in light rain, but the Goodyear event had just gotten started Sunday afternoon when it really started to rain, and Goodyear had to be cancelled; another meet just for this category was promised by the Aeroguidance Soc. boys. Due to declining interest, no event was scheduled for Class 1. Other winners: *Class 2* (4 entries), 1 — Ken Bonnema (279 pts. for two flights, using his Jester bipe — see March '67 A.M.); 2 — A. Sattler (259); 3 — Ed Abrams (112). *Class 3 Nov.* (18 entries), 1 — Jim Bonnema (279½); 2 — C. Olson (268½); 3 — N. Bell (264½). *Class 3 Ex.* (15 entries), 1 — Hal deBolt (358); 2 — Tony Bonetti (355); 3 — Ed Izzo (329). Scale had seven entries; unfortunately, results had not been posted when we were chased home by the rains. Most unusual plane in scale was a twin-engine Falcon (a small French twin-jet airliner with engines at the tail, as in a Caravelle) by Ron Jones. This beautiful job was powered by two .15 cu. in. engines sporting three-bladed props, made a fine takeoff and flight but crashed on landing approach — possibly due to flying out of range.

Fatal Spiral. Recent correspondence with old friend Dave Robelen (17 Cataline Dr., Hampton, Va. 23364) brings up an unusual problem he had with the tiny SE-5 we depicted in this space, page 34, June '67 issue. After quite a few success-

Continued on page 68

Hans Schumacher's 41 oz. glider bomb gets off on tow by car. Many tries are being made on the FAI speed for gliders category. It is not as easy as it looks! Record is 58 mph.

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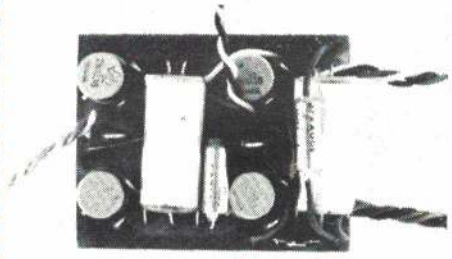

SIMPRO III KIT

The Simpro III kit above is a refinement of the earlier Simpro units which have appeared in American Modeler. The October 1967 issue contains full info on a relayless version for use with commercial actuators . . . Does away completely with any adjustments—and provides non-interacting rudder and elevator controls when used with the Ace Jansson or Sim-Plus transmitters, or most other GG transmitters. Motor control is achieved by full on and full off . . . The Simpro III makes into a compact unit. Measures 1½ x 1⅞ x ¾". Designed to work with most of the commercial proportional actuators available. Go-Around types are required for motor control. Compatible with Rand HR1 and HR2. Mini Max, Mini Max RM, Ghost, Airtrol, Bellamatics, and home made units built around Micro Mo motors. (NOTE: 1.8 ohm resistors required only for Micro Mo units are not furnished in kit.) . . . Kit contains reed units, all transistors and diodes, capacitors, resistors and an etched and drilled PC board to duplicate this fine decoder. Connectors not supplied.

No. 15K43—Simpro III Kit $27.75
No. 15K45—Simpro III assembled and tested $34.95

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You've got a good GG system, and it's a lot of fun—but you have wished for something that performed as well, in a plane just a bit larger? Well, there's no reason to start from scratch—simply add the Simpro III decoder unit, along with the required actuators and mounting board, and you are there! The Simpro III decoder can be adapted to almost ANY existing simple GG system and provide you power enough for engines up to .45! . . . Extra cost is minimized since you can use your transmitter and receiver (relay or relayless), and with Simpro III, Rand HR1 and HR2, you have proportional Rudder, Elevator and positionable Motor Control. Packages include a special 3/64" mounting plate for the Rand units to simplify mounting—template for use with any servo is silk screened on. . . . Or, you have a GG system using the LR3. Use the LR3 as the rudder-motor servo, and add a Rand HR1 for elevator and you cut cost still more with our package #2. . . . The Simpro III decoder pulses fast enough so there is only a slight dither in rudder; elevator works only on command. On motor, all surfaces cycle through fast and plane does not respond.

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No. 15K2—Simpro II package #2: Contains Simpro III decoder kit as above, Rand HR1, special 3/64" mounting plate for use with your GG combo and your LR3. A $46.00 value. Only $41.50

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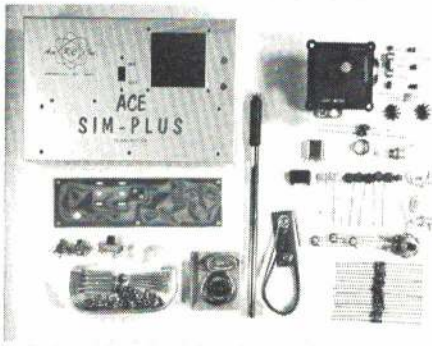
Among the many fine lines Ace represents Coming the new Rand Decoder, MRC-Webra I gines, Diesel and Glo; Wright Electric Fuel Pun More-Craft Goodies, Wilhold White Glue (best test), Epoxy Bond products, Jensen, Rocket Ci Micro Molding, and many, many more represe ing the BEST additions to our highly select line.

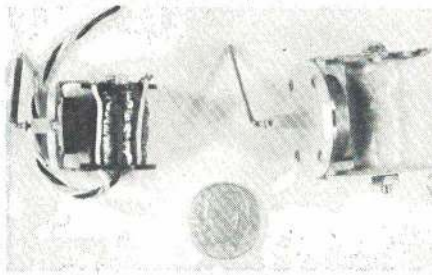


SIM-PLUS TRANSMITTER KIT
Design by Dick Jansson

This is the long awaited kit of the Jansson d signed Galloping Ghost transmitter. It is a PLU type transmitter, since it offers more versatili than any other GG unit on the market. Hundre of Jansson's have been built, and the mods the circuit improve the basic excellent desi and offer the PLUS factors.

The SIM-PLUS Transmitter Kit is so design that pulse rate and pulse width may be varie generally by minor internal adjustments, so th it may fit any of the GG systems on the mark any Decoder system, the Simpro Systems, a the Simplex systems. Has provisions to allow to be used with systems that are still in t works, so that it will not easily obsolete! To frequency may also be tailored to fit any to receiver . . . May be fitted with High Pulse, so is usable with Rate Detectors, or the full on a full off required on most of today's GG outfi May be adapted for Rudder Only escapement proportional, too! Many more PLUS features . All transistorized. Uses 9 volt dry battery for full season of flying. Also available for 6 mete Kit contains all components except batte Instructions are step by step and most comple we have ever produced. Some kit building exp rience is desirable.

No. 11K51—Sim-Plus Transmitter Kit (speci 26 to 28 MHz. crystal) . . . . $49.
No. 11K52—Sim-Plus Transmitter Kit 52.950 MHz. . . . . $53.
No. 11K53—Sim-Plus Transmitter Kit 53.100 MHz. . . . . $53.



Above picture compares size of Baby actuat with the Standard single actuator.

NEW! ADAMS BABY ACTUATOR

From Adams Manufacturing comes the Ada Baby Actuator. This Baby uses an entirely ne magnet which develops more torque, so that spite of its small size, you have more than amp power for .020 and larger equipment . . . T unit measures 1" x 1⅛" x ¾". Weight is on slightly over ½ ounce . . . Torque rod install tion must be used with this for adequate powe . . . Comes with pig tail leads to solder in your installation, either direct or with a conne tor (not furnished) . . . Unit draws about average of 110 ma, which means that batteri of the 225 ma size are more than adequate power the unit on 2.4 volts. Use with relayle receivers to which an AOSK has been added.

No. 14K15—Adams Baby Single Actuator, $6.

ACE-CLASSIC FULL SIZE PLANS

The ACE-CLASSIC Line of plans were originally published in GRID LEAKS. They include designs by Bud Atkinson, Jess Krieser, Bill Winter and many other top model designers and builders. All plans presented in this series are of semi-scale planes, and are designed primarily for the sports flyer. The plans are ozalid reproductions of the original drawings and are full size; folded for ease of mailing.

PIETENPOL AIR CAMPER . . . by Jess Krieser is a semi scale of the popular 1920 home built. Designed for .35 engine, it has a 60" span with wing area of 635 inches.
No. 13K49—Pietenpol Air Camper, $3.00

The CURTIS ROBIN Scale . . . by Don Knaust is another semi scale. Designed for .19 to .25 engines. Has a span of 57 inches and a wing area of 570 square inches.
No. 13K78—Curtis Robin Classic plan, $3.00.

SKY SQUIRE . . . is another Krieser design, and is excellent for .19 to .45 power. A semi scale of the Cessna Skylane type of airplane. Wing span is 57 inches.
No. 13L107—Sky Squire plans, $3.00.

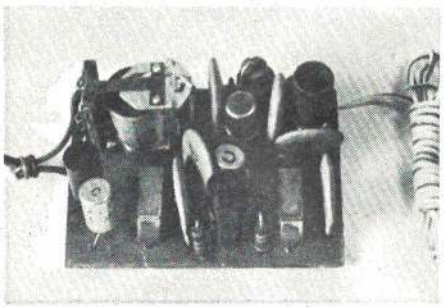
Bud Atkinson's CORBEN SUPER ACE is designed for the McCoy .35 and lightweight proportional. Has a wing span of 54 inches, and is beautifully detailed. Was featured in AMERICAN MODELER in 1966.
No. 13K191—Corben Super Ace plans, $3.00.

The LONG MIDGET MUSTANG . . . is by Jess Krieser and is a semi scale Goodyear type of racer. Designed for engines from .29 to .40. Slight modifications make this a good flyer.
No. 13K87—Long Midget Mustang, $3.00.

The UGLY STIK . . . designed by Phil Kraft, and originally called the Square Stik. By adding scalloped ailerons and scalloped elevators and a semi-scale type rudder, this .45 to .65 proportional test bed resembles the Fokker-Eindecker World War I plane. Features extremely fast construction, and is designed as a proportional trainer.
No. 13L108—Kraft's Ugly Stik, $3.00.

KR-34 CHALLENGER is built to a scale of 1 inch to 1 foot. This is the Krieder-Reisner Bi-plane of the 1920's. Plan is by Jim Dean. Fine for single channel pulse proportional with an .049.
No. 13G47—KR-34 Challenger, plans, $2.00.

The SNIPE is a sailboat of a very popular design in full size. This is a 36" scale model, patterned after real racing types. Plans contain full size sail plans, as well as some construction details on building this model. May be built from balsa or from plywood. Is just it for the R/C fan who is looking for something that is different, and yet easy to build.
No. 13L189—Snipe plans, $3.00



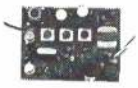
COMMANDER RECEIVER KIT

We're introducing a superegen relay type of receiver, primarily for use in our Raceways Mustang. However, there are many sections of the country, even close to metropolitan areas, where you can successfully fly superegen safely. This generally has to be away from a club flying site, but more and more tell us of having success with superegen equipment . . . Our Commander Receiver kit uses only three transistors and will operate from 2.4 to 3.6 volts. Housed in a small plastic case, it measures 1½ x 2⅛ x 1, including plastic case, it measures 1⅜ x 2⅛ x 1, including case. By cutting down component count, this unit is even easier to assemble than the relayless K3VK we had earlier. Weight is only 1½ ounces. Relay allows its use with many of the proportional actuators which require SPDT switching action on the motor . . . Will operate from 400 to 800 Hz. Available for 26-28 MHz.

Receiver Kit $14.95

NEW! ACE GG PACKAGE!

Galloping Ghost Transmitter by Dick Janson 9 volt battery- Citizenship SSH Receiver and the new Rand GG pack, with batteries.



If You are going GG—Go First Class—With ACE GG!

Now you can go First Class all the way with simple proportional on Galloping Ghost. Ace has pioneered in proportional for 14 years. This is a combination package that we believe takes the best of all of the components that are available and puts them into one first class package.

Start with the Galloping Ghost Transmitter by Dick Janson, which has been acknowledged as being one of the most versatile, couple this with a specially modified Citizenship SSH Receiver and the new Rand GG pack, with LR3 and new 600 ma GE sintered and vented batteries, and you have a winner! The package even includes a 9 volt battery for the transmitter—the dependable Mallory M1603. The Ace GG package is completely prewired and requires only installation in the plane. . . . Weight of the receiver with GG Pak, LR3, nickel cadmiums, and harness, hooked up ready to install is approximately 7 ounces, yet it has power enough to handle planes with engines up to .35. **Go First Class—Go Ace GG.**

No. 10G1—Ace GG Package, ready to go with all batteries $125.00

VARI-CHARGER

The new Ace Vari-Charger is a most useful accessory—it will charge nickel cadmium batteries from 20 mils to 150 mils. It is capable of charging up to 12 volt packs . . . The dial is indexed, and an easy to read chart is furnished which enables you to set your milliamp reading for the battery pack size you are using . . . Completely isolated from the AC line supply . . . The unit is housed in a handsome Dakaware case which measures 3 25/32" long and 2 21/32" wide and is 1 15/32" deep. Metal cover is used and has an on-off switch. This is an extra deluxe item, using highest quality newly manufactured transformer, UL approved line cord, 500 milliamp diode, on-off switch, and full instructions.

Available in two forms, either as a kit and completely assembled.

No. 34K21—Ace Vari-Charger Assembled, $8.95
No. 34K22—Ace Vari-Charger Kit, $7.50

COMMANDER TRANSMITTER KIT

The Commander Transmitter Kit was designed by Phil Kraft. It is essentially the same transmitter as the KT1 transmitter which is completely assembled and sells for $29.95 . . . With our instructions it is quite easy to assemble, and makes a handful of packaged power that will control your plane as far as you can see it. A Class C CB license is definitely required, since the input is over 500 mw. But this is an advantage over transmitters that are licensed under Part 15. In many airplane applications these become marginal performers. This Unit has a domestic antenna that is completely removable for ease of transporting, and also facilitates checking, since antenna may be easily removed for quick and practical bench checks. Antenna is base loaded and puts out its punch in a non directional basis. It will not collapse accidentally . . . The Commander uses one 9 volt battery of the Mallory 1603 type or equivalent for long and economical operation. Has a pushbutton of the click type for a positive feel and sound when it is depressed. May also be used with the Commander Pulser Converter Kit for proportional use. Kit has all components you need, including a preanodized metal case which measures 5 x 2½" x 2", completely punched. Four transistors, crystal, all required resistors, capacitors, transformer. Nothing extra to buy except battery. Available on all Class C frequencies.

No. 11K D41—Commander Transmitter Kit Deluxe $19.95

MORE THAN JUST A CATALOG FOR 1968!

Our 1968 version of the Ace R/C Catalog is also a handbook—has an R/C Glossary; How To Solder; Pulse Proportional Control for Rudder and GG, including Decoders; Schematic Symbols; Batteries and Charging, Resistor Color Code, Transistor Chart; Electric Motor Spec Chart and many more Data Sheets you will refer to again and again. Three holes punched, 8½ x 11 in size, it is designed to be added to! Will fit special* Ace Binder, for permanently keeping any of your R/C instruction as well . . . In addition it lists all the latest Ace R/C Products and thousands of other R/C items and R/C accessories made by other manufacturers all over the world . . . Cost is only $1.00. BUT this is refundable on your first order! So actually the catalog costs you nothing. Your order also places your name on the Ace mailing list to receive regular additional R/C Data info, and newsletters . . . The Ace Handbook-Catalog is a must for the tinkerer, the Sunday and the sport flyer. We have served the R/C field since 1953 . . . Send your catalog buck on a round trip today. You can't lose!

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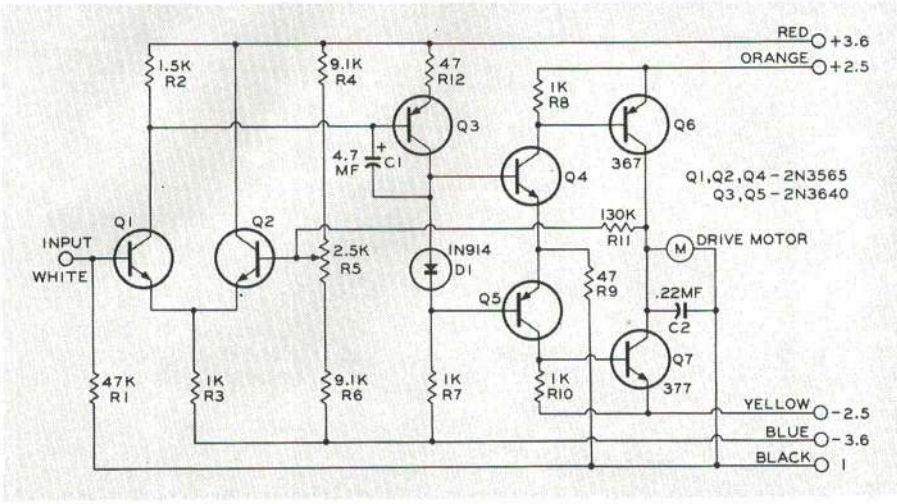
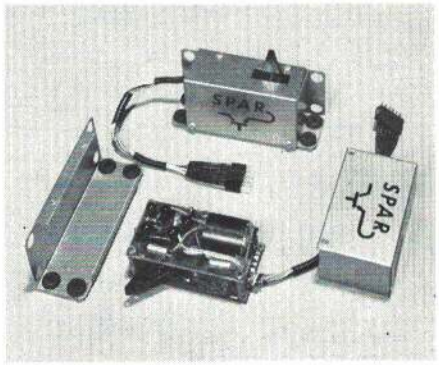


A Universal Servo

The 9S SPAR commands attention because of its versatile application to many systems, from analog sets to single-channel pulse, with digital resolution ability.

HOWARD MC ENTEE



Assembled servo in background shows small size compared with Deans connector. It can be operated without case, permitting convenient checking — or satisfying curiosity.

INTENDED primarily for use with analog control systems, the new Spar 9S servo is capable of other applications. It can be used with relayless single-channel gear, affording perfect rudder-only control; or applied to a multi-reed system, giving two semi-proportional functions. These servos can be obtained especially tailored for the characteristics of practically any propo system, and possibly some yet to come.

These universal applications make the 9S servo of special interest. A complete line of various analog and digital Spar servos have been available for some time. All use the same servo mechanicals and case, but with widely differing electronics. The unit is compact, rugged, and tight. The case measures $2\frac{1}{4} \times 1\frac{3}{8} \times 1''$; flanges for flat or upright mounting project another $\frac{9}{16}''$ at each end.

Even considered as just another analog servo the 9S is significant. A completely new type of amplifier circuitry was developed. Technically, it employs a very high-gain differential input amplifier. This gives it a position repeatability that compares favorably with digital servos, and accounts for its excellent temperature stability (operating range of zero to 140 F. with less than .04% drift per degree).

Silicon transistors are used throughout, except for the actual drive transistors which are powerful germanium types. Not only does the electronics offer accuracy, but the servo also uses a rebuilt and toughened Micro-Mo motor. (This motor is also used in their other servos.) Together, these features produce a powerful servo even for extremely small position changes. One problem with older analog servos was lack of power for small corrections in position. (Flyer moved the control stick to compensate — like holding a rubber band!)

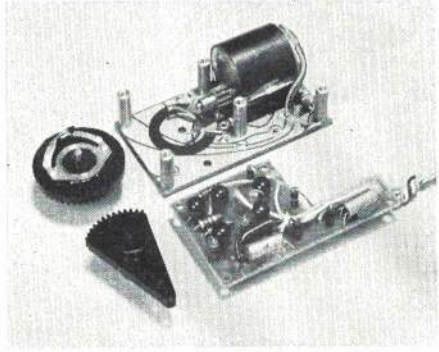
A feature of the servo's mechanical arrangement is that the two-piece thin aluminum outer case is completely removable from the "works"; latter may be operated and serviced with the case off. The inner assembly consists of two fiberglass-epoxy PC boards, held together by five threaded aluminum studs, one end of which is attached by two 2/56 screws to the bottom plate — the one carrying the motor. Removal of five screws allows the top plate to be lifted off, which frees the only movable pieces in the assembly (aside from those in the three ohm Micro-Mo motor with its 60-1 internal gearing), a crown gear which carries the pot wiper contacts on its under side, and the output arm which engages a pinion that is part of the large crown gear. These two pieces are precision molded of tough lexan. Gearing is so precise that there is no discernable backlash in the entire gear train, yet the output arm may be pushed back and forth by firm finger pressure. Virtually no wear has been found in sample servos which were subjected to life tests of 120,000 operations with a 1 lb. load (full deflection in each direction). Another test of 102,300 full deflection cycles with 18 oz. load to simulate aileron operation of a typical multi plane indicated the servo would perform satisfactorily in a model flown an average of 30 minutes a week for over 500 flights.

Spar feels the dual-brush composition potentiometer will give the longest possible trouble-free operation, and it is not subject to "catastrophic failure" as could happen with a wire-wound servo element.

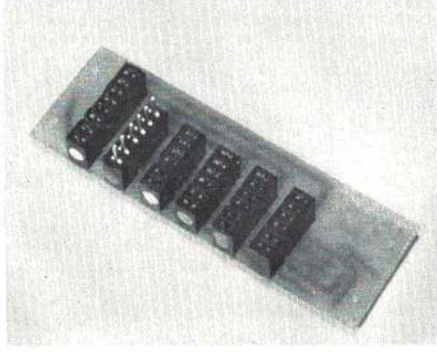
RTV silicone cement is used in several places to tie down leads, provide strain relief for the output cable, and to hold down the two rather large output transistors.

Unusual feature is built-in overdrive protection. If you feed the servo more input voltage than it's set up for, the pot wiper reaches one or the other of the two rectangular contacts just to the right of Q2. Instead of driving till the gears jam, the servo output arm will then

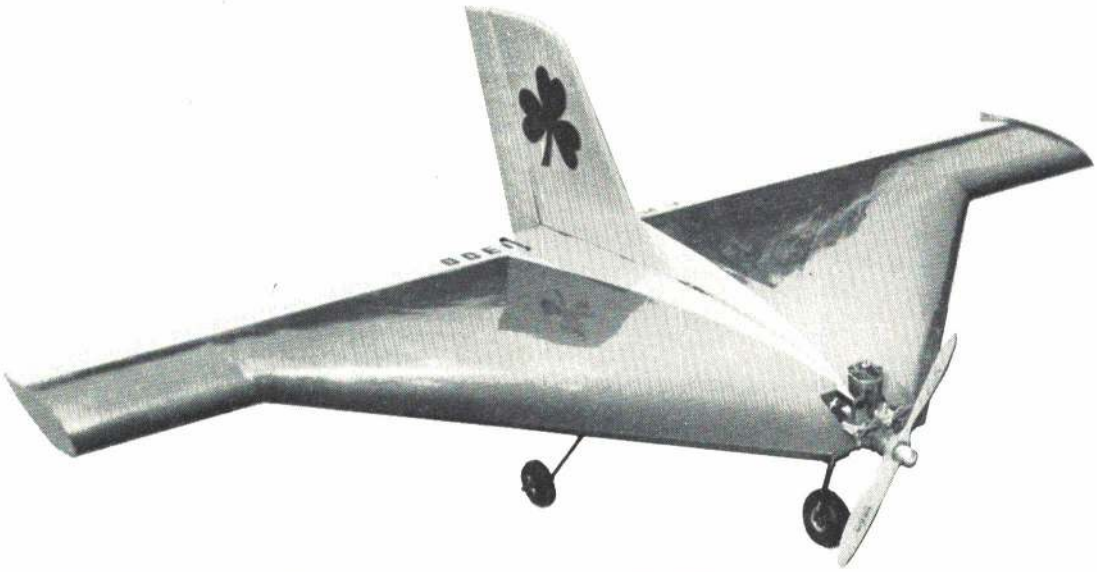
Continued on page 71



Disassembled view shows the stand-off braces that also serve as electrical connection between the boards. Drive motor is a tough reworked Micro-Mo unit with 60-1 gearing.

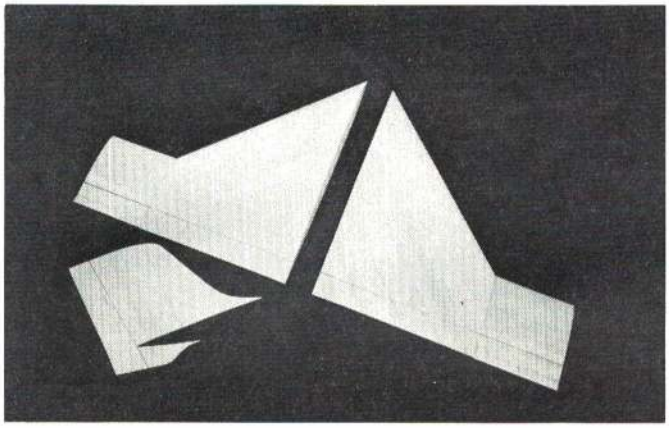


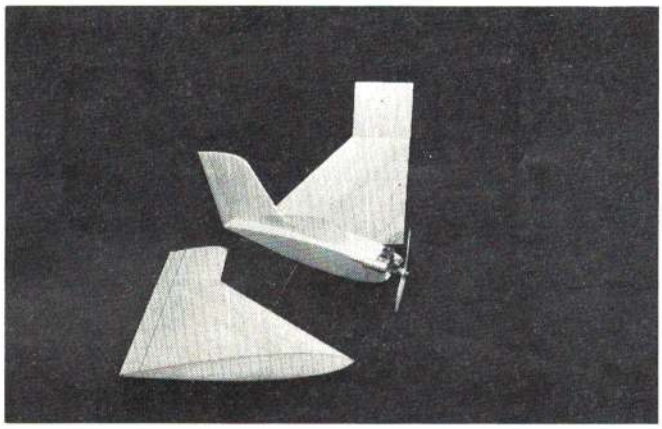
PC board with connectors is a helpful item with any analog servo. It provides double battery wiring for independent plus and minus lead-in's for voltage reference needed for analog types.

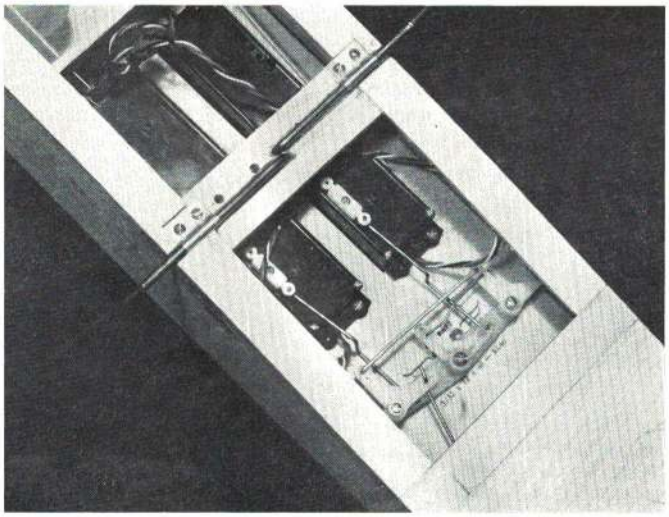


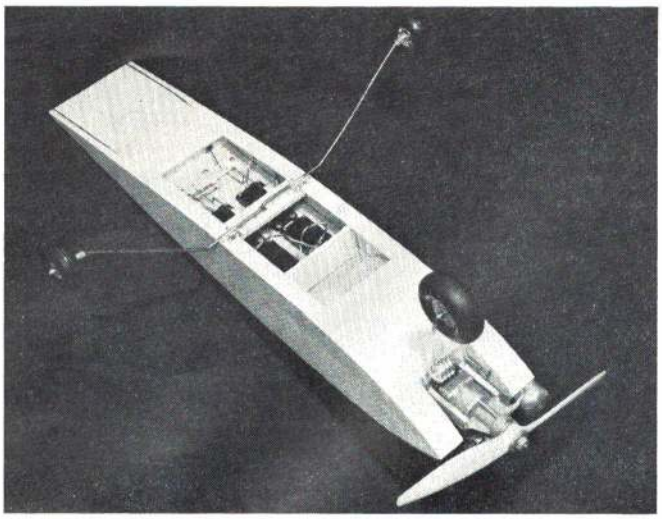
The Foam Neutrino

Constructed of foam and balsa is Dave Youngblood's ultra-performance RC design, which appeared in December issue with complete plans.









Upper: Control surfaces marked and ready to cut off. Armalite foam with 1/16″ balsa covering adhered with 3M Company 77 spray contact glue. Cut foam with templates at tip and root (see December issue for preparation of templates). Above: Servo and landing gear installation. Simple combination of nylon bellcranks achieves elevon's collective and differential action.

Upper: Fuselage holds everything and has space available for anything. It is built up with ¼ in. balsa sides, planking, bulkheads, ⅛ in. plywood servo tray, and ½ in. ply firewall. Above: Engine on Tatone mount with nose gear. Main gear is from Senior Falcon kit; note how it plugs into servo tray. Receiver and battery pack locate along side of fuel tank.

Milestone in Mankato:

In mid-August the nation's finest rocketeers assembled for NARAM-9. An eyewitness account

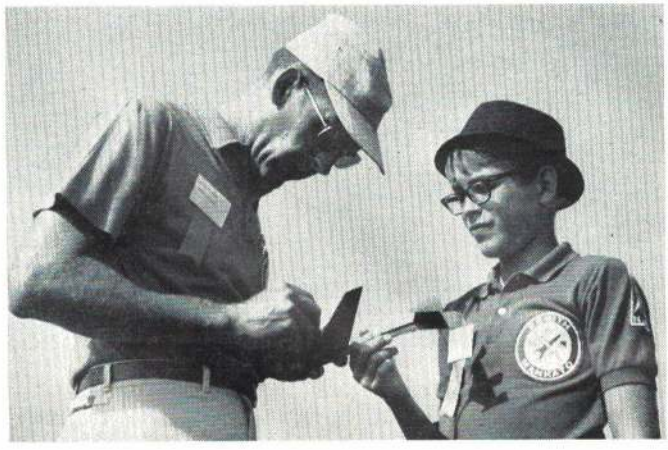
G. HARRY STINE

photography by the author

THE Ninth National Model Rocket Championships (NARAM-9) sanctioned by the NAR at Mankato State College, Mankato, Minn. was one for the books — technically, competitively, organizationally.

Contest Director Dr. Ellsworth B. Beetch, Professor of Chemistry at Mankato State, got the full support of the college and used the NAR Zenith Section to provide range equipment and management manpower. NAR Contest Board Chairman Al Kirchner selected the 74 invited contestants from all over the United States. Old-timer Manning Butterworth was in charge of the range set-up on the Mankato Airport; the rangehead was right at the intersection of the two active runways of the field. This might have caused some problems, since the field was not closed to air traffic, had it not been for the constant vigilance of Chief Safety Officer John Belkewitch and his eagle-eyed assistants. Leader Member Jack Higgins deftly handled scale judging while NASAman Bob Atwood took care of R&D judging. Pinky Guill ran the data reduction quickie-boards, working from tracking data supplied by Dr. William Perendy and his tracking crews.

The meet got under way on Tuesday, August 15th, with the first model — a Parachute Duration — launched by NASA Astronaut Thomas K. Mattingly. A certain amount of wind and a lack of good thermals denied good record-breaking Parachute Duration performance. In general, the PD models showed no new technological achievement, but there is a tendency to go to large-diameter bodies to hold the large chutes easier, and the winning chute models did not have very large canopies. Pat Artis, however, had a beautiful 30-inch chute made from ripstop nylon that can be used without wadding and is practically indestructible. Engineers from Scheldahl watched this event with great interest; they make big



New NAR President Dr. Ellsworth Beetch and son Konr preparing a Swift Class boost glider. (Plans for similar model, Aug. '67 A.M.)

Dr. William Perendy with highly successful device used at 1967 NARAM-9 for calculating the peak altitude of a model flight.

Ninth Rocketry Nats

Left: The Estes "Saturn Ib" goes way up. Interest in scale projects is growing very rapidly.

chutes for the big stuff. Winning times were not high.

Charles Gordon of Laurel, won Junior Division with 3:57. Leader Division blue ribbon went to Victor Ceicys of Parma, Ohio with 7:39, while Senior Division was copped by Gerry M. Grekorek, from the Department of Aeronautics and Astronautics at Ohio State University.

In Swift Class Boost-glider Duration, most of the birds were designed well. Tech transfer between B/G and hand-launched gliders was evident with some hi-point airfoils being used and vortex tips on a couple of designs. The Juniors and Leaders turned in better performances than the Seniors. Sam Atwood, Annapolis, Md. won Junior with 3:02 and Raymond Forbes, Ft. Riley, Kans., turned in a winning 3:26 for Leader Division. The husband-wife team of Jim and Judy Barrowman (he's a rocketsonde expert from NASA Goddard Space Flight Center) won Senior Division with 1:26.

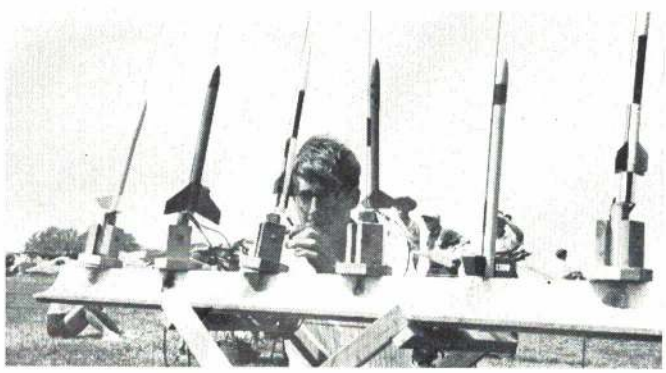
Wednesday, August 16th, was hot and sunny. PeeWee Payload got off with a roar. Some people had Payload birds that would really perform, but they were so hot that the trackers couldn't stay with them. Had these hot birds not suffered "track lost," we would have had higher winning altitudes than we did. The boys that won had large, slow-moving birds that could be tracked. For the first time, the event was pretty well mixed between the use of Estes engines and the new Flight Systems engine; 630 feet brought the Junior blue ribbon to Mike Poss of Huntington Beach, Calif. Joe Persio, Cheshire, Conn. was tracked to 540 feet for Leader Division first place. Your reporter took first place in Senior Division flying Talley Guill's Dubnica Payloader design (Count Down, September 1967) single-staged with a B3-5 engine; it went to 750 feet, which is right in the ball park of performance for this design.

Class 1 Scale Altitude was dominated by simple, well-proven scale models. Johnny Drake, New Canaan, Conn. hit 730 feet with an I.Q.S.Y.-Tomahawk (Count Down, October 1967) built with an Estes BT-20 tube. A Tomahawk also brought second place in Junior Division to Connie Stine, the only girl contestant at NARAM-9. In Leader Division, Old Champ Talley Guill flew a beautiful IRIS (with booster) to 465 feet to win with a total of 1319 points. His father, A. W. "Pinky" Guill, took first in Senior Division with an Astrobee-1500.

A certain amount of trouble was experienced by contestants who had not thoroughly read the rules or done sufficient research on their scale models. NAR rules say that the top stage of a multi-staged vehicle cannot be flown in scale events without operable lower stages unless it can be proven by the contestant that he modeled an upper stage that actually flew by itself without a booster. Again, I will say it, and can speak with some authority as a consultant on launch vehicles for the Smithsonian: (a) no WAC-Corporal ever flew without its Tiny Tim booster; it was designed to fly with this booster; (b) according to Atlantic Research Corporation, no IRIS ever flew without its booster, and it was designed to fly with a booster; (c) only one Aerobee ever flew without its booster; Aerobee A-10, an RTV-N-8 model, took off unexpectedly from the launch tower on the U.S.S. *Norton Sound* on March 17, 1949 as a result of a leaky valve, leaving its booster behind in the tower. And the booster must be operable; it cannot be a dummy that has been deliberately intended to be destroyed on the launch rail by the jet of the sustainer.

The spot landing event in the rain turned out to be fun anyway. Measurement crew checks landing distance of a flight.

On Thursday, the Aerospace Systems event was flown for the last time. In the new rule book now in effect, it has been changed completely into the Space Systems event. Charley Duelfer, Stamford, Conn. hit the jackpot in Junior Division after trying hard at four previous NARAMs; he won with his breech-launched ARCAS model. In Leader Division, it was Talley Guill and his old, reliable Convair MX-774. Yours Truly took the Senior Division with an I.Q.S.Y.-Tomahawk powered by an FSI D-1.15-6.



Left: "But sir, it flew O.K. last week!" Rocket C.P.-method expert Jim Barrowman checks Talley Guill's plastic Mercury-Redstone. Right: 1967 Junior Champion Charles Duelfer checks the igniter in his scale I.R.I.S. bird amid the competition.

Some beautiful scale models completely worthy of the title showed up for the Scale event. Steve Glines of New Canaan, Conn. took his first NARAM trophy with his Astrobee-1500 model. Again, Talley Guill's MX-774 took a winner's trophy in Leader Division; after building that bird for 5 years, Talley's getting very good with it. The same can be said for his father's Astrobee-1500 which took Senior first place. Some of the other notable scale birds were Jim Barrowman's excellent Nike-Tomahawk (Jim works on that bird at NASA Goddard), Johnny Drake's Shotput, Greg Scinto's big IRIS (with booster), and Dick Sternbach's Titan.

Plastic Scale became "plastic model" event this year with the elimination of requirements to prove scale qualities. It did not degrade the event in any way. It is tough to find a non-flying plastic model kit that can be converted into a good flying model, but the boys are doing a good job at it. True, there were some flops, which is to be expected. But the ones that went were great and showed meticulous craftsmanship that might be the envy of the International Plastic Model Society. In Junior Division, it was Johnny Drake of New Canaan, Conn. with his NASA X-15, a most difficult bird to get to fly properly. And it was an X-15 from the Revell kit that won Senior Division for the new NAR President Dr. Ellsworth Beetch and his son Konr; Al Beetch, being a professor of chemistry, knew just exactly what kind of paint to use on polystyrene plastics, and his X-15 had a perfect mirror finish. In this event, there were plenty of Hawk Jupiter-C kits modified for flight, a combination Hawk Jupiter-C and Revell Mercury capsule to produce a Mercury-Redstone by Talley Guill, numerous Revell Atlas-B's, an Aurora Regulus-II, and some Revell Thor's. The lure of this event seems to lie in several areas: finding the kit in the first place, modifying it to fly, and *getting* it to fly.

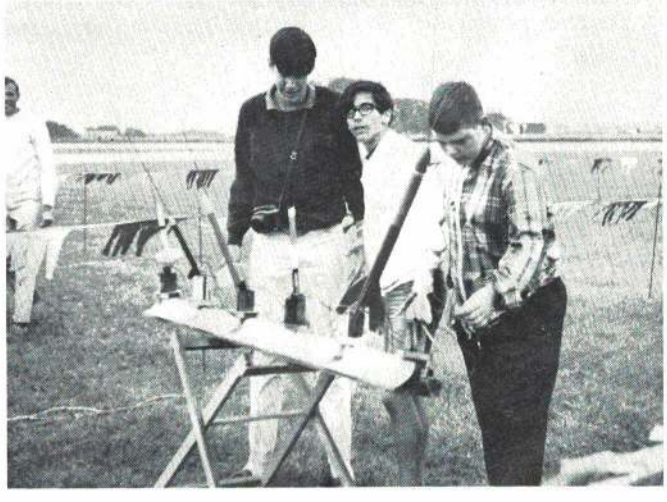
The Research and Development event this year was, to me, somewhat disappointing in the Junior and Leader age divisions. Most of the research and development might have been interesting and educational, but it wasn't practical. For example: (a) retro-rockets for soft landings may be interesting, but they would cause fire marshals to shudder; (b) water injection to improve performance requires so much additional weight that it offsets any possible performance gains; and (c) front-engined finless rockets were thoroughly investigated and discarded by Dr. Goddard and the old American Rocket Society back in the 1930's. However, in the Senior Division, some excellent work was in evidence that shows the beginnings of a trend predicted in "Count Down" some time ago: the aerospace professionals who have taken up model rocketry as a hobby are starting to apply professional techniques to the hobby in a way that the young rocketeers can understand and use. Doug Malewicki extended the graphs and charts of his Estes TR-10 to include the Flight Systems and Centuri engines. Dr. William Perendy came up with a new and improved tracking theodolite. Both Jim Barrowman and myself entered simplified methods of calculating the center of pressure of a model rocket. Gerry Gregorek of Ohio State used his department's computer to work on drag calculations of models, drag reduction, and altitude determination. Bernard Biales, of course, has been a B/G fan for years and has done a lot of work in that area.

A number of excellent demonstration flights on Thursday should be mentioned because they are indicative of the progress in model rocketry. Leroy Piester of Centuri boosted aloft some of his models

"Well chaps, time for another important mission. But I dare say they are all important, eh what?" In the crisp morning air near the aerodrome at Manquateaux, faithful ground crewman Mike Poss stands by to assist the takeoff of Mr. Countdown himself.

Orville H. Carlisle, NAR's first, and #1, member, preparing to launch one of his original 1957 model rockets. Is he flying in a mythical old-timer's event for antique models? Flies well.

The beauty of scale! Al Kirchner with his "Little Joe II" comparing models with Estes' "Saturn Ib" held by Jaroslav Broz.



Separate target poles for spot landing event results in launch rails being cocked at all angles. Which way to duck the birds?

powered by the Mini-Max Class E and Class F engines . . . and they move out! Vern Estes launched his new super-scale Saturn Ib powered by a cluster of four engines and recovered by two chutes on the booster and a single separate chute on the Apollo capsule; this bird flew beautifully twice and looks like the real thing when it goes up . . . but it is not for beginners! Irv Wait of Rocket Development Corporation flew some models powered by his new Enerjet Class E engine with its variable time delay assembly (you can choose the time delay you want before flight); the Enerjets use a modern composite solid propellant with a specific impulse of 182 and leave no visible jet or smoke trail . . . just WHOOM! Irv also flew a real rocketsonde, the RDC "Honeybee" which he is making for the Air Force; it is a big model rocket powered by an Enerjet with 99 Newton-seconds total impulse and carrying 0.75 pounds of payload to about one kilometer altitude with full parachute recovery.

The most spectacular flight of the demonstration was pulled off by George Roos of Flight Systems who launched his OSO kit model with an FSI Type F18-0 booster and an FSI Type F1.3-18 sustainer — a

Continued on page 68

Connie Stine preparing her I.Q.S.Y. Tomahawk for its Aerospace Systems flight. She was the only girl entrant at NARAM-9.

Vern Estes with "Saturn Ib" from his new kit. Model uses cluster of four engines.

model rocketeer

NATIONAL ASSOCIATION OF ROCKETRY

1239 Vermont Avenue NW, Washington, DC 20005

NAR

AIAA APPROVES MODEL ROCKETRY

The American Institute of Aeronautics and Astronautics Education Committee has endorsed the use of model rockets by its members and university sections. The announcement was made just before NARAM-9. The endorsement changes a 10-year position against the use of chemical exothermic engines by non-professionals.

The AIAA's new position opens the way for college and university students, affiliated with the organization, to carry out model rocket experiments as an official section activity.

NEW OFFICERS ELECTED AT NARAM-9

The new NAR president for the next three years is Dr. Ellsworth Beetch. Dr. Beetch replaces G. Harry Stine. Dr. Beetch is a professor of chemistry at Mankato State College. He is the first educator to head the NAR.

Other new officers are, Bryant Thompson, Vice President; Robert Atwood, Secretary; Dr. William B. Rich, Treasurer.

Serving on the Board of Trustees for the next three years are, John Worth, John Belkewitch, Jim Kukowski, A. W. Guill, James Barrowman, Dr. Willy Ley, Leslie Butterworth, G. Harry Stine and Albert Kirchner.

Kirchner remains as National Contest Director and Robert Atwood is also National Section Director.

NARAM-9 GUEST FROM EASTERN EUROPE

A special guest at NARAM-9 in Mankato, Minnesota was Jaroslav Broz. Broz, a member of the Czechoslovak Aeroklub, was brought to this country by Vernon Estes, president of Estes Industries.

Broz was one of the interpreters at the First International Model Rocket Competition held in Dubnica, Czechoslovakia in 1966. The U.S.A. sent a nine-member team to compete.

Broz was a guest at the Estes plant for several weeks.

NEW PINK BOOK RULES GAIN FAVOR

A number of new contests and revised contests opens the way for some exciting competition this year. There is unanimous opinion that the Quadrathon Competition will be a real brainbuster for design fans. The four-event contest requiring the use of a single rocket for P/D, Spot Landing, Pee Wee Payload and Class I Altitude shows some excellent imagination by the Pink Book Committee.

BYLAWS GET REVISION

The NAR Bylaws received a thorough going over in September by a committee appointed at NARAM-9. The major change in the governing rules of the NAR will allow Leader members to vote for officers of the Association. The proposed changes were made when the voting members of the NAR at NARAM-9 instructed the new Board of Trustees to submit a revised draft of the bylaws.

NAR # 001 AT NARAM-9

Besides the appearance of Vice President Hubert H. Humphrey and Astronaut Thomas K. Mattingly at NARAM-9, the presence of Orville H. Carlisle, Norfolk, Nebr., was well received. Carlisle, regarded as the originator of the model rocket, showed up unannounced and brought along several of the "first" model rockets. Carlisle holds NAR # 001.

Other guests at the NARAM were W. J. Rankin, National Safety Council representative; Harold C. Hartley, Federal Aviation Agency; "Flip" Schulke, photo-journalist; Paul R. Leatherwood, Director of Public Relations, Bendix Field Engineering Corp. and Leister Graffis, President, Bendix Field Engineering Corp. Mr. Graffis participated in the awarding of the Bendix trophies to the national champions.

Mr. R. V. Mrozinski, a staff member of the National Aeronautics and Space Council, Executive Branch, U. S. Government, was also present. Mr. Mrozinski was to give the awards banquet speech but relinquished his time to Mr. Humphrey.

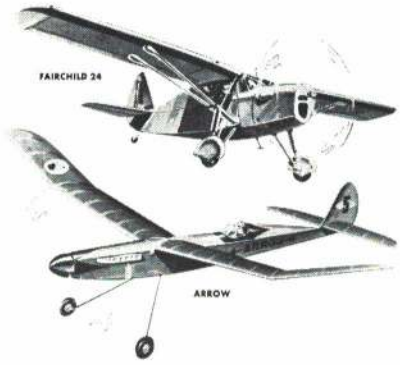
Also on hand was a three-man team from the Manned Spacecraft Center, Houston, Tex. The group, headed by Bob Jones, were there to gain firsthand information on model rocketry for the MSC Educational Programs Office.

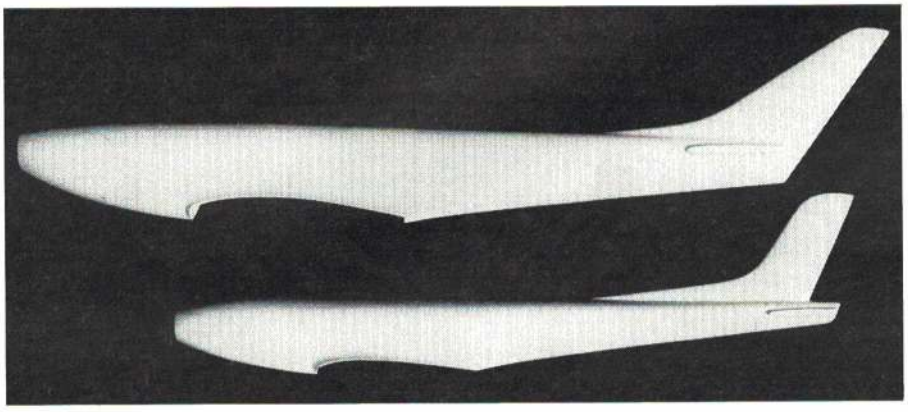
HAVE YOU RENEWED YET?

All NAR members should have received a membership renewal card. Any delay in renewing will delay your receiving of the AMERICAN MODELER magazine. It can also prevent you from competing in a meet if

Continued on page 55

NEW PRODUCTS CHECK LIST





Fiber Foam Products/Fiberglass Fuselages. Two sharp looking F/glass fuselages are Fiber Foam's RC market entry. The seams are smooth! No filling needed; one application of color will cover the white gel coat if desired. Fins are one piece with molded-in balsa insert for hinge mounting. A molded stab saddle makes for easy alignment. Nose and wing saddle are also reinforced to resist impact damage. Full-size templates of motor mounts and bulkheads are included. Supply your own built-up or foam wing and sheet balsa or built-up stab.

The "Tiger" at $32.95 is multi-purpose; for the novice a Falcon 56 wing with tip ailerons is advised. An advanced flyer will want a swept or straight, 50-52 in. wing. Fuselage is 43½" long. Engines .35 to .45.

Overall length of the "Phoenix" is 53½". Though many wings were tested, the straight or swept Phoenix wing works best. Use engines .45 to .60. Fuselage price is $39.95. When ordering direct, specify Express, Freight or Bus shipment as these cannot be mailed. FIBER FOAM PRODUCTS, P. O. Box 12091, Plantation, Fla. 33314.

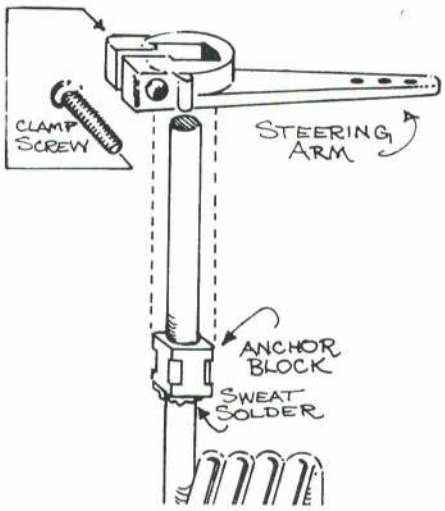
Paul K. Guillow/Flying Model Kits, Stage 2. These kits were engineered as a move-up from the "Stage 1" kits released in 1966 and to give exceptional rubber or glow engine performance. Both are larger; the Fairchild with a 25" wing span is easy to build and a replica of a famous private aircraft. The 28" span Arrow is guaranteed to perform also, giving reliable and smooth endurance flights. Both are built by numbered instructions and contain quality materials. Propeller/power combinations have been worked out for top performance. Each is priced at $2.50.

Guillow is releasing two rubber power propeller assemblies; each contains a light, smooth, efficient wood prop with shaft, washers and nose button—the same as those used in their kits. The 8½" prop sells for 29c and the 9½" size for 39c. Excellent for any rubber powered model needing a prop in this range. PAUL K. GUILLOW, INC., Wakefield, Mass. 01880.

L. M. Cox Mfg. Co./Speed Pan. The first time ever a die-cast speed pan of Magnesium is being produced for the ½A Proto or Speed flyer. Dale Kirn at Cox designed it to fit their potent Tee Dee .049 engine. It's factory drilled and tapped (3-48) for mounting that engine. Mount screws are included. Also the pan front is contoured

Vic's Custom Models/RC Taylorcraft. How do you describe a large kit model? First, you can say it's a scale, 1946 T-Craft and that it's one-fourth full size! And then — Vic's new RC model has a wing span of nine ft., a wing chord of nearly 16" and a landing gear formed of 3/16" dia. wire. Flying weight is 12 lbs. and a .60 engine or larger is advised. Note the size of those bulkheads, the wing ribs and cowling in the photo. Though large—the kit is shipped in two boxes — the construction is not complicated. A booklet guides you step-by-step. Wood quality is tops. Most of the plywood is five ply; the hardwood, oak. A formed windshield is included with a molded plastic cowl. A clever locking arrangement allows easy removal of landing gear and each wing half demounts for transportation. ANY radio gear will fit in the cockpit or out-of-sight under its floor. The original model flew without ailerons. If you want to install this control, Vic advises that a separate servo be used (without extensive linkage) at each aileron. Aileron size creates too great a load for one servo. Many modelers, feeling that only large models combine realistic appearance with full-size flight characteristics, will find this kit appealing. The rest will be attracted by the sheer size. Kit price is $79.95. More data is available from: VIC'S CUSTOM MODELS, 618 Cowpath Rd., Lansdale, Penna. 19446.

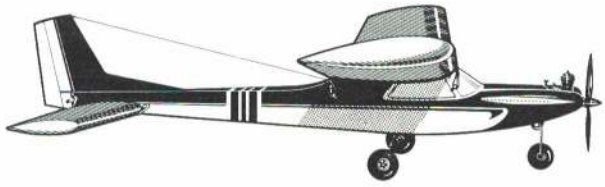
to fair into the Tee Dee spinner — no other spinner required. Overall length is 12 1/16" and the weight is less than an ounce! A very complete instruction sheet gives tips on drilling fuselage tie-down holes, mounting landing gear or skid and fuel tank recommendations. Retail price is $3.95. For info ask: L. M. COX MFG. CO., P. O. Box 476, Santa Ana, Calif. 92702.

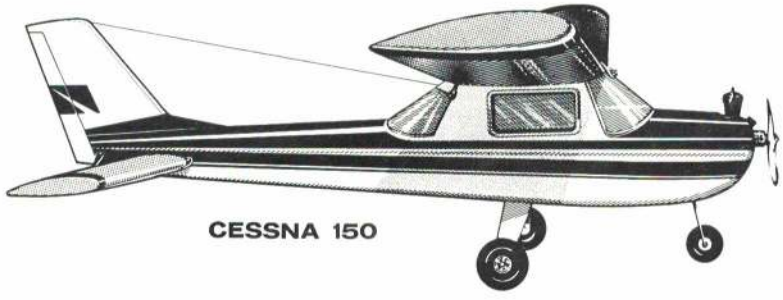


World Engines, Inc./Non-Slip Steering Arm. Another accessory in W. E.'s R/C Craft line is the non-slip, nose gear steering arm. It eliminates arm slippage or twisting through loosening of a collar or set screw. First — locate the square brass anchor block on the nose gear wire in the desired position and sweat solder in place. Then fit the plastic arm over the block, clamping it with the screw provided. The block fits 5/32" dia. wire. Price is 59c each. Write: WORLD ENGINES, INC., 8960 Rossash Ave., Cincinnati, O. 45236.

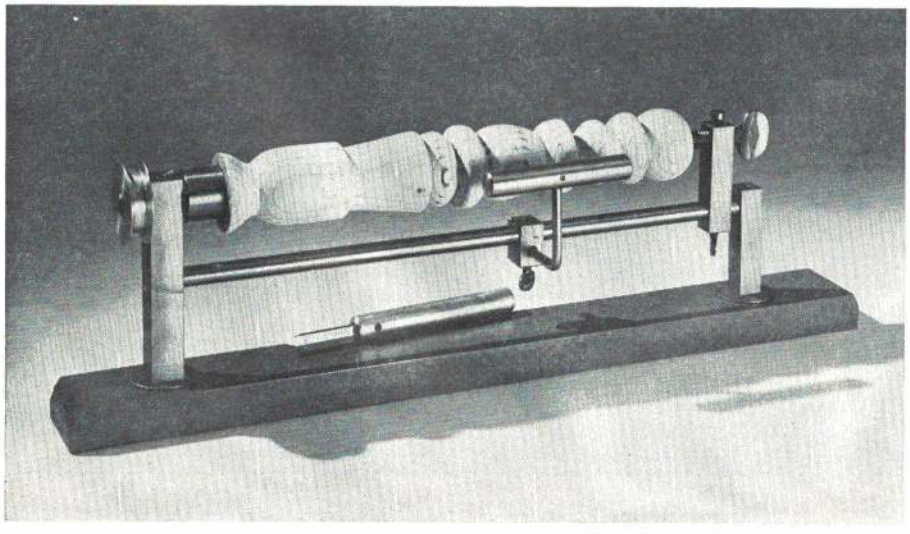
Moody Machine Products/#52 Utility Screw Driver Set. Another new tool set from Moody, this screwdriver set comes in a flat, plastic carrying case — just right to carry in your pocket for field or bench use. Each set contains a knurled handle and six interchangeable blades in these widths: .025", .040", .055", .070", .080" and .100". List price is $2.50. For information on their complete line of precision tools, write: MOODY MACHINE PRODUCTS CO., INC., 42-46 Dudley St., Providence, R.I. 02905.

Vintage Model Aircraft/From Out of the Past . . . Vintage uses this to describe their kit line. As the name says — these are new, up-to-date kits of old aircraft. All can be used for Free Flight, single channel RC or U-Control. The Sikorsky S-39 is typical; span of 45" and suitable for .049 to .09 engines. Kit price, $14.95. Also available is a 45" span Heath Parasol, great for G. Ghost and .049 to .09s, and a 38" span Bellanca "Columbia" for .049s. These last two are priced at $12.95 each. All kits contain die-cut parts, hardware, landing gear, covering material and preformed struts and cowls where needed. Note this new address: VINTAGE MODEL AIRCRAFT, 13636 N. 33rd. St., Phoenix, Ariz. 85032.





Midwest Products/Whiz Kid and Cessna 150. These two RC kits — both Owen Kampen designs — were added to the Midwest line. Each contains a molded, foam wing and stab. Just assemble the fuselage from die-cut parts (Midwest 'drop-outs')! All hardware is included with a pamphlet, "Care and Finishing of Foam." Priced at $8.95, the Whiz Kid has a 44" span, uses a .049 and is a perfect G. Ghost trainer. The Cessna 150, 44" span at $9.95, introduces the builder to semi-scale and is suitable for single channel or small multi RC gear. Takes any .049 to .10 engine. MIDWEST PRODUCTS CO., 400 S. Indiana St., Hobart, Ind. 46342.



G. Hobby Products/Miniature Lathe. G. Hobby calls it Subminiature Wood Turning Lathe, #C-21, price $8.95. We think it should be called 'miniature' since it's not much smaller than a regular modelmaker's lathe. It handles stock up to 10" long and with a maximum diameter of 4½" (in lathe terms that's 2¼" swing). It's made of steel and aluminum. For use, mount it on a suitable wood base. Bearings are of Teflon. Use any motor with at least ⅛ hp. An accessory arbor, #A-14 at 85c, allows a pulley to be added to any ¼" electric drill for use as a power source. Standard turning knife is a skew mounted in an aluminum handle, #C-22 at $1.55. Extra blades — gouge, round nose and spear point — cost 75c each and fit same handle. An ideal small lathe, it saves time whether you're turning out a cowl, nose cone or special mold for a F/glass part. G. Hobby has other fine tools too, ask for the circular: G. HOBBY PRODUCTS, 271 E. 10th. St., New York, N. Y. 10009.

SCALE TECHNIQUES...
for the plastic modeler

Westland Lysander – 'Tin Lizzie'

Interesting cockpit painting procedures are described

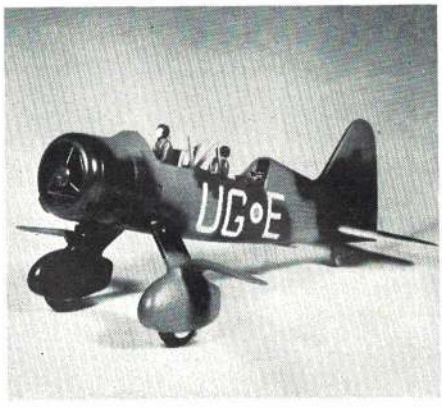
Fascinating British short-range tactical reconnaissance aircraft. Model by Hawk is well-detailed and accurate.

JOHN N. TOWNSLEY

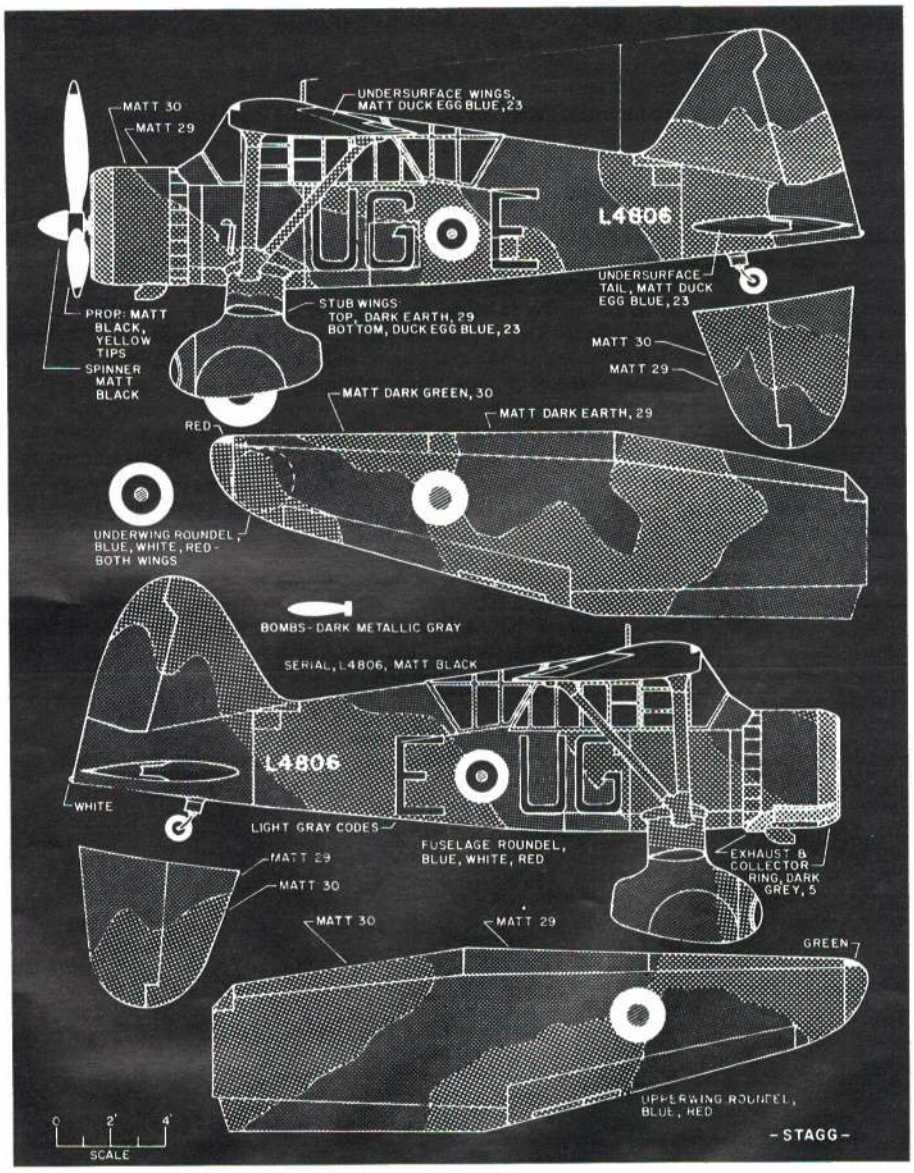
SEVERAL (British) Army co-operation squadrons equipped with the Westland Lysander monoplanes were sent to France in the opening weeks of the War, with the balance of the squadrons remaining in England. The Lysander was used as a tactical reconnaissance aircraft for short-range work over the immediate battle area and for aerial observation. The reconnaissance Lysander squadrons used in France were Numbers 2, 4, 13, and 16.

The color schemes for these squadrons were the same as those of the fighters of the period: upper surface camouflage pattern: dark green and dark earth; undersurfaces: black on the port side of the fuselage centerline and gray on the starboard side. A red and blue roundel was usually painted beneath the starboard wing and either red and blue, or red, white, and blue roundels on the fuselage. Red and blue roundels appeared above the wings, and no tail markings were carried. (Lysander's used for dropping sup-

Continued on page 60



Big landing gear struts add lift. Winglet extensions on wheel pants are bomb racks.



"Shadow shading" type camouflage is dark green and dark earth.

JANUARY 1968

model aviation

Official magazine of the Academy of Model Aeronautics • 1239 Vermont Avenue N.W., Washington, DC 20005

Sub-Junior Program Expanded For 1968

Junior membership for half price? Yes — for those who don't need to receive the magazine which is normally sent to all AMA members, and who don't intend to fly models with gas engines larger than ½A and who don't wish to vote in AMA elections — a special AMA membership is now available for only $1.50! For this fee is provided:

1. **A competition license** including number, with eligibility to enter all AMA sanctioned events except those in which an engine larger than Half-A (.050 cu. in.) would be used.
2. **Insurance coverage** for all model flying activities (contest or sport) with engines no larger than Half-A (.050 cu. in.).
3. **AMA decal** (new red, white and blue type).
4. **AMA Silver Wings Pin** — for lapel or tie-tack.
5. **Eligibility** for membership in AMA chartered clubs at no additional charter fee (though club dues may still be required).

For many current AMA Juniors this membership may be all that's needed — it's even cheaper than the usual family membership in which only one dollar is saved over the regular price. This membership permits licensed flying of all glider and rubber powered models, in addition to all types of ½A Gas or smaller engine powered models, including RC! The insurance covers ready-to-fly as well as homebuilt models.

How to get this special membership? Simply make out check or money order to AMA in the amount of $1.50, indicate the words "S-Junior," mail to: Academy of Model Aeronautics, 1239 Vermont Ave. N.W., Washington, D.C. 20005.

Can regular Junior membership be obtained at any time? Yes, by sending an additional $1.50 any time in 1968 between January 1 and July 31, or $1.00 from Aug. 1 through Oct. 31. Note: Those who convert from regular Junior membership will retain their current license number but prefix it with the letter "S."

Why this special Junior membership? One obvious reason is to reduce the cost for youngsters to try AMA competition activities, at least for those events which are basically low cost: gliders, rubber-powered, small engines. Similarly the cheaper rate makes it easier for clubs to have Junior programs, easier to add Junior members since the total cost — AMA dues plus club dues — need not be excessive.

All 1967 Juniors have been advised, with their '68 membership notices, that they have the option of rejoining under the new S-J program or continuing their regular Junior membership at the normal $3 rate. The hope here is that many Juniors convert and help reduce the subsidy which is now involved in their membership. At $3 AMA loses money on each regular Junior membership. In effect the Open members are subsidizing the Junior because part of their dues goes to offset the loss.

This factor has prevented large scale Junior campaigns — a large gain in loss producing memberships could easily wipe out what subsidy is available from Open memberships. And although the cause is worthy not many adults would be receptive to a dues increase to help this situation. And to raise the Junior dues to make each such membership self-sustaining is not attractive either. When a general dues increase was made in 1964 AMA did not lose many Open members but about 3,000 Juniors dropped out.

Another factor is behind the Sub-Junior program. A number of AMA chartered clubs, anxious to help youngsters get started in model aviation, are willing to subsidize Juniors to the extent of paying all or most of their AMA membership. At $3 the price was too high, but at half that such subsidization may be feasible, especially since no additional charter fees are required to have Sub-Juniors added to the club roster.

FAI Team Roundup

Free Flight — Indoor. Team selection finals were held on Aug. 2-4 at Northwood Institute in West Baden, Indiana. Fourteen qualifiers flew off out of over eighty who had participated in the program through qualification, quarter and semi-finals stages. Emerging on top and becoming 1968 team members were **Jim Richmond**, **Al Rohrbach**, and **Clarence Mather**. Bud Romak was fourth and was subsequently named Team Manager after the program administrator, Bud Tenny (1966 team manager), waived appointment.

Through program entry fees and contributions approximately $1,000 was raised to help fund team travel. At press time the site of the 1968 Indoor world championships was expected to be in Rome, Italy, although this was subject to final decision at the annual FAI meetings in late fall.

Free Flight — Outdoor. Ninety-one fliers qualified at seven semi-finals team selection meets held across the country last Labor Day weekend. Thirty fliers each qualified in Nordic and Wakefield, thirty-one in Power. These fliers, plus nine members of the 1967 team will flyoff at the team selection finals to be held in 1968. Four sites are under consideration for the flyoff: Bong Field, Wisconsin; Denver, Colorado; Perry, Oklahoma; Taft, California. Final decision as to site and flyoff dates is to be made before the end of January 1968.

Floyd Miller of Columbus, Ohio, Contest Director of the 1966 flyoff and also 1967 Team Manager, is current program administrator. Four hundred and fifty seven fliers participated in 1967: 169 in Power, 159 in Nordic, and 129 in Wakefield. Winners of the 1968 flyoff will make up the 1969 team. Unlike AMA's other team selection programs which start and are completed in the same year, the outdoor free flight program covers a two year span.

Control Line. At a two day flyoff held last Sept. 30-Oct. 1 at Buder Park in St. Louis, twenty-nine Speed, Stunt and Team Race finalists competed for berths on the 1968 team. Hosts for the meet were the St. Louis Yellow Jackets model airplane association, with Art Schaeffer as Contest Director.

The team selections came out as follows. **Speed: Roger Theobald, Arnold Nelson, Bill Wisniewski**; Jim Nightingale, first alternate. **Stunt: Bob Gieseke, Jim Silhavy, Steve Wooley**; Bill Werwage, first alternate. **Team Race: Stockton-Jehlik, Duncan-Wright, Marvin Albritton**; Barr-Theobald, first alternates.

Pete Brandt, program administrator was on hand to supervise this first combined-event central flyoff in the history of control line team selection meets. He reported that the meet was a great success in terms of participation by practically all those who had earlier qualified. Out of 11 who took part in the Speed portion of the program, 10 qualified and 8 showed at St. Louis. Out of 19 in Stunt, 16 qualified and 14 showed. Out of 17 teams in Team Race, 10 qualified and 8 showed.

Radio Control. The team selection program for 1968, to pick a 1969 team, is in final stages of development, with details scheduled for announcement in the next issue. Basically, it is expected to be similar to the program through which the 1967 RC team was selected. This was by way of a central flyoff for those who had qualified earlier at various AMA meets. The 1969 world championships is already scheduled to take place in Germany.

1968 NATIONAL MODEL AIRPLANE CHAMPIONSHIPS
JULY 29 - AUGUST 4
NAVAL AIR STATION
OLATHE, KANSAS
(near Kansas City)

RC at the '67 Nats

This is an accounting of Pattern and Pylon contestants, who they were and what they flew. The contestant information was compiled by Howard McEntee and contributed to AMA.

Self-explanatory abbreviation is utilized. The sequence goes: contestant's name, (ham call, if any), age, occupation, home city; club, if one. Then comes the description of the airplane entered which includes name (modifications, if any), wingspan, wing area, weight; covering and finish material. Engine data shows maker and size, propeller (diameter, followed by pitch), fuel used. Then we get into controls available, radio make, operating frequency.

Coverage includes the qualifiers only. There were perhaps as many as 175 planes "entered," a fair number of which weren't flown. Since every event had a qualification run-off, we endeavored to obtain data sheets for every plane which was flown in the Finals.

Here's how to decipher the shorthand used to describe controls: most entries show "REMA" which means rudder, elevator, motor (throttle) and ailerons. Class II drops the "A", while Class I has only "RM." Indicated is the type of brakes when specified. "F" after REMA shows working flaps. Also indicated are such additional functions as mixture control, and retractable LG.

All the Pylon entrants listed were qualified, but only nine prizes were given in this category, and thus we provide contestant information only up to 9th. Note: Scale information is to be provided next month.

Bill Anderson, 43, Salesman, Houston, Tex.; Houston RCC. Stafford kit Midget Mustang, 36″ span, 450 sq. in., 5 lb., silk, Aero Gloss. K & B 40 RR, 8-8½ prop, K & B fuel. REMA, Bonner 4Rs, 72.40 mc.

Bud Atkinson (WODDL), 42, Cabinet Maker, Blue Springs, Mo.; KCRC. Own Compromise, 60″ span, 700 sq. in., 7¼ lb.; silk, Sig dope. Enya 60, 11-7½ prop, Sig fuel. REMA, elec. brakes; Logictrol 4, 26.995.

Don Ballreich, Potato Chip Mfr., Tiffin, Ohio; Weak Signals club. Own Tornado, 72″ span, 780 sq. in., 7¼ lb.; silk and dope. Veco 61, 11¼-6 prop, Fox fuel. REMA, mech. brakes, mixture control. Orbit 7-14, 27.095.

Tony Bonetti, 37, Garage Owner, Emerson, N.J.; North Jersey RCC. Own Trouble Maker, 60″ span, 600 sq. in., 7 lb.; Hobbypoxy and MonoKote. Enya 60, 11-7 prop, Cox Blue Label. REMA, elec. brakes; Kraft, 53.1 mc.

Al Bowman, 43, Sales Eng., Anaheim, Calif.; RCL/OC. Kwik-Fli Mk II (semi-sym. wing), 66″ span, 660 sq. in., 5½ lb.; silk and butyrate. Enya 60, 11-8 Power prop, own fuel. REMA, drag brakes; Kraft KP-6, 75.640 mc.

Mike Bridges (K6EHA), 25, Machinist, El Monte, Calif.; San Gabriel Valley RCL. Kwik-Fli II (Jensen kit), 60″ span, 620 sq. in., 6½ lb.; silk and butyrate. Enya 60, 11-7¾ prop, Jensen formula fuel. REMA, friction brakes; Kraft radio, 52.950 mc.

Joseph Bridi, 39, Cabinet Maker, Harbor City, Cal.; BIRDS & LARKS. Stafford Midget Mustang, 46″ span, 460 sq. in., 5 lb., 10 oz.; silk, Sig dope. K & B 40 RR, 9-9 TF prop, own fuel. REMA, Logictrol, 27.195.

Ralph Brooke, 37, Dentist, Seattle, Wash.; RAMS. Own Crusader, 69″ span, 690 sq. in., 7½ lb.; MonoKote & Hobbypoxy. Fox 60, 11-7 prop, Sig fuel. REMA, elec. brakes, mixture control; Orbit, 72.96 mc.

Luis Castaneda, Engineer, Puebla, Mexico; Puebla Aeromod. Club. Own Brujo Sorcerer, 720 sq. in.; Aero Gloss. Enya 60, 11-8 prop, K & B 100. REMA, mixture cont.; Orbit 7-14, 26.995 mc.

Ron Chidgey (WA4OUA), 35, Mech. Eng.; Pensacola RC. Citron, 62″ span, 720 sq. in., 7½ lb.; silk, Sig dope. Merco 61, 11-7 TF, Cox blue label. REMA, elec. brakes; Kraft, 53.1 mc. Also: Pylon deBolt Special, 450 sq. in., 4-¾ lb.; silk, Sig dope. Front rotor K & B 40, 10-9 prop, Supersonic 1000. REMA, Kraft KP-6, 53.1 mc.

Alex Chisolm, 47, Insurance Agent, Fresno, Cal.; Fresno Radio Modelers. Lanier Bronco, 65″ span, 585 sq. in., 6½ lb. Enya 60, 11-8, K & B 100. REMA, PCS, 26.995.

Don Coleman (WB4CZS), 38, Dentist, Citronelle, Ala.; Gulf Coast RCC. Citron, 57″ span, 684 sq. in., 7¼ lb.; Hobbypoxy. Merco Mk II, 11-7 Rev-Up, Cox blue label. REMA, elec. brakes, Kraft, 52.995 mc.

Wallace Crichton, 30, Owner Lanier Indust., Oakwood, Ga. Lanier Thunderball, 65″ span, 6¼ lb. Enya, 11-8 prop, Glo-Go fuel. REMA, Kraft, 27.045 mc.

H. deBolt, 39, Model Plane Mfr., Cheektowaga, N. Y.; Flying Bisons. Own Special, 50″ span, 480 sq. in., 4 lb. 10 oz.; Aero Gloss and Hobbypoxy, K & P 40, 9-9 prop, Supersonic 1000 fuel. REMA, Orbit, 26.995 mc.

Donald Dolin, 37, City Employee, Seattle, Wash.; RAMS. Highly modified Taurus, 69″ span, 7¼ lb.; resin and lacquer finish. Enya, 11-7 prop, own fuel. REMA, Orbit, 26.995 mc.

Ray Downs, 49, Hobby Shop Owner, Los Angeles; LARKS, NMPRA. Little Mike (English plans, mod. to true scale), 460 sq. in. 5 lb.; balsa and silkspan, Aero Gloss. K & B RR engine, 9-8 prop, K & B 1000 fuel. REMA, Orbit 3+1, 27.195 mc.

Ken Duncan, 16, Student, Minnetonka, Minn.; Twin City RC. Penetrator, 60″ span, 720 sq. in. 6¾ lb.; silk and dope. Enya 60, 11-8 prop, own fuel. RM, Orbit, 27.195 mc.

Bror Faber, 36, Product Reliability Rep., Westminster, Calif.; BIRDS. Propocat (mod. tail section), 60″ span, 760 sq. in., 6½ lb.; Hobbypoxy, Enya 60, 11-8 prop, K & B 100. REM, elec. brakes, Orbit, 26.995 mc.

Joseph Foster, 40, Project Coordinator, San Jose, Cal.; Pioneer R/C. Rivets, from own plans, 46″ span, 452 sq. in., 5 lb.; Hobbypoxy #2 method finish. K & B 40 RR, 9½-9 prop, K & B 1000. REMA, Orbit 7-14, 27.195.

Bob Francis, 32, Printer, Santa Clara, Cal.; Pioneer RCC. Cosmic Wind (Ballerina), K & K Fiberglass Co., 48″ span, 450 sq. in., 5½ lb.; Hobbypoxy. REMA, Orbit 7-14, 27.195 mc.

Jackie Gardner, 39, Insurance, Jackson, Miss.; Capitol City RCC. Own Penetrator, 61½″ span, 738 sq. in., 6½ lb., silk, Aero Gloss. Veco-Lee 61, 11-7 prop, Thimble Drome fuel. RM, mixture control, Orbit 4-8D, 27.095 mc.

Paul Good, 31, Airline Instructor, Seattle, Wash.; RAMS. Flying Banana Mk III, 58″ span, 680 sq. in., 7½ lb.; Hobbypoxy, MonoKote. Enya 60, 11-7 prop, Sig fuel. REMA, mech. brakes, mixture control, Orbit, 72.40 mc. Qual. with Crusader, crashed in Finals.

Graham & Upton Team, 33, Patent Engineer, Santa Susana, Cal.; Valley Flyers. Stafford kit Mustang (FG fuselage, foam wing), 48″ span, 460 sq. in., 5 lb.; acrylic lacquer. ST 40RV, 8-8 prop, Cox red label fuel. REMA, PCS, 53.175 mc.

James Grier (K9ZNI), 36, Abrasives Mfr., Chicago; S.A.C. Own Anonymouse, 74″ span, 720 sq. in., 7 lb.; silk, dope. ST 60, 11-6 prop, Idle-X fuel. REMA, mixture control, Orbit, 52.95 mc.

Norman Hooper, 28 Draftsman, Beaverton, Ore.; Fly-A-Ways. deBolt Interceptor, 68″ span, 720 sq. in., 7¼ lb.; Hobbypoxy. Fox 60, 11-7 prop, Missile Mist. REMA, Bonner Dig. 4, 72.24 mc.

Gil Horstman (W7DWJ), 31, Elect. Technician, Las Vegas, Nev.; LVRC. Stafford kit Mustang; 48″ span, 460 sq. in., 5 lbs. 7 oz.; Silkspan, Fuller dope. K & B 40, 8½-8prop, Cox red & blue label fuel. REMA, PCS, 53.10 mc. Also: Aristo Cat (Midwest kit), 6 lb. 12 oz.; sheeted, Kampel dope. Veco 61, 12-6 prop, K & B 100. REM, PCS, 53.1 mc.

Ernie Huber, 35, Machinist, Beverly, Mass.; NERCM. AAMCO Special (Aeromaster fuse. with sym. low wing), 60″ span, 610 sq. in., 6¼ lb.; silk, Aero Gloss. Merco 61, 11-8 Power prop, K & B 100. REMA, Bonner 4RS, 72.24.

Edward Izzo, 44, Engineering Manager, Skaneatles, N. Y.; Syracuse ARCS. deBolt Midget Mustang, 450 sq.in., 5 lb.; silk, dope. K & B 40, 9½-8½ prop, K & B 1000. REMA, Logictrol, 27.145 mc.

Stanley Karpelowtiz, 30, Sales, Overland Park, Kans.; Kansas City RA. Qwik-Fli from kit (bigger rudder, main LG moved back); 6½ lb.; Aero Gloss. ST 60, 11-7 prop, Fox fuel. REMA, Kraft KP4, 27.195 mc.

Edward Keck, 37, Engineer, Webster, N. Y. Dmeco Midget Mustang, 50″ span, 460 sq. in., 4¾ lb.; silk, dope, Hobbypoxy. K & B 40, 9-8½ prop, K & B 1000. REMA, Orbit 27.195.

Neal Kilby (WA4PIN), 43, Manager of Champion Prod., Decatur, Ga.; Atlanta RCC. Widget design by H. Coleson, 68″ span, 740 sq. in., 6½ lb.; silk, dope. Enya 60, 11-8 prop, Glo-Go fuel. REMA, Kraft 72.08 mc.

George Killeen, 31, PCS Technician, Hacienda Heights, Cal.; SGVRCL. Henchman design by M. Franklin, 63″ span. 540 sq. in., 5¾ lb.; silk. Enya 60, 11-8 prop, Crawford fuel. REMA, PCS, 72.24 mc.

Jim Kirkland (WA4NMG), 42, USAF, Valparaiso, Fla.; Guided Mites. Own Taperwing Citron, 68″ span, 650 sq. in., 7 lb.; slik, dope. Merco 61, 11-7 prop, K & B 100 with additives. REMA, elec. brakes via SACS switching, Kraft KP-6B, 53.025 mc.

Phil Kraft (K6SQF), 41, R/C Mfr., Monterey Park, Cal. Own Qwik-Fli Mk III, 59½″ span, 620 sq. in., 6 lb.; silk dope. Enya 60, 11-7 prop, Cox fuel. REMA, Kraft, 52.875 mc. Grand slam for Phil, winner of R/C World Champs a month earlier.

Gerald Krause (WA5JBA), 33, Engineer, Fort Worth, Texas; Ft. Worth Thunderbirds. Copperhead design by Ed Rankin, 62″ span, 740 sq. in., 7 lb.; enamel finish. Fox 59, 11-7 prop, Dukes Mixture. REMA, Logictrol, 53.6 mc.

Larry Leonard, 25, Owner Larry's Hobby Center, Northridge, Cal.; Valley Flyers. Stafford kit Midget Mustang, 460 sq. in., 5½ lb.; Silkspan and acrylic lacquer. K & B 40 RR, 10-8 Speed prop, Cox blue label. REMA, Kraft KP6B, 52.950 mc. Also: Kwik-Fli from Jensen kit (⅝″ lower thust line), 60″ span, 620 sq. in. area, 6 lb., silk, dope. Lee-Veco 61, 11-8 Top Flite prop, Cox blue label. REMA, mixture control, Kraft KP-6, 52.950 mc.

Donald Lowe, 42, Aerospace Eng., Dayton, Ohio; WORKS. Own Phoenix, 720 sq. in., 7 lb.; dope finish. ST60, 11-7 prop, own fuel. REMA, Micro-Avionics, 27.095 mc.

Joe Martin, 32, Technician, Upland, Cal. DeNight Special, 50″ span, 5 lb. 6 oz.; dope. K & B 40, 9-9 prop, K & B 1000. REMA, Micro-Avionics, 72.4 mc.

Nick Neville (WB4ELN), 34, Engineering Tech., Huntsville, Ala.; Rocket City RK.

Lanier Pursuit, 63″ span, 630 sq. in., 6 lbs., Enya 60, 11-7 prop, Champion Glo-Go fuel. REMA, elec. brakes, Kraft, 52.950 mc.

Jim Oddino (WB600Y), 34, Engineer, Woodland Hills, Cal.; Valley Flyers. Own Honcho (longer tail moments, tapered wing, side-mounted engine), 58″ span, 600 sq. in., 6½ lb.; auto body primer, acrylic lacquer. Veco, 11-8 prop, Duke's fuel. REMA, Logictrol, 29.4 mc.

Richard Pence, 17, Student, San Diego, Cal. Original Jumping Jack, 58″ span, 700 sq. in., 6¾ lb.; silk, Aero Gloss. Enya 60, 11-7 prop, own fuel. REM, elec. brakes, Logictrol 26.995 mc.

Maurice Philips, 37, Teacher, Santa Clara, Cal.; Pioneers RCC. Low wing cabin original called Rudolph, 58″ span, 620 sq. in., 7 lb.; butyrate dope. Enya 60, 11-8 prop, own fuel. REMA, mech. brakes, Kraft KP-6 trans., KP-6B rec., 72.4 mc.

Tom Protheroe (WB6SXQ), 40, Pattern Maker & Model Boat Mfr., Santa Barbara, Cal.; Santa Barbara RCM. Little Mike, plans made from full-sized plane, 48″ span, 455 sq. in., 5½ lb.; fiberglass fuselage, tissued wings; Hobbypoxy. K & B 40 RR, 8½-8½ prop, K & B Gold fuel. REMA, PSC, 52.250 mc. To be kitted with the FG fuse.

Jerry Pullen, 40, Electronics, Sun Valley, Calif. Kwik-Fli, 6½ lb. Enya, 11-7¾ prop, Cox fuel. REMA, PSC, 52.950 mc.

Michael Ritter, 17, Student, Gobles, Mich.; RCC Kalamazoo. Original design, 58″ span, 638, sq. in., 5 lb. 10 oz.; silk, dope. ST 51, 11-7 prop, own fuel. RM, Min-X Astromite VI, 27.095 mc.

Doug Spreng (K6ALP), 35, Capitalist (!), Brighton, Sussex, England; Valley Flyers. DeNight special, 36″ span, 450 sq. in., 5½ lb.; silk, dope. K & B 40, 10-8 prop, K & B 1000. REMA, Micro-Avionics, 26.995 mc.

Joe Stream, 40, Hobby Shop Owner, Long Beach, Cal.; BIRDS. Kwik-Fli Mk II (thin wing), 60″ span, 640 sq. in. area, 5¾ lb.; silk, dope, acrylic finish. ST 60, 11-8 prop, own fuel. REMA, DuBro mech. brakes, Kraft KP-4, 75.640 mc.

William Thomas, 40, Master Design Draftsman, Bartlesville, Okla.; Bart. & Dewey Falcons. Own Perfection II (65018 sym. airfoil), 60″ span, 840 sq. in., 7¼ lb.; Hobbypoxy over Sig Balsa. Veco 61, 11-8 TF hard maple prop, Glo-Go fuel. REM, elec. brakes, Logictrol II-5, 27.145 mc.

Harold Tom, 35, Garage Operator, Edmonton, Alberta, Canada; Edm. RCS. Own Cutlass (FG fuse, foam wing), 70″ span. 730 sq. in., 8 lb.; MonoKote and acrylic. Veco 61, 11-8 prop, Hy Flyer fuel. REMA, mixture control, elec. brakes, Kraft KP-6B, 27.095 mc.

Joe Vartanian, 36, Truck Driver, Huntington Park, Cal.; San Gabriel Valley RC. Kwik-Fli (larger rudder), 60″ span, 6 lb. 15 oz.; silk, acrylic finish. Merco 61, 11-7½ prop, own fuel. REMA, elec. brakes, Brow ret. LG., Kraft, 53.1 mc.

Cliff Weirick (WA6VEG), 39, Electronics Tech., Los Angeles; Valley Flyers, LARKS. Stafford Mustang (thin wing), 51″ span, 455 sq. in., 5½ lb.; dope and epoxy. ST 40, 8-8 prop, Cox red label fuel. REMA, PCS, 53.175 mc.

Ted White, 30, Pres. of Galatron Corp., Albuquerque, N. M. Goldberg Shoestring (smaller wing), 5 lb.; Aero Gloss. Torp 40, 10-8½ prop, K & B 1000. REMA, Galaxy FS-5, 27.045 mc. Also: Own El Gringo, 72″ span, 700 sq. in., 9½ lb.; Silron, Aero Gloss. Veco 61, 11-8. Missile Mist. REMA, ret. LG, Galaxy FS-5, 26.995 mc.

Jim Whitley (WB4EKN), 39, Salesman, Decatur, Ga.; Dec. MAC. Own Daddy Rabbit (slightly shorter fuselage), 68″ span, 612 sq. in., 8 lb.; silk Aero Gloss. Lee Custom 61, 11-7, Cox fuel. REMA, mixture control, Logictrol, 53.5 mc.

Granger Williams (WA6GAD), 47, Self Employed, Huntington Park, Cal.; LARKS, FAST. Own La Jollita kit, 45″ span, 460 sq. in., 4¾ lb.; silk, urethane finish. K & B 40, 9-8 prop, Cox and K & B fuel. REMA, Bonner 4RS, 53.15 mc.

Don Yockey, 30, Airline Pilot, Houston, Texas; Houston RC. Stafford Mustang, 460 sq. in., 5¼ lb.; Aero Gloss. K & B 40 RR, 8-8, Missile Mist. REMA, Bonner 4RS.

Lynton Younger, 34, Minister, Ridgeland, Miss.; Capital City RCC. Penetrator, 61″ span, 738 sq. in., 6 lb.; Orbit, 27.045 mc.

RC pattern results

CLASS III EXPERT (FULL PATTERN)

NAME	POINTS
1. Kraft, Phil	358
2. Chidgey, Ron	354 1/3
3. White, Ted	354
4. Kirkland, Jim	348
5. Leonard, Larry	345 2/3
6. Bonetti, Tony	338 1/3
7. Tom, Harold	337 1/3
8. Whitley, James	333
9. Coleman, Don	331 2/3
10. Neville, Nick	324
11. Pullen, Jerry	322 1/3
12. Krause, Gerald	320 1/3
13. Oddino, James	316
14. Grier, James	305 1/3
15. Ballreich, Donald	302
16. Lowe, Donald	297 2/3
17. Huber, Ernest	290 2/3
18. Bowman, Albert	262 2/3
19. Brooke, Ralph	260
20. Kilby, Neal	221
21. Good, Paul	189

CLASS III EXPERT (SHORT PATTERN)

22. Izzo, Edward	125
23. DeBolt, Harold	125
24. Lee, Clarence	123
25. Salkowski, William	122.5
26. Feiner, Salo	122
27. Dennis, William III	121.5
28. Rambo, Nathan	120.5
29. Foster, Joseph	120.5
30. Bridi, Joseph	119
31. Hester, Maxey	117
32. Cox, Albert	117
33. Capan, Frank	116.5
34. Fruh, Les	116
35. Hayes, Charles	115.5
36. Franklin, Maurice	113.5
37. Allen, Richard	113.5
38. Spurlock, James	112.5
39. Butler, John	110.5
40. Kern, Robert	110.5
41. Murayama, Tadashi	110.5
42. Upton, Bob	110.5
43. Nicholson, Lloyd	110
44. Witt, James	109
45. Sager, Alvin	108
46. Kempton, William	108
47. Brazin, Henry	107.5
48. Keck, Edward	106
49. Findlay, Walter	106
50. Burt, David	105
51. Sawyer, Dennis	104
52. Knost, William	103.5
53. Francis, Robert	102
54. Barnes, Carl	101
55. Vaughn, John	99
56. Welker, William	97.5
57. Brow, Cletus	95
58. Zelinka, Nicholas	95
59. Brown, Charles	94
60. Purdy, Len	93
61. Yount, Ralph	91
62. Clark, William	89
63. Sabine, John	87
64. Saunders, Don	82.5
65. Cushman, Phil	81.5
66. Woods, Maurice	78
67. Seidowski, Albert	75
68. Boyer, Charles	75

CLASS III NOVICE (FULL PATTERN)

1. Bridges, Mike	314 1/3
2. Atkinson, Bud	283 1/3
3. Hooper, Roger	259 1/3
4. Vartanian, Joe	255
5. Stream, Joe	248 1/3
6. Crichton, Wallace	237 2/3
7. Philips, Maurice	233 1/3
8. Dolin, Donald	210
9. Karpelowitz, S.	209 1/3
10. Chisolm, Alex	208 1/3
11. Castenada, Louis	164
12. Killeen, George	121 1/3
13. Hooper, Norman	88.5
14. Voorheis, Alan	88
15. Plisco, William	88
16. Wickline, Richard	87.5
17. Schulman, Leon	87
18. Carsen, Julian	85.5
19. Garner, John	82
20. DeKoch, Richard	80.5
21. David, Carlos	79
22. Zienneker, Louis	78.5
22. Castenada, Louis	78.5
23. Burton, Larry	76.5
24. Batch, Bruce	75
25. Atum, Morris	73.5
26. Gavito, Jose	73.5
27. Hunt, W. E.	73
28. Guzman, Roberto	73
29. Mytar, Randy	72
30. Castenada, Ben	67
31. Betancourt, Max	64.5
32. Hebestreit, William	63.5
33. Goldklank, Harold	58.5
34. Summers, Leland	56
35. Brunner, Luis	50
36. McCullough, Donald	50
37. Voyles, Wayne	29.5
38. Lovett, Derek	26

CLASS II (FULL PATTERN)

1. Thomas, William	319
2. Faber, Bror	246
3. Pence, Richard	232 2/3
4. Horstman, Gilbert	168 2/3

CLASS II (SHORT PATTERN)

5. McCoy, Leonard	90
6. Cox, J. R.	86
7. Steiner, Paul	84.5
8. Penry, David	75
9. Hamilton, Dick	63.5
10. Egelhoff, Dan	38.5
11. Hebestreit, Charles	35
12. Staff, Walter	30.5
13. Sigafoose, Glen	28

CLASS I OPEN (FULL PATTERN)

1. Gardner, Jackie	215 1/3
2. Younger, Lynton	115 1/3

CLASS I OPEN (SHORT PATTERN)

3. Gardner, Wilfred	90
4. Kleinburg, Jerry	79.5
5. Williams, Tom	67.5
6. Sump, Donald	15
7. Ritter, Howard	3

CLASS I JR./SR. (FULL PATTERN)

1. Ritter, Michael	145
2. Duncan, Kenneth	116 2/3
3. Schroder, Walter	53.5
4. Wilmot, James	52
5. Woods, Bobby	37

RC pylon qualifiers

1. J. Foster
2. C. Weirick
3. R. Francis
4. C. Downs
5. E. Keck
6. T. Williams
7. R. Chidgey
8. J. Witt
9. J. Bridi
10. E. Izzo
11. D. Yockey
12. H. deBolt
13. W. Anderson
14. G. Horstman
15. J. Martin
16. L. Leonard
17. T. Protheroe
18. Upton-Graham
19. D. Spreng
20. H. Reed

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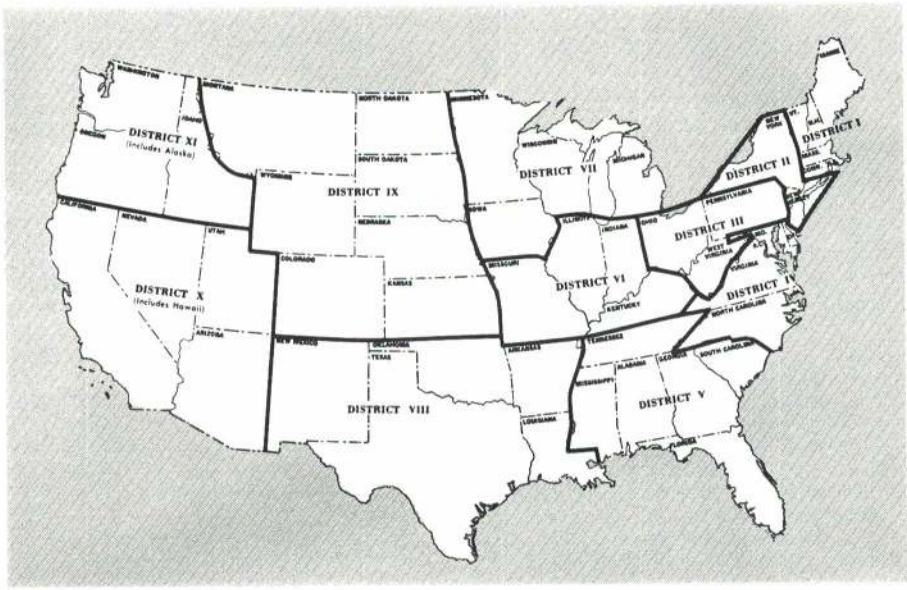

Advisory committees:

AMA's contest boards are the official rules-making bodies. They are supplemented by advisory committees which help screen rules proposals submitted by AMA members, study trends and make recommendations to contest boards for updating of rules. The committees have AMA district representation, but only the chairman are listed here, due to lack of space. AMA members who have an interest in the area indicated by the committee title are advised to correspond with the appropriate chairman to offer suggestions, make proposals, point out problems, or indicate other means of improving the activity concerned. The chairman will distribute suitable material to committee members for follow-up action.

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Glenn T. Lowry, 23448 Vanowen St., Canoga Park, Calif.

CLASS I RC ADVISORY
Jackie Gardner, P. O. Box 1252, Jackson, Miss.

CLASS II RC ADVISORY COMMITTEE
J. R. Cox, 101 W. Alto, Hobbs, N. M.

This is what AMA's new sub-Junior program is all about—encouragement of youngsters who build and fly simple and cheap model planes.

CONTEST CALENDAR

Official Sanctioned Contests of the Academy of Model Aeronautics

NOVEMBER

Nov. 18-19—Albuquerque, N. M. Winter Record Trials. Site: SWAT Flying Field. C. Averill CD, 2314 Palomas N.E., Albuquerque, N. M. 87110. Sponsor: **South West Aero Team.**

Nov. 19—Sacramento, Calif. (AA) S.F. Vulture Tatone Rule FF Contest. Site: Waegell Field. J. Pond CD, 2162 43rd Ave., San Francisco, Calif. 94116. Sponsor: **S.F. Vultures.**

Nov. 26—Sebring, Fla. (AAA) Big Cypress FF & CL Contest. Site: Sebring Air Terminal. R. Myers CD, 3935 S.W. 125 Ave., Miami, Fla. 33165.

Nov. 26—Fresno, Calif. (A) Fresno Monthly FF Contest. Site: Near Kerman. F. Gallo CD, 1725 Kenmore Dr. W., Fresno, Calif. 93703. Sponsor: **Fresno Gas Model Club.**

DECEMBER

Dec. 17—Fresno, Calif. (A) Fresno Monthly FF Contest. Site: Near Kerman. F. Gallow CD, 1725 Kenmore Dr. W., Fresno, Calif. 93703. Sponsor: **Fresno Gas Model Club.**

Dec. 29-31—Sebring, Fla. (AAA) 14th King Orange Internationals for FF, CL, RC. Site: Air Terminal. T. Sutor CD, Rt. #2, Box 470, Sebring, Fla. 22870.

FEBRUARY 1968

Feb. 17-18—Buckeye, Ariz. (AAA) 18th Annual Southwestern Regional Model Airplane Contest for FF, CL, RC. Site: Airport. Q. Webster CD, 3318 E. Sheridan, Phoenix, Ariz. 85012.

New records set for clubs, members

AMA's highest membership in thirty-one years was achieved in 1967. With only a few weeks remaining to close out the year the total stood at almost 22,500 — close to a thousand more than the previous high in 1958. To reach 22,000 has been the wish of AMA officers for several years, especially after a necessary dues increase in 1964 dropped the membership to less than 17,000. The announced promise back then was that by providing a more realistic dues structure, greater membership value could be provided. Evidently this has been achieved.

The 22,000th membership was processed by AMA Headquarters on Sept. 25. This was for Gary Berding of Mason City, Iowa.

AMA's chartered club program also set a record in 1967. By October 1, 406 clubs were chartered for the year, with a total of 9,056 AMA members on club rosters — 44% of the total AMA membership. The top ten states: California — 48, Illinois — 32, Pennsylvania — 25, Texas — 25, Ohio — 21, Michigan — 20, New York — 18, New Jersey — 15, Maryland — 15, Florida — 15.

Free Flight

Continued from page 26

the additional color will make your plane easier to spot in the air or on the ground. If you don't cover it, be sure that you use at least four or five coats of dope for fuel protection. Follow these steps:

1) Dope the entire fuselage and rudder, sand lightly and dope again.

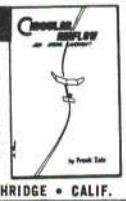
2) Cut your tissue — grain lengthwise — so you can cover one side at a time, with a ½-in. overlap at top and bottom. Dope a small section of the fuselage at either end. Attach one end of the tissue at these points, smoothing out the wrinkles. Then, holding the tissue away from the fuselage, dope the rest of the fuselage side. Pull the tissue tight and smooth it onto the doped wood.

3) Repeat for the other side, the pylon and the rudder. The overlap on the fuselage can be doped onto the fuselage top and bottom, or can be trimmed off. Cover the top and bottom of the fuselage in the same manner.

4) Do not watershrink tissue on the fuselage. Simply apply several coats of dope, and it's finished.

Installation of rigging: We are ready to install the wing hold-down dowels. Drill the necessary holes according to the plan — right below the wing rest platform. Drill them at least one inch deep; coat a 1½ to 2 in. section of dowel with cement and push into each hole.

The stab rigging is more involved so that the plane can dethermalize. You don't want to lose the model because of carelessness. Using paper clips, bend two hooks as indicated on the plans and insert, after gluing well, into the false ribs on the front end of the stab. Bend another clip and fasten to the back of the stab — glue securely. After



the glue has dried, cut a thin slice of silk or gauze and glue it onto the wire and the stab. (Sketch 6.) Glue another hook onto the rudder, as indicated. Fasten the wing and the stab to the fuselage with rubber bands. Line them up so that they are exactly centered on their respective mounts. Using 1/8 in. dowels split in half, glue them on both sides of the wing and stab right next to the platforms at the leading and trailing edges. This insures that the wing and stab are always put back in the same place when you rubber band them together at the field. After the keys have dried, tie a limit string or wire to the trailing edge of the stab and fasten the other end of the string to the fuselage. Allow an angle of about 40 degrees (Sketch 7). Securely glue the string or wire.

Mounting the engine and timer: Let's finish the assembly. Put the propeller on, and bolt the tank mount to the firewall. Bolt the engine to the tank. Install the timer using the small screws that come with it. (Sketch 8.) Cut a length of fuel line that will go from the fuel tank, through the timer loop, to the engine without kinks, or being loose and floppy.

Before we take out the ship, see that the balance point falls within 1/4 in. of that indicated on the plan. If the balance point is more than a 1/4 in. off, add weight to the nose or tail to compensate. Be sure of the keying and dethermalizer setup.

Test gliding: Go out on a day when the wind is mild or not even blowing (that'll be a day to remember!). Go to a field where the grass is at least a foot high. Be sure that wing and stab are well rubber-banded down. Facing the wind hold the model at the bottom just underneath the wing trailing edge and give it a smooth, easy toss to a spot on the ground about 50 ft. in front of you. It should glide in a straight line to the ground — with perhaps a slight left turn, but it probably won't. Most likely, it will tend to nose up slightly (stall). If, after several similar launches, it keeps doing the same thing, add a 1/32" shim to the trailing edge of the wing platform. This will lower the angle of attack of the wing.

If the plane does not stall, but dives into the ground (Sketch 9), add a 1/32" shim to the trailing edge of the stab platform. After the shims have dried, glide again. Keep adding shims until the plane has a glide with little or no stall or dive tendencies. Now, when we fly this model under power, we don't want it to glide straight ahead, but in circles. Otherwise, we will end up on a real cross-country chase; so add a 1/16" shim to the stab platform on the left-hand side (view from the rear), so that the stab is tilted with its left tip higher than the right tip. This will cause the plane to glide in left hand circles.

First power flights: This is a crucial part of your testing, so go easy. Follow these three simple steps:

1) First flight: set the timer to run only three or four seconds. Put your prop on backwards. Start engine and open needle valve enough so that engine runs a bit rich; light your dethermalizer fuse, and push the plane gently into the wind with a slight "up" angle as you release your timer. The plane should go straight ahead and up, or slightly to the left and up. If it doesn't, cut a small tab (Sketch 10) and bend and glue it so that it has about 1/16 in. left rudder, and repeat this step. If it flies correctly and has no violent tendencies, proceed to step 2.

2) Put the prop on the correct way, set the timer for five or six seconds, lean the engine out, light the fuse, and release gently into the wind, after releasing the timer. Again, the plane should climb almost straight, or slightly to the left at a high angle. After the engine cuts, check the glide — if it stalls, take out part of the stab trailing edge shim, if it dives, take out the wing shim. If the plane glides in wide left-hand circles, proceed to the next step. If it doesn't, add a bit more stab tilt.

3) Set the timer for about ten seconds, lean the engine out all the way so that it is running as fast as it can, and then turn open the needle valve about 1/4 turn; light the fuse and launch into the wind at about a 45- to 60-degree angle. The model should climb quickly at a high angle, with a slight left turn. When the engine cuts, it should pull out into a wide left-hand glide circle. If your plane climbs with a shallow angle, add upthrust (Sketch 11). If it climbs too steeply and tends to loop over onto its back, add downthrust (Sketch 11). If everything is right at this point, you are ready to increase your engine run to the full amount — 12 seconds for hand launch and 15 seconds for a vertical takeoff. Be sure to light the fuse.

Transitions: When the power cuts, does the plane tend to flounder around for awhile before going into a left-hand glide pattern? (Meanwhile, it is probably losing altitude much more rapidly than is necessary.) If this is the case with your model, you have a power-to-glide transition problem. To solve it, add a slight bit more left turn to the rudder tab, or tilt the stab an extra 1/32 in. Or you may wish to add a slight bit of left thrust to your engine (just add a shim washer behind the fuel tank where it bolts to the firewall on the top, and bottom bolts on the right side — this tilts the engine left). With all of these changes, it is wise to recheck your plane according to the three steps above.

Conclusions: Write your name and address on the model, so you can get it back in case of loss. But try not to lose it by always using a fuse — and always light it! Never forget to release your engine timer. Practice so that you know what your plane is going to do each time you let go of it.

GLOSSARY

Pylon: The portion of a model which raises the wing a distance above the fuselage. Also, a type of model which has the wing mounted above the fuselage on a pylon, the engine being mounted on the front of the fuselage proper.

High-Thrust: A model in which the engine is mounted above the fuselage proper, usually near the wing line.

Dihedral: The bend in the wing of a model which raises the tips above the center panel. Adds stability.

Dethermalizer: A device, usually a fuse or timer, used to bring the model down after a predetermined amount of time — usually three or five minutes.

Incidence: The angle of the wing, or stab, on the fuselage. Usually the wing is angled several degrees more than the stab angle.

Stab-Tilt: A device used to turn the model in the glide. One side of the stabilizer is raised above the other. Has little effect on the power portion of flight.

Vertical Take Off: When the model is launched from the ground with one point, usually the rudder, touching the ground.

NINE HINTS FOR IMPROVING PERFORMANCE:

1) Half of the problem of consistent flying can be whipped by building sturdy wings and stabs. Trussing is perhaps the best and lightest way of achieving this goal (See sketch 12).

2) There is nothing like knowing exactly what your model is going to do each time it is launched. Build correctly and sturdily (not heavily) and practice flying in all kinds of weather. Get the timer set so that it shuts off just under the limit — there is nothing worse than an engine overrun in the wind with a five-minute fuse.

Check your dethermalizer timer settings or fuse lengths to avoid dethermalizing too soon or too late (losing a trophy in the first case and a plane in the second).

3) Pressure fuel systems. Pressure gives clean and positive fuel shut-offs and the advantages of steady power. Also, if you bore out your venturi, it will give you a bit more power.

4) Short nose lengths (nose moment arms). Some modelers will disagree with this statement, but I've seen it work. If you can eliminate some of the frontal overhang, you will get better stall recovery and pull-out after the power cuts, because there is less inertia to overcome.

5) Keep it simple. Excess gadgetry just gives you that much more to go wrong. Everything you use should be as fool-proof and dependable as possible. Leave auto-rudder and auto-stab to the experts.

6) Go to a contest with a winning attitude; you have a better chance of taking home the hardware. Think positive. Above all, put in *all* your flights. Don't quiet when behind — even experts make mistakes.

7) Give competition credit for ability. Do your best to be better. This gives you something to shoot for. If you convince yourself your opposition is going to "max out," you will have to do the same — and more.

8) Know the flying area. If possible, try to fly the day before the contest on the site where the meet is to be held. In that way, you can figure on the best chase routes for retrieving. You also find the "hole-spots" and thermal areas.

9) Be prepared. Go to the contest with everything you need to fly. This includes repair materials as well — glue, pins, dope, razor, brushes, and tissue.

Model Rocketeer

Continued from page 45

you are a section member. Remember, all memberships expire on December 31, 1967. Don't fail, renew your membership now.

USE NAR TECHNICAL SERVICES

NAR members are encouraged to use NAR Technical Services. The new Pink Book contains a list of what's available. New members also receive a list of what is on sale from NARTS.

A Publication Committee has been formed to update and provide new publications for purchase by NAR members.

PITTSBURGH SECTION SCHEDULES CONVENTION

The Steel City Section has another great convention scheduled for March 1968. SCS President Arnold Pitler says he will send information sheets to modelers on request. Write to: Arnold Pitler, 1051 Negley Ave., Pittsburgh, Penna.

NOTICE TO NON AFFILIATED CLUBS

If you have a model rocket club, but are not chartered under the NAR, why not join in the fun? A recent regional meet at Aberdeen Proving Ground, Md. was a good example. Despite some poor weather (Hurricane Doria was acting up) it was very successful. A motel near the Army station provided low cost accommodations, a banquet hall and excellent food. It was well worth the effort and new friendships were made among members of the sections in attendance.

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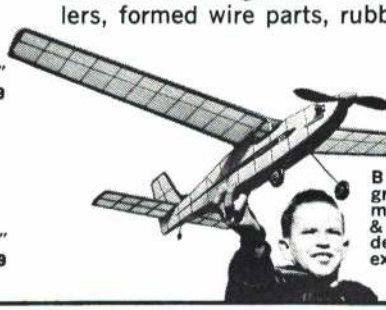

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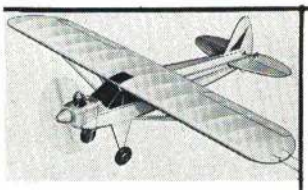

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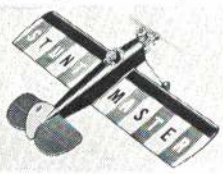

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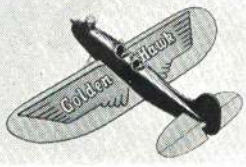

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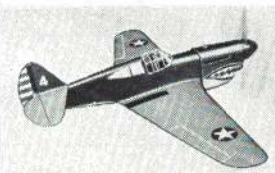

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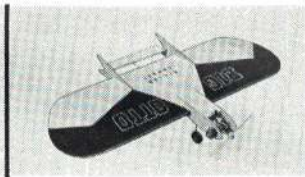

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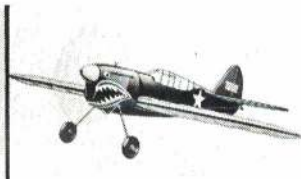

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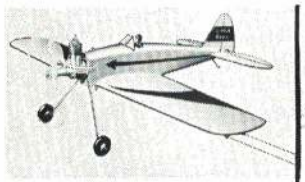

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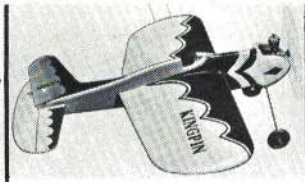

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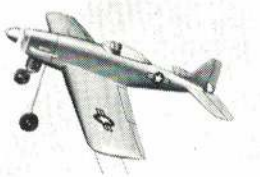

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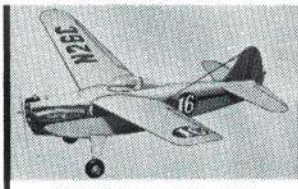

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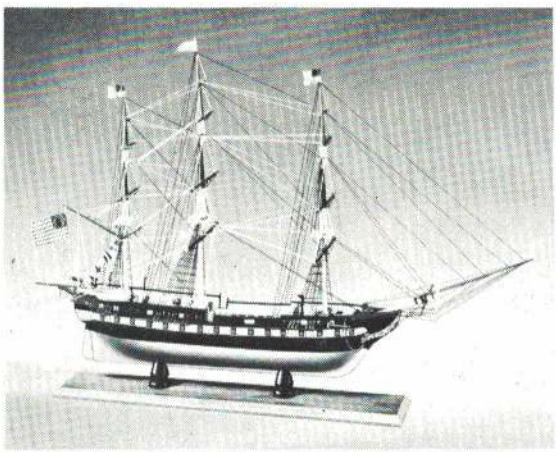

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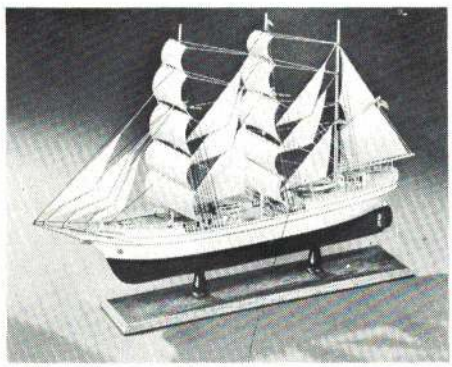

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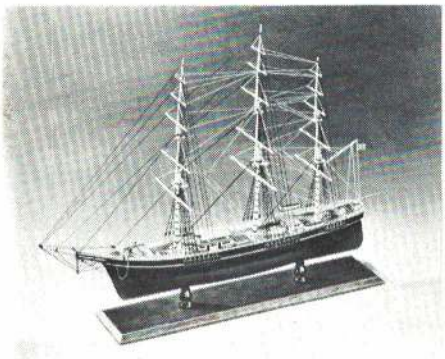

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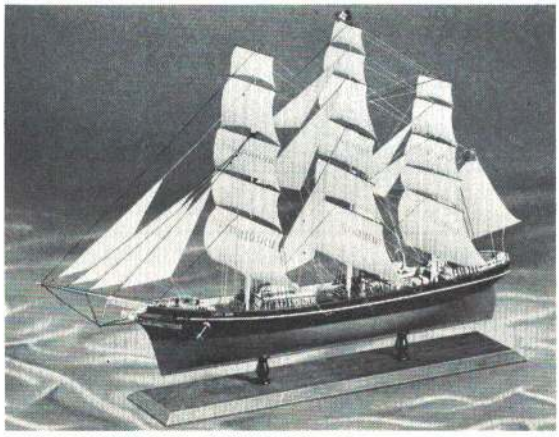

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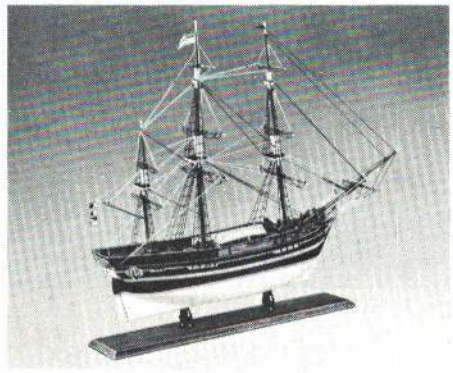

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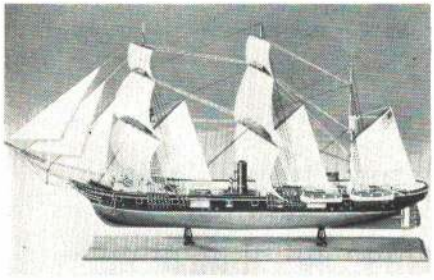

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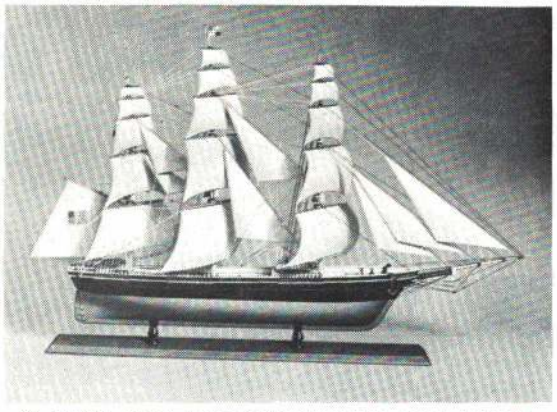

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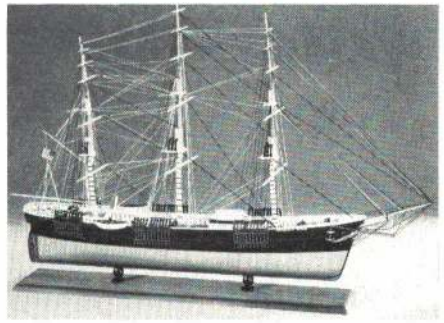

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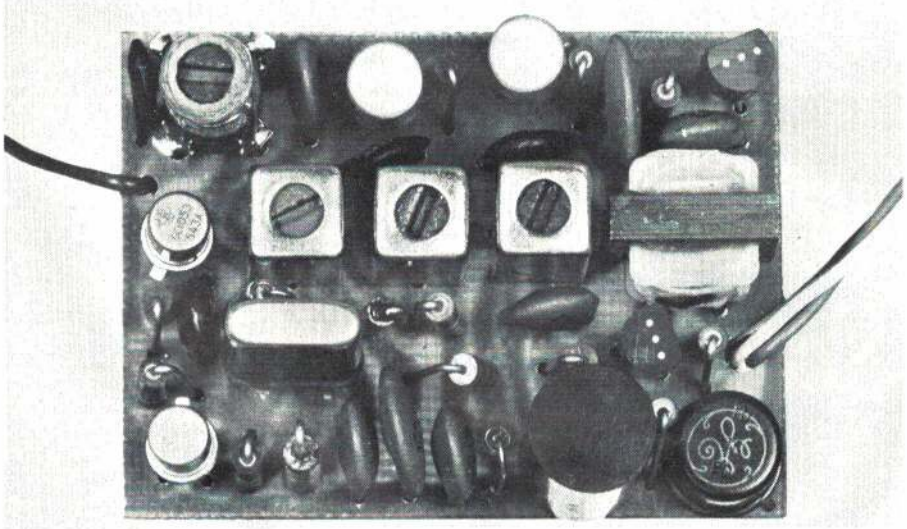
Getting STARTED in RC

Receivers—What Type Do You Need?

Sixth in a series.



The Citizen-Ship SSH receiver is a typical superhet. With case removed the antenna coil is easily seen at top left (adjust for peak performance); at center is the row of three I.F. cans (keep hands off these). Below the far left I.F. can is the crystal case. Transistors, resistors, capacitors, etc. make up other components.

LET'S consider receivers this month. There is a wide variety of types, not counting many different makes. The most basic split in types is between those that operate on a plain RF (radio frequency) signal (also termed CW — which means continuous wave, or straight RF — and carrier), and tone receivers; the latter will operate only when they receive a certain audio tone. Some will produce output for tones of quite a wide range, others must have extremely sharp tones to do the required job — which usually boils down to triggering an escapement, servo or actuator in the model.

Up to perhaps 10 years ago, CW receivers were in the majority but tone units were proven to have many advantages and gradually have taken over the field. We do not see any of those old-type CW receivers any more; they were very prone to interference, were sometimes guilty of radiating quite a strong signal (operating like miniature low-power transmitters) and had other faults we need not go into here. There is really no sharp dividing point where a receiver ceases to be a CW type and becomes a tone type. It is generally considered that if the RF signal from the transmitter is interrupted at a fairly fast rate, it is a tone transmitter, and the receiver must match it.

But what's "fairly fast"? Some RCers consider the dividing line to be 100 cycles; RF interruptions below this do not constitute a tone according to this thinking; thus, proportional pulsing, which generally is in the range of 3 to 20 pps (pulses per second) is not a tone.

Some proportional systems pulse at considerably higher rates. And digital trans-

mitters are sometimes referred to as CW units, even though their output is pulsed off at a rather high rate. We have considered this tone or CW matter from the transmitter end; it's not *quite* the old chicken-or-egg deal — if you don't have a transmitter to put out a signal of the required RF *and* audio, no receiver will operate properly.

Having explained the CW and tone matter (we hope!), let's go on. The vast majority of receivers in use today probably are true tone types; this includes all single-channel jobs, those that operate reeds, and all analog propo units (including the full-house variety); digital propo outfits that required true AF tones have been built, but most of those in use today might be considered more akin to CW outfits.

While we are on the matter of AF tones, it should be explained that many single-channel receivers will function properly on signals modulated by a wide tone range; some will accept from 400 to over 1000 cycles. Others have tuned filters so that they will respond only to a rather limited range of tones. These are much more resistant to interference, including voice signals. Depending upon their tone frequency (which in such tuned-filter types generally runs from 1000 cycles up to perhaps 4000) they might operate with tones spreading only 50 to 150 cycles.

The "sharpest" receivers are those designed to drive reed units. The reeds themselves may be considered as extremely sharp filters — they will respond only to tones within a couple of *cycles* of optimum! Thus reed receivers are undoubtedly the most impervious to any form of interference that we have today.

A few analog propo receivers respond to a varying tone, producing output suited to drive a servo as the tone frequency is shifted over a small range.

The other great division of receivers, of course, is between super-regenerative (usually shortened to super-regen, or just "regen") and super-heterodyne (also shortened to superhet) types. The regens are lighter and smaller, much cheaper, generally more resistant to interference generated *inside* the plane (from servo motors, relay and other electrical contacts, rubbing metal linkages and the like), and highly sensitive. Unfortunately, their main drawback is a serious one — they tune very broadly. Thus, you can only operate one regen at a time on the 27 mc spots — an impossible situation at many of today's crowded flying fields. Superhets have the big advantage of very sharp tuning — hence you can operate six receivers and their matching transmitters simultaneously on the six 27 mc spots. Early super-hets were badly troubled with inside-plane noise or interference; improved design has helped, but these receivers are generally still not as tolerant as regens.

While superhets do have good adjacent-channel signal immunity (meaning they are not bothered by signals within 20 kc or so of their frequency) they have a weakness to so-called "image" frequency signals. Without going into specifics, these signals must be on a frequency twice the receiver IF (the Intermediate Frequency, (which is usually 455 kc, or close to it); thus, beware of signals about 900 kc from your operating frequency (and almost always, such signals must be lower in frequency).

All present-day superhets employ a crystal (similar in electrical design, but usually smaller than that in the transmitter, and generally 455 kc lower in frequency) to set their receiving frequency. It's generally preferable to get receiver and transmitter crystals in matched pairs, also to obtain matched Rx and Tx, tuned at the factory, if possible.

Even though the receiver crystal determines its frequency, most superhets have at least one tuning adjustment to "peak up," to more perfectly match the receiver to the antenna and installation in your model. If this peaking is not done, you may likely have reduced range — the set will work fine near the transmitter but not further away.

Most superhets have several small rectangular cans on the baseboard (the IF transformers) and in some cases you can see screw heads inside a hole on top of these cans. Unless you are sure of what you're doing (as suggested in the receiver instructions for example) do not turn these screws!

Receiver output can be relay or relayless; the former means there's an integral relay, to which you connect the servo and associated batteries. Relayless receivers have transistor circuitry to replace the relay; this is usually preferable, as it's lighter, less likely to give trouble from engine vibration. However, you must be sure the relayless receiver will be suited to the type of escapement, servo or actuator you would like to use. A "single-ended" relayless receiver will operate an escapement only (although by modification of the centering arrangements, such a receiver

(*Continued on page 60*)

will also drive some types of magnetic actuators). A "double-ended" receiver is a relayless type that will drive most any magnetic actuator; it will also allow you to use an escapement for rudder, plus a second escapement in the "quick-blip" set-up for motor control.

A different type of double-ended receiver is required for a motor-driven propo servo (it will also operate magnetic servos, some escapements, etc.)

With relay receivers, you can operate just about any control mover, regardless of current drain. But relayless sets are a bit more restricted; make sure such a unit is capable of handling the current of whatever you wish to hook on the output.

Single-ended receivers may be adapted to operating any type of servo unit by addition of special "switchers," which are just simple and compact electronic circuits. Some servos now come with the switchers built-in, will thus work on either relay or relayless receivers.

One last note on receivers of any style — if you wish to use them for any form of proportional control, make sure they will pulse properly, and fast enough to suit your chosen system. Some will — others will not. The latter may be suited only for the simplest escapement control, or very low pulse-rate propo. Generally, manufacturers of present-day equipment are more alert to the needs of propo; however older sets were often limited in the pulse rate they would accept. (Ed. — Whew!)

Westland Lysander

Continued from page 48

plies to the besieged troops in Calais were painted in this manner.)

In the spring of 1940, by which time all of the Lysander's were again operating in England, the duck-egg blue undersurfaces replaced the black and gray color scheme, and red, white, and blue roundels were added beneath each wingtip. A yellow ring was added to the fuselage roundel, and red, white, and blue stripes were painted in many different patterns on the fin. Squadron code lettering: Used in France — FY, EE, OO, TV; used in Great Britain — KO, HB, BA, KJ, VM, YX, LX, UG, AR (AR was code lettering for Polish Squadron).

Camouflage: The camouflage pattern, called "shadow shading," came into use in 1937 and derived its name from the fact that two patterns of camouflage were used, one being a mirror-image of the other. The shadow-shading consisted of large, irregular patches of dark green and dark earth. The two patterns were designated Scheme A and Scheme B. Scheme A was applied to all aircraft which had even serial numbers, i.e., L-1706, L-1708; Scheme B was used in all aircraft which had uneven serial numbers, i.e., L-1707, L-1709, etc.

Late in 1938, the code letter system was inaugurated for all British aircraft. This system used three letters on each aircraft, two of which were painted together on one side of the fuselage roundel, indicative of the squadron to which the aircraft belonged — the third letter on the opposite side of the roundel identified the individual aircraft within the Squadron.

Step 1: Check kit for broken or missing parts after opening box. Empty contents on a table so that you will not lose any pieces, and then think that you have purchased an incomplete kit. Checking your kit also helps you to become familiar with

location of parts — a worthwhile procedure.
Step 2: Break all small parts away from plastic "runner" or "tree." Using tweezers, grasp part as close to tree as possible and gently work part back and forth until it breaks off tree. Place small parts in fine mesh tea strainer, and dunk in mild detergent solution (lukewarm), then add larger parts. Rinse all well in clear lukewarm water, keeping small parts in stainer, so you will not lose them. Put all parts on newspaper, turning them over so that water will drain from the parts.

TOOLS: Jeweler's saw (you will need a few extra blades as they break easily when you are working with plastic); Small paint spatula, approximately 5" long, available at art good stores; Tweezers.

Two pairs of scissors: one curved cuticle scissors, one small straight scissors with pointed ends; Single-edge razor blades; Pin-vise and drills (X-acto has a very good set); X-acto knife, #11 blade.

MATERIALS: Package of small-size rubber bands; Frisket paper with adhesive backing; Roll of masking tape (¼ or ½"); Sandpaper (garnet finishing), #70 to #80, and wet or dry; Silicon carbide paper #400 — #240 grade, wet or dry.

Sable brushes: Number 00 — Artist's brush, ⅛"; Duratite Surfacing Putty; Duco Special Spot Putty; Flat enamels, assorted colors, Testor's or Pactra. The British Humbrol flat enamels are excellent, and come in a wide range of authentic wartime aircraft colors. (I have used Humbrol's enamels on the model and have listed the manufacturer's item numbers on the Lysander drawing).

Step 3: Use small file or folded sand paper to remove all parting lines (mold lines) from each part, no matter how small.
Step 4: Spray small parts as follows, making sure that each coat is thoroughly dry before applying additional coats: *Gas tanks, pilot seat, observation seat*: silver; *Gun and gun mount*: blue-black. *Wooden handle and handle grip* on machine-gun: wood tan color.

Wheel centers: yellow. (When wheel is dry, paint tire flat black with small amount of flat white added.) Paint interior of fuselage halves a gray-green; *Propeller*: flat black with yellow tips. *Spinner* (part #22): flat black; *Engine*: flat black — touch up pushrods with chrome or flat silver, and spray crankcase medium gray; *Exhaust support, exhaust*, and *collector-ring*: dark gray; *Tail wheel*: silver. *Tires*: flat black.

By now the gas tank, pilot's seat, and observer's seat should be dry. Scrape off paint to bare plastic at the points where you will cement the part to fuselage. Cement in place.

Now to give the observer some individuality. You will note that both figures are identical. To give the illusion that two different figures were used, I filed away the pilot's control stick on one figure; in addition, I used the fine blade on the jeweler's saw to separate the head from the shoulders to make another change in the figures. Next, I cemented the head back into position, and before the cement dried, the head was twisted slightly to the right. Touch up the neckline with a rat-tail file, and you no longer have identical twin-figures. Using the smallest brush you have, paint faces with thinned-out flesh color

paint, so that the small details will not be filled in. To complete the figures, paint helmet, shoes, and gloves black; uniform, medium blue; life jacket, bright yellow; parachute straps, gray; parachute, olive drab.

I departed from the procedures outlined in the instructions supplied in the Hawk kit as follows: I assembled the painted wheels inside the landing gear, taped the wheels, and then filed the four pins off in the wing section, at the point where the right and left wings join the canopy center section. This was done because I wanted to be able to paint the wings separately and also get a better cement joint by cementing the canopy center section to the canopy main frame. I then cemented the canopy center section to the canopy main frame, painted the canopy frames (I used Humbrol dark earth for frames). The same procedure was repeated on canopy aft section, then the rest of the plane was assembled as per Hawk instruction sheet, but the three canopy sections were left off, to be cemented in place later.

Fill any crevices in assembly joints. After spot putty (or Duratite) is dry, sand filled parts to contour. Spray all parts with primer coat, except small parts previously painted. After primer coat is dry, sand smooth any rough spots which appear.

Spray camouflage scheme as per Lysander drawing in article. The drawing in the article is a one-half reduction; therefore, will have to be enlarged to fit the Hawk model. After enlarging, you can trace off the camouflage pattern and transfer direct to your model, ready for spraying.

After model is completely sprayed, first cement the pilot, observer, machine guns and ammo cases; slide decal map into place, and then cement painted canopies in place. Allow to dry overnight. Next, before you slip right and left wing into position, be sure to file the two pins off in each wing, then cement wing struts into position. After wing struts are cemented and dry, cement small parts into place (motor, propeller, tail wheel, antenna mast, etc.). Cut and trim decals as closely as possible and place on your model as per drawing in article.

Used for the model were: Hawk kit #563 (retailing at $1.00); Humbrol enamels; Badger #200 Air Brush; Testor's liquid cement; Duratite, and 3-M wet or dry. Although this model is not as historically important as some others in this series, I am sure you will appreciate its classic lines as I do. It does indeed make a graceful addition to the collection, and played its part well in the overall picture during WW II.

SPECIFICATIONS:

Wingspan: 50′ 0″; Length: 30′ 6″; Weight empty: 4,160 lbs.; Weight loaded: 6,015 lbs.

Powerplant: 905 hp Bristol Perseus XII, nine-cylinder air-cooled radial engine; Propeller: 11′ diameter, three-bladed D.H. propeller.

Armament: Two fixed-position Brownings — 0.303″ machine guns mounted in wheel spats above main wheels; Ammunition supply: 500 rounds each. One Lewis M.K. 303, mounted in rear cockpit with eight 97-round drums. With detachable stub-wing bomb carrier, and using the rear fuselage racks, 16 20-pound bombs could be carried.

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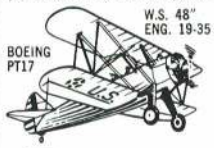

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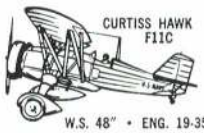

CURTISS HAWK F11C — W.S. 48" • ENG. 19-35

GRUMMAN F3F1 FIGHTER W.S. 48" • ENG. 19-35

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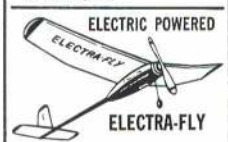

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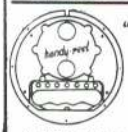

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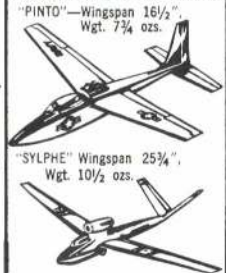

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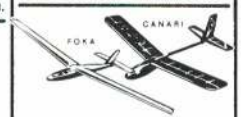

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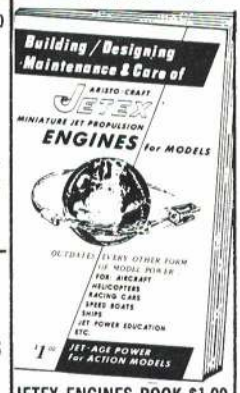

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Aeronca Champion

Continued from page 27

more with their concept of a postwar trainer. It was early in 1944 when their chief engineer, Raymond Hermes, put his slide rule to work and laid out the preliminary drawings for what would become known as the Model 7 series Champion. The new design was nothing extraordinary or radical. While the basic configuration followed the prewar TA series of popular tandem trainers and the military 0-58 Defender counterparts produced during the war, the Champion was a completely new design and incorporated a number of welcome features.

Today, 90% of the aircraft produced are tricycle gear but, following WW II, only the newest and most expensive planes available to the civil market sported this advanced feature. However, following the war the conventional gear was still the most acceptable even though, as far as the manufacturers were concerned, it was to be the final days of the tail draggers. One of the biggest drawbacks with the tailwheel configuration has been forward visibility when the aircraft is on the ground. This is especially true with the tandem seating arrangement. With the Aeronca Champion this problem was minimized to the point where the first comment of anyone sitting in the Champ noted its remarkable visibility in all directions, from either seat and especially forward over the nose. Because of the low nose position and high seating arrangement, pilots would fight a tendency to put the plane in a climb during their indoctrination flight. The gnawing thought, "I must be diving according to the nose and horizon relationship," persisted until they became accustomed to the visibility characteristics.

Good visibility was not the only attribute the Champion had for its brisk but brief postwar market. The large one-piece autotype door, the large and sensitive elevator trim tab and combination oleo-spring shock absorbing system of the main landing gear were also big plus features.

The fuselage was of welded steel tubing, faired with plywood formers and wood stringers. The basic tubular framework was triangular in shape aft of the cabin area. This razorback skeleton has been the trademark of Aeronca lightplanes since the original C-2 series of the early 1930's. The wing consisted of two wood spars and metal ribs with an aluminum sheet leading edge. Tail surfaces were metal tube construction and the entire aircraft fabric covered. Somewhat novel at the time was a brown sprayed-on flocking used for the cabin lining surface. This simple textured finish proved both durable and eye appealing and also served as sound proofing.

Power was supplied by the Continental A-65-8 engine rated 65 hp at 2,350 rpm, takeoff and emergency; 53 hp at 2,150 rpm cruise setting. This provided the Champion with an honest top speed of 100 mph, cruising speed of 83/90 mph and a stalling speed of 38 mph. On the normal fuel capacity of 14 gallons, a range of 270 miles could be obtained at cruise. This was excellent performance on such low horsepower. The Champ featured as standard equipment a full complement of VFR instruments, dual mechanical wheel brakes in the front cockpit, a parking brake, wiring for navigation lights, fittings for radio installation, steerable tail-wheel, dual stick control, rudder pedals, throttles, carburetor controls and ignition switches. While the company recommended solo flying from the front seat, the plane was just as stable when soloing from the rear seat. It was also suggested that the student use the front seat during dual instruction and it was found that he learned the rudiments faster; a reverse of earlier policies and training procedures.

Initial rate of climb was 500 ft. per minute with the best climb being at 60 mph. The Champion was a thoroughly honest airplane, coordination of controls came easily, stalls were smooth with no tendency to fall off on a wing. Turns were natural right up to the near vertical bank where the plane seemed to help you in establishing the correct attitude to make the maneuver like an expert. Although the Champ could be put into a spin, it wanted to work itself around this maneuver and it took a bit of forcing to make it perform. This was even more prevalent on later models with the added dorsal fin.

Ray Hermes gave considerable thought to the postwar Champion and its two-place side-by-side seating sister, the Model 11 Chief. Both featured the same power plants and to simplify production and put the lowest retail price on each model, the wings and struts were totally interchangeable, as well as tail surfaces, landing gear and engine cowling.

The two prototype Aeronca Model 7AC Champions, NC39556 and NC39557 were completed on April 29, 1944. A third and fourth machine, NC39562 and NC39632, joined the evaluation and sales force as demonstrators shortly thereafter. Chief test pilot, Louis E. Wehrung, took up 7AC No. 1 on its maiden flight at the Middletown airport in May 1944 and the Champion took wings. The first three machines were international orange and chrome yellow in color. Number three sported a green and yellow scheme. These optional colors and a variance upon a design theme were to be offered the public but, in the interest of maintaining a set production line and keeping costs low, only the familiar and attractive orange and yellow survived. Flight tests of the prototype for CAA approval were flown in January 1945. ATC759 was granted the Aeronca Model 7 series on October 18, 1945. Under this certificate the Champion was also eligible for operation on twin floats or with skis when flying from winter snows.

It was hoped the Champion could be produced for $2,095, leaving the Piper PA-11 (J-3) Cub the only serious competitor in the two-place trainer field. Unfortunately, neither Aeronca nor Piper was able to meet their intended low price. The final price for the 1946 Champion was set at $2,295. Even this price had to be increased to $2,475 in 1947 and 1948 due to the demand for more standard equipment aboard by customers and the first effects of a spiraling inflationary economic trend. Still these prices were below any comparable machine at the time.

In 1947 a contract was received from the Army/USAF for 509 liaison versons of the Champions as L-16A models powered with fuel injection 85-hp Continental 0-190-1 engines (Military designations). These were built as Aeronca model 7BCM. (Second model, Champion, Military.) The first L-16A was accepted by General James A. Stowell in mid-year. An additional 215 L-16B models (company model 7CCM) were built during 1948 powered with fuel injection 90-hp Continental 0-205-1 engines. These engines were in reality the same; the 1948 model produced the extra power through engineering modifications including a higher compression ratio. Some records will show the first L-16A's were delivered to the Army Air Force while the last were procured by the United States Air Force. This is because the AAF became USAF officially on September 18, 1947 just about in the middle of the L-16 production and deliveries. All the L-16's

were eventually turned over to the Civil Air Patrol. This ambitious program called for each C.A.P. squadron throughout the country to receive a L-16, thus stimulating the youth to participate in the air activities which the C.A.P. has to offer.

Following many of the military requirements as set forth in the L-16's, Aeronca produced a civil model in 1948 under the designation 7DC. From all outward appearance, little change could be noted. It was a cross between the two military models but without the extended greenhouse observation windows and Air Force furnishings. The 7DC Champion had the 85-hp. Continental installed (as the L-16A), the extended dorsal fin of the L-16B series and an added fuel tank installed in the right wing root area. There were 7190 Model 7AC's built between 1945 and the final ship produced on April 12, 1948. During 1948 and 1949, 166 Model 7DC's were produced before turning to the final version known as the 7EC.

In spite of good sales and a reputable product following WW II, Aeronca was besieged by new and unfamiliar management and financial deficits during the crucial years of 1947 and 1948. These were troubled years economically and the interest in the two-place lightplane waned. To stimulate sales, the company announced in February 1948, the four-place all-metal-wing Model 15 sedan, their first entry into the larger, more powerful and higher priced field. During the same period the Scout was also produced as a further incentive. The Scout was basically a stripped version of the 65-hp Chief and selling for $190 less. On August 10 of that year, with sales still lagging, Aeronca announced a price cut of $100 to $400 on various models. This policy bolstered sales temporarily, but could not stem the inevitable.

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2. Mail subscriptions	31,719	32,115
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D. Free Distribution (including samples) by mail, Carrier or other means	1,476	1,540
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I certify that the statements made by me above are correct and complete.

(Signed) Norman J. Ward, Business Manager.

In 1949 a reorganization took place and the financial position appeared better when negotiations were completed to produce the Bollinger-Koppen Helioplane. Under the agreement the Helioplane would be manufactured by Aeronca, but sold exclusively by the Helio-Corp. These negotiations failed to materialize due either to the fact that the Helioplane wasn't quite ready for the market or the market wasn't quite ready for the Helioplane.

Aeronca went into the sub-assembly business in 1950. In this field they gained a variety of contracts from jet engine parts to prefabricated missile shelters for the Army's Jupiter ICBM's. In this and allied fields Aeronca today (Aeronca, Inc.) enjoys a sound business foundation and respected reputation. For the aviation minded it was regrettable to see the last of the Aeronca airplanes being produced in 1950. During the 1946 peak, 30 Aeroncas were being built a day.

The last Champ was known as the 7EC model, produced during the later part of 1949 and throughout 1950. The 7EC had the familiar Champion look with the long dorsal fin, a 90-hp Continental engine, a complete electrical system, self starter, etc., and added navigation and communications equipment. Looked upon as a deluxe version with increased performance and utility, the 7EC failed to gain sufficient sales which could warrant continued production. The tandem-seat, two-place, fabric-covered airplane had about reached the end of the line. In January 1951, the 96th 7EC and last Champ (S/N 96) N4749E rolled out of the Middletown plant. Total production of Model 7 Champions was approximately 8166 aircraft.

Of the many aircraft produced by Aeronca throughout their 20 years in the airframe business only the Champion survived and is in production, although under heavy disguise. In the fall of 1954 the Champion Aircraft Corp. of Osceola, Wis. purchased the manufacturing rights of the Model 7. In 1956 when their new plant opened, the first models produced were reappointed 7EC models. Later the old Aeronca Champion grew under the steady development of the Osceola Corp. into the present day Model 7ECA Citabria (airbatic spelled backwards).

They called it the Aeronca Champion, the Champ, the Airknocker, the Sunday Putt Putt, but whatever the name it was usually said with affection. For the model builder, the Aeronca Champion is a natural flyer for scale free flight, U.C., R.C. or just as an attractive, neat and clean display model.

The author acknowledges with sincere appreciation the valuable assistance of Mr. John Houser, Aeronca Corp. in the preparation of the article.

Dee-Bee

Continued from page 17

and the less experienced builders should note that the wing is rather deep set. So get that stick or button time on a trainer type. Don't try learning on Dee-Bee; it's no trainer by any means.

Wing construction: Horizontal alignment of the ribs is assured by use of the sub-leading edge and sub-trailing edge, cemented to the oversized ¼"-thick L.E. and ⅛"-thick T.E. Select straight-grain balsa and use a straight edge for cementing the sub-L.E. and T.E. to the center line, which should be 27/32 in. from each edge. Pin the completed L.E. and T.E. assembly to the plan and place a 3/32 sheet or shims under the main spar location, install the ribs, etc.; shimming under the space is necessary so that, when the wing is turned over, it will make contact on the building board as it did when started.

Wing sheathing should overlap the L.E. as shown. At the T.E. on the side of the wing you start first, the sheathing should butt the T.E. and overlap the T.E. on the last side covered. The wing tip blocks may not be the best way to produce rounded tips, but find me a faster way.

The wing fairing is installed after the center section is fiberglassed, messy but worthwhile. Sharp edges on the T.E. of all control surfaces make for better response and care should be taken to produce and maintain these edges. Select straight-grained firm balsa for the ailerons, the elevator, and rudder as well. Laminated C-grain balsa works best. The aileron horns are longer than the stock types available so you'll have to make your own.

Horizontal and vertical stabilizers. Construct as shown. Their construction is typical. But a word about warping. When finishing, silking, doping, painting, etc., treat both sides equally and at the same time; not one side first then, when dry, the other — this is when the warps occur.

Fuselage: Alignment is a must right from the beginning. Cement (epoxy, please) the motor mounts to Formers F-1 and F-2 using your engine temporarily bolted in place (a tri-square will help), to hold alignment. Use centerlines! This unit determines the fuselage accuracy. After cementing the ¼" doublers to the ¼" sides (right and left, don't forget) cement them to F-1 and F-2, holding the top edges parallel to a flat surface with some short 2 x 4 blocks for props. When dry, add the remaining formers, checking lengthwise alignment. Add top and bottom blocks, and the small amount of strip planking and you are home-free.

I add the cockpit and head-rest just after sanding. Sanding the cylindrical shape is easy. Obtain a sanding belt from a 4-in. portable sander then cut it to make a long narrow strip which is used like a shoppolishing rag. This prevents flat spots which show up when you get started on the finish.

Cowl: It's not as hard as it looks. Cut annular segments from ¾" thick balsa planks, epoxy together to form rings, which are laminated to plywood cowl ring, and shaped. I don't have a lathe. By making a ¼" thick plywood adaptor bolted to the cowl attachment ring, my drill press and sandpaper got the job done in short order. Apply fiberglass resin or epoxy to the inside of the cowl.

A needle-valve extension is not shown because I believe that once you've broken in an engine you could just as well break off the needle valve if you stick to one brand of fuel. The setting doesn't change. An exhaust opening is not needed because most of the residue clings inside the cowl. Removal for cleaning is simple with three screws.

Landing gear, pants, and fairings: Silver solder or "shiny-brite" is a must for joining the 5/32 main gear to the ⅛ gear braces. Make a simple jig to assure alignment. Epoxy these units to WP-1; laminate WP-2 and WP-3 to inboard side of the gear. When dry, install wheels and complete assembly with the outboard WP-2, WP-3, installing the WP-4's to each side of WP-1. Shape to the contour shown. I was able to bend the gears and braces, solder the joints, cut out all plywood and balsa parts, and epoxy both gear assemblies together, less shaping, in a five-hour period.

Dee-Bee is quite groovy and responsive, an all-around flyer. You can slow her down to a walk for landings, but you **must** fly her, don't follow her, through the sky.

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RC World

Continued from page 37

ful flights, the plane crashed in a violent right-hand spiral; suspecting radio problems, Dave wasted a lot of time checking his equipment, before he finally realized that his trouble was aerodynamic. To cool down the hot little Cox .01 engine, Dave had installed a relatively heavy plastic 4½ x 2½ propeller. Gyroscopic forces of this prop would overcome the natural stability of the little plane in a right-hand spiral — and down she'd come! Dave then carved a much lighter wooden prop of the same size. This cured the trouble completely. At the time his photo was in the mag, Dave was using an Otarion receiver, a 50 ohm relay as a propo actuator, and Eveready S-76 silver-oxide cells for power; plane weight was 74 grams. Since then he has installed the tiny Bentert receiver and actuator, and uses a pair of 50 maH nickel-cad cells; this installation dropped total weight to 64 grams; with its 63 sq. in. wing area, Dave says the plane is a real gentle flyer. Even at 74 gms the plane was as easy as a Schoolboy to fly — except for that fatal spiral!

'68 Stunt Rules. Radical changes have been made in the stunt rules for the 1968 season. There will be no breakdown as to number of controls, but the new classes will be separated by number and difficulty of maneuvers. Class A will include eight of the present Pattern stunts. Class B will have 11 such stunts. Class C will consist of eight mandatory maneuvers, plus ten out of a list of 18 optional maneuvers. Flyers will be advanced through the Classes as has been done in the past Novice/Expert split — three wins (first, second or third) in any class advances flyer to next higher Class. The RC Contest Board members voted to adopt the 1967 NMPRA rules for Goodyear Pylon, plus the 600 sq. in. "Continental" category; the Board felt that some means should be developed to slow speeds of the Goodyear planes. Builder of the Model rule will henceforth apply only to those events where points for appearance and workmanship are a factor (here come the Buy-and-Fly boys!). Undecided at the moment (no votes received from two districts) was whether to apply the present Novice/Expert split to the new Pattern event setup.

Halberstadt D-II

Continued from page 31

aimed at the more experienced modeler we will describe only the unusual aspects of its construction.

Construction: The upper wing is one piece. The plywood joiner is cemented to the leading edge pieces, automatically forming the correct dihedral. Do this before the ribs are cemented in place. Some ribs are ¼" balsa. The lower wing plywood tongue fits into the slot in the fuselage side. The leading and trailing edges are trimmed and sanded to final shape after complete assembly of the wing. Wings are silk covered; do not forget the weight in outboard tip.

Landing gear is secured to plywood bulkheads with "J" bolts or it can be sewn in place. Cabane struts are wire; secured to the plywood bulkheads with round-head wood screws. Strut attachment to the wings is by means of electrical soldering lugs. These banjo-shaped fittings are clamped over the ends of the cabane and interplane struts and soldered in place. They are then bent to fit the wing camber as shown. Wood screws hold the soldering lugs to the strut supports which have been rigidly built into the wing structure before covering. Pilot holes are drilled into the supports to receive the screws. Cement is also applied to the strut attachment points. Recess the soldering lugs and wood screws into the wing.

The scale elevator halves are cemented to the ⅛" dowel joiner only after the two brass washers and the short length of metal tubing have been slipped on the dowel. When dry, the tubing is cemented against the fuselage rear. Cut a slight notch in the fuselage rear to match the tubing. Wrap several layers of silk and cement around this attachment to insure a firm installation. Fill in the upper and lower elevator surfaces in way of the dowel with Plastic Balsa and sand smooth when dry. Control horn is cut out and bent from scrap aluminum.

Do not forget to install the fuel tank before the fuselage top and bottom are added. Also add the plastic tube filling, vent, and feed lines.

All wood parts receive at least six coats of sanding sealer. Sand lightly after each coat is dry. Many Halbertstadts were finished in clear dope or varnish which gave them an overall light tan or buff color. Others, like the plane flown by von Althaus, were camouflaged in irregular patches of olive green and reddish brown on all sides and upper surface, while the bottom was a very pale blue. Clear dope the silk-covered surfaces with about six coats before the color is applied. Markings are cut from Wondurcal solid-color, fuel-proof decal sheet. Silver thread or fine wire can be used for rigging.

The scale engine intake and exhaust piping, as well as the water pipe, are bent from ⅛" dia. solder. This adds some needed weight to the nose. Radiator and fuel tank are cut from stiff paper, such as an index card, cemented in place, and painted. Radiator should be a brass color, the tank following the colors of the plane. Scale wheels are available from Miniature Wheel Co., P. O. Box 2647 Firestone Park Station, Akron, Ohio for $1.50 postpaid.

Flying: It is advisable to fly from smooth surfaces, such as a parking lot, school yard or packed hard earth. Line lengths depend upon your experience. Start with something like 40 feet and graduate up to longer lengths if desired. This is not a windy weather flyer so wait for a fairly calm day before you take off on that "dawn patrol."

Paint Mixing Instructions: 1) Add a few drops of Curtiss Blue at a time to the Swift White until a very pale blue results — use for underside of wings, tail, and fuselage; 2) Mix equal parts of Stearman Red and Stinson Green to make reddish brown; 3) Add a few drops of jet black to the remaining Stinson Green to make it "dirty"; 4) Use the Curtiss Blue for the water pipe which runs from radiator to engine; 5) Add pale blue to the black to make dark gray for engine and exhaust.

Count Down

Continued from page 45

short-duration high-thrust booster coupled to a stop-stage sustainer that burns for 10 seconds; the bird went out of sight with the top stage still under thrust, the trackers locked up at 90-degrees elevation, and the bird must have hit over 8,000 feet. These large engines are very powerful, very expensive, and meant *only* for the *advanced* model rocketeer who has plenty of room to fly in, but they are needed because they provide the means to do the

kind of advanced work the older model rocketeers want to do.

Friday, August 18th, the final day of NARAM-9, dawned cold and rainy . . . real Dubnica weather. And Jaroslav Broz from Prague, our Czechoslovakian guest courtesy Vern Estes, remarked on this. But the moment the rain stopped at about 9:30, the Spot Landing event got under way. Juniors, Leaders, and Seniors had different target poles, which made the adjustable launch rails look like a mass of crossed swords as contestants strove to compensate for wind and target location. Bernard Biales of Madison, Wis. dropped his bird in to beat all the Seniors, and Scott Upton, 18, of St. Louis stood near the Leader pole beckoning his spot lander in to win, nearly becoming a member of the Royal Order of Pole Hangers. In the Junior Division, it was Thomas Glass, 14, of Baltimore who got the closest to the pole.

By the time Hawk Boost-glider Duration rolled around, the wind was still blowing and the overcast hung above our heads. This more powerful class of B/G is somewhat of a challenge to modelers, and there were a number of "strip tease" flights wherein the stress of launch caused the wings to part company with the model. However, Bernie Biales got off a good winning Senior Division flight of 1:59 using an elliptical-winged B/G with very low wing loading and large area, proving that windy weather does not automatically require gliders of high wing loading. There were a number of "red barons," so-called because sometimes a strip pod fails to separate and the model comes spiralling in with the streamer fluttering out behind, looking like a trail of fiery smoke issuing from behind a vanquished Sopwith Camel. Ray Stamford, 19, of Rock Island, Ill. took the Leader Division while Kevin Stumpe, 15, of St.

Ansgar, Iowa, walked away with Junior.

And that about wrapped up the meet except for some demonstration flights. Dr. Al Beetch had run off a full-scale NARAM on an active airport with planes operating on all sides of us at all times. The FAA men from Minneapolis had visited us early in the meet and satisfied themselves that we were doing a safe job. We'd also had visits from representatives of the National Safety Council, an organization that had, up until then, looked askance at model rocketry. They were there because the day before the meet opened, the American Institute of Aeronautics and Astronautics in New York reversed their decade-old policy of discouraging all forms of non-professional rocketry to recognize and endorse model rocketry, a tremendous breakthrough.

Our guests on the range during the final day included Leister Graffis, President of Bendix Field Engineering Company who had flown from Baltimore to see the meet and present the Bendix Trophies for excellence to the national champs. Also on hand was R. V. Mrozinski of the National Aeronautics and Space Council.

For the first time we held an awards luncheon; Jim Kukowski MC'ed. As he started to hand out awards, all doors to the room suddenly had intense, dapper men standing beside them . . . the Secret Service. And Dr. Beetch walked in with Vice President Humphrey!

The Vice President, as Chairman of the National Aeronautics and Space Council, was visibly impressed by the model rockets on display in the room, and he graced us all with a short speech. "The world needs talent, your kind of talent," he told the young rocketeers. He went on to remark that they were all making an important contribution to their educations through model rocketry and urged them to get a college education. He then personally handed out the Bendix Trophies, assisted by Bendix President Graffis.

After trying five years, Charles Duelfer, 16, of Stamford, Conn. won the coveted Junior National Championship. The runner-up was William Bloch of Pittsburgh. J. Tally Guill, 18, of New Canaan, Conn. became Leader National Champion for the third year in a row (and this was preceded by the 1964 Junior National Championship and participation in the First Internationals at Dubnica) with Joseph Persio, 18, of Cheshire, Conn. as runner-up. Yours Truly became Senior National Champion in a closely-run race with Karl Feldman of South Bergen, N. J. And Fairchester Section, Stamford, Conn. took the Champ Section pennant for the 4th year in a row!

The Trustees Outstanding Service Award went to Dr. William B. Rich, NAR's hard-working Treasurer and former Secretary-Treasurer, who really deserves it. The Sportsmanship Award went by acclamation to Al Kirchner, Jr., last year's Junior National Champion, who gave up competition this year in order to handle NARAM-9 contest paperwork and represent his father who is Chairman of the Contest Board.

Junior competition has always been rough because of the predominance of Junior members in NAR, and Leader division competition is getting that way as more and more model rocketeers who have gone to college keep up their model rocketry. There's a great cadre of Senior competitors now — Pinky Guill, John Belkwitch, Doug Malewicki, Jim Barrowman, Bob Atwood, Al Beetch, Bernie Biales, Les Butterworth, Karl Feldman, Gerry Gregorek, and Tommy Thompson. In addition to being top modelers, most of these men now sit on the new NAR Board of Trustees, giving us the most active Board we've ever had.

NARAM-9 is now a fond memory.

Universal Servo

Continued from page 40

bounce back and forth at its limit (one side or the other) till the overly high voltage is reduced.

As noted earlier, this servo design is really universal. Type 9S-0 is set up for an input signal of + .3V; the 9S-1 requires + .5V for full deflection. Type 9S-2 is intended for single control operation in a model; it requires no separate reference voltage, and just a pair of 2.4V batteries. Type 9S-3 is for use where the reference voltage is + 6V. Reference voltage is normally + 3.6V. except where the user specifies some other value, or in the case of the 9S-2 and 9S-3. Actually, the same battery may be used for reference as for driving the servo motor + 2.5V. If this is done the maker strongly recommends that separate leads be run to the battery plus and minus, right from the servo red and blue leads; the voltage drop that's inevitable under heavy servo motor loads through the regular wiring, switches and connectors will then not bother the servo. Such drop could affect all servos in an installation, even though only one was being moved, and would appear to the user to be interaction among the controls.

Use of a different reference voltage from what a servo is set up for would cause the output arm to move a different distance than intended, if input voltage were kept the same. Actually, Spar can adjust the 9S servo to operate satisfactorily with any input signal from .25 to 1.0V, and any reference voltage from 2.4 to 10V. The change is basically in resistors R4, R6 and R11. To make this easy for Spar (and for do-it-yourself modelers), these three resistors are placed where they may be reached

without need for disassembling the two PC boards — right at the brush end of the motor. R11 is the "dampening" resistor, is normally set to give rapid and accurate centering, but with no jiggling back and forth at neutral.

Bench and flying tests have shown us that the Spar servos are indeed fast and accurate in action; if your analog equipment is in good shape (and there is no "slop" in the control pots or their linkage in the transmitter) these servos will make you think you are operating a digital rig! They are an ideal replacement for analog propo servos which are prone to drift with temperature or voltage changes, or which simply don't measure up to modern standards of performance, size and weight, or construction.

You might be able to order the standard models of Spar servos through a local dealer. If not, write direct to the factory at 7969 Engineer Rd., San Diego, Calif. 92111. When ordering servos to special specs, be sure to give data on input voltage swing, reference voltage (or mention you wish to use the servo batteries as reference), any other pertinent factors. Price for most units is $34.95 (postage additional). Note that all these servos are designed to utilize only 2.5V (from four nickel-cad cells) for the motor supply.

A.M. Reviews

Continued from page 10

all the types of airplanes and helicopters now flown in the scheduled airline service throughout the world. It includes both the giant jetliners, with crews of ten and payload of 175 passengers, which travel at near-sonic speed, and the small, 70 mph light-planes with a single pilot and two or three passengers. The planes are pictured, as well as described.

In **Fighter Aircraft of the United States** are pictured and described all the types, including the McDonnell F-4 Phantom II, and F-101 Voodoo; the Republic F-105 Thunderchief; Ling-Temco-Vought F-8 Crusader and A-7A Corsair II; the Convair F-106 Delta Dart and Delta Dagger; Lockheed F-104 Starfighter and YF-12A; General Dynamics F-111; North American F-100 Super Sabre, F-86D Sabre, and FJ Fury; Grumman F-11A Tiger; and Republic F-84F Thunderstreak.

Bomber Aircraft of the United States represents the major part of the retaliatory forces of the United States. It includes the pint-sized Douglas Skyhawk and the mighty B-52 as well as some of the less publicized strategic bombers, such as the Martin P-5 Marlin patrol bomber and the Grumman A-6 Intruder attack bomber. All the different types serving the Navy, Marines and Air Force are illustrated and described.

Aeronautics 1: Early Flying up to the Reims Meeting, by C. H. Gibbs-Smith; **Aeronautics 2: Flying since 1913**, by G. W. B. Lacey; **Aeronautica — Objets d'Art, Prints, Air Mail**, by W. T. O'Dea; **Power to Fly — Aircraft Propulsion**, by W. J. Tuck; all 48 pages, $1 each. British Science Museum booklets published by Her Majesty's Stationery Office of England.

Each of these very attractive booklets is illustrated with excellent color photographs on fine quality paper. They are distributed by the British Information Service, 845 Third Ave., New York, N. Y.

Aeronautics 1: Early Flying features the first aerial voyage in 1783; the first hydrogen balloon in 1783; Cayley, the Father of Aerial Navigation; Henson's aerial steam carriage (1842-3), Stringfellow's model triplane (1868); Ader's steam-powered Eole (1890), Phillip's Multiplane model (1893); Lilienthal's gliders (1891-9); Santos-Dumont circling the Eiffel Tower (1901); Julliot's Airship (1903); the Langley 'Aerodrome' (1903); the Wright brothers first powered flights (1903); the Voisin biplane (1908); the Standard type A Wright Flyer (1908); the first channel crossing by airplane (1909); the Farman biplane (1909); the Antoinette Monoplane; first world aviation meeting (1909).

Aeronautics 2: Flying since 1913 features the Royal Aircraft factory S.E.5A (1917); the Fokker triplane (1917); the Avro 504K (1918); the Vickers Vimy (1919); the de

**Havilland Moth (1925); the Cierva C.6D Autogiro (1926); the Armstrong Whitworth Argosy (1926); the Supermarine S.6B seaplane (1931); the Douglas DC-3 Dakota (1936); the Junkers Ju 87 Stuka (1939); the Hawker Hurricane and Supermarine Spitfire (1940); the Messerschmitt Me 163 Komet (1944); the Westland S-51 Helicopter (1947); the Vickers Viscount (1953); the Hawker Hunter (1954); the Electric Lightning (1954); the Boeing 707; the Vickers Vc-10 (1964); and the Vertical Take-off (1961-63).

Aeronautica — Objets d'Art, Prints. Air Mail features a print of the Montgolfier ascent (1783); a dressing table ornament, fans, pottery, buttons, fancy boxes on the first balloon ascents; ivory boxes depicting the first balloon fatality in 1785; a fancy snuff box depicting the battle of Fleurus 1794; a print, the Gillray cartoon (1810); a print on the balloon ascent at Liverpool in 1849; color photos of the balloon message forms (1850 and 1870); medals commemorating famous flights; posters advertising the world aviation meetings at Nice and Milan (1910); playing cards picturing both planes and aviation pioneers; letter covers of some famous transatlantic flights; interesting airmail stamps; rocket postcards (1931-34).

Power to Fly features the Lennox Eagle airship (1835); the Giffard airship (1852); the Tissander airship (1883); the Stringfellow steam engines (1848); the Maxim steam engine (1894); the Manly-Balzer engine (1902); the Wright engine (1903); the 50-hp Antoinette engine 1907; the Anzani engine (1909); the Hargrave rotary engine; the N.E.C. engine (1910); the Rolls-Royce Eagle engine (1919); the Hele-Shaw-Beacham propeller (1928); the Merlin Supercharger (1943); the Bristol Centaurus engine (1947); the Whittle WI Turbojet (1941); the Rolls-Royce Trent (1945); the vertical-lift test rig (1954); German V2 rocket engine (1942).

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New for RC

Shock-absorbing padding (R/C Engineering, 4901 East Holly, Phoenix, Ariz. 85008). Impervious to alcohol and castor oil, unicellular (does not absorb liquids), useful in boats; does not soak up fuel in case of leaking tank. Does not burn. Lacks "snapback" of foam rubber — a very dead material. A ½ x 3½ x 3½" piece weighs .4 oz.; sheets 8 x 12" in ½" thickness, $1.35. Organized to repair and maintain RC apparatus in Arizona area, firm has expanded to handle such work on national basis. They service any RC equipment, including digital propo, equipment built from kits, or foreign. Their technicians have years in electronics, model building and the digital computer field. Repair work guaranteed 30 days. Concern requests careful packing of equipment, and inclusion of a note outlining trouble in full detail.

New idea in foam wing cores (Sullivan Products, 535 Davisville Rd., Willow Grove, Pa. 19090.) Now under development, will reduce weight; core molded in waffle pattern for stiffness. Another new idea is wing covering which may be doped, MonoKoted, etc. Wing cores cost $6, finished wings, $12. Sullivan developing several types of fuselages. One will be vacuum-formed, other "filament wound" — resin-coated thread wound on fuselage-shaped mandrel, thickness varied automatically as desired. Many thread layers at nose for strength, fewer near tail for light weight. Wings available, work is still in progress on the fuselages.

Quick Blips, World Wide Radio Control, 7845 Wyoming Ave., Dearborn, Mich. 48126. Illustrates, describes many latest offerings lists bargain specials in electronics equipment, plane kits, engines and miscellaneous items. Free.

Special exhaust piping, B & N Model Accessory Co., 94 Cedar Dr., Plainview, N. Y. 11803. Extension tubes to fit tail pipes of their standard mufflers. Pipes 7/16" ID (same as muffler outlet), have enlargement at one end to fit tightly together with minimum leakage. Each section 4" long, made straight or with a 60-degree curve. Cut to suit your requirements.

Command Master RTE, Sterling Models, Philadelphia, Pa. 19144. Feedback propo 3+1 system offers two fully proportional controls for elevator and rudder (or use CAR with latter) plus trimmable engine. System operates via pulse rate and length variation of one AF tone, another tone utilized for motor control. Superhet receiver includes sharp filters to separate these tones — and to reduce chances of interference. Completely relayless, utilizes silicon transistors throughout. Transmitter in same case as that for the Command Master rudder and throttle control system, but Bonner control stick assembly fitted — two buttons for engine speed change. Airborne weight of receiver, nickel-cad power pack and three servos is 15 oz., including separate connection board that carries On-Off switch. RTE transmitter powered by 9.6V nickel-cad battery; complete RTE system price ($250) includes this and charger for both batteries. Those who own the Command Master RT-1000 system may have it converted to the RTE for $125. The new system continues Sterling's unique five-year "Black Box" guarantee policy; Sterling will repair or replace any non-functioning receiver (regardless of cause — including crashes — that is returned to factory with check for $9.50. Servos covered same way, but fee is $7.50 each. No limit to number of times such repairs will be made, within the five-year period. Usual guarantee on material and workmanship.

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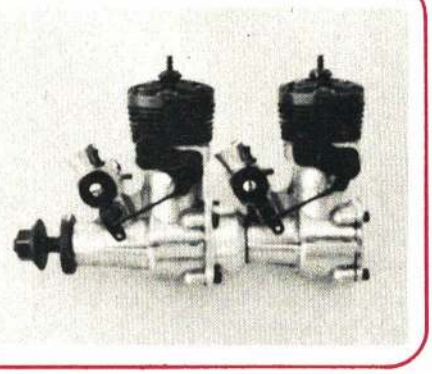

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