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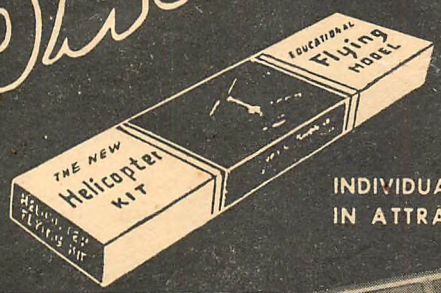

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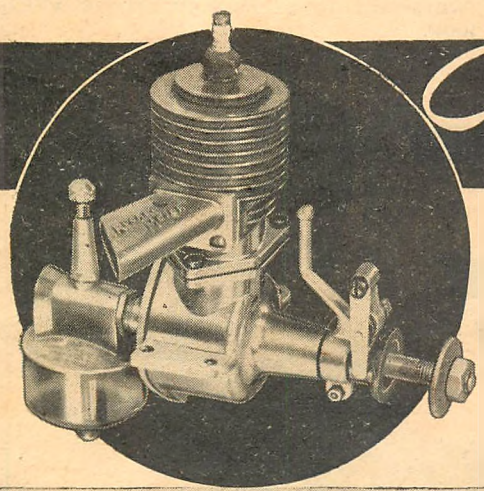

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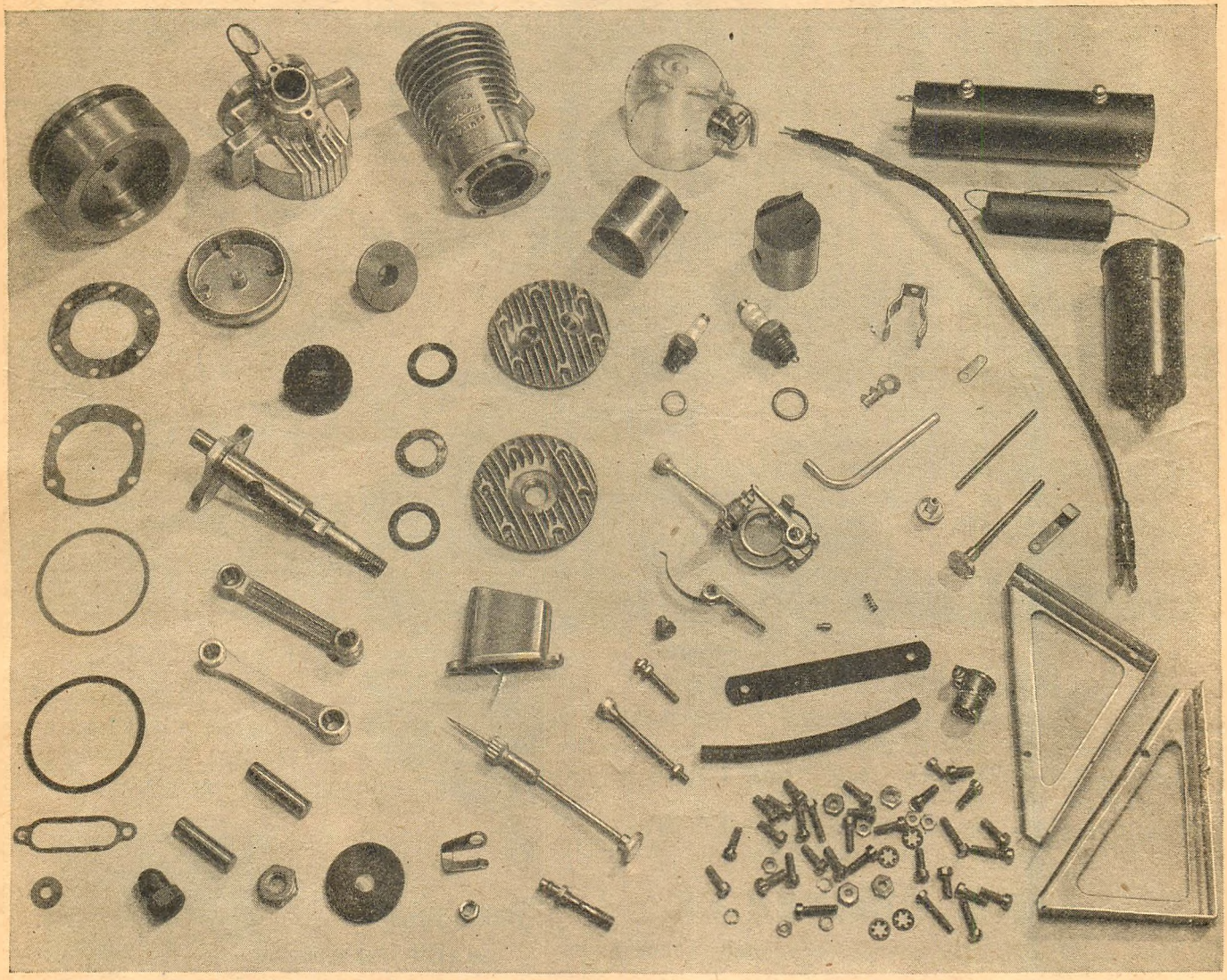

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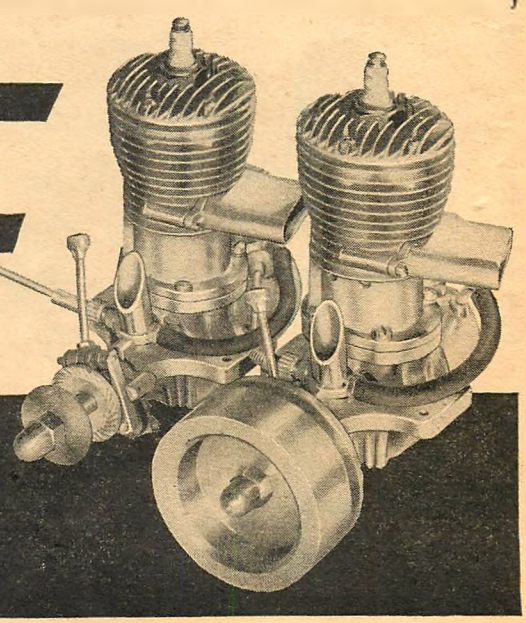

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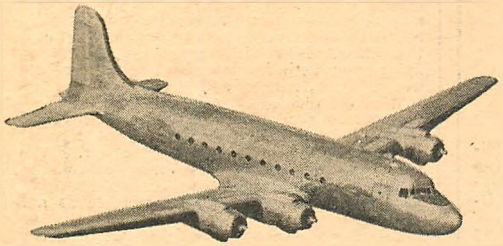

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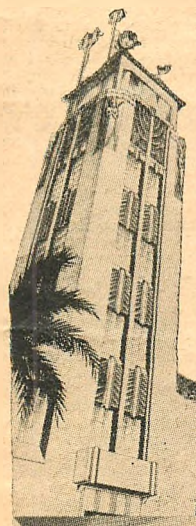

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Latest on the Nationals!

THIS on-again off-again contest is now definitely scheduled for Labor Day weekend in Wichita, Kansas. For more information see page 52 of this issue.

Model Airplane NEWSLETTER

by AL LEWIS

IF YOU have been following this column for any length of time, or mingling with the experts, you may have heard considerable discussion about records. Well, such discussion usually is centered around National records. Until a few years ago all American marks were computed on the basis of duration alone. Now with the advent of control line flying, you keep hearing about miles per hour as well as hours, minutes and seconds.

With the addition of speed classifications the U. S. records more nearly fall in line with the international classes, except that for world speed records the model must fly free over a fixed course. It is all very interesting and we're devoting the column this month to international competition. So get out your pencil and paper—you're going to do a little figuring!

Before we give you the latest record listing as released by the Federation Aeronautique Internationale—the international body for sporting aviation, full scale as well as model—a brief discussion of the rules is in order.

Rubber powered models must weigh at least 15 grams per square decimeter of wing area. That works out to about 4.9 oz. per sq. ft. Gas models have a maximum weight limit of 16.4 oz. per sq. ft. of wing area. No minimum weight requirements. Gliders must meet the same wing loading requirement as rubber powered models.

About the only other limits on models is that the powered ships have a crossectional area for the fuselage of not less than $L^2/100$, where L equals overall length of the model. Glider fuselage requirement is $L^2/200$ and consequently such bodies are much slimmer. Only other stipulation is that the wingspan on all models must be more than 2.29 ft. and not greater than 11.48 ft. All rather simple, isn't it? For tailless aircraft the F.A.I. comes up with a pretty complicated formula, but we'll skip that this time if you don't mind; want to get on to where and how the models can be flown for record.

Gliders, which have always been a popular type of model in Europe, are permitted to be catapult launched, hand launched, towline launched, or launched by running. This last is similar to kite flying where you get the kite up into the air by running with it. The contestant may not run more than 246 ft., however, in getting his glider up in the air.

Catapult launching rules limit the unstretched catapult to 118 inches. For towline launching where a winch is used, either mechanical or hand type, the towline is limited to 656 ft. But even then that is quite a lengthy line and properly utilized should provide considerable altitude for the model.

About the only requirement for rubber powered models other than the general ones already mentioned is that the rubber used for motive power must be contained entirely within the fuselage. For gas models a maximum displacement rule limits the engines to not more than .61 cubic inches.

So far we've converted all these requirements to our system of measurement. But since the records themselves are in the metric system perhaps we'd better refresh your memory to the extent that 1 kilometer equals .6214 miles; 1 meter equals 3.28 ft.; 1 yard equals .9144 meters. Okay? We're off.

All international records are accepted in four categories for each type of model except in the case of gliders, which has only three categories. The four popular ones are: duration, distance in a straight line, altitude, and speed. The latter is dropped in the case of gliders as you would guess.

The main classes of models are as follows:

LANDPLANES, hand launched rubber powered models.

LANDPLANES, rise-off-ground rubber powered models.

LANDPLANES, rise-off-ground gasoline engine powered models.

SEAPLANES, rise-off-water rubber powered models.

SEAPLANES, rise-off-water gasoline engine powered models.

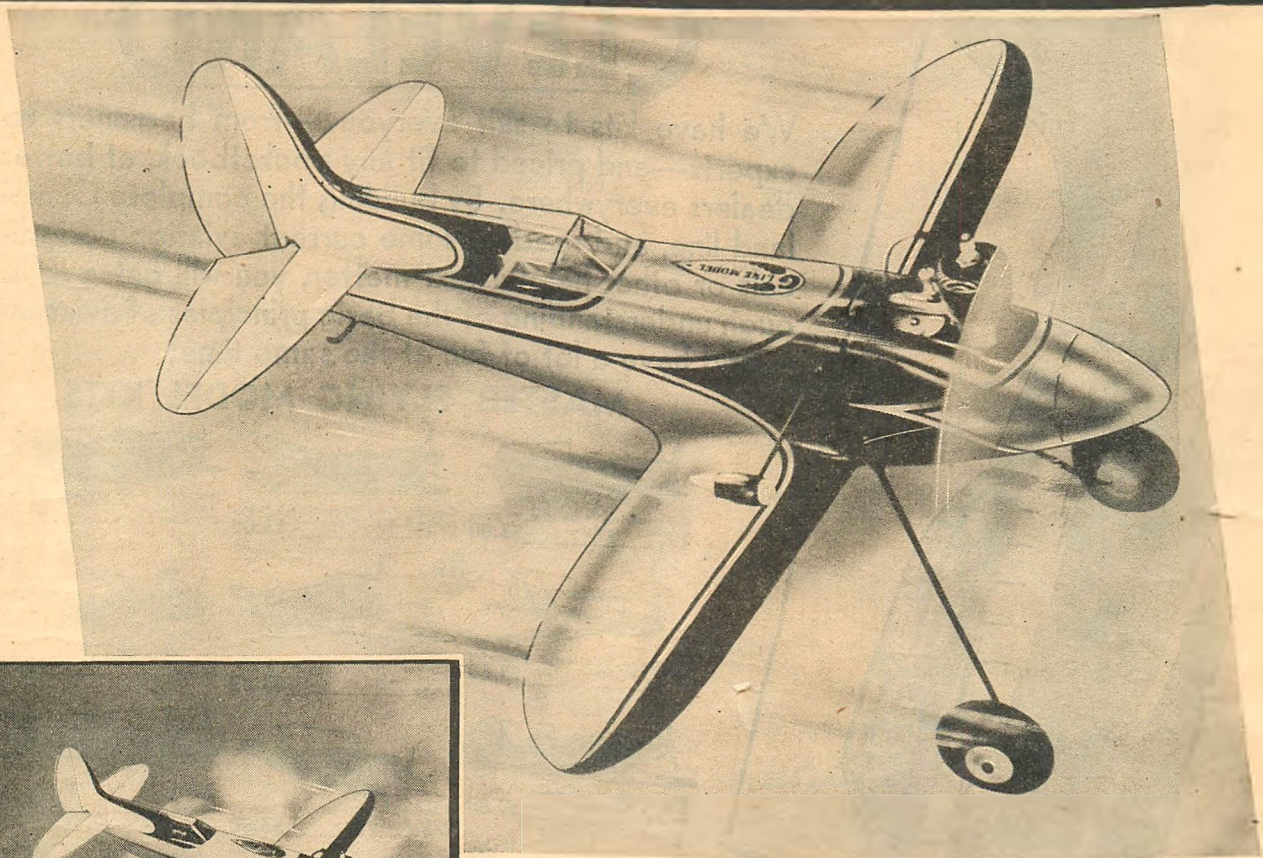
GLIDERS, optional types of launching.

When you divide each of these events into the four categories described (gliders into three, remember) you come out with 23 different types of models and records. It all sounds too simple compared to our national record listing which in free flight alone boasts 18 different categories, to say nothing of control line models, rubber powered jobs, and so on, far into the night. And then, just to complicate things further, we divide ours into age groups.

The international listing contains only 18 records, which just goes to show that there is plenty of room for improvement there, too. For a number of years some leaders have been calling for the national rules to conform closely with the international reg-

(*Turn to page* 95)

RACY • RUGGED • and FULL of FLIGHT...
STANZEL *Super* "V" SHARK



Super-sturdy and super-speedy, the Super "V" Shark deserves its rating as the best speed-and-stunt model for Class "B" and "C" motors. The streamlined, G-line Super Shark hits a phenomenal 120 m.p.h. and features the new, improved Roller Control. Built of balsa, with hardwood and plywood reinforcing stress points, the model's durability is increased by an all-steel landing gear.

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THE BABY "V" SHARK

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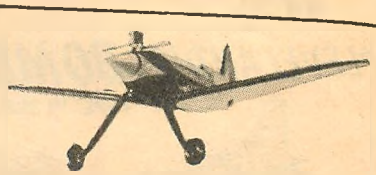

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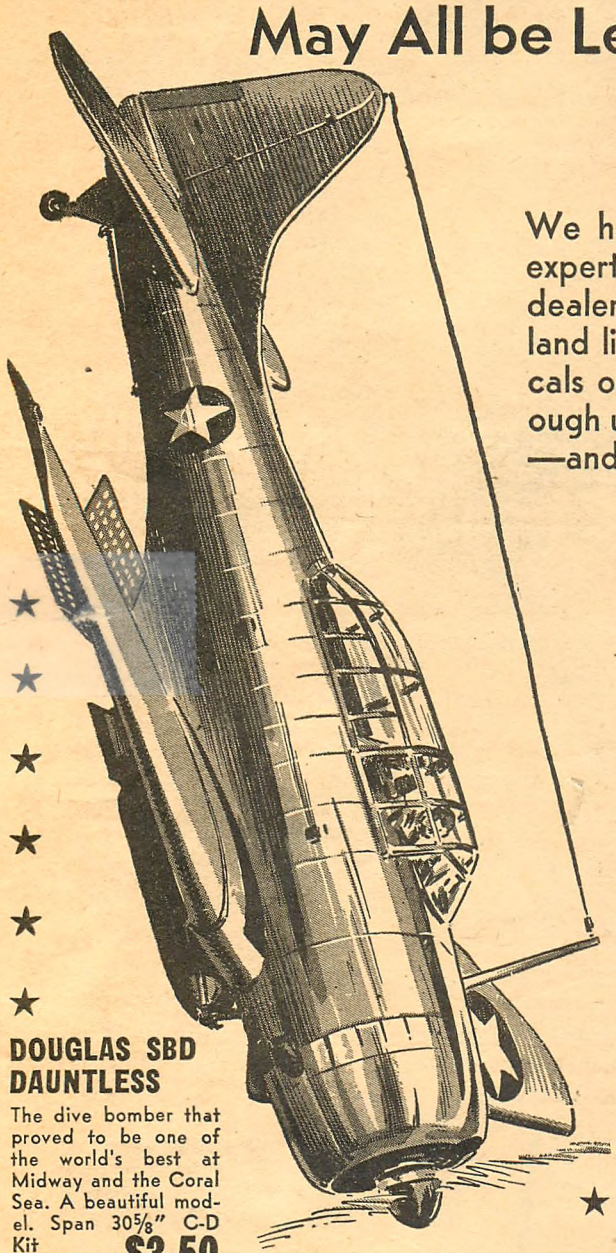

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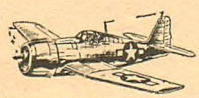
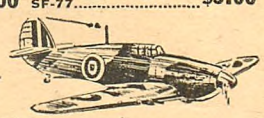
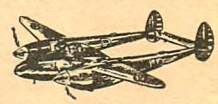


Grumman "Hellcat," Powerful Navy Fighter— SF-97..... **$3.50**

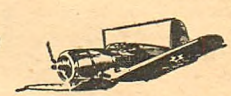


Hawker "Hurricane," R.A.F. Fighter— SF-78..... **$3.00**



Lockheed P-38 "Lightning," Famous Fighter— SF-85..... **$4.00**

Bell P-39 "Airacobra," Sleek A.A.F. Fighter— SF-76..... **$3.00**



Sikorsky "Corsair," Speedy Navy Fighter— SF-79..... **$3.50**

Mitsubishi 00 "Zero," Jap Fighter— SF-86..... **$3.00**

N. Amer. P-51 "Mustang," A.A.F. Fighter— SF-91..... **$3.00**

Grumman TBF "Avenger," Torpedo Bomber— SF-93..... **$4.00**

Westland "Whirlwind," R.A.F. Fighter— F-105..... **$3.50**

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Messerschmitt ME-109, German's Pride— SF-74..... **$3.00**

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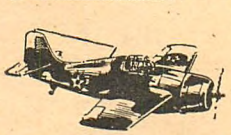
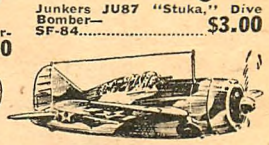


Grumman "Wildcat," Carrier-Fighter—SF-83 **$3.00**

Lockheed "Hudson," R.A.F. Bomber— SF-95..... **$7.50**



Brewster "Buffalo" Carrier Fighter— SF-87..... **$3.00**

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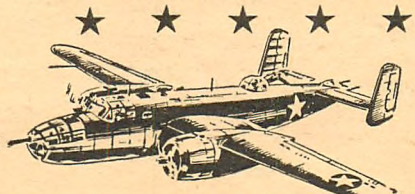

North American B-25 "Mitchell," Famous Tokyo Raider—Kit SF-125..... $8.50
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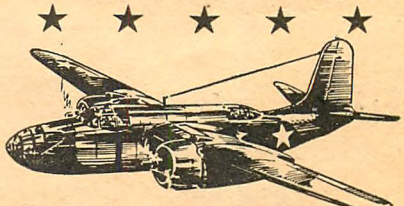

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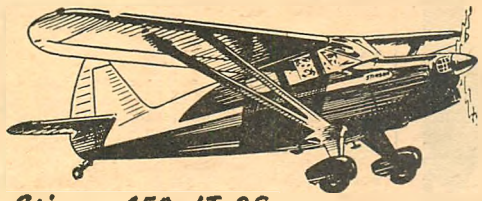
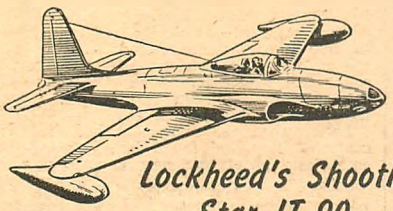


Stinson 150, IT-98



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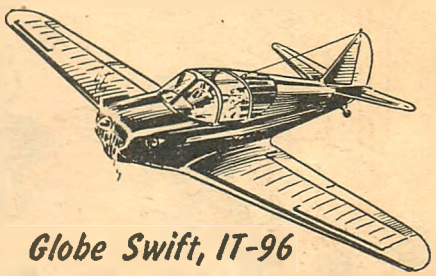
Ryan Fireball, IT-92



Globe Swift, IT-96

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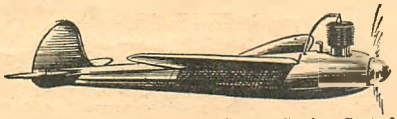

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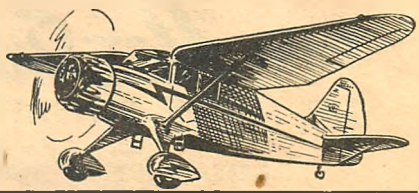

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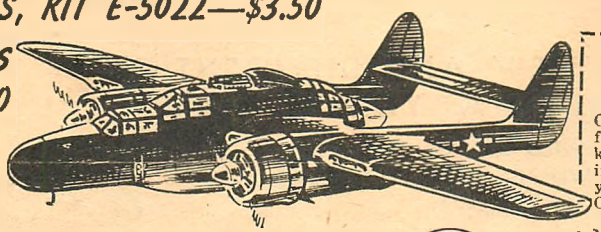

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WEST COAST TIPS

By JOHNNY DAVIS

WE HAD quite a day at the Lockheed club contest. It was the first big meet of the year and let us tell you it was really large. The entries ranged all the way from San Diego up to Palo Alto, Berkeley and north of San Francisco.

Roy Mayes from the Albany Patrol Flyers put on a swell exhibition of precision upside down flying. Only once did he appear to be in trouble, when his motor sagged out while he had his beautiful Fokker D-7 upside down about 5 ft. off the ground. By babying it and towing it higher—still upside down mind you!—he finally got it up high enough to drop it over right side up, and just as he did, the motor quit completely. All over the place you could hear people letting out the breath they had been holding. And don't think Mr. Mayes didn't let out the biggest one of all.

Later, when the excitement had died down, we contacted Roy and found him bubbling over with enthusiasm about the new association which had

Jack Dyer receiving a Torpedo engine for his efforts at Bakersfield contest

been started in the San Francisco area—the Aero Modelers Association of Northern California (AMANC). According to Roy, the majority of clubs in the San Francisco area are all joined under this organization. They hold inter-association meets under sponsorship of one club after another, with points as well as trophies awarded the winners. (We might point out with pride that this column advocated this identical idea for all sections of the country in May MODEL AIRPLANE NEWS.)

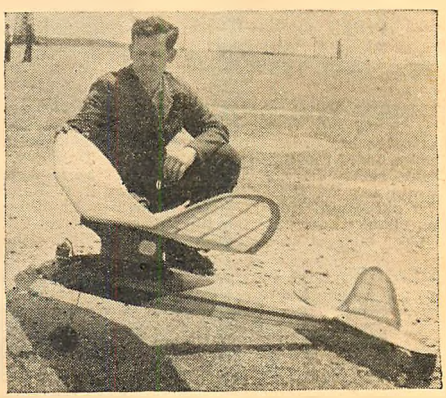
The AMANC is an offshoot of the old Western States Model Airplane Assoc., with a new set of rules that are sharp and right up to the minute. A list of these rules follows at the end of this article.

However, Roy, this column would like to point out that somewhere along the line Oakland seems to have fouled the works. We recently made a trip up through the Bay area and found that U-control flying in Oakland is practically at a standstill because of the extremely rigid safety rules.

Now we are in favor of safety rules that do what is asked of them—namely, protect the model builders and their spectators. However, the set of rules laid down by the East Bay U-control Safety Committee reminds us of the multitude of rules and regulations concerning the safety of flying real airplanes as laid down by the Air Transport Command

(*Turn to page* 12)

Jack Light of Bakersfield is shown with the ship he designed and built; this gassie is as efficient as she is beautiful



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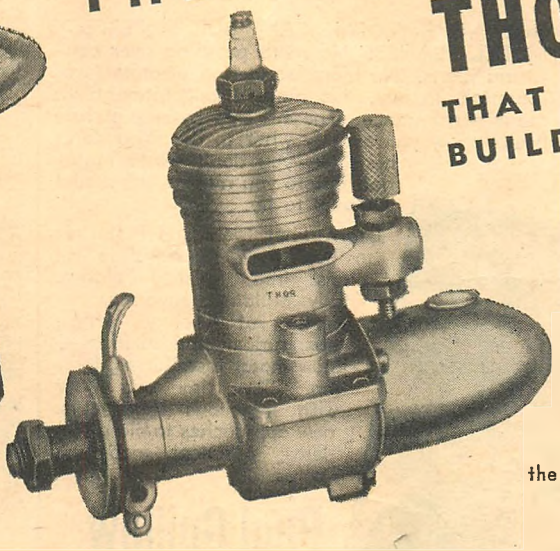

Yes—thousands of you modelers helped us build this wonderful new THOR "B." And now, here it is, with these unusual features which you said you wanted in the "perfect" model engine:

- Presto Starting Device
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- Better Fuel Control
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TESTIMONIALS

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B. E., Midland, Texas.

"I also want you to know I am very pleased with the Thor engine I recently ordered from you. I'm amazed by the compression that is found in a motor so inexpensive as yours."
B. W., Ann Arbor, Mich.

"I received my Thor engine and am very much pleased with it."
F. G., Clinton, Okla.

"I have really enjoyed my Thor since I have had it."
E. W., Orlando, Fla.

"Have received my Thor engine and am well pleased with it."
E. C., Norfolk, Va.

"I am really surprised and pleased with my Thor engine. It is really of fine workmanship and materials."
D. J., Sanford, Fla.

"A friend of mine received a motor from you the other day and it runs perfect. Please send me one right away."
R. C., Vestal, N.Y.

"I like the engine very well and it runs good."
S. S., Nashville, Tenn.

"I have gotten very satisfactory performance from your Thor."
G. B., San Rafael, Calif.

"I like the even and steady way it runs much better than several other motors I have owned. It also seems to have plenty of soup for its size."
E. L., Warm Springs, Mont.

"We are in receipt of the two Thor engines we ordered from you recently and are very well pleased with this motor and are enclosing our check for 4 more of these engines."
S. S., Pampa, Texas.

"I am a pleased and satisfied owner of one of your Thor gasoline engines."
S. W., Rutledge, Pa.

"After seeing one of the Thor engines run which was owned by one of my buddies, I reached a conclusion that it was a superior engine for the listed price."
W. F., Del. Co., Pa.

"I am a proud owner of your Thor engine and it runs with clockwork precision."
A. L., Long Beach, N.Y.

"The first ¼ dozen were great so now ship me with haste 4 dozen more."
H. H., Omaha, Nebr.

"I am very pleased with my Thor engine."
B. R., Middlesboro, Ky.

"I am very pleased with your engine and hope to have it in a contest in the near future."
A. L., Long Beach, N.Y.

"Have had this engine for about one week now and am having excellent results with it."
O. W., Gulfport, Miss.

"Recently I purchased one of your 1/6 H.P. engines for use in a model plane. It is a perfectly good engine and I'm sure I never saw another one-cylinder job run so smoothly. I should know a little about it since I have been working on aircraft engines for the last five years."
M. C., Elmira, N.Y.

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The mighty Engine that spells P-O-W-E-R

SPECIFICATIONS

H.P.: 1/6	Displacement: .29
Bore: 13/16	R.P.M.: 300-11,000
Stroke: 9/16	Weight: 4½ oz.

Class B, NAA RULES

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and abhorred by every combat pilot that ever had to fly under the control of ATC. The same thing is happening in Oakland. Now the boys go somewhere else to fly where there isn't so much red tape.

We realize that accidents caused the condition to exist. However, it is felt by many control flyers that inadequate supervision at the beginning was to blame for any unpleasantness and that now everybody is leaning over backwards to accomplish the impossible, when actually all they are doing is killing the sport.

Instead of taking it out on the poor long-suffering model builders why don't they police the foolish spectators who wander into the speed circle to "get a closer look?" How many times have any of you seen some simpleton blunder right through a model builder's brand new set of lines and then get insulted when the modeler bawls him out for such stupidity? No, we believe that adequate policing of the crowds is the way to cut down accidents—not restriction of the model builder.

We have seen several dozen large contests and have put on a couple of the largest in Southern California; we find that the simple expedient of holding spectators behind a wire screen and keeping the distance from the circles to the crowd to at least 100 feet is the best accident insurance you could ever get.

. . . . . .

Jim Saftig, one of San Diego's biggest wheels, also made quite a showing at the Lockheed meet. Jim owns a hobby house in San Diego where many modelers hang out. It is said that should anybody mention flying models on say a Tuesday or some other weekday not ordinarily associated with flying these "blasted crates," Jim simply closes his doors and grabs wires, battery and airplane and off they go. Gosh, it must be wonderful to just go off and forget business that way.

Incidentally, the team of Jim Saftig, George Berry, Jack Kramer, and H. G. Murray are getting pretty tough for the local boys to beat. These boys all work together and you can find them at any of the meets around Southern California.

Another boy who has started some of the fellows groaning is Don Newburgher of Long Beach. Don set a new world's record (AMA or otherwise) of 125 mph for Class C speed at Los Angeles Aero Modelers contest May 5; and also a new Class D record of 126.08 mph at Santa Monica meet May 19—the latter was made by an original design ship with McCoy motor and dropoff gear.

Following are some meet results:

LOCKHEED CONTEST—APRIL 14

Precision Sr.—1. Roy Mayes. 2. Jim Saftig. 3. Palladino.

Precision Jr.—1. Davis Slagle. 2. Neil Perry. 3. Tom Davie.

Flying Scale Sr.—1. Roy Mayes (Fokker D-7). 2. J. C. Yates (Sirius). 3. Bob Palmer (Altair).

Flying Scale Jr.—1. Kenneth Worell.

Team Stunt—Wing Twisters (Hollywood), 7 planes in one circle.

Speed Class A—1. Les MacBrayer & Wellman Green, 93.75 mph, Orwick 23; 2. Norm Morgan, 91.04 mph, Ohlsson 23; 3. Art Cummings, 73.46 mph, Ohlsson 23.

Speed Class B—1. Frank Greene, 101.80 mph, Tiger; 2. Virgil Clark, 97.27 mph, Torpedo; 3. Knowlton Fernald, 90.00 mph, Tiger.

Speed Class C—1. George Berry, 119.84 mph, Hornet; 2. Clarence Benskin, 118.80 mph, Hornet; 3. Bob Smith, 117.02 mph, Hornet.

SAN DIEGO AERONEERS & DAILY JOURNAL WESTERN STATES CHAMPIONSHIP

Free Flight Class A—1. M. Roney. 2. Alphie Faulkner. 3. Jimmy Squires.

Class B—1. Whitney Glines. 2. Denny Davis. 3. D. J. Weiss.

Class C—1. C. W. Hoteling. 2. Ross Houch. 3. Frank (Pappy) Davis.

Professional—1. Mrs. Downs. 2. R. L. Yokum. 3. L. J. Cading.

Best Appearing Plane—Jack Stralow.

Jr. Event—Ronald Truelson.

Worst Crackup—Leonard Ross.

Sweepstakes and Service Man Award—Denny Davis.

Stunt Event—Joe Weathers.

CONTEST RULES OF THE AERO MODELERS ASSOCIATION OF NORTHERN CALIFORNIA

General Rules

1. CONTESTANTS: Anyone, whether a member of a club or not, is eligible to enter these contests.

2. RULES: Contestants agree to abide by these rules, conditions and regulations, as well as any amended or additional rules announced by the association. Any contestant failing to abide by the rules may be disqualified. The decision of the judges is final.

3. WAIVER: By entering these contests, contestant agrees to waive any claim for damages which may arise in conjunction with these contests, against any City or County, Park Commission, Recreation Department, Junior Chamber of Commerce, School Board, or any member thereof, or any club sponsoring the contest.

4. PROTESTS: All protests must be submitted in writing to the Contest Committee not later than 30 minutes after the incident in question has taken place.

5. BUILDER OF MODEL: Planes may be obtained from any source.

6. SAFETY COMMITTEE: Each model will be inspected before being allowed to fly. Models not

(*Turn to page* 94)

EAGLE *puts the accent on* DESIGN

Besides being outstanding favorites with model builders from coast to coast, Eagle models have been winning contests with persistent regularity. This is no mere accident but the result of a hard-boiled formula — Eagle always starts with a sound design, refines it, puts it into easy-to-follow plans and instructions, and furnishes only best quality building materials.

The country's top-ranking designers have been commissioned in developing the Eagle line. New designs are put thru a series of flight tests and any inherent bugs are removed. Before being put into kit form we are sure that it is an absolutely stable airplane of real merit. Eagle's engineering department has developed photo-viz plans to take the guess-work out of building. All parts are shown with photographic realism and each step in construction clearly outlined in the instructions. Eagle has endeavored to make it *easier* for you to build *better* models.

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1/8 x 1/8	.01½
1/8 x 3/16	.02½
1/8 x 1/4	.03
3/16 x 3/16	.03
1/4 x 1/4	.04
1/4 x 1/2	.08
1/8 x 3/8	.04
1/8 x 1/2	.05

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1/32	.08	
1/16	.08	.10
3/32	.10	.15
1/8	.12	.19
3/16	.16	.20
1/4	.18	.25

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18" 2.70

Don Williams for Free Flight
6" pitch ..... 16" 80c 18" 90c
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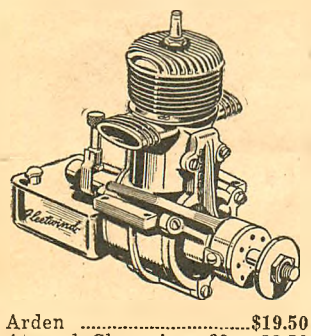

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Model "60-B" for boats.
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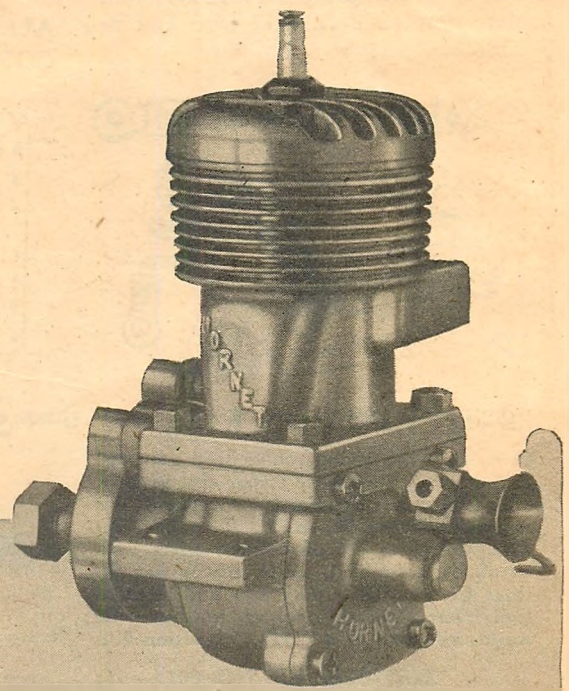

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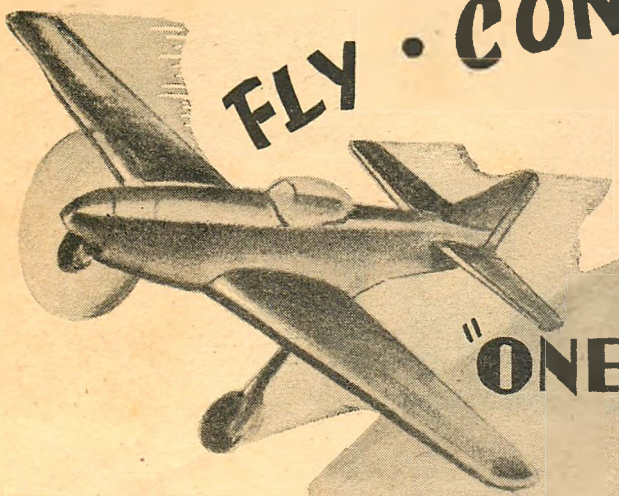

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ALL METAL—WEIGHS JUST 4 OZ.
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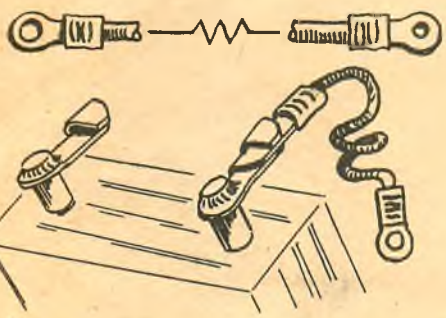

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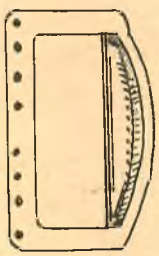
Here it is—the wiring you've been wanting! Brand new, thoroughly tested and proven. (Meets Aircraft Standards.) Fireproof, gas and oil resistant PLASTIC INSULATED wire. Complete set of colored wires with terminals assembled, quick disconnect fittings (in wet cell battery kit) and installation instructions. No solder, no fuss—the work's all done in a "DTD" Ignition Kit.

WET CELL KIT NO. 8015—65c
DRY CELL KIT, NO. 8234—50c



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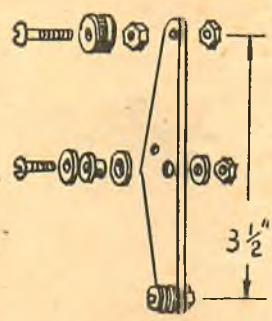
- Made of lightweight polished Dural metal with built-in pistol-grip handle.
- Design arrangement of 8 attaching holes allows adjustment for either speed or stunt flying.

NO. 9087, PRICE—75c



"DTD" METAL REEL

- Made of steel, spot-welded together and finished in cadmium plate.
- Designed-in provisions for attaching wires with steel clip to prevent un-winding.
- Special knurled knobs to give fast wind-out and wind-up.

NO. 9057, PRICE—$1.00

"DTD" BELL CRANK ASSEMBLY

- Made of polished .040 Duralium.
- Design of hole pattern gives differential control. (Approx. ⅓ down, ⅔ up.)
- Special bearings give smooth anti-friction movement.

COMPLETE ASSEMBLY,
NO. 1510, PRICE—25c

WATCH FOR NEWS . . .

- New "DTD" POWER UNIT . . . designed for your 1" scale models . . . COMING SOON! Write for FREE booklet.
- Pats. pend. on all products.
- All items in sturdy, attractive boxes.

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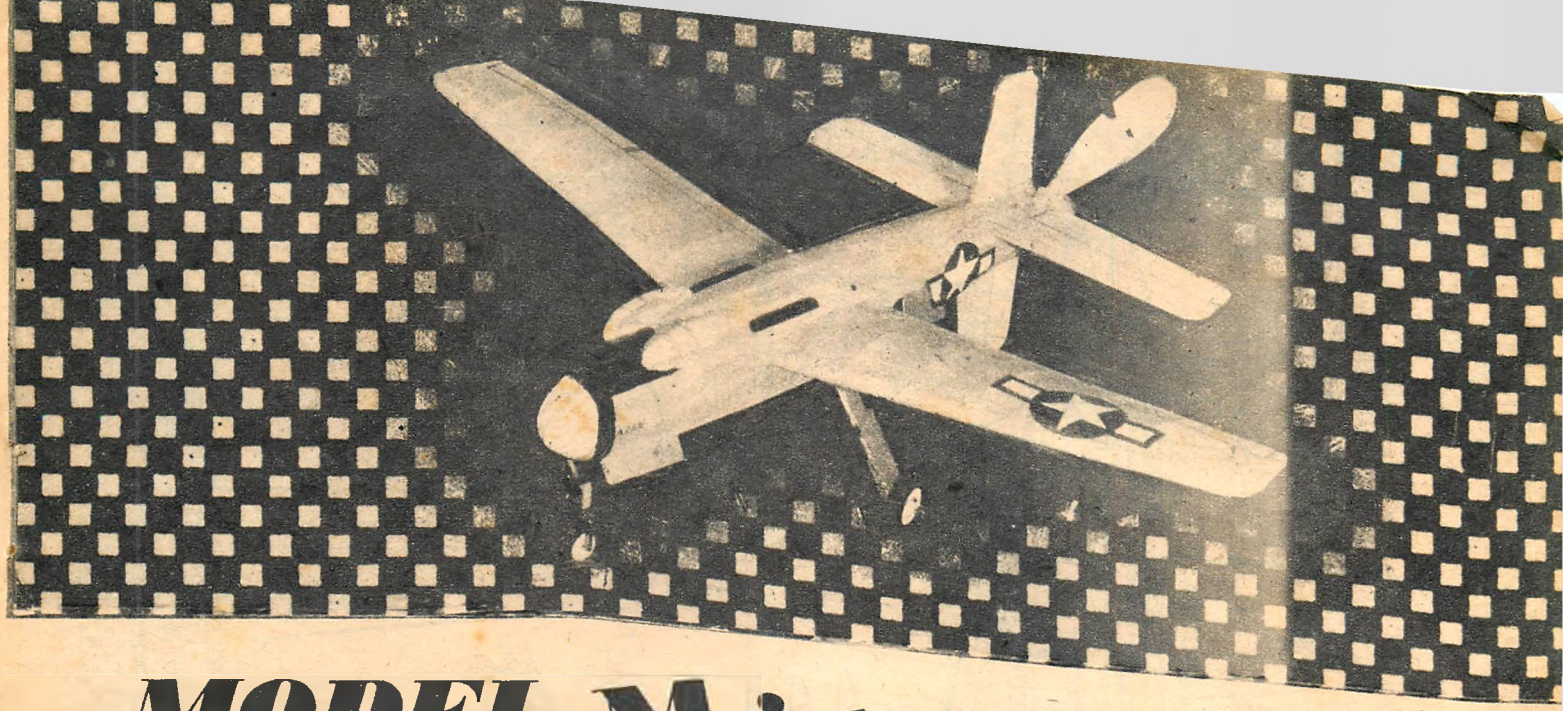
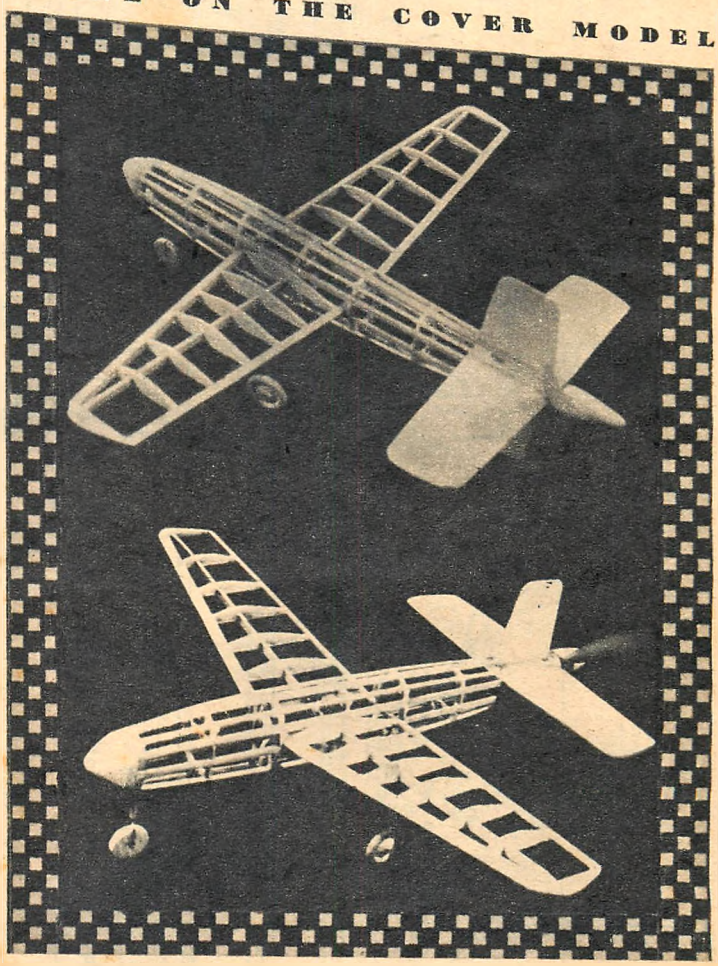


MODEL MixmASTER

by HERB WEISS

Try out the tail propeller principle yourself with this fine model

PLANE ON THE COVER MODEL



HERE'S a ship that caught our eye as a likely subject for a flying model the moment we saw the first pictures of it—the Douglas XB-42 high speed bomber, popularly known as the *Mixmaster*. Unusual in layout, its proportions are nevertheless as favorable for good flying qualities in our model as they were in the original. One of the fastest of propellered planes, it crossed the continent in a little over five hours.

The XB-42 weighs 36,000 pounds and is powered by two Allison V-1710 liquid cooled engines, both mounted inside the fuselage and driving counter-rotating coaxial propellers located at the tail. But although a pusher, the *Mixmaster* is not a "canard" or tail-first type, since its wing is mounted about at the midpoint of the fuselage and its tail carries conventional control surfaces—conventional, that is, except that the vertical surface extends below as well as above the fuselage.

Each propeller is independent of the other, and can be feathered independently of the other. The XB-42 is able to cruise efficiently with only one engine and one propeller operating.

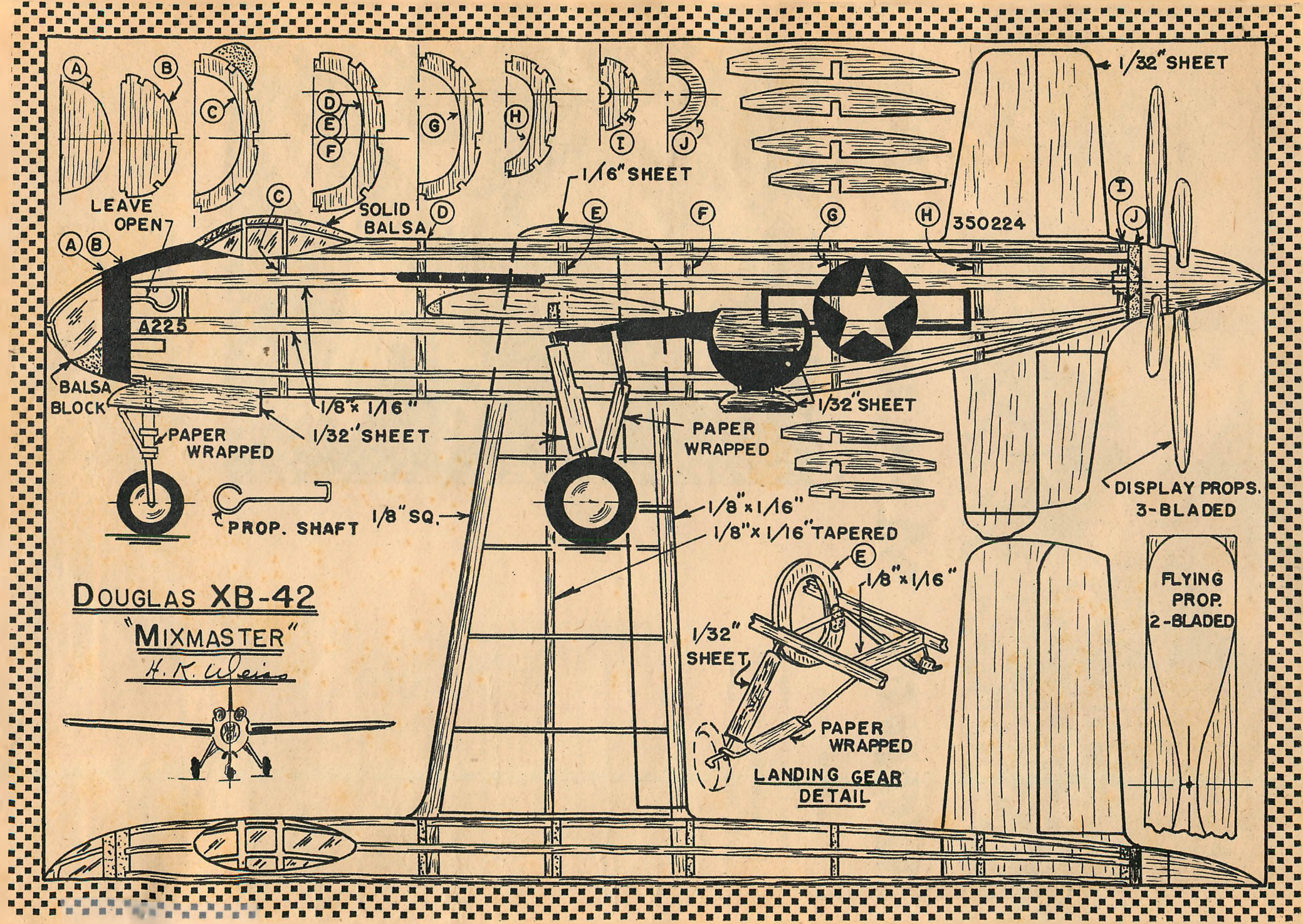
Sharp-eyed airplane recognition fans will have noted in photographs released on the *Mixmaster* that at least two models exist, and there are two major differences apparent in them. The size and shape of the vertical fin differs in the two models; and in one model the pilot and co-pilot sit side by side under a fuselage-wide canopy, while in the other each man has his own cockpit and streamlined hood. For our model we chose the less conventional type of "bug-eye" dual cockpits.

WINGS AND TAIL—First part of the model to build is the wing. Cut the ribs from 1/32" sheet. We have found it helpful to make the ribs a little oversize, and then sand off the excess after the wing frame has been assembled. The whole wing is made in one piece. Pin a piece of waxed paper over the plan, then pin the leading edge, trailing edge, and main spar in place. Leading and trailing edges need not be shaped at this time, but the main spar should be tapered to fit the notches in the ribs. Fasten the ribs in place, using plenty of cement. Add the wing tips, cut from 1/16" sheet. When the cement is thoroughly dry, unpin the wing frame and, treating it as a unit, go over it with sandpaper rounding off the leading edge, bringing the trailing edge to a point, and generally removing irregularities so that a good covering job will be easy.

Crack the spars at the midpoint of the wing and re-cement them so the wing has about 3/8" dihedral at each tip. Cut out the tail surfaces from 1/32" sheet balsa and sand them smooth. The stabilizer is made in one piece.

FUSELAGE—Cut two halves of each fuselage bulkhead from 1/16" sheet and cement the halves together. Strengthen

(Turn to page 82)


A
B
C
D
E
F
G
H
I
J
LEAVE OPEN
SOLID BALSA
1/16" SHEET
1/32" SHEET
A225
350224
BALSA BLOCK
1/8" x 1/16"
1/32" SHEET
PAPER WRAPPED
PROP. SHAFT
1/8" SQ.
1/8" x 1/16"
1/8" x 1/16" TAPERED
DISPLAY PROPS. 3-BLADED
FLYING PROP. 2-BLADED
1/32" SHEET
PAPER WRAPPED
LANDING GEAR DETAIL
DOUGLAS XB-42
"MIXMASTER"
H. K. Weiss

DESIGN FORUM

by CHARLES H. GRANT

Included in our designs this month is a good one from a lady engineer

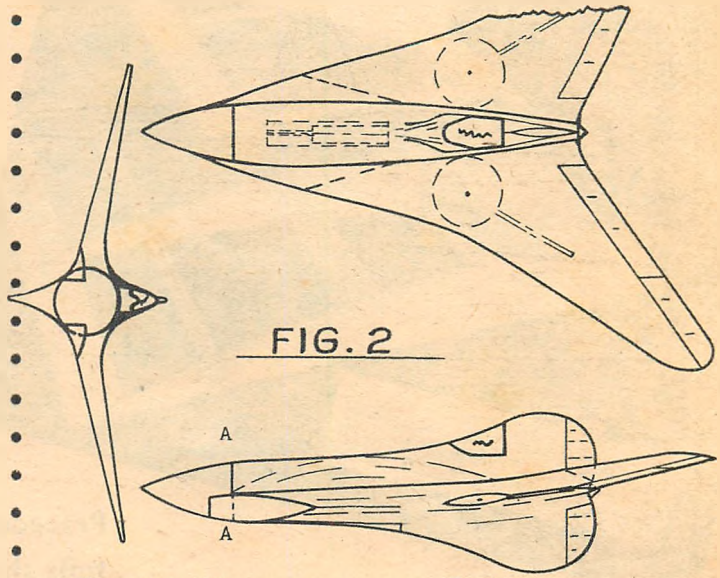


FIG. 2

Wingspan= 31'
Length = 30'
Height at Rudder Fin= 10'
Thickness at A-A is 4'

Performance
Speed= 700 M.P.H. & up
Max. Altitude =100,000 ft.
Stressed skin of alum.

JET AND ROCKET CRAFT

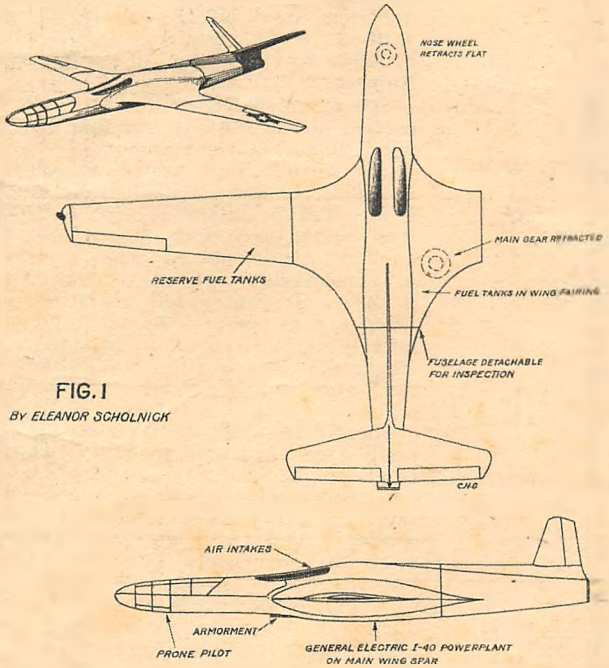


FIG. 1
BY ELEANOR SCHOLNICK

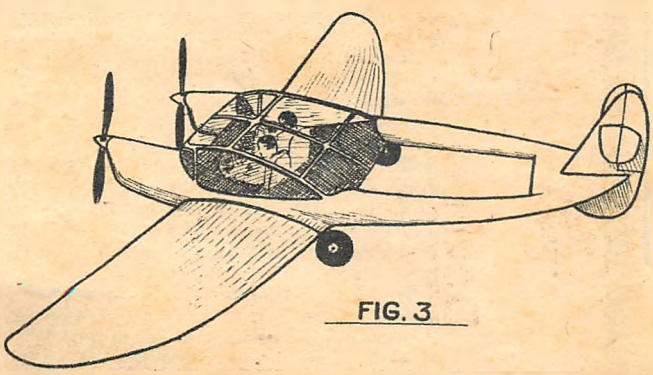


FIG. 3

MOST aeronautical ideas of value have come from men. Women so far have played only a comparatively small part in practical aeronautical engineering and design. It is true that they have been responsible in many cases for new adventures in development through the inspiration they have given to men of science and other valuable but unpublicized efforts. Their non-participation has not been entirely due to lack of ability because they have a natural instinct for design and in many cases are superior to men in this respect. The science of design is based upon a sense of the fitness of things—perhaps this explains the reasons for their talent.

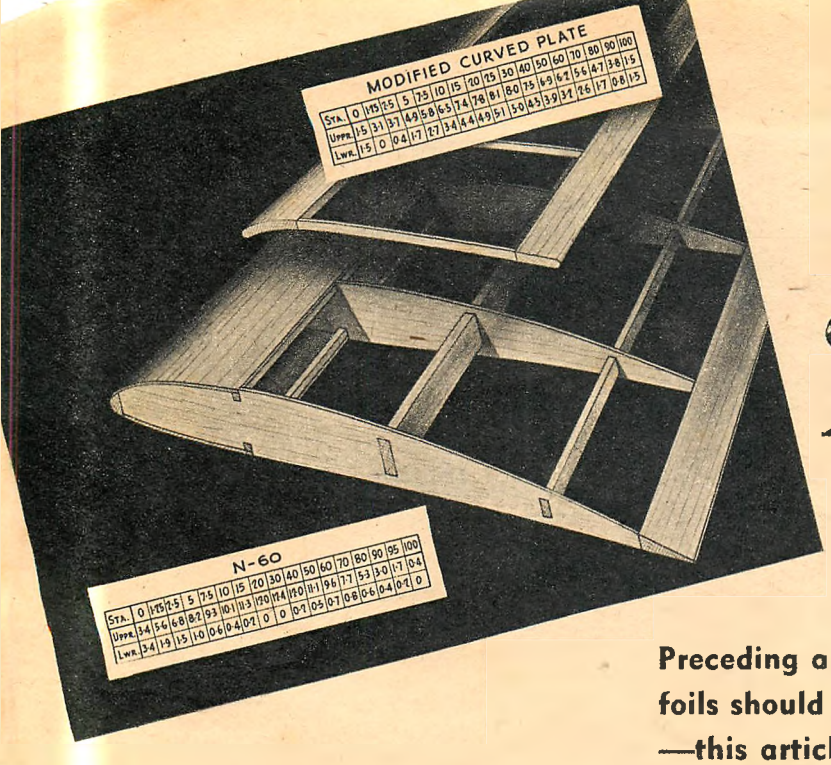
In the past all our contributions have come from the male members of the aeronautic family. Miss Eleanor Scholnick, of 719 Newark Ave., Jersey City, N.J., presents the first contribution from the gentler sex. It discloses the natural instinct for design which we mentioned above and contains that basic quality that all excellent designs must possess—simplicity. Many designers have endeavored to improve airplanes by adding something to it, thereby complicating it, with the usual result that the airplane gains some advantage from the new feature but also some disadvantage. The actual worth of such an addition must be measured by the difference between these two, and often disadvantages outweigh the advantages.

True genius is signified by simplicity. If a designer produces a simple design that incorporates every necessary feature and function, its performance is usually outstanding. Miss Scholnick has accomplished this. Her design, Fig. 1, is notably free of complication. It has wings, a fuselage and a tail like other airplanes; but these are so arranged and are of such shape that drag is reduced to a minimum without losing other necessary characteristics, such as stability, vision, etc. Her plane is a prone high speed pursuit model powered by a jet engine.

Let us consider the characteristics of this airplane as presented and note their significance in respect to low drag which means high speed. The first consideration for speed is reduction of the projected frontal area of the airplane—that is, the fuselage should be of small crossection, the wings thin and of such crossection that lift is maximum and drag minimum.

Every airplane must have a certain number of basic units—fuselage, wings and tail surface, with power to

(Turn to page 44)



AIRFOILS

By W. H. S. Bird and J. S. Luck

Preceding articles stressed that special airfoils should be used in the low speed range —this article tells how to design your own

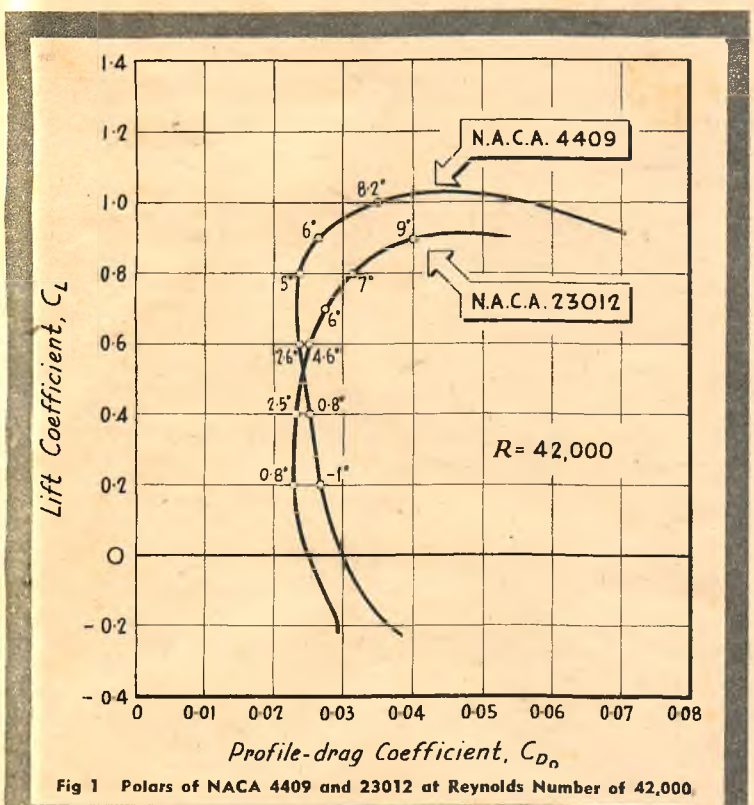


Fig 1 Polars of NACA 4409 and 23012 at Reynolds Number of 42,000

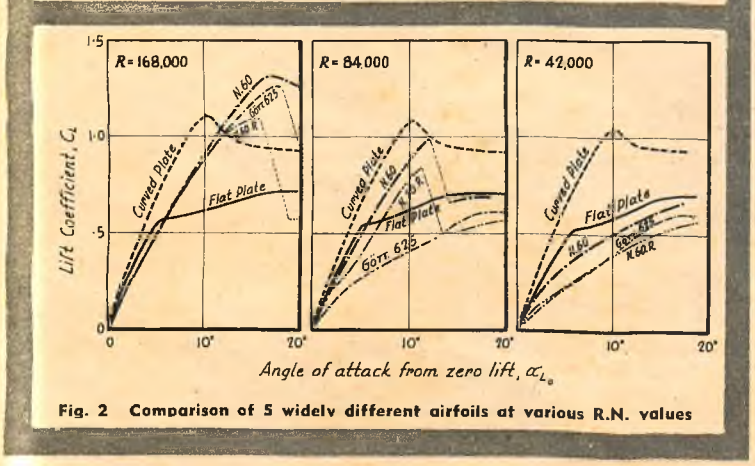


Fig. 2 Comparison of 5 widely different airfoils at various R.N. values

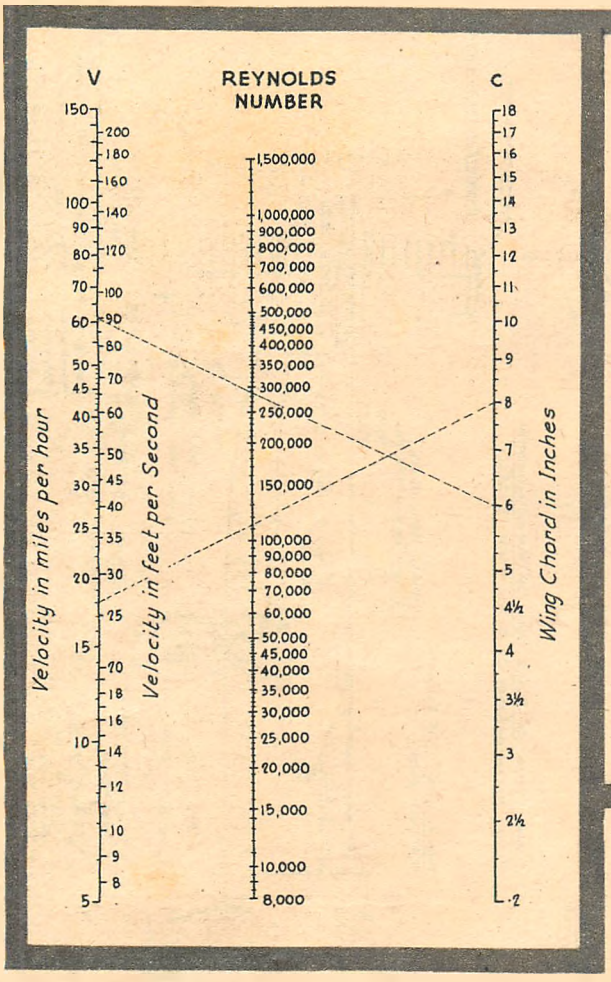
WHEN data from a model test is applied to a flight problem, the condition that should be satisfied is that the flows for the two cases be similar. The Reynolds Number . . . is ordinarily used as the criterion of similarity." This is a quotation from NACA Report No. 586 entitled "Airfoil Section Characteristics as affected by Variations of the Reynolds Number."

The report describes a series of tests carried out in NACA's variable density wind tunnel in which a number of different airfoils were tested at varying Reynolds Numbers. Although the report is intended to aid the aerodynamicist in interpreting the results of model tests as applied to full scale airplanes, it is also of considerable interest to the aeromodeler. It lists airfoil characteristics when R is as low as 40,000, and authoritatively demonstrates how profoundly R affects the characteristics of an airfoil in the lower ranges of the aerodynamic scale.

The NACA 23012, a very popular and really excellent section for real airplanes, is chosen to illustrate one instance of what happens when, as Report 586 might say, "the flows for two cases are *not* similar." This airfoil develops a Maximum Lift Coefficient of 1.6 at R 3 $\times$ 10^6; but when R is reduced to 42,400, the $C_{L\,max.}$ falls off to just over 0.09,—a reduction of almost half. At the same time, the $C_{Do\ min.}$ (minimum profile drag coefficient) is nearly quadrupled — from 0.008 to 0.022. In view of this, it is little wonder that an exact flying scale model can never equal the flight characteristics of its full scale counterpart.

It naturally follows that a model's airfoil is not necessarily well chosen because it works effectively on a Piper Cub or a highly efficient soaring glider. In fact it is quite evident from available low speed data that in the lower ranges of R which apply to model flight, the simple curved plate is a far better lift producer than any of the conventional airfoils used for real airplanes, and their scaled down replicas alike.

The Polar Diagram for assessing the merits of an airfoil may be something new to many readers. If so, they should lose no time in becoming familiar with this particular type of characteristic



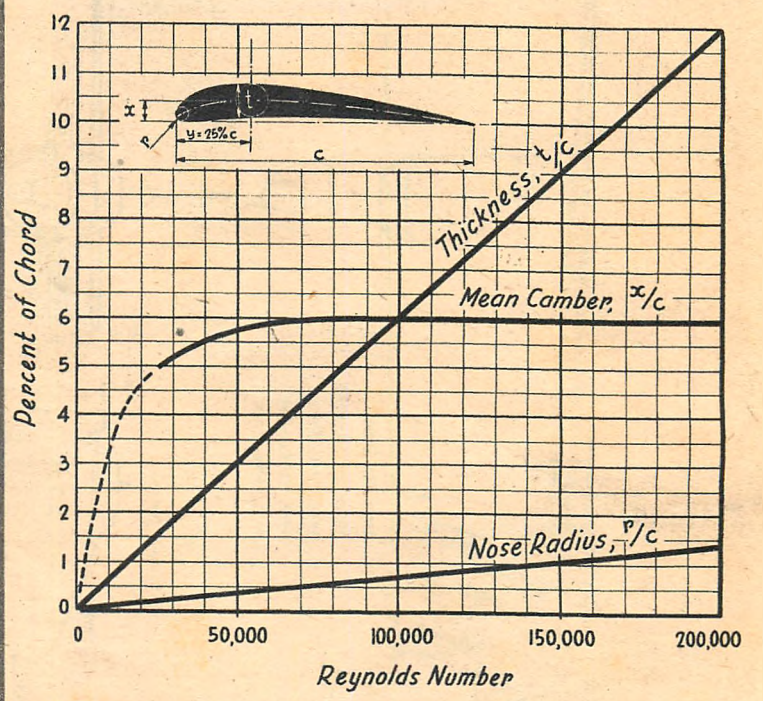


Fig. 3 (left) Nomogram for determining Reynolds Number. Fig. 4 (above) Figuring airfoil parameters.

curve—it tells the story at a glance. As opposed to the conventional form of chart in which the C_L is plotted against α (angle of attack), the polar plots the C_L against C_{Do} and the angle of attack is noted at various points along the curve. Fig. 1 shows the polars of the NACA 23012 and NACA 4409 at R 42,000—just about where the average Class A model flies.

Let us assume that the 4409 wing of a model is in a steady glide at 6° α; C_L is then 0.85, and C_{Do} is about 0.026. On the other hand, suppose the model had a 23012 wing; for the same lift as the 4409 produced, C_{Do} would now be increased 61.5% to 0.042. Not only that; the NACA 23012 is almost at stalling point, and even a small increase in the angle of attack would cause the model to "mush" or even stall completely.

So much for one excellent "full scale" section that is useless for model work. There are many others, some worse, some very much better; but this is definite, an airfoil for a model must be chosen because of its efficiency in the R range it is destined to fly in. What its characteristics are at R 3 × 10^6 or more is of no interest whatsoever to the aeromodeler.

Fig. 2 shows the affect of R on several sections (with definitely known Low Speed characteristics) which were chosen for purposes of illustration because of their wide variation of parameters. A comparison of their lift values demonstrates quite clearly, for example, that in the neighborhood of R 170,000—the range of many small Class C's and moderately fast control liners—the N-60 develops the best $C_{L\ max.}$ It is shown too that at α of from 2° to 4°, where the tethered ship may be flying at speed under high power, the ordinary curved plate develops more lift.

It is true that a comparatively smaller wing of curved plate section could support a speed model at that small angle of attack, but where the attitude of the ship is constantly changing, as in stunt flying, the Gött. 602, for example, is far better suited. Down in the Reynolds Number range of about 40,000 even the flat plate is better than the N-60, and the curved plate is best of all. This incidentally explains why the little single surfaced indoor rubber jobs have such amazing performances. The reason? *The leading edge of a curved plate section is sharp enough to promote a turbulent boundary layer even at these very low values of R.*

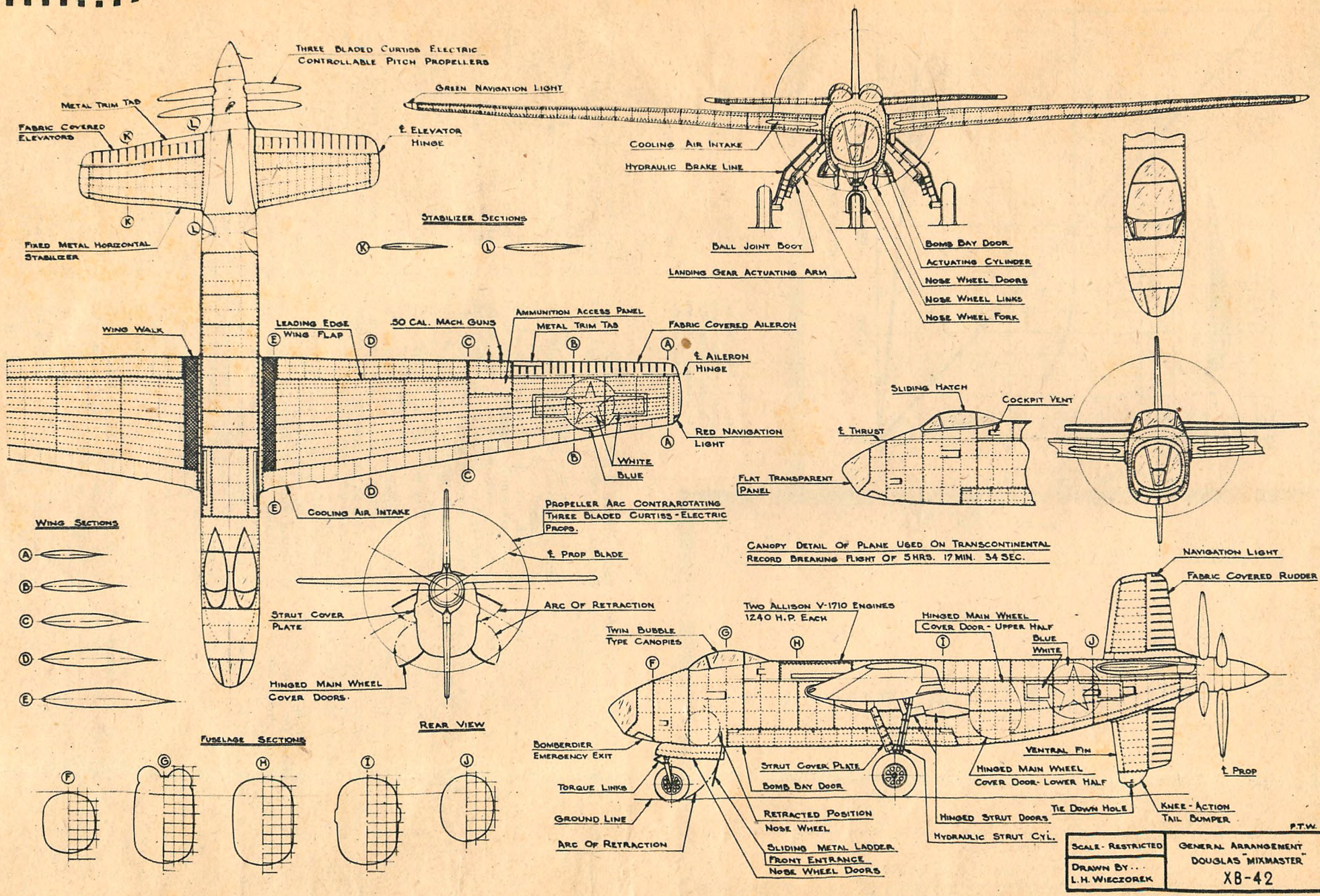
Unfortunately, we must compromise to some extent, especially when we get to U-control and free flight gas models of considerable weight. The curved plate simply would not stand up to the rigors of control line and outdoor free flight flying; therefore it becomes necessary to choose a section that is thick enough to accommodate appropriate spars. For a large Class C free flight job, where R approaches something like 200,000, the N-60 looks better than all other sections which have been *accurately* measured. It has relatively high $C_{L\ max.}$, low CDo, and is thick enough for good spar depth. Other considerations such as moment coefficients (a measure of the Center of Pressure travel) is also a factor to be considered in making a selection, but an adequate discussion of that subject would take up more space in this article than its importance would warrant. It is enough to say that the N-60, while not as good as the N-60 R for instance, as far as C.P. movement is concerned, is sufficiently better in all other respects to be a highly desirable section.

The reflexed trailing edge of an airfoil stabilizes the C.P. movement. At the higher values of R, the C.P. is almost stationary for normal flight attitudes. Unhappily, in the model range of the aerodynamic scale the same desirable stability of C.P. does not continue to hold good and, because a reflexed trailing edge causes C_L to drop off considerably, it would seem hardly worthwhile to consider it. In the interest of adequate longitudinal stability, it would not be safe to cut down the horizontal stabilizer area of a ship with a wing of reflexed profile. If, however, a turbulence wire is used, the "separation effect" is delayed long enough to make the reflexed trailing edge more effective. (See Fig. 8b.)

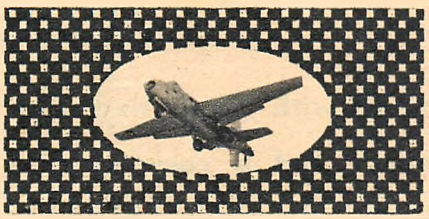
Professor F. W. Schmitz, a well known aerodynamicist, has carried out a long series of careful experiments dealing with the problems encountered at low Reynolds Numbers. In his book *Aerodynamik des Flügmodels*, he suggests a diagram similar to Fig. 3. Although he states that it should be regarded only as a "temporary guide," it will fit the bill quite nicely until further research develops something better.

It was Schmitz who established from his tests that the N-60, although only mediocre for full scale airplanes, is probably one of the best all-round airfoils at a Reynolds Number of about 200,000. At R 50,000 (approaching the region of the average rubber model) the curved plate was unquestionably the best. The N-60 is about 12% thick; that is, the ratio of thickness to chord, or t/c, is 12%. The modified curved plate measured by Schmitz was 3% c thick. These two points were spotted on the diagram at their respective values of R and by drawing a connecting line the t/c ratio for any value

(*Turn to page* 40)

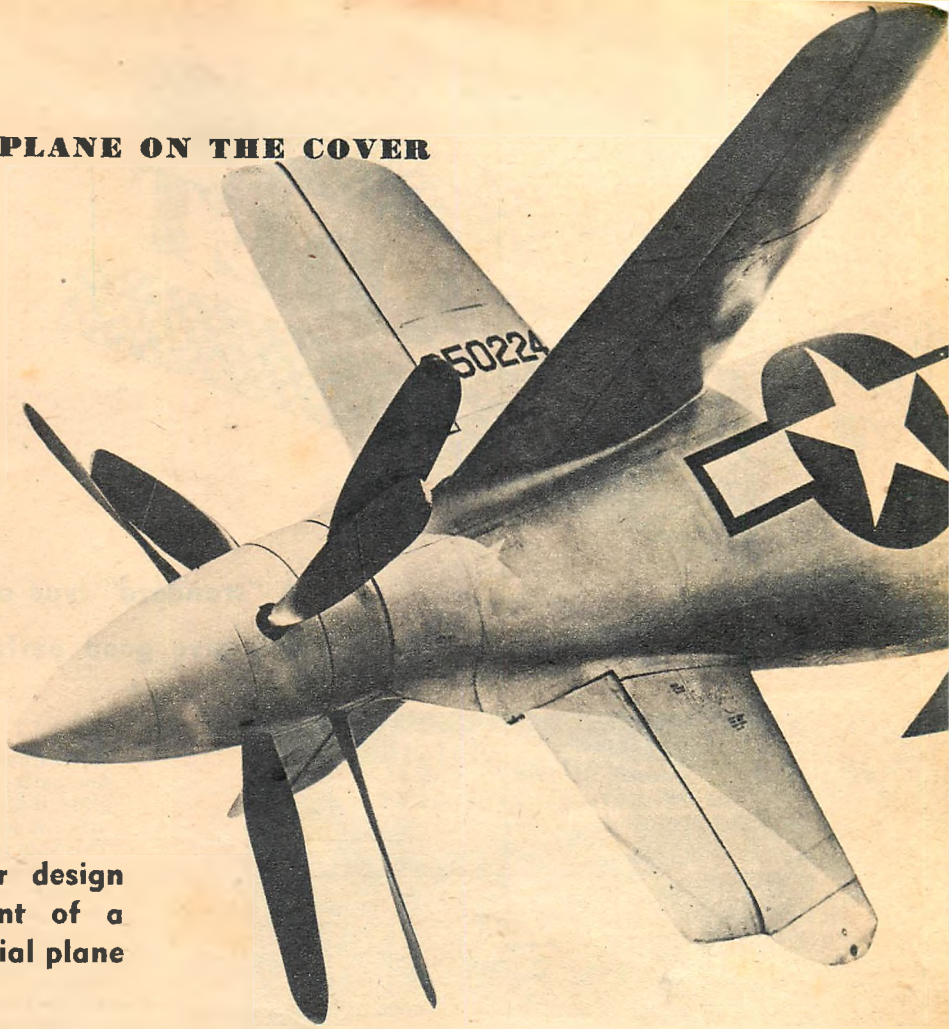

THREE BLADED CURTISS ELECTRIC CONTROLLABLE PITCH PROPELLERS
GREEN NAVIGATION LIGHT
METAL TRIM TAB
FABRIC COVERED ELEVATORS
℄ ELEVATOR HINGE
COOLING AIR INTAKE
HYDRAULIC BRAKE LINE
STABILIZER SECTIONS
FIXED METAL HORIZONTAL STABILIZER
BALL JOINT BOOT
LANDING GEAR ACTUATING ARM
BOMB BAY DOOR ACTUATING CYLINDER
NOSE WHEEL DOORS
NOSE WHEEL LINKS
NOSE WHEEL FORK
WING WALK
LEADING EDGE WING FLAP
.50 CAL. MACH. GUNS
AMMUNITION ACCESS PANEL
METAL TRIM TAB
FABRIC COVERED AILERON
℄ AILERON HINGE
RED NAVIGATION LIGHT
WHITE
BLUE
COOLING AIR INTAKE
SLIDING HATCH
COCKPIT VENT
℄ THRUST
FLAT TRANSPARENT PANEL
WING SECTIONS
PROPELLER ARC CONTRAROTATING THREE BLADED CURTISS-ELECTRIC PROPS.
℄ PROP BLADE
STRUT COVER PLATE
ARC OF RETRACTION
HINGED MAIN WHEEL COVER DOORS
REAR VIEW
CANOPY DETAIL OF PLANE USED ON TRANSCONTINENTAL RECORD BREAKING FLIGHT OF 5 HRS. 17 MIN. 34 SEC.
NAVIGATION LIGHT
FABRIC COVERED RUDDER
TWO ALLISON V-1710 ENGINES 1240 H.P. EACH
HINGED MAIN WHEEL COVER DOOR - UPPER HALF
BLUE
WHITE
TWIN BUBBLE TYPE CANOPIES
FUSELAGE SECTIONS
BOMBERDIER EMERGENCY EXIT
VENTRAL FIN
STRUT COVER PLATE
BOMB BAY DOOR
HINGED MAIN WHEEL COVER DOOR - LOWER HALF
℄ PROP
TORQUE LINKS
GROUND LINE
RETRACTED POSITION NOSE WHEEL
HINGED STRUT DOORS
TIE DOWN HOLE
KNEE-ACTION TAIL BUMPER
ARC OF RETRACTION
SLIDING METAL LADDER FRONT ENTRANCE NOSE WHEEL DOORS
HYDRAULIC STRUT CYL.
F.T.W.
SCALE - RESTRICTED
DRAWN BY... L.H. WIECZOREK
GENERAL ARRANGEMENT
DOUGLAS "MIXMASTER"
XB-42

DOUGLAS XB-42



by ROBERT McLARREN

PLANE ON THE COVER



A radical light bomber design that led to development of a highly efficient commercial plane

IN THESE peace times when most engineers are poring over captured German aeronautical data, and aviation fans are deluged with seeming evidence of German superiority in basic research and "years ahead" progress in aircraft design, we are prone to accept this intelligence without analysis and to unconsciously, yet completely, belittle the originality and advances of our own American aircraft industry. The astute engineer has admitted German superiority in many specialized fields of aeronautical research and development. But he has just as clearly recognized German inferiority to our own initiative in just as many other specialized fields.

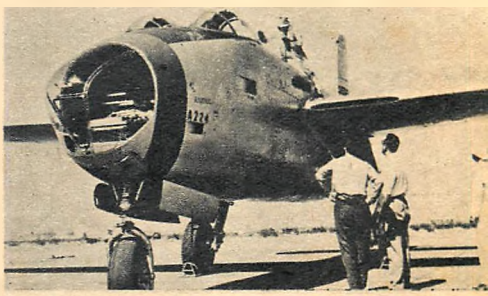
Certainly the Nazis either could not or did not produce a Boeing B-29 *Superfortress*, a Norden bombsight, counter-revolving propellers, a 22,000 lb. bomb, an electronically controlled remote turret or automobile-pilot, a 75 mm aircraft cannon, a 3,000 hp aircooled, radial engine, a reverse-thrust propeller, a 12 in. aircraft rocket, or a radar ground control approach system. Nor did they produce a design with engines located in the nose and pusher propellers mounted in the extreme tail. The country that did all this was the United States, and the man who did it was Donald W. Douglas, an American born in Brooklyn. He called it the *Mixmaster* and we call it our Plane on the Cover this month.

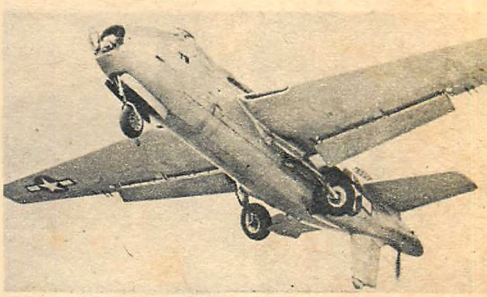
It is a design comprising a monoplane with the engines located in the forward portion of the fuselage, and counter-revolving propellers, driven by extension shafting, mounted in the extreme tail of the airplane behind the empennage. It was this arrangement that provided the solution to the principal problem of the pusher airplane: weight balance. Earlier attempts had unimaginatively placed the engine in the tail, thereby producing an awkwardly large moment arm that had to be balanced by locating the useful load in the extreme nose of the plane. Douglas engineers retained the merits of the tail propeller location and solved the balance problem by locating the engines—the largest and most concentrated weight item in an airplane—in the forward fuselage.

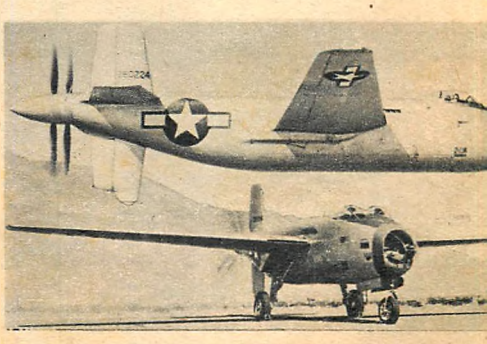
Why pusher? The argument is an old one but the tangible benefits, accruing from the removal of the propeller from the front of the fuselage together with its drag-producing turbulence, include a drag reduction of some 20% according to Douglas engineers. This produces a speed increase of approximately 44 mph which, in combat, would enable you to outrun the effective range of enemy aircraft .50 cal. machine gun fire in just 46½ seconds, obviously a useful increment merely through relocation of the propeller!

The *Mixmaster* idea dates back to 1908 and has been carried through endless evolutions over the intervening years. Its practical application had to wait on the satisfactory development of numerous auxiliary problems. For example, extension shafts have been a seemingly insoluble problem but the final answer was found in the Bell P-39 *Airacobra*. Despite fears expressed by many engineers during its introduction, the extension shaft of the *Airacobra*, and later the Bell P-63 *Kingcobra*, has not been subject to a single failure from torsional vibration, the bugaboo of such an installation. Douglas engineers examined these reports with eager interest, during the design stage of the XA-42, as the *Mixmaster* was originally designated. As the layout took shape

(Turn to page 83)



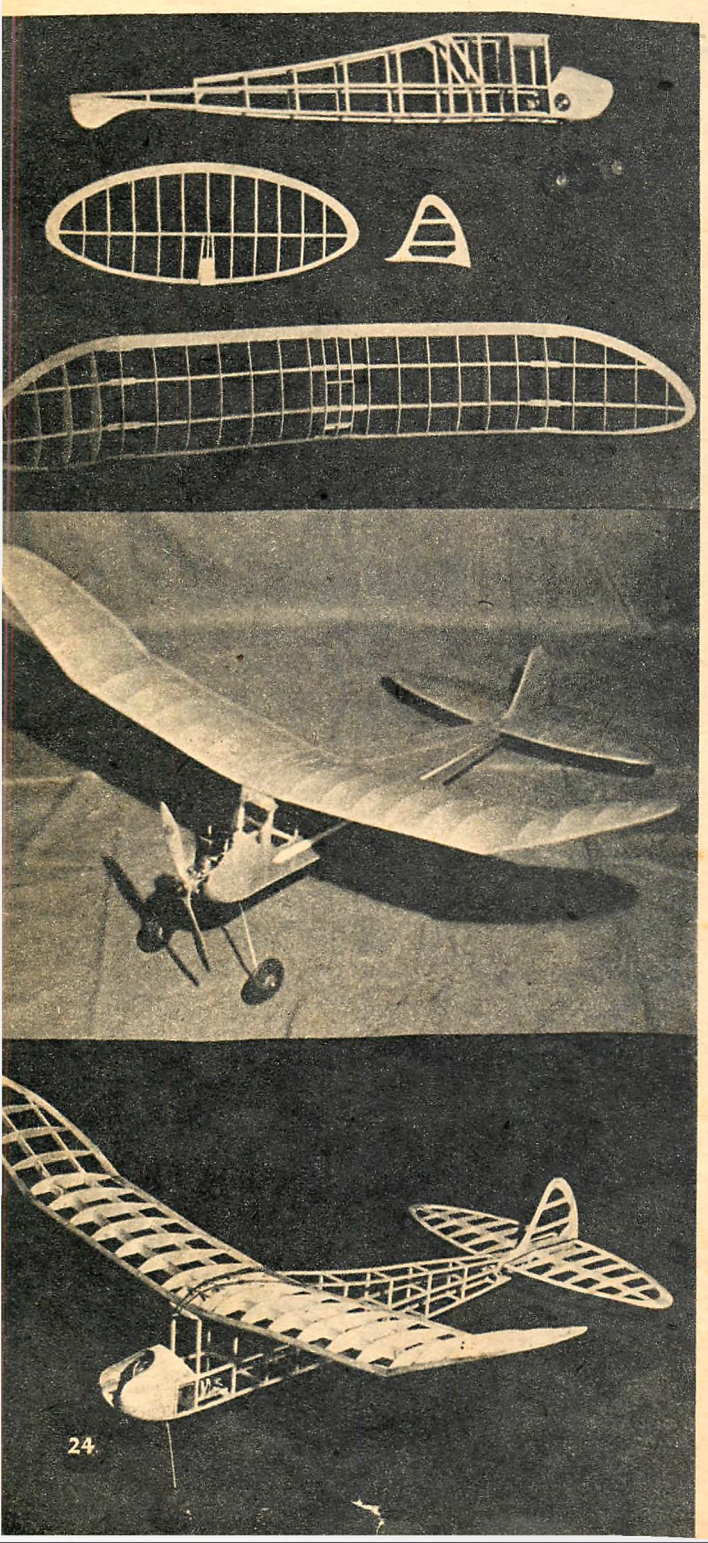




THE CADET

by SAL TAIBI

A "standard" type of model with simple lines that will give good performance and is easy to build



THE *Cadet* represents everything that is needed for fine performance, plus a fast zippy climb and slow flat glide; it is of standard square construction which should make it easy to build for both beginners and experts. This ship is the result of years of practical building and flying gas models. I think the average model builder will get much enjoyment in building and flying the *Cadet*, so let's get busy.

Before attempting construction, the plans should be scaled up to full size as this will give a better idea of what the *Cadet* looks like and may clear up any little doubts in construction.

FUSELAGE—The fuselage is built of 3/16" sq. hard balsa. Build the two sides at once, one atop the other; extend the center longeron out about 3" past the last fuselage brace at the nose, then trim it off even with the motor mounts when they are installed. After the sides dry remove them from the board and give them an extra coat of cement. To assemble the fuselage first cement the tail together and install the two plywood nose bulkheads, then install the fuselage spacers directly under the wing trailing edge. Let this set and when dry insert the rest of the fuselage spacers.

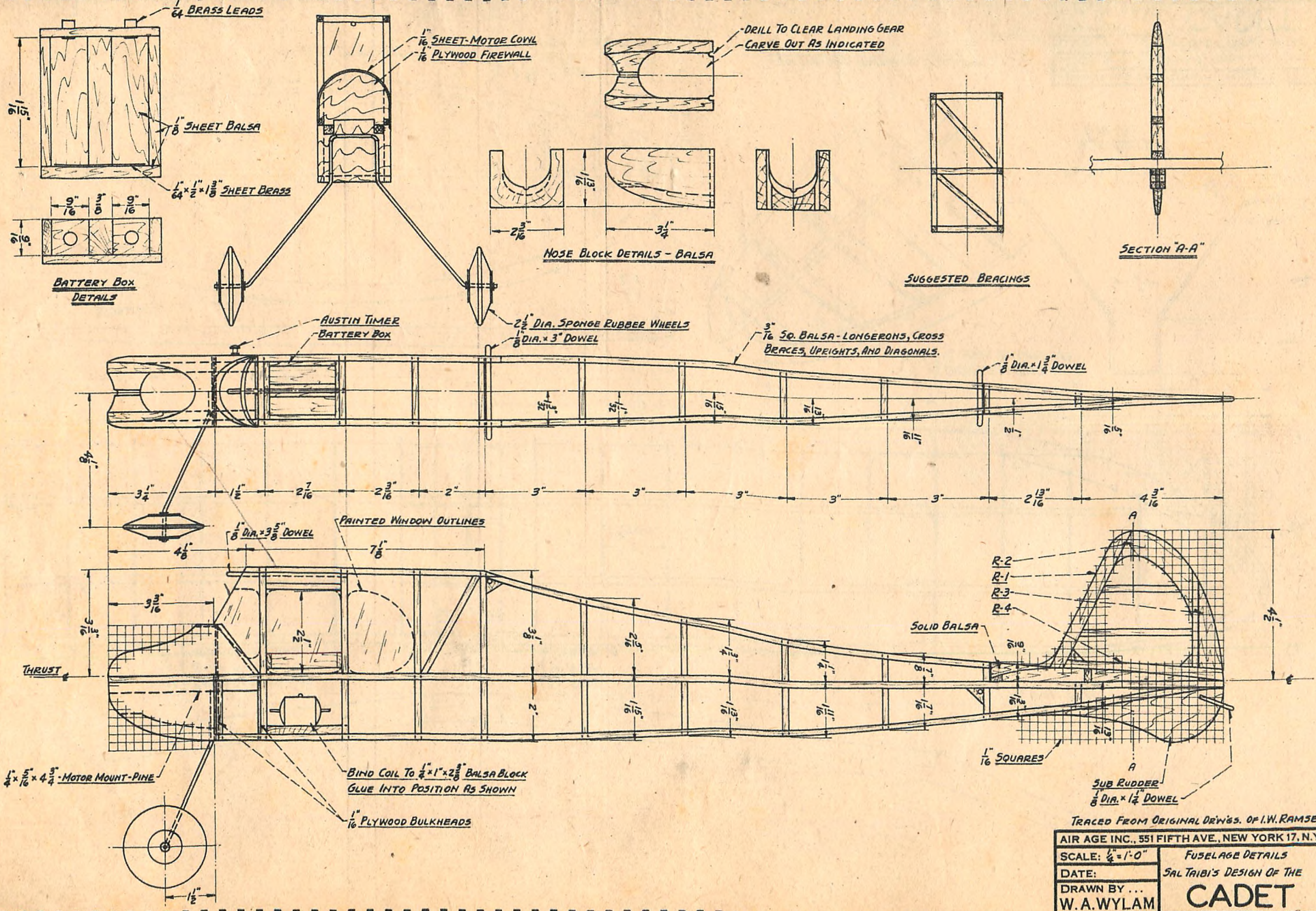
Build the battery box and cement in place flush with top of fuselage. The batteries were located at this position so they would be easily accessible and eliminate the worry when flying (will the batteries stay in the box or not?), the bottom of the wing acts as the cover for the battery box. Next cement the motor mounts in place and then the side nose blocks. Before the bottom nose block is installed set the motor in the mounts and drill the bolt holes. Insert bolts in the holes and tighten the bolt until the nut makes a slight impression on bottom of the mount. Cut out this impression until the nut is completely countersunk in bottom of motor mount; cement two or three times and remove the bolt; then you never need worry about holding the nuts in place when installing the motor.

Bend the landing gear to shape from pattern shown on plans and fasten to the firewall as shown; now cement the bottom block in place, then the two top bulkheads. The top cowling is not cemented in place until the ship is completely wired; cement a piece of 3/16" sheet in side of fuselage for the timer. The coil is wrapped to a piece of 1/4" sheet balsa and then cemented to bottom crossbraces. Location of the coil will be determined by the way the ship balances; if it is tail heavy move the coil forward; if nose heavy move it back. Cement the top cowling in place then the top celluloid fairing, and drill holes for dowels in fuselage.

Note that the wing leading edge dowel goes right through the center of the battery box; sheet gussets hold the wing trailing edge dowel and the stabilizer leading edge dowel in place. Cement the sub rudder in place. The fuselage is now ready for covering.

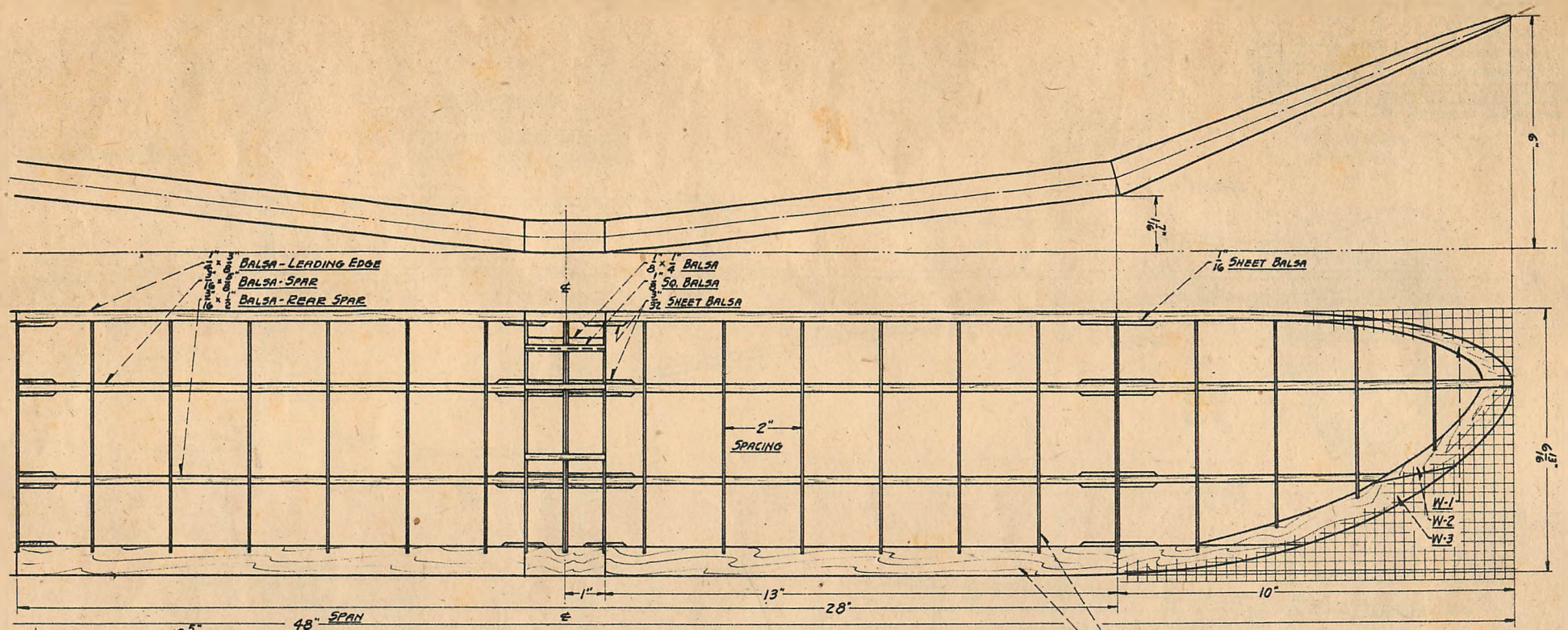
WING—Cut out the required number of main ribs and tip ribs and taper the spars as shown on plans. Pin the leading and trailing edges and tips in place, placing a rib at center section of wing and one rib at the polyhedral section. This will help line up the two main spars. Pin the spars in place, slip all the ribs in place,

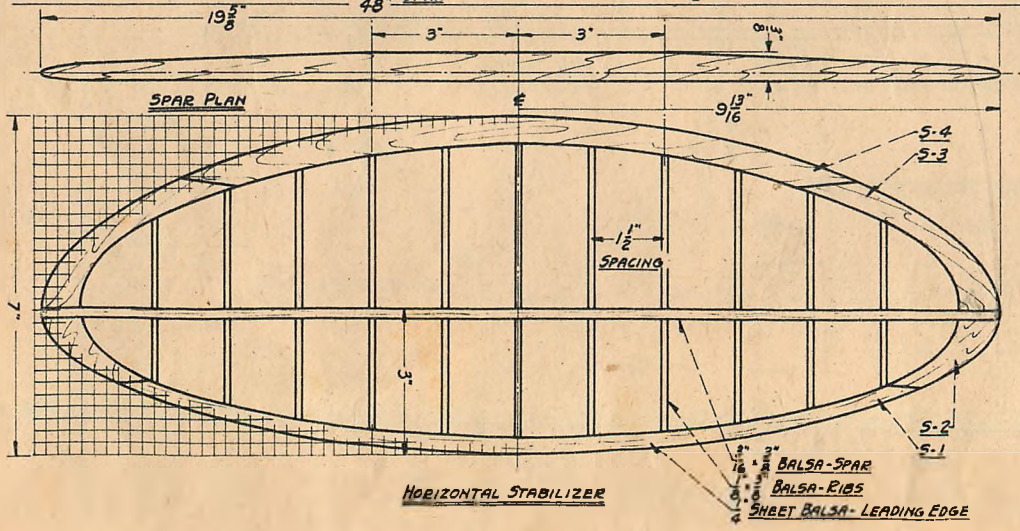
(Turn to page 43)



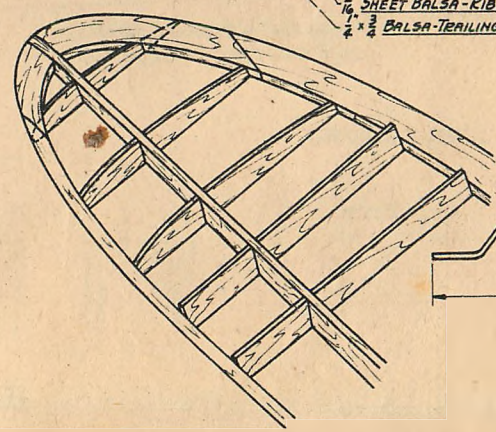
TRACED FROM ORIGINAL DRW'GS. OF I.W. RAMSEY

AIR AGE INC., 551 FIFTH AVE., NEW YORK 17, N.Y.	
SCALE: 1/4" = 1'-0"	FUSELAGE DETAILS
DATE:	SAL TAIBI'S DESIGN OF THE
DRAWN BY ... W. A. WYLAM	CADET

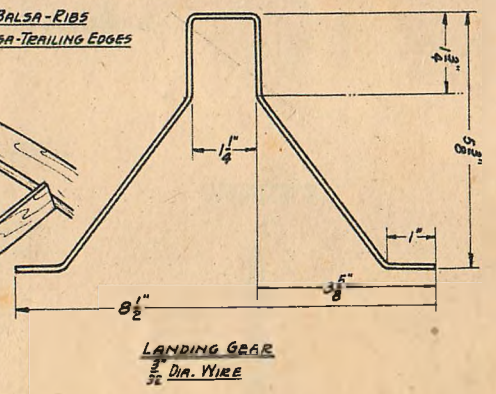




Horizontal Stabilizer

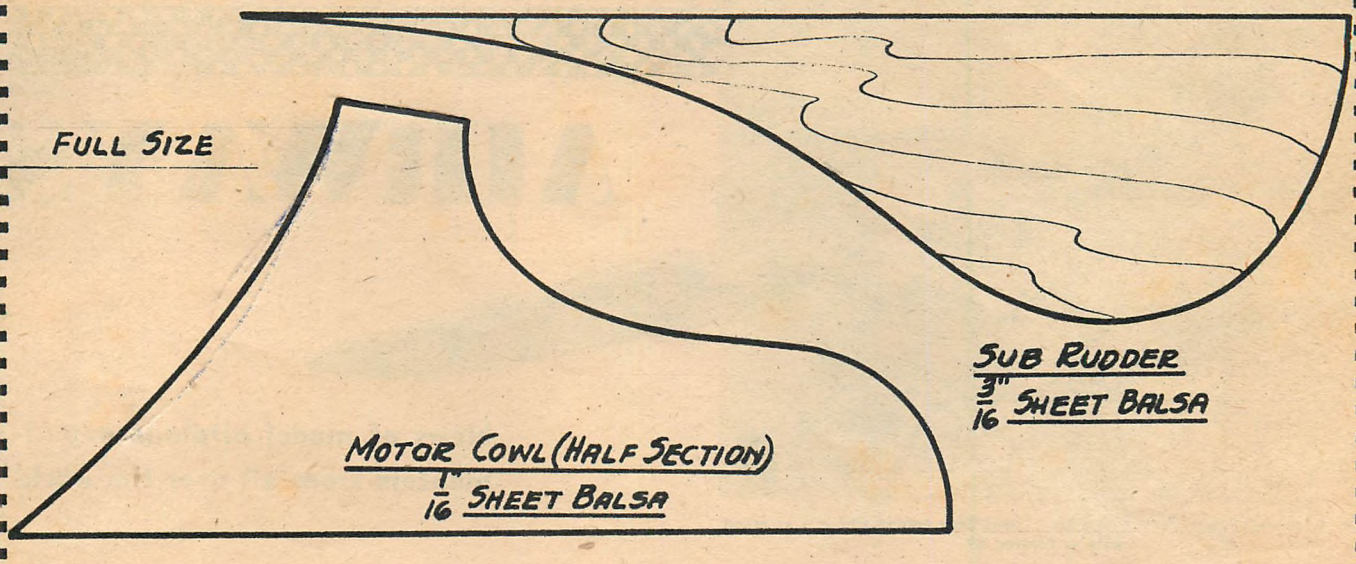


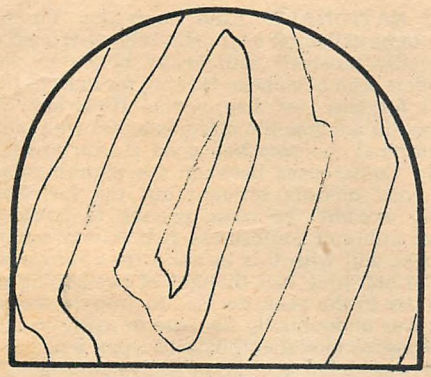
View Showing Horizontal Stabilizer

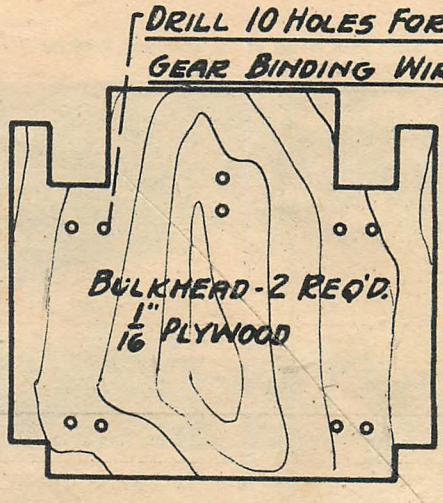


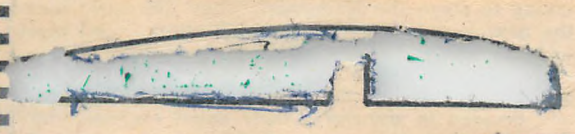
Landing Gear
3/32 Dia. Wire

AIR AGE INC., 551 FIFTH AVE., NEW YORK 17, N.Y.	
SCALE: 1/2 = 1'-0"	Wing & Stabilizer Details
DATE:	Sal Taibi's Design Of The
DRAWN BY W. A. WYLAM	CADET


FULL SIZE
SUB RUDDER
3/16 SHEET BALSA
MOTOR COWL (HALF SECTION)
1/16 SHEET BALSA

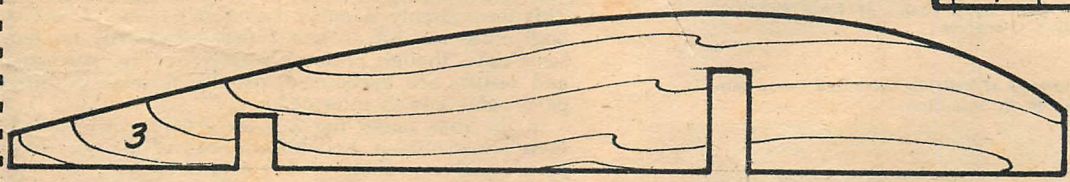

FORMER #2
1/8 SHEET BALSA


DRILL 10 HOLES FOR LANDING GEAR BINDING WIRES
BULKHEAD - 2 REQ'D.
1/16 PLYWOOD

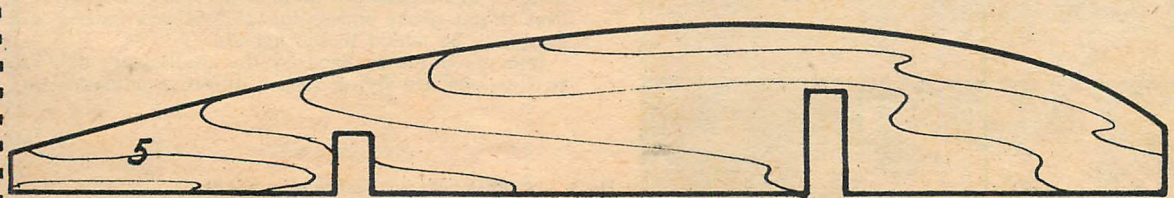



2


FORMER #1
1/8 SHEET BALSA


3


4
ALL RIBS
1/16 SHEET BALSA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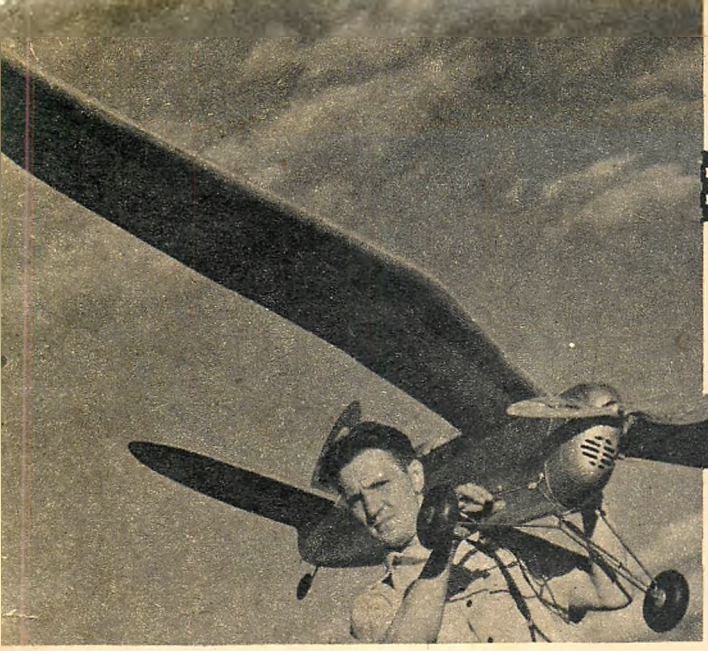
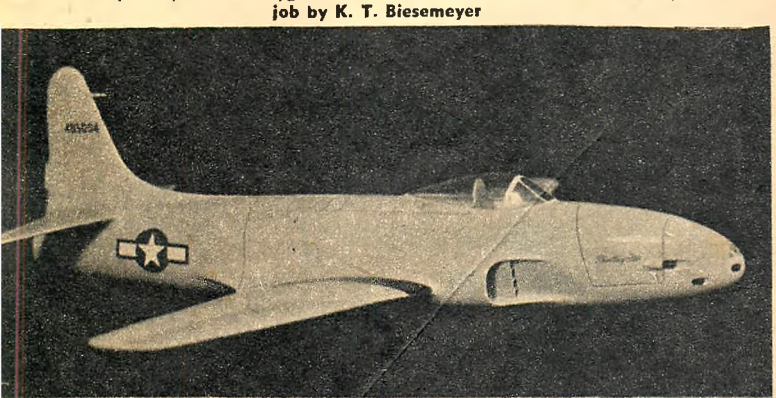
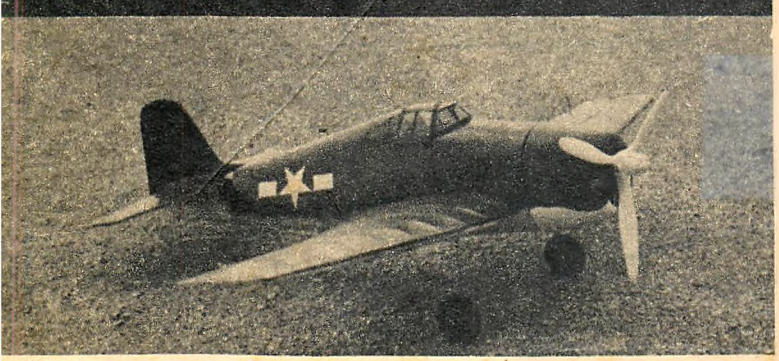


No. 1 (above) Roger Tessier lugs his 9' span *Star Falcon* which is powered with a *Forster* 99

No. 2 (below) Beautiful ½" scale solid model of the Lockheed P-80 jet job by K. T. Biesemeyer





No. 3 *Phantom*-powered *Hellcat* built by a friend of Ichio Egashiro; it is flown U-control

No. 4 Super-detailed ¾" scale *Spitfire* of built-up balsa and tissue construction by K. T. Hamilton

AIRWAYS

News of model airplane experimenters from all over the world

THE NATIONALS. First news that the Nationals were to be called off or indefinitely postponed was undoubtedly received with heavy hearts by the many modelers who have been looking forward to this flying event for the past five years. However, when we stopped to analyze the circumstances we realized that the original sponsors had good reason to call off the meet. Conferences between the planning committee and hotel officials brought out the fact that there simply wouldn't be room enough to house the expected influx of contestants, helpers and spectators in Chicago, and with this in mind the Chicago sponsors, who at one time had thought of postponing the meet until late in the year, decided to drop the idea entirely.

As was undoubtedly the case in many localities, the Los Angeles model enthusiasts, upon hearing that the meet was definitely off at Chicago, began feverish preparations to hold it in that area. Sponsors were contacted, fields located and great enthusiasm drummed up all in the space of a few days. However, for a variety of reasons this group also decided against trying to stage the Nationals. They did settle upon the next best thing, however, a Western Open Meet to [illegible] and decided to transform their usual regional Mid-States meet to top rank and stage the big event in their city. More details will be found on page 52 of this issue.

DECENTRALIZED MODEL MEETS. We recently received a letter from a model airplane club in England expressing a wish to hold what they call a "decentralized meet" with an American organization. This term simply denotes a contest by mail wherein both clubs run off an event (not necessarily on the same date, though preferably so if weather permits) and results are exchanged, usually through a third party who acts as intermediary.

In the case noted the English organization picked their opponents—a well-known club of midwest experts—and sent along a very simple set of rules. If we can get these widely separated flyers "together" on this contest we will present all the particulars at a later date.

We believe this sort of contest is greatly to be encouraged, as it is the forerunner of the widely known and highly successful Wakefields and similar events which, let us hope, can be revived in the near future.

Pending wider distribution of engines, the English flyers wrote that they feel qualified to compete only in the rubber category at present. Later on, if these first efforts prove successful, gliders and gassies will doubtless be added to the agenda.

It is of course realized by the challengers that the two groups are flying under different climatic con-

No. 5 L. C. Riley built this *Seabee* from M.A.N. plans. It is powered with an *Ohlsson* engine

ditions. Other variations, such as quality of rubber used, will also affect the outcome. However, the main thing is to get the ball rolling and we confidently expect the challenged American club to enter into the spirit of this international competition.

As noted, we will report results later. Meanwhile, if model clubs in this country, England, or any other spot wish to try this idea, we offer our services as intermediaries.

AIRWAYS PHOTOS. It was only a few months ago (March, 1946, p. 28) that we detailed some of our troubles in connection with photos for "Airways." However, several new angles to this subject have cropped up and this is as good a time as any to discuss them.

First let us say that we have a huge pile of photos on hand. Even before we offered a free subscription last fall for each shot used, we were receiving lots of prints and the offer practically doubled the intake. Because we have so many good pictures available, we have become very "choosy" in our final selection so that only the best and most interesting models are illustrated.

Due to the large volume of letters handled we are unable to return prints, so *please* fellows, if you have a prized shot of some model that cannot be replaced, don't send it in and expect to get it back. Also along this same line, do not send in negatives—we cannot use them and if they are lost you will be unable to make any more pictures for your own use.

Except in rare cases, we do not use photos of models made from commercial kits—not that we have the slightest objection to "kit building," far from it! However, we feel that "Airways" is of interest mainly because modelers can view therein the results of original thinking by other builders and plenty of beautifully built kit models can be seen in the ad section.

Scale models—whether rubber, gas or solid—are not, strictly speaking, original designs. However, their successful adaptation from full size down to model size is where original thinking and design show up, and for this reason scale models are very welcome.

Since we have been giving a subscription to builders whose models appear in "Airways" we try not to use more than one picture per builder in order that the greatest number may benefit from this offer. Some have sent us as many as a dozen high class photos and probably wonder a bit when only one is used.

Many readers have complained that we favor control line models. The reason for this is probably that we receive more control liners than any other class, and oddly enough, pictures of this type seem in general to be better photographically speaking.

The rules for "Airways" photos can be summed up about as follows:

1. The picture must be clear and sharp with good lighting and background. Prints must be glossy and may be of any size, from snapshots up to 8" x 10".

2. The model depicted should be of original design or should have some unusual "angle" that makes it of real interest to other modelers.

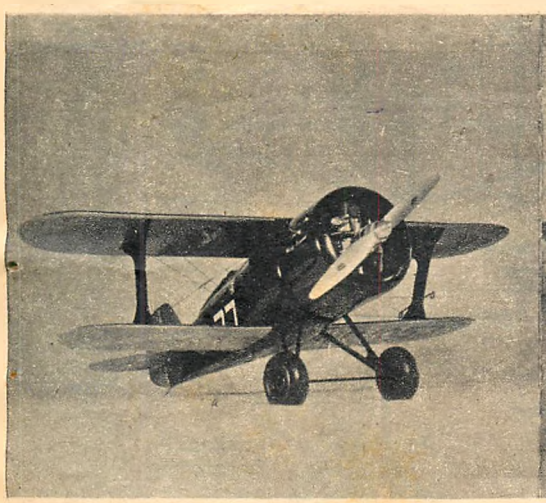
3. We cannot return photos, either used or unused, and cannot use negatives.

4. Only one picture from each contributor can be used (or as we hear so often these days, "only one to a custom-

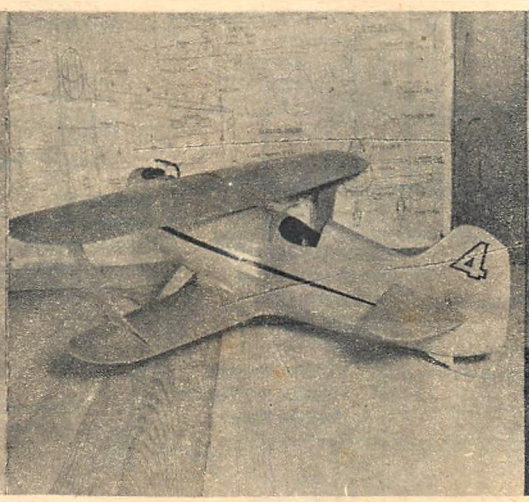
(*Turn to page* 52)

No. 11 (above) Joyce Hoffman with one of her models, an ex-kit job with many improvements

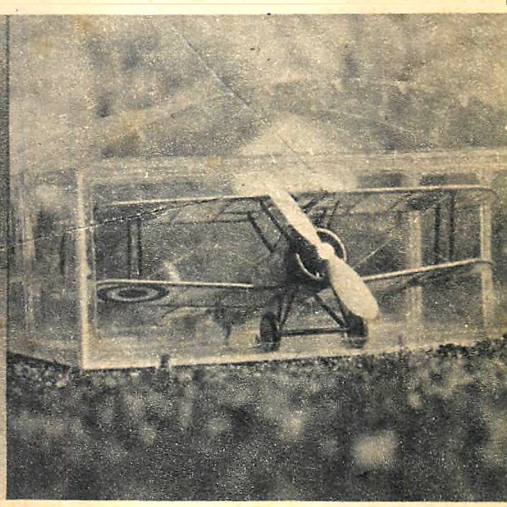
No. 12 (top) This glider, held by its proud designer Robert Campbell, flew out of sight



No. 8 R. E. Schumacher put a lot of special features in this control line Laird racer



No. 9 This fine model of the ever popular Knight Twister by Bob Dishong is an excellent flier

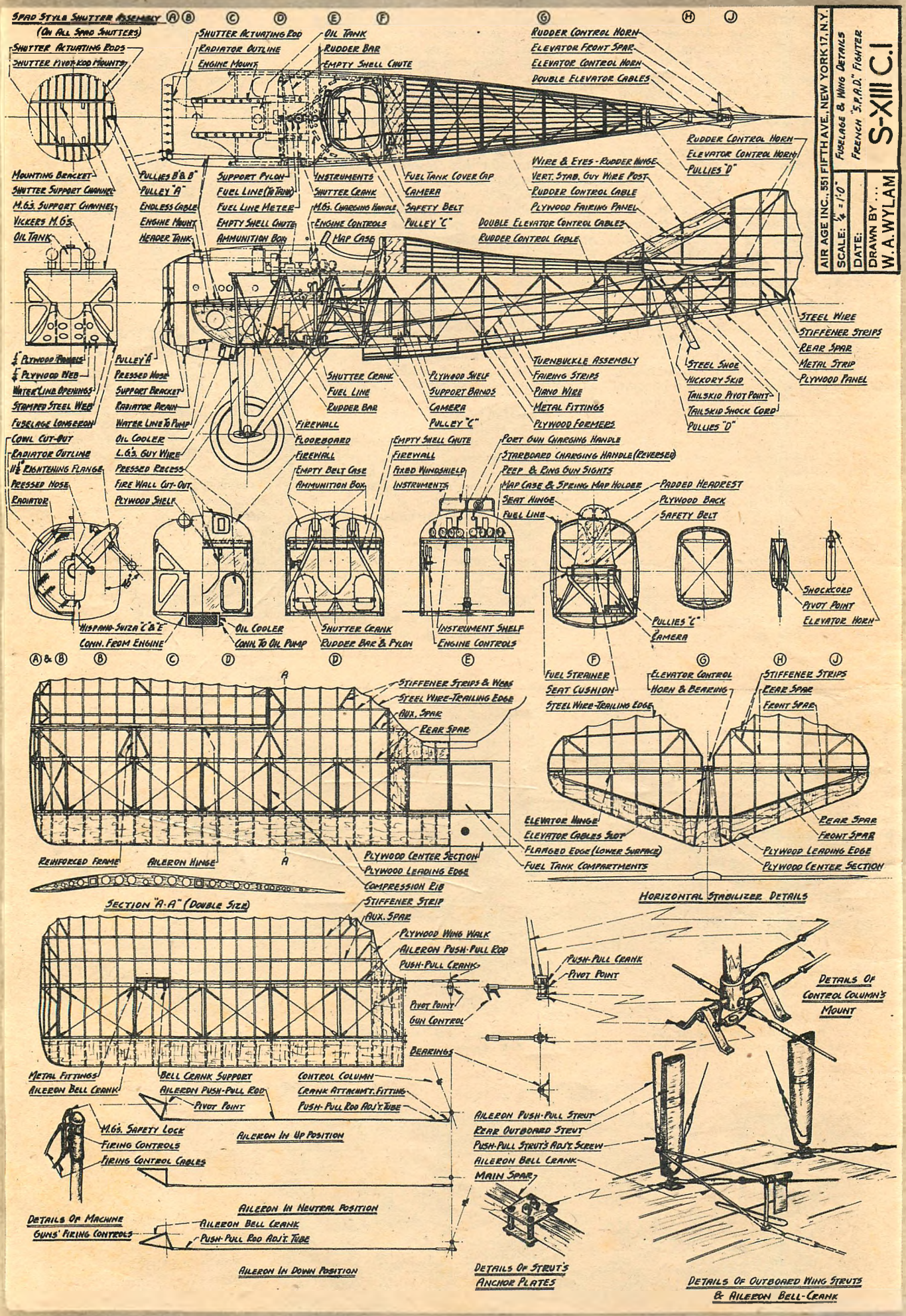


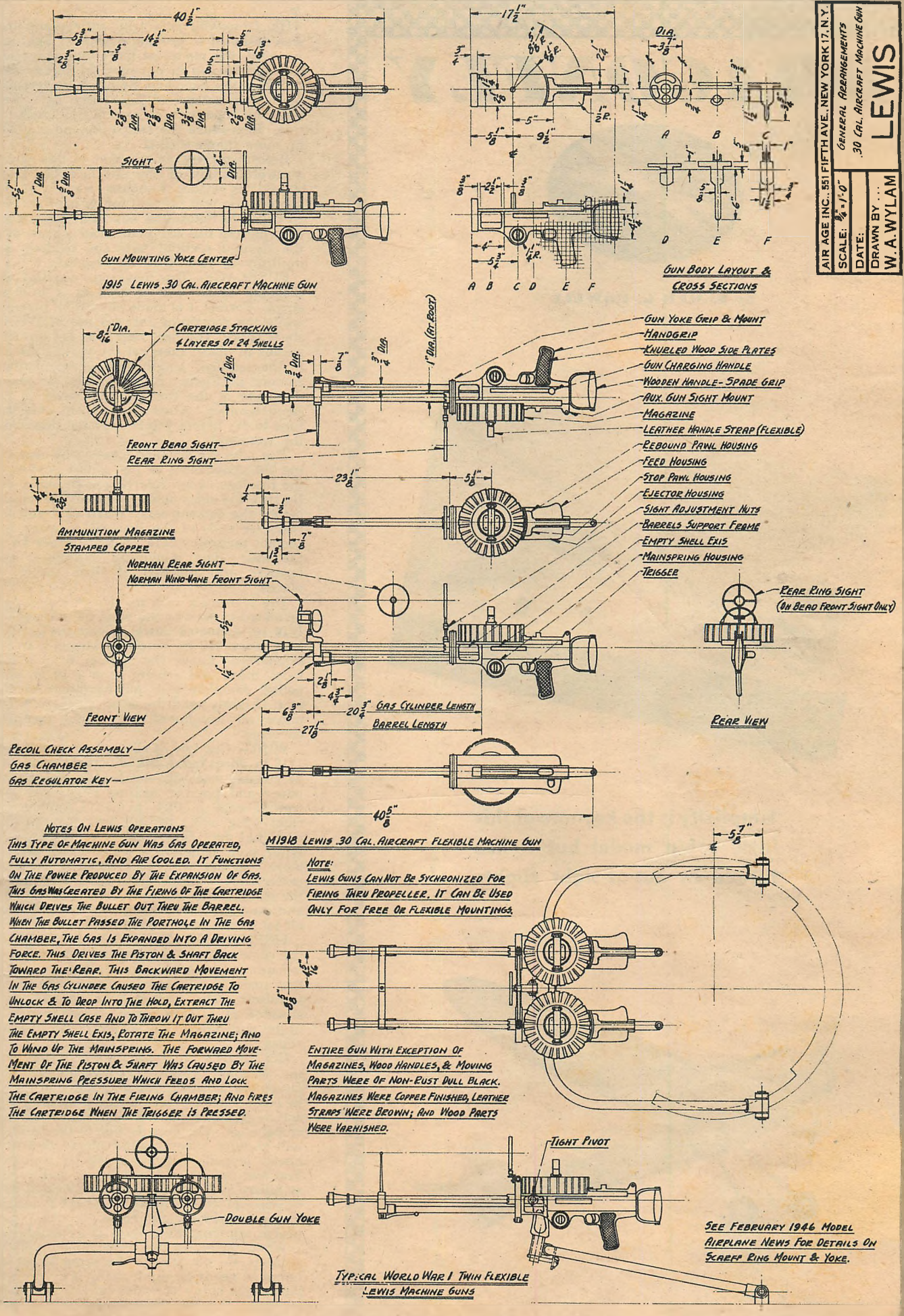
No. 10 R. L. Bryant houses his flying *Camel* model in a plastic hanger when not in use

No. 6 Big and little by Sgt. Ralph Kiefert. The big gull-wing job is nylon-covered and is powered by a *Rocket*

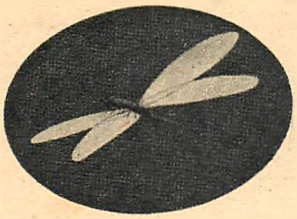
No. 7 An unusual Italian diesel-powered model sent in by A. Castellani. Note motor location

This completes the three pages of Wylam Masterplans on the Spad 13-C1 (Other two pages appeared in July issue)

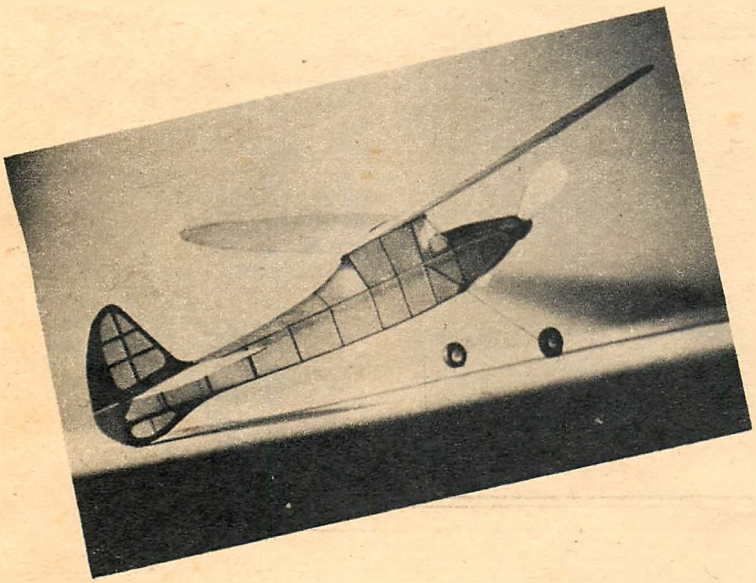



AIR AGE INC., 551 FIFTH AVE., NEW YORK 17, N.Y.
SCALE: 3/4"-1'-0"
DATE:
DRAWN BY ... W. A. WYLAM
GENERAL ARRANGEMENTS
.30 CAL. AIRCRAFT MACHINE GUN
LEWIS
1915 LEWIS .30 CAL. AIRCRAFT MACHINE GUN
GUN MOUNTING YOKE CENTER
SIGHT
GUN BODY LAYOUT & CROSS SECTIONS
CARTRIDGE STACKING 4 LAYERS OF 24 SHELLS
GUN YOKE GRIP & MOUNT
HANDGRIP
KNURLED WOOD SIDE PLATES
GUN CHARGING HANDLE
WOODEN HANDLE - SPADE GRIP
AUX. GUN SIGHT MOUNT
MAGAZINE
LEATHER HANDLE STRAP (FLEXIBLE)
REBOUND PAWL HOUSING
FEED HOUSING
STOP PAWL HOUSING
EJECTOR HOUSING
SIGHT ADJUSTMENT NUTS
BARRELS SUPPORT FRAME
EMPTY SHELL EXIS
MAINSPRING HOUSING
TRIGGER
FRONT BEAD SIGHT
REAR RING SIGHT
AMMUNITION MAGAZINE STAMPED COPPER
NORMAN REAR SIGHT
NORMAN WIND-VANE FRONT SIGHT
REAR RING SIGHT (ON BEAD FRONT SIGHT ONLY)
FRONT VIEW
REAR VIEW
RECOIL CHECK ASSEMBLY
GAS CHAMBER
GAS REGULATOR KEY
GAS CYLINDER LENGTH
BARREL LENGTH
M1918 LEWIS .30 CAL. AIRCRAFT FLEXIBLE MACHINE GUN
NOTES ON LEWIS OPERATIONS
THIS TYPE OF MACHINE GUN WAS GAS OPERATED, FULLY AUTOMATIC, AND AIR COOLED. IT FUNCTIONS ON THE POWER PRODUCED BY THE EXPANSION OF GAS. THIS GAS WAS CREATED BY THE FIRING OF THE CARTRIDGE WHICH DRIVES THE BULLET OUT THRU THE BARREL. WHEN THE BULLET PASSED THE PORTHOLE IN THE GAS CHAMBER, THE GAS IS EXPANDED INTO A DRIVING FORCE. THIS DRIVES THE PISTON & SHAFT BACK TOWARD THE REAR. THIS BACKWARD MOVEMENT IN THE GAS CYLINDER CAUSED THE CARTRIDGE TO UNLOCK & TO DROP INTO THE HOLD, EXTRACT THE EMPTY SHELL CASE AND TO THROW IT OUT THRU THE EMPTY SHELL EXIS, ROTATE THE MAGAZINE; AND TO WIND UP THE MAINSPRING. THE FORWARD MOVEMENT OF THE PISTON & SHAFT WAS CAUSED BY THE MAINSPRING PRESSURE WHICH FEEDS AND LOCK THE CARTRIDGE IN THE FIRING CHAMBER; AND FIRES THE CARTRIDGE WHEN THE TRIGGER IS PRESSED.
NOTE:
LEWIS GUNS CAN NOT BE SYCHRONIZED FOR FIRING THRU PROPELLER. IT CAN BE USED ONLY FOR FREE OR FLEXIBLE MOUNTINGS.
ENTIRE GUN WITH EXCEPTION OF MAGAZINES, WOOD HANDLES, & MOVING PARTS WERE OF NON-RUST DULL BLACK. MAGAZINES WERE COPPER FINISHED, LEATHER STRAPS WERE BROWN; AND WOOD PARTS WERE VARNISHED.
DOUBLE GUN YOKE
TIGHT PIVOT
TYP: CAL WORLD WAR I TWIN FLEXIBLE LEWIS MACHINE GUNS
SEE FEBRUARY 1946 MODEL AIRPLANE NEWS FOR DETAILS ON SCARFF RING MOUNT & YOKE.

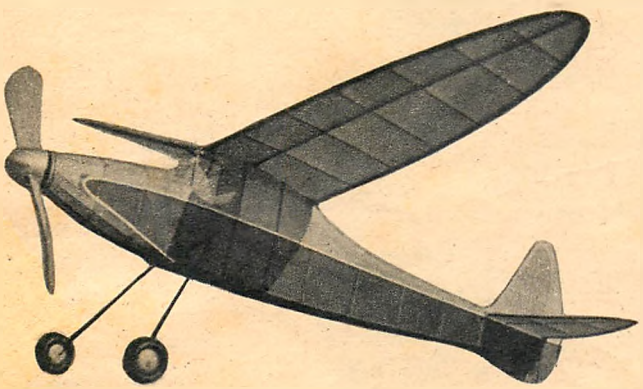
DRAGONFLY



by ELMER G. POWELL



Simplicity is the keynote of this little cabin model but it has turned in out-of-sight flights



THE *Dragonfly* is a trim little plane that was designed to provide everyday flight enjoyment; the model on more than one occasion has turned in out-of-sight flights. Because of the excellent flying characteristics, more than a score of this design have been built by members of our model organization. Reproduce the *Dragonfly* and you will be more than satisfied.

Before starting construction of this model, a careful study of the one-half size plans should be made; knowing what you are about to do will prevent faulty construction. In order to determine any dimension when drawing the full size plan, place a scale over the desired section; note the reading and multiply by two. Now let's begin.

FUSELAGE—The longerons, vertical and diagonal braces are of 3/32 in. x 3/32 in. strips. Former 1 is made of 1/16 in. plywood while the remaining formers are of 1/16 in. sheet balsa. The first step is to pin the longerons in place; then cut the vertical braces to the required length and cement in their correct positions. Another side, an exact duplicate of the first, is then made in the same manner. Allow the cement sufficient time to dry before you remove the sides from the worktable.

The sides are fastened together by cementing the crosspieces at the widest portion of the fuselage, when referring to the top view. Be sure the sides and crosspieces are square before the cement sets. When dry, join the two rear ends of the fuselage together and cement securely. Now cement former 1A at the nose. The remaining crosspieces and formers are attached at their respective places.

The 1/16 in. x 1/16 in. stringers may now be added as well as the wing mount and the 1/16 in. diameter dowel. Bend the landing gear from .040 in. wire and attach it to the crossbrace. Carve the spinner from a soft balsa block and cement it to a 10 in. propeller; complete this unit as shown on the plan. Lightly sand the entire fuselage to remove all roughness that might mar the covering.

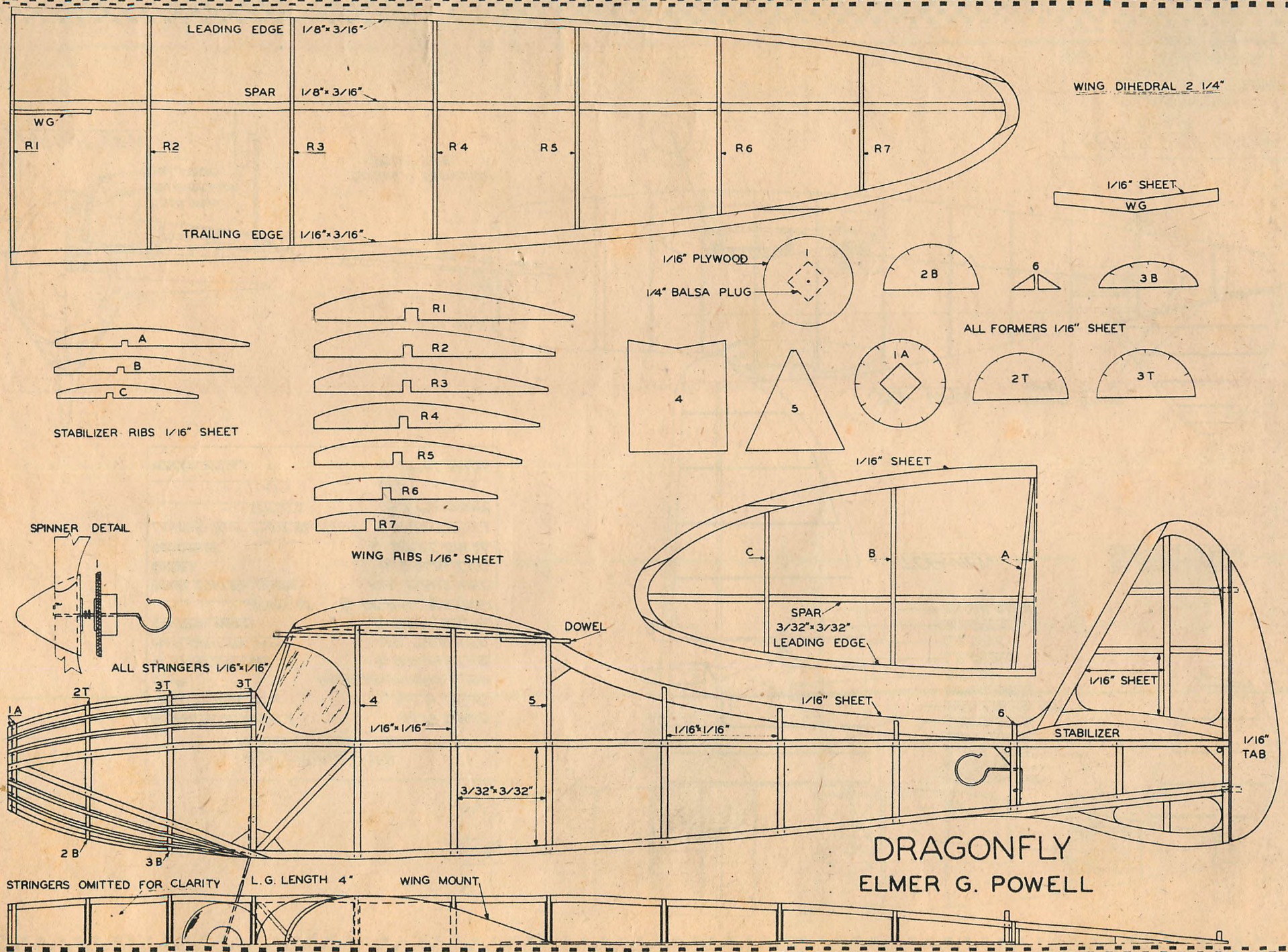
WING—Cut two of each rib section out of 1/16 in. sheet balsa; the wingtips should also be cut out now. Cover the plan with waxed paper and pin the leading edge, spar and trailing edge in their places. Complete the right wing panel by inserting the tips and ribs. Let dry. Now make a left wing panel. After both panels are constructed, cement them together with a dihedral of 2-1/4 in. under each wingtip; add gusset WG. Taper the leading edge as well as the trailing edge and sand the entire wing unit smooth. Give all joints a second coat of cement.

EMPENNAGE—The stabilizer is made in the same manner as the wing except that it is built in one piece. To do this you must first make a full size drawing of the entire stabilizer. The rudder and fin are constructed of 1/16 in. sheet. Sandpaper both units and taper the leading and trailing edges.

COVERING—Red and blue Silkspan was the original color arrangement on the *Dragonfly;* however you may use your favorite color scheme. Have the grain of the paper run lengthwise on the fuselage, wing and empennage. The nose section of the fuselage will require several small pieces of tissue, neatly lapped, to avoid unsightly wrinkles. Top and bottom of the wing, as well as the stabilizer and rudder, should be covered with separate pieces of tissue. To fasten the paper to the framework, use clear dope as an adhesive, applying it evenly with a small brush.

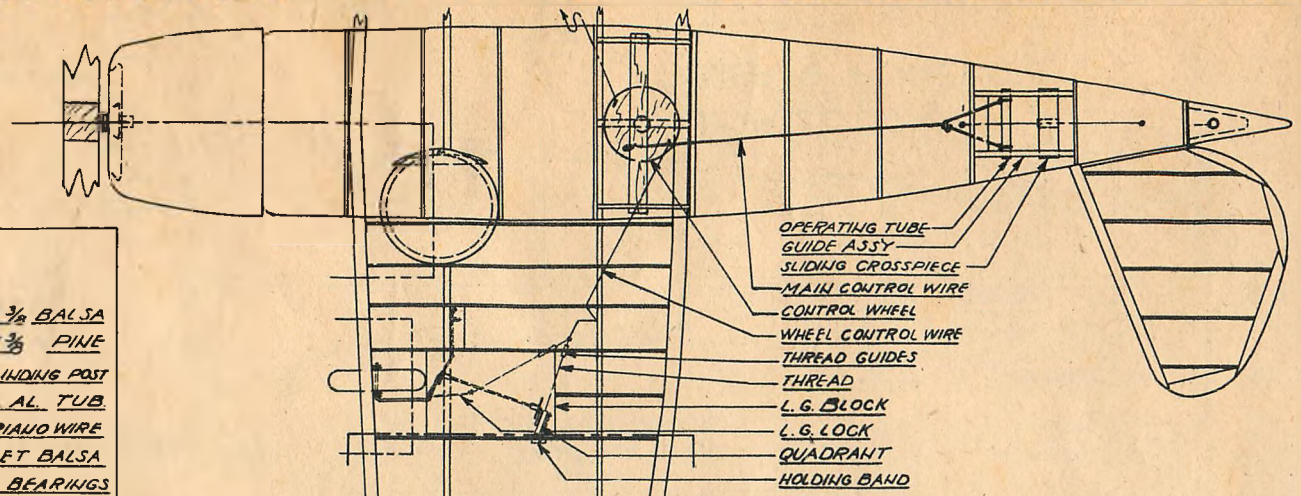
When fastening the tissue to the various sections, do not stretch the paper in an attempt to get it on tight; apply it evenly and let a light spray of water do the tightening for you. Fix the flying surfaces in a level

(Turn to page 93)


LEADING EDGE 1/8"×3/16"
SPAR 1/8"×3/16"
TRAILING EDGE 1/16"×3/16"
WG
R1
R2
R3
R4
R5
R6
R7
WING DIHEDRAL 2 1/4"
1/16" SHEET
WG
1/16" PLYWOOD
1/4" BALSA PLUG
1
2B
6
3B
ALL FORMERS 1/16" SHEET
A
B
C
STABILIZER RIBS 1/16" SHEET
R1
R2
R3
R4
R5
R6
R7
WING RIBS 1/16" SHEET
4
5
1A
2T
3T
1/16" SHEET
C
B
A
SPAR
3/32"×3/32"
LEADING EDGE
SPINNER DETAIL
1
DOWEL
ALL STRINGERS 1/16"×1/16"
1A
2T
3T
3T
4
5
1/16"×1/16"
1/16"×1/16"
1/16" SHEET
6
STABILIZER
1/16" SHEET
1/16"
TAB
3/32"×3/32"
2B
3B
STRINGERS OMITTED FOR CLARITY
L.G. LENGTH 4"
WING MOUNT
DRAGONFLY
ELMER G. POWELL

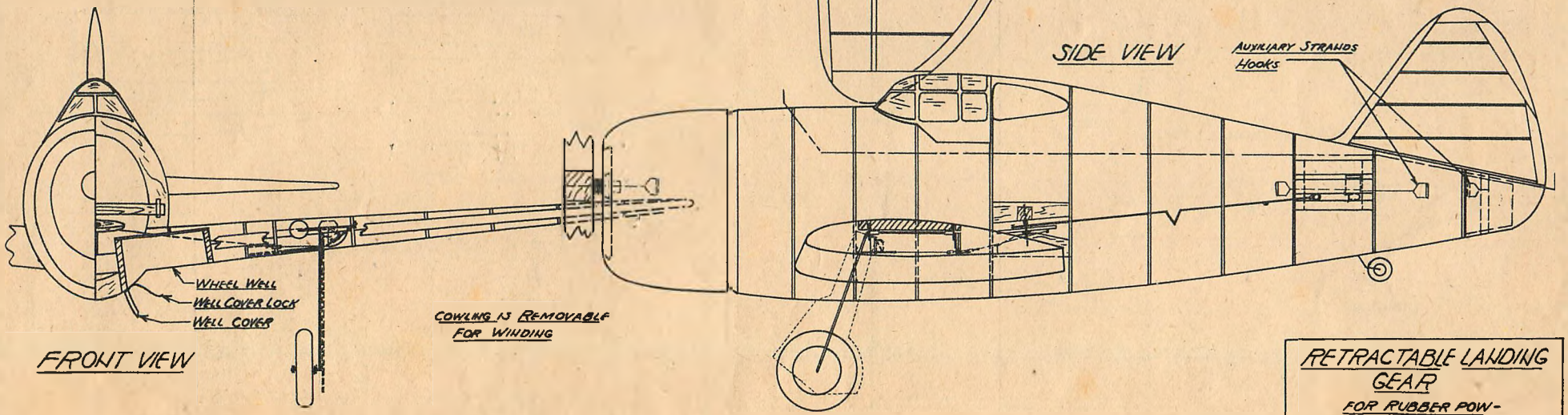
MATERIALS USED
TO INSTALL LANDING GEAR

CROSSPIECE GUIDES	1/8 X 3/8 BALSA
CROSSPIECE	1/8 X 3/8 PINE
CLIP	RADIO SPRING BINDING POST
OPERATING TUBE	3/16 O.D. AL. TUB.
MAIN CONTROL WIRE	.020 PIANO WIRE
CONTROL WHEEL	1/8 SHEET BALSA
" " BEARINGS	5/16 DIA. BALL BEARINGS
WHEEL CONTROL WIRES	.014 PIANO WIRE
GUIDES	1/16 O.D. AL. TUB.
QUADRANT	1/16 SHEET BALSA
LANDING GEAR PIVOT BEARINGS	FLANGED BUSHINGS
" " STRUTS	.049 PIANO WIRE
" " LOCKS	.020 " "
WHEEL WELLS	1/8 SHEET BALSA



TOP VIEW

TAIL BLOCK IS NOT CEMENTED IN PLACE



SIDE VIEW

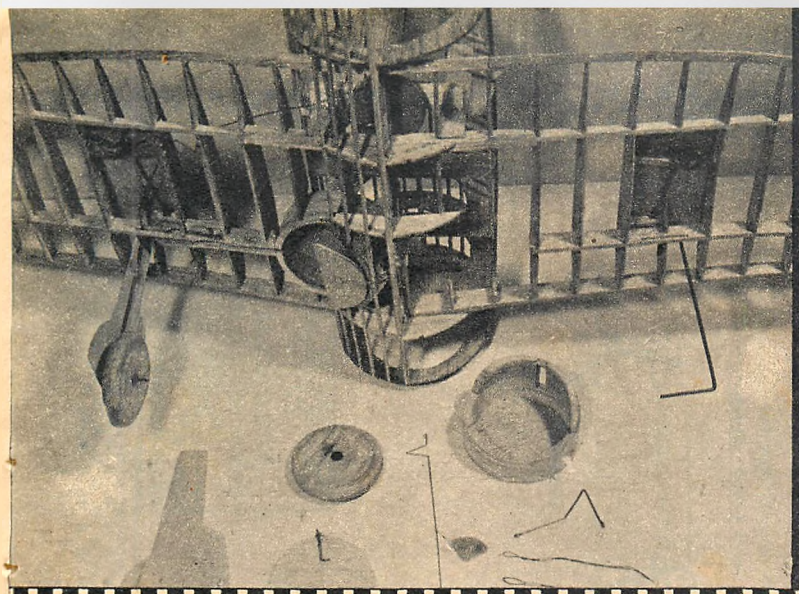
FRONT VIEW

COWLING IS REMOVABLE FOR WINDING

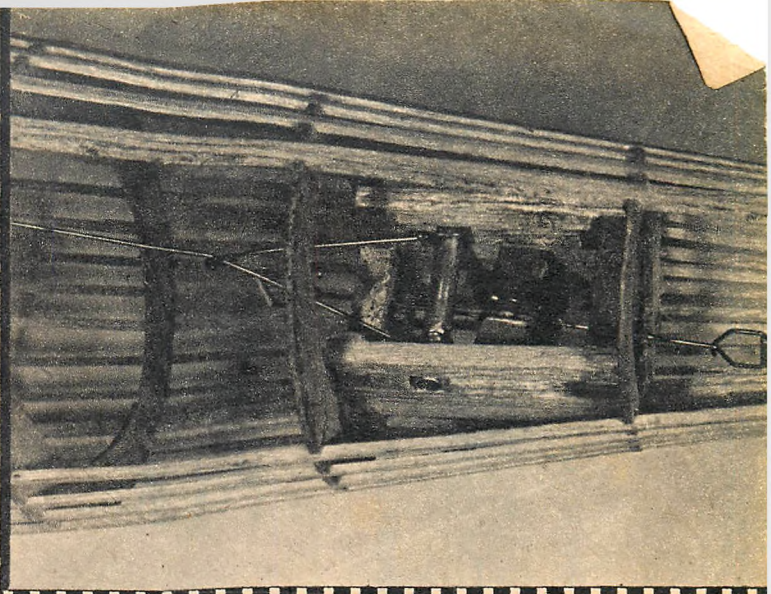
RETRACTABLE LANDING GEAR
FOR RUBBER POWERED MODEL AIRPLANES
ASSEMBLY

SCALE: 1/4 = 1

DRAWING & DESIGN Roger M. Bennett

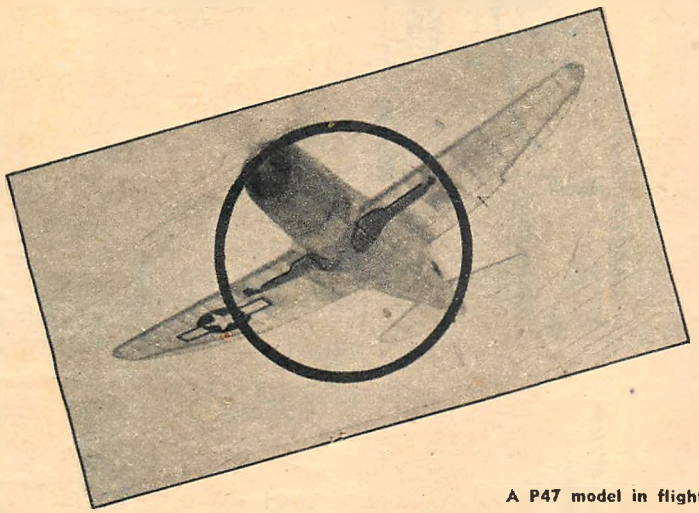


Installation of the landing gear and some of the components



The movable rear rubber crosspiece is the heart of the mechanism

RETRACTABLE LANDING GEAR



A P47 model in flight with the gear folded

by **ROGER M. BENNETTS**

A system for fully automatic landing gear operation—the last word in realism.

MODELERS who continue to build rubber powered scale jobs in spite of the scarcity of good rubber can add a lot of realism to their flights with this retractable landing gear. Entirely automatic, the landing gear will retract after the take-off, remain retracted during flight and extend before the plane lands.

Development of this system was made in a P-51 *Mustang*, 36" span. In the course of several weeks of experimentation with this method of operating retractable landing gear, the P-51 was badly damaged. However, the perfected system was subsequently installed in the P-47 *Thunderbolt* from which the photo illustrations and drawings were made. The plane was built from a popular kit, substituting all balsa construction for the pine, bass and balsa combination used in the wartime kits; it has a 30" span. To compensate for the change in the C.G., the wing was moved back ½"; no other changes were made excepting minor constructional ones necessary to permit accommodation of the landing gear and retracting mechanism.

Construction of this retractable landing gear job is begun in the conventional manner. Start with the fuselage leaving out enough stringers to permit easy access to its interior to install the retracting mechanism; cut the landing gear blocks of ¼" sheet 2½" long to fit between the ribs corresponding to the landing gear position. Trim these blocks to fit the upper camber and cement them in place. Cement the wing in place in the fuselage.

Make the landing gear struts of .049 piano wire, bending to the shape shown. Slip the flanged bushings onto the landing gear pivots before bending the quadrant end of the struts. In positioning the landing gear pivots on the landing gear blocks, place the strut in the retracted position and carefully mark the position of the pivots in the landing gear blocks. Cut slits in the blocks to fit the flanged bushings. Cement the struts in place, using ¼" blocks across the bushings.

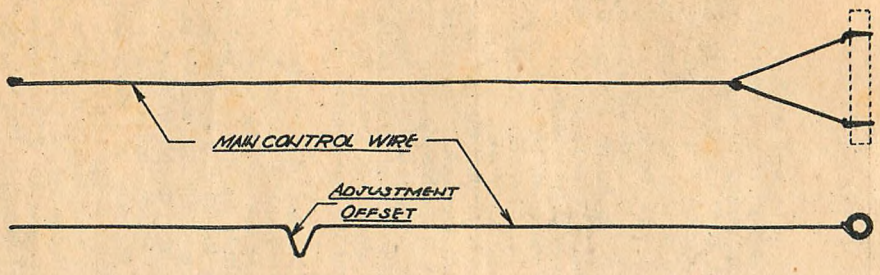
The quadrants are made from two sheets of 1/16" cemented together, grain crossed. Cut a "V" shaped notch around the arc. Cement the "holding band" pins in place on the quadrants and cement the quadrants to the strut pivots. Check to see that the quadrants do not extend past the wing surface. The control guides are made from 1/16" aluminum tubing; extend through the ribs as shown and cement in place. Cut lengths of linen thread long enough so that when doubled they will reach around the arcs of the quadrants and through the guides with ⅜" to spare, with the landing gear in the extended position. Cement the loose ends of the thread to the quadrants, using about 3/16" overlap on the flat sides of the quadrants. The locks are made from .020 wire bent to the shape shown.

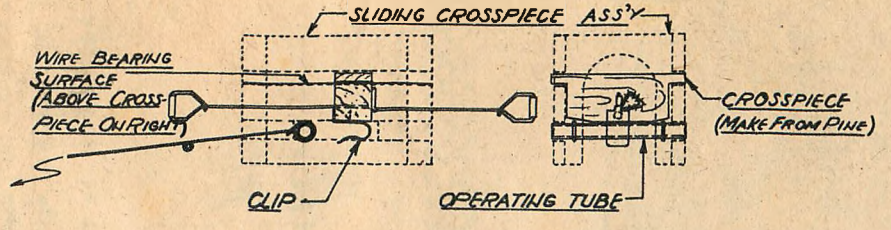
The lock blocks are made of 5/16" square balsa with the slots being cut to permit operation of the lock return springs. These springs are made of .014 piano wire and cemented to the blocks 1/16" extending below the blocks. Cement the blocks between the ribs and ⅛" inside the lower wing surface. Cut 1/16" x ¾" slots in the ribs and spar to accommodate the locks. Insert the locks and fasten to the blocks using pins for hinges. Double lengths of linen thread again, long enough to reach from the locks through the guides with about ¼" to spare and cement the loose ends to the loops in the locks.

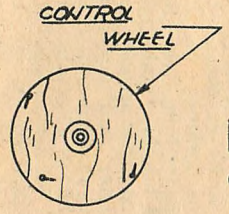
With this done install the holding bands; cut 3/16" square holes in the ribs next to the landing gear struts opposite the pin in the quadrant and immediately below the landing gear blocks. Make the holding bands ⅛" shorter than the distance from the pin in the quadrant to the 3/16" square holes. Loop the bands over the pins and insert them through the holes in the ribs holding them there with a short length of 1/16" square balsa. The bands are of 1/32" square rubber. The wheels are 2" in diameter and can be hardwood or balsa although balsa is recommended.

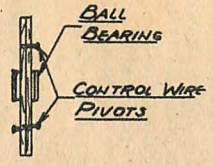
Build the wheel wells up of ⅛" sheets, crossing the grain in each lamination to give added strength. This is done so that the wells will serve to reinforce the

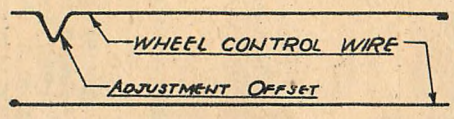
(Turn to page 74)

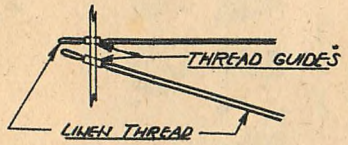


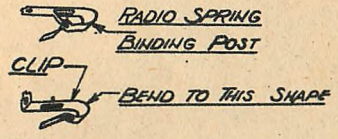


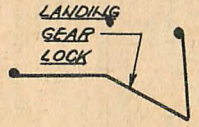


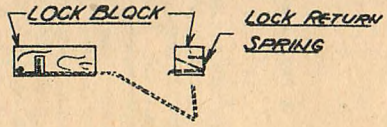


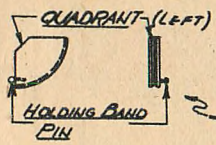


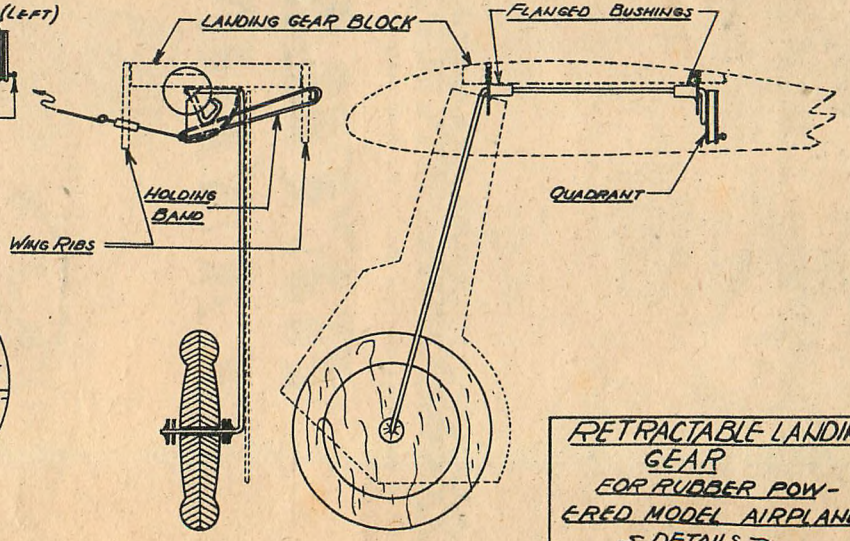


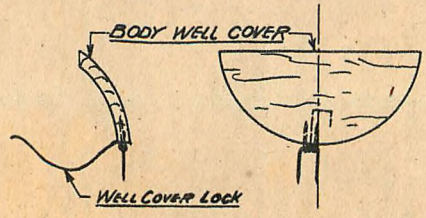


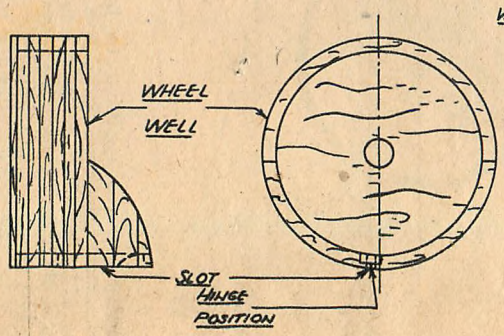












RETRACTABLE LANDING GEAR FOR RUBBER POWERED MODEL AIRPLANES
- DETAILS -

SCALE: ½" = 1" EXCEPT AS NOTED	DRAWING & DESIGN Roger M. Bennett

From Maker of Champions... New O.K. 29

O.K. Engines

O.K. 29

Brings you these design features: 1 pc. steel cylinder. (No gaskets—no heat dam!) 1 pc. hardened and ground crankshaft; Exclusive patented porting (Pat. No. 2,179,683). Exhaust stack integral with crankcase. And others, too numberous to list! See "OK" '29' at your dealer!

$18.50

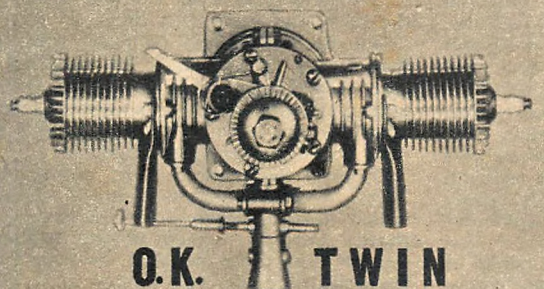
Bore .760, Stroke .660, Displ. .299
Complete with "OK" Coil, High Tension Lead, Spark Plug and Bakelite Fuel Tank.

O.K. 60

It's tried . . . it's proven . . . it's tested . . . it's an old friend, proved by exhaustive laboratory tests—confirmed by modellers from coast to coast in "free" and "tethered" flight — "OK" Super 60 has exceptional thrust, torque and endurance. SOME features are High Turbulence Piston Head, Rotary valves, Ball Bearing Radial and Thrust.

$21.00

Complete, ready to run with Coil, Condenser, Spark Plug, Bakelite Gas Tank, Neoprene Fuel Line and Hook Up Wire. SPECIFICATION: Bore .900; Stroke .950; Displ. .604; Weight (bare) 12 oz.



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Improved design! Improved performance! Outstanding pre-war. More famous post war. The only opposed "twin-cylinder" motor of its kind! Ideal for radio control models and experimentation. Featured by your "OK" Dealer. **$55.00**

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Monarch of the Air!

Way up high . . . in the wide, blue yonder . . . where "OK" takes you fast, these engines are the "blue-blooded" line, monarch of all they survey!

"OK" supremacy . . . it goes back to pre-war days! . . . is based on easy starting and consistent running! Fast climb and top speed for championship FREE FLIGHT . . . unfailing responsiveness for CONTROLINE thrills . . .

Flight-in, flight-out your "OK" flying partner will deliver every-time! Delivers the power to bring out the top flight characteristics of your model!

"OK" engines are "toughies" . . . unusually rugged construction assures a l-o-n-g, l-o-n-g, trouble free companionship.

Step in line with outstanding American modellers . . . build around an "OK" power plant in the confidence that you will receive a ceiling run for your money, every time you want to fly!

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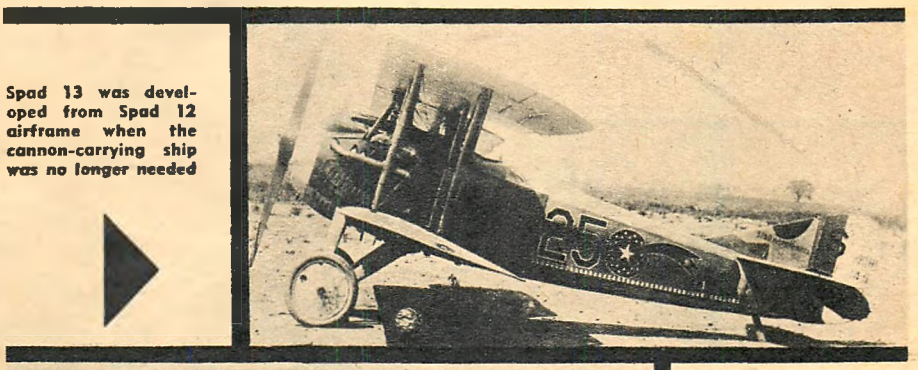
New O.K. Coil

Engineered-for Model Engines. This coil meets—and exceeds our exacting standards for maximum efficiency with minimum internal losses! Delivers a high voltage, hot, intense spark for modern high compression engines! Complete with high-tension lead.

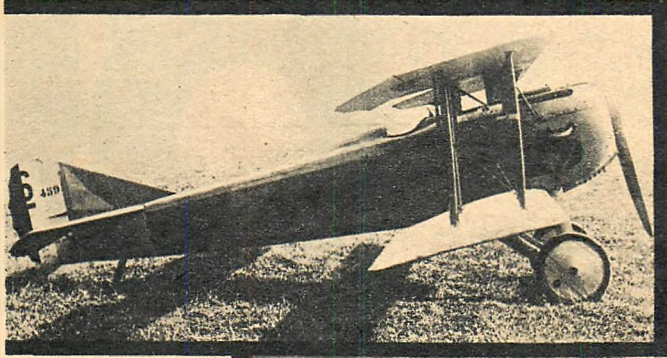
$3.00 For All Single Cylinder Motors—At All Dealers

by ROBERT CAMPBELL

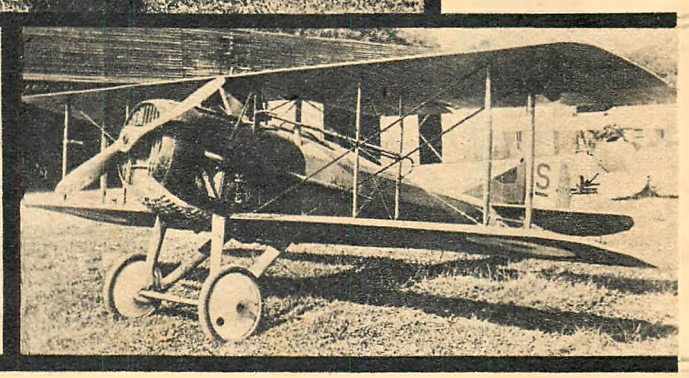
WORLD WAR I



Spad 13 was developed from Spad 12 airframe when the cannon-carrying ship was no longer needed



Note wing stagger on this Spad 12, and the high straight-line contour of the engine cowl



A high radiator and geared motor were used to facilitate mounting the 37 mm cannon

TO THOSE readers who have followed the World War I feature in this magazine, it is apparent that certain designers carried the ball for aircraft advancement during the 1914-18 period just as Mitchell, Keartveli, Hibbard and others have done during the past ten years. In each case, names of a few farsighted engineers have been remembered in connection with an idea or a design which eventually represented a milestone in aviation advancement.

Among the big names in the ranks of World War I designers, Bechereau comes up again and again in connection with developments other than pure airplane designs. Although justly famed for his Spad 7 and Spad 13 designs, Bechereau claimed many aviation "firsts"—one of which was a night fighter version of his two place S-11 artillery observation plane. It was intended to do in World War I what Northrop's *Black Widow* P-61 did in World War II—seek out the enemy in the dark and shoot him down.

But Bechereau had no radar. To see the enemy in the dark he installed a giant searchlight in front of the S-11's propeller hub to light up German night bombers long enough to give the French pilot and observer a few shots!

Perhaps Bechereau's most noteworthy "first" was the engine-mounted cannon which fired through a hollow propeller shaft. Certain models of the Messerschmitt used the same setup developed by Bechereau thirty years ago, and with modification the idea was successfully incorporated in the Bell pursuits of World War II.

The Problem

By the time the Spad S-7 was in general service, World War I had become a fairly immobile proposition. With both

(*Turn to page* 78)

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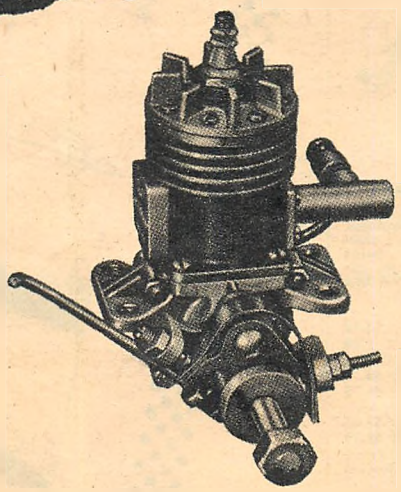

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Complete with coil, condenser and fully illustrated instructions.

SPECIFICATIONS

4 Part 2 Stroke Cycle—
¾" Stroke—
15/16" Bore—
300-7000 R.P.M.—
Bearing Surface, 1¼" Long—
Crankshaft, 5/16" Diam.
Motor Weight, 10 oz.—
Rotation, Either Direction
Invertible—
Runs on 2 Flashlight Cells—
Runs 27 Minutes on One Ounce of Fuel
Height, 4½"—
Width, 2½"—
H.P. Approx. 1/5th—
Displacement, .517 cubic inches
Class "C" under N.A.A. Rules

EXCEPTIONAL ENGINE VALUE WITH THE IDEAL ENGINE FOR ALL MODELS!

Imagine—operating your own G.H.Q. 1/5 Horsepower gasoline engine—tiny enough to put in the palm of your hand—yet turning up over 7000 rpm and powerful enough to fly model airplanes of from 5 to 10 foot wingspan. Also perfect for midget cars and boats.

Here is a scientifically constructed mechanical marvel that will thrill you with thousands of pleasure-packed hours. Get the real kick that goes with controlling the powerhouse that is your engine with just a finger tip.

Tested and proven over a span of 10 years. Yes, over 100,000 of these powerful G.H.Q. engines are in use. There is a reason for it! Why not join the ranks of this great fraternity of hobbyists?

These features make the G.H.Q. Gas Engine a Winner!

1. Easy starting.
2. Steady running—as long as gas, oil and spark are supplied.
3. Motor starts and runs on two flashlight cells.
4. Motor cannot overheat.
5. Piston and cylinder features: piston constructed on one piece, with uniflow battle and high compression head, centerless ground to within .0002". Cylinder is selected grey iron for long life, Hutto-honed to within .0001" of absolute roundness. Piston and Cylinder are hand fitted to insure perfect compression.
6. Accurate long wear aluminum die castings for cylinder head, crankcase, etc.
7. One-piece drop-forged chrome-nickel steel shaft, perfectly balanced and centerless ground. Absolutely unbreakable.
8. Main bearing (1¼" long) is reamed and lapped to perfect fit.
9. Connecting rod of high-speed bronze.
10. Carburetor is accurately designed—extremely simple to operate.
11. Timer assembly compact, tool-proof, long-wearing, replaceable and adjustable. Genuine tungsten points. Not a cheap "wipe" timer but a real aviation type "make and break" system.
12. Coil will not overheat or short circuit; convenient terminals make soldering unnecessary; oil, gas, and water-proof; not a pee-wee—but a husky, yet lightweight, spark coil that will give a maximum spark.
13. Condenser is gas, oil and water-proof.
14. Champion "V" Spark Plug and Washer.
15. Easily inverted and runs in either direction.
16. Absolutely safe—impossible to explode.
17. Speed range 300 to 7000 R.P.M.
18. Low gas consumption—runs 27 minutes on one ounce of fuel.
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J. N., BRECKENRIDGE, MINN.: Am having good results from my motor.
E. D., PLEASANT HILL, MO.: Received my G.H.Q. motor in fine shape. Very well satisfied, and think it is a swell little motor, runs fine. A friend of mine wants one, too, so wanted me to order it for him.
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G. F., PITTSBURGH, PA.: My G.H.Q. engine has given very satisfactory service for several years now.
E. S. J., TALLAHASSEE, FLA.: I have a G.H.Q. engine that I purchased from your company a short while ago and it operates satisfactorily.
N. L. B., N.Y.C.: I received my G.H.Q. motor in fine shape. It runs swell, and I am sending another order to you.
M. B. N., OMAHA, NEB.: I think the G.H.Q. motor is the best motor I have ever seen.
A. Z., TEXARKANA, TEX.: I have had about seven of your motors in the past and think quite a lot about them.
B. D. J., SAN FRANCISCO, CAL.: I already own one of your G.H.Q. engines and it performs like new.
R. D., GLEN ALLEN, VA.: I started it with only a few turns of the propeller and was very pleased with it.
J. M., ARLINGTON, VA.: I've had one of your motors for about three years now and it's still going strong.
C. C. N., AMARILLO, TEX.: Before my induction into the Army I built a few models which incorporated your G.H.Q. motor. I found it satisfactory and put a great deal of faith into it because of its dependability.
D. B. R., JR., LITCHFIELD, CONN.: I purchased one of your engines a few years ago and it is still in working order. I have used it in boat models with great success. I am particularly impressed by its easy-starting qualities. These are very valuable in a boat, where it is more difficult to start an engine. Usually, only one attempt is needed once the engine has been primed. As a matter of fact, my G.H.Q. motor starts easier now than when I bought it. The motor has satisfied me very much.

ABOVE LETTERS AND MANY HUNDREDS OF OTHERS AVAILABLE FOR INSPECTION AT OUR OFFICE.

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G.H.Q. MOTORS

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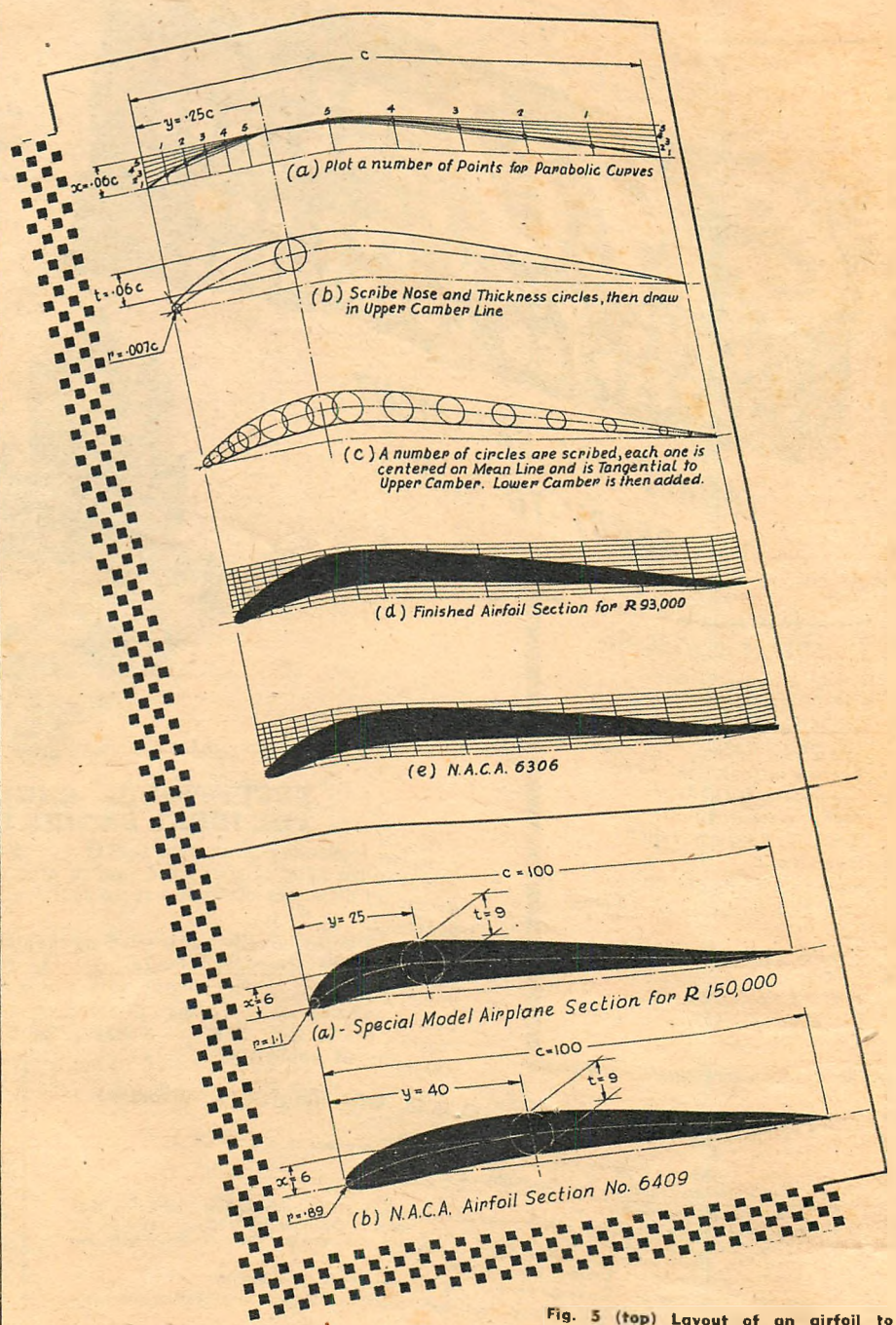

Fig. 5 (top) Layout of an airfoil to prescribed parameters, and final result

Fig. 6 (bottom) Comparison of an ideal section and the popular NACA 6409

Airfoils

(*Continued from page 21*)

of R is then given. The nose radius r/c was determined in the same manner. Comparison with other good model airfoils falling between these points showed that his theory was correct and further gave him a basis for another curve whereby the height of the mean chord line x/c could be determined.

Now to see how Fig. 3 works out. Assume that an airfoil for a Class A job is to be selected. The wing chord is to be 6" and the glide has been estimated at between 18 and 20 mph.* Since the prerequisite of duration is optimum glide there is no need to worry unduly about climb. In this regard, the average gas powered job certainly takes care of itself under the existing power and wing loading rules—what a pity the designer is denied this additional challenge to his skill! As a matter of fact, the airfoils determined by the Schmitz method are a very good compromise between best climb and best glide, since a high L/D ratio is expressly considered.

From Fig. 3 we determine that the Reynolds Number is about 93,000. A line

*The formula for calculating exact minimum flying speed is: $V_{min.} = \sqrt{\frac{W}{C_{L\ max.} \cdot .001198 \cdot S}}$ where W equals weight of model in pounds; S equals wing area in square feet; and V is given in mph. However, because most available Low Speed data is of questionable accuracy, it is probable that a $V_{min.}$ estimated from past study of model flight will be just about as close to the truth as most calculated speeds are apt to be.

drawn up through R 93,000 on Fig. 4 indicates that our maximum nose radius r/c is about 0.7%; the height of mean camber line, x/c, should be 6%; and the thickness, t/c, approximately 6%. The exact position of maximum curvature is still in some doubt, but tests do indicate that the ideal location should be between 15 and 20%. Actually, however, the further the point of maximum mean camber is from the leading edge the less sensitive the airfoil is to gust conditions. Therefore, although 20% may be theoretically ideal, 25% is more practical in that no excessive force is required to maintain a reasonable degree of longitudinal stability. Hence the compromise.

Having established these parameters, there remains two courses open to the designer: (a) find an existing airfoil meeting these specifications; or (b) draw an entirely new section to stipulated specifications. By the first alternative, see which section has a 6% c mean camber, and thickness also of 6% c. The NACA number their sections so that these parameters are apparent at a glance. The first digit represents the height of the mean line, x; the second, the distance from nose to point of maximum camber, y; and the last two, the thickness t. Therefore, the required airfoil starts with 6 and ends with 06.

One series of NACA airfoils has the point of maximum camber located at the 30% mark, so, as the last zero is omitted, the appropriate section would be designated NACA 6306. (Fig. 5e) The nose radius of this particular section is 0.4%—well within the limit. By the second alternative, an entirely new section may be laid out to meet these specifications. Fig. 5 a-d shows a suggested procedure. Compare the finished section, 5 d, with the NACA 6306—startlingly similar, isn't it!

Fig. 6 a is an airfoil designed for an R value of 150,000—the range of the average large B or small Class C. Compare it to Fig. 6b and, as proof of the Schmitz method, remember how many contests are won in Class B and C with the popular NACA 6409. Consider also that (theoretically at least) the 6409's maximum camber is too far aft, that it is most efficient only at its proper R value and that the individually designed section is unconfined by either of these considerations and should be superior in general characteristics to any airfoil not specifically designed for model work.

Now a word of caution: It was men-

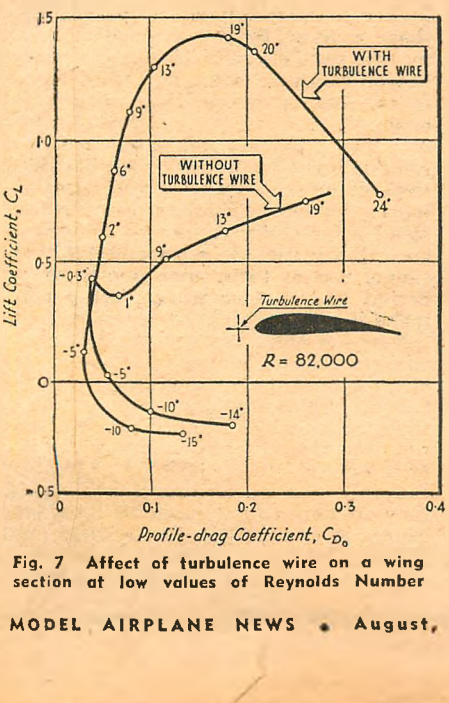

Fig. 7 Affect of turbulence wire on a wing section at low values of Reynolds Number

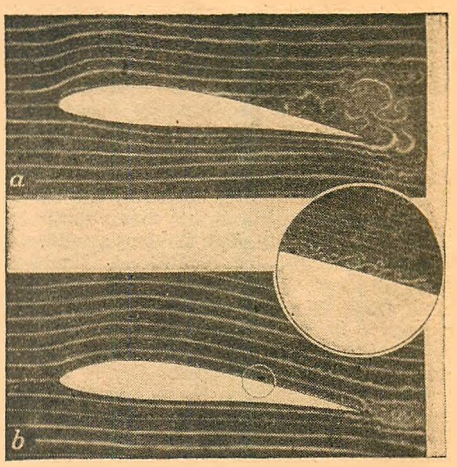

Fig. 8 Flow of air over a wing without (a) and with (b) turbulence wire

tioned that Schmitz referred to his airfoil selection chart as a temporary guide. The reason, of course, is that there have not yet been sufficient *accurate* wind tunnel or flight tests, carried out at low values of R to determine the really ideal section for any particular set of conditions. For wind tunnel tests, the air stream must be really *laminar*. Any turbulence will act in much the same manner as a turbulance wire, Figs. 7 & 8, and will give fictitiously higher L/D ratios. The importance of turbulence effect is graphically demonstrated in Fig. 8 and again in nature, by the flight formation of wild geese, ducks, other migratory birds and even insects. They are enjoying the advantages of added lift due to the turbulence generated by the leaders. Oh yes! the first in line unassisted by turbulence phenomena soon gets fatigued and drops to the rear—a new and rested leader takes over. This rotation in flight formation continues during all of the long journey.

In view of all this, when looking at most of the Low Speed measurements which are available, remember that just because a section has been tested in a tunnel does not mean that the results must be accurate. They may be *comparative* but not necessarily *accurate*—and in that there is quite a distinction.

In the second paragraph of this article mention was made of airfoils being tested in NACA's variable density tunnel. Because the really excellent NACA tunnel was built specifically for testing at much higher effective Reynolds Numbers than those covered by the average model, it may be none too reliable in lower ranges; not only due to some degree of turbulence, but to quote from Report 586 again: "*. . . results for effective Reynolds Numbers below 800,000, however, become relatively inaccurate owing to limitations imposed by the sensitivity of the measuring equipment.*" Schmitz's measurements stand a far better chance of being categorical because his especially built test tunnel was as turbulence free as proper design and careful workmanship could make it.

Now the reader sees why, when giving various figures for section parameters, etc., the undefinable "approximately" and "about" are scattered so profusely about the text, or why airfoil dimensions have not been given in thousandths, every 10% of the chord. The charts presented here can only give *basic* parameters. Though they *are* derived from accurate tests, they cannot as it were take into account such things as paper sag between the ribs, and at best can only point the way to a better,

less uncertain means of selecting the proper airfoil section. Because airfoils chosen according to the data given will be in the *super-critical* state for any predetermined value for *R*, they should contribute in large measure to the optimum performance of any airplane model whether it be rubber powered or gas, indoor or out.

In conclusion, far too little attention has been paid in the past to the effects of Reynolds Number on model flight. It is not suggested that the proper design for *R* means everything, because it certainly does not. The consistent contest winner knows all the angles. He has spent a great deal of time in meticulous adjustments to his model, establishing wing incidence, thrust settings, *C.G.* location, and so on. He knows his ship thoroughly. When he arrives at the field he is rarely the first to get his ship airborne. He hangs back, carefully studying the other models drifting around, until he just about knows each thermal by its Christian name. Not until he has made up his mind that all conditions are right, does his call of *"Timer"* ring out loud and clear. Thus, his well built model, carefully adjusted, blessed with a certain amount of luck (or can it be called luck?) flies off with top honors.

Nevertheless, if the consistent winner doesn't use the *ideal* airfoil section, and the reader does, it may be just enough to weight the balance (thermals playing no favorites), so that the carefully designed "dark horse" may yet snatch victory from an expectant grasp and leave the habitual winner muttering darkly to himself, quote, * * * ? ! ! ! * etc. . . . and other such coarse expressions intended to convey surprise and bitter disappointment.

The Cadet

(*Continued from page 24*)

cement and let dry. When dry, remove and repeat the procedure for the other half of wing. Sand both wing halves and insert dihedral as shown on plans. Note the center section is flat and not V'd. Insert wing holding rubber braces in the center section ribs.

RUDDER AND STABILIZER — The rudder is built from 3/16" sheet balsa and 3/16" sq. stock. Cut out rudder outlines and pin in place then cement braces in place, let dry, remove and sand smooth.

Cut out all stabilizer curved parts and pin in place. Taper the spar as noted on drawing and pin it and the leading edge in place; fit and cement the ribs in place; let dry, then cut the ribs to shape as noted on drawings, sand all over, cement the fuselage fairing to stabilizer. Rudder and stabilizer are now ready for covering.

COVERING—The original model was covered with white Silkspan and painted with red dope. The stripe down the fuselage is optional; stripe on the original was white.

FLYING—Wait for a nice calm day before test hopping; it pays to wait a few days and still have an airplane.

Glide the model until a smooth flat glide is obtained. If it stalls, add a bit of incidence under leading edge of stabilizer; if it dives, add a little under the trailing edge.

Start the motor and launch. Do not use more than half power on the first flight; after you have familiarized yourself with the model give it a little more power each flight until it is wide open. Under full power the model should turn to the right in a wide climbing turn, and on the glide it should circle in a tight right bank. Good Luck!

Design Forum

(*Continued from page 19*)

drive it, so drag cannot be reduced by eliminating any one of these; it can only be reduced by giving them a particular shape and form. The tail surfaces usually cause considerable drag and serve only as a means of stability, contributing nothing to the lift of the airplane. Normally they consist of a horizontal stabilizer and fin, stabilizer for longitudinal balance and control, and the fin with rudder at its trailing edge for directional control.

Tail surfaces are necessary but it is not required that they take the usual form mentioned above. Miss Scholnick has cleverly combined the horizontal and vertical tail surfaces so that instead of three—namely, a right and left stabilizer *plus* a vertical surface—she uses only a right and left stabilizer, eliminating the vertical surface. However, these stabilizing surfaces are placed at an angle to one another instead of horizontally. Thus they serve both as stabilizer and fin because they have a vertical as well as a horizontal projection.

Tail surfaces of this nature will operate entirely satisfactorily though each stabilizer half must be made approximately one-third larger in order that they function both as stabilizer and fin. This increase in size will add drag to the stabilizer itself. A reduction in total drag is not due so much to the reduction in frontal area of the tail surfaces as it is to the lack of interference produced at the junction of the tail surfaces where they join the body. It is a law that the greater the angle between two intersecting surfaces the less will be the drag.

In Miss Scholnick's design the two surfaces are set so that the angle between them and between any half and the fuselage is approximately 120 degrees. With the customary tail surfaces the angle between any two surfaces at their junction is only 90°. Less interference and drag therefore results from Miss Scholnick's design even though total frontal area of the tail surfaces may be the same as ordinary surfaces of stabilizer plus fin. Interference between wing and fuselage has been reduced by careful fairing. Therefore drag has been kept to a minimum.

In this plane the pilot lies horizontally or prone in the nose of the fuselage, making possible a much smaller fuselage crossection. When lying prone the pilot can also dive and pull out at higher speeds without losing consciousness. The centrifugal force due to a sudden pull-out will pull the blood from the pilot's head and produce unconsciousness. This does not occur when he is in a prone position. This small fuselage crossection, however, does not necessarily result from the prone position of the pilot. It is perfectly possible for him to sit erect in this fuselage without increasing its diameter.

The crossection is determined by the diameter of the motor which must be enclosed. Obviously the fuselage cannot be smaller than the motor's diameter. Nevertheless with the pilot prone it is possible to keep the nose comparatively sharp and therefore improve streamlining.

Usually the air vents for the jet engine make it necessary to increase the crossectional area of the fuselage or the wings when they are in the wing leading edge. These vents usually take the form of bulges on the fuselage sides. Miss Scholnick, however, has cleverly used the extra crossection necessary for the engine

(*Turn to page 46*)

THE ALBATROS SERIES

MORE details on these sleek World War I fighters will be given in Wylam's Masterplans in the September issue of MODEL AIRPLANE NEWS. The D5 and D6 models will be featured.

to form the vents. The air therefore goes straight into the engine without the necessity of adding bulges that cause disrupted airflow around the fuselage.

Without exception this is the cleanest design for a jet fighter we have seen. Another excellent feature is the long tapered wings which, because of their high aspect ratio, give high lift and low drag. This feature also improves the climb although at supersonic speeds they will give more drag due to the compressibility effect than if they were constructed with sweptback leading edges. Use of a very thin wing section, however, may overcome this difficulty.

The plane is equipped with a three wheel retractable landing gear. It should be highly maneuverable because weights are well centered and the wings protrude from a point approximately at the center of gravity in respect to vertical displacement. It should balance well as shown in the plans, the heavy weight of the engine being at center of the wings, the nose and the pilot with armament, etc., balancing the weight of the tail. It should give extremely high performance not only because of its low drag, but because of its light weight made possible by this simple construction.

* *

William H. Enders, 126 Cedar Hill Ave., Belleville 9, N. J., submits another design for a high speed aircraft. This is even more modern than Miss Scholnick's design. In fact, future high speed airplanes undoubtedly will take the general form of his plane, shown in Fig. 2. At present little data is available on this type of aircraft. Its outstanding feature is the sweptback trailing edge which is essential for speeds above 700 mph. This reduces the compressibility effect and the drag which builds up with great rapidity above this speed. With ordinary wings an increase in speed of only a very few miles per hour would require tremendous additional horsepower. Mr. Enders has overcome longitudinal instability, usually present in tailless aircraft. The tips of the wings are swept back to such a degree that when used as negative stabilizing surfaces they are a considerable distance from center of gravity of the aircraft.

In other words, the tips act as stabilizers whose moment arm is equal to the distance between center of gravity and their rearward position. This distance is comparatively long and therefore the aircraft should be very stable. In the average tailless aircraft this distance is short, causing sudden longitudinal deviation and lack of stability. Any tailless airplane with a short longitudinal moment arm is bound to be unstable.

Mr. Enders has incorporated another feature, which though not used on present aircraft is most essential if inherent stability is to be present—and that is a vertical keel surface. Most present day craft do not have this surface but retain their stability and balance by control operation. Airplanes with vertical keel surface will be much more stable and require less controling. At high speeds slight deviations from normal flight-line have great effect. The vertical keel area shown in this design will tend to keep the plane on its course without this deviation.

Obviously, this tailless plane is most adaptable to jet or rocket propulsion. Mr. Enders writes the jet is used until high altitude is attained and then the rocket is turned on. He claims this combination is used because the jet motor is not efficient at high speeds where the air is thin. We believe he has been misinformed or rather

(*Turn to page* 48)

has failed to consider certain points concerning this. A jet motor produces great speed at high altitudes. It is true that rockets will be helpful, but not over a long period of time. If the added weight of the rocket is put into the jet engine itself so that it will produce more power, equal or greater efficiency will result.

Mr. Enders says the motor will produce less power because the air is thinner. This is quite true, although he fails to observe that the power obtained is proportional to the difference in air pressure and blower pressure. Though less air goes into the engine, the difference between the air pressure and the blower pressure will be nearly as great, possibly more. Suppose the power of the engine drops, as Mr. Enders contends; at high altitudes, however, less power is required to drive the airplane. In fact, the reduction of power required due to the thinner air and lowered drag is usually far greater than the reduction of power delivered by the engine. This would result in greater speeds at high altitude than at low.

As a minor detail Mr. Enders specifies a unique heating system, a combustion chamber surrounded by a water jacket with an intake and outlet vent. Temperature of the chamber walls is kept down by the circulating water which absorbs the heat and circulates through a system to warm all parts of the airplane and provide comfort for the pilot. On the whole, Mr. Enders shows considerable imagination and ability in putting new ideas in practical form.

* *

John Lynch sends a unique design for a commercial airplane, Fig. 3. He uses the Burnelli principle of a lifting fuselage. Instead of the orthodox pilot and passenger cabin he has broadened it and shaped it longitudinally so that it has the crossection of a wing. This cabin extends between the nacelles of two tractor engines. Booms which are continuations of the nacelles extend rearward to hold the tail surfaces. In fact, the cabin between the two motors is a thick wing covered on top and sides with transparent material, glass, plexiglass, or similar transparent plastic substance. This is an excellent idea but apparently Mr. Lynch has failed to consider the enormous lift produced by the fuselage and the resulting suction over the top of the cabin.

He does not show a structure that would withstand this great lift. We fear that in flight the lift over the upper part of the cabin would either pull the plexiglass off or bulge it out of shape. Such an arrangement is possible, provided the structure to which the glass is attached is built to withstand the lifting stresses. On the other hand, this may require such a complicated combination of beams and struts that it would clutter up the cabin and interfere with operation, and with the comfort of pilot and passengers. It is possible to build some form of cabin that can withstand such stresses but it is doubtful that it can be entirely covered with transparent material.

We fail to see the advantage in the tail arrangement. Joining the two booms and filling in the space between them at the joints only complicates matters, and it would be far superior to extend booms straight rearward and place the stabilizer between them at their rear ends.

If you have any unusual ideas send them to Design Forum. Be sure to present them in neat and understandable form. Contributions which are carefully presented and neatly drawn up will be given preference.

Airways

(*Continued from page* 29)

er!").

Regardless of the rules above, if you have a pic of a model you would like to show us, even if not suitable for reproduction, send it in because even if we can't use it we are still interested in seeing what modelers are building.

FIELD HOGS. We recently received a letter from a model builder living near New York who disclosed a situation we certainly hope is not widespread. Our correspondent lives in a community we will call West Orchid (not the correct name) where unfortunately there are few places for model flying. However the neighboring community of South Orchid has a good model field. So our friend goes there and is just about to launch his model when, as he puts it,

(*Turn to page* 54)

NATIONAL MEET SHIFTED TO WICHITA, KANSAS

Washington, D. C.—The 15th National championship model airplane meet will be held in Wichita, Kansas, on August 30 and 31, September 1 and 2, according to an announcement by the Academy of Model Aeronautics.

Originally scheduled for Chicago early in July, lack of ample housing facilities and personnel brought about the change in location and later dates. Outside of those essential differences, the size and scope of the "Victory" Nationals will be pretty much as detailed in the June issue of MODEL AIRPLANE NEWS.

The competition, the blue ribbon event of American aeromodeling, and annually the largest contest held in the world, will be sponsored by the Wichita Kiwanis Club and the Wichita Y.M.C.A. Contest directors will be James E. McClelland, Jr., aeronautical engineer for one of Wichita's four aircraft plants, and Al J. Hummel, executive secretary of the East Side Branch, Wichita YMCA.

Wichita, with its important aircraft factories, large airports and central location, is a "natural" for the meet. Plenty of housing and camping facilities have been promised by the meet management; there is no lack of interest in the community for staging the Nationals.

Those who have not already written A.M.A. headquarters requesting information on hotel accommodations, events, awards and regulations, and who intend to compete in the meet, are urged to send a request to Al J. Hummel, 4007 East Kellogg, Wichita, Kansas, for such data. Include 10c in stamps or coin to defray handling charges.

The later dates for the big battle have met with considerable approval. It means that more contests can be held in advance of the "finals" and more trips to the contest can be offered as local and state meet prizes. The Wichita aeromodeling leaders, in addition to being active on Academy committees, are affiliated with the Mid States Model Aeronautical Association which has done much this season to coordinate meet dates and procedures in the mid-west area.

This is the first time the national contest has been held in Kansas. Previously it has been run off in Detroit, Dayton, Atlantic City, New York City (where it was sponsored by MODEL AIRPLANE NEWS), Akron, St. Louis, and Chicago.

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Streaking through the Rose Bowl sky, lap after lap, this model airplane, powered by MINIJET, opened up a new era in model aircraft history.

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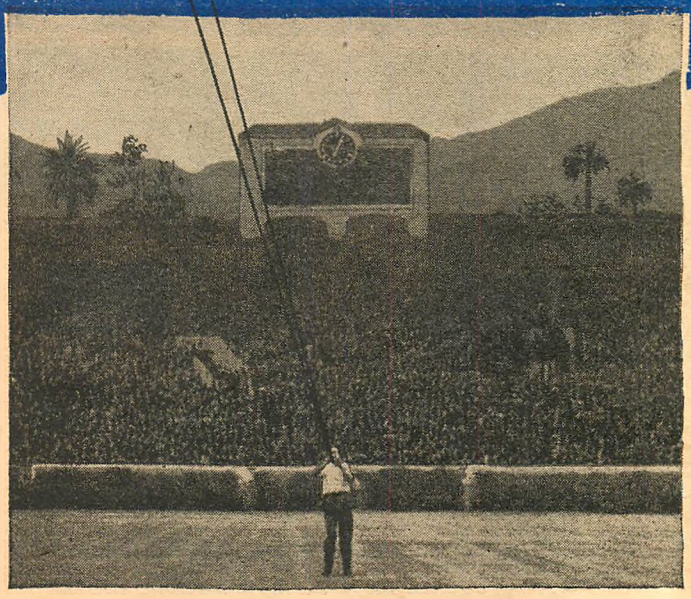
MINIJET is a scientifically designed, ruggedly built jet motor—complete in every detail. ***Your dealer is receiving shipments. See him today.***



A Rose Bowl crowd saw this MINIJET-powered model take off, and go through its paces—a sensational demonstration of a new, proven power unit for model planes.

Send this coupon and 30 cents in stamps for complete working blueprints for building a B-24 flight model.

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". . . some big jerk comes over and tells me the field is only for guys from South Orchid,"—and rightly he is highly incensed. We think this is about the worst display of poor sportsmanship we have heard of in some time. We suggest that our friend contact the director of the club to which the burly snob belongs, explain the situation and see if a little more friendly arrangements cannot be worked out.

* *

Picture No. 1 was sent in some time ago by Roger Tessier, 2106 Bleury St., Montreal, and shows his *Super Star Falcon* which was made from the original plans of J. S. Luck. This large ship has a span of 9 ft. and weighs 5 lb. 6 oz. ready to fly. Mr. Tessier writes: "I am of the opinion that this is the way any 'contest' design can look and still be among the top winners. Mr. Luck has proved with his 56" *Star Falcon* that a model can be attractive as well as a contest winner, and I for one would like to see an end to ugly pylon ships whose only excuse for existing is alleged efficiency which can at any time be equalled by a design that also has appearance to its credit." After looking at this beautiful model we are inclined to agree with Mr. Tessier.

The P-80 solid scale model in No. 2 was built by K. T. Biesemeyer of 3637 Graceland Ave., Indianapolis 8, Ind. Since Mr. Biesemeyer was at one time an instructor on the J-33 jet engine, he had a great deal of interest in the P-80 and decided to make up a model which in its final shape has many cockpit details, lamp in the nose and so on, and is finished off with genuine P-80 enamel.

No. 3 shows a *Phantom* powered *Hellcat* built by a friend of Ichio Egashira's. This U-controlled model was moderately successful for the first few test flights but unfortunately the motor was pretty nearly worn out and failed during one of the flights, resulting in a crash that wrecked the wings. After being rebuilt, the photo shown here was taken. The three blade propeller, incidentally, is simply a decoration as all flights are made with a standard two blader. This model has a planked fuselage and fabric covered wings. If the original builder of this ship, Harry Inatomi, sees this picture, Ichio would like to get in touch with him at 1201 E. Rosecrans, Los Angeles 2, Calif.

The beautiful *Spitfire* in No. 4 was built by K. W. Hamilton, 1483 Glendon Ave., Los Angeles 24, Calif. It is entirely of built-up balsa and tissue construction to a ¾ in. scale and is finished with authentic camouflage in green, brown and pale sky blue. The model started from an ordinary commercial kit but as Mr. Hamilton went along he added many details and modified the kit to the latest *Spitfire* design. Before it was finished, however, the *Spitfire* was changed even more so Mr. Hamilton's model is not quite up to date. The detail is quite complete and includes a pilot carved out of balsa wood. All letters and insignia are painted on the model and no decals or stickers were used.

No. 5 shows a *Seabee* made from MAN plans by L. C. Riley who unfortunately doesn't tell us much about construction or results. It is *Ohlsson* powered and will be converted to Mr. Riley's own idea of U-control as soon as he gets a chance to work on it.

Sgt. Ralph Kiefert, 16005606, Med. Det. R.C., Fort Sam Houston, Tex., sent in No. 6 showing his largest and smallest models. The tiny job is his first solid model, a P-51, of which he's very proud. The

(*Turn to page* 56)

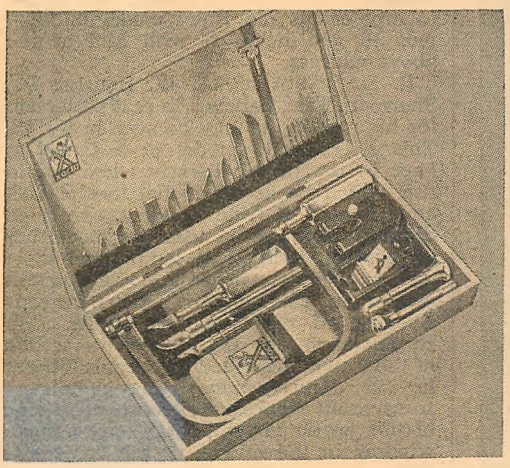
13 Different Blade Shapes

X-acto is always right—always ready!

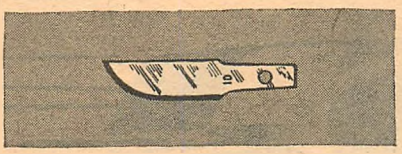
"Like my good right hand..."

That's how much X-acto Knives mean to Martin Prehn, professional artist and expert whittler of Freeport, Long Island. He has used them for years, he says, for both his work and his hobby . . . and finds them *always* sharp, with *always* the needed blade contour."

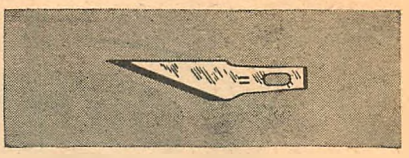
Just look at them — there to the right are the thirteen scientifically designed blade shapes which make X-acto the ideal knife for every art and craft. Each of fine surgical steel, ground scalpel-sharp. With X-acto's three firm-grip, all-metal knives, and an assortment of these versatile, interchangeable blades, even an amateur can tackle any hobby job with confidence and gusto.



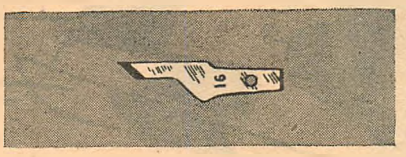
"Small Tools Are a Big Help," says Mr. Prehn. "There are so many small jobs that *only* small tools do *well*. X-acto Tools fit the hobby, and the hand, perfectly." No. 85 X-acto Tool Chest: 3 all-metal Knives; complete blade assortment; planer; sander; stripper; saw; drills; holders; ruler; complete in handy desk-drawer-size wooden chest, $12.50.



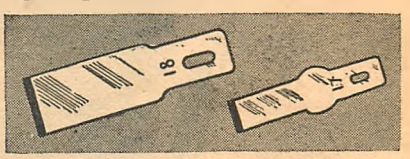
No. 10 — For all small, fine general work, including small concave or convex surfaces.



No. 11 — For fine angle cutting and deep cuts in narrow places, with less danger of splitting. Also for stencils.

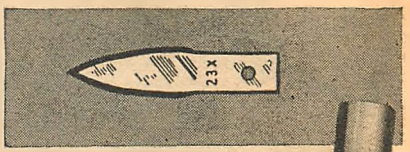


No. 16 — For small holes or notches. Ideal for templates, friskets, or stencils in thin materials, even tracing paper.



No. 17 — A chisel blade, ¼-inch wide, for working those hard-to-get-at flat surfaces. No. 18 — Same, ½-inch wide.

No. 22 — For long cuts along a template, or close corners. For whittling concave or convex surfaces.

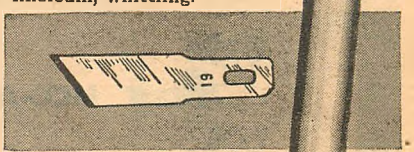


No. 23X — Ideal for acute-angled corners. All purpose blade with 2 cutting edges.

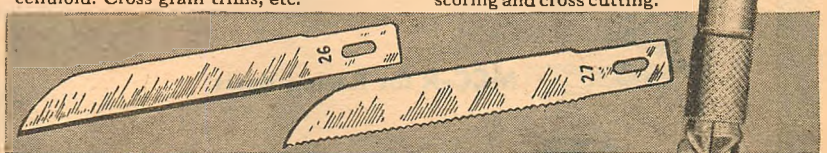
No. 25 — The ideal blade for general carving and all outside heavier cutting. Use it with No. 2 or No. 6 Knife.

No. 28—Hooked, for outside curved shaping. For leather, linoleum, whittling.

No. 24—For light chiseling, close corners. Templates and mats of cardboard, paper, celluloid. Cross grain trims, etc.



No. 19—A broader blade for general roughing, deep scoring and cross cutting.



No. 26—3-inch whittler's blade. No. 27—3-inch saw blade.

ALL-METAL No. 2 X-acto Knife—**50¢** With 5 assorted blades, $1. Other Knives, Tools, Chests, 50¢ to $12.50.

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**Reg. U. S. Pat. Off.*

large one is his first gassie; it has a 6 ft. 6 in. wingspan and is powered with a *Rocket*. This ship has made over 23 flights with no accidents other than a few broken props. It is covered with a strip of nylon taken from a G.I. flare chute. Sgt. Kiefert writes that on the first flight the ship flew into a thorn apple tree and he thought it would be a complete wreck. The nylon covering, however, held up perfectly and when the ship was retrieved there wasn't the slightest mark on it. He also tells us that his buddies were doubtful that he would be able to compete with the old hands in model building to get his picture in "Airways" so Sgt. Kiefert can show them the proof herewith!

The unusual model in No. 7 was sent in by A. Castellani, L'Aviazione, Via Cerasa 1, Cremona, Italy. It is unusual in a number of respects, the principal one being the method of mounting the motor. This may be seen projecting from top of the fuselage directly in back of the wing pylon, and the propeller is driven of course by means of a long extension shaft. The extreme height of the pylon is also unusual although many Italian models are made in this manner. The motor is of the compression ignition type, as are the majority of those used in Italy, and the fuselage is constructed entirely of aluminum.

The attractive model of Speed Holman's Laird Solution racer in No. 8 was built by R. E. Schumacher of 422 S. Vendugo Drive, Burbank, Calif. This model has a 28 in. span and is powered by a *Thermite* motor of .45 in. displacement. It is, of course, flown U-control. It will be seen that this motor is almost completely cowled in this design. Actually only the very tip of the sparkplug projects above the cowl. The model has a mechanically operated throttle developed by Mr. Schumacher, total weight of the mechanism being only 1 oz. Another unusual feature is that the flying wires are sprung in such a manner that they remain taut yet flexible enough to prevent any strain upon structure or the wires.

No. 9 shows a beautiful model of the famous Knight Twister built by Bob Dishong of McComb, Ohio, while in the Navy. This model is powered by an *Ohlsson* 60, and Bob tells us it is an excellent flyer. He asks us to insert a note to any of his old Navy model building pals to get in touch with him at the above address.

R. L. Bryant of 828 W. Houston St., Sherman, Tex., believes in real protection for his models, as may be seen in No. 10. This flying scale model of a *Camel* is kept in the plastic hangar when not in use, which keeps the model free of dust and protects it from accidents while on display. As may be seen the model has all control, flying and landing wires as well as complete insignia, cockpit details and so on. The model is a fair flyer considering all the details it carries. Mr. Bryant mentions that the centersection of the *Camel* described by Joseph Wherry in our January issue was completely transparent whereas he has seen pictures of this particular ship with only a small window in the middle of the centersection. We looked up this particular point and find that the *Camel* was made both ways so that either one is quite authentic.

No. 11 shows Joyce Hoffman of R.D. 2, Medina, Ohio, with one of her efforts. This started out to be a kit model but quite a few alterations were made resulting in a ship that is much more stable and a better flyer than the original. It

(*Turn to page* 60)

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Arden Motor with Ball Bearing, $22.50

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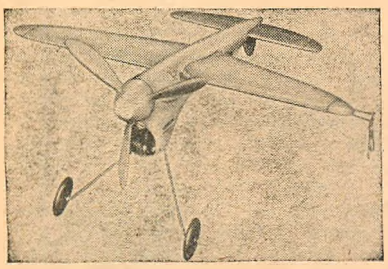

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Beautifully contoured aluminum completely preformed for speedy assembly.....$10.00
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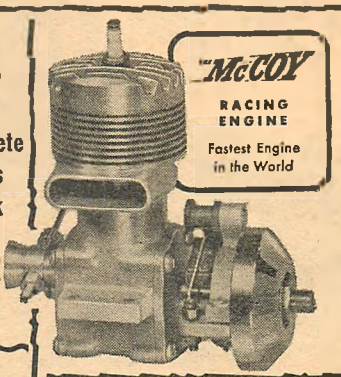
We Carry a Complete Parts Stock



$35.00

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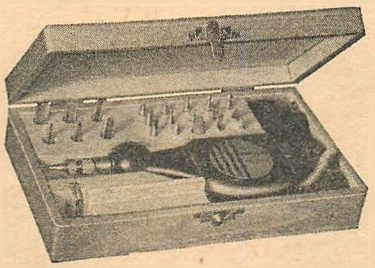
A NEW model engine built to give you championship performance every flight. Easy starting and easy to control. Less Coil and Condenser.



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McCOY Racing Car

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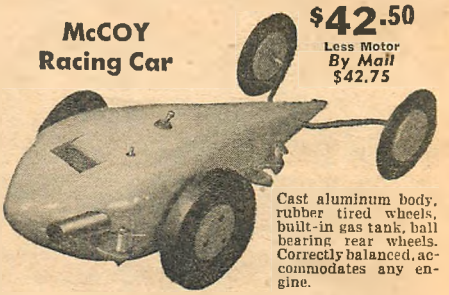

Cast aluminum body, rubber tired wheels, built-in gas tank, ball bearing rear wheels. Correctly balanced, accommodates any engine.

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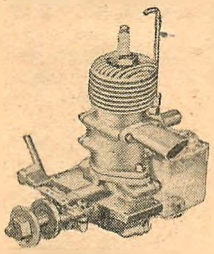

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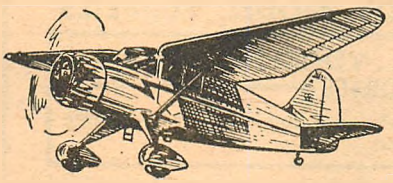
Class "C," .57 cu. in. displacement. ¼ h.p. @ 6500 rpm. Precision manufacture guarantees maximum output.



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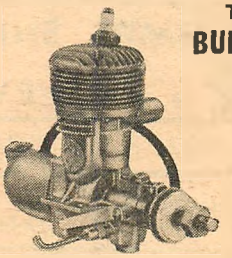

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Less Coil and Condenser. Class "B"—.275 cu. in. displacement—wt., 4¾-oz. Reliable precision build. Full written guarantee with every motor.

A Post-War Engine at Pre-War Price!

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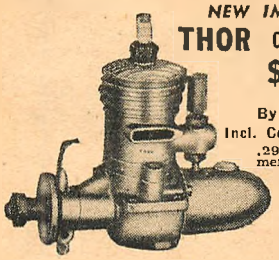
.29 cu. in. displacement. 1/6 h.p. Wt., 4½-oz. Every part precision engineered to perfection. Full 30-day guarantee against defective parts.



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ROGERS "29" Class "B"

$15.75

By Mail, $16
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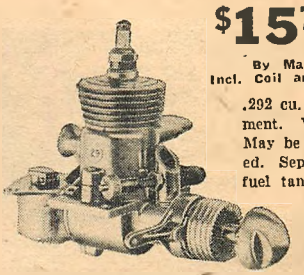
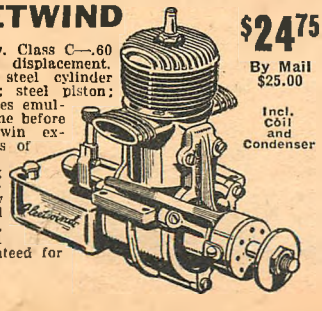


.292 cu. in. displacement. Wt., 4¾-oz. May be used inverted. Separate plastic fuel tank. Equipped with rotary valve, dual charge carburetion.

FLEETWIND

Brand new. Class C—.60 cu. in. displacement. Hardened steel cylinder and head; steel piston; twin intakes emulsify gasoline before mixing; twin exhaust ports of special design; long life bearings; new type metal gas tank, capacity 1 oz. Guaranteed for 60 days.



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And others

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Falcon CADET Stunt Plane

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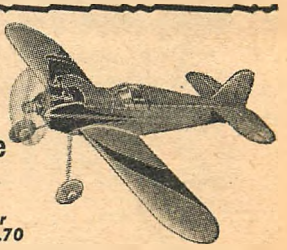


It's the latest by Frank Greene. Light enough for class B motors. Wing span 33 inches, length 24 inches. Duralumin control horn. 100 ft. .012 line, spring steel wire, waterproof firewall, plenty of silk span. Complete kit (dry).

has a rather steep climb and a slow floating glide, and Joyce expects to add a retractable landing gear to increase the performance even more. We are indeed happy to receive this letter from a young lady model builder and would like to have more of them. Joyce's comments on the model shown herewith and on others she has built shows that she is well versed in the design and construction of these little ships.

No. 12 shows Robert Campbell, 832 42nd St., Brooklyn 32, N.Y., with his original design Class E glider. Several months ago, after being towed aloft on a 100 ft. line, the glider flew out of sight after being observed for 20 min. It was finally returned by someone who had picked it up 10 miles away from the starting point. The ship was in the air for approximately 4½ hours on this flight and ended up with a perfect landing in a driveway. Mr. Campbell tells us that this particular glider has never made a flight of less than 3 min., but the one detailed above is certainly its record.

NEWS OF MODELERS

We know that several of our readers will welcome the opportunity to correspond with model enthusiasts from North Rhodesia, Africa. S. P. Adkins writes us that he and his fellow club members are all greatly interested in hearing from American modelers, who can reach Mr. Adkins at the Rhokana Corp., Ltd., Nkana, Northern Rhodesia.

Bill Tsumpes, 308 Franklin St., Marion, Ohio, appeals to fliers in his vicinity for help in locating his "American Ace" model, *Forster 29* powered, lost in March. The ship can be identified by Bill's AMA number 19506 on the wing, the motor number 3512, and a red and yellow dope covering.

Raymond E. Sharland of 4333 Lily Ponds Dr., N.E., Washington 19, D.C., addresses the following request to "News of Modelers": "I am interested in obtaining plans for World War I planes and others built up to 1940. I have several back copies of MAN about the late '30's and early '40's which I would be glad to trade, minus 3-views, for other 3-view plans with crossections of the type in which I am interested."

Karl Jansson, Freygatan 10, 2 tr., Stockholm, Sweden, would like to find contacts among other model builders who collect photos, drawings and aviation publications as he does.

One of our readers, David Stammerjohan, is anxious to secure plans for R. C. Shumacker's flying scale Rose *Parakeet*, published in Nov. 1945 "Airways". Anyone who can help him should write to him: 3723 E. 4th Ave., Spokane 15, Wash.

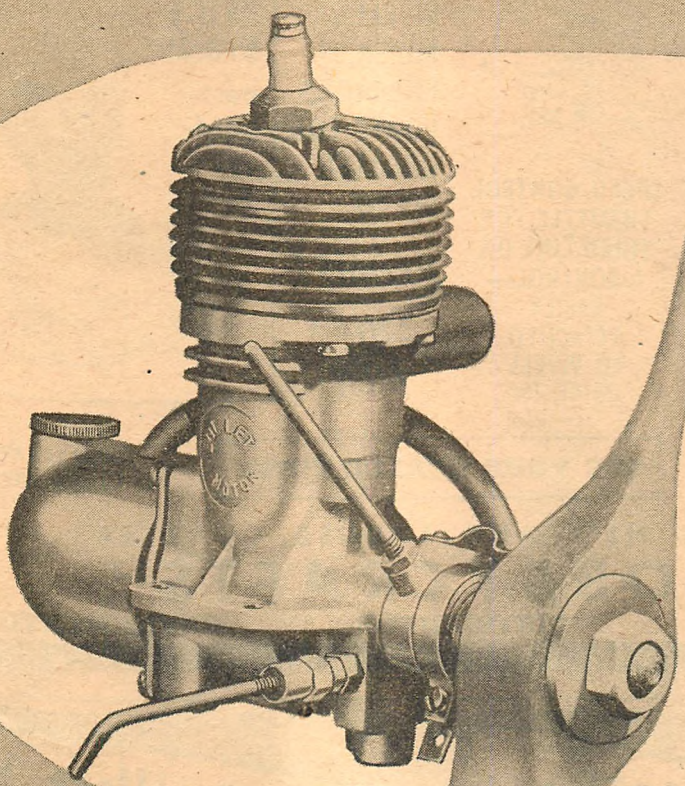
CLUB NEWS

Arkansas

Little Rock now boasts its own model club, the *Little Rockets*, formed under the sponsorship of the Recreational Department to heighten Arkansas young people's interest in modeling. No membership restrictions on age, sex or present active model building status have been imposed. The *Rockets* hold their meetings in the City Hall regularly, preceding the control line contests which are conducted on the first Sunday of each month. The following officers have been elected: A. J. Parsel, Pres.; Thomas J. Jones, Vice Pres. & Program Chairman; James E. Webb, Jr., Secy.-Treas. & Publicity Chairman. If interested, write J. E. Webb, Jr., 2106 Chester, Little Rock.

(*Turn to page* 62)

GREATEST value of them all!



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The new, improved Bullet Motor gives you more for your money in every way—outstanding performance and trim, polished appearance... the result of precision workmanship with highest quality materials. The Bullet is continually setting new records for speed, power and endurance. Its performance makes it outstanding in its class... (9,000 RPM with a 9"-10 pitch prop—6,000 RPM with an 11"-12 pitch. Speeds in excess of 100 MPH reported)... its price is far below comparable motors. You will be proud to own a Bullet—to install it in your finest model—to win free flight or speed contests! Buy your Bullet from your hobby dealer today! Only $12.75 without condenser or coil.

SPECIAL ATTENTION

If your hobby dealer is unable to supply your Bullet Motor, send your order to us with your name and address AND name and address of dealer. Shipment will be made direct from factory.

SPECIFICATIONS

- .275 cubic inch displacement.
- ¾" bore—⅝" stroke.
- Weight—4¾ ounces.
- All major external parts are die cast.
- Shaft rotary valve.
- Heat treated, precision ground one-piece crankshaft.
- Super-honed steel cylinder.
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- Attached fuel tank permits motor mounting upright or inverted.
- Die cast parts highly polished—all other parts have high lustre finish.
- Every motor fully guaranteed.

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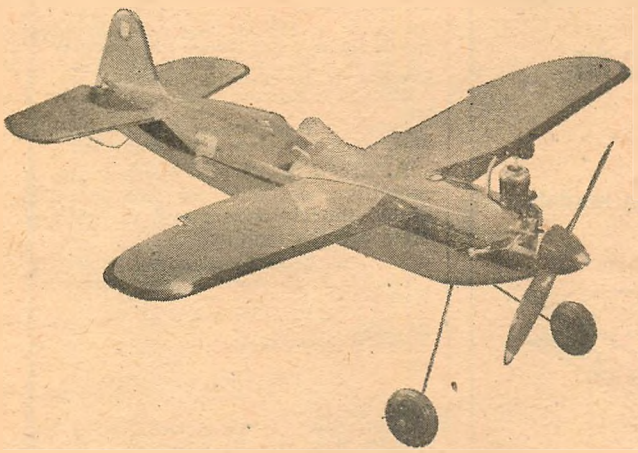
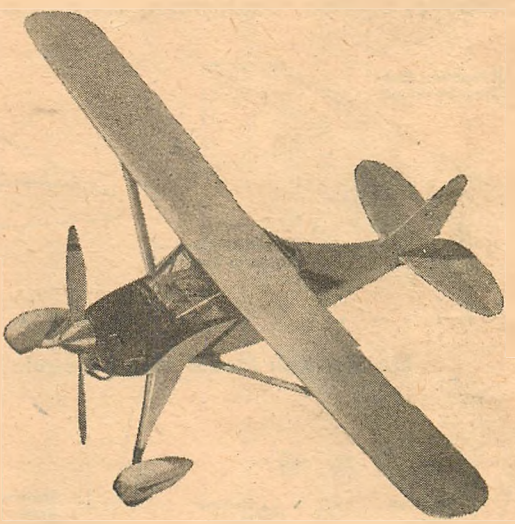
MEET THE ROYAL FAMILY

Here are the first two members of the Royal Family . . . you'll meet the others soon . . . so ask your dealer to let you see these precision cut kits . . . designed by America's outstanding model Builder . . . Built by aircraft engineers, good reasons why you'll want to *fly the Royal Line*



THE SKY PRINCE
Class B or C
Solid Balsa airfoil wings, Redi-bent landing gear, quickly demountable Power unit; every part carefully selected and prepared material.

$5.50
Kit, less motor



THE SKY QUEEN
Class B or C
This beautiful semi-scale model of the Voyager 105 is a slick performer with pre-formed airfoil, Solid Balsa Wings and features demountable Power unit.

$7.50
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Dealers—Royal Models can supply you with the Sky Queen and the Sky Prince now. Ask your distributor or write

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California

THE San Francisco Recreation Department's model club sponsored its Air Scout Show on May 11, playing host to the Frisco *Pterodactyls* who were invited to participate in the meet. The program was planned to include a model contest in addition to exhibits and demonstrations.

ROSCOE NELSON, a returned veteran, headlined the F.G.M.A.C.'s monthly free flight contest on April 7 with a high time of 11:14 in the Class B event. Winners and runner-ups in the different classes were:

Class A 1. Richard Beggs 2. Henry Vincent 3. Ronald Mosier 4. Bob Bennett 5. George Choi.
Class B 1. Roscoe Nelson 2. Paul Rozell 3. M. Martin 4. D. Van Tassell 5. Ray Balekian.
Class C 1. Raymond Rudholm 2. Tommy Cochran.
Juniors 1. Henry Vincent 2. Ray Balekian 3. R. Mosier 4. Tommy Cochran 5. George Choi.

APRIL 7 WAS also marked up as a monthly meet date for two San Diego clubs—the *Aeroneers* and the *Airliners*. Here are the results:

San Diego Aeroneers—Free Flight
Class A 1. Bill Sweet 2. James Squires 3. Alfy Faulkner.
Class B 1. E. J. Brown 2. H. C. Glines 3. George Escabellis.
Class C 1. J. Slovack 2. Busalacchi 3. Bill Hotaling.

San Diego Airliners—U-Control
Class B Speed 1. Bill Nelson 2. Carl Eichenlaub 3. Bob McVay.
Class C Speed 1. Jack Kramer 2. George Berry.
Junior Stunt 1. Carl Eichenlaub 2. Bill Nelson 3. John Nelson 4. Howard Forbes.
Senior Stunt 1. Jim Saftig 2. F. Thompson 3. Sam Spinalli.

BUSY California modelers can include these meet dates in their schedules:

Lindsay-Porterville, Free Flight—July 21.

Los Angeles Aeromodelers, Free for All Gas Model Flights—Aug. 4.

Calif. State Championships—Nov. 24.

THE E.B.A.A. welcomed back from the wars several old time members during its monthly contest on April 21, and Class A, B and C events were run off. Though the engine run was limited to 12 sec. three ships were lost. Fellows whose ships just missed the "lost" classification thanked their dethermalizers for luck in recovering the models after five or ten minutes' flight time. Here are the results of the day's flying:

Class A 1. Jack Dyer 2. Recco Clark.
Class B 1. James Elliott 2. Dale Root 3. Les Foote 4. Jim Liebee.
Class C 1. Charles Doane 2. Paul Homak 3. Chas. Hubbard 4. Ed Boddy.

E.B.A.A. indoor contests were also held during April. The first, a microfilm event, was won by Hank Cole; the second, a handlaunched glider contest, placed James Elliott in the winning spot.

Connecticut

A round of free flight gas contests, the Connecticut State Championships, are being run off on July 14 at the Willimantic Airport. Sponsored by the *Model Aero Engineers* of Hartford and sanctioned by the AMA, the meet includes Classes A, B & C Gas events and offers to winners trophy, motor and merchandise awards.

Florida

The first annual postwar Dixie States model meet will be staged in Jacksonville at Herlong Field on July 27 and 28 under the sponsorship of the Jacksonville *Journal*. Contestants will fly their ships according to AMA rules in the following events: Class A, B & C Gas; Rubber Cabin and Stick; Towline and Hand Launched Glider; U-control A, B & C, Scale and Stunt. Eleven trophies and six

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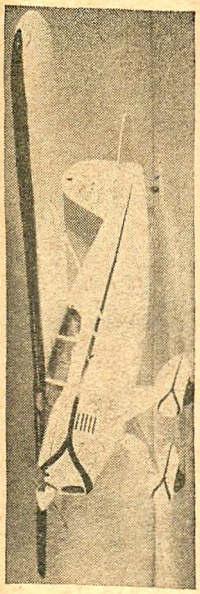
REARWIN SPORTPLANE GAS MODEL



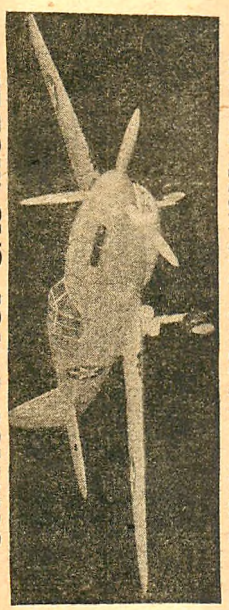
56" Span. Length 37½". Free Flight

Set has all parts printed on balsa, ready cut wheel pants, set of colored paints, glue, full size drawing, and all parts, silk span covering, axles, body planked ⅛ back, large quantity of materials. Uses "B" gas motor. Const. set, without motor **$10.50**

ADD 20c TO EACH SET FOR PACKING AND POSTAGE

SEND 10c COIN FOR NEW CATALOG

CURTISS P-40F GAS MODEL

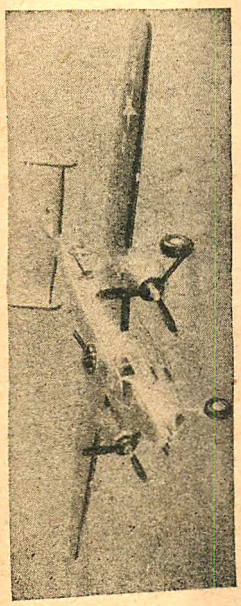


48" SPAN. 1-1/3" SCALE. GAS MODEL DE LUXE

SPECIAL FEATURES: ALL BALSA CONSTRUCTION, PLANKED BALSA BODY, USES "B" OR "C" CLASS GAS MOTOR, INVERTED CONCEALED IN RADIATOR

This is one of the strongest models ever built. Suitable for U control, free flight, or even as De Luxe exhibition model. Construction is all parts printed on balsa wood. Uses ⅛" x ⅜" balsa body planking. Large sheet of celluloid, axle wire, clear dope, glue, full size drawing, and all parts. Const. set, without motor **$9.00**

NORTH AMERICAN B-25-H



33½" Span. Length 24¼". ½" Scale. Color, Silver

A real beauty. Exact detailed model of the most heavily armed medium bomber in the world. Set has turned motor fronts, set of paints, glue, all parts printed on balsa, wheels, and scale drawing. Const. set **$4.00**

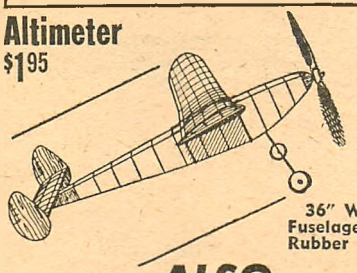
MINIATURE AIRCRAFT CORP.
83 LOW TERRACE, STATEN ISLAND 1, NEW YORK

1945 A.S.M.A.E. National Champs

The STRATOMETER and ALTIMETER each won first places at the American Society of Model Aero Engineers National Contest at Bendix, N. J., on October 14, 1945.

All kits complete with pre-cut notched and matched wing and stabilizer ribs (not die-cut).

Altimeter
$1.95



36" Wingspan
Fuselage R.O.G.
Rubber Powered

ALSO

Here are three new models that are breaking records from coast to coast.

Stratometer 36" Wingspan Stick	$1.95
Enduro 44 In. Wingspan Stick	$2.40
Sensatherm 44 In. Wingspan Fuselage R.O.G.	$2.40
Super Soarer 44 In. Wingspan Towline Glider	$1.65

All kits come complete with 100% balsa construction, pre-cut notched and matched wing and stabilizer ribs, machine cut prop, hardware, imported tissue, finished trailing edges, drilled and tapered nose plug, etc.

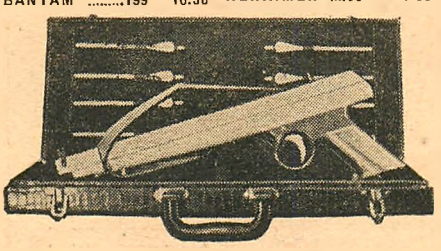
SPECIAL COMBINATION
The ARDEN, class "A" engine and Eagle 'RUNT'—a perfect combination for perfect flying—only..... $21.95 P.P.

Other High Quality Approved Gas Model Kits

U-CONTROL		FREE FLIGHT	
TARPON	$10.75	BANSHEE	$ 6.95
WHIZZER	9.95	CLOUD CHASER, A-B	3.95
BUZZ	8.00	BUCCANEER, B	3.95
CYCLONE	4.95	STRATO STREAK, A	2.95
DREAMER	7.50	BUCCANEER, C	6.95
G-13	7.95	LARKEY, A-B	3.50
BIPE	3.95	INTERCEPTOR, A-B	2.95
SPORTSTER	5.45	PIPER CUB, C	10.95
CADET	5.45	MERCURY, C	5.50
TOPPING	10.00	YOGI, B	3.95
STRATO-CAT	5.95	PIPER CUB, A	1.95

High Quality Approved Engines Our Stocks Are Large And Complete, No Waiting!

ARDEN	.099	$19.50	BROWN	.60	16.50
DENNYMITE	.57	17.85	ROGERS	.29	14.00
VIVELL	.35	18.00	CANNON	.29	19.75
OHLSSON	.23	16.50	MERLIN	.23	21.50
OHLSSON	.60	18.50	HERKIMER	.60	21.00
BANTAM	.199	16.50			



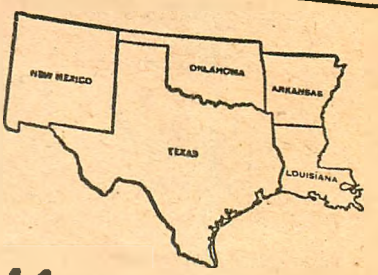
EXCLUSIVE! Cross-Bow

Hand Pistol Type

Travels half the speed of a .22 bullet. Not a toy . . . but a real target and hunting weapon. Beautiful finished case . . . Includes cross-bow pistol with maple barrel and laminated mahogany grip. Lemonwood bow — 8 cedar arrows and illustrated folder. May be used for indoor sports..... **$25.00**

FREE Catalogue sent on request.
DEALERS: Write for special list of exclusive items.
HOW TO ORDER: Send check or money order, add 15c for postage, to dept M-8.

RIDGEWOOD HOBBIES, Inc.
196 E. Ridgewood Ave., Ridgewood, New Jersey



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YOUR FASTEST, CHEAPEST AND MOST LOGICAL SOURCE OF SUPPLY FOR:

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Atwood "Super Champ"
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Star-Line Structures
Testor's complete line

WRITE FOR CATALOG

HARRY J. GARRETT & CO.
1913-B COMMERCE ST.
DALLAS 1, TEXAS

"½ BLOCK FROM CITY HALL"

The Ultimate in Compact Assembly and Mounting of Engine and Power Accessories

This complete free-flight unit includes...

The superior ARDEN .099 engine... more H.P. per cubic inch displacement and per ounce of weight than ever before attained.

One-piece CHASSIS of strong, lightweight, transparent plastic which accommodates built-in coil, flight timer, condenser and batteries.

Landing wheels and supporting members which are sturdily held in position by engine and mounting flange. Propeller not included.

Integral concentric jack connection for quick starting with booster batteries. Can be instantly connected or disconnected without fear of wrong polarity.

CHECK THESE ENGINEERING HIGHLIGHTS

All controls are readily accessible from outside the fuselage.

Batteries, easily replaceable, are held in position by a simple retaining catch which makes all connections.

Condenser can be quickly replaced without tools.

Space factor inside of fuselage measures only 1 9/16" in diameter by 8" in length.

Total weight of Arden .099 engine, chassis and accessories, only 8⅜ ounces.

PRICE COMPLETE $26.50

Ask your supply dealer or write us direct

MICRO-BILT INCORPORATED

370 Lexington Ave. New York 17, N. Y.

motors are in the prize lineup, and modelers under 18 years of age will have a chance to capture a National Airlines award of a round trip to New York on a National plane plus a week's stay in the city with all expenses paid.

Illinois

The *Rockford Gas Bugs* are preparing for their 3d annual Rock River Valley Gas Model Championships, an AAA-sanctioned contest, on Aug. 4. The program will include the following events: Class A, B & C free flight gas and speed and stunting in U-control. R. E. Lawerance, Contest Director, promises entrants a large prize list including trophies, engines, kits and other merchandise, and he asks that requests for entry blanks be forwarded to the club secretary, Bill Olson, at 1906 S. Fourth St., Rockford.

Indiana

R. BENNETT, the *Elwood Prop Busters'* scribe, announced his club's free flight contest, scheduled for Aug. 11. The fellows will compete in Class A, B & C events for prizes valued at $125 in the trophy and model merchandise line.

WAITING FOR THE AMA go-ahead before making up their schedule of big-time meets, the *Purdue Aeromodelers* have reorganized with 40 members to the good, retaining their old Aeromodeler Club's AMA charter. At the first meeting held in the Purdue Memorial Union hall where the fellows maintain two large workshops, the following officers were elected: Bill Berryman, Pres.; Woody Jerome, Vice Pres.; Bill Zimmerman, Secy.; Floyd Reck, Treas. This group of active model enthusiasts treks en masse to the Purdue Airport every Sunday either for a flight session or an intraclub contest. Woody Jerome states that he and his fellow members feel they are "now on the way to good models, good contests and good times."

Kansas

The combined planning of 15 active *Hy-Flyers Club* plus Y.M.C.A. and Kiwanis Club sponsorship adds up to Wichita's model jamboree on Sept. 1 and 2. Predictions that this will be the largest airplane meet in the Middle West for 1946 seem justified in the $800 guaranteed prize list and the already expressed intentions of modelers from five states to make this event a must on their lists. Leo Rutledge, sponsor of the *Hy-Flyers Eagles*, and Al J. Hummel, Exec. Secy. of the East Side Y.M.C.A., will be contest directors for this AMA-sanctioned affair which will offer entrants competition in all classes.

We have just received news that this contest will be expanded and become the official 1946 Nationals. See details elsewhere in this issue.

Maryland

We are awaiting results of the *Aerocraftsman Gas Model Club's* invitational gas model meet held on Sunday, June 16. AMA rules governed decisions; the contest was staged at the *Aerocraftsmen's* own airport, Modelhaven.

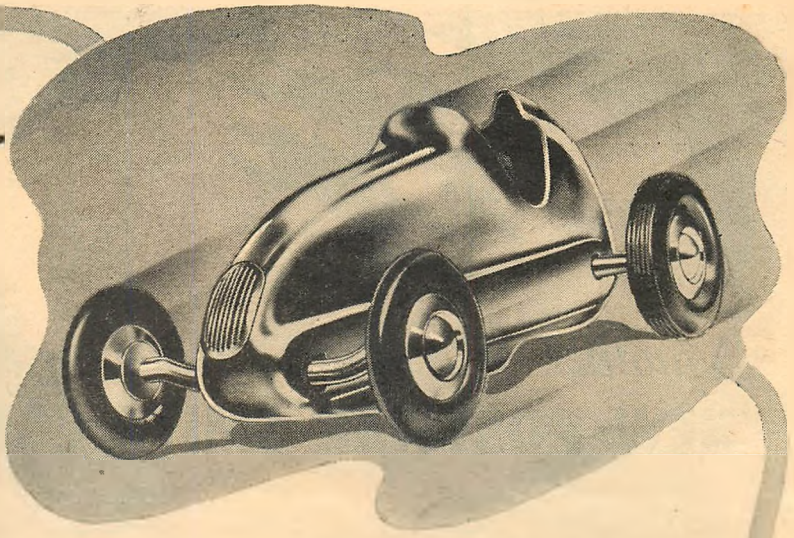
Massachusetts

A control line contest on July 21 at Municipal Field is on the Westfield *Aeronauts'* schedule of activities for the flying season. William Wesson, contest committee chairman, writes us that a definite point system will be used to include takeoffs, stunts and landing as well as speed. There will be two classes, below and above .30 cu. in. motor displacement.

(*Turn to page* 68)

DEALERS..

WIN WITH DOOLING



MORGAN MODEL SUPPLY CO., the foremost model distributor on the west coast, has just received a limited number of the..NEW DOOLING MODEL 'F' RACE CAR. The latest of all the famous DOOLING RACERS embodies all the features of its forerunners PLUS SEVERAL NEW INNOVATIONS.

- ★ Ball Bearing Drive Unit
- ★ Ball Bearing Front Wheels
- ★ Knee Action Front End Suspension
- ★ Double Universal Joint
- ★ Light-weight Die Cast Highly Polished Magnesium Body
- ★ Duralumin Wheel Hubs
- ★ Brass Flywheel

Mr. Dealer: The long suspended manufacture of miniature race cars has left a vast unsatisfied demand for this branch of the model hobby. Get your order in NOW...Have this fast selling, popular favorite in stock when your customers ask for it. DON'T DELAY! ORDER TODAY! We can give you immediate delivery.

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The new

Meteor for SPORT · STUNT · SPEED

featuring the "fixed or droppable" landing gear

The original prefabricated Speed-Kit—demanded more and more by leading builders. Engineered for unsurpassed performance—while eliminating tedious assembly time usually required. Can be ready to fly in just six hours. The application of proven principles of aerodynamics to the sensational Meteor makes for faster flying, greater stability and quicker maneuverability—and gives the operator positive control under any flight conditions. Easy maintenance, too, with the patented Speed-Snap that affords quick access to engine, fuel tank, coil and battery.

Kit is *Completely Prefabricated*

- ★ All parts preformed—inside and out—finished scale from finest grade balsa.
- ★ Balsa wing skins—no paper or cloth covering.
- ★ Special dual purpose landing gear, hardwood motor supports and hardware included.
- ★ Complete, illustrated plans and instructions for assembling, testing, and flying furnished with kit.
- ★ Wing Span . . . 24 inches. Overall Length . . . 27 inches.

Licensed under J. Walker U Control Pat. No. 2-292-416

Place your order with your local Meteor dealer—if he cannot supply you, order by mail (Check or Money Order)—and your Meteor will be shipped postpaid.

8.95 less wheels

Fly the Meteor—for a new air thrill!

ENGINEERING DEVELOPMENT CO. OHIO AT MAPLE ESCONDIDO, CALIF.

Michigan

With the resumption of full time model building activities, older modelers in Ann Arbor have organized to form a club for younger builders. The group, sponsored by the Junior Chamber of Commerce, is comprised of 30 members who specialize in gas powered control line and free flight, meeting every other Monday night and flying every Sunday. The Ann Arbor Airport has been secured for the annual outdoor model meet on Aug. 4, which will offer contestants stiff competition in free flight gas events—Class A, B & C—speed and stunt control line, and $500 in prizes.

Minnesota

St. Paul's first Annual Hobby Show on Apr. 28 attracted a good representation of model aero contestants in addition to auto racers. U-control demonstrations, rubber, glider, microfilm and gas events were featured.

Members of the *St. Paul Modeleers Aero Club*, many of whom participated in the hobby program, have mapped out their own flying schedule to include rubber and glider competition on July 21; U-control on Aug. 11 and free flight gas on Sept. 8. 1946 officers of the *Modeleers Club*, founded in 1940, are: Warner Swanson, Pres.; Raoul Brickner, Vice Pres.; Gerald Shepardson, Secy.; Elmer Poppert, Treas.

Missouri

The outstanding success of the Kiwanis Club's first model plane contest last year has prompted the club to extend this year's meet to two days, and elaborate plans are in formation to accommodate a capacity spectator crowd and top ranking contestants. The scene of this second annual model program will be the Sedalia Airport—the dates, July 27 and 28.

New York

Sunday, June 2, marked the opening of the New York State Exchange Clubs' annual convention in Buffalo and a model contest which is sponsored by the organization every year in connection with the convention. The meet was held at the Audubon Airport, Millersport Hwy., Eggertsville.

E. S. COLLINS has posted results of the *Schenectady Aeroneers'* sixth annual model meet held on May 5 at the Schenectady Airport and sponsored by the Four Star Model Builders Supply Co. of that city. The first AMA-sanctioned event in this area, the meet was well attended in spite of adverse weather conditions. A total of 247 flights were made in all classes, and a new national record was set in the towline glider event by Al Ames of Hartford with a run of 17 min. 7.8 sec. Runners-up in this contest were:

2. J. Formica 3. J. Mathews 4. Ray Voight 5. G. Grant.

Hand Launched Stick, 1. George Nolan 2. Harold Hine 3. H. De Bolt 4. J. Mathews 5. Ray Factor.

R. O. G. Cabin Fuselage, 1. Harold Hine 2. Aubrey Pearson 3. Al Sherman 4. George Nolan 5. J. Mathews.

Free Flight Gas, Class A—1. Ed Lays 2. H. De Bolt 3. Bob Heinley 4. Ray Voight 5. Deck Van Zandt.

Free Flight Gas, Class B—1. Ed Keck 2. Gene Howard 3. E. Hunt 4. Ed Lays 5. Harold Hine.

Free Flight Gas, Class C—1. W. Warren 2. Aubrey Pearson 3. George Humphrey 4. H. Bradish 5. Ed Keck.

George De Bolt, national champion in Class B and C control line flying, easily won first place in the meet's A, B and C events.

THE Model Airplane Div. of American Hobby Institute, which grew out of the old *Wilson Aero Club* of Brooklyn,

(*Turn to page* 70)

LUSCOMBE MODEL 10

THIS attractive single place private plane will be featured in the September issue of MODEL AIRPLANE NEWS; the coverage includes a flying scale rubber model by the old expert, Earl Stahl.

should be of especial interest to model fans in parts of the country where there is little model activity. Director F. J. Zerilli informs us that the club has many advantages to offer prospective members including membership cards, a newspaper, monthly cash prizes, etc. Mr. Zerilli will be glad to furnish all details if you write him at 91-17 173rd St., Jamaica 3, N.Y.

THE *Propspinners* of Queens are launched on a new-members campaign and request those interested to contact John Marotta at 7512 Jamaica Ave., Woodhaven 21, N.Y. The *Spinners* also report results of their monthly gas and rubber contest on April:

Gas—1. Warren Fletcher 2. John Marotta 3. Skeets Reinhardt 4. Oscar Rauchmann 5. Bob Hatcheck.
Rubber—1. Bill Fletcher 2. Bob Hatcheck 3. Warren Fletcher 4. Skeets Reinhardt 5. Lenny Kendy.

Ohio

A new addition to our club roster is the *Marion Prop Busters,* formed last fall with the return of modelers just out of service. AMA-chartered, the club is 32 members strong and has installed the following officers: Bob Blank, Senior Advisor; Bill Tsumpes, Pres.; Dick Maxim, Treas.; Tom Dwyer, Secy. The *Prop Busters* will welcome new members and would like to correspond with other clubs, especially in Ohio.

Oklahoma

The *Oklahoma City Model Aviation Club* has scheduled a meet for Aug. 3 and 4 for the entire Southwestern area. $500 in prizes will be offered to winners, and a large turnout is expected. L. G. Vargo, who sent in the above announcement, is a former member of the *Chicago Aeronuts* and would like very much to contact some of the members he knew in the Windy City.

FRANK SIMARD, in his regular report on Enid model club doings, informs us of a Chamber of Commerce-sponsored warmup contest which was held on May 31 at Woodring Field together with an air show, dedication of the field and a state air tour.

Oregon

The *Portland Gashoppers* make "Club News" this month with a report of their annual AMA and NGMA sanctioned free flight meet which was run off on June 9. C. A. Stuhr, the *Gashoppers'* scribe, informs us that trophies, medals and merchandise totaling well over $300 were awarded.

Pennsylvania

The Lebanon Business Men's Assn. will sponsor its tenth annual contest at the Lebanon Valley Airport on August 24. This is the Association's first meet after a lapse of four years, and modelers in the central Pennsylvania area may look forward to a good show. George W. Hess, Contest Director, will furnish you with complete details.

THE *West Philadelphia Gas Model Club* has re-formed after three years of inactivity during wartime when members were in the fight to the last man, the greater proportion seeing service in the Air Force. Annual election of officers on May 2 produced the following results: Donald Rothera, Pres.; Gilbert Gollub, Vice Pres.; Ara Shakaryian, Secy.; Thomas Rothers, Sponsor and Director. The club's first contest of the season staged on May 5 was a great success. Enthusiastic members participated in free and controlled flight events, the judges handing in the following decisions:

(*Turn to page 72*)

Free Flight—1. Gilbert Gollub 2. Harry Jackson 3. Harry Harrison 4. Jack Lenderman 5. Allan Miller.
Controlled Flight—1. Harry Allison 2. Richard Slutz 3. Jack Lachlan 4. Ara Shakaryian 5. Bill Wishing.

Modelers will be interested to know that the tether contest was not run on speed or stunting ability but was judged by the way in which the flier handled himself and his plane—starting of motor, takeoff, landing, steadiness in flight, etc.

Virginia

The *Brainbusters*, Hampton's model club, engaged in a series of contests in each of the following three classes: outdoor rubber, outdoor gas and indoor. Winners in one of the indoor events:

Indoor Cabin—1. Dick Everett 2. Cadwell Johnson 3. Joe Boyle 4. Charles Folk 2. Jessie Shepard.
Indoor Stick—1. Dick Everett 2. Cadwell Johnson 3. Jessie Shepard 4. Joe Boyle 5. Charles Folk 6. Jerome Lewis.

Comprising 21 active members, the *Brainbusters* are headed by the following officers: Gordon Cheeseman, Pres.; Charles Folk, Secy.; Dick Sladick, Treas.; Jerome Lewis, Publicity.

Washington

Ted Lomax writes us of the renewed activities of the *Tacoma Aeromudlers* with the advent of good flying weather in the Northwest. The April 7 free flight ratio-timing gas contest winners were:

1. Byron Blanchfield 2. Bill Mazzoncini 3. C. A. Sims

In connection with the Young Men's Business Club Sports Carnival Week the club and local business houses sponsored a novelty event on June 25 which attracted wide attention in Tacoma. A Mercury gas model built by Robert Norgaard was released from top of the Medical Arts Building equipped with a full tank of gas. The ship carried a number which entitled the finder to a new model engine, a gas kit, and other awards.

U-control and towline glider events were held in April and May—and for July 21, the *Aeromudlers'* calendar contest lists the annual State Invitational Free Flight Gas Meet, sponsored by the Young Men's Business Club.

England

A recent issue of the Association of British Aeromodellers fortnightly *News Letter* outlines the season's program thus:

April 21—Decentralized
Open duration—for any type of rubber-driven model, excluding stick models
Open glider—for any type of glider conforming to S.M.A.E. formula
May 5 & 6—Club Competition Day
For A.B.A. clubs, affiliated clubs and A.T.C. Clubs.
Events—rubber driven and glider
June 2—Centralized Petrol and Wakefield Competitions
To be run at Eaton Bray Model Sportsdrome. Billington Rd. Petrol rules as for Irish National Competitions, Wakefield rules under same authority. First three of each team to go to Ireland for Irish Nationals.
July 7—A.B.A. Gala Day, at Eaton Bray Model Sportsdrome
Duration
Petrol—20 secs. motor run
Flying Scale
Concour d'Elegance—duration, glider, scale and petrol
Experimental Flying
Flying Boat
Seaplane—duration competition

Some details of the important June 2 event mentioned above were: The winner of the Wakefield event was awarded the President's Trophy, and a trophy worth 15 guineas went to the first man in the petrol contest. The two next best in each event formed the team with the winners which proceeded to Ireland for the International on June 23. The Model Airplane Council of Ireland also invited teams from the United States and other countries.

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AIRPLANES RACE CARS SHIPS RAIL ROADS
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"Make Tuthill Your Hobby Headquarters"

FREE FLIGHT GAS KITS

Comet Zipper A	$ 1.95
Comet Zipper B	5.95
Brigadier 38	1.95
Comet Sailplane	8.95
The Atomic	3.50
The Air Foiler	3.95
The Larke	3.50
Mercury Class C	5.50
Varsity B	3.50
Baby Play Boy	1.00
Playboy B	2.95
Playboy Senior	4.95
American Ace B-C	3.95
Musketeer Std.	4.95
Custom Cavalier 108	15.00
Buccaneer B Special	3.95
Roamer A-B	2.95
Pacer B	3.95
Pacer C	4.95
Megow Piper Cub	6.95
Megow Ranger	3.00
Megow Zombie	3.00
Megow Aero Champ	2.50
Banshee	6.95

Add 25c for Packing & Post.

U-CONTROL

Short Snorter	$ 2.95
Aero Puppet	5.95
Controliner	5.95
Scientific-Cyclone	4.95
Whizzer	9.95
Falcon, all models	5.45
Miss Behave	3.95
Tiger Shark	4.95
Baby Miss Behave	2.65
Duralyt	14.95
Streamliner	4.95
Buzz	8.95
Duraplane	12.50
G-13	7.95
Baby V Shark	2.95
Super Shark	4.95
Dreamer	7.50
Sharpie	1.00
Teather Shark	3.50
Ercoupe	12.50
A-J Fireball	10.00
P. D. Q.	5.00
Eagle Scale-Liner	4.95
Piper Skycycle	7.50
Strato-trainer	3.95

Add 25c for Packing & Post.

JET PROPULSION

Ray Racer	$1.25
Ray Jet Streak	.75
Ray Jet Wing	1.00
Ray Swisher	.50
Ray Lockhead P-80	1.20
Ray Super Rocket	1.00
Hotshot Jet Race Car	.50
Launching Gun	1.00
10 Rocket Bulbs	1.00
Plungers	.15

Add 15c for Packing & Post.

SOLIDS

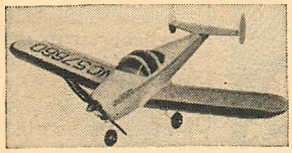
Railway Express Truck	$8.95
Wardie Jay Circus	
Plank Wagon	1.50
Water Wagon	2.00
Austincraft Board	1.00
Cavacraft SE-5	.50
Strombeck-Becker	.25 up
Cavacraft P-51	.50
Swing Control P-38 & P-40	1.75
Falcon	.50 up
Ray Ring	1.00
Testor	1.00 up
Red-Y-Cut	.40 up
Leddy Amphibian	2.50
Leddy Jeep	1.90
Cavacraft Piper Cub	.50
Maircraft	.35 up

Add 15c for Packing & Post.

RUBBER POWERED

Cleveland	$1.00 up
Megow	.25 up
Scientific	.35 up
Comet	.25 up
Green Hornet	.50
Kaydet	.25
Shooting Star, Ryan Fireball, Globe Swift, Stinson	1.00
Capitol	.65 up
Berkeley	1.25 up
Eagle 4-1 Series	1.00
Modelcraft	.25 up
Ideal	3.50 up

Add 15c for Packing & Post.

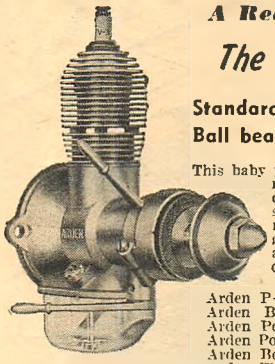


POPULAR ERCOUPE

$7.50 less motor

Add 25c for postage

This U-Control plane has a 40" wingspan and is a deluxe model. With the war over, fellows are turning to models of favorite civilian planes such as the Ercoupe. This is one of the most famous because it has eliminated the use of rudders and is certified spin-proof.



A Real Power House

The New ARDEN

Standard $19.50

Ball bearing $22.50

This baby packs the power! One of the newest motors. Precision machining and your choice of the standard or ball bearing model make this motor a giant among the midgets. Get an Arden and get ahead of the crowd.

Arden P-099	$19.50
Arden B-099	22.50
Arden Power Unit	26.50
Arden Power Unit (less engine)	9.00
Arden Booster Jack	1.50
Arden Flight Timer	1.50

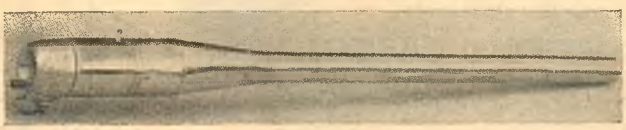
A Real

JET

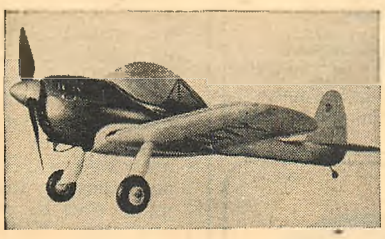
Engine!

$35.00

Add 25c for Packing & Post.



This MINIJET engine is the real thing, modeled after the famous V-1 Buzz Bomb engine. The Minijet is 27" long and 2" in dia. Weighs 16 oz. Burns gasoline—2 oz. per minute. Develops more than 2 lb. thrust. It can be used as the fuselage with surfaces attached directly to the engine's body.



PIPER SKYCYCLE

$7.50 less motor

Add 25c for postage

This baby (a Capitol Model) is patterned after its big brother recently brought out by Piper, the famous light plane designer. No collection is complete without the Skycycle. Buy it and fly it!

Burgess Batteries!

Burgess 3-volt Booster Battery	$1.05
Burgess 3-volt Class B	.55
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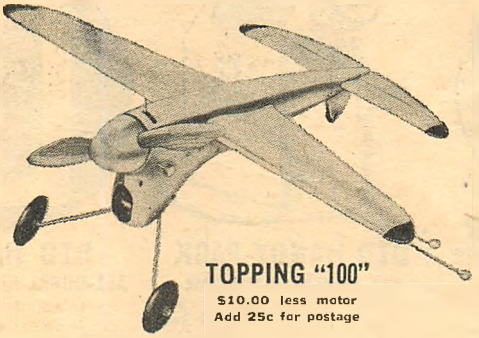

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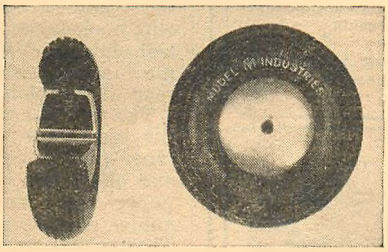

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Retractable Landing Gear

(*Continued from page* 35)

main spar which it will be necessary to cut. The wells are ¾" deep and large enough in inside diameter to allow 1/16" clearance around the wheel. The walls are ⅛" thick. Carefully mark the position of the wells and cut away the necessary ribs, etc., to permit the wells to fit snugly into the wings and cement the wells in place. Cut a 3/16" square notch in each rib inboard of the wheels and directly in front of the main spar to accommodate the wheel struts. Line this recess with 1/16" sheet balsa. Make the wheel strut covers of 1/16" sheet and cement them to the struts.

To help prevent these covers from cracking or breaking off when the landing gear struts bend in absorbing shock, cement only the ends of the strut to the cover. The body well covers are made of 3/32" sheet, curved to fit the wheel wells. Make the hinges from straight pins. Be sure these hinges work freely. The well cover locks are made of .014 wire bent as shown and cemented to the well covers. In attaching the well covers to the fuselage the hinges are placed ⅛" off center toward the rear of the plane, to prevent the airstream from the propeller from closing them prematurely.

The control wheel is installed next. It is made from two 1/16" sheets cemented together grain crossed. Pins are used as control wire pivots. Cement a 5/16" diameter ballbearing to each side of the control wheel using a wire through the center to line them up. Be careful not to get any cement inside the bearings. The control wheel mounting blocks are made of balsa; use piano wire for an axle and install the wheel. Place a ⅛" spacer of 1/16" aluminum tubing between the upper mounting and the wheel. Install the wheel in an inclined position so the main control wire will run parallel to its upper surface. The wheel control wires are made of .014 piano wire. The offsets are necessary to permit adjustments to be made and to coordinate the wheels in retracting. Cut slots in the ribs as necessary to permit the control wires to operate freely and clip them to the control wheel pins. Then attach the loops of thread from the quadrants to the control wires and adjust the length of the control wires by means of the offsets until there is ⅛" slack. This ⅛" of free movement will be used to unlock the landing gear. Pin the locks back and retract the landing gear by tuning the control wheel. If the wheels do not retract together coordinate them by changing the length of the control wires. Now release the locks and attach the thread from the locks to the control wire pulling them up snug. If the wheels are retracted now, the locks will unlock before the wheels begin to retract.

The sliding crosspiece and operating tube guides complete with crosspiece, clip, hooks, operating tube, and main control wire are constructed separately from the fuselage and installed as a unit in the rear of the plane.

The guides are made of ⅛" x ⅜" balsa; the crosspiece is built up of ⅛" x ⅜" pine—pine being used because it is harder and offers less friction. .020 wire on the upper right and lower left crosspiece guides provide a smooth bearing surface. Torque will prevent contact between the crosspiece and the remaining two surfaces. The clip is made from a radio spring binding post. Both the rear motor hook and auxiliary strand hooks are made on the same wire, first bending the

(*Turn to page* 76)

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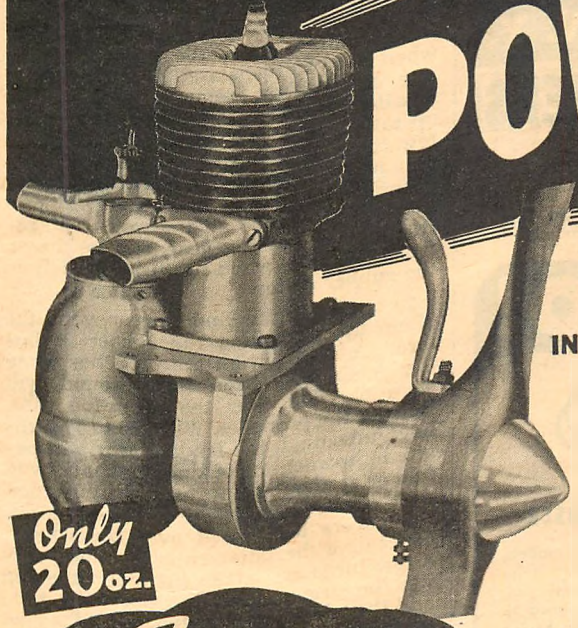

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motor hook, then pushing the wire through the crosspiece and bending the offset and the auxiliary strand hook. The motor hook is 1/16" higher than the auxiliary strand hook to compensate for a small binding turning moment which would result when the landing gear was retracting if the two hooks were in line. This method of compensating for the turning moment results in the same moment acting when the plane is being wound up, but in this case it can be overlooked as it does not interfere with the operation of the system.

Final adjustment of this turning moment can be made when installation of the system has been completed by sliding the rear auxiliary strand hook up or down on its post as required. The operating tube is made from 3/16" O. D. aluminum tubing, a shallow slot being filed 3/16" from each end where the main control wire is to be fastened to prevent the control wire from slipping. The main control wire is made from .020 piano wire. Use the "Y" connection at the operating tube to prevent the tube from twisting in the guides. Do not cement the wire to the operating tube as it has a tendency to rotate while being withdrawn from the clip.

The adjustment offset is used in the main control wire to permit adjustment in its length. Attach the main control wire to the operating tube and place tube in its guides; then set the entire unit between the bulkheads, line it up carefully and cement in place. It will be necessary to cut the bulkhead in front of the guides assembly to get the main control wire into the fuselage. Clip the main control wire to its pin on the control wheel; then install the auxiliary strands; 6 strands of ⅛" flat rubber were used in the P-47. Use a vertical post for the rear support. 16 strands of ⅛" flat rubber were used to fly the model.

To adjust the retracting mechanism, wind up the model, stretching the rubber before beginning to wind it. If the clip is not pulled up to the operating tube when 30 to 50 turns are left to be packed into the rubber, remove some of the auxiliary strands. If the clip reaches the operating tube too soon, try putting a few turns in the tail block in which the rear post is mounted. Adjust the clip by opening and closing it until it will pull the operating tube all the way back, retracting the landing gear, and be drawn from the tube, when no turns are left in the rubber motor.

In operating the landing gear, wind the plane up, stretching the rubber as before. A final tug on the propeller when the motor has been fully wound will snap the clip over the operating tube. Release the propeller. When 30 to 50 turns have unwound, the landing gear will begin to retract, unlocking first, and will fold after about 100 turns of the propeller. As the wheels strike the well cover locks, the covers are closed over the wheels, concealing the latter entirly. When only a few turns are left in the motor the clip will be drawn from the operating tube and the wheels will extend, the locks then springing back into place.

Be sure everything works freely and nothing sticks to prevent the wheels from extending.

Test the model in flight and determine the number of turns of the propeller necessary to get the ship off the ground before setting the tension in the auxiliary strands and flying the model with the retractable landing gear in operation.

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with a DELONG "30"

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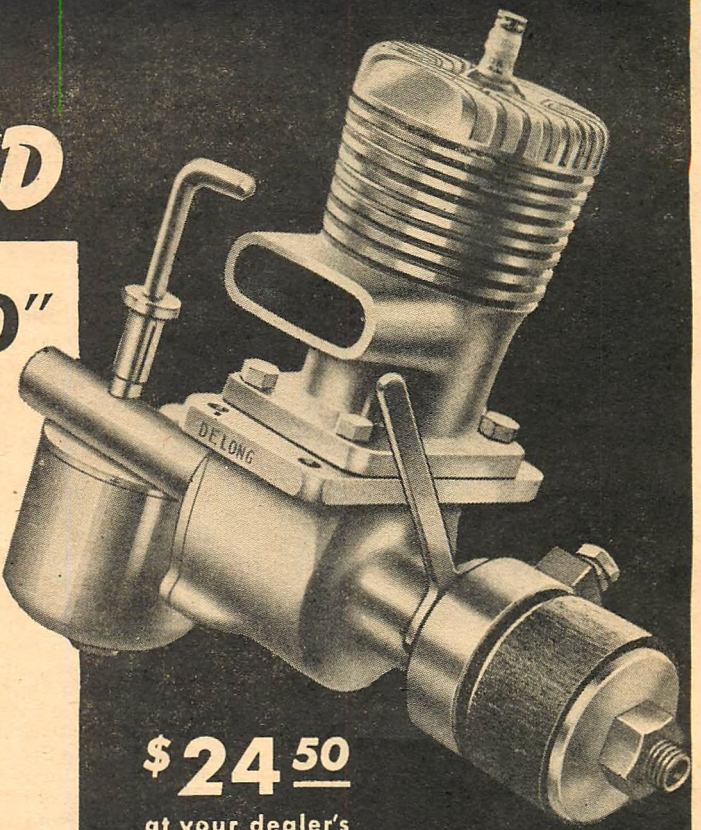

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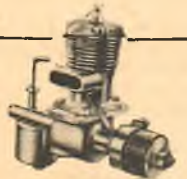

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World War I

(*Continued from page* 38)

German and Allied armies trenched in, fighting was marked by sporadic sector drives, some of which meant the gain of a few hundred yards of ground and the loss of a good many men.

To ease the situation, the air arms of both factions had been called upon from time to time to give support to the attackers. As the Spads, Nieuports, Fokkers, and Albatroses went after the opposition preparatory to an "over the top" drive, what we know as attack aviation developed. The application of airplanes to this duty in 1916 changed the strategic picture to a considerable extent, but there was much to be desired.

In a French General Staff meeting in mid-summer 1916, it was pointed out that destruction of materiel in an attack was more important than destroying personnel. Aircraft designers were requested to develop something that would help to realize this new strategy. As a result, improved Le Prieur rockets were tried, but the limited numbers which could be carried and the difficulty in hitting a small target ruled them out. Salmson proposed and built an armored version of the two place observation plane to protect it from ground fire but did nothing to increase its offensive potential. Small bombs were fitted to attacking pursuit planes, but ships like the Spad or Nieuport could carry at the most only 4 twenty pounders and their chances of hitting a target direct were as slim as with rockets.

Bechereau's Answer

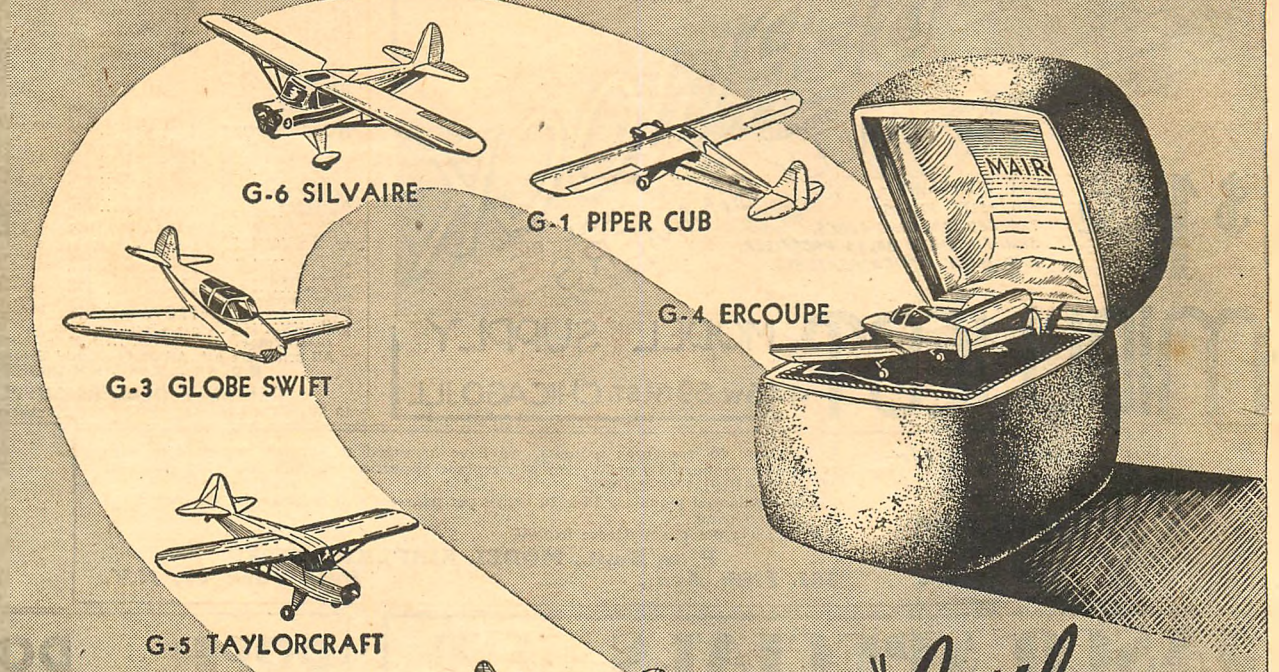
Where other designers merely tried to adapt existing weapons to solve the problem, Bechereau worked on a thought passed on by one of the French officers at the meeting: the solution to an effective attack was the destruction of enemy arms by pinpoint attack. Bechereau knew .303 slugs then used in aircraft machine guns could kill troops but generally bounced harmlessly off important heavy ground equipment. Since direct hits by bombs and rockets were unlikely, he reasoned that direct hits by a missile somewhere between the .303 slug and a twenty pounder was required.

Bechereau envisioned a new single seat fighter, equipped with a small bore cannon in its nose, larger and heavier than his Spad S-7 in order to carry the added weight of guns and ammunition. This also required more power. Bechereau contacted Marc Birkight, Hispano-Suiza designer with whom he had worked previously, and outlined to him the idea. And Birkight, as he had in the past, came through with a new motor to do the job: the Hispano-Suiza model 8C, delivering 220 rated horse power, more than had ever been put into a single seater.

The engine was well suited for Bechereau's idea of having a shell fired through the propeller shaft because of its reduction gear box. The 8C engine turned 2,150 revolutions per minute to deliver its power output against 1,700 and 1,800 for earlier models. The gear box reduced the high crankshaft revolutions to an efficient figure for the propeller. And with a small bore cannon fitted into the "V" of the engine cylinder blocks, low enough to extend the blast tube through the prop shaft, Bechereau had his answer.

While Birkight was working out production details of the cannon engine, Bechereau turned to designing a plane to carry the combination. On his design

(*Turn to page* 81)



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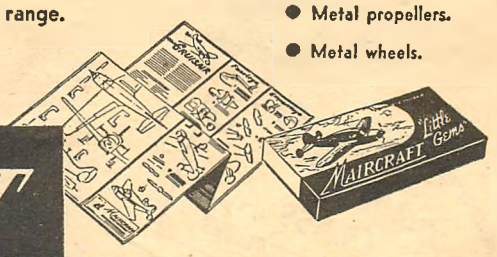

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list it became model S-12Ca.1 and rapidly took shape. Following closely the lines of previous Spad types, the S-12 had a wing area of 215 sq. ft., and a gross weight of 1,960 lbs., about 400 lbs. heavier than the S-7. Overall length of 21 ft. 7 in. and wingspan 26 ft. 3 in. provided a larger ship than previous models.

The longer moment arm of the S-12, compared to the S-7, required additional rudder area. This was added by rounding the rudder's trailing edge. And to take care of the offset in the thrust line caused by raising the propeller shaft vertically (the gear box was responsible for this), the entire radiator assembly was placed higher on the S-12 than on the S-7. Engine cowling on the cannon carrying plane thus lost the down-curved contour and cylinder head covers familiar on the S-7.

The cannon Bechereau and Birkight chose for the installation fired a 37 mm. (about 1½ in.) diameter explosive shell. Developed early in the war as a naval weapon, the gun was at first installed on several French observation and bombing types, notably Voisin and Breguet, both of which were pusher biplanes. Planes so equipped were purely experimental, however, and the idea of a cannon carrying plane died because nobody at that early stage of aerial warfare could figure a way to use it effectively.

In the S-12, the cannon was fitted so its breech rested in the cockpit between the pilot's feet and legs. A single shot affair, the weapon was loaded, charged and the empty shells ejected, all by hand. Two ammunition cases, located one on each side of the fuselage beneath the instrument panel, carried a total of 14 rounds. In firing position the breech was moved forward sufficient distance to make room for recoil. In addition to the cannon, the Spad S-12 carried a single Vickers machine gun synchronized to fire through the propeller following the standard practice.

Spad 12Ca.1 Performance

Since stability and smoothness of control was a requisite to the S-12's success as a gun platform, Bechereau paid considerable attention to details insuring these features. Stagger was incorporated in the S-12 cellule where it had been ignored in the S-7 to make a maneuverable ship. As a compromise, the S-12 was also designed for a good rate of climb should it be attacked and the pilot find it necessary to go upstairs in a hurry. But all these things combined to make the Spad S-12 slower than the last model Spad S-7, in spite of higher power and more favorable loadings.

Specifically, the S-12 was capable of 130.5 mph at 6,500 ft. altitude and 116 at 16,400 ft. Although not designed as a high altitude fighter, the S-12 had an absolute ceiling of just 20,000 ft. Rate of climb was good, however. The S-12 reached 6,500 ft. in 4 min. 20 sec., and 16,400 ft. in 18 min. 40 sec. Air endurance, because of a low fuel load, was only 1 hr. 10 min. at cruising rpm.

Spad S-12 in Action

As a matter of record it should be stated here that the Spad S-12 airframe, during the long Hispano-Suiza 8C development period, was modified and fitted with a standard Hispano 8Ba engine of 200 hp and put in production as the Spad S-13C.1. The need for a new fighter to replace the Spad S-7 was paced by developments in bombing which pretty much eliminated the need of the S-12 as a ground support weapon. The result was that when the S-13 went into action in squadron numbers during August 1917, the Spad S-12 was sent along as part of the contingent to test the capabilities of its cannon as an air-to-air weapon. Like so many airplanes in World War II, the need for the S-12 passed before it could be made ready for action!

Rather than trust its future to unskilled pilots, French headquarters earmarked the few existing models of the S-12 for aces like Fonck and Guynemer. These two men were the only pilots who accounted for German aircraft with the S-12's cannon. Guynemer flew the ship intermittently for nearly a month before he was shot down in September. The plane he flew at the time of his death was a Spad S-13, but he managed to gain one victory with the cannon job.

Intensely interested in the mechanical details of airplanes, Guynemer was very much disturbed over the fact that the cannon recoil mechanism did not absorb the shock sufficiently to prevent damage to the plane's structure. He reported that many glued joints in the forward fuselage were cracked. Also annoying to him was the noise in the propeller gear box which developed after the cannon had been fired several times. Apparently the firing shock loosened the assembly beyond its engineered tolerances.

Rene Fonck, on the other hand, was more successful with his Spad S-12 and managed to shoot down a total of 11 German planes, 7 of which were confirmed and stand in his official victory log. His main objection was the slowness with which the gun had to be loaded. Although he admitted it was "formidable armament," Fonck claimed that about 30 seconds were required to extract a fired

shell and replace it with live ammunition. This necessitated much hand work, bending down to reach the mechanism, during which time the pilot's attention was distracted from the air about him.

Another objection raised unanimously by all who flew the S-12 related to their fear that a German bullet might hit and explode the cannon ammunition.

Experiments with the S-12 continued well into 1918, but the plane was never produced in other than service test quantities. Bechereau's idea and Birkight's perfection of it just didn't have a place in the air war scene of 1918. They established a precedent, however, that was used successfully in World War II. Their pioneering put the airborne cannon on the "must" list of modern aircraft weapons!

Model Mixmaster

(*Continued from page* 17)

the bulkheads cross-grain by cementing strips of 1/32" x 1/16" balsa across the joints. All bulkheads are 1/16" sheet except A, B, I and J which are 1/8" sheet.

Cement bulkheads D, E and F to centersection of the wing. Add the two 1/8" x 1/16" stringers on each side. Then add the remaining bulkheads and stringers. The nose is solid balsa, cut roughly to shape, cemented in place against bulkhead A, then sanded to its final proportions. When the cement has dried, go over the fuselage frame carefully with sandpaper. If you detect any poorly cemented joints, re-cement them.

Note that a small hardwood bearing block is used to guide the propeller shaft.

ASSEMBLY AND COVERING—Tail surfaces and landing gear are installed before the model is covered. The music wire frame for the landing gear may take a little cutting and trying to get it shaped just right, but once securely cemented in place it's just about undamageable because the wire absorbs landing shocks.

Cover the model carefully with tissue. Use small pieces where the frame is sharply curved, as at the nose and tail of the fuselage. If the tissue wrinkles as you put it on, remove it and try again with smaller pieces. When the frame has been covered, spray it lightly with water to tighten the tissue. A single coat of very thin clear dope will make the model more durable at the expense of weight.

DETAILS—The two "bug-eye" pilot enclosures are carved from solid balsa and cemented in place. The nose and the two "bug-eyes" are given about three coats of white dope with sanding between coats, and the frames shown in the drawing are simulated by drawing with india ink. The blue and white stars are painted in place, or if bought from a model dealer, doped in place. Engine exhausts are simulated by strips of 1/16" square balsa doped black and cemented to the fuselage at positions shown. The wells into which the wheels retract are painted in with black dope; the well-covers are cut from 1/32" sheet balsa and cemented in place.

If you've done a careful job of construction on your *Mixmaster* you'll want to use it as a display model when you're not flying it. In this case, the two three bladed scale props shown on the drawing will be well worth building. For flying, however, a single two bladed prop is used.

FLYING—Try gliding the model. If it stalls, add modelling clay to the nose until it glides smoothly. If the model dives, warp up the trailing edge of the stabilizer. Two strands of 1/8" flat rubber are just about right to power the ship. Use a winder when you've reached the right adjustment and prepare to start running!

Plane on the Cover

(*Continued from page 23*)

however, ATSC engineers, headed by H. Allen Sullivan, saw the greater application of the design to bombardment rather than attack missions, and the designation was changed to XB-42. (It was by the greatest coincidence that "B-42" happened to be the next number on the list available for a new bomber design and this change was not merely one of replacing an "A" with a "B.")

Successful completion of the radical XB-42 involved the solution to numerous problems of precedence-shattering complexity. For example, with no engine nacelles in which to retract the main landing gear, Douglas engineers were forced to design a gear that would retract into the fuselage. Location of the stowed position was difficult because of the engine location, the arrangement of the bomb bay and the necessity for locating the main trunnions as well as the wheel axles in a carefully prescribed relationship with the airplane center of gravity, the nose wheel axle and the wing lift line in the landing attitude. Final solution appeared in the aft fuselage placement, with large doors opening to enclose the gear as it retracts and sealing it in the fuselage without interruption to the airflow.

Because of its radical powerplant arrangement, high speed, original armament installation and numerous tactical features, the XB-42 was designed, built and tested in greatest secrecy. First of the two experimental models built was initially flown at Wright Field in June 1944. The second plane was in a preliminary testing stage when the first of the type was destroyed. The engineering and testing team of the second plane shouldered the responsibility of the endless changes and modifications dictated by flight tests and obtained encouragement from General Arnold in a plan for a dramatic coast-to-coast dash. Early last September the existence of the *Mixmaster* was officially announced and the strange craft groomed for its flight. On December 8, 1945 it covered the 2,295 miles from Long Beach, Calif., to Washington, D.C., in 5 hrs. 17 min., an average speed of 432 mph, breaking the existing record by well over an hour!

But the *Mixmaster* jinx that had dogged the first plane overtook No. 2 and on Dec. 16 it, too, was completely demolished in a crash following a takeoff from Bolling Field, Washington, D.C. All three of the occupants parachuted to safety; the pilot reported difficulty with an engine air intake cooling flap which malfunctioned.

The XB-42 had a wingspan of 70 ft. 6 in. and was 53 ft. 8 in. long. It weighed 10 tons empty and about 36,000 lbs. fully loaded. It was powered by two Allison V-1710 engines each developing 1,630 hp @ 3,200 rpm @ 3,000 ft. The liquid cooled engines drove individual propellers in contra-rotating directions, thereby eliminating torque. A feature, which actually saved the lives of the crew and proved its purpose, was a special cord of magnesium wrapped around the propeller shafts which, when ignited, neatly burned the housing in two and thus ejected the propellers from the plane. The 3 place high speed bomber carried 4,000 lbs. of bombs over a range of 3,000 miles, and could be augmented to 5,000 miles for special ferrying purposes.

This second mishap to the *Mixmaster* design seemingly torpedoed the company's plans for production of a commercial model. Although numerous airlines had expressed interest in the strange

craft, they quickly withdrew their engineers from the project and aviation seemed ready to forget the *Mixmaster*. But not Donald Douglas, the canny but persevering Scotsman. A Douglas official tells MODEL AIRPLANE NEWS readers that the firm has *not* abandoned the DC-8, as it is to be known; nor have the airlines completely dropped their interest. The project is now undergoing redesign, not because of any error in its design calculations nor because of the XB-42 accidents, but simply to accommodate more completely the airlines' rapidly changing requirements. The airlines cannot comfortably afford to overlook the astonishing 41.6c per airplane mile the DC-8 will achieve.

Few commercial airliners have ever met more of the airlines' request than has the DC-8. For example, the cabin floor is only 60 in. from the ground, affording ease and time-saving in loading and unloading passengers and cargo. Pilot vision is clear all around and not obscured by large engine nacelles. The forward portion of the cabin may be quickly converted from passenger to cargo accommodations through use of a simple partition, thereby permitting it to fly at 100% load factor at all times. The engines are located in the fuselage belly near the nose, making possible inspection, adjustment and maintenance without use of ladders or elevated workstands.

The DC-8 is a large airplane yet its wingspan is only 110 ft. It is 77 ft. 10 in. long and stands 25 ft. 9 in. high to the tip of its cruciform tail. It will weigh just 20 tons gross of which nearly 40% is useful load. Passenger accommodations vary between 34—permitting maximum utilization of the convertible cargo-passenger compartment—and 48, the maximum provided.

The strange craft will have a top speed of more than 300 mph and will cruise at 270 mph at 10,000 ft. It will climb at sea level at 1030 feet per minute, and at 840 fpm at 10,000 ft. On one engine it will still climb at 285 fpm at sea level and 145 fpm at 10,000 ft., a remarkable accomplishment. On one engine it can operate continuously at 12,000 ft. It will land in 3960 ft. and take off in 3950 ft.

Creation of the DC-8 was a wedding of two separate Douglas ideas. Two years ago Douglas announced the *Skybus*, a 24 passenger, twin engine monoplane designed for maximum economy, weighing only 17,300 lbs. loaded. At the time Douglas had just completed the first test flight of the XB-42 bomber. By combining the predominate features of each, the DC-8 resulted.

Donald Douglas has become inseparably linked with transport aircraft and the world well knows that there were more DC-3 transport planes in service during World War II than all other types combined. The DC-1, prototype of the thousands of twin engine, low wing monoplanes that were to establish entirely new rules and conceptions in airline operational thinking, was born in 1932 under the knowing engineering of Donald Douglas, Arthur Raymond and John K. Northrop. The DC-2 was the production version, the DC-3 a slightly larger, more luxurious version. Douglas' "ten years ahead" thinking produced the mighty DC-4 four motored giant that spawned the powerful and ubiquitous C-54 *Skymaster* of World War II fame, and that bids fair to find the universal acceptance and usage in the years ahead that was accorded the DC-3.

(*Turn to page* 86)

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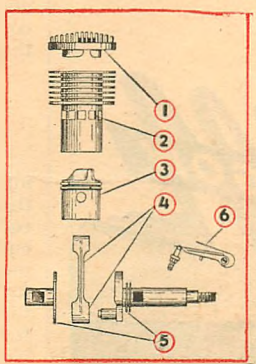

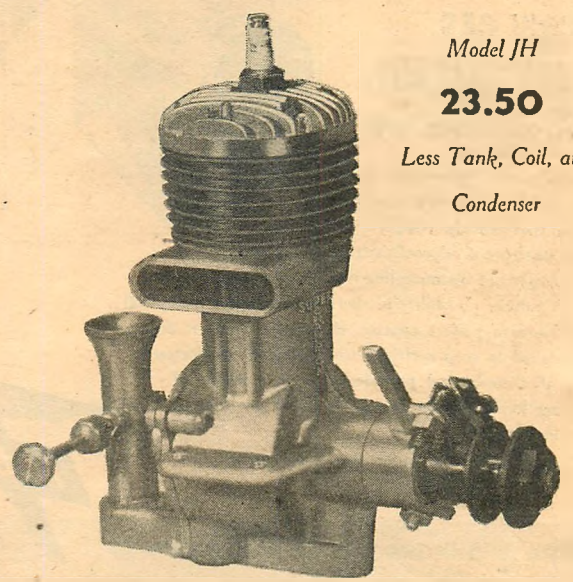

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The DC-5 answered the oftspoken desire of the airlines to have an airliner whose wing was atop the fuselage, thereby providing the passengers with adequate clear space for sightseeing. But the airline traveler had graduated from the "sightseeing" stage and the DC-5's went to foreign airlines, who used them to pioneer new routes where airliners had never flown before. The Marines used them as the first paratrooper transports in the U. S. and carried them right into war service. The DC-6 was another step upward, an enlarged DC-4 with longer fuselage and more passenger and cargo accommodations. The mighty DC-7 is the world's largest transport plane now in service in quantity, and as the AAF C-74 *Globemaster* it is capable of smashing all existing records for high speed, high altitude load carrying.

The DC-8 is a return to the "medium" size transport, the size the airlines know are the answer to the problem of frequent service, the major demand of the air traveling public. Strange as it may appear, the DC-8 stands up to the Boeing 431-16, Consolidated-Vultee Model 110, Martin 202, Curtiss-Wright CW-28 and other designs submitted to the airlines and achieves superiority on numerous counts while comparing favorably with them on all counts.

Flash News

(*Continued from page 2*)

alternating current electrical system and the special "force feel bellows" which reduce the control surface loads to those easily handled by the average pilot. The monster 10,000 mile range bomber is the first of 15 of the type and cost $13,000,000 to build. Its first test flight is scheduled for early summer and will take place at Northrop plant in Hawthorne, Calif.

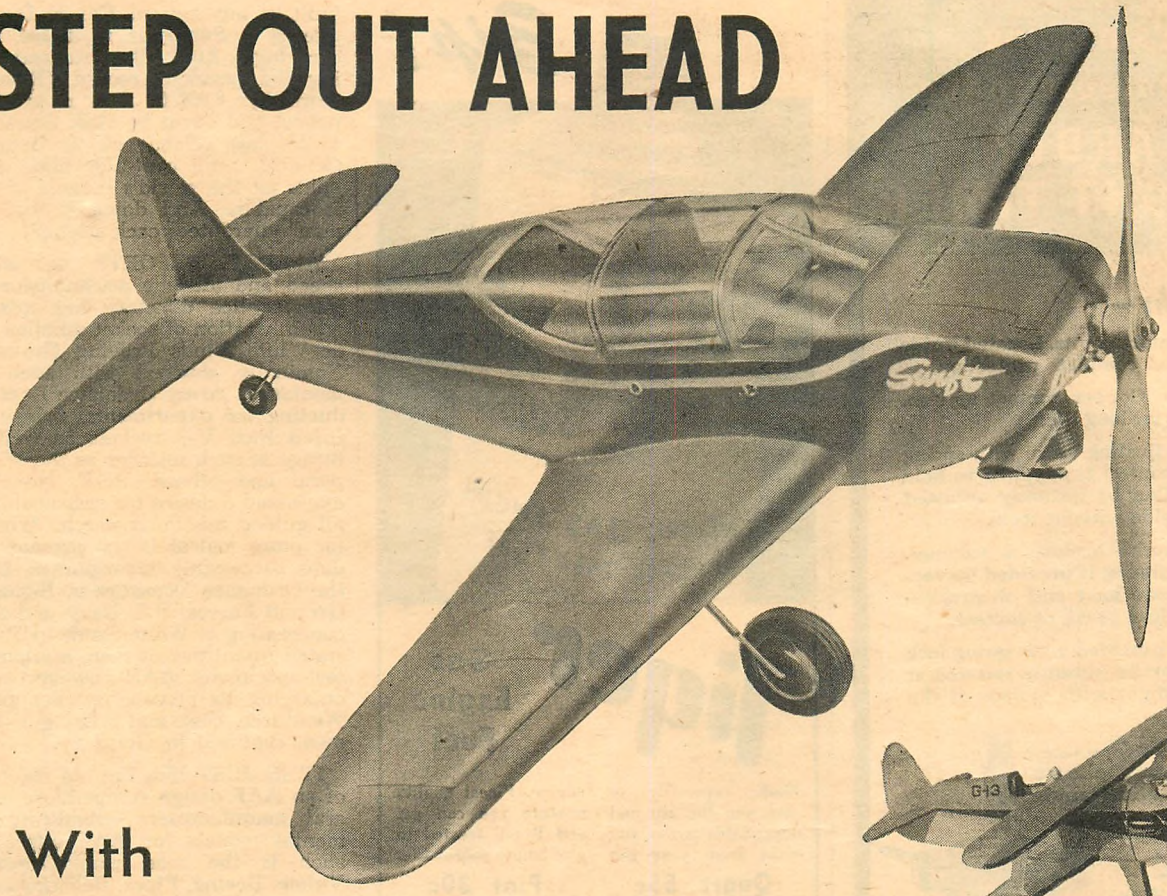
FIRST TRANS-CONTINENTAL mass flight of jet propelled aircraft was completed successfully with the flight of 25 Lockheed P-80 *Shooting Star* fighters from March Field, Riverside, Cal. to Washington, D.C. The flight was made in easy stages (just loafing along between 450 and 500 mph) and was led by Col. Bruce Holloway, C.O. 412th Fighter Group at March Field. Maj. Gen. Elwood R. Quesada, C.G. Tactical Air Command, directed the operation. The P-80's were accompanied (more or less) by four Fairchild C-82 *Packets* containing spare parts and ground crews.

WHAT LOOMS AS the largest and most elaborate air show since V-J Day, the "World's Fair of Aviation," will be held at Omaha, July 18-21. Both Army Air Forces and Naval Aviation announced their intention to participate with late-model planes in both the exposition and flight phases of the show.

AAF HAS opened war on mosquitoes and insects at its bases and camps throughout U.S. Three Douglas C-47 *Skytrains* of Troop Carrier Command, especially equipped, will spray DDT from low altitude over the affected areas. Major B. F. Forester is in charge of the work. This will mark the first full scale attack by airborne DDT and will provide data which may prove useful for infected towns and cities in the future.

MORE AND MORE Boeing B-29 *Superfortress* records are being set, the latest for altitude with load. While these may not seem as dramatic as the speed or long distance variety, they represent world's best performance and superiority of the B-29 over any other airplane ever

STEP OUT AHEAD



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Price per pair **$3.50**
Complete with mounting bracket

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This kit is designed to save you time in construction and assure you a realistic model without motor or liquids **$7.50**

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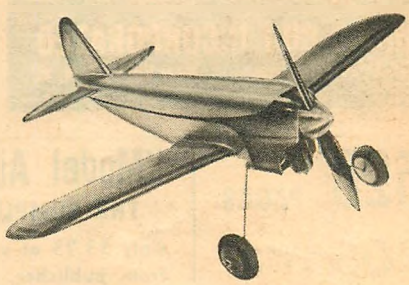
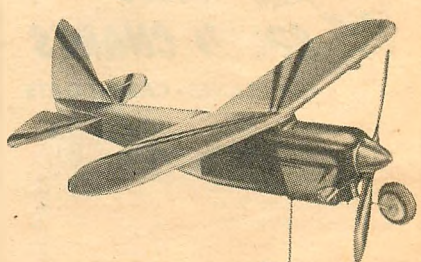
The "G-13" **$7.95**



The Hornet **$7.50**



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built by any nation! Col. E. D. Reynolds piloted a *Superfort* to 44,200 ft. while carrying a 2,000 kilogram load, surpassing the previous record (Russian) by more than 8,000 ft. AAF record breaking policy, laid down by Gen. Arnold as one of his last official acts as Commanding General, will continue until the U.S. holds all the world's records of which it is capable. And doing it for "the ole man" guarantees each attempt!

AMIDST REPORTS of astounding speed and altitude accomplishments, an inter-service difficulty has arisen over administration of rocket missiles research at White Sands Proving Ground, N.M. Nominally charged with such experimentation, Army Ordnance Dept. is conducting the experimental firings of captured Nazi V-2 rockets as well as test firings of such missiles as the *WAC Corporal* and others. AAF, however, has expressed a desire for responsibility over all guided missile research. What seems far more logical is the present (and to date successful) arrangement in which the Ordnance Department, Signal Corps, Ground Forces, U.S. Navy and AAF are cooperating at White Sands by furnishing stated quantities of men, equipment and test specimens. AAF, however, is rapidly enlarging its private proving ground at Wendover, Utah and is firing V-2's of its own, captured in Germany.

IT IS JUST like the old days to hear of an AAF design competition, with several manufacturers submitting experimental models for AAF appraisal, but such is the case with Consolidated-Vultee, Boeing, Piper, Bellanca and Ludington Griswold supplying Wright Field with test models for a new liaison and artillery-spotting design. Although no details are available, the Griswold design is said to be the most radical.

THE SECOND Landgraf helicopter is due for first test flights soon. It is being built under an AAF contract and will be considerably different from the original model. No designation yet announced.

BOEING AIRPLANE Co., in its report to stockholders, reveals it now has contracts for 60 B-50 *Superforts* (B-29 with P&W *Wasp Major* engines) and 10 C-97 *Stratocruiser* cargo models.

LOOK FOR even more unpredictable designs from Northrop Aircraft. Latest news is the Northrop *Pioneer*, a high performance commercial transport that is not a flying wing but a tri-motor!

THE NAVY has purchased American patents to famed Handley Page Slotted Wing, which was used on Curtiss-Wright and other military craft during the war. This move indicates a cash purchase proved more profitable than recurring royalties on rights which, in turn, would indicate the Navy's expectancy of much future use of the feature which has been employed since 1919.

BOEING has gone into production on its much-discussed Model 417 feederliner at its Wichita Division. The 20-24 place monoplane has been an "on again-off again" project for many months. The twin engine craft will feature such "big plane" items as "hot-wing" deicing, dual-wheel tricycle landing gear, cabin conditioning, independent ventilation system.

ENGLAND HAS at last recognized the helicopter as being here to stay! The Bristol and Fairey companies announced helicopter projects which, incidentally, they refer to as "gyrodynes." Numerous Sikorsky models have been in use with R.N.A.S. and R.A.F. throughout the war.

No details of the two projects are available as yet although one report indicates that the "best features of the autogiro and the helicopter will be combined in the new designs."

CONTINUING RELEASE of secret wartime developments indicate that not the "next war" but the last one was an "electronic" war. Data on the "Ring" and "Block" television systems reveals that television was actually used during World War II in several applications. "Ring" is a system consisting of one camera in the nose and one in the fuselage, electronically controlled, which transmitted images up to 200 miles to command posts on the ground. "Block" is a single camera system useful for distances of 15 to 20 miles. Television was used for guiding pilotless bombers loaded with high explosives, observation of gunfire, artillery spotting, amphibious landings and mapmaking. It was used for the first time at Bougainville and Rabaul and in numerous operations thereafter. Essentially the system consists of an airborne unit which picks up what it sees and transmits it to a television screen in the control room at headquarters. Officers are enabled to direct their operations on the basis of the instantaneous situation at the front from a point well to the rear.

ONE OF AVIATION'S worst enemies has been partially licked. Precipitation static, created by discharge of electrostatic current generated by rain, snow, dust, etc. has played havoc with radio reception and been blamed for countless disasters. The Joint Army-Navy Precipitation Static Project, formed during the war, completed its three year investigation and announces that a tiny cotton wick, impregated with colloidal silver, is the most effective corona discharge device yet provided for eliminating this menace to aircraft radio.

AUSTRALIA'S NEW Commonwealth CA-15, a North American *Mustang* built under license, has been considerably modified. Release of pictures following the successful flight test of the first production model reveals a general "squaring up" of the *Mustang's* formerly smooth fuselage lines. An elongated fuselage and dihedral horizontal stabilizer are the most pronounced differences.

TWO OF THE most important appointments in recent years are those of Arthur E. Raymond and Ronald M. Hazen to National Advisory Committee for Aeronautics. This is the first time in the 30 year history of this famed group that representatives from the aircraft manufacturing industry have sat on the main committee, a move carefully avoided in previous years due to the "general benefit" directive of the group. Raymond is Vice - President Engineering, Douglas Aircraft Co., Inc. and President of Institute of Aeronautical Sciences. Hazen is Chief Engineer, Allison Division, General Motors Corp.

THE $500,000,000 Federal Airport Bill was passed by Congress but its approval simply authorizes the expenditure of this fund; it does not appropriate the money, which must be provided at a later date.

NEW LIGHTPLANES continue to pop out of factories varying from multi-million dollar converted warplants to backyard workshops. The new Meyers MAC-125C is a two place all-metal low wing with 120 mph cruising speed. It has retractable landing gear and slotted flaps. The Bartlett *Blue Zephyr* is a development of the early Babcock monoplane. It is a single place shoulder-wing monoplane of steel tube-fabric covering con-

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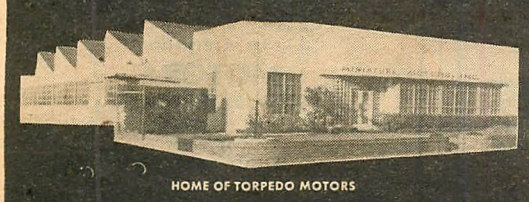

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struction. Aviation Boosters' *Skyhopper* now sports a sliding canopy. It cruises at 110 mph and has been announced in the $1,000 class. North American is now releasing the *Navion* for construction on a 750 plane basis, a sharp upward revision of earlier production plans. First deliveries are scheduled for July. Beech Aircraft received 500 firm, money-backed orders for its still unannounced, unspecified, undesigned four place, all-metal, 165 hp model, certain evidence of the value of a reputation. Cessna has upped its price on the two place 140 to $3245, and to $2695 for the two place Model 120. Republic is holding fast to its $3995 tag on the *Seabee* and announces production plans for 900/month towards a goal of 5,000 completed airplanes before this year is out. Whew! The Globe *Swift* has a new 125 hp engine, replacing the 85 hp previously used, which raises its cruising speed to 135 mph. Bell is at work on 500 of its Model 47 two seat helicopters and will announce the five seat Model 42 this fall. Officially licensed and approved, the Sikorsky D-51, with a sleek commercial paint job, is now in production. Howard Hughes has decided not to produce the Johnson *Rocket*, following studies made by his engineers.

IT SHOULDN'T happen to a dog but it did. AAF 2nd Lieut. P. L. Murray got into trouble the other day and landed on a farm near Cold Spring, N. Y. The farmer got down off his tractor and approached the young man. When he introduced himself as Secretary of War Patterson, Murray retorted: "So's your old man!" Patterson, spending a working weekend on his farm, provided gasoline for the young pilot who continued his flight. If our younger readers hear of an AAF officer by the name of P. L. Murray in 1970 we can bet he'll still be *Second Lieutenant* Murray!

Dragonfly

(*Continued from page 32*)

position on your workboard to prevent possible warpage. In order to keep the tissue taut, give the entire model two coats of clear dope. The cabin section may be covered with a thin sheet of celluloid. Outline the windows with strips of black tissue.

ASSEMBLY—Cement the rudder perpendicular to the stabilizer; be sure it is not offset to the right or left. Several drops of cement hold the wheels in place. Insert 8 strands of lubricated 1/8 in. rubber in the fuselage. The wing and stabilizer unit are held on by rubberbands.

FLYING—Careful testing is required to get maximum performance from your model. The first step necessary in adjusting is to glide the model from shoulder height. This should be done over high grass in order to prevent any damage during this stage. The gliding period should be continued until a long flat glide is obtained. Correct any stalling or diving tendencies by applying positive or negative incidence to the stabilizer. Your model should now be ready for the initial power flights.

Give the motor a few turns and launch the model into the wind; observe the flying characteristics. If necessary, make any needed adjustments. Increase the amount of turns when you are sure the model is adjusted correctly. To get maximum power from your rubber motor, lubricate it, use a mechanical winder, and stretch the rubber while winding.

Special note: since the *Dragonfly* will keep you chasing, be sure to have an ample supply of vitamin tablets on hand.

West Coast Tips

(*Continued from page 12*)

meeting approval will not be allowed to fly until the defect is corrected.

7. NUMBER OF MODELS. Each contestant will be allowed to enter a maximum of two different models, and they must be in different events. He will also be allowed to *fly* a maximum of two models, including his own. Each model may be entered only once in an event. A contestant may enter one model in two different events or two models in two different events. A model cannot be entered by more than one contestant.

8. NUMBER OF FLIGHTS; Not to exceed three attempts to make two official flights. A club may reserve the right to make it only two attempts for one flight if circumstances make it necessary.

9. ENTRY FEES: No club shall charge more than 50c for each model entered in each event.

10. STARTING: Four minutes are allowed to get the model started. Failure to do so constitutes one attempt. Multi-motored models will be allowed four minutes for the first motor and three minutes for each additional motor.

11. ENGINES MUST BE INTERNAL COMBUSTION RECIPROCATING.

Special Speed Rules

1. CLASSES: Class A—0.001 to .25 cu. in. displacement; Class B—0.251 to .45 cu. in. displacement; Class C—0.451 to .65 cu. in. displacement.

2. WEIGHT: There will be no weight ruling.

3. LINES: Lines must be of steel, 0.010 will be the minimum dia. Also, for each three ounces of model's weight, the lines must be .001 inches in diameter.

4. CLOCKING: Will start on the signal of the operator or his assistant. Two clockings will be taken during one flight upon signal of operator.

5. FOULS: No whipping will be allowed during the clocking of the speed event. If whipping is done to clear engine, two laps without whipping must be done before clocking will begin. Operator must fly model below 15 feet with 52.5' lines and 20 feet with 60' and 70' lines. If foul signal is sounded, operator must signal for new timing.

6. LINE LENGTHS: Lines must be:—52.5 ft., Class A; 60 ft., Class B; or 70 ft., Class C.

7. FLIGHTS: Flights over five minutes duration will be disqualified and charged as one attempt.

Precision Flight Rules

1. CLASSES: Class A—0.001 to 25 cu. in. displacement; Class B—0.251 to .45 cu. in. displacement; Class C—.451 to .65 cu. in. displacement. (Multi-engine models will take the class of the largest motor in the model.)

2. LINES: Need not be steel, but must be strong enough to pass Safety Committee approval. Must not be longer than 70 ft.

3. FLIGHTS: Flights over five minutes duration will lose landing and flight pattern points.

4. POINTS FOR PRECISION FLYING: Points will be as follows:

A. *Take-off:* sloppy—1; rough—3; smooth—5.

B. *Level flying:* Approx. 6 ft. above ground for two laps: rough—1; wavy—3; smooth—5.

C. *Climb:* (Should be at least 15 vertical feet) climb—3; steep climb—7; vertical climb—10.

D. *Dive:* (Should be at least 15 vertical feet) dive—3; steep dive—7; vertical dive—10.

E. *Wing-over:* (Vertical climb and vertical dive passing directly over pilot's head and cutting the ground circle in half) poor—5; fair—10; excellent—15.

F. *Loops:* (Consecutive) one—3; two—7; three—12; four—18; maximum five—25. Loops must be done within a quarter of a lap and must not exceed an altitude formed by an acute 60 degree angle between the ground and the control wires.

G. *Inverted flight:* Must start and end in normal right side up position and laps must be in opposite direction to take-off and landing. One lap—10; second lap—10; recovery to normal flight altitude—10. Total—30.

H. *Outside loop:* (May be started inverted or upright, but complete loop must be made)—25.

I. *Horizontal figure eight*—25.

J. *Vertical figure eight*—25.

K. *Special Maneuvers:* (Must be described on entry blank) Max. 25 total.

L. *Flight pattern:* (Contestant may choose his own pattern of any or all of the above maneuvers. Choosing a maneuver and failing to attempt to do it will lose flight pattern points, with the exception being a crash or motor failure. A crash during a maneuver will not void the flight pattern points already made from that specific maneuver up to the time of the crash.) Flight pattern points—25.

M. *Landing:* Nose over—1; rough—3; bounce—7; smooth—10.

5. APPEARANCE RATING: 1 to 10. Appearance points will be given, using the appearance rating as one factor and 50% of the total flight points made by the plane that makes the highest number of flight points in that class, as the other factor. The two factors will be multiplied together and one decimal place will be struck off the total (right side) i.e. The biggest flight points made by a plane in that class is 140 points. Let us that your plane had an appearance rating 50% of 140 gives us 70. 9 x 70 gives us off one decimal point and you appearance. Multiplying any rating by 70 would then give points for that plane, after str place.